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Landslide Risk Assessment

Proposed Residential Development
2983, 3053 and 3079 Navan Road
Ottawa, Ontario

Prepared For

EXP Services Inc. (c/o 12714001 Canada Inc.)

February 18, 2022

Report PG6142-1

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1.0 Introduction

1.1 Purpose of Study and Scope of Work

Paterson Group (Paterson) was commissioned by EXP Services Inc. to conduct a landslide risk assessment for the properties addressed 2983, 3053 and 3079 Navan Road, in the City of Ottawa, Ontario (refer to Figure 1 - Key Plan in Appendix 2 of this report). The study has been prepared in response to the requirement by the Rideau Valley Conservation Authority (RVCA) as part of the Site Plan Approval process for the City of Ottawa for the subject site.

The objectives of the risk assessment were to:

- ❏ Demonstrate that any landslide on the sloped areas, including a large "catastrophic landslide", has an annual probability less than 1:10,000;
- ❏ If the landslide hazard cannot be demonstrated to have an annual probability of less than 1:10,000, it must be demonstrated that the individual risk is $<1 \times 10^{-5}$ per year and group risk falls within the "Acceptable" zone on a suitable group risk chart.
- ❏ If none of these criteria can be satisfied without mitigation measures, then the mitigation actions required must be demonstrated to reduce the risk below 10^{-5} per year and to "as low as reasonably practicable" (ALARP). If mitigation is required, further discussion with the RVCA will be required to determine what will be acceptable.
- ❏ An associated hazard assessment of the potential for "creep" movement throughout the landslide scar.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains our findings and includes geotechnical recommendations pertaining to the design and construction of the subject development as they are understood at the time of writing this report.

1.2 Risk Assessment Methodology

The methodology of this study was undertaken using a combination of the criteria and requirements set out by the following risk assessment guidelines:

- ❏ Fraser Valley Regional District's Hazard Acceptability Thresholds for Development Applications dated October, 2020
- ❏ The Association of Professional Engineers and Geoscientists of British Columbia's (APEGBC) Guidelines for Legislates Landslide Assessments for Proposed Residential Developments in BC, dated May 2010
- ❏ Geological Survey of Canada's Open File 7312 - Landslide Risk Evaluation Technical Guidelines and Best Practices, dated 2013
- ❏ Australian Geomechanics Society (AGS) Landslide Risk Management Guidelines 2007 (AGS 2007)

The scope of work used in this assessment included a review of published literature describing landslides, geotechnical hazards, inventoried regional landslides, earthquake database, risk assessment and the geological setting of the study area. Desktop review of published topographic mapping, LiDAR imaging, and other geological mapping was also used as part of this assessment.

Field reconnaissance was carried out over several geotechnical field programs that have taken place throughout the subject site, including field review and subsurface investigations. Further, Paterson compensated the subsurface information for the study area with a review of test hole information gathered for nearby sites in close proximity to the subject site which were investigated by Paterson as part of this assessment.

1.3 Proposed Development

The subject site is to be developed as a residential development. It is understood the proposed development will consist of a residential subdivision consisting of several low-rise townhouse structures and mid-rise apartment buildings with one basement level. A gas station is also anticipated at the northwest portion of the subject site. Landscaped areas, roadways and access lanes are also anticipated as part of the proposed development. The proposed development will be integrated into the neighbouring and existing residential communities and municipal infrastructure systems and will be municipally serviced.

1.4 Review of Previous Geotechnical Investigation

For this assessment, subsurface information was collected from a set of site-specific investigations and several previous investigations carried out by Paterson and others throughout the surrounding area of the subject site. The results of the previous investigations are presented in the following reports:

- Report prepared by EXP Services Inc. for 12714004 Canada Inc. - *Geotechnical Investigation - Proposed Residential Development - 2983, 3053 and 3079 Navan Road, Ottawa, Ontario - OTT-21004743-B0,* dated August 19, 2021.
- Report prepared by Paterson for Taggart Realty Management Inc. - *Geotechnical Investigation - Proposed Commercial Development - Brian Coburn Boulevard at Navan Road, Ottawa, Ontario - PG4415-1* Revision 1, dated November 13, 2018.
- Report prepared by Paterson for Richcraft Homes Limited - *Geotechnical Investigation - Proposed Residential Development - Page Road at Renaud Road, Ottawa, Ontario - PG0861-1* dated February 26, 2007.
- Report prepared by Paterson for Claridge Homes (Carson) Inc. - *Geotechnical Investigation - Proposed Road Reconstruction - Renaud Road, Ottawa, Ontario - PG1745-1* dated January 19, 2009.
- Report prepared by Paterson for Taggart Realty Management Inc. - *Geotechnical Investigation - Proposed Commercial Development - Brian Coburn Boulevard at Navan Road, Ottawa, Ontario - PG4415-1 Revision 1* dated November 13, 2018.

Further, boreholes catalogs made available by the Ministry of Energy, Northern Development and Mines of Ontario have also been incorporated as part of the assessment. Relevant test hole information and locations are presented on the Drawing PG6142-1 - Test Hole Location Plan in Appendix 2.

2.0 Background of Study Area

Existing physiographic, geological and geotechnical information for the subject site and surrounding area is presented below to provide background information for the evaluation of the landslide risk associated with the subject site.

2.1 Bedrock Geology

The geology throughout the area of the subject site and surrounding area is generally underlain by Paleozoic sedimentary bedrock consisting of limestone, shale and dolostone. The Paleozoic bedrock is generally further underlain by igneous and metamorphic bedrock of the Precambrian shield. Specifically, the majority of the subject site is underlain by interbedded limestone and shale of the Lindsay Formation and the area south of the subject site is underlain by shale of the Billings Formation. The majority of the land north of the subject site to the Ottawa River is underlain by limestone, dolomite, shale or interbedded deposits of these sedimentary rocks (GSC Open File 8600, 2019).

2.2 Surficial Geology

Eastern Ontario Region - Pleistocene Epoch to Holocene Era

The overburden throughout the greater Ottawa region was deposited by the melting glaciers following the end of the last ice age associated with the Pleistocene Epoch. The Pleistocene Epoch began approximately 2.5 million years ago and ended locally nearly 12,000 years before present (BP). This era was characterized by a 2 to 3 km thick glacier that covered nearly all of Canada known as the Laurentide ice sheet. The weight imposed by this glacier during this era was sufficient to depress the area and the surface underlying the glacier to sea level (W. A. Johnston, 1917).

This glacier is understood to have deglaciated rapidly around 12,000 to 10,000 years BP (Wu and Hasegawa, 1995). The deglaciation period is generally characterized and observed by the erosion of the bedrock surface due to the receding action of the glacier and the depositing of these eroded sediments known as glacial till. Glacial till throughout the region, as well as the study area, has been observed to consist of an unsorted mixture of soil particles such as clays, silts, sands, gravels, cobbles and boulders. Glaciofluvial deposits, consisting of fine-grained sediments such as silts, sand and fine gravels, was deposited upon the till deposit in areas where the melting glacier gave way to streams of meltwater known as eskers. Typically, glacial till ranges in thickness from 1 to 15 m in thickness, is considered relatively dense due to the nature of its deposition, and is underlain by weathered and fractured bedrock, and further by sound unweathered bedrock.

As the glacier retired from the area during the deglaciation period, the sea water flooded west from the Atlantic Ocean and covered the land by the Gulf of St. Lawrence and formed what is known as the Champlain Sea. The Champlain Sea covered the Ottawa valley from approximately 12,000 years BP to 10,000 years BP and covered the lower ground of the ice-sheet as fast as the ice withdrew throughout Eastern Ontario (Golder Associates, 2004).

The Champlain Sea was understood to have attained a maximum elevation of 200 m above sea level (masl) at its peak (Hunter, Aylsworth et al., 2003).

During the time it covered the area, the sea deposited fine-grained marine sediments consisting of clay and silt particles throughout its basin (Fransham and Gadd, 1977). These marine deposits are commonly referred to as Leda clay, and are considered geotechnically sensitive and have been subject to extensive studies with regards to its stability, sensitivity and other geotechnical characteristics. Leda clay is characterized by its relatively thick layer depth (5 to over 60 m throughout the region) as is associated with the Champlain Sea, its grey colouring, notable compressibility and significant loss of shear strength once disturbed.

The ground surface at this time was understood to be rising, referred to as a period of isostatic rebound, due to the retreat of the glaciers (Hunter, Aylsworth et al., 2003). Unloading from the receding and melting glacier permitted a slow rise of the ground surface which further carried out the displacement of the Champlain Sea. Between 10,000 and 8,000 years BP, the rising ground surface gave way to new channels, referred to as paleo-channels, which carried substantially higher flows than the Champlain Sea (Aylsworth, Lawrence, 2001). These channels formed the proto-Ottawa River and are characterized by their depressed ground surface which may be observed in present day. The location of the subject site with respect to the paleo-island formed by the Mer Bleue and Hammond paleo-channels is depicted on Figure 7 - Paleo-Island from Proto-Ottawa River in Appendix 2.

By the end of this period, around 8,000 years BP, the paleo-channels were abandoned due to the on-going rise of the ground surface. It is understood that the proto-Ottawa River receded to its present-day alignment of the Ottawa River as a result of the rising ground surface and receding watercourses.

Between 8,000 years BP and since people have inhabited the region, significant physiographic changes have generally not occurred to the extent of the pre-8000 year BP period. This time has seen extensive weathering of the then-freshly surfaced ground and growth of vegetation and forests throughout the region. The Greater Ottawa region is now heavily urbanized and in its core and ancillary town-centres. The areas surrounding the urbanized zones are generally used for agricultural purposes.

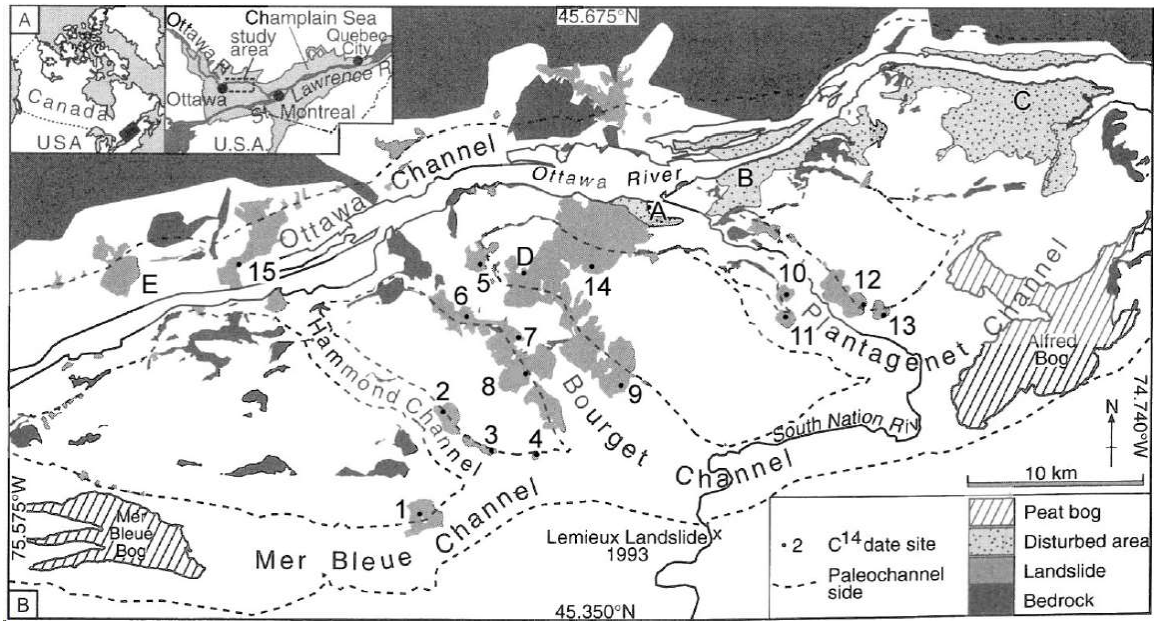

Figure 1 - Paleo-channels formed by the Proto-Ottawa River (GSC OF7432, 2021)

2.3 Seismicity and Landslides

Seismicity

The Ottawa region is located within the Western Quebec Seismic Zone (WQSZ), which extends from the Timiskaming region of Quebec to the Adirondack Highlands of New York. Further, the Ottawa region is located within a geological depression known as the Ottawa-Bonnechere Graben which merges to the east to the St-Lawrence rift system (Adams and Basham, 1989). Historically, this study area undergoes frequent small to moderate magnitude earthquakes, notably within a band located along the Ottawa River and a second band north of the River. Notable earthquake events associated with the WQSZ are the 1935 Temiscaming event which had a magnitude of earthquake intensity of 6.2, the 1944 Cornwall-Massena event which had a magnitude of 5.6 and the June 2010 Val-des-Bois event which had a magnitude of 5.0.

Recent earthquakes throughout the region have been catalogued by several agencies by the use of seismographic instrumentation, including Earthquakes Canada (EQC), United States Geological Survey (USGS) and the National Oceanic and Atmospheric Administration (NOAA). Records made available to and by these agencies date to 1663. During that period, nearly 890 seismic events have been recorded and/or catalogued within a distance of 130 km from the subject site. These records have been tabulated and may be referenced in Appendix 1 of this report. Generally, the area is considered to be a relatively high zone of seismic activity.

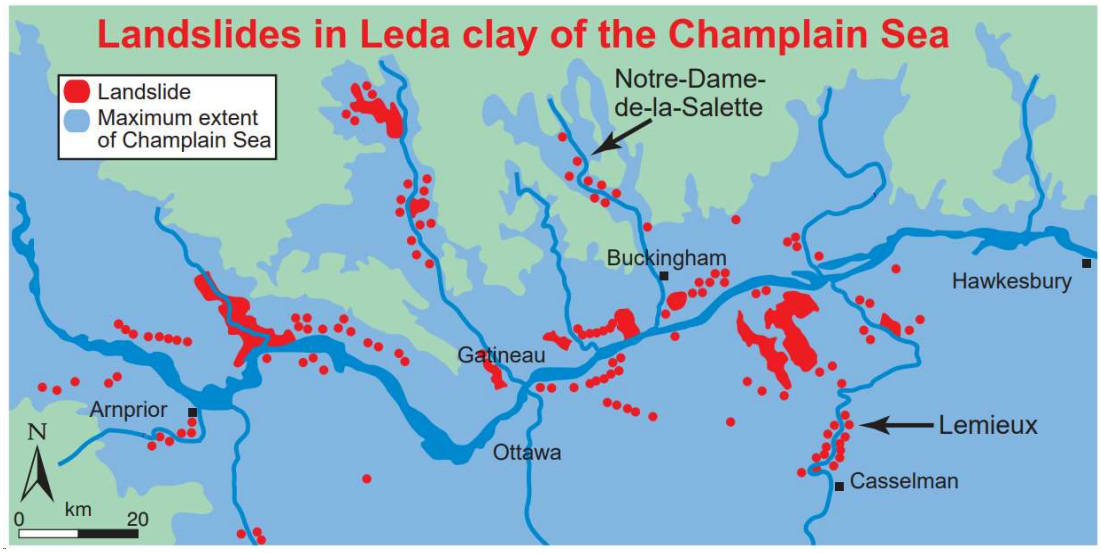

Figure 2 - Landslides in Leda Clay of the Champlain Sea (CGEN)

Previous Landslide Events in Ottawa Sensitive Clay

Landslides throughout the Ottawa region have been observed primarily throughout escarpments, steep terrains and hillsides. Landslides throughout the area have been studied and documented in literature by the Geological Survey of Canada (GSC) and other reputable agencies and institutions and are often characterized to have been triggered by a combination of factors such as:

- ❏ Significant increases in pore-water pressure during periods of rapid-snowmelt and high rainfall.
- ❏ Loss of stability at the toe of a slope or rapid drawdown, generally caused by erosion at the base of a slope from submerged or water flow conditions.
- ❏ Propagation of seismic events or ground-motion forces exceeding the forces from soil strength to resist failure and movement.

Landslides which have been radiocarbon dated by documented landslide surfaces and debris fields by GSC are generally dated as being prehistoric and having occurred between recent history and the recession of the Champlain Sea (approximately 8,000 years BP) (Brooks & Crow, 2020). Further, a notable concentration of these radiocarbon dated landslide events were grouped over a timespan of between approximately 6600 to 7150, 5000 to 5400, and 980 to 1060 years BP. It is estimated that the concentrated clusters of landslides depicted on Figure 4 in Section 4.2.3 may have been triggered by large individual paleo-earthquake events of minimum magnitudes between 6.1 and 6.4 (Brooks, 2015).

The majority of these landslides have taken place throughout sensitive deposits of the Champlain Sea which are considered susceptible to this occurrence due to their physiographic and geological settings. One of the more significant and recent landslide events that have taken place throughout the region would be the Lemieux landslide of 1993 which took place along the South Nation River. Prior to the event, regional studies had concluded that the town of Lemieux was located within a zone of potential high retrogressive failure. The town was abandoned in light of the findings in 1991 and residents were relocated. In 1993, a large earthflow consumed 17 hectares of farmland adjacent to the former town site.

The Lemieux landslide was caused by failure at the toe due to erosion at the river bank. Once the failure had been initiated, the failure zone continued to expand outwards and laterally until the movement reached a state of equilibrium. The township estimated direct costs of this event were nearly $4 million (Ottawa Gatineau GeoHeritage).

Another notable and more recently comparable landslide event had been triggered as a result of the 2010 Val-des-Bois earthquake event (National Resources Canada). At that time, a magnitude 5.0 earthquake with an epicentral distance approximately 20 km from the subject site triggered a landslide throughout a property located approximately 20 km from the epicenter of the movement. This resulted in a monolithic-slab of land to become detached and displaced nearly 40 m from its original location. The existing structure, trees and other notable features were noted to be relatively intact throughout the footprint of the mobilized land. The trees located at the bottom of the earthflows path of movement were knocked down. No injuries or deaths were associated with the landslide event (Perret, 2017).

More recently, GSC has carried out a LiDAR and DEM survey of the City of Ottawa to further inventory historic landslide footprints within the City's boundaries. The inventory and map was carried out under GSC Open File 8600 and catalogued approximately eighty-nine landslides. Review of these landslides would reveal that several landslides occurred in clusters and in relatively close proximity to one another. Considering the Rideau River as a dividing boundary, 36 landslides were recorded throughout the eastern portion of the City. Further, several clusters were noted along the souther-western and northern boundaries of the paleo-island formed by the Mer Bleue and Hammond paleo-channels. Several large landslides (>0.5 km^2 scar area) were also noted throughout the northeastern and southeastern portions of this paleo-island as Cmb3 and MBu13.

Based on GSC's 2019 study "Sensitive clay landslide inventory map and database for Ottawa, Ontario" dated 2019 and under Open File 8600, approximately 13 historical landslides have been observed throughout the footprint of the Mer Bleue paleo-channel. Further, four of the landslides located throughout the existing and active Waste Connects of Canada landfill site are speculated through historical aerial photography by GSC. However, the response by the property managers at the time of carrying out the study concluded they had not seen any signs of the landslides throughout the inception of the landfill (Brooks, 2019). Nearly 5 km of the banks of the paleo-island formed by the Mer Bleue and Hammond paleo-channels were affected by these paleo-earthquakes.

The remainder of the inventoried landslide events along the Mer Bleue paleo-channel have relatively smaller scar areas (i.e.- less than 0.03 km^2) with the exception of MBu2 and MBu13 which have a scar area of 0.123 and 1.423 km2, respectively. MBu2 is located throughout the footprint of the subject site and approximately 217 existing residential dwelling structures, including single lot and townhouse style-buildings. In addition to MBu2, a smaller (0.01 km2) landslide has been identified directly and approximately 45 m southeast of MBu2 which is located below approximately 5 townhouse style residential buildings.

Further, MBu1 is located approximately 1.3 km northwest from the subject site and along the same escarpment along Navan Road. MBu1 has a scar-area of approximately 0.02 km2 whose scarp is located along the edge of Navan Road and debris field throughout existing agricultural lands.

GSC has radiocarbon dated landslide MBu13 as occurring in a range between 4979 and 5467 years BP. No data is currently available to assign a precise period of time to the landslide footprints observed throughout and in close proximity to the subject site. However, the ground surface located below the top of the Navan Road escarpment indicates a slight increase in the ground surface surrounding the scarp slope. This is an indicator of a debris field associated with these landslides, which would further indicate the landslides would likely have taken place after the Champlain Sea had recessed.

This finding also supports that the landslides observed throughout the area of the subject site may have been triggered by a sufficiently high ground motion. However, insufficient information is available to postulate additional landslide triggers. Further to these indicators, MBu2, located within the footprint of the subject site, is believed to have retrogressed towards the north and northwest along Page Road to form the bulb-like shape depicted on Figure 4 - Approximate Landslide Location (1965 Aerial) and Figure 5 - Approximate Landslide Location (2019 Aerial). It is also worth noting that the surface area of MBu2 is considered to be completely altered by GSC indicating the ground surface that may have resulted from the earthflow is now unrecognizable.

In addition to the inventorying carried out by GSC as part of Open File 8600, the landslide associated with MBu2 is also understood to have been considered an “earth flow” by the Ontario Geological Survey (OGS) as part of their regional study carried out under paper MP 68, dated 1976.

It should be further noted that the slope stability mapping carried out by both GSC and OGS classifies the slope throughout the area of the subject site to have a factor of safety greater than 2.5. Based on their review they have indicated that the slope should be inspected, but no remedial action is likely to be required. However, these factors are understood to be a guide for the slope condition and not a firm basis for engineering design or development. This may be further observed on Figure 6 - OGS Miscellaneous Paper MP 68 - Regional Slope Stability Study in Appendix 2.

2.4 Field Investigation and Observations

Geotechnical Investigations

An initial field investigation was completed at the subject site by Paterson on May 22 and 23, 2018. At that time, four (4) boreholes were advanced to a maximum depth of 9.8 m below existing ground surface. A supplemental investigation was completed on April 28 to 30, 2021 by EXP Services Inc. At that time, ten (10) boreholes were advanced to a maximum depth of 30.5 m below ground surface.

The test hole locations for the investigations are presented on Drawing PG6142-1 - Test Hole Location Plan included in Appendix 2. The subsurface profiles are presented in the Soil Profile and Test Data sheets and in the Borehole Logs by Others presented in Appendix 1.

Sampling and In Situ Testing

Soil samples were collected from the boreholes using a split-spoon (SS) sampler, or from the auger flights.

The Standard Penetration Test (SPT) was conducted in conjunction with the recovery of the split-spoon samples. The SPT results are recorded as “N” values on the Soil Profile and Test Data sheets. The “N” value is the number of blows required to drive the split-spoon sampler 300 mm into the soil after a 150 mm initial penetration using a 63.5 kg hammer falling from a height of 760 mm.

Undrained shear strength testing was carried out in cohesive soils using a field vane apparatus.

The overburden thickness was evaluated by a dynamic cone penetration test (DCPT) completed at BH 2 (2018) and BH 6. The DCPT consists of driving a steel drill rod, equipped with a 50 mm diameter cone at the tip, using a 63.5 kg hammer falling from a height of 760 mm. The number of blows required to drive the cone into the soil is recorded for each 300 mm increment.

Subsurface conditions observed in the test holes were recorded in detail in the field. Reference should be made to the Soil Profile and Test Data sheets and in Borehole Logs by Others presented in Appendix 1 for specific details of the soil profile encountered at the test hole locations

Groundwater

Flexible polyethylene standpipes were installed in the boreholes at selected locations to allow groundwater level monitoring. The groundwater observations are presented in Borehole Logs by Others presented in Appendix 1.

Geotechnical Laboratory Testing

The soil samples recovered from our field investigation were examined in our laboratory to collaborate the field findings. Additionally, a total of 6 grain size distribution analyses, 3 consolidation tests and 5 Atterberg limits tests were completed on selected soil samples by others.

Atterberg Limit Tests

Atterberg Limit Testing and moisture content testing were completed by others on recovered silty clay samples at selected location throughout the subject site. The results of the Atterberg Limits are presented on Table 1, below.

Table 1 - Atterberg Limits Results

Sample	Depth (m)	LL (%)	PL (%)	PI (%)	w (%)	Classification
BH 2 - SS7	6.1 - 6.7	50	25	25	76	CH
BH 3 - SS3	2.3 - 2.9	32	17	15	65	CL
BH 4 - SS6	4.7 - 5.3	58	27	31	62	CH
BH 6 - SS8	9.1 - 9.7	45	26	19	78	CL
BH 10 - SS4	3.2 - 3.8	56	50	28	71	CH

Notes: LL: Liquid Limit; PL: Plastic Limit; PI: Plasticity Index; w: water content;
CH: Inorganic Clay of High Plasticity CL: Silty Clay of Medium Plasticity

Grain Size Distribution and Hydrometer Testing

Grain size distribution (sieve and hydrometer analysis) was also completed by others at six (6) selected soil samples. The results of the grain size analysis are summarized in Table 2 and presented in Grain-Size Distribution and Hydrometer Testing Results by Others on Appendix 1.

Table 2 - Summary of Grain Size Distribution Analysis

Test Hole	Sample	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
BH 1	SS1	0	84	16	
BH 2	SS7	0	0	100	
BH 3	SS3	0	3	97	
BH 4	SS6	0	0	100	
BH 6	SS8	0	0	100	
BH 10	SS4	0	2	98	

Existing Building Assessment

Paterson has carried out a pre-construction survey of existing buildings nearby the subject site. This voluntary program Paterson offered to local residences was undertaken in response to complaints received by Caivan from the City of Ottawa regarding vibrations and/or noise caused by pre-construction site works undertaken throughout the subject site. Where carried out as permitted by home-owners, the assessment consisted of a documentation of the exterior of the existing structures and not of interiors due to health and safety restrictions associated with COVID-19. Five of the homes reviewed as part of this assessment (2824 Pagé Road, 6027 Renaud Road, 6071 Renaud Road, 6079 Renaud Road, 6099 Renaud Road) were constructed throughout the footprint of MBu2.

2.5 Existing Conditions

Surface Conditions

The subject site is currently undeveloped and generally covered with mature trees and vegetation. The site is bordered by Brian Coburn Boulevard West to the north, residential dwellings followed by Page Road to the east and residential buildings followed by Navan Road to the south.

The ground surface across the subject site is at grade with the surrounding roadways and properties at approximate geodetic elevation ranging between 81 and 85 m.

Subsurface Conditions

Generally, the soil profile encountered at the test hole locations consisted of a topsoil layer underlain by a deep deposit of silty clay. The silty clay deposit consisted of a stiff to very stiff brown silty clay crust followed by a deep, firm to stiff grey silty clay deposit.

A thin layer of silty sand was encountered overlying the silty clay deposit at the north portion of the subject site.

Refusal to DCPT was not encountered throughout the subject site.

Based on available geological mapping, the bedrock throughout the majority of the subject site consists of interbedded limestone and shale of the Lindsay Formation. However, the bedrock at the south portion of the subject site consists of Paleozoic Shale of the Billings formation. Also, based on available geological mapping, the overburden thickness is expected to range from 25 to 50 m throughout the entire subject site.

Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for the details of the soil profile encountered at each test hole location.

Groundwater

Groundwater level readings were recorded on June 19, 2021 by others. The groundwater level readings are presented in Borehole Logs by Others on Appendix 1. It should be noted that surface water can become trapped within a backfilled borehole that can lead to higher than typical groundwater level observations.

However, it should be noted that groundwater levels are subject to seasonal fluctuations. Therefore, the groundwater levels could vary at the time of construction.

2.6 Proposed Conditions

Reference should be made to Section 1.3 for a background on the proposed development. Based on the above-noted information, it is understood that the footprint of MBu2 would underlie the footprints of the southeast portion of the proposed residential development. Municipal infrastructure, such as roads and service alignments, are also anticipated throughout this area.

Further, the majority of the proposed residential structures are anticipated to be founded upon native, undisturbed in-situ soils such as the compact layer of silty sand or stiff deposit of silty clay.

3.0 Slope Stability Analysis

The analysis of the stability of the slope was carried out using SLIDE, a computer program which permits a two-dimensional slope stability analysis using several methods including the Bishop's method, which is a widely used and accepted analysis method. The program calculates a factor of safety, which represents the ratio of the forces resisting failure to those favouring failure. Theoretically, a factor of safety of 1.0 represents a condition where the slope is stable. However, due to intrinsic limitations of the calculation methods and the variability of the subsoil and groundwater conditions, a factor of safety greater than one is usually required to ascertain than the risks of failure are acceptable.

Two (2) slope cross-sections were analysed utilizing the latest topographic mapping. The slope stability analysis was completed at each slope cross-section under worst-case-scenario by assigning cohesive soils under fully saturated conditions. The analysis was carried out in accordance with the City of Ottawa's standard guidelines prepared by Golder Associates titled Slope Stability Guidelines for Development Applications in the City of Ottawa, dated 2004.

The effective strength soil parameters used for static analysis were chosen based on the subsoil information recovered during the geotechnical investigation. The effective strength soil parameters used for static analysis are presented in Table 3 below.

Table 3 - Effective Soil and Material Parameters (Static Analysis)

Soil Layer	Unit Weight (kN/m^3)	Friction Angle (degrees)	Cohesion (kPa)
Silty Sand	21	35	1
Brown Silty Clay Crust	17	33	5
Grey Silty Clay	16	33	10
Glacial Till	20	33	1
Bedrock	Impenetrable		

The total strength parameters for seismic analysis were chosen based on the in situ, undrained shear strengths recovered within the open boreholes completed at the time of our geotechnical investigation and based on our general knowledge of the areas geology. The strength parameters used for seismic analysis at the slope cross-sections are presented in Table 4 below.

Table 4 - Total Stress Soil and Material Parameters (Seismic Analysis)			
Soil Layer	**Unit Weight (kN/m^3)**	**Friction Angle (degrees)**	**Undrained Shear Strength (kPa)**
Silty Sand	21	35	N/A
Brown Silty Clay Crust	17	-	120
Grey Silty Clay	16	-	32 at Top of Layer. Increases by 2.5 kPa/m to a maximum of 100 kPa
Glacial Till	20	33	N/A
Bedrock	Impenetrable		

The location of the three cross-sections analyzed are presented on Drawing PG6142-1 - Test Hole Location Plan enclosed.

Static Loading Analysis

The results of the static analysis for the proposed slope under fully saturated conditions (worst-case-scenario) are shown in Figure 2A and 3A attached to the current report. The minimum analysed slope stability factor of safety under fully saturated conditions (worst case scenario) were calculated to be greater than 1.5.

As a result, the two slope cross-sections analyzed were all above the recommended Factor of Safety of 1.5 and are considered stable under static conditions.

Seismic Loading Analysis

An analysis considering seismic loading was also completed as part of our slope stability assessment. A horizontal seismic acceleration, K_h, of 0.18g was considered for the analyzed section and discussed further in Section 4.2.3 of this report.

This acceleration is considered as half of the peak (horizontal) ground acceleration (PGA) of 0.153g, specified in the National Building Code of Canada (NBCC 2015) Seismic Calculator as having a probability of exceedance of 2% in 50 years (1:2,475 year earthquake) for the subject site. Since the PGA is considered for “firm ground” Site Class C values, the value was factored by 0.98 to an equivalent PGA for a Site Class E. Further, since the provided PGA values are representative of shaking forces at the surface of bedrock or dense soil, the analyses considers an increase of 20% to the design PGA, equivalent to 0.18g, to account for soil amplification of ground shaking

experienced by the overburden. A factor of safety of 1.1 is considered to be satisfactory for stability analysis including seismic loading (i.e. pseudo-static) as per the City of Ottawa's *Slope Stability Guidelines for Development Applications.*

The results of the analysis including seismic loading fully saturated conditions (worst-case-scenario) are shown in Figure 2B and 3B attached to the current report.

The overall slope stability factor of safety at the three slope cross-sections when considering seismic loading was found to be greater than 1.1 which is considered to be stable under seismic loading.

Seismic Considerations

Based on the results of the geotechnical investigation, a seismic **Site Class E** is considered applicable for foundation design within the area of the subject site as per Table 4.1.8.4.A of the OBC 2012.

4.0 Landslide Hazard and Risk Assessment

4.1 General Methodology of Assessment

The landside hazard assessment presented in this report has been undertaken in general accordance with the methodology presented by the APEGBC and according to the Fraser Valley Regional District approach. The methodology followed to undertake this assessment may be considered as follows:

- ❏ Identification of hazards that could impact structures and people throughout the subject site.
- ❏ Assessment of the likelihood that the hazard, should it occur, could impact the above-noted elements.
- ❏ Assessment of the likelihood that if a person is impacted, it would result in loss of life.

If the hazard probability cannot be demonstrated to have an annual probability of less than 1:10,000, a risk assessment estimating the annual probability of loss of life for individuals would be carried out in accordance with the following equation to further assess group risk:

$$Risk = P(H) \times P(S:H) \times P(T:S) \times V \times E$$

Where R = the risk or annual probability of loss of life of an individual, P(H) = the annual probability that a landslide occurs, P(S:H) = the probability of impacting the elements taking into consideration the scale and location of the landslide events, P(T:S) = the temporal spatial probability (i.e.- a person being present being present at the location at risk) of the elements being present at the time of a landslide, V = the vulnerability, or likelihood of death or permanent injury of the individual given they are impacted and E = the number of elements that would be impacted. E will also be considered the number of occupants for the grouped areas.

It should also be noted that quantitative values to approximate the annual probability of hazards were estimated using qualitative likelihoods as described in Appendix C of the AGS 2007. These qualitative measures of likelihood may also be found in Appendix 1 as AGS 2007 Qualitative Risk Assessment Terminology.

Further, a hazard assessment of the potential for “creep”in the landslide scar to occur throughout the subject site has also been addressed in the following report sections.

4.2 Hazard Probability, P(H)

As noted in Section 2.3, landslides that have been observed throughout the Ottawa region have been observed primarily throughout escarpments, steep terrains and hillsides generally consisting of sensitive deposits of clay. Generally, these landslide and slope stability failures are understood to be triggered by one of the following failure mechanisms:

- ❏ Significant increases in pore-water pressure during periods of rapid-snowmelt and high rainfall.
- ❏ Loss of stability at the toe of a slope or rapid drawdown, generally caused by erosion at the base of a slope from submerged or water flow conditions.
- ❏ Propagation of seismic events or ground-motion forces exceeding the forces from soil strength to resist failure and movement.

In addition to these initial trigger events, additional hazards result from a slope failure triggered by one or a combination of the above-noted failure mechanisms. For the subject site, this would also include the hazard of potential long-term ground movement that may be associated with creep in the landslide scar. An estimate of the likelihood for these aforementioned failure mechanisms and hazards to occur throughout the subject site will be discussed further in the following section.

The conclusions are based on our interpretations of the subject site and study area from a geotechnical perspective, our 60 years of experience of carrying out geotechnical assessments throughout the Eastern Ontario region and within geologically similar land, and review of historic and recently available research and databases of pertinent information.

4.2.1 Snowmelt or Heavy-Rain Event Induced Slope Failure

One of the triggers associated with landslides throughout the Ottawa region are high volumes of snowmelt and/or heavy rain events. During a significant event, the ground is loaded relatively quickly such that pore water pressures may increase sufficiently to cause movement throughout the subsurface profile. These events are considered rare throughout the Ottawa region, and are inherently verified as part of routine slope stability analysis by assuming fully saturated conditions.

GIS-based modes of snowmelt-induced landslide susceptibility was carried out in 2013 by Umar, Fall and Daneshfar. The comprehensive study published mapping of slopes throughout Ottawa susceptible to landslides by snowmelt taking into consideration existing local geotechnical and hydrogeological information, LiDAR and digital elevation models, existing precipitation data and conservative slope stability analysis parameters. Based on their results, the area of and surrounding the subject site is not considered susceptible to landslide or slope stability failures due to snowmelt based on existing conditions.

The current ground surface throughout and surrounding the subject site is graded to promote sheet drainage of surface water across and away from the footprint of the subject site. The proposed post-development surface conditions will be further improved in imperviousness to the ingress of surface water. This is anticipated as based on the installation of asphalt surfaced roads, grading that is anticipated to consist of site generated or imported clay fill and the use of catch basins throughout the site which surface water will be redirected to for drainage.

Based on this information, the likelihood for a landslide or slope failure to occur due to the increase in pore water pressures from snowmelt or rain events is considered significantly unlikely to occur throughout the subject site. The trigger mechanism will be considered to be as likely as it may currently be conceived throughout similarly graded and surfaced residential subdivisions located throughout the Orleans area such as Convent Glen South, Queenswood Village and the surrounding Chapel Hill South area. Therefore, this trigger mechanism is considered to be of insignificant and negligible risk and likelihood given the post-development characteristics of the subject site.

4.2.2 Toe Erosion and Rapid Drawdown Event

The existing ground surface at the subject site slopes gently to the south and is at grade with the surrounding properties. The subject site is currently heavily vegetated and is not subjected to erosion or rapid drawdown loading from water. Based on our understanding of the geological setting of the subject site, the lowlands and sloped terrain noted to be parallel to the existing Navan Road alignment, and located south to the subject site, can be considered as the bank formed by the receding Champlain Sea. This bank has been in-filled in its majority and re-shaped such that it can no longer be recognized or evaluated as the bank formed by the Champlain Sea.

Portions of this bank, such as some of the undeveloped portions of the bank between the subject site and Innes Road, may be more reflective of the conditions left behind by the Champlain Sea. Throughout these areas, the adjacent lowland farm and agricultural plots are provided drainage swales to divert surface run-off to municipal drains further down-stream.

With the exception of these drainage swales and the drainage channel located northwest and parallel to Brian Coburn Boulevard, there are no watercourses that may erode or affect the stability the existing slope throughout the subject site. Based on this, the toe erosion trigger mechanism is considered to be of insignificant and negligible risk and likelihood given the current and post-development characteristics of the subject site. Based on this, this hazard trigger will not be explored further as a risk factor that may negatively impact the proposed development.

4.2.3. Earthquake or Ground-Motion Induced Landslide

Regional Landslide Inventory and Geology

The area of the subject site and the Greater Ottawa region is located within the Western Quebec Seismic Zone, as discussed in Section 2.3 of this report. The WQSZ and Ottawa region are located within an area of high seismicity. The combination of seismic, geological and geomorphological settings throughout the WQSZ are generally considered favorable for some settings and areas to be susceptible to landslide hazards.

Due to large area and variety in geological conditions across the WQSZ, landslide occurrence cannot be compared equally across its footprint. The geological conditions experienced throughout the Ottawa region are unique to the eastern corridor of the WQSZ extending between Ottawa and east along the St-Lawrence River as it had been primarily formed by the presence of the Champlain Sea and its associated sensitive clay deposits.

West of the Ottawa region beyond Pembroke is not relatively comparable from a macro-scale of landside-frequency due to the lack of sensitive clay soils throughout the remainder of the WQSZ. Landslides observed throughout the eastern portion of the WQSZ where Champlain Sea clay deposits are known to exist were digitally inventoried by the GeoEngineering Centre at Queens in 2007 (Quinn et. al., 2007). Mapping at a macro-scale between Ottawa and over 800 km northeast along the St-Lawrence river was complete by Quinn et. al. and may be referenced in Figure 3.

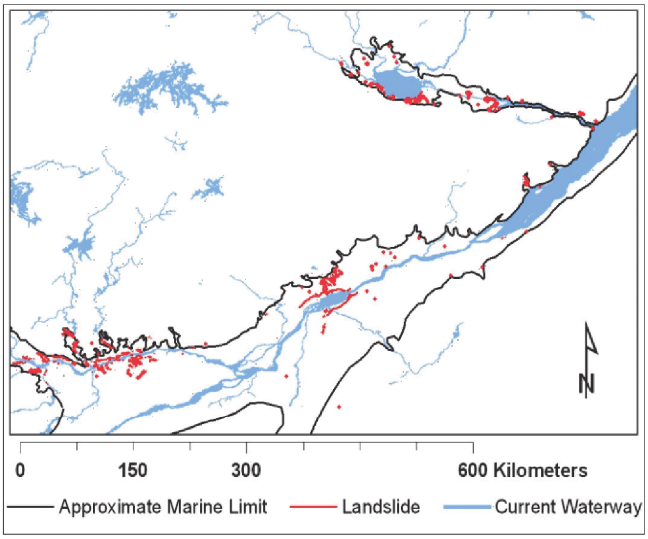

Figure 3 - Landslides Along Eastern Belt of WQSZ (Quinn. et. al, 2007)

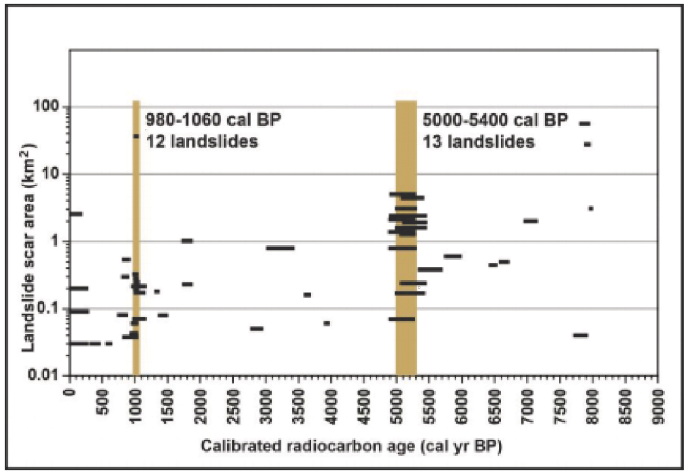

Figure 4 - Radiocarbon-Dating and Clustered Landslide Timelines (GSC OF8724)

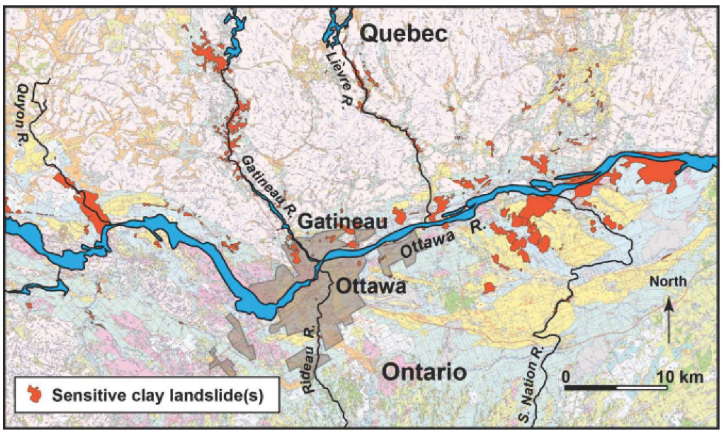

Figure 5 - Landslides Throughout Ottawa Valley (GSC OF8724)

As discussed in the paper and as is observed in Figure 4 and Figure 5 prepared for the Ottawa valley under GSC Open File 8724, many landslides observed throughout the Ottawa region have been found to have occurred during three distinct periods of increased frequency close to 1,000, 5,000 and 8,000 years BP.

It is observed that a higher frequency of landslides have occurred in close proximity to active watercourses (i.e., throughout Quebec and along the Ottawa River) than abandoned river banks. However, a significant quantity of landslides have been recorded throughout the abandoned river banks. It is assumed that the subsurface conditions throughout the majority of these landslide scars are similar to that of the subject site (i.e.- sloped terrain underlain by a sand cap or clay crust layer underlain by a relatively deep deposit of sensitive grey clay over a layer of glacial till and further by bedrock).

This is generally affirmed by geological mapping carried out by GSC under Open File 5311 indicating the majority of the top areas of the abandoned banks consist of nearshore and/or alluvial sediments such as deltaic and estuarian sand and silts. Further, the sloped terrain and paleo-valleys generally consist of offshore marine sediments, such as silt and clay.

Landslides in marine clays have been documented as being more common where a thin layer of sand overlies the deeper clay deposit (Fransham, 1977). Test holes carried out to the north and several throughout the subject site indicate the presence of a 1 to 3 m thick layer of silty sand and/or sandy silt over the clay deposit. Findings by others indicate this may be due to the inability for a crust to form within the surficial portion of the clay deposit due to poor drainage characteristics of the sand-clay interface (Hugenholtz, 2004). However, test hole coverage indicates the presence of a hard to very stiff layer of brown silty clay crust either at surface or below the surficial layer of sand in most test holes where sand had been encountered. Due to the variability in the test hole findings with regards to the presence of a sand cap and clay crust layer, the landslide hazard is not considered either increased or reduced by this factor.

Local Landslide Inventory

The presence of several landslide scars MBu1, MBu4 and MBu9 within approximately 1.3, 0.04 and 2.5 km from MBu2, respectively, indicates that a specific set of terrain conditions may exist to promote landslide susceptibility. MBu1 and MBu9 appear to be located throughout unoccupied land consisting of agricultural farmland and heavily forested areas, respectively. MBu10, MBu11 and MB12 also share that their ground surface is currently covered by heavily vegetated forests. These landslide scars (MBu1, MBu4, MBu9 through MBu12) each have an identified footprint area smaller than MBu2.

The morphology for each of these landslides beyond MBu2 indicates that their debris fields are truncated and have been completely eroded across the edge of the source area. It should be noted that the debris field throughout MBu2 has been completely altered by urbanization (GSC OF8600, 2019).

The only other landslide footprint that is similar in failure type to MBu2 is MBu13 which is located approximately 18 km from the subject site at the southeastern ridge of the Mer Bleue paleo-island. Samples from the debris field have been carbon-dated to have occurred 4,380 to 4,560 years BP and is one of 13 landslides interpreted to have been triggered by a significant paleo-earthquake approximately 5,200 years ago (GSC OF8600, 2019 and Aylsworth, 2000).

Given the above, there are several other landslide scars in relatively close proximity to the subject site which could indicate landslide susceptibility in the area of the subject site based on historical landslide inventory.

Slope Stability

As discussed in Section 3.0, the slopes present throughout the subject site are considered stable under drained static conditions and using a pseudo-static “seismic” analysis considering undrained strength parameters for the appropriate soil layers. The results of the seismic analysis were based on the published seismic hazard data available by Earthquakes Canada for the subject site and referred to in Appendix 1. Based on this assessment, there is an annual probability of 1 in 2,475 of the site experiencing ground motions resulting in a factor of safety less than 1.1 for seismic (pseudo-static) loading conditions.

This factor of safety is expected to be stable based on the findings by the study undertaken by the OGS under paper MP 68 and as discussed in Section 2.3 of this report. The current ground surface throughout the subject site is generally flatter than 10H:1V (nearly 6°). Based on the findings by OGS, slopes with a height of up to 6 m and steepness of 22° would maintain their stability with a Factor of Safety of 1.5. Given the above, the landslide hazard is considered to be reduced from the period which the existing landslide scar (MBu2) had occurred given existing conditions.

The slope stability analysis results indicated all failure planes with factors of safety greater than the minimum of 1.5 and 1.1 for static and seismic loading, respectively. It should be further noted that the slope stability analysis was completed under the assumption that groundwater will be located at proposed finished grade across the subject site. However, it is expected that the long-term groundwater will be controlled at/or below the design underside of footing elevation of the proposed buildings, which would result in an increase to the overall slope stability for the subject site.

Landslide Probability

In order to estimate the probability of a catastrophic landslide to occur throughout the subject site, the frequency of landslides to occur throughout settings that are similar to the subject site would need to be considered. Based on the discussion in this section, the region of the subject site is considered unique to the banks of the abandoned paleo-channels throughout the Ottawa region. These would generally consist of the banks and slopes along the abandoned Mer-Bleue, Hammond, Bourget and Plantagenet paleo-channels. These areas have had more landslides that were triggered by periods of strong earthquakes rather than toe erosion and related morphological features as presented by published literature. Although each of these landslide scars have not been assigned a certain trigger mechanism, this discussion will conservatively assume they were all triggered by paleo-earthquakes.

To further relate the historical landslides in the area of the subject site, it would have to be inferred that other variables, such as geological and terrain features are also the same. A notable source providing the required coverage is geological mapping of the surficial geology throughout this region. This mapping has been published under GSC Open File 5311 and identifies regions in the area of the subject site composed primarily of offshore deposits such as marine clays and nearshore sediments such as sands and silts. Reference should be made to Figure 8 - Surficial Geology and Paleo Island Footprints in Appendix 2, which depicts published landslide footprints and their surficial geology. Mapping generally indicates that these historic landslides have nearly exclusively occurred throughout areas of offshore marine deposits consisting of silt and clay, which serves to provide a suitable basis to estimate the probability of a landslide along banks composed of this deposit and strengthens the reliability of this analysis.

Since the subject site is located nearby the bank fronting the proto-Ottawa river, only landslides fronting abandoned paleo-channels were considered for this analysis. The analysis considers the perimeter of the abandoned proto-Ottawa River formed by the paleo-island as a single linear bank consisting of areas that have and have not been in contact with a landslide footprint. This linear feature results in approximately 142 km of paleo-channel banks and a frequency of 39 km which have been crossed by or considered as a historic landslide. This results in a ratio of 17 to 71 of affected to unaffected land, or 27.5%. The trigger and morphology for each landslide is not known at this time, however, is conservatively inferred to have been triggered by a historic earthquake and not influenced by bank erosion.

It is understood that during three distinct periods of increased frequency of landslides occurred close to 1,000, 5,000 and 8,000 years BP (reference should be made to Figure 4 - Radiocarbon-Dating and Clustered Landslide Timelines (GSC OF8724)). This is indicative of a return period for an earthquake of sufficient size to trigger numerous large landslides in the region being between 3,000 to 4,000 years based on that evidence, with an average return period of approximately 3,500 years.

Based on this return period and the percentage of landslides that have occurred throughout the abandoned banks of the paleo-islands, it may be estimated that the upper-boundary of the probability of a large landslide triggered by an earthquake along the banks of the paleo-islands as 11 in 140,000 per year, or approximately **1 in 12,728** per year (the product of 27.5 % and a 1:3,500 year return period). Based on the above, the annual probability of a large catastrophic landslide occurring at or directly impacting the subject site is less than 1:10,000.

4.2.4 "Creep" Movement in Existing Landslide Scar

It is understood that the subject site is located within the footprint of a landslide scar. Although it is not known when the landslide may have taken place, it is considered to be a pre-historic landslide which may have occurred within the past 8,000 years. In order to support servicing and infrastructure design for the subject site, the proposed ground surface throughout the majority of the site will be raised to accommodate the proposed design details. Due to this grade raise, there is a potential for an excessive amount of "creep" movement to develop throughout subsurface during the design-life of the proposed structures and infrastructure.

Existing Conditions Throughout the Landslide Scar

As noted, the existing landslide is understood to have occurred pre-historically. This would imply that it had occurred prior to the construction of the buildings that may be observed on historical aerial photographs throughout the landslide footprint. Based on our review of these photographs, approximately 24 buildings occupied the landslide footprint in 1965. Comparing modern aerial photographs to historical aerial photographs, it appears approximately six of these older buildings were not modified extensively or entirely replaced from their original footprint. Of these unmodified buildings, Paterson has had the opportunity to review the exterior of 6027 and 6071Renaud Road and 2824 Pagé Road as part of a pre-construction survey. Paterson has also reviewed the exterior of 6079 Renaud Road, 6099 Renaud Road, both of which are assumed to have been constructed in the 1990's.

Generally, the above-noted buildings appeared to be in relatively good condition with some defects that are considered typical for residential structures founded over sensitive clay deposits throughout the Orleans area and Ottawa valley.

This damage typically consists of small gaps between garage door and window frames from the building frame, diagonal or vertical cracking within mortar joints in brick facades, small cracks in weak points throughout the foundation such as window-wells and basement door openings, and small cracks where roof soffits meets the exterior wall facade. The majority of these defects form over a 10- to 30- year timespan, and are generally associated with long-term and tolerable movement of the foundation.

Generally, and in our experience, this movement may be attributed to subsurface condition factors such as fluctuations in the groundwater table, additional settlement from excessive grade raises or post-construction additions and moisture depletion of clay from high-water demanding trees.

In our experience, it is very likely that the non-structural defects noted at the time of our review are associated with some of the common issues with buildings founded over Champlain clay. It should also be noted the ground surface throughout the subject site is lower than all south and north neighbouring land parcels.

Further, Paterson had been involved with the residential development located within the northern portion of the landslide-bowl shape. The methodology applied in carrying out the geotechnical design for the buildings located within this existing subdivision are the same implemented for the subject site. This includes assessing the geotechnical strength and in-situ conditions of the subsurface profile and providing design details that would mitigate excessive settlement and movement of the buildings to support the proposed development.

Should excessive movements have been observed by the current home-owners, whether noted in interior or exterior of these buildings, the original builder would have been made aware of these issues. Since these homes have been constructed in the early 2010's, Paterson has not been made aware of any claims of damage that may be associated with movement of the ground by the builder. The finished grade throughout the portion of this subdivision within the landslide scar has also been raised above the original pre-development ground surface elevation.

Comparatively to the subject site, there is an existing and similarly dense residential subdivision located throughout the southern portion and debris field of MBu2. Paterson was not involved in the phases of the development located throughout the landslide scar. Based on review of public well records, the subsurface profile throughout this subdivision is considered to very similar to the subject site.

Based on aerial photographs, this subdivision was constructed throughout the early 2010's. Based on the previously noted observations and understanding of this general area, Paterson considers it unlikely for the portion of the subdivision located throughout the footprint of MBu2 to have undergone intolerable ground movements.

This is believed as intolerable movements or damage associated with ground movements in a new residential subdivision would have likely become a well-known local issue amongst builders and land developers. Further, municipal infrastructure would have been undergoing equally damaging movement such that it is unlikely the City of Ottawa would not be aware of potentially damaged subsurface linear infrastructure.

Further, cursory review of the existing roadways and properties located throughout the area of the landslide scar do not show signs of observable damage associated with ground movement. This is expected to consist of cracks in landscaped and hardscaped ground surfaces, similar to slope failures or tension cracks, and tearing or excessive cracking of pavement surfaces.

Further, although grade raises might be required to accommodate the proposed residential development, it is expected that the grades proposed throughout the landslide scar will not exceed permissible grade raise restrictions provided for the subject site.

Geotechnical Assessment and Conclusion

Based on our review, there is a possibility for movement throughout the subsurface profile associated with “creep” in the landslide scar. However, it is not considered to be of relevant magnitude, and is considered negligible and would not likely be of a sufficient magnitude to exceed the conventional post-construction settlements noted in the aforementioned geotechnical report. Further, considering the majority of the MBu2 footprint has been altered significantly without negatively impacting the structures within its footprint, the failure plane is considered to be stable and/or unaffected by the existing ground conditions and structures/infrastructure.

Should movement be occurring throughout the landslide scar, it is unlikely to affect “creep” movement currently being experienced by the remainder of the structures founded within its footprint. It is generally expected that the proposed buildings will experience “creep” movement, if present, in a manner that is very similar to and within the tolerances of conventional post-construction settlements.

5.0 Conclusions

In summary, a residential development is currently being proposed to occupy the subject site. A pre-historic landslide event is understood to have taken place throughout the south portion of the subject site and several others within 2 to 3 kilometers of the subject site. These landslide events took place along the banks of the proto-Ottawa River throughout the now-abandoned Mer Bleue paleo-channel.

Field investigations and reconnaissance carried out by Paterson throughout the subject site and study area did not indicate any signs of movement, activity or cause of concern with respect to the pre-historic landslide footprint. The area was also reviewed by means of available published literature of the surrounding inventory, research and studies carried out by others specializing in the field of earthquakes, landslides and geology. Using a combination of the above and our experience with sites of very similar geology throughout the Ottawa region, **the annual probability of a large catastrophic landslide occurring at or directly impacting the subject site is less than 1:10,000**. Based on our interpretation of the information available to carry out this assessment, the subject site is considered safe and suitable for consideration of the purpose of the proposed development.

6.0 Statement of Limitations

The recommendations made in this report are in accordance with our present understanding of the project and the applicable guidelines.

A geotechnical investigation of this nature is a limited sampling of a site. The recommendations are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around the test locations. The extent of the limited area depends on the soil, bedrock and groundwater conditions, as well the history of the site reflecting natural, construction, and other activities. Should any conditions at the site be encountered which differ from those at the test locations, we request notification immediately in order to permit reassessment of our recommendations.

The assessment provided in this report are intended for the use of design professionals associated with this project. The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than EXP Services Inc. or their agent(s) is not authorized without review by Paterson Group for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.

Drew Petahtegoose, B.Eng.

David J. Gilbert, P.Eng.

Report Distribution

- ❑ EXP Services Inc. (email copy)
- ❑ Paterson Group (1 copy)

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APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

BOREHOLE LOGS BY OTHERS

GRAIN-SIZE DISTRIBUTION AND HYDROMETER TESTING RESULTS BY OTHERS

TABULATED EARTHQUAKE INVENTORY

EARTHQUAKES CANADA SEISMIC HAZARD (NBCC 2015)

AGS2007 QUALITATIVE RISK ASSESSMENT TERMINOLOGY

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Commercial Development - Navan Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

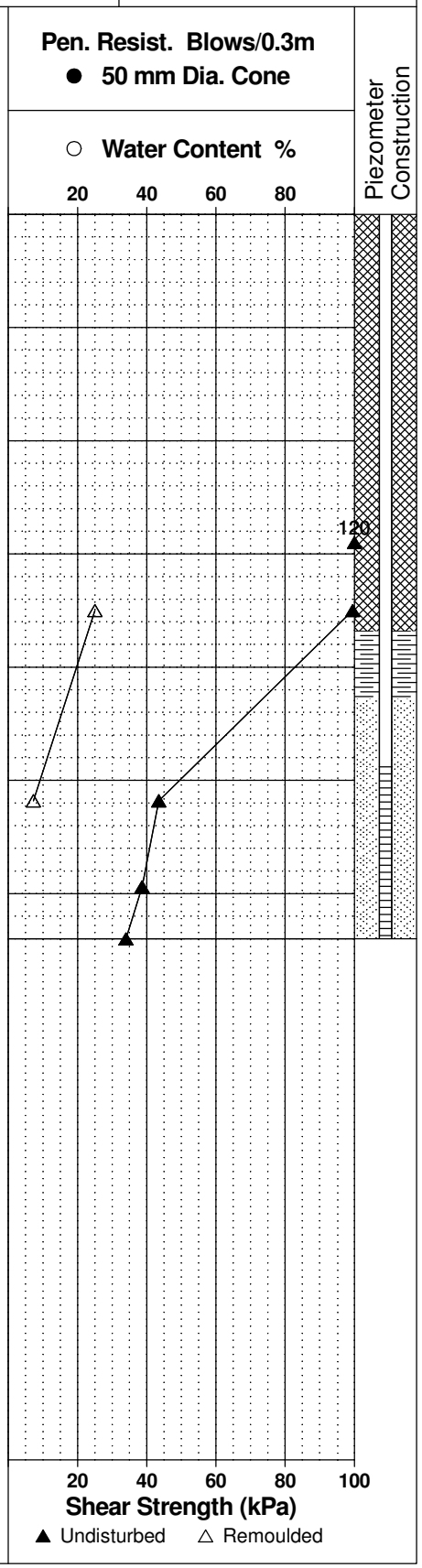
FILE NO. PG4415

REMARKS

HOLE NO. BH 1

BORINGS BY CME 18 Power Auger **DATE** May 22, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	85.34
TOPSOIL 0.63		AU	1				
Compact, brown **SILTY SAND,** trace gravel, organics 1.45		SS	2	83	15	1	84.34
		SS	3	96	5	2	83.34
Very stiff to stiff, brown **SILTY CLAY**						3	82.34
- stiff to firm and grey by 3.7m depth		SS	4	100	W	4	81.34
						5	80.34
						6	79.34
6.40 End of Borehole							



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Commercial Development - Navan Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

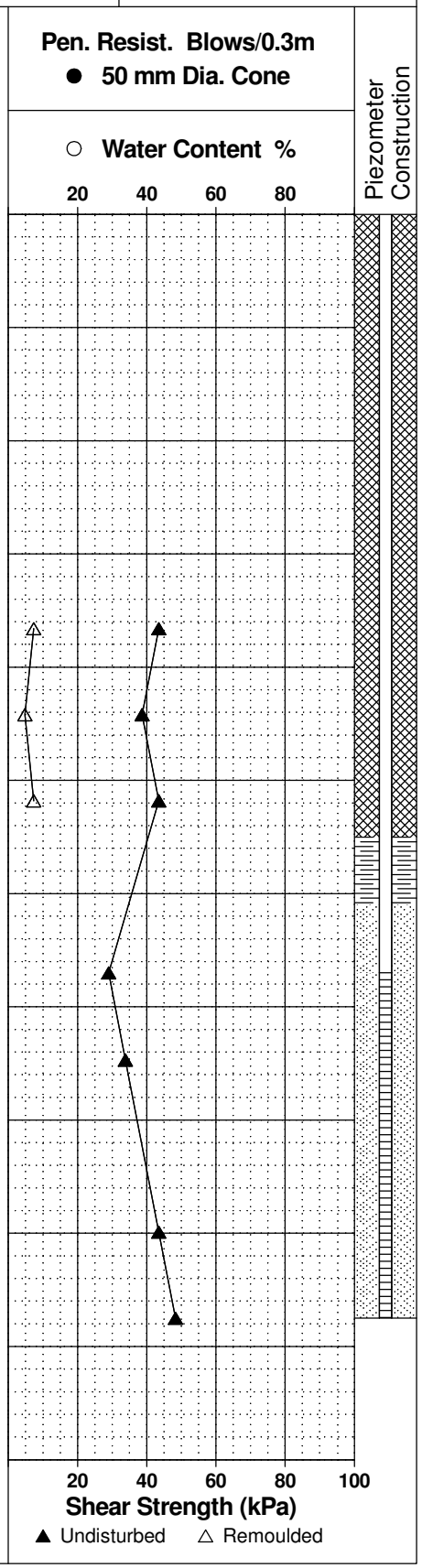
FILE NO. PG4415

REMARKS

HOLE NO. BH 2

BORINGS BY CME 18 Power Auger **DATE** May 22, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	84.32
TOPSOIL 0.46		AU	1				
		SS	2	96	4	1	83.32
		SS	3	100	4	2	82.32
		SS	4		W	3	81.32
						4	80.32
Firm, grey **SILTY CLAY**						5	79.32
		SS	5	100	W	6	78.32
						7	77.32
		SS	6	83	W	8	76.32
						9	75.32
9.75						10	74.32
Dynamic Cone Penetration Test commenced at 9.75m depth. Cone pushed to 24.7m depth.						11	73.32



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Commercial Development - Navan Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

FILE NO. PG4415

REMARKS

HOLE NO. BH 2

BORINGS BY CME 18 Power Auger **DATE** May 22, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
						11	73.32		
						12	72.32		
						13	71.32		
						14	70.32		
Inferred **SILTY CLAY**						15	69.32		
						16	68.32		
						17	67.32		
						18	66.32		
						19	65.32		
						20	64.32		
						21	63.32		
						22	62.32		

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Commercial Development - Navan Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

FILE NO. PG4415

REMARKS

HOLE NO. BH 2

BORINGS BY CME 18 Power Auger **DATE** May 22, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
Inferred **SILTY CLAY**						22	62.32		
						23	61.32		
						24	60.32		
						25	59.32		
						26	58.32		
						27	57.32		
						28	56.32		
						29	55.32		
						30	54.32		
30.48									
End of Borehole									

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Commercial Development - Navan Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

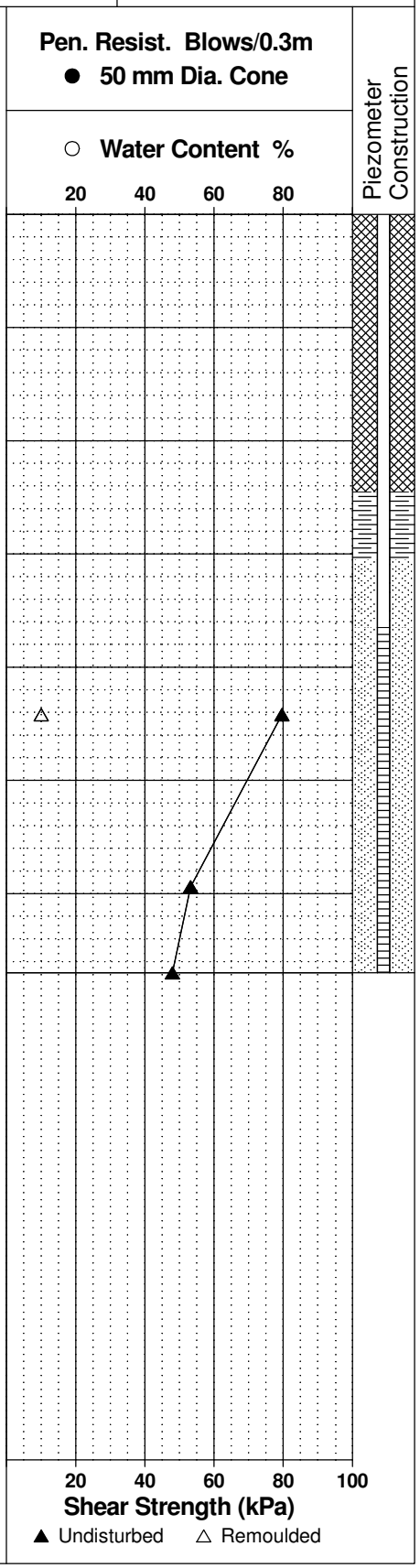
FILE NO. PG4415

REMARKS

HOLE NO. BH 3

BORINGS BY CME 18 Power Auger **DATE** May 22, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	84.27
TOPSOIL 0.51		AU	1				
Loose, brown **SILTY SAND,** some clay		SS	2	83	8	1	83.27
1.45		SS	3	100	4	2	82.27
Stiff to firm, brown **SILTY CLAY**		SS	4	96	4	3	81.27
		SS	5	100	2	4	80.27
- grey by 3.7m depth		SS	6	25	W	5	79.27
						6	78.27
6.70							
End of Borehole							



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Commercial Development - Navan Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

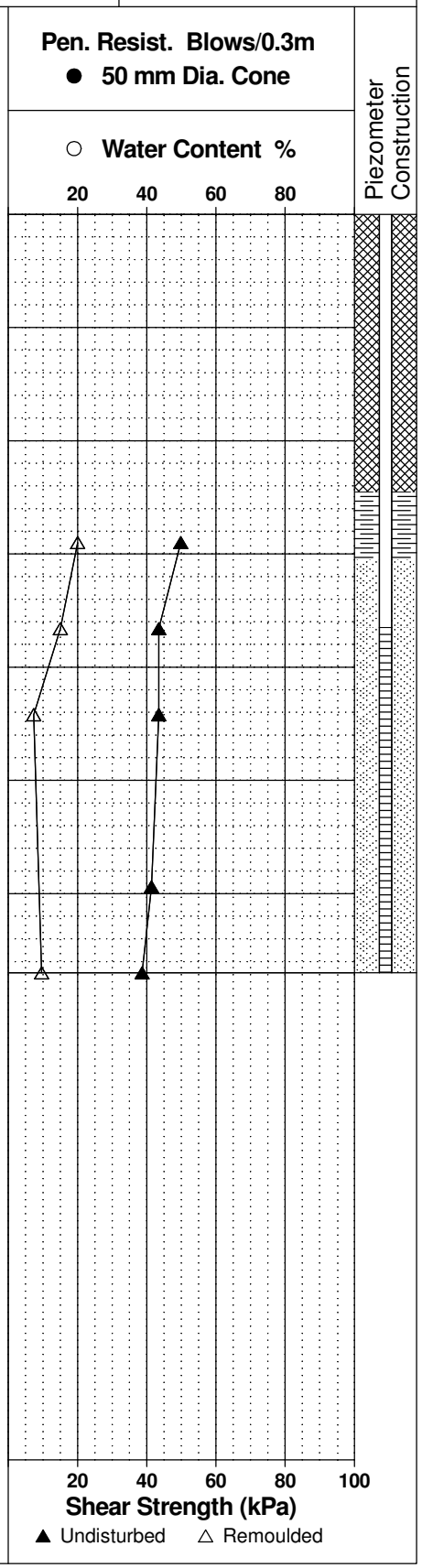
FILE NO. PG4415

REMARKS

HOLE NO. BH 4

BORINGS BY CME 18 Power Auger **DATE** May 23, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	85.01
TOPSOIL 0.51		AU	1				
Compact, brown **SILTY SAND**		SS	2	54	23	1	84.01
1.45							
		SS	3	92	4	2	83.01
Stiff to firm, brown **SILTY CLAY,** trace sand						3	82.01
- grey by 3.0m depth						4	81.01
		SS	4	46	W	5	80.01
						6	79.01
6.70							
End of Borehole							



SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

Relative Density	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their “sensitivity”. The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called “mechanical breaks”) are easily distinguishable from the normal in situ fractures.

RQD %	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic limit, % (water content above which soil behaves plastically)
PI	-	Plasticity index, % (difference between LL and PL)
Dxx	-	Grain size which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2$ / (D10 x D60)
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu are not applicable for the description of soils with more than 10% silt and clay
(more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

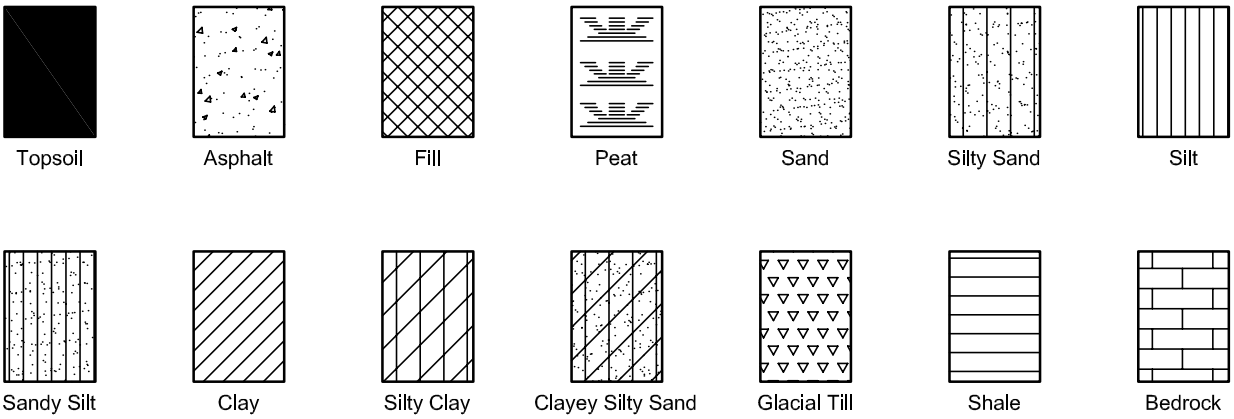
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

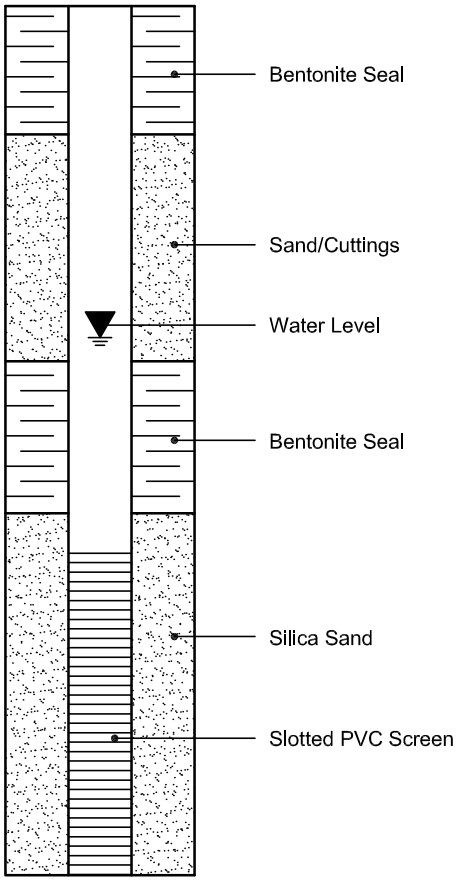
SYMBOLS AND TERMS (continued)

STRATA PLOT

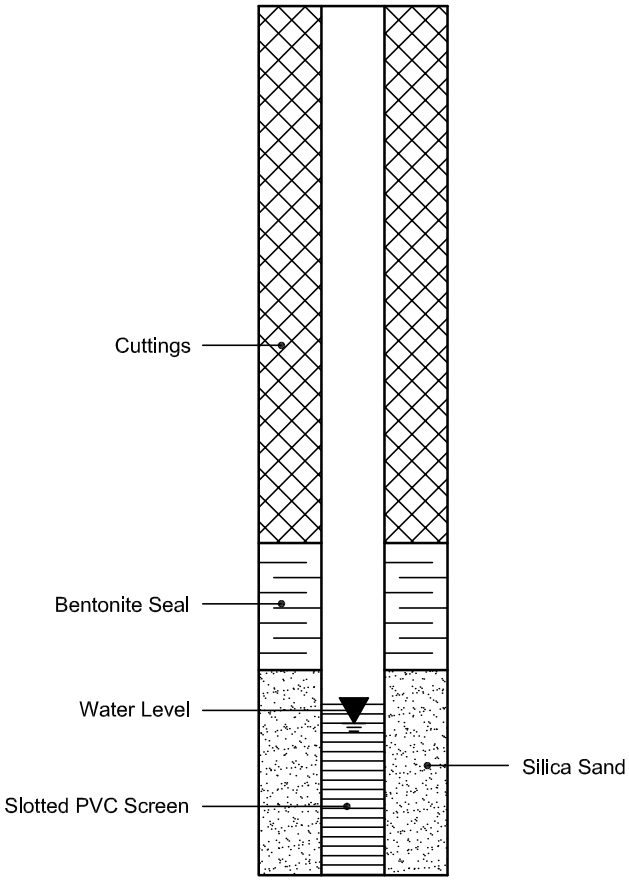


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



Log of Borehole BH-01

Project No: OTT-21004743-B0

Project: Proposed Residential Development

Location: 2983, 3053 and 3079 Navan Road, Ottawa, Ontario

Figure No. 3

Page. 1 of 1

Date Drilled: 'April 29, 2021

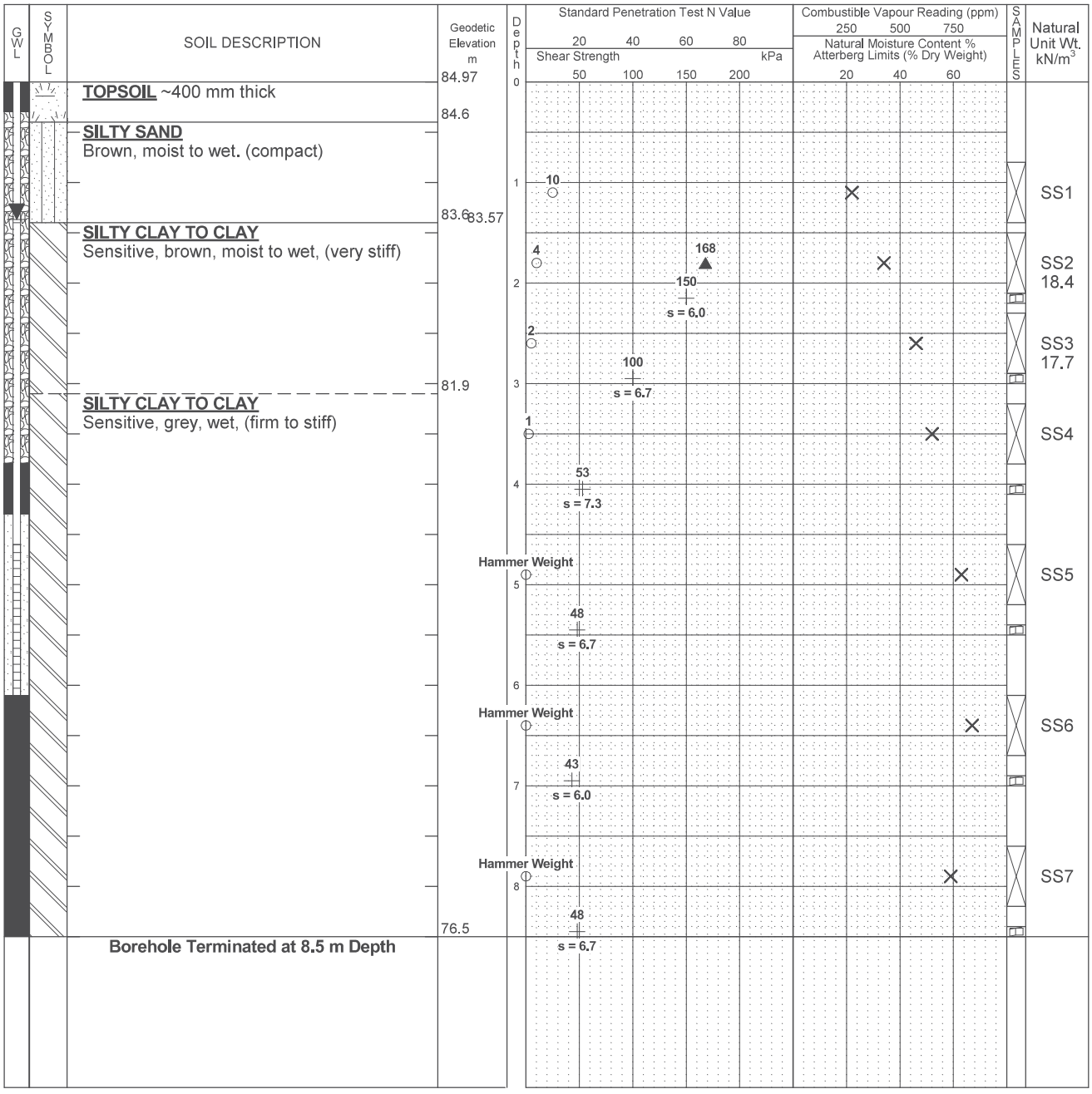
Drill Type: CME-850 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: ML Checked by: SMP

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits —○—
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲



LOG OF BOREHOLE BH LOGS - JULY 5 UPDATED BOREHOLE LOGS.GPJ TROW OTTAWA.GDT 7/7/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21004743-B0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Completion	2.7	7.6
June 19, 2021	1.4	

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH-02

Project No: OTT-21004743-B0

Project: Proposed Residential Development

Location: 2983, 3053 and 3079 Navan Road, Ottawa, Ontario

Figure No. 4

Page. 1 of 1

Date Drilled: 'April 28, 2021

Drill Type: CME-850 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: ML Checked by: SMP

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits —○—
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		GRANULAR FILL ~100 mm thick Silty sand and crushed gravel, grey, damp	81.13 81.0	0			AS1	
		FILL ~360 mm thick Gravelly sand, brown and black, moist	80.6					
▽		**SILTY SAND TO SANDY SILT** Brown, moist to wet, (loose to compact)	80.23	1	10		SS2	
				2	16		SS3	
				3	7		SS4	
		CLAY High plasticity, sensitive to extra-sensitive, grey, wet, (firm to stiff)	78.3		34 s = 9.3			
					Hammer Weight		SS5	
					29 s = 6.0			
				5	Hammer Weight		SS6	
					34 s = 7.0			
				6	Hammer Weight		SS7	
				7	48 s = 8.0			
					Hammer Weight		SS8	
			72.6	8	53 s = 7.3			
		Borehole Terminated at 8.5 m Depth						

LOG OF BOREHOLE BH LOGS - JULY 5 UPDATED BOREHOLE LOGS.GPJ TROW OTTAWA.GDT 7/7/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21004743-B0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Completion	1.5	7.6
June 19, 2021	0.9	

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH-03

Project No: OTT-21004743-B0

Project: Proposed Residential Development

Location: 2983, 3053 and 3079 Navan Road, Ottawa, Ontario

Figure No. 5

Page. 1 of 1

Date Drilled: 'April 29, 2021

Drill Type: CME-850 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: ML Checked by: SMP

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits ⊢○⊣
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~75 mm thick	84.73	0				
		SILTY SAND Brown, moist to wet. (loose)	84.6					
			84.13					
		SILTY CLAY TO CLAY Sensitive, brown, moist to wet, (very stiff)	83.4	1	8		SS1	
				2	5; 144; 130; s = 6.5		SS2	18.1
		SILTY CLAY Low plasticity, medium sensitive to sensitive, grey, wet, (firm to stiff)	82.2	3	1; 53; s = 7.3; Hammer Weight		SS3	
					48; s = 6.7; Hammer Weight		SS4	
				5	43; s = 6.0; Hammer Weight		SS5	
				6	41; s = 5.7		SS6	
				7	Hammer Weight		SS7	
			77.7		43; s = 6.0			
		Borehole Terminated at 7.0 m Depth						

NOTES:
1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21004743-B0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Completion	3.0	6.1
June 19, 2021	0.6	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE BH LOGS - JULY 5 UPDATED BOREHOLE LOGS.GPJ TROW OTTAWA.GDT 7/7/21

Log of Borehole BH-04

Project No: OTT-21004743-B0

Project: Proposed Residential Development

Location: 2983, 3053 and 3079 Navan Road, Ottawa, Ontario

Figure No. 6

Page. 1 of 1

Date Drilled: 'April 30, 2021

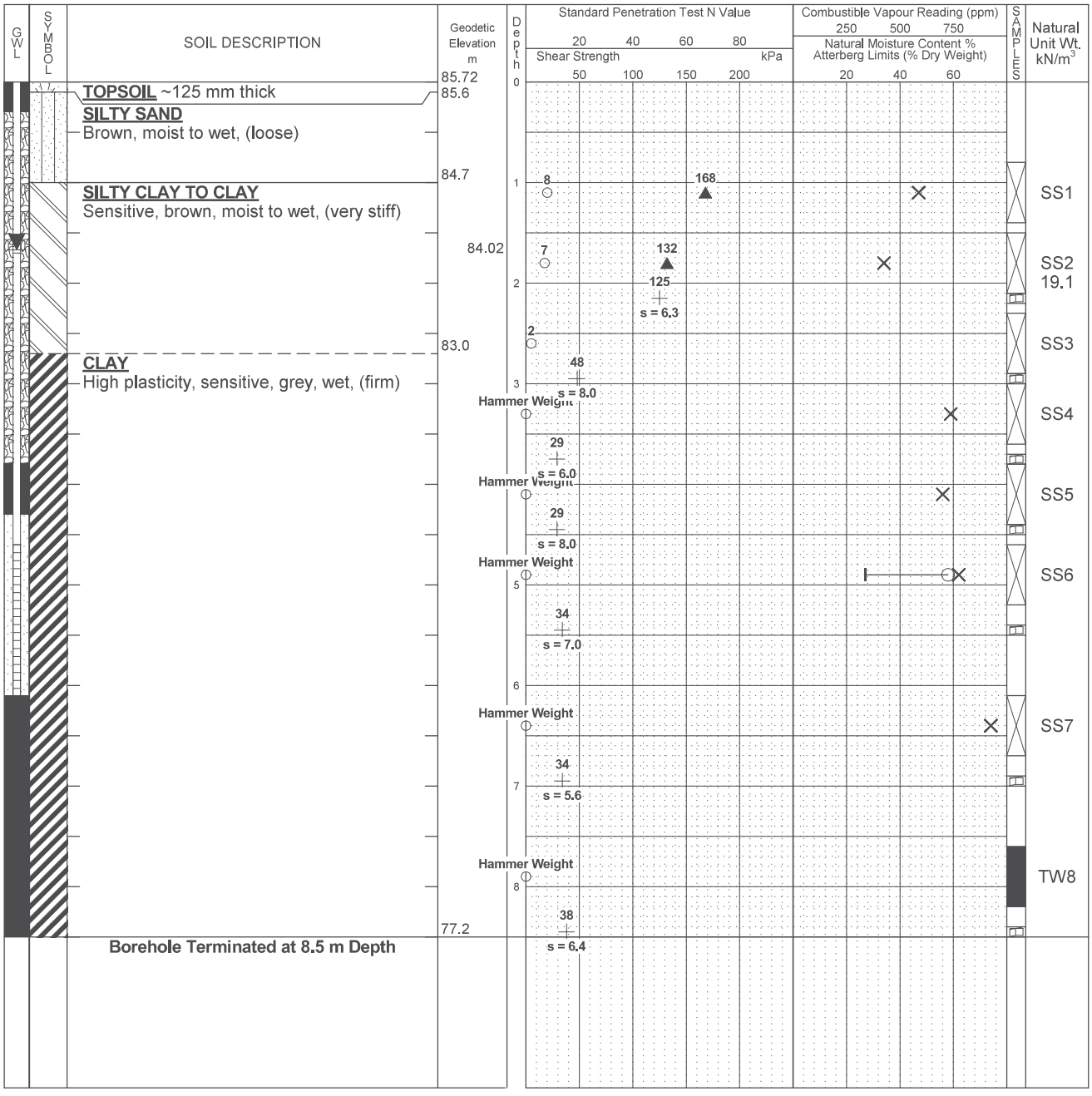
Drill Type: CME-850 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: ML Checked by: SMP

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test + S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits |—○—|
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲



LOG OF BOREHOLE BH LOGS - JULY 5 UPDATED BOREHOLE LOGS.GPJ TROW OTTAWA.GDT 7/7/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21004743-B0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Completion	2.4	7.6
June 19, 2021	1.7	

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH-05

Project No: OTT-21004743-B0

Project: Proposed Residential Development

Location: 2983, 3053 and 3079 Navan Road, Ottawa, Ontario

Figure No. 7

Page. 1 of 1

Date Drilled: 'April 28, 2021

Drill Type: CME-850 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: ML Checked by: SMP

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits ⊢○
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~400 mm thick	81.46	0				
		SILTY CLAY TO CLAY Extra-sensitive, brown, moist to wet, (stiff to very stiff)	81.1				AS1	
			80.46	1	2 ○ 120 ▲ 67 + s = 9.3		SS2	
			79.6	1	1 ○		SS3	
		SILTY CLAY TO CLAY Sensitive, grey, wet, (soft ot firm)		2	48 + s = 6.7			
					Hammer Weight ○		SS4	
				3	29 + s = 8.0			
					Hammer Weight ○		SS5	
					24 + s = 6.7			
					Hammer Weight ○		SS6	
					24 + s = 6.7			
				5				
					Hammer Weight ○		SS7	
				6	29 + s = 6.0			
				7	Hammer Weight ○		SS8	
			73.7		34 + s = 7.0			
		Borehole Terminated at 7.8 m Depth						

LOG OF BOREHOLE BH LOGS - JULY 5 UPDATED BOREHOLE LOGS.GPJ TROW OTTAWA.GDT 7/7/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21004743-B0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Completion	0.0	6.7
June 19, 2021	1.0	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH-06

Project No: OTT-21004743-B0

Project: Proposed Residential Development

Location: 2983, 3053 and 3079 Navan Road, Ottawa, Ontario

Figure No. 8

Page. 1 of 3

Date Drilled: 'April 28, 2021

Drill Type: CME-850 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: ML Checked by: SMP

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test (S)
Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		FILL ~300 mm thick Gravelly sand, brown and black, moist	81.19	0				
		SILTY CLAY TO CLAY Brown, moist to wet, (very stiff)	80.9					
▽			79.49	1	8 ○ 144 ▲		SS1	18.0
				2	7 ○ 132 ▲		SS2	17.1
		SILTY CLAY TO CLAY Sensitive, grey, wet, (firm to stiff)	79.0	3	1 ○		SS3	
					34 ⊣ s = 7.0			
					Hammer Weight ○		SS4	
				4	34 ⊣ s = 7.0			
				5	Hammer Weight ○		SS5	
					34 ⊣ s = 7.0			
				6	Hammer Weight ○		SS6	
				7	38 ⊣ s = 8.0			
					Hammer Weight ○		SS7	
				8	53 ⊣ s = 7.3			
		Medium plasticity from 9.1 m to 9.7 m depths		9	Hammer Weight ○		SS8	
				10	48 ⊣ s = 6.7			

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21004743-B0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Completion	1.8	7.6
June 19, 2021	1.7	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE BH LOGS - JULY 5 UPDATED BOREHOLE LOGS.GPJ TROW OTTAWA.GDT 7/7/21

Log of Borehole BH-06

Project No: OTT-21004743-B0

Project: Proposed Residential Development

Figure No. 8

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		SILTY CLAY TO CLAY Sensitive, grey, wet, (firm to stiff) *(continued)*	71.19	10	Shear Strength 20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
				11	Hammer Weight		SS9	
					55 s = 7.7			
				12	Hammer Weight		TW10 15.0	
			68.1	13	62 s = 6.5			
		Dynamic cone penetration test (DCPT) conducted from 13.1 m to 30.5 m termination depth.		14				
				15				
				16				
				17				
				18				
				19				
				20				
				21				
				22				

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21004743-B0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Completion	1.8	7.6
June 19, 2021	1.7	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE BH LOGS - JULY 5 UPDATED BOREHOLE LOGS.GPJ TROW OTTAWA.GDT 7/7/21

Log of Borehole BH-06

Project No: OTT-21004743-B0

Project: Proposed Residential Development

Figure No. 8

Page. 3 of 3

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa (20 40 60 80 / 50 100 150 200)	Combustible Vapour Reading (ppm) 250 500 750 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 20 40 60	SAMPLES	Natural Unit Wt. kN/m³
		Dynamic cone penetration test (DCPT) conducted from 13.1 m to 30.5 m termination depth. *(continued)*	59.19	22				
				23				
				24				
				25				
				26				
				27				
				28				
				29				
				30				
		DCPT Terminated at 30.5 m Depth	50.7					

LOG OF BOREHOLE BH LOGS - JULY 5 UPDATED BOREHOLE LOGS.GPJ TROW OTTAWA.GDT 7/7/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21004743-B0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Completion	1.8	7.6
June 19, 2021	1.7	

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH-07

Project No: OTT-21004743-B0

Project: Proposed Residential Development

Location: 2983, 3053 and 3079 Navan Road, Ottawa, Ontario

Figure No. 9

Page. 1 of 1

Date Drilled: 'April 30, 2021

Drill Type: CME-850 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: ML Checked by: SMP

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits —○—
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

Depth	Geodetic Elevation m	SOIL DESCRIPTION	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
0	84.12	**TOPSOIL** ~100 mm thick				
	84.0	**SILTY SAND** Brown, moist to wet, (loose)				
1			7		SS1	
	82.7					
	82.72	**SILTY CLAY TO CLAY** Sensitive, brown, moist to wet, (very stiff)	6, 156, 115, s = 7.7		SS2	18.2
2					SS3	
	81.3		2			
		SILTY CLAY TO CLAY Sensitive to extra-sensitive, grey, wet, (firm)	45, s = 6.0, Hammer Weight		SS4	
3			34, s = 9.3, Hammer Weight		SS5	
			31, s = 8.7, Hammer Weight		TW6	15.3
5			29, s = 6.0			
6			Hammer Weight		SS7	
	77.1		34, s = 7.0			
7		**Borehole Terminated at 7.0 m Depth**				

LOG OF BOREHOLE BH LOGS - JULY 5 UPDATED BOREHOLE LOGS.GPJ TROW OTTAWA.GDT 7/7/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21004743-B0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Completion	2.1	6.1
June 19, 2021	1.4	

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH-08

Project No: OTT-21004743-B0

Project: Proposed Residential Development

Location: 2983, 3053 and 3079 Navan Road, Ottawa, Ontario

Figure No. 10

Page. 1 of 1

Date Drilled: 'April 29, 2021

Drill Type: CME-850 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: ML Checked by: SMP

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test + S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits ⊢○
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~250 mm thick	82.28	0				
		SILTY CLAY TO CLAY Sensitive, brown, moist to wet, (very stiff)	82.0					
			80.88	1	7 ○ 180 ▲		SS1	
				2	4 ○ 132 ▲ 120 + s = 8.0	×	SS2	
		SILTY CLAY TO CLAY Sensitive to extra-sensitive, grey, wet, (firm)	80.0	3	1 ○ 34 + s = 9.3 Hammer Weight ○	×	SS3	
				4	31 + s = 8.7		TW4	15.1
				5	Hammer Weight ○ 29 + s = 8.0	×	SS5	
				6	Hammer Weight ○	×	SS6	
			75.3	7	31 + s = 6.5			
		Borehole Terminated at 7.0 m Depth						

LOG OF BOREHOLE BH LOGS - JULY 5 UPDATED BOREHOLE LOGS.GPJ TROW OTTAWA.GDT 7/7/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21004743-B0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Completion	1.8	6.1
June 19, 2021	1.4	

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH-09

Project No: OTT-21004743-B0

Project: Proposed Residential Development

Location: 2983, 3053 and 3079 Navan Road, Ottawa, Ontario

Figure No. 11

Page. 1 of 1

Date Drilled: 'April 30, 2021

Drill Type: CME-850 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: ML Checked by: SMP

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits ⊢○
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~300mm thick	84.7	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
			84.4					
		SILTY CLAY TO CLAY Brown, moist, (very stiff)		1				
				2	120 +S s = 8.0			
			82.1					
		SILTY CLAY TO CLAY Grey, wet, (firm)		3	29 +S s = 6.0			
				4	29 +S s = 6.0			
				5	31 +S s = 6.5			
					34 +S s = 7.0			
			78.5	6	34 +S s = 7.0			
		Borehole Terminated at 6.2 m Depth						

LOG OF BOREHOLE BH LOGS - JULY 5 UPDATED BOREHOLE LOGS.GPJ TROW OTTAWA.GDT 7/7/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21004743-B0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Completion	1.8	6.1
June 19, 2021	Damaged	

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH-10

Project No: OTT-21004743-B0

Project: Proposed Residential Development

Location: 2983, 3053 and 3079 Navan Road, Ottawa, Ontario

Figure No. 12

Page. 1 of 1

Date Drilled: 'April 29, 2021

Drill Type: CME-850 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: ML Checked by: SMP

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits |—○—|
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~200 mm thick	84.72	0				
		SILTY SAND ~ 300 mm thick Brown, moist to wet	84.5					
		SILTY CLAY TO CLAY Brown, moist to wet, (very stiff)	84.2	1	2; 120		SS1	
			83.42					
		SILTY CLAY TO CLAY Sensitive, grey, moist to wet, (firm to stiff) with sand seams from 1.5 m to 2.9 m depths	83.2	2	5; 53; s = 5.5		SS2	
				3	1; 34; s = 7.0		SS3	
		High plasticity from 3.2 m to 3.8 m depths		4	Hammer Weight; 29; s = 6.0		SS4	
				5	Hammer Weight; 34; s = 5.6		SS5	
				6	Hammer Weight		TW6	
			77.7	7	41; s = 6.8			
		Borehole Terminated at 7.0 m Depth						

LOG OF BOREHOLE BH LOGS - JULY 5 UPDATED BOREHOLE LOGS.GPJ TROW OTTAWA.GDT 7/7/21

NOTES:
1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21004743-B0

WATER LEVEL RECORDS

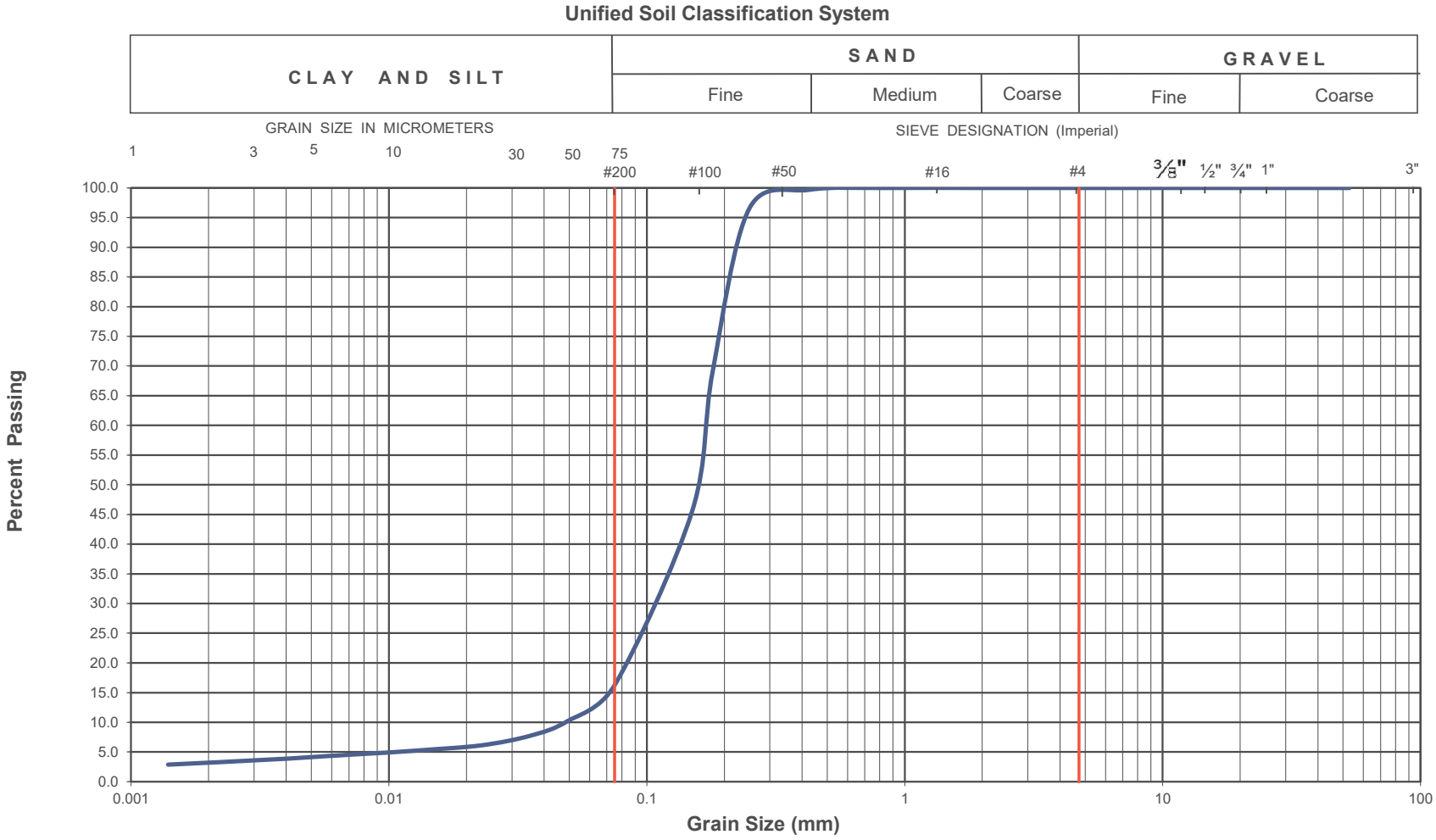
Date	Water Level (m)	Hole Open To (m)
Completion	1.8	6.1
June 19, 2021	1.3	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422

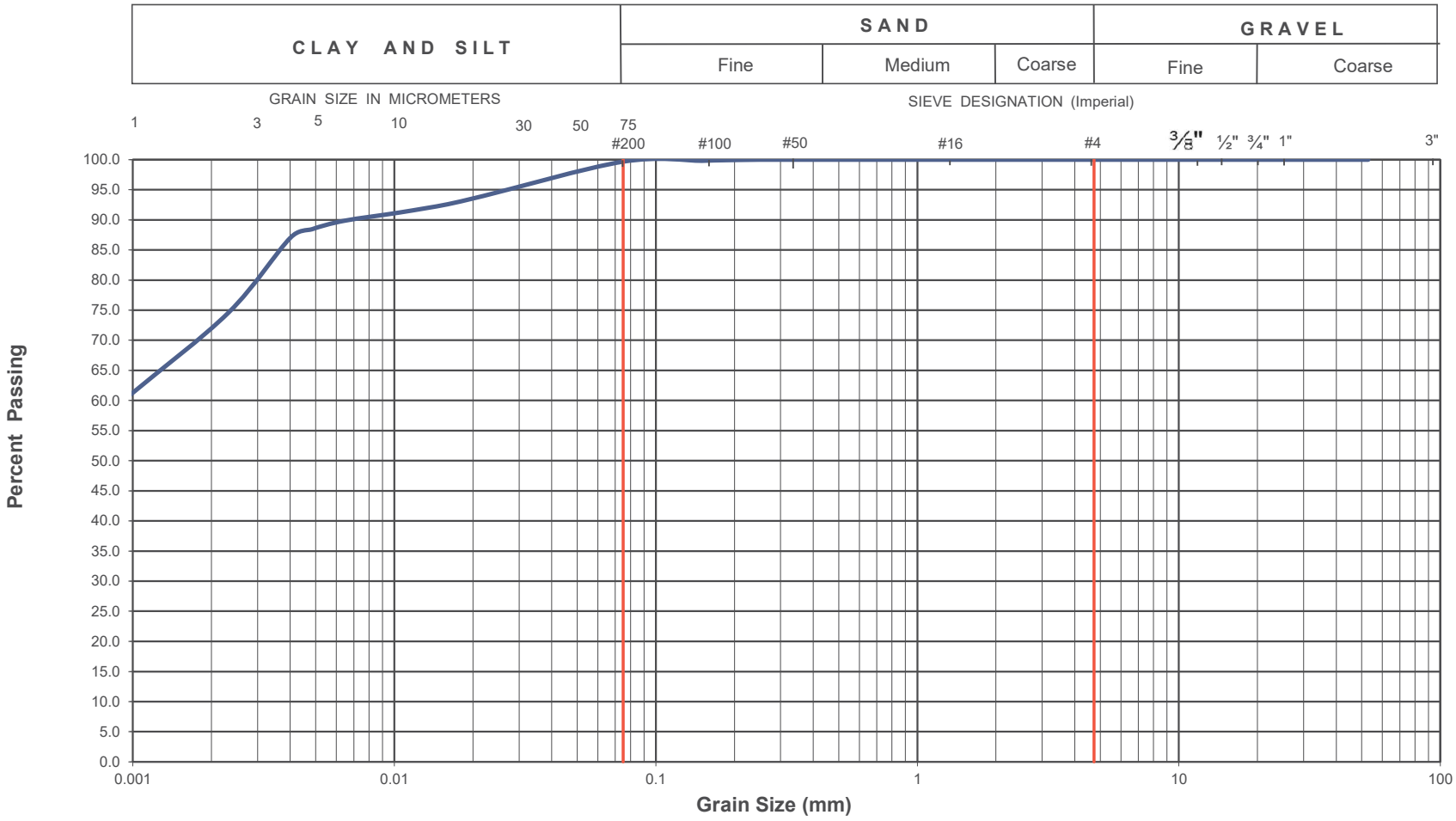


EXP Project No.:	OTT-21004743-B0	Project Name :	Proposed Residential Development						
Client :	12714001 Canada Inc.	Project Location :	2983, 3053 & 3079 Navan Road, Ottawa, ON						
Date Sampled :	April 29, 2021	Borehole No:	BH 1		Sample No.:	SS1		Depth (m) :	0.8-1.4
Sample Description :		% Silt and Clay	16	% Sand	84	% Gravel	0	Figure :	13
Sample Description :		Silty Sand (SM)							

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422

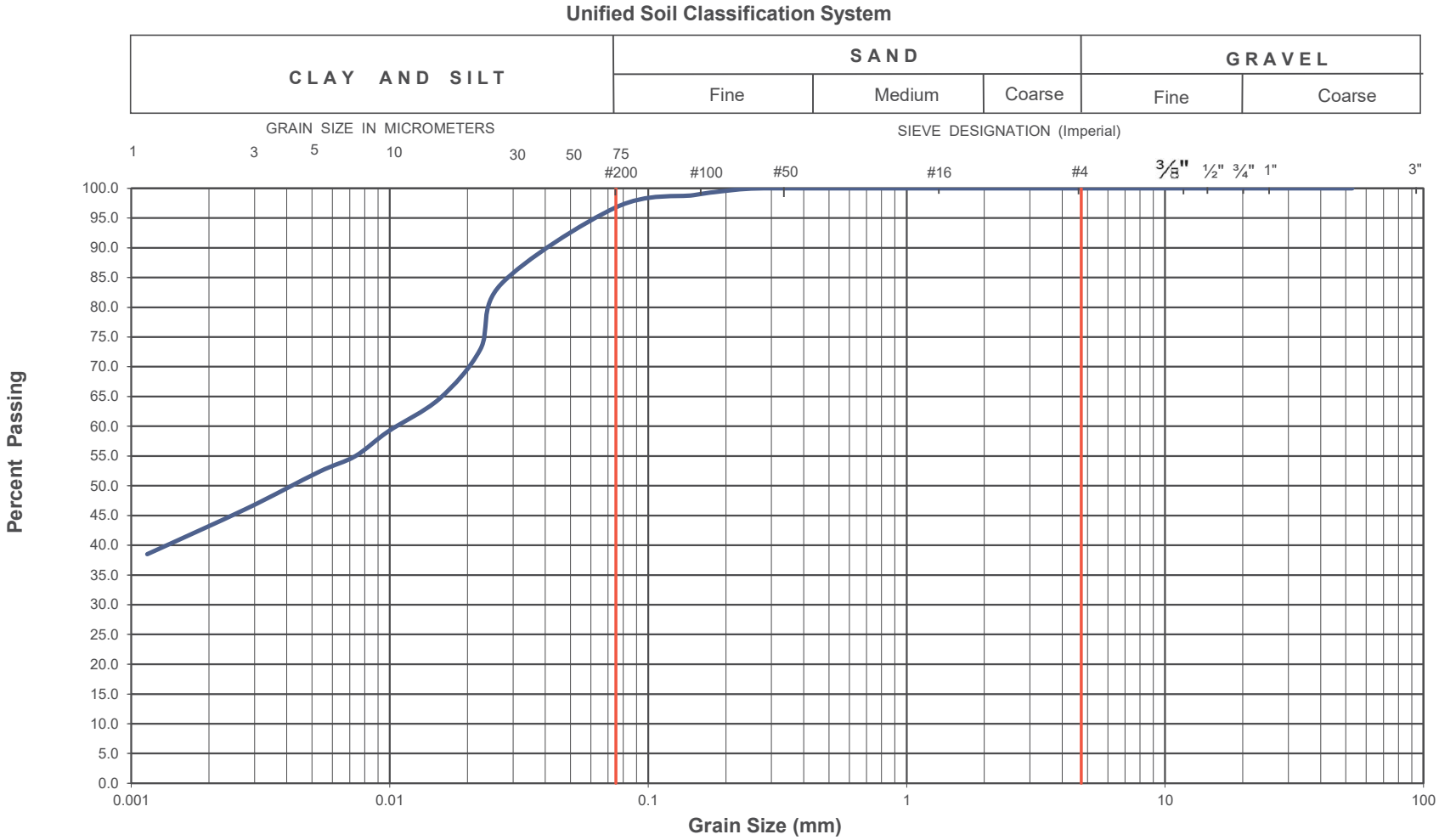
Unified Soil Classification System



EXP Project No.:	OTT-21004743-B0	Project Name :	Proposed Residential Development						
Client :	12714001 Canada Inc.	Project Location :	2983, 3053 & 3079 Navan Road, Ottawa, ON						
Date Sampled :	April 28, 2021	Borehole No:	BH 2		Sample No.:	SS7		Depth (m) :	6.1-6.7
Sample Description :		% Silt and Clay	100	% Sand	0	% Gravel	0	Figure :	14
Sample Description :		Grey Clay of High Plasticity (CH)							

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

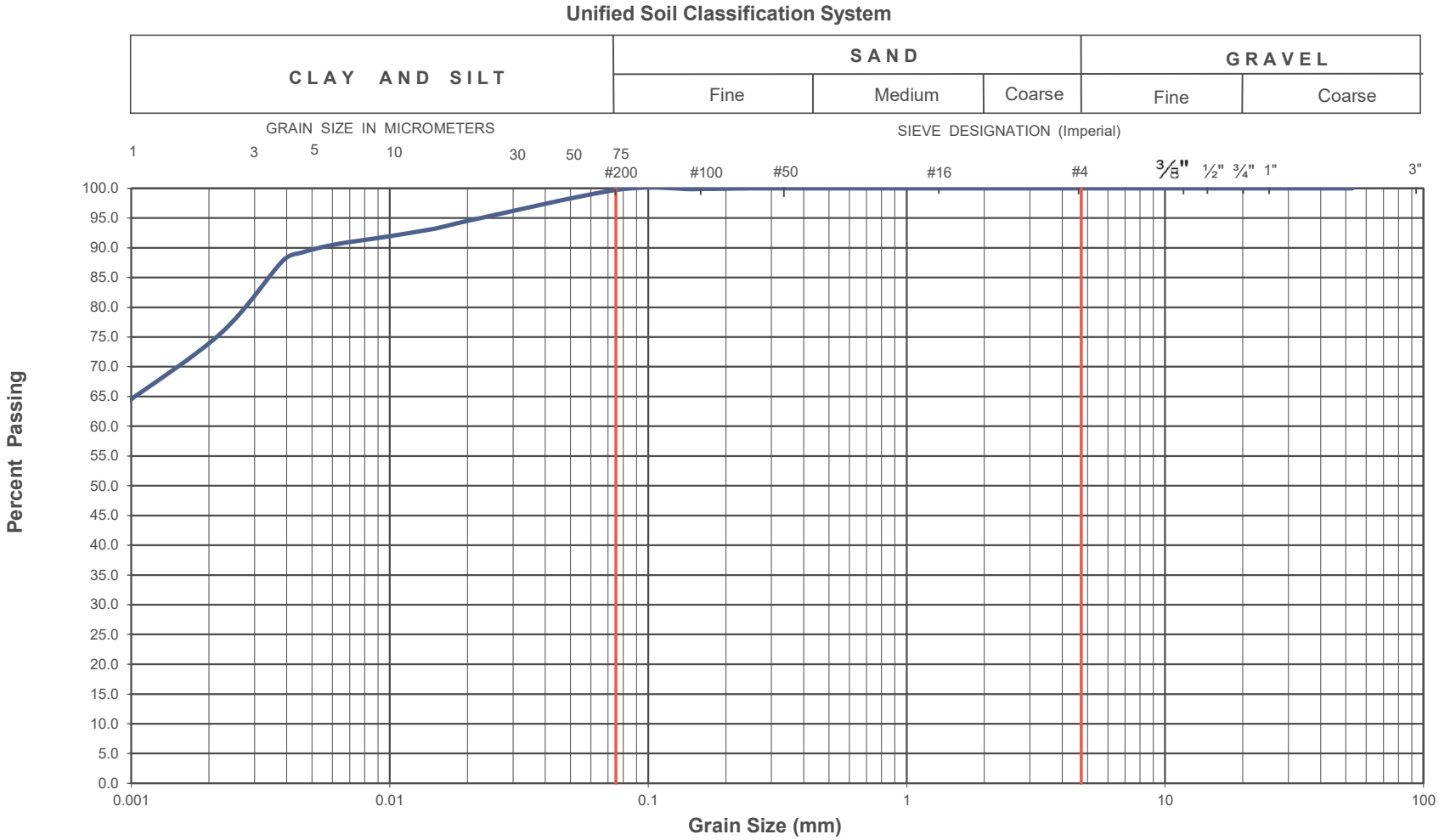
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	OTT-21004743-B0	Project Name :	Proposed Residential Development						
Client :	12714001 Canada Inc.	Project Location :	2983, 3053 & 3079 Navan Road, Ottawa, ON						
Date Sampled :	April 29, 2021	Borehole No:	BH 3		Sample No.:	SS3		Depth (m) :	2.3-2.9
Sample Description :		% Silt and Clay	97	% Sand	3	% Gravel	0	Figure :	15
Sample Description :		Grey Silty Clay of Low Plasticity (CL)							

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

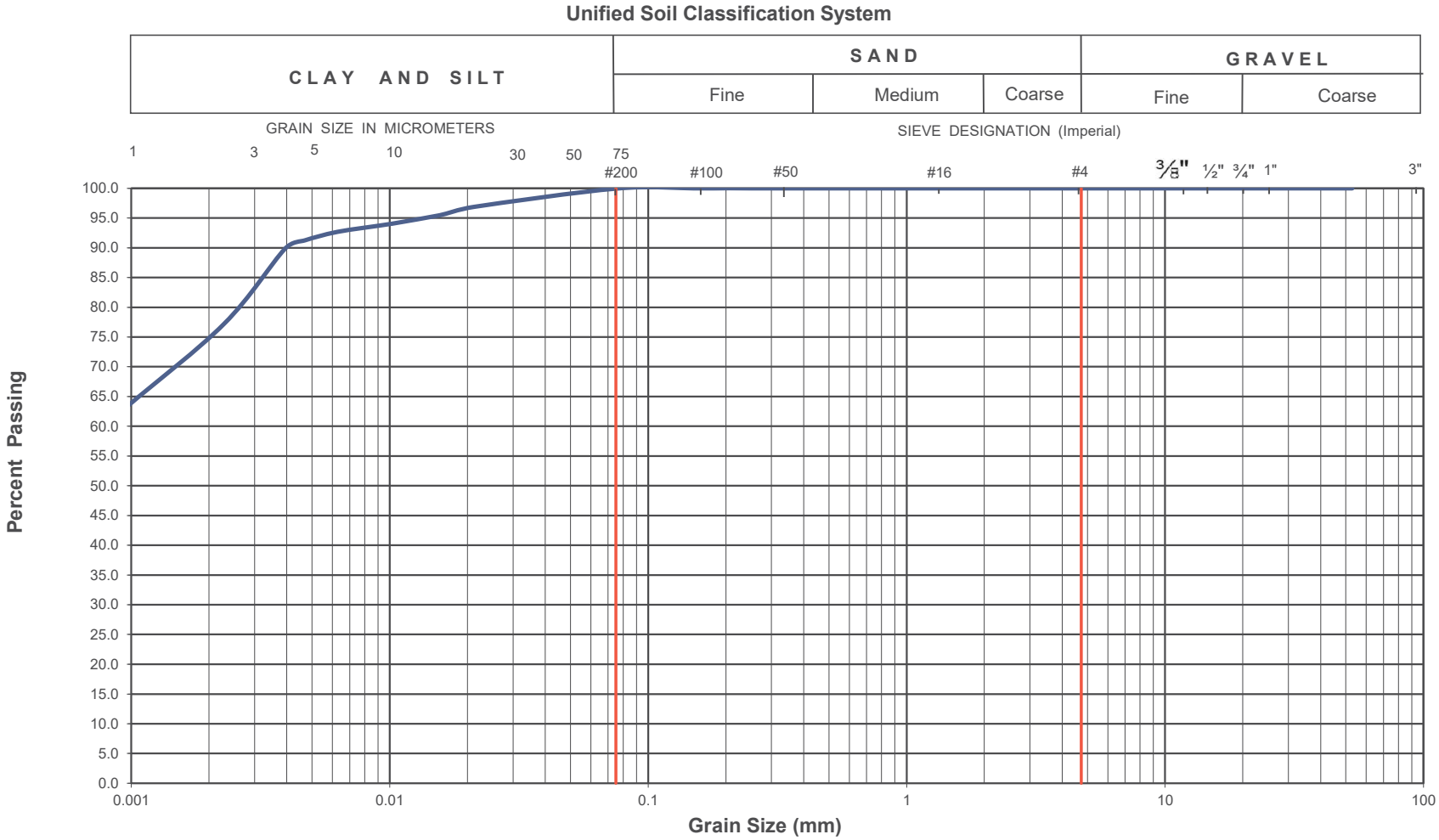
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	OTT-21004743-B0	Project Name :	Proposed Residential Development						
Client :	12714001 Canada Inc.	Project Location :	2983, 3053 & 3079 Navan Road, Ottawa, ON						
Date Sampled :	April 28, 2021	Borehole No:	BH 4		Sample No.:	SS6		Depth (m) :	4.7-5.3
Sample Description :		% Silt and Clay	100	% Sand	0	% Gravel	0	Figure :	16
Sample Description :		Grey Clay of High Plasticity (CH)							

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422

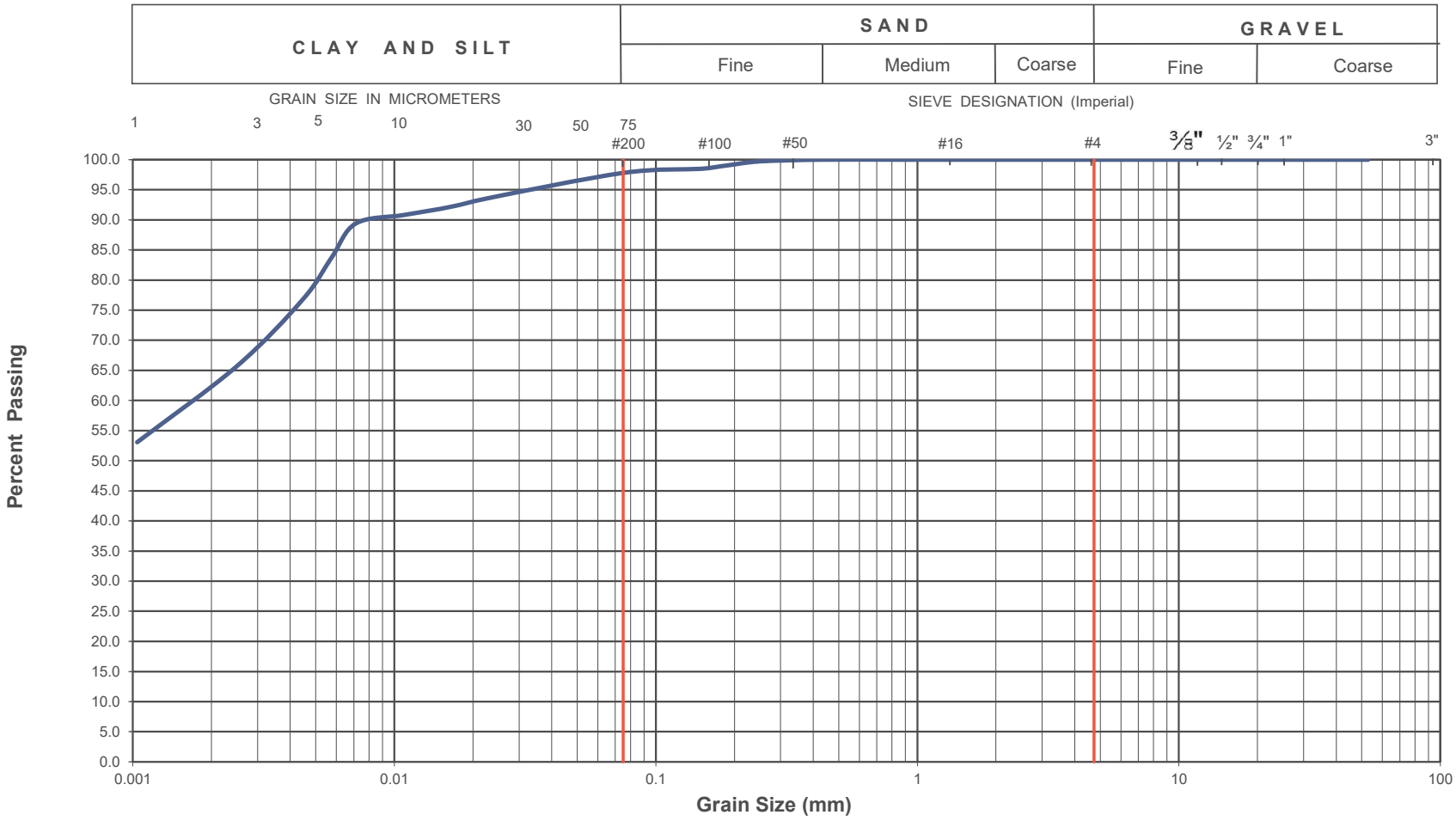


EXP Project No.:	OTT-21004743-B0	Project Name :	Proposed Residential Development						
Client :	12714001 Canada Inc.	Project Location :	2983, 3053 & 3079 Navan Road, Ottawa, ON						
Date Sampled :	April 28, 2021	Borehole No:	BH 6		Sample No.:	SS8		Depth (m) :	9.1-9.7
Sample Description :		% Silt and Clay	100	% Sand	0	% Gravel	0	Figure :	17
Sample Description :		Grey Silty Clay of Medium Plasticity (CL)							

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422

Unified Soil Classification System



EXP Project No.:	OTT-21004743-B0	Project Name :	Proposed Residential Development						
Client :	12714001 Canada Inc.	Project Location :	2983, 3053 & 3079 Navan Road, Ottawa, ON						
Date Sampled :	April 29, 2021	Borehole No:	BH 10		Sample No.:	SS4		Depth (m) :	3.2-3.8
Sample Description :		% Silt and Clay	98	% Sand	2	% Gravel	0	Figure :	18
Sample Description :		Grey Clay of High Plasticity (CH)							

2018-01-12T04:36:00	45.6488	-75.7389	18.00	1.60	15 km E from Wakefield, QC/15 km E de Wakefield, QC	30
2018-01-09T02:04:24	45.7511	-75.2567	18.00	1.30	15 km W from Saint-Andre-Avellin, QC/15 km O de Saint-Andre-Avellin, QC	41
2017-12-27T00:14:31	45.4498	-74.6913	18.00	2.00	8 km SW from Vankleek Hill, ON/8 km S-O de Vankleek Hill, ON	65
2017-11-19T11:49:48.300Z	45.7460	-75.1240	14.10	2.80	5km NW of Saint-Andre-Avellin, Canada	47
2017-11-19T11:49:48	45.7464	-75.1242	14.05	2.80	6 km NW from Saint-Andre-Avellin, QC. Felt/6 km N-O de Saint-Andre-Avellin, QC. Ressenti	47
2017-10-19T11:08:55.000Z	46.1800	-74.7500	10.00	3.10	9km W of Mont-Tremblant, Canada	103
2017-10-11T22:45:49	45.7407	-76.3378	18.00	2.00	19 km NE from Shawville, QC/19 km N-E de Shawville, QC	72
2017-10-09T20:00:50	45.7676	-75.6866	18.00	2.20	17 km SSW of Val-des-Bois, QC/17 km SSO de Val-des-Bois, QC	40
2017-10-06T14:48:14.680Z	45.2607	-75.6780	16.60	2.50	13km ESE of Bells Corners, Canada	22
2017-10-06T14:48:14	45.2657	-75.7030	18.00	2.50	4 km E from Ottawa, ON/4 km E de Ottawa, ON	23
2017-08-14T20:58:34.990Z	45.7243	-75.4677	14.36	2.57	17km ENE of Val-des-Monts, Canada	33
2017-08-14T20:58:34	45.7174	-75.4533	17.50	3.30	15 km N from Buckingham, QC. Felt/15 km N de Buckingham, QC. Ressenti	32
2017-08-09T10:58:25	45.2037	-74.7964	15.10	2.60	18 km SW from Alexandria, ON/18 km S-O de Alexandria, ON	62
2017-08-04T23:54:28	45.7049	-74.6935	18.00	1.90	10 km N from L'Orignal, ON/10 km N de L'Orignal, ON	71
2017-07-31T14:50:34.000Z	45.8800	-75.4600	21.50	3.10	30km NNE of Val-des-Monts, Canada	50
2017-07-17T17:40:47	45.7858	-74.6844	18.00	2.50	19 km N from L'Orignal, ON/19 km N de L'Orignal, ON	76
2017-06-22T00:15:45.190Z	46.1156	-74.9348	12.28	2.60	24km SW of Labelle, Canada	89
2017-06-05T00:47:55	45.2758	-75.7041	9.45	2.10	4 km E from Ottawa, ON/4 km E de Ottawa, ON	22
2017-05-14T12:11:38	45.8079	-75.1924	18.00	1.40	14 km NW from Saint-Andre-Avellin, QC/14 km N-O de Saint-Andre-Avellin, QC	49
2017-04-21T23:47:40	45.7402	-76.3571	18.00	1.60	18 km NE from Shawville, QC/18 km N-E de Shawville, QC	74
2017-04-21T06:38:31.500Z	45.9927	-75.6050	18.00	2.80	38km N of Val-des-Monts, Canada	63
2017-03-29T19:41:20	45.8027	-75.1906	18.00	2.10	14 km NW from Saint-Andre-Avellin, QC/14 km N-O de Saint-Andre-Avellin, QC	49
2017-03-28T01:52:58	45.8117	-75.1913	18.00	1.90	14 km NW from Saint-Andre-Avellin, QC/14 km N-O de Saint-Andre-Avellin, QC	50
2017-03-03T01:24:33	45.3849	-75.1449	18.00	0.80	5 km S from Bourget, ON/5 km S de Bourget, ON	30
2017-02-21T03:47:31	45.7919	-75.2262	18.00	1.70	15 km NW from Saint-Andre-Avellin, QC/15 km N-O de Saint-Andre-Avellin, QC	46
2017-02-17T13:25:59	45.5594	-74.2795	18.00	1.40	9 km N from Rigaud, QC/9 km N de Rigaud, QC	98
2017-02-04T01:18:17	45.6380	-75.1364	18.00	1.60	10 km W from Papineauville, QC/10 km O de Papineauville, QC	38
2017-01-11T14:34:33	45.4217	-75.8240	18.00	1.90	8 km N from Crystal Beach, ON/8 km N de Crystal Beach, ON	24
2017-01-08T06:24:39	45.6540	-74.7415	18.00	1.40	6 km NW from L'Orignal, ON/6 km N-O de L'Orignal, ON	66
2016-12-22T11:03:01	45.4115	-75.5007	18.00	1.60	15 km SE from Gatineau, QC/15 km S-E de Gatineau, QC	3
2016-12-02T12:08:13	45.7366	-74.4824	18.00	1.90	8 km NW from Brownsburg-Chatham, QC/8 km N-O de Brownsburg-Chatham, QC	88
2016-11-27T09:18:12	45.3966	-75.0844	18.00	1.00	7 km SE from Bourget, ON/7 km S-E de Bourget, ON	34
2016-11-15T02:31:16	45.8243	-75.5124	18.00	0.90	12 km SE from Val-des-Bois, QC/12 km S-E de Val-des-Bois, QC	44
2016-11-07T01:10:03	45.7000	-76.1722	18.00	1.80	20 km W from Wakefield, QC/20 km O de Wakefield, QC	59
2016-10-29T09:21:42	45.5225	-75.2597	18.00	1.40	4 km SE from Rockland, ON/4 km S-E de Rockland, ON	23
2016-10-06T21:58:03	45.5137	-74.9084	18.00	1.50	6 km SW from Alfred, ON/6 km S-O de Alfred, ON	49
2016-09-28T10:09:56	45.3228	-74.8739	18.00	1.30	16 km E from Casselman, ON/16 km E de Casselman, ON	52
2016-09-05T10:38:53	45.2770	-75.0020	18.00	1.10	8 km SE from Casselman, ON/8 km S-E de Casselman, ON	44
2016-08-27T18:36:45	45.2237	-74.3726	18.00	2.60	13 km SW from Les Coteaux, QC/13 km S-O de Les Coteaux, QC	93
2016-08-10T00:20:47	45.8044	-75.1789	18.00	1.10	13 km NW from Saint-Andre-Avellin, QC/13 km N-O de Saint-Andre-Avellin, QC	49
2016-08-10T00:19:50	45.8025	-75.1846	18.00	1.20	13 km NW from Saint-Andre-Avellin, QC/13 km N-O de Saint-Andre-Avellin, QC	49
2016-08-09T07:45:16	45.7413	-76.3523	18.00	1.50	19 km NE from Shawville, QC/19 km N-E de Shawville, QC	73
2016-08-07T07:05:18	45.8067	-75.1704	18.00	0.90	13 km NW from Saint-Andre-Avellin, QC/13 km N-O de Saint-Andre-Avellin, QC	50
2016-08-07T03:27:48	45.7976	-75.1830	18.00	1.30	13 km NW from Saint-Andre-Avellin, QC/13 km N-O de Saint-Andre-Avellin, QC	49
2016-08-04T06:30:58	45.4695	-75.4062	18.00	1.00	13 km SW from Rockland, ON/13 km S-O de Rockland, ON	10
2016-05-22T22:05:42.920Z	45.8960	-75.5923	18.00	2.60	27km NNE of Val-des-Monts, Canada	52
2016-05-02T13:20:26	45.7281	-74.7169	18.00	1.50	13 km N from L'Orignal, ON/13 km N de L'Orignal, ON	71
2016-04-24T21:55:33	45.7483	-76.3511	18.00	2.20	19 km NE from Shawville, QC/19 km N-E de Shawville, QC	74
2016-04-10T13:48:56	45.5251	-75.3831	18.00	0.10	7 km S from Buckingham, QC. Aftershock/7 km S de Buckingham, QC. Replique	15
2016-04-10T02:23:44	45.5316	-75.3832	18.00	2.00	6 km SE from Buckingham, QC/6 km S-E de Buckingham, QC	16
2016-04-04T00:48:33	45.1066	-75.1539	18.00	1.50	6 km E from Chesterville, ON/6 km E de Chesterville, ON	46
2016-03-22T02:59:59	45.5834	-75.0401	12.00	2.80	4 km SW from Papineauville, QC. Felt/4 km S-O de Papineauville, QC. Ressenti	41
2016-03-22T02:59:58.760Z	45.5950	-75.0280	18.00	2.80	2km SSW of Papineauville, Canada	43
2016-02-29T16:23:36	45.7669	-75.3442	18.00	0.30	20 km N from Thurso, QC/20 km N de Thurso, QC	40
2016-02-24T20:24:30.250Z	45.8756	-75.5597	18.00	2.80	26km NNE of Val-des-Monts, Canada	50
2016-02-06T10:04:36	45.5775	-75.6072	18.00	1.80	9 km N from Gatineau, QC. Felt/9 km N de Gatineau, QC. Ressenti	18
2016-02-02T15:16:23	45.5239	-75.7304	18.00	1.50	7 km NW from Gatineau, QC/7 km N-O de Gatineau, QC	19
2016-01-14T13:25:46	45.8042	-75.1817	18.00	1.40	13 km NW from Saint-Andre-Avellin, QC/13 km N-O de Saint-Andre-Avellin, QC	49
2016-01-09T14:52:01	45.8377	-75.3886	18.00	1.30	19 km SE from Val-des-Bois, QC/19 km S-E de Val-des-Bois, QC	46
2015-12-11T20:54:06	45.4131	-75.5043	18.00	1.20	15 km SE from Gatineau, QC/15 km S-E de Gatineau, QC	2
2015-12-05T08:55:02	45.5263	-75.3627	18.00	1.20	6 km SW from Rockland, ON/6 km S-O de Rockland, ON	16
2015-12-05T08:15:13	45.5260	-75.3513	18.00	1.80	5 km SW from Rockland, ON/5 km S-O de Rockland, ON	17
2015-11-28T05:16:54.250Z	44.9785	-74.7305	5.00	3.23	4km S of Cornwall, Canada	80
2015-11-19T16:11:11	45.5499	-76.1978	18.00	2.00	11 km NW from Constance Bay, ON/11 km N-O de Constance Bay, ON	54

2015-11-12T03:02:15	45.4264	-76.5120	5.00	1.90	13 km W from Arnprior, ON/13 km O de Arnprior, ON	77
2015-11-04T07:33:38	45.7025	-76.4477	18.00	1.50	12 km N from Shawville, QC/12 km N de Shawville, QC	78
2015-11-03T08:14:30	45.5073	-75.9525	18.00	1.80	10 km E from Constance Bay, ON/10 km E de Constance Bay, ON	35
2015-09-24T15:12:17	45.4339	-76.2102	18.00	1.80	11 km E from Arnprior, ON/11 km E de Arnprior, ON	54
2015-09-14T01:47:07	45.7536	-76.3425	18.00	1.60	20 km NE from Shawville, QC/20 km N-E de Shawville, QC	73
2015-09-09T19:17:51.070Z	45.7670	-76.3743	10.00	3.19	20km NE of Shawville, Canada	76
2015-09-09T19:17:50	45.7644	-76.3443	14.50	3.70	21 km NE from Shawville, QC. Felt/21 km N-E de Shawville, QC. Ressenti	74
2015-08-15T15:45:59	45.6296	-75.3274	18.00	2.20	7 km NW from Thurso, QC/7 km N-O de Thurso, QC	27
2015-08-08T09:08:29.910Z	45.8910	-75.5646	18.00	2.50	27km NNE of Val-des-Monts, Canada	51
2015-08-05T07:56:05.490Z	45.8894	-75.5673	18.00	2.70	27km NNE of Val-des-Monts, Canada	51
2015-08-05T07:37:51.110Z	45.9542	-75.5657	3.09	2.72	26km NNE of Val-des-Monts, Canada	58
2015-08-02T12:55:05	45.7881	-74.2908	18.00	1.80	15 km NE from Brownsburg-Chatham, QC/15 km N-E de Brownsburg-Chatham, QC	104
2015-07-21T12:03:03	45.4858	-74.5288	18.00	1.80	10 km E from Vankleek Hill, ON/10 km E de Vankleek Hill, ON	78
2015-07-15T22:00:19.520Z	45.4743	-74.5435	10.23	3.27	13km SSE of Hawkesbury, Canada	76
2015-07-15T22:00:18	45.4698	-74.5399	14.50	3.90	9 km SE from Vankleek Hill, ON. Felt/9 km S-E de Vankleek Hill, ON. Ressenti	77
2015-04-22T15:33:51.930Z	46.1088	-74.6623	18.00	2.50	9km SSW of Mont-Tremblant, Canada	101
2015-04-15T19:48:46	45.5472	-74.7969	18.00	1.70	6 km E from Alfred, ON/6 km E de Alfred, ON	58
2015-03-02T17:39:46	45.3548	-75.1523	18.00	2.10	7 km NW from Casselman, ON/7 km N-O de Casselman, ON	30
2015-02-25T05:54:27	45.6922	-76.1569	18.00	1.40	19 km W from Wakefield, QC/19 km O de Wakefield, QC	57
2015-02-21T20:50:36	45.2758	-75.2126	18.00	1.60	6 km E from Embrun, ON/6 km E de Embrun, ON	30
2015-02-15T22:44:47	45.7771	-74.5688	18.00	2.10	16 km NW from Brownsburg-Chatham, QC/16 km N-O de Brownsburg-Chatham, QC	84
2015-01-30T01:23:20	45.1814	-74.4519	18.00	1.50	21 km SW from Les Coteaux, QC. Felt/21 km S-O de Les Coteaux, QC. Ressenti	88
2015-01-22T09:55:58	45.8028	-75.0897	18.00	1.00	10 km N from Saint-Andre-Avellin, QC/10 km N de Saint-Andre-Avellin, QC	53
2015-01-17T05:03:53	45.6061	-75.5589	18.00	1.70	11 km W from Buckingham, QC/11 km O de Buckingham, QC	20
2015-01-12T01:50:27	45.4300	-75.1573	10.97	1.40	1 km SW from Bourget, ON/1 km S-O de Bourget, ON	28
2015-01-01T19:23:53	45.4133	-75.4447	17.56	2.20	19 km SE from Gatineau, QC/19 km S-E de Gatineau, QC	6
2014-12-24T16:27:41.640Z	46.1433	-74.9434	18.00	2.60	22km SW of Labelle, Canada	91
2014-12-12T00:36:42	45.4679	-75.2137	14.17	2.00	6 km NW from Bourget, ON/6 km N-O de Bourget, ON	24
2014-12-06T11:16:45	45.5148	-74.3529	18.00	1.80	5 km NW from Rigaud, QC/5 km N-O de Rigaud, QC	92
2014-11-29T19:19:36	45.5221	-76.3505	18.00	1.70	10 km N from Arnprior, ON/10 km N de Arnprior, ON	65
2014-10-30T03:09:17.270Z	45.9456	-74.1888	19.58	2.50	4km W of Sainte-Adele, Canada	118
2014-10-14T14:14:17	45.6857	-75.1465	18.00	1.50	7 km SW from Saint-Andre-Avellin, QC/7 km S-O de Saint-Andre-Avellin, QC	41
2014-09-22T01:52:42	45.5504	-75.7796	19.63	2.00	12 km NW from Gatineau, QC/12 km N-O de Gatineau, QC	24
2014-09-05T23:27:15	45.8321	-75.0253	12.04	1.80	13 km N from Saint-Andre-Avellin, QC/13 km N de Saint-Andre-Avellin, QC	59
2014-08-19T08:40:26.150Z	45.7312	-74.7365	14.32	2.50	17km NNW of Hawkesbury, Canada	70
2014-08-19T08:40:26	45.7312	-74.7365	14.32	2.50	13 km N from L'Orignal, ON, Felt/13 km N de L'Orignal, ON , Ressenti	70
2014-08-15T01:05:45	45.5807	-75.8832	15.59	1.30	7 km SE from Wakefield, QC/7 km S-E de Wakefield, QC	33
2014-07-21T08:20:26	45.7300	-75.3159	18.00	0.90	15 km N from Thurso, QC/15 km N de Thurso, QC	37
2014-07-04T22:55:57.000Z	45.9220	-74.8570	18.00	3.00	27km NE of Saint-Andre-Avellin, Canada	75
2014-06-20T07:10:45	45.6063	-74.5175	18.00	1.40	8 km E from Hawkesbury, ON/8 km E de Hawkesbury, ON	81
2014-06-14T09:47:08	45.8108	-75.0887	13.69	2.20	11 km N from Saint-Andre-Avellin, QC/11 km N de Saint-Andre-Avellin, QC	54
2014-05-09T07:29:18	45.7358	-75.3138	18.00	-0.30	16 km N from Thurso, QC/16 km N de Thurso, QC	38
2014-04-29T14:43:51	45.1080	-75.0696	18.00	1.20	13 km E from Chesterville, ON/13 km E de Chesterville, ON	50
2014-04-27T09:49:57	45.8097	-74.7672	18.00	2.50	22 km N from L'Orignal, ON/22 km N de L'Orignal, ON	72
2014-04-13T09:55:47	45.5454	-75.6662	18.00	1.00	5 km N from Gatineau, QC/5 km N de Gatineau, QC	17
2014-03-22T17:00:13	45.4655	-74.8857	18.00	1.70	10 km S from Alfred, ON/10 km S de Alfred, ON	50
2014-03-16T16:17:42	45.7318	-76.2141	18.00	1.40	24 km NW from Wakefield, QC/24 km N-O de Wakefield, QC	64
2014-03-15T01:29:58	45.8013	-75.2953	18.00	2.70	20 km NW from Saint-Andre-Avellin, QC. Felt/20 km N-O de Saint-Andre-Avellin, QC. Ressenti	45
2014-03-09T05:55:48	45.6743	-74.5728	18.00	2.00	9 km N from Hawkesbury, ON/9 km N de Hawkesbury, ON	79
2014-03-05T06:31:28	45.7241	-75.3619	18.00	-0.50	16 km N from Buckingham, QC/16 km N de Buckingham, QC	35
2014-02-16T11:59:36	45.7389	-75.3123	18.00	0.80	16 km N from Thurso, QC/16 km N de Thurso, QC	38
2014-02-13T05:50:55	45.4129	-75.3495	18.00	1.40	16 km W from Bourget, ON/16 km O de Bourget, ON	14
2014-02-13T04:04:56	45.7325	-76.3413	18.00	1.90	18 km NE from Shawville, QC/18 km N-E de Shawville, QC	72
2014-01-30T05:51:51	45.3909	-74.4199	18.00	1.90	14 km SW from Rigaud, QC/14 km S-O de Rigaud, QC	86
2014-01-26T17:09:26	45.7130	-75.1100	18.00	1.70	3 km W from Saint-Andre-Avellin, QC/3 km O de Saint-Andre-Avellin, QC	45
2014-01-01T18:33:31	45.5322	-74.2889	18.00	2.20	6 km N from Rigaud, QC/6 km N de Rigaud, QC	97
2013-12-17T15:16:16	45.8173	-75.9878	18.00	1.30	15 km S from Kazabazua, QC/15 km S de Kazabazua, QC	56
2013-11-22T06:03:36	45.3858	-75.2097	18.00	1.50	7 km SW from Bourget, ON/7 km S-O de Bourget, ON	25
2013-11-18T13:37:22	45.7547	-76.3509	18.00	2.10	20 km NE from Shawville, QC. Aftershock. Felt/20 km N-E de Shawville, QC. Replique. Felt. Ressenti	74
2013-11-16T12:50:39.850Z	45.7510	-76.3440	18.00	2.90	19km NNE of Shawville, Canada	73
2013-11-16T12:50:39	45.7506	-76.3444	18.00	2.90	20 km NE from Shawville, QC. Felt/20 km N-E de Shawville, QC. Ressenti	73
2013-11-05T17:02:24	45.5445	-74.9042	18.00	1.60	3 km SW from Alfred, ON/3 km S-O de Alfred, ON	50
2013-10-12T04:04:08	45.7695	-76.3396	18.00	1.50	22 km NE from Shawville, QC/22 km N-E de Shawville, QC	74
2013-10-04T07:23:52	45.6332	-75.1199	18.00	1.00	8 km W from Papineauville, QC/8 km O de Papineauville, QC	39

2013-10-02T13:21:35	45.6150	-74.7143	18.00	1.80	2 km W from L'Orignal, ON/2 km O de L'Orignal, ON	66
2013-10-01T11:27:15	45.5531	-74.6862	18.00	1.60	5 km NW from Vankleek Hill, ON/5 km N-O de Vankleek Hill, ON	66
2013-09-25T14:24:34	45.3700	-75.8375	18.00	2.50	2 km N from Crystal Beach, ON/2 km N de Crystal Beach, ON	26
2013-09-11T09:15:15	45.4843	-75.2891	18.00	1.70	7 km S from Rockland, ON/7 km S de Rockland, ON	19
2013-08-20T14:53:02	45.8243	-75.3177	18.00	1.30	23 km NW from Saint-Andre-Avellin, QC/23 km N-O de Saint-Andre-Avellin, QC	47
2013-08-20T11:00:22	45.7309	-76.3616	12.00	1.90	17 km NE from Shawville, QC. Aftershock/17 km N-E de Shawville, QC	73
2013-07-31T00:15:29	45.4916	-75.2604	9.89	1.90	7 km S from Rockland, ON/7 km S de Rockland, ON	21
2013-07-23T22:21:08	45.8286	-76.8973	18.00	2.20	13 km W from Fort-Coulonge, QC/13 km O de Fort-Coulonge, QC	116
2013-07-21T08:13:28	45.7386	-76.3470	13.46	1.90	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	73
2013-06-30T08:49:08	45.7470	-76.3695	12.00	1.00	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	75
2013-06-30T08:40:46.000Z	45.7480	-76.3520	14.00	3.10	19km NNE of Shawville, Canada	74
2013-06-30T08:40:46	45.7482	-76.3517	13.97	3.10	19 km NE from Shawville, QC, aftershock. Felt/19 km N-E de Shawville, QC, replique. Ressenti	74
2013-06-22T04:25:57	45.7437	-76.3545	13.19	1.40	19 km NE from Shawville, QC. aftershock/19 km N-E de Shawville, QC. replique	74
2013-06-16T05:47:22	45.2456	-75.3482	13.27	2.60	2 km E from Russell, ON, felt/2 km E de Russell, ON, Ressenti	25
2013-06-15T15:58:31.690Z	45.7440	-76.3520	13.30	2.50	18km NNE of Shawville, Canada	73
2013-06-15T15:58:31	45.7440	-76.3516	13.33	2.50	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	73
2013-06-13T13:00:40	45.4688	-75.8814	12.36	2.10	14 km N from Crystal Beach, ON/14 km N de Crystal Beach, ON	28
2013-06-10T10:38:59	45.7467	-76.3709	12.00	1.50	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	75
2013-06-09T06:07:38	45.7478	-76.3640	12.00	1.10	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	75
2013-06-08T07:04:47	45.7471	-76.3435	12.98	1.90	20 km NE from Shawville, QC, aftershock/20 km N-E de Shawville, QC, replique	73
2013-05-30T08:09:45	45.7418	-76.3722	12.00	0.90	18 km NE from Shawville, QC, aftershock/18 km N-E de Shawville, QC, replique	75
2013-05-30T05:34:59.140Z	45.7695	-76.3692	13.25	2.93	19km NNE of Shawville, Canada	76
2013-05-30T05:34:58	45.7488	-76.3510	13.50	3.70	19 km NE from Shawville, QC. Aftershock. Felt/19 km N-E de Shawville, QC. Replique. Ressenti	74
2013-05-28T00:43:29	45.7348	-76.3523	12.00	1.60	18 km NE from Shawville, QC, aftershock/18 km N-E de Shawville, QC, replique	73
2013-05-27T07:09:48	45.7486	-76.3776	12.00	1.30	18 km NE from Shawville, QC, aftershocl/18 km N-E de Shawville, QC, replique	75
2013-05-26T03:05:41	45.7400	-76.3449	12.00	1.40	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	73
2013-05-25T01:10:06	45.7510	-76.3461	12.00	1.40	20 km NE from Shawville, QC, aftershock/20 km N-E de Shawville, QC, replique	73
2013-05-25T01:08:05	45.7459	-76.3774	12.00	1.40	18 km NE from Shawville, QC, aftershock/18 km N-E de Shawville, QC, replique	75
2013-05-24T19:48:08	45.7407	-76.3459	14.56	2.80	20 km NE from Shawville, QC. Aftershock Felt.. Felt/20 km N-E de Shawville, QC. Ressenti. Replique.. Ressenti	73
2013-05-24T13:16:59	45.7467	-76.3580	12.00	2.00	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	74
2013-05-23T13:49:49	45.7486	-76.3656	12.00	1.70	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	75
2013-05-22T02:47:26	45.7377	-76.3592	12.00	1.00	18 km NE from Shawville, QC, aftershock/18 km N-E de Shawville, QC, replique	74
2013-05-21T20:43:01.940Z	45.4413	-74.1990	12.01	2.73	7km WSW of Hudson, Canada	103
2013-05-21T15:38:18	45.7459	-76.3606	12.00	1.70	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	74
2013-05-21T04:23:28	45.7406	-76.3495	12.00	1.10	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	73
2013-05-20T23:16:05	45.7478	-76.3254	12.00	1.60	21 km NE from Shawville, QC, aftershock/21 km N-E de Shawville, QC, replique	72
2013-05-20T14:21:59	45.7600	-76.3471	12.00	1.70	21 km NE from Shawville, QC, aftershock/21 km N-E de Shawville, QC, replique	74
2013-05-20T02:48:39	45.7568	-76.3523	12.00	1.30	20 km NE from Shawville, QC, aftershock/20 km N-E de Shawville, QC , replique	74
2013-05-19T20:54:40	45.7401	-76.3625	12.00	1.20	18 km NE from Shawville, QC, aftershock/18 km N-E de Shawville, QC, replique	74
2013-05-19T16:14:28	45.7215	-76.3472	12.00	1.20	17 km NE from Shawville, QC, aftershock/17 km N-E de Shawville, QC, replique	72
2013-05-19T15:59:01	45.7462	-76.3499	12.00	1.10	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	73
2013-05-19T10:29:37	45.7425	-76.3672	12.00	1.00	18 km NE from Shawville, QC, aftershock/18 km N-E de Shawville, QC, replique	74
2013-05-19T09:46:40	45.7489	-76.3418	12.00	1.30	20 km NE from Shawville, QC, aftershock/20 km N-E de Shawville, QC	73
2013-05-19T05:14:22	45.2017	-75.5102	18.00	2.20	5 km SW from Metcalfe, ON/5 km S-O de Metcalfe, ON	25
2013-05-18T04:54:11	45.7398	-76.3596	12.00	1.00	18 km NE from Shawville, QC, aftershock/18 km N-E de Shawville, QC, replique	74
2013-05-18T02:46:44	45.7455	-76.3449	12.00	1.10	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	73
2013-05-17T22:29:22	45.7367	-76.3559	12.00	1.50	18 km NE from Shawville, QC, aftershock/18 km N-E de Shawville, QC, replique	73
2013-05-17T20:15:17.000Z	45.7670	-76.3460	18.00	3.10	21km NNE of Shawville, Canada	74
2013-05-17T20:15:17	45.7518	-76.3467	13.96	3.20	20 km NE from Shawville, QC. Aftershock. Felt/20 km N-E de Shawville, QC. Replique.Ressenti	74
2013-05-17T19:59:31	45.7369	-76.3701	11.45	1.60	18 km NE from Shawville, QC, aftershock/18 km N-E de Shawville, QC, replique	74
2013-05-17T19:31:46	45.7634	-76.3549	14.43	1.70	21 km NE from Shawville, QC, aftershock/21 km N-E de Shawville, QC, replique	75
2013-05-17T17:50:36	45.7241	-76.3511	9.91	2.10	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	72
2013-05-17T17:46:07	45.7503	-76.3406	14.48	2.10	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	73
2013-05-17T16:22:02	45.7321	-76.3300	12.00	1.50	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC, replique	71
2013-05-17T14:46:12	45.7671	-76.3628	14.53	1.70	21 km NE from Shawville, QC, aftershock/21 km N-E de Shawville, QC, replique	75
2013-05-17T14:16:18	45.7460	-76.3655	12.00	1.40	19 km NE from Shawville, QC, aftershock/19 km N-E de Shawville, QC	75
2013-05-17T13:53:55.830Z	45.7577	-76.3545	10.72	3.63	18km NE of Shawville, Canada	74
2013-05-17T13:53:55	45.7460	-76.3453	14.00	4.10	20 km NE from Shawville, QC. Aftershock. Felt.. Felt/20 km N-E de Shawville, QC. Replique. Ressenti.. Ressenti	73
2013-05-17T13:43:24.440Z	45.7568	-76.3533	13.00	5.06	19km NNE of Shawville, Canada	74
2013-05-17T13:43:23	45.7396	-76.3449	13.50	5.20	18 km NE from Shawville, QC, Felt/18 km N-E de Shawville, QC, Ressenti	73
2013-05-15T19:13:14	45.4161	-75.9834	18.00	2.70	12 km SE from Constance Bay, ON. Felt/12 km S-E de Constance Bay, ON. Ressenti	36
2013-04-27T21:29:22	45.6111	-75.2068	18.00	1.50	4 km E from Thurso, QC/4 km E de Thurso, QC	32
2013-04-15T13:32:25	45.7816	-74.4376	12.80	3.10	11 km N from Brownsburg-Chatham, QC. Felt.. Felt/11 km N de Brownsburg-Chatham, QC. Ressenti.. Ressenti	93
2013-03-31T21:27:43	45.7490	-75.3051	18.00	1.40	17 km N from Thurso, QC/17 km N de Thurso, QC	39

2013-03-28T23:07:50	45.1204	-75.4309	18.00	1.60	8 km NW from Winchester, ON/8 km N-O de Winchester, ON	35
2013-03-28T23:07:16	45.1071	-75.4464	18.00	1.40	8 km W from Winchester, ON/8 km O de Winchester, ON	36
2013-03-28T23:07:07	45.1045	-75.4503	18.00	1.10	8 km W from Winchester, ON/8 km O de Winchester, ON	37
2013-03-28T23:06:36	45.1139	-75.4394	18.00	1.30	8 km NW from Winchester, ON/8 km N-O de Winchester, ON	36
2013-03-20T04:57:47	45.7504	-75.2878	9.50	-0.50	17 km N from Thurso, QC/17 km N de Thurso, QC	40
2013-03-13T20:32:21	45.5476	-74.5791	18.00	2.70	5 km SE from Hawkesbury, ON/5 km S-E de Hawkesbury, ON	75
2013-03-06T02:24:28	45.5375	-74.4263	18.00	1.80	12 km NW from Rigaud, QC/12 km N-O de Rigaud, QC	86
2013-03-04T08:41:53	45.6589	-74.7203	18.00	1.20	5 km NW from L'Orignal, ON/5 km N-O de L'Orignal, ON	67
2013-02-17T07:07:05	45.7827	-75.0822	18.00	1.40	7 km N from Saint-Andre-Avellin, QC/7 km N de Saint-Andre-Avellin, QC	52
2013-02-03T08:27:00	45.6082	-74.6685	18.00	1.90	L'Orignal, ON. Aftershock./L'Orignal, ON. Replique.	69
2013-02-02T23:56:38	45.6064	-74.6565	13.00	2.30	L'Orignal, ON. Felt.. Felt/L'Orignal, ON. Ressenti.. Ressenti	70
2013-01-25T18:08:20	45.3478	-75.4549	18.00	1.10	13 km N from Metcalfe, ON/13 km N de Metcalfe, ON	10
2013-01-16T01:01:48.950Z	46.0630	-75.4330	18.00	3.00	southern Quebec, Canada	71
2013-01-16T00:53:04.880Z	46.0610	-75.4420	18.00	3.50	southern Quebec, Canada	70
2013-01-12T07:34:37	45.5520	-74.7918	18.00	2.50	7 km E from Alfred, ON/7 km E de Alfred, ON	58
2012-12-26T15:39:47	45.6770	-74.6315	18.00	1.30	8 km NE from L'Orignal, ON/8 km N-E de L'Orignal, ON	75
2012-12-24T07:12:42	45.2367	-75.5185	18.00	1.30	4 km W from Metcalfe, ON/4 km O de Metcalfe, ON	21
2012-12-07T15:31:13	45.7391	-75.3105	18.00	0.10	16 km N from Thurso, QC/16 km N de Thurso, QC	38
2012-11-14T02:58:37	45.5739	-74.7188	18.00	1.30	5 km SW from L'Orignal, ON/5 km S-O de L'Orignal, ON	65
2012-11-06T10:12:39	45.6266	-74.9954	18.00	2.40	2 km N from Papineauville, QC/2 km N de Papineauville, QC	46
2012-11-06T09:42:25	45.6081	-74.5927	18.00	2.20	2 km E from Hawkesbury, ON. Aftershock. Felt/2 km E de Hawkesbury, ON. Replique. Ressenti	75
2012-11-06T09:05:28.400Z	45.6185	-74.6010	11.07	3.74	Ontario-Quebec border region, Canada	75
2012-11-06T09:05:27	45.6014	-74.5906	6.50	4.20	2 km E from Hawkesbury, ON. Felt/2 km E de Hawkesbury, ON. Ressenti	75
2012-10-31T06:42:00	45.5834	-75.2567	18.00	1.20	2 km S from Thurso, QC/2 km S de Thurso, QC	27
2012-10-24T08:20:15	45.2190	-74.3624	18.00	2.60	12 km SW from Les Coteaux, QC. Felt/12 km S-O de Les Coteaux, QC. Ressenti	94
2012-10-14T00:55:39	45.5878	-74.5891	18.00	1.30	3 km SE from Hawkesbury, ON/3 km S-E de Hawkesbury, ON	75
2012-10-08T18:27:59	45.3000	-75.2155	18.00	1.30	6 km NE from Embrun, ON/6 km N-E de Embrun, ON	28
2012-09-22T18:53:04	45.4663	-75.3155	10.63	2.30	10 km S from Rockland, ON/10 km S de Rockland, ON	17
2012-09-22T17:36:31.280Z	45.4742	-75.3255	10.00	2.53	Ontario-Quebec border region, Canada	16
2012-09-22T17:36:30	45.4653	-75.3152	10.02	3.10	10 km S from Rockland, ON. Felt.. Felt/10 km S de Rockland, ON. Ressenti.. Ressenti	17
2012-08-30T00:59:57	45.7958	-74.9765	18.00	1.30	11 km NE from Saint-Andre-Avellin, QC/11 km N-E de Saint-Andre-Avellin, QC	59
2012-08-26T21:48:19	45.4983	-75.4096	18.00	1.60	9 km S from Buckingham, QC/9 km S de Buckingham, QC	12
2012-07-31T01:40:13	45.7721	-74.3389	18.00	1.40	12 km NE from Brownsburg-Chatham, QC/12 km N-E de Brownsburg-Chatham, QC	100
2012-07-23T11:21:58	45.7548	-75.0890	9.01	2.30	Saint-Andre-Avellin, QC. Felt/Saint-Andre-Avellin, QC. Ressenti	49
2012-07-16T12:16:05	45.8075	-74.9977	18.00	1.30	11 km NE from Saint-Andre-Avellin, QC/11 km N-E de Saint-Andre-Avellin, QC	58
2012-07-14T14:31:14	45.5251	-75.4537	18.00	1.20	7 km SW from Buckingham, QC/7 km S-O de Buckingham, QC	12
2012-06-18T02:27:21	45.6624	-75.7615	5.41	1.20	14 km E from Wakefield, QC/14 km E de Wakefield, QC	32
2012-06-14T14:08:56	45.7574	-74.9939	2.39	1.60	7 km NE from Saint-Andre-Avellin, QC/7 km N-E de Saint-Andre-Avellin, QC	55
2012-05-30T21:34:00	45.6098	-75.8945	18.00	1.70	4 km SE from Wakefield, QC/4 km S-E de Wakefield, QC	35
2012-04-28T00:12:59	45.8192	-74.8408	18.00	1.60	21 km NE from Saint-Andre-Avellin, QC/21 km N-E de Saint-Andre-Avellin, QC	68
2012-04-07T21:47:28.820Z	45.6815	-75.7722	6.50	2.52	Ontario-Quebec border region, Canada	34
2012-04-07T21:47:28	45.6699	-75.7318	18.00	3.10	16 km E from Wakefield, QC. Felt/16 km E de Wakefield, QC. Ressenti	31
2012-04-07T01:21:10	45.8251	-74.7154	18.00	1.50	23 km N from L'Orignal, ON/23 km N de L'Orignal, ON	77
2012-04-06T02:25:15	45.5467	-74.5506	18.00	2.30	7 km SE from Hawkesbury, ON/7 km S-E de Hawkesbury, ON	77
2012-03-10T13:03:27	45.7706	-75.5324	18.00	1.00	17 km S from Val-des-Bois, QC/17 km S de Val-des-Bois, QC	38
2012-02-21T13:26:18	45.6053	-76.6653	18.00	1.50	14 km W from Shawville, QC/14 km O de Shawville, QC	91
2012-02-21T09:10:35	45.7276	-76.1936	18.00	1.10	23 km NW from Wakefield, QC/23 km N-O de Wakefield, QC	62
2012-02-20T06:24:17	45.8257	-75.5607	18.00	0.60	11 km S from Val-des-Bois, QC/11 km S de Val-des-Bois, QC	44
2012-02-08T22:24:27	45.5730	-75.2148	13.65	2.30	4 km SE from Thurso, QC. Felt.. Felt/4 km S-E de Thurso, QC. Ressenti.. Ressenti	29
2012-01-28T01:54:47	45.6238	-75.7485	11.60	0.90	14 km E from Wakefield, QC/14 km E de Wakefield, QC	28
2012-01-17T09:51:42	45.5509	-74.8212	18.00	1.70	5 km E from Alfred, ON/5 km E de Alfred, ON	56
2012-01-14T03:58:12	45.3470	-74.3582	18.00	1.30	12 km NW from Les Coteaux, QC/12 km N-O de Les Coteaux, QC	91
2012-01-10T11:10:22	45.5831	-76.2072	18.00	2.00	13 km NW from Constance Bay, ON/13 km N-O de Constance Bay, ON	56
2011-12-14T08:58:52	45.3205	-75.2540	18.00	1.10	6 km N from Embrun, ON/6 km N de Embrun, ON	24
2011-11-07T03:21:59	45.6378	-74.8129	18.00	1.10	10 km W from L'Orignal, ON/10 km O de L'Orignal, ON	60
2011-11-05T20:06:13	45.5268	-76.3569	18.00	2.00	10 km N from Arnprior, ON/10 km N de Arnprior, ON	66
2011-11-03T16:02:47	45.8372	-76.7596	18.00	2.50	4 km W from Fort-Coulonge, QC/4 km O de Fort-Coulonge, QC	106
2011-10-22T02:39:45	45.8189	-74.6971	18.00	2.80	22 km N from L'Orignal, ON. Felt/22 km N de L'Orignal, ON. Ressenti	77
2011-10-20T17:46:46	45.4685	-74.5340	18.00	2.10	11 km SE from Vankleek Hill, ON/11 km S-E de Vankleek Hill, ON	77
2011-10-16T03:44:09	45.5827	-75.2186	11.38	2.80	3 km SE from Thurso, QC. Felt/3 km S-E de Thurso, QC. Ressenti	29
2011-10-09T09:29:26	45.7093	-76.7537	18.00	2.10	16 km S from Fort-Coulonge, QC/16 km S de Fort-Coulonge, QC	101
2011-10-01T10:53:07	45.7349	-75.4368	18.00	-0.20	17 km N from Buckingham, QC/17 km N de Buckingham, QC	35
2011-09-29T21:12:05	45.4240	-74.5163	18.00	1.80	15 km SE from Vankleek Hill, ON/15 km S-E de Vankleek Hill, ON	78
2011-09-23T16:15:07	45.5795	-75.2145	10.56	1.20	4 km SE from Thurso, QC/4 km S-E de Thurso, QC	29

2011-09-22T22:04:30	45.4534	-75.2760	13.30	1.80	11 km S from Rockland, ON/11 km S de Rockland, ON	19
2011-09-18T19:19:14.040Z	45.6013	-75.2345	5.00	3.84	Ontario-Quebec border region, Canada	29
2011-09-18T19:19:13	45.5779	-75.2128	12.51	4.10	4 km SE from Thurso, QC, Felt locally. Felt/4 km S-E de Thurso, QC, Ressenti	29
2011-09-15T09:32:04	45.4729	-74.4422	18.00	1.90	11 km W from Rigaud, QC/11 km O de Rigaud, QC	84
2011-08-24T17:14:32.670Z	44.7030	-74.3822	5.00	3.19	New York	121
2011-08-07T11:00:11	45.4873	-75.4240	18.00	1.00	11 km S from Buckingham, QC/11 km S de Buckingham, QC	10
2011-07-21T23:05:53.560Z	45.8052	-76.1230	15.00	2.94	southern Ontario, Canada	63
2011-07-21T23:05:52	45.7378	-76.1397	9.64	3.50	20 km NW from Wakefield, QC, FELT/20 km N-O de Wakefield, QC, RESSENTI	59
2011-05-26T03:43:50	45.1249	-75.0816	18.00	1.60	12 km E from Chesterville, ON/12 km E de Chesterville, ON	48
2011-05-24T07:13:32	45.5337	-75.0894	18.74	2.40	10 km SW from Papineauville, QC/10 km S-O de Papineauville, QC	36
2011-05-23T11:18:32	45.5761	-76.2723	18.00	1.70	17 km E from Shawville, QC/17 km E de Shawville, QC	61
2011-05-19T13:02:58	45.7341	-75.0968	18.00	1.90	3 km NW from Saint-Andre-Avellin, QC/3 km N-O de Saint-Andre-Avellin, QC	47
2011-05-12T04:07:48	45.3089	-75.1982	11.57	2.50	8 km NE from Embrun, ON. Felt/8 km N-E de Embrun, ON. Ressenti	29
2011-05-11T19:13:04	45.5307	-76.3975	18.00	1.80	10 km SE from Shawville, QC/10 km S-E de Shawville, QC	69
2011-04-06T21:33:08	45.5591	-74.3493	18.00	1.50	9 km NW from Rigaud, QC/9 km N-O de Rigaud, QC	92
2011-04-06T14:22:30	45.7344	-76.1348	9.62	2.50	19 km NW from Wakefield, QC/19 km N-O de Wakefield, QC	59
2011-04-05T08:40:37	45.4190	-75.5220	18.00	1.00	13 km SE from Gatineau, QC/13 km S-E de Gatineau, QC	1
2011-04-02T03:13:32	45.5831	-74.5896	18.00	1.60	3 km SE from Hawkesbury, ON/3 km S-E de Hawkesbury, ON	75
2011-03-24T15:22:05	45.6829	-75.7637	18.00	1.50	14 km E from Wakefield, QC/14 km E de Wakefield, QC	34
2011-03-16T17:36:56.460Z	45.6165	-74.5370	10.00	3.87	Ontario-Quebec border region, Canada	79
2011-03-16T17:36:55	45.5813	-74.5534	12.75	4.30	6 km SE from Hawkesbury, ON. Felt/6 km S-E de Hawkesbury, ON. Ressenti	77
2011-03-11T08:09:04	45.6472	-75.0840	18.00	1.00	6 km NW from Papineauville, QC/6 km N-O de Papineauville, QC	42
2011-02-12T22:57:24	45.6524	-75.7410	13.40	1.10	15 km E from Wakefield, QC/15 km E de Wakefield, QC	30
2011-02-08T08:10:07	45.4701	-75.2392	18.00	1.60	14 km S from Thurso, QC/14 km S de Thurso, QC	22
2011-02-06T20:31:43	45.5589	-74.6189	18.00	1.30	5 km S from Hawkesbury, ON/5 km S de Hawkesbury, ON	72
2011-02-02T07:02:18	45.7481	-75.3120	18.00	1.50	17 km N from Thurso, QC/17 km N de Thurso, QC	39
2011-01-13T12:32:20.600Z	45.9060	-76.2870	18.00	2.80	southern Ontario, Canada	80
2010-12-27T16:08:44.340Z	45.7720	-75.3147	8.34	2.62	Ontario-Quebec border region, Canada	41
2010-12-27T16:08:44	45.7448	-75.3108	15.29	3.10	20 km NE of Buckingham, QC. Felt.. Felt/20 km N-E de Buckingham, QC. Ressenti.. Ressenti	39
2010-12-15T08:55:32	45.8102	-75.3714	18.00	1.90	21 km SE from Val-des-Bois, QC/21 km S-E de Val-des-Bois, QC	44
2010-12-13T08:34:25	45.8159	-75.3464	11.02	2.20	23 km SE from Val-des-Bois, QC/23 km S-E de Val-des-Bois, QC	45
2010-10-24T11:10:18	45.5196	-75.4071	18.00	1.40	7 km S from Buckingham, QC/7 km S de Buckingham, QC	13
2010-10-15T22:16:15	45.5185	-75.3065	18.00	2.20	4 km S from Rockland, ON/4 km S de Rockland, ON	19
2010-09-30T07:31:08	45.5349	-74.9554	18.00	1.70	7 km SW from Alfred, ON/7 km S-O de Alfred, ON	46
2010-09-25T20:27:11	45.5753	-74.9397	18.00	1.50	5 km W from Alfred, ON/5 km O de Alfred, ON	48
2010-09-09T12:26:21	45.6679	-76.2340	18.00	2.30	21 km E from Shawville, QC/21 km E de Shawville, QC	62
2010-09-06T10:18:00	45.3934	-74.4747	18.00	1.50	15 km NE from Alexandria, ON/15 km N-E de Alexandria, ON	82
2010-09-02T23:40:28	45.7997	-76.9105	18.00	1.60	15 km W from Fort-Coulonge, QC/15 km O de Fort-Coulonge, QC	116
2010-09-02T14:21:08	45.7929	-75.1585	18.00	2.60	11 km NW from Saint-Andre-Avellin, QC/11 km N-O de Saint-Andre-Avellin, QC	49
2010-08-12T08:34:34	45.2024	-74.3442	18.00	1.80	13 km SW from Les Coteaux, QC/13 km S-O de Les Coteaux, QC	95
2010-07-07T20:18:33	45.5930	-74.4384	18.00	1.90	10 km S from Brownsburg-Chatham, QC/10 km S de Brownsburg-Chatham, QC	86
2010-07-02T16:31:22.450Z	45.8870	-75.5120	20.80	2.60	Ontario-Quebec border region, Canada	51
2010-06-26T09:46:30.570Z	45.8690	-75.5400	13.50	2.50	Ontario-Quebec border region, Canada	49
2010-06-26T05:22:29.550Z	45.8860	-75.4830	18.80	2.60	Ontario-Quebec border region, Canada	51
2010-06-25T07:25:08	45.8359	-75.5030	18.00	1.60	12 km SE from Val-des-Bois, QC. Aftershock./12 km S-E de Val-des-Bois, QC. Replique.	45
2010-06-25T06:26:36.220Z	45.8730	-75.4640	19.60	2.50	Ontario-Quebec border region, Canada	49
2010-06-25T01:57:09	45.7639	-75.3181	18.00	1.00	20 km N from Thurso, QC/20 km N de Thurso, QC	40
2010-06-24T23:49:08.170Z	45.8710	-75.5180	16.70	3.20	Ontario-Quebec border region, Canada	49
2010-06-24T08:55:23.410Z	45.8750	-75.5040	17.00	2.70	Ontario-Quebec border region, Canada	50
2010-06-24T05:49:36.000Z	45.8540	-75.5590	14.70	2.70	Ontario-Quebec border region, Canada	47
2010-06-24T04:41:58.260Z	45.8770	-75.5310	15.60	2.60	Ontario-Quebec border region, Canada	50
2010-06-24T04:40:14.310Z	45.8750	-75.5210	15.70	2.60	Ontario-Quebec border region, Canada	49
2010-06-24T02:39:28	45.8040	-75.4499	18.00	0.80	17 km SE from Val-des-Bois, QC. Aftershock./17 km S-E de Val-des-Bois, QC. Replique.	42
2010-06-23T23:34:03.160Z	45.8710	-75.4740	22.90	3.30	Ontario-Quebec border region, Canada	49
2010-06-23T22:24:25.710Z	45.8820	-75.4940	18.00	2.50	Ontario-Quebec border region, Canada	50
2010-06-23T21:06:55.310Z	45.9090	-75.4970	18.00	2.60	Ontario-Quebec border region, Canada	53
2010-06-23T20:41:28	45.8390	-75.5101	18.00	1.40	11 km SE from Val-des-Bois, QC. Aftershock/11 km S-E de Val-des-Bois, QC. Replique	45
2010-06-23T19:18:21.250Z	45.8650	-75.4960	18.00	2.90	Ontario-Quebec border region, Canada	48
2010-06-23T19:02:06.400Z	45.8640	-75.4880	18.00	2.70	Ontario-Quebec border region, Canada	48
2010-06-23T18:29:02.990Z	45.8970	-75.4650	18.00	3.00	Ontario-Quebec border region, Canada	52
2010-06-23T18:25:09.630Z	45.8770	-75.4640	18.00	2.70	Ontario-Quebec border region, Canada	50
2010-06-23T18:22:47.120Z	45.9010	-75.4750	18.00	2.90	Ontario-Quebec border region, Canada	52
2010-06-23T18:15:47.870Z	45.8820	-75.5160	18.00	2.60	Ontario-Quebec border region, Canada	50
2010-06-23T18:07:13.950Z	45.8900	-75.5100	18.00	3.00	Ontario-Quebec border region, Canada	51

2010-06-23T18:04:32.670Z	45.8810	-75.5080	18.00	2.90	Ontario-Quebec border region, Canada	50
2010-06-23T18:03:32.410Z	45.8950	-75.5030	18.00	2.70	Ontario-Quebec border region, Canada	52
2010-06-23T17:53:34.490Z	45.8780	-75.4770	18.00	3.10	Ontario-Quebec border region, Canada	50
2010-06-23T17:41:42.700Z	45.8835	-75.4750	18.89	5.35	Ontario-Quebec border region, Canada	51
2010-05-18T23:05:01.250Z	45.9870	-74.7950	18.00	2.60	Ontario-Quebec border region, Canada	84
2010-05-18T05:32:15	45.6295	-74.8821	18.00	1.80	8 km N from Alfred, ON/8 km N de Alfred, ON	54
2010-05-11T21:18:31	45.4604	-75.2131	18.00	1.50	6 km NW from Bourget, ON. Aftershock/6 km N-O de Bourget, ON. Replique	24
2010-05-11T14:26:55	45.4630	-75.2085	18.00	2.70	6 km NW from Bourget, ON/6 km N-O de Bourget, ON	25
2010-05-08T09:55:48	45.4602	-75.2034	18.00	1.70	5 km NW from Bourget, ON/5 km N-O de Bourget, ON	25
2010-05-05T06:09:47	45.2124	-75.1919	18.00	1.70	9 km SE from Embrun, ON/9 km S-E de Embrun, ON	35
2010-04-26T21:00:40	45.7024	-75.0569	18.00	1.40	2 km SE from Saint-Andre-Avellin, QC/2 km S-E de Saint-Andre-Avellin, QC	47
2010-04-16T06:46:39	45.6916	-75.7429	18.00	1.50	16 km E from Wakefield, QC/16 km E de Wakefield, QC	34
2010-03-24T05:34:27	45.6257	-75.1442	18.00	2.00	9 km E from Thurso, QC/9 km E de Thurso, QC	37
2010-03-20T17:00:18	45.8139	-74.8183	18.00	1.80	22 km NE from Saint-Andre-Avellin, QC/22 km N-E de Saint-Andre-Avellin, QC	69
2010-03-10T13:09:04	45.7310	-74.4508	17.50	3.30	4 km N from Brownsburg-Chatham, QC. Felt./4 km N de Brownsburg-Chatham, QC. Ressenti.	90
2010-03-09T23:12:12	45.2388	-75.3754	18.00	1.80	1 km SW from Russell, ON/1 km S-O de Russell, ON	24
2010-03-01T17:02:16	45.6901	-74.4825	18.00	2.30	5 km W from Brownsburg-Chatham, QC. Aftershock. Felt/5 km O de Brownsburg-Chatham, QC. Replique. Ressenti	86
2010-03-01T08:10:50	45.7212	-74.4704	18.00	1.60	6 km NW from Brownsburg-Chatham, QC. Aftershock/6 km N-O de Brownsburg-Chatham, QC. Replique	88
2010-02-28T13:19:37.960Z	45.6990	-74.4690	18.00	2.60	Ontario-Quebec border region, Canada	87
2010-02-28T13:19:37	45.6991	-74.4688	18.00	2.60	4 km NW from Brownsburg-Chatham, QC. Aftershock. Felt/4 km N-O de Brownsburg-Chatham, QC. Replique. Ressenti	87
2010-02-28T05:00:05	45.7216	-74.4559	18.00	1.90	5 km NW from Brownsburg-Chatham, QC. Aftershock/5 km N-O de Brownsburg-Chatham, QC. Replique	89
2010-02-28T04:47:58	45.6885	-74.4907	18.00	1.70	6 km W from Brownsburg-Chatham, QC. Aftershock/6 km O de Brownsburg-Chatham, QC. Replique	85
2010-02-28T03:51:24.840Z	45.7262	-74.4562	7.37	3.41	Ontario-Quebec border region, Canada	89
2010-02-28T03:51:24	45.7155	-74.4638	17.50	3.90	6 km NW from Brownsburg-Chatham, QC. Felt.. Felt/6 km N-O de Brownsburg-Chatham, QC. Ressenti.. Ressenti	88
2010-02-28T01:44:52	45.6125	-75.2957	18.00	1.80	4 km W from Thurso, QC/4 km O de Thurso, QC	27
2010-02-14T03:14:11	45.6072	-74.6433	18.00	1.80	2 km W from Hawkesbury, ON/2 km O de Hawkesbury, ON	71
2010-02-05T01:48:43	45.5592	-75.1559	18.00	1.50	9 km SE from Thurso, QC/9 km S-E de Thurso, QC	32
2010-01-17T00:17:38	45.1331	-75.0599	18.00	2.20	14 km E from Chesterville, ON/14 km E de Chesterville, ON	49
2010-01-13T21:36:47	45.6218	-74.9062	18.00	2.60	7 km N from Alfred, ON. Felt/7 km N de Alfred, ON. Ressenti	52
2010-01-09T17:49:46	45.7150	-76.8575	18.00	1.80	18 km SW from Fort-Coulonge, QC/18 km S-O de Fort-Coulonge, QC	109
2009-11-02T03:16:45.290Z	46.1083	-74.7528	3.92	3.59	southern Quebec, Canada	96
2009-10-13T23:38:36	45.5975	-76.2383	18.00	1.90	16 km NW from Constance Bay, ON/16 km N-O de Constance Bay, ON	59
2009-10-12T02:38:46	45.4938	-75.3383	18.00	1.50	7 km SW from Rockland, ON/7 km S-O de Rockland, ON	16
2009-10-03T21:32:29	45.5795	-74.5512	18.00	1.50	6 km SE from Hawkesbury, ON/6 km S-E de Hawkesbury, ON	77
2009-09-29T16:19:07	45.6181	-74.4926	18.00	2.00	9 km SW from Brownsburg-Chatham, QC/9 km S-O de Brownsburg-Chatham, QC	83
2009-09-26T23:32:50	45.6314	-74.7682	18.00	1.30	6 km W from L'Orignal, ON/6 km O de L'Orignal, ON	63
2009-09-25T14:43:32	45.6125	-76.2583	18.00	2.20	18 km E from Shawville, QC/18 km E de Shawville, QC	61
2009-09-01T00:46:57.560Z	45.7220	-75.3782	15.17	2.54	Ontario-Quebec border region, Canada	34
2009-09-01T00:46:57	45.7268	-75.3786	18.00	2.50	16 km N from Buckingham, QC. Felt/16 km N de Buckingham, QC. Ressenti	35
2009-08-29T01:34:40	45.5882	-74.6323	18.00	1.70	2 km SW from Hawkesbury, ON/2 km S-O de Hawkesbury, ON	71
2009-07-31T22:12:24	45.4286	-76.2045	18.00	1.70	11 km E from Arnprior, ON/11 km E de Arnprior, ON	53
2009-07-22T23:30:31	45.8158	-75.1695	18.00	1.70	14 km NW from Saint-Andre-Avellin, QC/14 km N-O de Saint-Andre-Avellin, QC	51
2009-07-06T11:33:00	45.7747	-74.4610	18.00	2.40	11 km N from Brownsburg-Chatham, QC. Felt.. Felt/11 km N de Brownsburg-Chatham, QC. Ressenti.. Ressenti	91
2009-07-06T03:02:47	45.7127	-75.3321	18.00	0.70	14 km NW from Thurso, QC/14 km N-O de Thurso, QC	35
2009-06-15T18:40:25	45.6504	-75.0775	18.00	1.10	6 km NW from Papineauville, QC/6 km N-O de Papineauville, QC	42
2009-05-29T23:06:45	45.1298	-75.0620	18.00	1.40	14 km E from Chesterville, ON/14 km E de Chesterville, ON	49
2009-05-28T09:19:24.740Z	45.8255	-75.8258	3.87	3.02	Ontario-Quebec border region, Canada	50
2009-05-28T09:19:24	45.8278	-75.8474	18.00	2.80	19 km SE from Kazabazua, QC. Felt/19 km S-E de Kazabazua, QC. Ressenti	51
2009-05-23T13:02:12	45.7464	-74.9981	18.00	1.60	6 km NE from Saint-Andre-Avellin, QC/6 km N-E de Saint-Andre-Avellin, QC	54
2009-05-15T04:10:24	45.3668	-74.7496	18.00	1.90	11 km NW from Alexandria, ON/11 km N-O de Alexandria, ON	61
2009-05-08T19:47:01.530Z	45.4938	-75.9605	21.18	3.10	Ontario-Quebec border region, Canada	35
2009-05-08T19:47:00	45.4793	-75.9639	26.09	3.20	10 km E from Constance Bay, ON Felt/10 km E de Constance Bay, ON Ressenti	35
2009-04-20T03:04:11	45.7677	-74.6705	18.00	1.60	17 km N from L'Orignal, ON/17 km N de L'Orignal, ON	76
2009-04-03T02:06:34	45.7408	-76.3030	18.00	1.30	21 km NE from Shawville, QC/21 km N-E de Shawville, QC	70
2009-04-01T08:55:29	45.5914	-74.5468	18.00	1.40	6 km E from Hawkesbury, ON/6 km E de Hawkesbury, ON	78
2009-03-30T01:35:24	45.5343	-75.4757	18.00	1.10	7 km SW from Buckingham, QC/7 km S-O de Buckingham, QC	12
2009-03-15T16:38:31	45.8396	-75.4021	18.00	2.20	18 km SE from Val-des-Bois, QC/18 km S-E de Val-des-Bois, QC	46
2009-03-05T06:51:05.270Z	45.6150	-76.2390	5.08	2.81	southern Ontario, Canada	60
2009-03-05T06:51:04	45.6128	-76.2431	18.00	2.60	18 km NW from Constance Bay, ON/18 km N-O de Constance Bay, ON	60
2009-01-30T11:51:55.290Z	46.2267	-74.9808	5.00	2.52	southern Quebec, Canada	98
2009-01-09T20:52:59	45.7439	-74.4021	18.00	2.00	7 km N from Brownsburg-Chatham, QC/7 km N de Brownsburg-Chatham, QC	94
2008-12-31T06:54:48.740Z	46.1535	-75.4477	7.11	3.20	southern Quebec, Canada	81
2008-12-24T20:59:52	45.1532	-75.5247	18.00	1.20	6 km E from Osgoode, ON/6 km E de Osgoode, ON	31
2008-12-15T11:54:17	45.6505	-74.7037	18.00	1.90	9 km NW from Hawkesbury, ON. Felt/9 km N-O de Hawkesbury, ON. Ressenti	68

2008-11-29T11:18:37	45.5661	-75.0610	18.00	1.60	7 km SW from Papineauville, QC/7 km S-O de Papineauville, QC	39
2008-11-02T05:05:19	45.5157	-76.0026	18.00	1.30	7 km E from Constance Bay, ON/7 km E de Constance Bay, ON	39
2008-10-04T15:01:59	45.7814	-75.3494	18.00	1.00	22 km N from Thurso, QC/22 km N de Thurso, QC	41
2008-09-26T04:07:02	45.7389	-76.8045	18.00	1.30	14 km SW from Fort-Coulonge, QC/14 km S-O de Fort-Coulonge, QC	106
2008-09-07T21:32:42	45.6792	-74.7778	18.00	1.00	10 km NW from L'Orignal, ON/10 km N-O de L'Orignal, ON	64
2008-09-02T02:21:02	45.4716	-75.1304	18.00	1.50	5 km N from Bourget, ON/5 km N de Bourget, ON	31
2008-08-02T08:00:29.420Z	46.1050	-75.7560	18.00	2.70	southern Quebec, Canada	77
2008-07-26T19:45:31.590Z	45.4517	-74.8690	16.67	2.60	Ontario-Quebec border region, Canada	51
2008-07-26T19:45:31	45.4562	-74.8692	18.00	2.40	11 km S from Alfred, ON/11 km S de Alfred, ON	51
2008-07-25T00:49:25	45.6675	-74.9232	10.24	1.80	9 km NE from Papineauville, QC/9 km N-E de Papineauville, QC	54
2008-06-26T05:42:37	45.0986	-74.9606	18.00	2.10	19 km W from Cornwall, ON/19 km O de Cornwall, ON	57
2008-06-25T22:17:48	45.0995	-74.9426	18.00	1.90	18 km NW from Cornwall, ON. Foreshock/18 km N-O de Cornwall, ON. Precurseur	58
2008-06-11T04:36:34.590Z	45.6387	-75.3850	18.35	3.28	Ontario-Quebec border region, Canada	26
2008-06-11T04:36:34	45.6291	-75.3750	18.00	3.20	6 km NE from Buckingham, QC. Felt/6 km N-E de Buckingham, QC. Ressenti	25
2008-06-06T20:50:09	45.1089	-74.7735	18.00	2.10	9 km N from Cornwall, ON/9 km N de Cornwall, ON	69
2008-05-25T22:58:13	45.5536	-75.4200	18.00	1.20	3 km S from Buckingham, QC/3 km S de Buckingham, QC	16
2008-04-15T08:04:23	45.7191	-75.5818	18.00	0.60	20 km NW from Buckingham, QC/20 km N-O de Buckingham, QC	32
2008-03-31T20:45:08	45.4566	-75.8344	18.00	1.50	12 km N from Crystal Beach, ON/12 km N de Crystal Beach, ON	25
2008-03-31T15:49:06	45.6122	-74.8122	5.00	1.80	8 km NE from Alfred, ON. Aftershock./8 km N-E de Alfred, ON. Replique.	59
2008-03-31T15:47:12.000Z	45.6405	-74.8215	6.99	2.55	Ontario-Quebec border region, Canada	59
2008-03-31T15:47:12	45.6122	-74.8122	5.00	2.50	8 km NE from Alfred, ON/8 km N-E de Alfred, ON	59
2008-03-23T10:16:12	45.5230	-75.4062	18.00	1.50	7 km S from Buckingham, QC/7 km S de Buckingham, QC	14
2008-03-23T08:38:57	45.7715	-74.7089	18.00	1.90	17 km N from L'Orignal, ON/17 km N de L'Orignal, ON	74
2008-03-20T17:25:45.650Z	45.0343	-75.6182	6.02	2.79	Ontario-Quebec border region, Canada	45
2008-03-07T23:34:47.400Z	45.2887	-75.1727	6.86	2.94	Ontario-Quebec border region, Canada	31
2008-03-07T23:34:46	45.2897	-75.1785	18.00	2.80	8 km W from Casselman, ON. Felt/8 km O de Casselman, ON. Ressenti	31
2008-01-20T19:52:45	45.6114	-74.5294	18.00	1.40	7 km E from Hawkesbury, ON/7 km E de Hawkesbury, ON	80
2008-01-13T00:40:19	45.8116	-76.1903	18.00	1.90	20 km SW from Kazabazua, QC/20 km S-O de Kazabazua, QC	67
2008-01-10T06:12:43.440Z	46.1062	-74.8172	16.69	3.13	southern Quebec, Canada	93
2007-12-29T23:05:12	45.6023	-75.2573	18.00	1.30	Thurso, QC/Thurso, QC	28
2007-12-17T22:11:29.500Z	46.1042	-74.9023	8.51	2.53	southern Quebec, Canada	89
2007-12-07T11:25:07	45.6166	-74.8323	18.00	2.20	7 km NE from Alfred, ON/7 km N-E de Alfred, ON	58
2007-11-24T19:32:28	45.6263	-74.5754	18.00	1.30	4 km NE from Hawkesbury, ON/4 km N-E de Hawkesbury, ON	77
2007-11-24T16:29:29	45.6135	-74.5696	18.00	1.90	4 km E from Hawkesbury, ON/4 km E de Hawkesbury, ON	77
2007-11-23T17:45:28	45.6269	-74.5795	18.00	1.70	4 km NE from Hawkesbury, ON/4 km N-E de Hawkesbury, ON	77
2007-11-23T17:34:01	45.6253	-74.5794	18.00	1.60	4 km NE from Hawkesbury, ON/4 km N-E de Hawkesbury, ON	76
2007-11-15T14:00:35	45.5568	-76.3051	7.30	1.70	14 km N from Arnprior, ON/14 km N de Arnprior, ON	63
2007-11-09T09:45:20	45.7979	-75.4098	18.00	1.80	20 km SE from Val-des-Bois, QC/20 km S-E de Val-des-Bois, QC	42
2007-10-29T22:04:46	45.6151	-75.3016	16.49	2.00	4 km NW from Thurso, QC. Felt/4 km N-O de Thurso, QC. Ressent. Ressenti	27
2007-09-18T06:22:59	45.7420	-75.2434	18.00	1.30	14 km W from Saint-Andre-Avellin, QC/14 km O de Saint-Andre-Avellin, QC	41
2007-09-12T11:01:28.680Z	45.6327	-75.1322	8.97	2.72	Ontario-Quebec border region, Canada	38
2007-09-12T11:01:28	45.6415	-75.1355	18.00	2.70	10 km W from Papineauville, QC. Felt/10 km O de Papineauville, QC. Ressenti	38
2007-09-11T07:22:49	45.7294	-76.5725	18.00	1.50	16 km NW from Shawville, QC/16 km N-O de Shawville, QC	88
2007-08-29T07:07:16	45.6041	-74.6419	18.00	1.60	2 km W from Hawkesbury, ON/2 km O de Hawkesbury, ON	71
2007-08-22T21:31:23.970Z	46.0792	-75.2353	9.72	2.59	southern Quebec, Canada	76
2007-08-09T07:20:59	45.6585	-74.3976	18.00	1.10	3 km SE from Brownsburg-Chatham, QC/3 km S-E de Brownsburg-Chatham, QC	91
2007-07-28T08:07:16	45.1637	-75.3458	18.00	1.40	9 km N from Winchester, ON/9 km N de Winchester, ON	33
2007-06-26T06:37:29	45.5875	-75.3639	18.00	1.00	4 km E from Buckingham, QC/4 km E de Buckingham, QC	21
2007-06-02T02:19:54.530Z	46.0910	-74.9570	14.64	3.00	southern Quebec, Canada	86
2007-05-23T02:14:00	45.5529	-76.7235	18.00	1.40	10 km N from Renfrew, ON/10 km N de Renfrew, ON	95
2007-05-16T09:16:19	45.6587	-74.5063	18.00	1.90	8 km W from Brownsburg-Chatham, QC/8 km O de Brownsburg-Chatham, QC	83
2007-05-07T00:59:56	45.3070	-74.6349	18.00	1.70	Alexandria, ON/Alexandria, ON	71
2007-04-12T00:58:14	45.5989	-74.9315	18.00	1.60	6 km NW from Alfred, ON/6 km N-O de Alfred, ON	50
2007-04-12T00:22:58	45.6395	-75.7944	5.00	1.60	11 km E from Wakefield, QC/11 km E de Wakefield, QC	32
2007-04-10T10:05:10.550Z	46.1127	-74.9962	9.32	2.67	southern Quebec, Canada	86
2007-04-09T05:12:17	45.6204	-75.7983	5.00	1.50	11 km E from Wakefield, QC/11 km E de Wakefield, QC	30
2007-03-16T02:05:12	45.7552	-76.8081	18.00	1.80	12 km SW from Fort-Coulonge, QC/12 km S-O de Fort-Coulonge, QC	106
2007-03-05T00:33:05.210Z	45.6282	-75.2333	13.32	2.67	Ontario-Quebec border region, Canada	31
2007-03-05T00:33:04	45.6625	-75.2338	18.00	2.40	7 km N from Thurso, QC. Felt/7 km N de Thurso, QC. Ressenti	34
2007-02-26T02:49:33	45.1507	-75.0526	5.00	0.70	16 km E from Chesterville, ON/16 km E de Chesterville, ON	48
2007-02-17T05:03:34	45.5506	-75.3399	18.00	2.00	4 km W from Rockland, ON/4 km O de Rockland, ON	19
2007-02-14T19:02:25	45.7896	-75.2784	18.00	0.80	18 km NW from Saint-Andre-Avellin, QC/18 km N-O de Saint-Andre-Avellin, QC	44
2007-02-03T06:10:15	45.5557	-74.5736	18.00	1.90	6 km SE from Hawkesbury, ON/6 km S-E de Hawkesbury, ON	75
2007-01-30T02:47:52.660Z	45.5587	-74.5548	9.74	2.91	Ontario-Quebec border region, Canada	77

2007-01-30T02:47:52	45.5653	-74.5641	19.00	2.80	6 km SE from Hawkesbury, ON. Felt/6 km S-E de Hawkesbury, ON. Ressenti	76
2007-01-26T08:58:11.810Z	46.0995	-75.1502	7.05	2.65	southern Quebec, Canada	80
2007-01-03T16:10:55	45.7083	-76.7541	18.00	1.00	16 km S from Fort-Coulonge, QC/16 km S de Fort-Coulonge, QC	101
2006-12-17T05:55:26	45.7441	-75.2938	18.00	2.00	16 km N from Thurso, QC/16 km N de Thurso, QC	39
2006-12-16T05:27:21	45.7490	-75.2179	18.00	0.90	12 km W from Saint-Andre-Avellin, QC/12 km O de Saint-Andre-Avellin, QC	43
2006-12-12T15:44:21	45.6401	-75.0792	18.00	1.50	6 km NW from Papineauville, QC/6 km N-O de Papineauville, QC	42
2006-12-03T01:51:28	45.4533	-74.3759	18.00	1.40	7 km SW from Rigaud, QC/7 km S-O de Rigaud, QC	89
2006-11-02T05:32:35	45.4114	-74.5370	18.00	1.50	13 km NE from Alexandria, ON/13 km N-E de Alexandria, ON	77
2006-09-15T15:50:06	45.8061	-74.8200	18.00	2.00	22 km NE from Saint-Andre-Avellin, QC/22 km N-E de Saint-Andre-Avellin, QC	69
2006-09-04T14:23:23	45.6904	-75.4713	18.00	1.00	13 km N from Buckingham, QC/13 km N de Buckingham, QC	29
2006-09-01T08:33:57	45.8263	-75.1054	18.00	1.20	13 km N from Saint-Andre-Avellin, QC/13 km N de Saint-Andre-Avellin, QC	55
2006-08-26T13:08:44.000Z	45.6230	-74.5208	10.72	2.81	Ontario-Quebec border region, Canada	81
2006-08-26T13:08:43	45.6337	-74.5315	18.00	2.70	8 km NE from Hawkesbury, ON. Felt/8 km N-E de Hawkesbury, ON. Ressenti	80
2006-07-23T10:37:59	45.6976	-75.2639	18.00	1.60	11 km N from Thurso, QC/11 km N de Thurso, QC	36
2006-07-15T08:00:29	45.2002	-75.6448	18.00	1.80	6 km N from Kars, ON/6 km N de Kars, ON	27
2006-07-01T07:37:48	45.8206	-74.7944	18.00	2.10	24 km N from L'Orignal, ON/24 km N de L'Orignal, ON	71
2006-06-18T08:01:29	45.8256	-74.9733	18.00	2.00	14 km NE from Saint-Andre-Avellin, QC/14 km N-E de Saint-Andre-Avellin, QC	61
2006-06-10T10:26:50	45.1884	-75.0764	18.00	0.80	14 km S from Casselman, ON/14 km S de Casselman, ON	44
2006-06-08T01:49:45.200Z	45.8567	-74.5827	16.79	2.56	Ontario-Quebec border region, Canada	87
2006-06-05T11:18:49.670Z	45.4638	-76.0013	10.47	2.54	southern Ontario, Canada	38
2006-06-05T11:18:48	45.4583	-76.0303	18.00	2.70	6 km SE from Constance Bay, ON. Felt/6 km S-E de Constance Bay, ON. Ressenti	40
2006-05-29T08:37:15	45.4319	-75.3261	18.00	1.50	13 km S from Rockland, ON/13 km S de Rockland, ON	15
2006-05-23T04:05:24.440Z	46.1488	-74.9868	10.00	2.79	southern Quebec, Canada	90
2006-04-07T18:42:43	45.6083	-74.8139	18.00	1.60	7 km NE from Alfred, ON/7 km N-E de Alfred, ON	59
2006-04-06T03:14:00	45.6675	-75.2256	18.00	1.30	8 km N from Thurso, QC/8 km N de Thurso, QC	35
2006-02-26T04:09:22.490Z	45.5268	-74.7168	13.54	3.19	Ontario-Quebec border region, Canada	64
2006-02-26T04:09:22	45.5468	-74.7056	18.00	3.10	9 km SW from Hawkesbury, ON. Felt/9 km S-O de Hawkesbury, ON. Ressenti	65
2006-02-25T05:36:44	45.6786	-75.2253	18.00	1.10	9 km N from Thurso, QC. Aftershock/9 km N de Thurso, QC	36
2006-02-25T02:26:12	45.6628	-75.2139	18.00	1.00	8 km N from Thurso, QC. Aftershock/8 km N de Thurso, QC	35
2006-02-25T02:02:41	45.6709	-75.2122	18.00	1.80	8 km N from Thurso, QC. Aftershock. Felt/8 km N de Thurso, QC. Ressenti	36
2006-02-25T01:39:22.790Z	45.6275	-75.2003	10.56	3.96	Ontario-Quebec border region, Canada	33
2006-02-25T01:39:22	45.6522	-75.2296	20.00	4.50	6 km N from Thurso, QC. Felt.. Felt/6 km N de Thurso, QC. Ressenti.. Ressenti	34
2006-02-07T04:07:22.640Z	46.2232	-75.2557	6.69	2.78	southern Quebec, Canada	91
2006-01-14T10:18:30	45.7254	-75.0840	18.00	1.10	Saint-Andre-Avellin, QC/Saint-Andre-Avellin, QC	47
2005-12-24T16:57:59	45.5335	-75.0609	18.00	2.60	10 km S from Papineauville, QC/10 km S de Papineauville, QC	38
2005-12-09T15:04:42	45.7704	-75.4592	18.00	0.90	20 km SE from Val-des-Bois, QC/20 km S-E de Val-des-Bois, QC	38
2005-12-08T05:56:57	45.7241	-75.3122	18.00	1.20	15 km N from Thurso, QC/15 km N de Thurso, QC	37
2005-12-04T22:39:41	45.5992	-75.5362	18.00	1.80	9 km W from Buckingham, QC/9 km O de Buckingham, QC	19
2005-10-20T16:24:33	45.6333	-74.8708	18.00	1.90	8 km N from Alfred, ON/8 km N de Alfred, ON	55
2005-09-19T00:39:37	45.4608	-75.0954	18.00	1.20	5 km NE from Bourget, ON/5 km N-E de Bourget, ON	33
2005-09-11T18:25:05	45.4752	-75.0749	18.00	1.00	8 km NE from Bourget, ON/8 km N-E de Bourget, ON	35
2005-09-06T03:12:07	45.7282	-75.4039	18.00	1.00	16 km N from Buckingham, QC, Aftershock/16 km N de Buckingham, QC	34
2005-09-06T02:58:46.750Z	45.5918	-75.4375	0.52	2.50	Ontario-Quebec border region, Canada	19
2005-09-06T02:58:45	45.7236	-75.3604	18.00	2.90	16 km N from Buckingham, QC. Felt/16 km N de Buckingham, QC. Ressenti	35
2005-08-30T16:03:47	45.6159	-74.8023	18.00	2.70	9 km W from L'Orignal, ON/9 km O de L'Orignal, ON	60
2005-08-06T06:36:29	45.2851	-75.0052	18.00	1.50	7 km SE from Casselman, ON/7 km S-E de Casselman, ON	43
2005-08-06T03:55:32	45.8260	-74.3690	18.00	1.60	16 km N from Brownsburg-Chatham, QC/16 km N de Brownsburg-Chatham, QC	100
2005-07-22T14:14:58	45.3054	-75.5910	18.00	1.30	13 km NW from Metcalfe, ON/13 km N-O de Metcalfe, ON	15
2005-07-17T03:38:33	45.7310	-75.2988	18.00	0.50	15 km N from Thurso, QC/15 km N de Thurso, QC	38
2005-07-15T03:30:43	45.2493	-75.3631	18.00	1.30	Russell, ON/Russell, ON	24
2005-07-10T12:43:22	45.7533	-76.2614	18.00	1.30	24 km NE from Shawville, QC/24 km N-E de Shawville, QC	68
2005-07-03T02:44:07	45.2327	-75.4955	1.00	0.50	2 km W from Metcalfe, ON/2 km O de Metcalfe, ON	22
2005-06-23T18:32:08.970Z	46.0757	-75.0902	10.00	2.74	southern Quebec, Canada	79
2005-06-23T18:16:23.710Z	46.0167	-74.9923	10.71	2.53	southern Quebec, Canada	77
2005-06-16T08:49:32	45.4420	-74.4717	18.00	1.40	14 km W from Rigaud, QC/14 km O de Rigaud, QC	82
2005-06-16T04:52:51	45.4377	-74.4424	18.00	1.90	12 km SW from Rigaud, QC/12 km S-O de Rigaud, QC	84
2005-06-02T00:39:21	45.6504	-75.0834	18.00	1.50	6 km NW from Papineauville, QC/6 km N-O de Papineauville, QC	42
2005-05-31T13:49:05.280Z	44.9450	-74.0787	10.00	2.50	New York	125
2005-05-03T04:46:53	45.8362	-74.6173	18.00	1.50	23 km NW from Brownsburg-Chatham, QC/23 km N-O de Brownsburg-Chatham, QC	84
2005-04-17T08:53:33	45.6973	-74.7263	18.00	1.20	9 km N from L'Orignal, ON/9 km N de L'Orignal, ON	69
2005-04-07T03:08:50	45.6324	-75.5728	18.00	1.20	13 km NW from Buckingham, QC/13 km N-O de Buckingham, QC	23
2005-03-28T06:26:49	45.8324	-75.3864	18.00	0.60	19 km SE from Val-des-Bois, QC/19 km S-E de Val-des-Bois, QC	46
2005-03-20T18:15:28	45.6241	-74.9932	18.00	1.40	2 km NE from Papineauville, QC/2 km N-E de Papineauville, QC	46
2005-03-20T15:33:16	45.6415	-75.0155	18.00	1.60	3 km N from Papineauville, QC/3 km N de Papineauville, QC	46

2005-03-19T20:26:03	45.5229	-75.6370	18.00	0.80	3 km N from Gatineau, QC/3 km N de Gatineau, QC	14
2005-03-03T02:22:01.900Z	45.0540	-74.1850	11.37	2.64	Ontario-Quebec border region, Canada	113
2005-02-23T15:29:20	45.6136	-74.7768	18.00	1.20	7 km W from L'Orignal, ON/7 km O de L'Orignal, ON	61
2005-02-19T13:28:51	45.6791	-75.3383	18.00	0.80	11 km NW from Thurso, QC/11 km N-O de Thurso, QC	31
2005-02-17T10:58:42	45.6845	-74.4679	18.00	1.40	4 km W from Brownsburg-Chatham, QC/4 km O de Brownsburg-Chatham, QC	87
2005-02-16T17:40:14	45.6597	-76.0107	18.00	2.10	7 km W from Wakefield, QC/7 km O de Wakefield, QC	46
2005-02-01T12:57:03	45.7708	-75.5809	18.00	0.90	16 km S from Val-des-Bois, QC/16 km S de Val-des-Bois, QC	38
2005-01-24T02:55:01	45.3421	-75.8633	18.00	1.70	3 km W from Crystal Beach, ON/3 km O de Crystal Beach, ON	28
2005-01-22T07:45:20	45.4851	-76.4280	18.00	1.00	8 km NW from Arnprior, ON/8 km N-O de Arnprior, ON	71
2005-01-13T12:00:58.000Z	45.6900	-74.8300	18.00	2.70	Ontario-Quebec border region, Canada	61
2005-01-13T12:00:58	45.6840	-74.8218	6.74	2.70	14 km NW from L'Orignal, ON. Felt/14 km N-O de L'Orignal, ON. Ressenti	61
2005-01-02T15:05:15	45.7276	-75.7315	18.00	2.70	18 km NE from Wakefield, QC. Felt/18 km N-E de Wakefield, QC. Ressenti	37
2004-12-04T14:38:13	45.6175	-74.6352	18.00	2.40	2 km NW from Hawkesbury, ON/2 km N-O de Hawkesbury, ON	72
2004-11-30T23:50:17	45.7107	-75.5465	18.00	1.50	17 km NW from Buckingham, QC/17 km N-O de Buckingham, QC	31
2004-11-10T20:33:55	45.8357	-75.2826	18.00	1.40	30 km N from Buckingham, QC/30 km N de Buckingham, QC	49
2004-09-09T09:38:34	45.7066	-75.2546	18.00	1.70	12 km N from Thurso, QC/12 km N de Thurso, QC	37
2004-09-04T02:05:32.040Z	44.8988	-74.8930	3.60	2.94	New York	77
2004-08-24T00:08:44	45.3065	-75.3029	18.00	1.20	5 km N from Embrun, ON/5 km N de Embrun, ON	22
2004-08-19T07:02:16	45.4351	-75.4325	18.00	1.60	17 km S from Buckingham, QC/17 km S de Buckingham, QC	7
2004-07-26T04:12:37	45.5109	-74.7848	18.00	0.40	9 km SE from Alfred, ON/9 km S-E de Alfred, ON	58
2004-07-20T08:34:21	45.6196	-76.4194	18.00	2.10	5 km NE from Shawville, QC/5 km N-E de Shawville, QC	73
2004-07-15T06:07:17	45.5118	-74.4699	18.00	1.60	14 km W from Rigaud, QC/14 km O de Rigaud, QC	82
2004-05-27T01:46:21	45.5211	-74.9772	18.00	1.60	9 km SW from Alfred, ON/9 km S-O de Alfred, ON	44
2004-05-16T01:24:46	45.2100	-75.0581	18.00	1.40	12 km S from Casselman, ON/12 km S de Casselman, ON	44
2004-04-04T06:47:07	45.6166	-76.7214	18.00	2.20	17 km N from RENFREW, ONT./17 km N de RENFREW, ONT.	96
2004-03-23T06:40:59	45.5390	-74.5417	18.00	1.40	9 km SE from HAWKESBURY, ONT./9 km SE de HAWKESBURY, ONT.	77
2004-03-17T22:01:58.150Z	44.8958	-74.9115	8.00	2.70	New York	76
2004-03-17T12:38:15.000Z	45.0500	-75.6600	18.00	2.50	Ontario-Quebec border region, Canada	44
2004-03-14T08:25:37	45.7758	-75.2388	18.00	0.70	26 km NE from BUCKINGHAM, QUE./26 km NE de BUCKINGHAM, QUE.	44
2004-03-02T00:42:36	45.4358	-74.9973	18.00	1.50	35 km SW from HAWKESBURY, ONT./35 km SW de HAWKESBURY, ONT.	41
2004-01-11T06:57:52	45.8166	-76.0126	18.00	1.80	45 km NW from GATINEAU, QUE./45 km NW de GATINEAU, QUE.	58
2003-12-07T18:59:56	45.1291	-75.2174	18.00	2.60	32 km N from IROQUOIS, ONT./32 km N de IROQUOIS, ONT.	41
2003-11-22T14:41:04	45.5636	-76.4446	18.00	2.60	11 km N from BRAESIDE, ONT./11 km N de BRAESIDE, ONT.	74
2003-09-22T06:04:45	45.6125	-75.2732	18.00	1.40	12 km E from BUCKINGHAM, QUE./12 km E de BUCKINGHAM, QUE.	28
2003-09-19T17:22:34	45.7892	-74.8458	18.00	3.30	50 km NE from BUCKINGHAM, Que./50 km NE de BUCKINGHAM , Que.	66
2003-08-31T09:07:51	45.6893	-76.9027	18.00	1.60	22 km SE from PEMBROKE, ONT./22 km SE de PEMBROKE, ONT.	111
2003-08-20T01:58:19.110Z	46.0077	-74.9657	8.31	2.70	southern Quebec, Canada	77
2003-08-18T05:19:05	45.7226	-75.5173	18.00	1.60	18 km NW from BUCKINGHAM, QUE./18 km NW de BUCKINGHAM, QUE.	33
2003-05-09T06:55:05	45.5040	-75.0934	18.00	1.60	27 km E from BUCKINGHAM, QUE./27 km E de BUCKINGHAM, QUE.	34
2003-04-22T06:55:58	45.5904	-75.2246	18.00	0.90	15 km E from Buckingham, Que./15 km E de Buckingham, Que.	29
2003-04-08T15:06:14.400Z	44.6150	-74.3400	10.00	3.70	New York	130
2003-04-02T06:50:13	45.7680	-75.5954	18.00	1.20	25 km NW from Buckingham, Que./25 km NO de Buckingham, Que.	38
2003-03-29T06:17:10	45.5608	-75.3199	18.00	1.00	10 km E from Buckingham, Que./10 km E de Buckingham, Que.	21
2003-03-28T17:24:11	45.5934	-75.0981	18.00	1.10	25 km E from Buckingham, Que./25 km E de Buckingham, Que.	38
2003-03-28T09:47:05	45.5492	-75.4030	18.00	1.00	4 km S from Buckingham, Que./4 km S de Buckingham, Que.	16
2003-03-27T18:51:40	45.5951	-75.1902	18.00	2.00	18 km E from Buckingham, Que./18 km E de Buckingham, Que.	32
2003-03-07T04:58:08	45.7555	-76.5201	18.00	1.40	33 km N from Braeside, Ont./33 km N de Braeside, Ont.	86
2003-02-25T15:11:10	45.5229	-75.3640	18.00	2.50	10 km SE from Buckingham, Que. Felt.. Felt/10 km SE de Buckingham, Que. Ressenti.. Ressenti	16
2003-02-20T02:16:06	45.6789	-76.6137	18.00	1.20	24 km N from Renfrew, Ont./24 km N de Renfrew, Ont.	89
2003-02-12T01:16:00	45.5937	-74.8234	18.00	1.20	16 km W from Hawkesbury, Ont./16 km O de Hawkesbury, Ont.	57
2003-01-28T16:52:18	45.3105	-74.9153	18.00	3.00	35 km NW from Cornwall, Ont.. Felt/35 km NO de Cornwall, Ont.. Ressenti	49
2003-01-28T07:30:43	45.7049	-75.4723	18.00	1.10	15 km N from Buckingham, Que./15 km N de Buckingham, Que.	31
2003-01-27T19:03:28	45.6872	-74.7148	18.00	1.60	12 km NW from Hawkesbury, Ont./12 km NO de Hawkesbury, Ont.	69
2003-01-26T09:05:16	45.4439	-74.3225	18.00	1.60	24 km S from Lachute, Que./24 km S de Lachute, Que.	94
2003-01-24T16:57:47	45.6868	-75.5074	18.00	2.30	13 km NW from Buckingham, Que./13 km NO de Buckingham, Que.	29
2003-01-18T22:48:07	45.6834	-75.5447	18.00	1.60	15 km NW from Buckingham, Que./15 km NO de Buckingham, Que.	28
2003-01-09T16:18:05	45.5882	-74.4592	18.00	2.90	12 km SW from LACHUTE, QUE./12 km SW de LACHUTE, QUE.	85
2002-12-30T04:11:07	45.7412	-76.6169	18.00	1.40	30 km N from Renfrew, Ont./30 km N de Renfrew, Ont.	92
2002-11-12T16:01:08	45.2733	-75.8379	18.00	1.90	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	30
2002-11-11T18:02:53	45.4630	-75.5591	18.00	1.70	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	5
2002-10-21T05:39:35	45.3567	-74.5873	18.00	2.00	27 km S from Hawkesbury, Ont./27 km S de Hawkesbury, Ont.	73
2002-10-16T00:17:31	45.1644	-75.3806	18.00	1.50	8 km N from Winchester, Ont./8 km N de Winchester, Ont.	32
2002-08-20T05:08:50	45.5987	-74.6195	18.00	1.40	Hawkesbury, Ont./Hawkesbury, Ont.	73
2002-06-28T17:05:47	45.7960	-75.0855	18.00	1.80	35 km NE from Buckingham, Que./35 km NE de Buckingham, Que.	53

2002-06-18T07:36:37	45.7621	-76.1242	18.00	2.10	40 km NE from Braeside, Ont./40 km NE de Braeside, Ont.	60
2002-06-12T10:29:27	45.8324	-74.9307	18.00	2.70	35 km NW from Hawkesbury, Ont. Felt.. Felt/35 km NO de Hawkesbury, Ont. Ressenti.. Ressenti	64
2002-06-08T02:34:35	45.7766	-75.4033	18.00	1.20	22 km N from Buckingham, Que./22 km N de Buckingham, Que.	40
2002-05-28T09:15:38	45.6259	-76.6234	18.00	3.40	15 km N from Renfrew, Ont. Felt.. Felt/15 km N de Renfrew, Ont. Ressenti.. Ressenti	89
2002-05-25T15:01:45	45.7678	-75.9185	18.00	1.80	35 km NW from Gatineau, Que./35 km NO de Gatineau, Que.	49
2002-05-03T17:02:24	45.4556	-75.5788	5.00	1.90	7 km SE from GATINEAU, QUE., Felt/7 km SE de GATINEAU, QUE. Ressenti	5
2002-04-18T18:38:43	45.6368	-74.5411	18.00	2.20	7 km NE from Hawkesbury, Ont./7 km NE de Hawkesbury, Ont.	80
2002-03-15T02:19:32	45.6654	-75.1732	18.00	2.70	22 km NE from BUCKINGHAM, QUE./22 km NE de BUCKINGHAM, QUE.	38
2002-03-02T16:43:32	45.5746	-76.3252	18.00	2.30	13 km NE from Braeside, Ont./13 km NE de Braeside, Ont.	65
2002-02-24T21:38:33.000Z	45.2900	-75.1700	18.00	3.10	Ontario-Quebec border region, Canada	32
2002-02-24T21:38:33	45.2855	-75.1744	18.00	3.10	38 km SE from Buckingham, Que. Felt.. Felt/38 km SE de Buckingham, Que. Ressenti	31
2002-01-11T06:38:13	45.5176	-75.1034	18.00	1.80	25 km E from Buckingham, Que./25 km E de Buckingham, Que.	34
2001-12-17T22:20:32	45.7772	-75.2052	18.00	1.90	30 km NE from Buckingham, Que./30 km NE de Buckingham, Que.	46
2001-12-11T23:07:46	45.3690	-76.3493	18.00	1.80	7 km S from Arnprior, Ont./7 km S de Arnprior, Ont.	65
2001-11-27T06:14:18	45.7336	-75.5813	18.00	1.20	20 km NW from Buckingham, Que./20 km NO de Buckingham, Que.	34
2001-11-03T20:04:05	45.7939	-75.4090	18.00	1.10	24 km N from Buckingham, Que./24 km N de Buckingham, Que.	41
2001-10-22T02:13:23	45.1336	-75.2131	5.00	1.50	33 km N from IROQUOIS, ONT./33 km N de IROQUOIS, ONT.	41
2001-09-20T06:11:45	45.3812	-75.7402	18.00	1.50	Ottawa, Ont./Ottawa, Ont.	18
2001-08-24T21:56:35	45.5756	-74.5453	18.00	2.70	6 km SE from Hawkesbury, Ont./6 km SE de Hawkesbury, Ont.	78
2001-08-10T00:47:02	45.5558	-74.6786	18.00	2.50	7 km SW from Hawkesbury, Ont./7 km SO de Hawkesbury, Ont.	67
2001-08-07T01:58:43	45.2404	-75.4562	18.00	1.80	28 km SE from Ottawa, Ont./28 km SE de Ottawa, Ont.	22
2001-07-30T07:25:14	45.3837	-75.4648	5.00	1.70	20 km E from Ottawa, Ont./20 km E de Ottawa, Ont.	7
2001-06-18T02:44:40	45.8044	-76.9037	18.00	1.80	17 km E from Pembroke, Ont./17 km E de Pembroke, Ont.	115
2001-06-16T00:11:44	45.7593	-76.5594	18.00	2.40	35 km N from Renfrew, Ont./35 km N de Renfrew, Ont.	89
2001-06-13T05:19:02	45.6983	-76.6590	18.00	2.70	25 km N from Renfrew, Ont./25 km N de Renfrew, Ont.	93
2001-06-09T01:39:24	45.7479	-76.8465	18.00	1.30	23 km E from Pembroke, Ont./23 km E de Pembroke, Ont.	109
2001-06-09T01:37:02	45.7428	-76.8488	18.00	1.70	23 km E from Pembroke, Ont./23 km E de Pembroke, Ont.	109
2001-05-29T08:56:50	45.4300	-75.6905	18.00	2.20	Ottawa, Ont. Felt.. Felt/Ottawa, Ont. Ressenti.. Ressenti	13
2001-05-12T02:11:12	45.4357	-75.4649	18.00	1.60	16 km SE from Gatineau, Que./16 km SE de Gatineau, Que.	4
2001-05-10T02:53:02	45.6662	-76.2351	18.00	1.60	25 km NE from Braeside, Ont./25 km NE de Braeside, Ont.	61
2001-05-08T11:49:10	45.7812	-74.6522	18.00	2.10	20 km N from Hawkesbury, Ont./20 km N de Hawkesbury, Ont.	78
2001-05-05T11:03:02	45.5915	-74.3863	18.00	2.00	8 km SW from LACHUTE, QUE./8 km SW de LACHUTE, QUE.	90
2001-05-03T14:36:05	45.5931	-76.6634	18.00	1.60	14 km N from RENFREW, ONT./14 km N de RENFREW, ONT.	91
2001-05-03T11:57:20	45.8338	-74.5720	18.00	1.90	26 km N from Hawkesbury, Ont./26 km N de Hawkesbury, Ont.	86
2001-05-03T09:41:33	45.6054	-76.1386	18.00	1.40	26 km NE from ARNPRIOR, ONT./26 km NE de ARNPRIOR, ONT.	52
2001-04-17T20:46:50	45.2445	-75.3153	18.00	2.30	36 km SE from Ottawa, Ont./36 km SE de Ottawa, Ont.	26
2001-03-16T21:35:04	45.4960	-75.3269	18.00	1.70	12 km SE from BUCKINGHAM, QUE./12 km SE de BUCKINGHAM, QUE.	17
2001-03-11T10:08:41	45.5850	-74.5033	18.00	2.00	10 km E from Hawkesbury, Ont./10 km E de Hawkesbury, Ont.	81
2001-03-07T23:28:09	45.6129	-76.1512	18.00	1.40	25 km NE from Braeside, Ont./25 km NE de Braeside, Ont.	53
2001-02-23T18:25:46	45.5315	-74.5455	18.00	2.00	10 km SE from Hawkesbury, Ont./10 km SE de Hawkesbury, Ont.	77
2001-01-24T17:06:53	45.5144	-75.5084	18.00	1.40	10 km SW from Buckingham, Que./10 km SO de Buckingham, Que.	9
2001-01-01T22:12:57	45.6406	-74.4678	18.00	2.20	11 km W from LACHUTE, QUE./11 km O de LACHUTE, QUE.	85
2000-12-28T06:21:30	45.5797	-76.8786	18.00	1.40	20 km NW from Renfrew, Ont./20 km NO de Renfrew, Ont.	107
2000-11-10T07:40:53	45.7374	-75.2999	18.00	3.30	Felt. 20 km NE from Buckingham, Que.. Felt/Ressenti. 20 km NE de Buckingham, PQ.. Ressenti	38
2000-10-23T10:25:17	45.6391	-75.2021	18.00	2.60	20 km E from Buckingham, Que./20 km E de Buckingham, Que.	34
2000-10-09T05:32:06	45.8003	-75.3708	18.00	1.70	25 km N from BUCKINGHAM, QUE./25 km N de BUCKINGHAM, QUE.	43
2000-10-04T23:39:09	45.8279	-74.9296	18.00	2.00	40 km NW from HAWKESBURY, ONT./40 km NO de HAWKESBURY, ONT.	64
2000-08-06T08:52:24.000Z	46.1900	-74.9700	18.00	4.00	southern Quebec, Canada	95
2000-07-13T08:26:34	45.3563	-75.2905	18.00	1.30	27 km SE from BUCKINGHAM, QUE./27 km SE de BUCKINGHAM, QUE.	20
2000-07-11T20:13:55	45.3448	-75.3033	18.00	2.50	30 km E from Ottawa, Ont./30 km E de Ottawa, Ont.	19
2000-07-08T09:12:58	45.7374	-75.0245	18.00	2.30	35 km NE from BUCKINGHAM, QUE./35 km NE de BUCKINGHAM, QUE.	52
2000-05-28T07:25:08	45.5812	-75.2941	18.00	1.00	10 km E from BUCKINGHAM, QUE./10 km E de BUCKINGHAM, QUE.	24
2000-05-24T05:41:52	45.4789	-75.3997	18.00	2.20	10 km S from BUCKINGHAM, QUE./10 km S de BUCKINGHAM, QUE.	11
2000-05-20T07:53:46	45.1693	-74.7630	18.00	2.10	16 km N from CORNWALL, ONT./16 km N de CORNWALL, ONT.	66
2000-05-14T21:17:30	45.1407	-75.2738	18.00	1.50	33 km N from IROQUOIS, ONT./33 km N de IROQUOIS, ONT.	38
2000-04-04T06:59:06	45.6908	-76.4646	18.00	1.50	25 km N from BRAESIDE, ONT./25 km N de BRAESIDE, ONT.	79
2000-03-21T06:01:20	45.7698	-74.9391	18.00	1.50	31 km NW from HAWKESBURY, ONT./31 km NO de HAWKESBURY, ONT.	59
2000-03-19T22:37:17	45.7258	-76.2628	18.00	1.60	31 km N from BRAESIDE, ONT./31 km N de BRAESIDE, ONT.	66
2000-03-16T04:40:18	45.6829	-75.8117	18.00	2.30	Felt at La Peche, Que.. Felt/Ressenti a La Peche, Que.. Ressenti	36
2000-03-14T03:31:27	45.8158	-74.9960	18.00	1.90	38 km NW from HAWKESBURY, ONT./38 km NO de HAWKESBURY, ONT.	59
2000-03-10T13:45:29	45.7814	-74.4777	18.00	2.00	19 km NW from LACHUTE, QUE./19 km NO de LACHUTE, QUE.	90
2000-02-22T03:27:00	45.7156	-75.3979	18.00	1.50	15 km N from BUCKINGHAM, QUE./15 km N de BUCKINGHAM, QUE.	33
2000-01-12T08:58:54	45.5376	-74.3845	18.00	1.70	13 km S from LACHUTE, QUE./13 km S de LACHUTE, QUE.	89
1999-12-16T03:08:13	45.3994	-75.0859	18.00	1.90	9 KM N FROM CASSELMAN, ONT./9 km SE de CASSELMAN, ONT.	34

1999-11-12T05:36:43	45.6832	-76.5763	18.00	2.10	25 km N from RENFREW, ONT./25 km N de RENFREW, ONT.	87
1999-10-31T20:14:10.000Z	45.8500	-74.3200	18.00	4.20	Ontario-Quebec border region, Canada	104
1999-10-10T23:25:55	45.5849	-74.3829	18.00	1.60	8 km SW from LACHUTE, QUE./8 km SO de LACHUTE, QUE.	90
1999-10-10T05:54:54	45.6505	-74.9524	18.00	1.70	27 km W from HAWKESBURY, ONT./27 km O de HAWKESBURY, ONT.	51
1999-08-08T21:33:19	45.8283	-74.8495	18.00	2.20	31 km NW from HAWKESBURY, ONT./31 km NO de HAWKESBURY, ONT.	68
1999-07-30T09:34:21	45.5706	-74.4654	18.00	2.20	13 km E from HAWKESBURY, ONT./13 km E de HAWKESBURY, ONT.	84
1999-07-10T12:33:04	45.6522	-74.3284	18.00	1.80	LACHUTE, QUE./LACHUTE, QUE.	96
1999-06-28T19:04:12	45.7663	-76.5270	15.58	2.10	35 km N from BRAESIDE, ONT./35 km N de BRAESIDE, ONT.	87
1999-05-03T00:30:12	45.6678	-74.7974	18.00	2.00	16 km NW from HAWKESBURY, ONT./16 km NO de HAWKESBURY, ONT.	62
1999-03-19T16:34:04	45.7545	-76.0073	18.00	2.10	39 km N from AYLMER, QUE./39 km N de AYLMER, QUE.	52
1999-02-15T12:56:06	45.7868	-75.3469	18.00	1.30	24 km N from BUCKINGHAM, QUE./24 km N de BUCKINGHAM, QUE.	42
1999-01-19T06:23:20	45.4382	-74.5341	18.00	3.00	19 km S from HAWKESBURY, ONT. FELT.. Felt/19 km S de HAWKESBURY, ONT.. Ressenti	77
1998-12-12T22:41:35	45.6422	-75.8384	5.00	2.10	22 km NW from GATINEAU, QUE. FELT.. Felt/22 km NW de GATINEAU, QUE. RESSENTI.. Ressenti	34
1998-11-28T18:59:51	45.7022	-76.6746	18.00	1.20	26 km N from RENFREW, ONT./26 km N de RENFREW, ONT.	95
1998-11-06T10:20:47	45.6844	-76.1668	18.00	1.40	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	58
1998-10-05T09:22:50	45.1424	-75.5186	18.00	2.50	FELT; 34 km SE from OTTAWA, ONT;. Felt/RESSENTI; 34 km SE de OTTAWA, ONT.. Ressenti	32
1998-09-25T02:32:29	45.6764	-76.7816	18.00	1.60	24 km N from RENFREW, ONT./24 km N de RENFREW, ONT.	102
1998-09-12T07:10:41	45.7544	-75.5741	18.00	1.30	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	36
1998-08-09T07:40:26	45.7780	-75.3428	18.00	1.10	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	41
1998-07-30T08:57:22.000Z	46.1600	-74.7300	10.00	3.80	southern Quebec, Canada	102
1998-06-17T04:29:33	45.8173	-74.3164	18.00	1.90	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	103
1998-05-18T01:10:26	45.7234	-75.3654	18.00	1.60	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	35
1998-05-17T08:42:56	45.5332	-74.4209	18.00	1.90	15 km SW from LACHUTE, QUE./15 km SW de LACHUTE, QUE.	87
1998-05-17T08:08:17	45.5344	-74.4321	18.00	1.50	15 km SW from LACHUTE, QUE./15 km SW de LACHUTE, QUE.	86
1998-05-17T07:54:13	45.5315	-74.4311	18.00	2.00	15 km SW from LACHUTE, QUE./15 km SW de LACHUTE, QUE.	86
1998-04-18T16:22:52.000Z	45.5700	-74.9900	18.00	4.10	Ontario-Quebec border region, Canada	44
1998-04-18T16:22:52	45.5780	-74.9688	18.00	4.10	Eastern Ontario.. Felt/L'est de l'Ontario.. Ressenti	46
1998-03-20T00:04:15	45.7515	-74.5577	18.00	1.90	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	83
1998-03-09T02:31:50	45.4951	-75.3007	18.00	2.40	WESTERN QUEBEC SEISMIC ZONE. Felt.. Felt/L'OUEST DU QUEBEC. Ressenti.. Ressenti	19
1998-02-26T14:20:31.000Z	46.0700	-76.3600	18.00	3.70	southern Quebec, Canada	96
1997-11-08T22:04:05	45.8267	-75.1370	18.00	2.60	WESTERN QUEBEC SEISMIC ZONE. Felt.. Felt/ZONE SEISMIQUE DE L'OUEST DU QUEBEC.. Ressenti	53
1997-10-12T08:28:22.350Z	44.9080	-74.5470	14.00	2.90	New York	96
1997-09-24T10:39:02	45.2720	-75.0523	18.00	1.60	Eastern Ontario/L'est de l'Ontario.	41
1997-08-28T03:45:19	45.7070	-74.4023	18.00	1.20	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	92
1997-08-24T10:52:37	45.6253	-74.7355	18.00	1.70	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	65
1997-08-23T07:05:30	45.4221	-75.1532	18.00	1.70	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	29
1997-08-10T10:46:47	45.6099	-75.8195	18.00	1.60	18 km NW from GATINEAU, QUE./18 km NW de GATINEAU, QUE.	31
1997-07-27T01:18:28	45.5420	-74.3881	18.00	1.30	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	89
1997-07-10T13:57:51.000Z	45.0400	-74.8300	18.00	2.90	Ontario-Quebec border region, Canada	69
1997-07-03T19:54:26	45.6582	-74.5545	18.00	1.50	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	79
1997-06-12T10:18:03	45.6133	-76.7521	18.00	1.40	14 km N from RENFREW, ONT./14 km N de RENFREW, ONT.	98
1997-05-30T11:07:35	45.3256	-75.1788	18.00	1.80	Eastern Ontario/L'Est d'Ontario	29
1997-05-24T18:52:06.360Z	45.9780	-74.4210	10.00	4.20	Ontario-Quebec border region, Canada	105
1997-05-20T10:25:37	45.6172	-74.4561	18.00	1.70	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	86
1997-05-02T06:28:51	45.7758	-74.8511	18.00	1.80	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	65
1997-05-01T04:15:57	45.5163	-75.1000	18.00	1.70	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	34
1997-04-29T05:36:36	45.5118	-75.6147	1.00	1.30	Ottawa-Hull region/Region d'Ottawa-Hull.	12
1997-03-16T09:20:13	45.7245	-75.1098	18.00	1.90	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	46
1997-03-02T08:05:35	45.4940	-76.2630	18.00	1.70	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	58
1997-02-03T07:33:40	45.4744	-75.6588	7.61	1.20	EASTERN ONTARIO./L'EST D'ONTARIO.	12
1996-12-27T02:34:30	45.4739	-75.6340	18.00	1.70	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	10
1996-10-15T02:00:08	45.5657	-74.5477	18.00	2.10	Eastern Ontario./L'Est de l'Ontario.	77
1996-09-16T23:15:55	45.5496	-74.5995	18.00	2.20	Eastern Ontario./L'est de l'ontario.	73
1996-09-11T23:30:38	45.8026	-75.0674	18.00	2.50	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	54
1996-09-06T08:00:50	45.2197	-75.3673	18.00	1.80	Eastern Ontario./L'est de l'Ontario.	26
1996-08-29T22:43:54	45.1095	-75.1061	18.00	2.30	33 km W from CORNWALL, ONT./33 km W de CORNWALL, ONT.	48
1996-07-23T13:17:48	45.6777	-76.1877	18.00	1.60	WESTERN QUEBEC./OUEST DU QUEBEC.	59
1996-07-21T13:51:20	45.5613	-74.6396	18.00	2.50	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	70
1996-07-18T08:13:10	45.3295	-75.9045	18.00	2.50	Felt. Ottawa Valley.. Felt/Ressenti. Vallee Des Outaouais.. Ressenti	32
1996-06-13T09:25:38	45.4944	-75.3686	18.00	2.25	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	14
1996-04-21T18:28:49	45.2598	-75.0809	18.00	2.04	CHARLEVOIX SEISMIC ZONE, QUE./ZONE SEISMIQUE DE CHARLEVOIX, QUE.	39
1996-03-14T10:42:26.000Z	45.9900	-74.4300	18.00	4.50	Ontario-Quebec border region, Canada	105
1996-03-06T21:51:13	45.7170	-74.8031	18.00	1.86	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	64
1996-02-25T20:27:27	45.5379	-76.6732	18.00	1.94	NEAR RENFREW, ONT./PRES DE RENFREW, ONT.	91

1995-12-28T15:56:57	45.7357	-76.3121	18.00	2.44	WEST QUEBEC SEISMIC ZONE/ZONE SEISMIQUE DE L'OUEST DU QUEBEC	70
1995-12-10T06:47:13	45.6312	-76.2368	18.00	2.04	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	60
1995-12-10T05:17:25	45.6024	-76.2554	18.00	2.15	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	60
1995-09-21T23:03:27.000Z	45.0800	-74.2100	18.00	3.10	Ontario-Quebec border region, Canada	110
1995-09-17T06:42:40	45.5893	-74.4748	18.00	1.51	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	83
1995-09-12T03:59:05.000Z	45.6100	-74.4300	18.00	3.70	Ontario-Quebec border region, Canada	87
1995-09-12T03:59:05	45.5985	-74.4439	18.00	3.67	WESTERN QUEBEC SEISMIC ZONE.. Felt/ZONE SEISMIQUE DE L'OUEST DU QUEBEC.. Ressenti	86
1995-09-09T13:19:26	45.2956	-75.0556	18.00	2.06	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	39
1995-08-22T10:42:32	45.2525	-75.1317	16.31	2.72	southeastern Ontario/le sud-est d'Ontario	36
1995-07-31T09:43:22	45.8299	-75.1254	18.00	1.51	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	54
1995-07-28T05:47:37.100Z	46.1680	-74.9530	20.70	3.30	southern Quebec, Canada	93
1995-06-14T06:51:24	45.8022	-74.8942	18.00	2.47	WESTERN QUEBEC SEISMIC ZONE./ZONE SEISMIQUE DE L'OUEST DU QUEBEC.	64
1995-06-06T22:40:53	45.1034	-75.2439	18.00	2.07	Eastern Ontario./Est de l'Ontario.	42
1995-03-15T00:57:33	45.6670	-75.2390	18.00	1.70	WESTERN QUEBEC 17 KM NE OF BUCKINGHAM, QUE./OUEST DU QUEBEC 17 KM NE DE BUCKINGHAM, QUE.	34
1995-02-15T15:53:57.000Z	45.9000	-75.0400	18.00	3.50	Ontario-Quebec border region, Canada	64
1994-11-25T19:56:15	45.3680	-75.8510	18.00	2.40	WESTERN OTTAWA, ONT. NOT REPORTED FELT ./ OUEST D'OTTAWA, ONT. PAS RAPPORTE COMME AYANT ETE RESSENTI.	27
1994-10-10T23:07:26	45.8070	-75.0520	18.00	1.70	WESTERN QUEBEC/OUEST DU QUEBEC	56
1994-09-26T05:43:14	45.7140	-76.1770	18.00	2.10	WESTERN QUEBEC/OUEST DU QUEBEC	60
1994-09-14T00:57:16	45.7690	-76.0560	18.00	1.40	NEAR LOW, QUE. WESTERN QUEBEC/PRES DE LOW, QUE. OUEST DU QUEBEC	56
1994-04-10T02:21:16	45.2820	-75.3650	18.00	2.30	NEAR RUSSELL, ONT. REPORTED FELT AND HEARD AT THE SOUTH. Felt/PRES DE RUSSELL, ONT. RAPPORTE RESSENTI ET ENTENDU DANS. Ressenti	20
1994-04-09T02:32:07	45.5420	-75.4000	18.00	2.20	WESTERN QUEBEC/OUEST DU QUEBEC	16
1994-02-18T16:28:26	45.8350	-74.8120	18.00	1.50	WESTERN QUEBEC/OUEST DU QUEBEC	71
1994-01-24T10:17:35	45.3000	-75.2290	8.19	1.90	EASTERN ONTARIO NEAR RUSSELL, ONT./EST DE L'ONTARIO PRES DE RUSSELL, ONT.	27
1994-01-11T00:25:49	45.7640	-76.0690	18.00	3.40	SOUTH OF LOW, QUE. WESTERN QUEBEC.. Felt/AU SUD DE LOW, QUEBEC, OUEST DU QUEBEC.. Ressenti	57
1993-10-17T05:23:43	45.6670	-74.7520	7.93	1.60	1 KM N OF POINTE-AU-CHENE, QUE. 12 KM NW OF HAWKESBURY, ONT./1 KM N DE POINTE-AU-CHENE, QUE. 12 KM NO DE HAWKESBURY, ONT.	65
1993-10-16T10:14:47	45.4450	-74.5570	10.06	1.80	1 KM E OF DALKEITH, ONT. 17 KM S OF HAWKESBURY, ONT./1 KM E DE DALKEITH, ONT. 17 KM S DE HAWKESBURY, ONT.	75
1993-09-23T06:45:28.400Z	46.0650	-74.6050	18.00	3.80	southern Quebec, Canada	100
1993-09-20T07:07:09	45.7840	-74.7160	16.49	2.80	6 KM SW OF HARRINGTON, QUE. 20 KM N OF HAWKESBURY, ONT.. Felt/6 KM SO DE HARRINGTON, QUE. 20 KM N DE HAWKESBURY, ONT. Ressenti	74
1993-08-29T10:53:18	45.3160	-75.5840	20.74	1.50	5 KM N OF GREELY, ONT. 15 KM SE OF OTTAWA, ONT./5 KM N DE GREELY, ONT. 15 KM SE D' OTTAWA, ONT.	14
1993-08-22T06:57:49	45.6180	-74.7770	16.23	2.00	4 KM SW OF POINTE-AU-CHENE, QUE. 12 KM W OF HAWKESBURY, ONT./4 KM SO DE POINTE-AU-CHENE, QUE. 12 KM O DE HAWKESBURY, ONT.	62
1993-07-30T22:30:54.000Z	45.2600	-74.1200	8.00	3.90	Ontario-Quebec border region, Canada	111
1993-04-01T00:25:03	45.5950	-75.1070	3.82	2.60	24 KM E OF BUCKINGHAM, QUE. WESTERN QUEBEC/24 KM E DE BUCKINGHAM, QUE. L'OUEST DU QUEBEC	37
1992-11-17T05:58:27	45.7740	-74.9270	16.00	1.00	WESTERN QUEBEC 29 KM NW OF HAWKESBURY, ONT./OUEST DU QUEBEC 29 KM NO DE HAWKESBURY, ONT.	60
1992-11-17T04:33:43	45.7740	-74.9270	16.00	1.40	WESTERN QUEBEC 29 KM NW OF HAWKESBURY, ONT./OUEST DU QUEBEC 29 KM NO DE HAWKESBURY, ONT.	60
1992-11-17T04:08:20	45.7740	-74.9270	16.00	1.80	WESTERN QUEBEC 29 KM NW OF HAWKESBURY, ONT./OUEST DU QUEBEC 29 KM NO DE HAWKESBURY, ONT.	60
1992-11-17T03:58:01	45.7740	-74.9270	16.00	4.40	MAG 4.0 MB (NEIC) 2 OBS 26 KM NW OF HAWKESBURY, ONT.. Felt/26 KM NO DE HAWKESBURY, ONT.. Ressenti	60
1992-11-17T03:58:00.900Z	45.7640	-74.8620	18.00	4.00	Ontario-Quebec border region, Canada	63
1992-11-13T02:17:44	45.8220	-75.6080	18.00	1.90	30 KM NW OF BUCKINGHAM, QUE. WESTERN QUEBEC/30 KM NO DE BUCKINGHAM, QUE. OUEST DU QUEBEC	44
1992-10-18T04:57:59	45.5610	-74.5390	18.00	1.50	7 KM SE OF HAWKESBURY, ONT. WESTERN QUEBEC/7 KM SE DE HAWKESBURY, ONT. OUEST DU QUEBEC	78
1992-10-15T23:34:19	45.2380	-75.1900	18.00	1.30	42 KM SE OF BUCKINGHAM, QUE./42 KM SE DE BUCKINGHAM, QUE.	34
1992-09-17T04:30:57	45.8340	-75.1300	18.00	1.50	36 KM NE OF BUCKINGHAM, QUE. WESTERN QUEBEC/36 KM NE DE BUCKINGHAM, QUE. OUEST DU QUEBEC	54
1992-09-09T02:44:13	45.5810	-74.6320	18.00	2.00	2 KM SW OF HAWKESBURY, ONT. WESTERN QUEBEC/2 KM SO DE HAWKESBURY, ONT. OUEST DU QUEBEC	71
1992-08-13T03:13:07	45.2640	-75.1350	18.00	2.00	41 KM NW OF CORNWALL, ONT. EASTERN ONTARIO/41 KM NO DE CORNWALL, ONT. EST DE L'ONTARIO	35
1992-06-14T23:57:36	45.7530	-76.6250	18.00	2.00	3 KM NW OF CAMPBELL'S-BAY, QUE./3 KM NO DE CAMPBELL'S-BAY, QUE.	93
1992-06-03T04:40:02.800Z	46.2570	-75.0290	18.00	3.30	southern Quebec, Canada	100
1992-05-16T05:33:11	45.7130	-74.6780	18.00	1.80	13 KM N OF HAWKESBURY, ONT. WESTERN QUEBEC/13 KM N DE HAWKESBURY, ONT. OUEST DU QUEBEC	73
1992-05-02T16:28:58	45.7820	-74.4950	18.00	2.10	19 KM N OF HAWKESBURY, ONT. WESTERN QUEBEC/19 KM N DE HAWKESBURY, ONT. OUEST DU QUEBEC	89
1992-04-27T02:06:33	45.6890	-75.1250	18.00	2.20	25 KM NE OF BUCKINGHAM, QUE./25 KM NE DE BUCKINGHAM, QUE.	42
1991-11-29T05:23:23	45.5680	-75.1410	18.00	1.80	21 KM E OF BUCKINGHAM, QUE./21 KM E DE BUCKINGHAM, QUE.	33
1991-08-25T19:46:45	45.7170	-76.2190	18.00	2.30	31 KM NE OF BRAESIDE, ONT./31 KM NE DE BRAESIDE, ONT.	63
1991-08-14T07:26:41	45.6330	-76.2980	18.00	2.00	6 KM SW OF LAC-DES-LOUPS, QUE. WEST QUEBEC/6 KM SO DE LAC-DES-LOUPS, QUE. QUEST DU QUEBEC	65
1991-05-17T18:08:47.000Z	45.5000	-74.4000	18.00	4.40	Ontario-Quebec border region, Canada	88
1991-05-17T18:08:45	45.5830	-74.4160	18.00	3.10	FELT IN HAWKSBURY, ONT. BROWNSBURG, LACHUTE, QUE.. Felt/RESSENTI A HAWKSBURY, ONT. BROWNSBURG, LACHUTE, QUE.. Ressenti	88
1991-04-06T08:13:00	45.5380	-74.3910	14.58	2.90	WESTERN QUEBEC NEAR CARILLON, QUE./OUEST DU QUEBEC PRES DE CARILLON, QUE.	89
1991-03-20T21:12:29	45.2640	-75.6970	18.00	1.70	SOUTH OF OTTAWA, ONT./AU SUD D'OTTAWA, ONT.	23
1990-11-18T01:45:27	45.7460	-75.1790	9.63	2.40	WESTERN QUEBEC/OUEST DU QUEBEC	44
1990-10-08T14:34:39	45.6360	-75.0230	18.00	2.00	31 KM E OF BUCKINGHAM, QUE. WESTERN QUEBEC/31 KM E DE BUCKINGHAM, QUE. OUEST DU QUEBEC	45
1990-06-03T03:40:14	45.6090	-74.3910	18.00	2.30	6 KM SW OF LACHUTE, QUE. WESTERN QUEBEC/6 KM SO DE LACHUTE, QUE. OUEST DU QUEBEC	90
1990-05-20T12:20:15	45.6040	-75.1600	18.00	2.30	WESTERN QUEBEC ZONE/ZONE DE L'OUEST DU QUEBEC	34
1990-05-13T18:28:02	45.6450	-75.0340	18.00	1.50	WESTERN QUEBEC/OUEST DU QUEBEC	45
1990-04-20T04:16:35	45.8050	-74.6490	20.11	2.40	WESTERN QUEBEC/OUEST DU QUEBEC	80
1990-03-19T07:13:37	45.5970	-74.6550	18.00	1.90	WESTERN QUEBEC ZONE/ZONE DE L'OUEST DU QUEBEC	70
1990-03-03T01:12:35	45.2240	-75.2840	8.67	2.90	WESTERN QUEBEC ZONE SOUTH-EAST OF OTTAWA/ZONE DE L'OUEST DU QUEBEC SUD-EST D'OTTAWA	29
1989-07-16T12:23:08	45.4450	-75.9710	20.30	1.80	WESTERN QUEBEC/OUEST DU QUEBEC	35

1989-05-30T02:59:16	45.8220	-74.7660	12.39	2.20	WESTERN QUEBEC/OUEST DU QUEBEC	73
1989-03-14T03:27:43	45.7060	-74.8670	10.85	2.40	NORTH OF MONTEBELLO, QUEBEC WESTERN QUEBEC/AU NORD DU MONTEBELLO, QUEBEC OUEST DU QUEBEC	59
1989-02-01T18:01:13	45.2440	-75.2270	13.52	2.50	NEAR EMBRUN, ONT./PRES D'EMBRUN, ONTARIO	31
1988-12-29T05:24:54	45.3740	-75.4520	18.00	1.20	SOUTH OF OTTAWA/	8
1988-08-14T19:48:53	45.8220	-76.7220	18.00	2.00	WESTERN QUEBEC/OUEST DU QUEBEC	103
1988-08-11T00:25:49	45.5540	-75.0890	13.71	1.80	WESTERN QUEBEC/OUEST DU QUEBEC	36
1988-08-09T13:57:26.980Z	44.9950	-74.9550	10.00	3.50	New York	66
1988-07-16T17:35:28	45.2690	-76.1390	14.25	2.10	ALMONTE, ONTARIO/	52
1988-05-15T06:10:05.600Z	45.1700	-75.5800	7.00	3.50	Ontario-Quebec border region, Canada	29
1988-05-15T06:10:05	45.1560	-75.6070	8.53	3.30	EASTERN ONTARIO, SOUTH OF OTTAWA FELT AND HEARD IN MANOTICK,. Felt/EST D'ONTARIO, SUD D'OTTAWA RESSENTI ET ENTENDU A MANOTICK,. Ressenti	31
1988-01-24T20:57:09	45.5790	-74.6420	9.03	2.70	FELT MILDLY IN HAWKESBURY, ONT. AND IN CALUMET AND GRENVILLE, QUE.. Felt/OUEST DU QUEBEC RESSENTI LEGEREMENT A HAWKESBURY, ONT.. Ressenti	70
1987-11-16T20:25:44	45.8040	-75.7780	0.00	2.60	FELT AT NOTRE-DAME-DE-LA-SALETTE. Felt/OUEST DU QUEBEC RESSENTI	46
1987-11-11T08:00:27	45.7760	-75.3360	21.11	3.20	AFTERSHOCK FELT IN BUCKINGHAM, QUE.. Felt/OUEST DU QUEBEC REPLIQUE. Ressenti	41
1987-11-11T07:58:33	45.7690	-75.3360	17.15	3.50	WESTERN, QUEBEC FELT III IN BUCKINGHAM ,QUE.. Felt/OUEST DU QUEBEC RESSENTI III. Ressenti	40
1987-10-23T12:31:02	45.7610	-74.5110	14.76	3.70	NEAR KILMAR, QUE. 15 KM NE OF HAWKESBURY. Felt/OUEST DU QUEBEC PRES DE KILMAR, QUE.. Ressenti	87
1987-09-30T13:55:19	45.6630	-75.8020	26.97	2.70	NOT REPORTED FELT ST.PIERRE DE WAKEFIELD, QUE./OUEST DU QUEBEC SAINT-PIERRE-DE-WAKEFIELD, QUE.	34
1987-08-21T13:41:20	45.5980	-74.7670	23.95	1.60	WESTERN QUEBEC NEAR HAWKESBURY, ONT./OUEST DU QUEBEC PRES DE HAWKESBURY, ONT.	62
1987-07-11T11:15:06	45.1760	-74.7570	7.78	2.30	NEAR MARTINTOWN, ONT./PRES DE MARTINTOWN, ONT.	66
1987-07-05T02:37:09.300Z	44.6570	-75.5580	5.20	2.90	New York	86
1987-06-19T19:40:55	45.5620	-75.5970	1.00	1.80	POSSIBLE BLAST/DYNAMITAGE POSSIBLE	16
1987-05-14T11:38:57	45.7490	-75.2200	18.11	2.20	WESTERN QUEBEC/OUEST DU QUEBEC	43
1987-04-20T03:43:39	45.5620	-74.7730	12.08	2.60	NOT REPORTED FELT NEAR HAWKESBURY, ONT./PRES DE HAWKESBURY, ONT. PAS RAPPORTE COMME AYANT ETE RESSENTI	60
1987-03-25T03:23:28	45.6490	-74.7090	18.00	1.90	NEAR HAWKESBURY, ONT./PRES DE HAWKESBURY, ONT.	68
1986-12-09T13:02:33	45.3400	-76.2100	18.00	2.20	40 KM W FROM OTTAWA, ONT./40 KM O DE OTTAWA, ONT.	55
1986-08-17T21:48:03	45.7600	-76.5000	18.00	2.20	80 KM W FROM GLEN ALMOND, QUE./80 KM O DE GLEN ALMOND, QUE.	85
1986-08-13T04:55:18.400Z	45.1310	-74.2460	24.00	3.40	Ontario-Quebec border region, Canada	105
1986-08-02T09:56:02	45.4670	-74.5260	18.00	2.20	MAGNITUDE (WESTON OBS.) MC 2.4/MAGNITUDE (WESTON OBS.) MC 2.4	78
1986-07-28T15:26:37	45.4600	-74.5400	18.00	2.60	FELT IN RIGAUD, QUEBEC 70 KM W FROM MONTREAL, QUE.. Felt/RESSENTI A RIGAUD, QUEBEC 70 KM O DE MONTREAL, QUE.. Ressenti	77
1986-07-24T05:56:43	45.7600	-76.5400	18.00	1.80	TWO SIMILAR EVENTS WITHIN HOUR 70 KM E FROM CHALK RIVER, ONT./DEUX EVENEMENTS SIMILAIRES EN MOINS D'UNE HEURE	87
1986-07-24T05:43:45	45.7500	-76.5500	18.00	1.60	TWO SIMILAR EVENTS WITHIN HOUR 80 KM E FROM CHALK RIVER, ONT./DEUX EVENEMENTS SIMILAIRES EN MOINS D'UNE HEURE	88
1986-07-22T22:41:31	45.5890	-76.6110	18.00	2.40	80 KM SE FROM CHALK RIVER, ONT./80 KM SE DE CHALK RIVER, ONT.	87
1986-06-14T16:43:13	45.7300	-76.6100	18.00	2.70	70 KM SE FROM CHALK RIVER, ONT./70 KM SE DE CHALK RIVER, ONT.	91
1986-06-04T15:48:27	45.4500	-75.5200	1.00	1.70	PROBABLE BLAST/PROBABLEMENT DYNAMITAGE	2
1986-05-15T00:50:17	45.5030	-74.4930	16.72	2.20	MAGNITUDE MC 2.8 (LDGO) 70 KM W FROM MONTREAL, QUE./MAGNITUDE MC 2.8 (LDGO) 70 KM O DE MONTREAL, QUE.	81
1986-05-07T19:59:14	45.4600	-75.4000	1.00	1.70	PROBABLE BLAST 25 KM E FROM OTTAWA, ONT./PROBABLEMENT DYNAMITAGE 25 KM E DE OTTAWA, ONT.	10
1986-01-27T11:35:44.000Z	45.8000	-74.9800	18.00	2.90	Ontario-Quebec border region, Canada	59
1986-01-27T11:35:44	45.8100	-74.9800	18.00	2.90	40 KM E FROM GLEN ALMOND, QUE./40 KM E DE GLEN ALMOND, QUE.	60
1985-08-24T06:04:02	45.6800	-76.6540	18.00	3.10	FELT IN RENFREW,ONT. 70 KM SE FROM CHALK RIVER, ONT.. Felt/RESSENTI A RENFREW,ONT. 70 KM SE DE CHALK RIVER, ONT.. Ressenti	92
1985-07-13T18:30:57	45.6830	-74.9980	18.12	2.30	40 KM E FROM GLEN ALMOND, QUE./40 KM E DE GLEN ALMOND, QUE.	49
1985-04-10T09:18:39	45.5790	-74.9290	7.91	2.00	45 KM E FROM GLEN ALMOND, QUE./45 KM E DE GLEN ALMOND, QUE.	49
1985-01-30T09:46:13	45.7480	-75.1530	16.20	2.60	25 KM E FROM GLEN ALMOND, QUE./25 KM E DE GLEN ALMOND, QUE	46
1984-11-26T09:03:49.000Z	45.1900	-75.0500	14.00	3.20	Ontario-Quebec border region, Canada	45
1984-01-17T19:04:46.000Z	45.5600	-75.1200	19.00	3.10	Ontario-Quebec border region, Canada	34
1983-10-16T03:00:47.000Z	45.6200	-75.0500	11.00	3.10	Ontario-Quebec border region, Canada	42
1983-10-11T04:10:55.000Z	45.2100	-75.7700	15.00	4.20	Ontario-Quebec border region, Canada	31
1982-08-06T06:29:10.000Z	45.8900	-75.4600	18.00	3.70	Ontario-Quebec border region, Canada	51
1982-07-13T02:18:49.000Z	46.0300	-74.5500	17.00	3.90	southern Quebec, Canada	101
1981-09-20T22:17:46.000Z	45.7600	-74.3900	18.00	2.80	Ontario-Quebec border region, Canada	95
1981-07-07T23:59:59.750Z	45.1080	-74.6100	16.00	2.90	Ontario-Quebec border region, Canada	80
1981-07-05T21:47:23.900Z	45.1060	-74.6070	16.00	3.30	Ontario-Quebec border region, Canada	80
1981-07-04T23:19:17.500Z	45.1060	-74.6060	16.00	3.00	Ontario-Quebec border region, Canada	80
1981-07-04T23:16:33.000Z	45.1080	-74.6080	16.00	3.50	Ontario-Quebec border region, Canada	80
1978-08-21T08:47:10.900Z	44.5230	-74.5080	1.00	3.10	New York	129
1978-07-30T10:54:44.000Z	45.6800	-74.4400	18.00	3.80	Ontario-Quebec border region, Canada	89
1977-07-14T07:39:30.000Z	46.0300	-74.4000	10.00	3.80	southern Quebec, Canada	110
1976-07-13T03:51:14.000Z	45.1750	-74.0960	0.00	2.90	Ontario-Quebec border region, Canada	115
1944-09-05T08:51:06.000Z	44.9990	-74.6520	1.00	4.50	New York	83
1944-09-05T04:38:46.300Z	44.9580	-74.7230	12.00	5.54	New York	82
1928-03-18T15:20:00.000Z	44.5000	-74.3000		4.10	New York	141
1867-12-18T08:00:00.000Z	44.7000	-75.2000		4.30	East of Ogdensburg, New York	85
2010-06-23	45.9000	-75.5000	22.40	5.00	Val des Bois	52

2015 National Building Code Seismic Hazard Calculation

INFORMATION: Eastern Canada English (613) 995-5548 français (613) 995-0600 Facsimile (613) 992-8836
Western Canada English (250) 363-6500 Facsimile (250) 363-6565

Site: 45.430N 75.521W **User File Reference:** Renaud Road and Navan Road, Navan, Ontario 2021-02-17 12:59 UT

Probability of exceedance per annum	0.000404	0.001	0.0021	0.01
Probability of exceedance in 50 years	2 %	5 %	10 %	40 %
Sa (0.05)	0.494	0.273	0.162	0.047
Sa (0.1)	0.574	0.327	0.202	0.064
Sa (0.2)	0.477	0.275	0.173	0.058
Sa (0.3)	0.360	0.209	0.132	0.045
Sa (0.5)	0.253	0.147	0.093	0.032
Sa (1.0)	0.124	0.073	0.046	0.016
Sa (2.0)	0.058	0.034	0.021	0.006
Sa (5.0)	0.015	0.008	0.005	0.001
Sa (10.0)	0.006	0.003	0.002	0.001
PGA (g)	0.306	0.177	0.109	0.034
PGV (m/s)	0.210	0.117	0.071	0.022

Notes: Spectral (Sa(T), where T is the period in seconds) and peak ground acceleration (PGA) values are given in units of g (9.81 m/s^2). Peak ground velocity is given in m/s. Values are for "firm ground" (NBCC2015 Site Class C, average shear wave velocity 450 m/s). NBCC2015 and CSAS6-14 values are highlighted in yellow. Three additional periods are provided - their use is discussed in the NBCC2015 Commentary. Only 2 significant figures are to be used. **These values have been interpolated from a 10-km-spaced grid of points. Depending on the gradient of the nearby points, values at this location calculated directly from the hazard program may vary. More than 95 percent of interpolated values are within 2 percent of the directly calculated values.**

References

National Building Code of Canada 2015 NRCC no. 56190; Appendix C: Table C-3, Seismic Design Data for Selected Locations in Canada

Structural Commentaries (User's Guide - NBC 2015: Part 4 of Division B)
Commentary J: Design for Seismic Effects

Geological Survey of Canada Open File 7893 Fifth Generation Seismic Hazard Model for Canada: Grid values of mean hazard to be used with the 2015 National Building Code of Canada

See the websites www.EarthquakesCanada.ca and www.nationalcodes.ca for more information

PRACTICE NOTE GUIDELINES FOR LANDSLIDE RISK MANAGEMENT 2007

APPENDIX C: LANDSLIDE RISK ASSESSMENT

QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY

QUALITATIVE MEASURES OF LIKELIHOOD

Approximate Annual Probability		Implied Indicative Landslide Recurrence Interval		Description	Descriptor	Level
Indicative Value	Notional Boundary					
10^{-1}	$5x10^{-2}$	10 years	20 years	The event is expected to occur over the design life.	ALMOST CERTAIN	A
10^{-2}	$5x10^{-3}$	100 years	200 years	The event will probably occur under adverse conditions over the design life.	LIKELY	B
10^{-3}	$5x10^{-4}$	1000 years	2000 years	The event could occur under adverse conditions over the design life.	POSSIBLE	C
10^{-4}	$5x10^{-5}$	10,000 years	20,000 years	The event might occur under very adverse circumstances over the design life.	UNLIKELY	D
10^{-5}	$5x10^{-6}$	100,000 years	200,000 years	The event is conceivable but only under exceptional circumstances over the design life.	RARE	E
10^{-6}		1,000,000 years		The event is inconceivable or fanciful over the design life.	BARELY CREDIBLE	F

Note: (1) The table should be used from left to right; use Approximate Annual Probability or Description to assign Descriptor, not *vice versa*.

QUALITATIVE MEASURES OF CONSEQUENCES TO PROPERTY

Approximate Cost of Damage		Description	Descriptor	Level
Indicative Value	Notional Boundary			
200%	100%	Structure(s) completely destroyed and/or large scale damage requiring major engineering works for stabilisation. Could cause at least one adjacent property major consequence damage.	CATASTROPHIC	1
60%	40%	Extensive damage to most of structure, and/or extending beyond site boundaries requiring significant stabilisation works. Could cause at least one adjacent property medium consequence damage.	MAJOR	2
20%	10%	Moderate damage to some of structure, and/or significant part of site requiring large stabilisation works. Could cause at least one adjacent property minor consequence damage.	MEDIUM	3
5%	1%	Limited damage to part of structure, and/or part of site requiring some reinstatement stabilisation works.	MINOR	4
0.5%		Little damage. (Note for high probability event (Almost Certain), this category may be subdivided at a notional boundary of 0.1%. See Risk Matrix.)	INSIGNIFICANT	5

Notes: (2) The Approximate Cost of Damage is expressed as a percentage of market value, being the cost of the improved value of the unaffected property which includes the land plus the unaffected structures.

(3) The Approximate Cost is to be an estimate of the direct cost of the damage, such as the cost of reinstatement of the damaged portion of the property (land plus structures), stabilisation works required to render the site to tolerable risk level for the landslide which has occurred and professional design fees, and consequential costs such as legal fees, temporary accommodation. It does not include additional stabilisation works to address other landslides which may affect the property.

(4) The table should be used from left to right; use Approximate Cost of Damage or Description to assign Descriptor, not vice versa

APPENDIX C: – QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY (CONTINUED)

QUALITATIVE RISK ANALYSIS MATRIX – LEVEL OF RISK TO PROPERTY

LIKELIHOOD		CONSEQUENCES TO PROPERTY (With Indicative Approximate Cost of Damage)				
	Indicative Value of Approximate Annual Probability	1: CATASTROPHIC 200%	2: MAJOR 60%	3: MEDIUM 20%	4: MINOR 5%	5: INSIGNIFICANT 0.5%
A – ALMOST CERTAIN	10^{-1}	VH	VH	VH	H	M or **L** (5)
B - LIKELY	10^{-2}	VH	VH	H	M	**L**
C - POSSIBLE	10^{-3}	VH	H	M	M	**VL**
D - UNLIKELY	10^{-4}	H	M	**L**	**L**	**VL**
E - RARE	10^{-5}	M	**L**	**L**	**VL**	**VL**
F - BARELY CREDIBLE	10^{-6}	**L**	**VL**	**VL**	**VL**	**VL**

Notes: (5) For Cell A5, may be subdivided such that a consequence of less than 0.1% is Low Risk.
(6) When considering a risk assessment it must be clearly stated whether it is for existing conditions or with risk control measures which may not be implemented at the current time.

RISK LEVEL IMPLICATIONS

Risk Level		Example Implications (7)
VH	VERY HIGH RISK	Unacceptable without treatment. Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to Low; may be too expensive and not practical. Work likely to cost more than value of the property.
H	HIGH RISK	Unacceptable without treatment. Detailed investigation, planning and implementation of treatment options required to reduce risk to Low. Work would cost a substantial sum in relation to the value of the property.
M	MODERATE RISK	May be tolerated in certain circumstances (subject to regulator's approval) but requires investigation, planning and implementation of treatment options to reduce the risk to Low. Treatment options to reduce to Low risk should be implemented as soon as practicable.
L	LOW RISK	Usually acceptable to regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance is required.
VL	VERY LOW RISK	Acceptable. Manage by normal slope maintenance procedures.

Note: (7) The implications for a particular situation are to be determined by all parties to the risk assessment and may depend on the nature of the property at risk; these are only given as a general guide.

APPENDIX 2

FIGURE 1 - KEY PLAN

FIGURES 2 & 3 - SLOPE STABILITY SECTIONS

FIGURE 4 - APPROXIMATE LANDSLIDE LOCATION (1965 AERIAL)

FIGURE 5 - APPROXIMATE LANDSLIDE LOCATION (2019 AERIAL)

FIGURE 6 - MISCELLANEOUS PAPER MP 68
REGIONAL SLOPE STABILITY STUDY

FIGURES 7A AND 7B - PALEO-ISLAND FROM PROTO-OTTAWA RIVER

FIGURE 8 - SURFICIAL GEOLOGY AND PALEO-ISLAND FOOTPRINTS

DRAWING PG6142-1 - TEST HOLE LOCATION PLAN

DRAWING PG6142-2 - GEOLOGICAL SECTION A-A

DRAWING PG6142-3 - GEOLOGICAL SECTION B-B

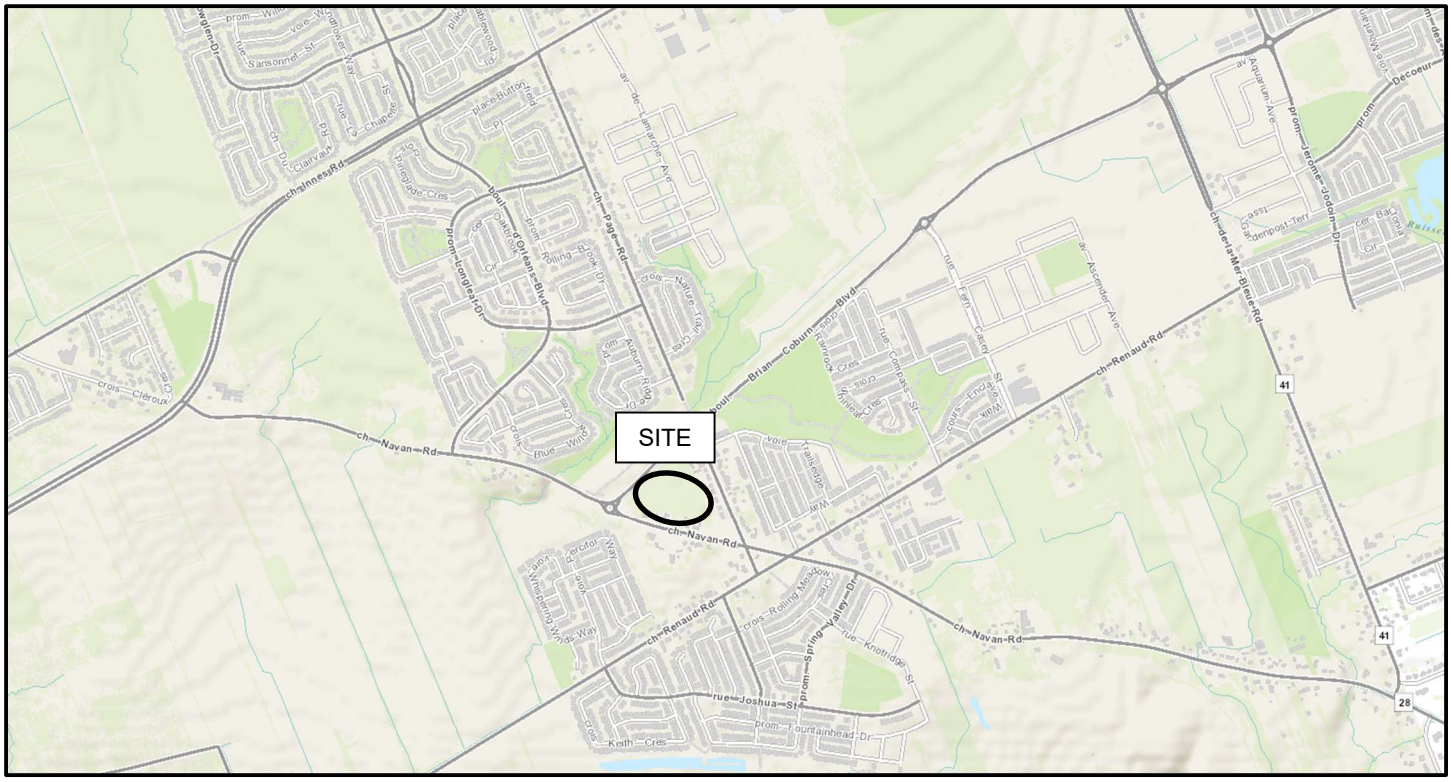
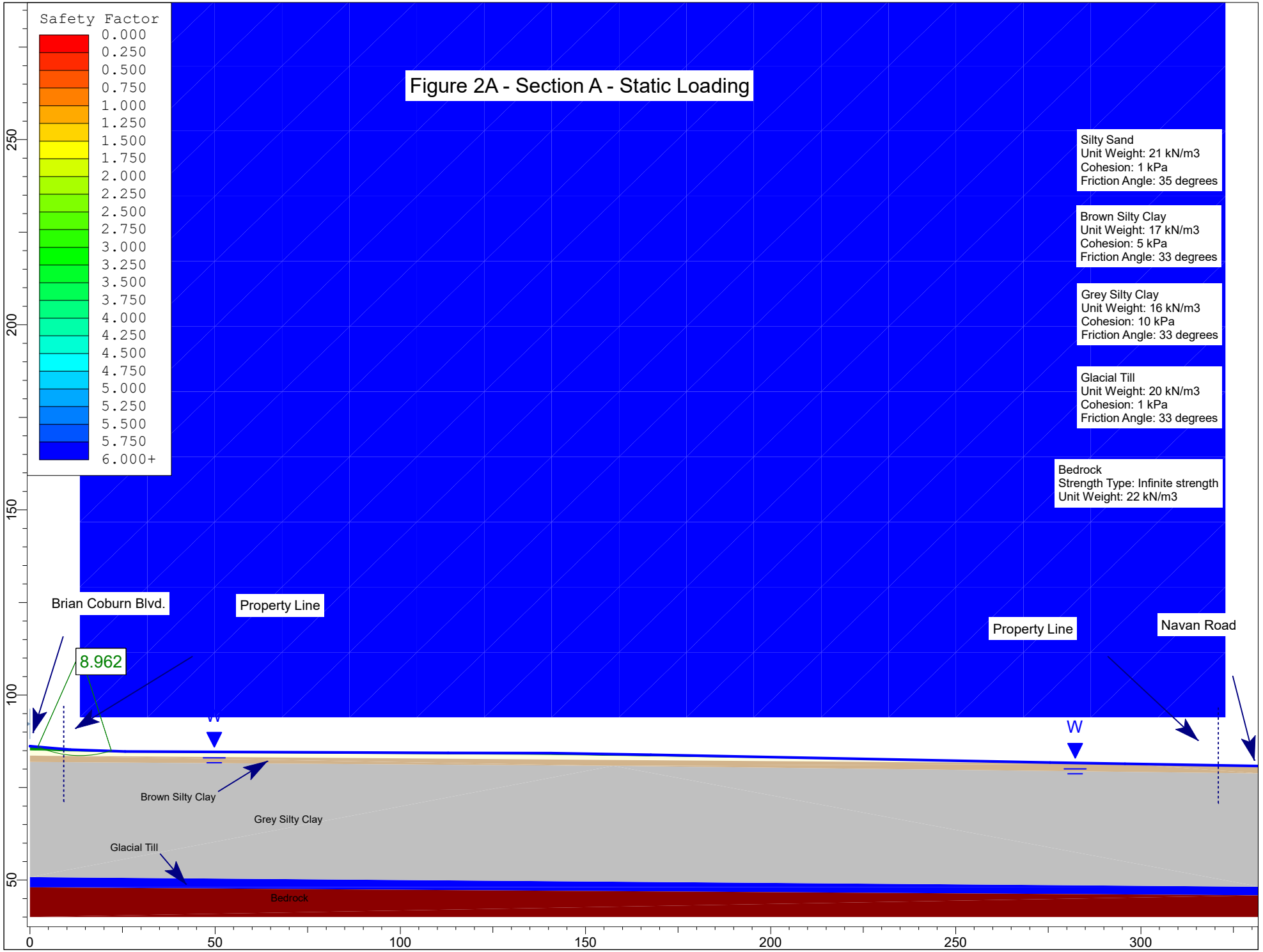


FIGURE 1

KEY PLAN


Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+
Figure 2A - Section A - Static Loading
Silty Sand
Unit Weight: 21 kN/m3
Cohesion: 1 kPa
Friction Angle: 35 degrees
Brown Silty Clay
Unit Weight: 17 kN/m3
Cohesion: 5 kPa
Friction Angle: 33 degrees
Grey Silty Clay
Unit Weight: 16 kN/m3
Cohesion: 10 kPa
Friction Angle: 33 degrees
Glacial Till
Unit Weight: 20 kN/m3
Cohesion: 1 kPa
Friction Angle: 33 degrees
Bedrock
Strength Type: Infinite strength
Unit Weight: 22 kN/m3
Brian Coburn Blvd.
Property Line
Property Line
Navan Road
8.962
W
W
Brown Silty Clay
Grey Silty Clay
Glacial Till
Bedrock
250
200
150
100
50
0
50
100
150
200
250
300

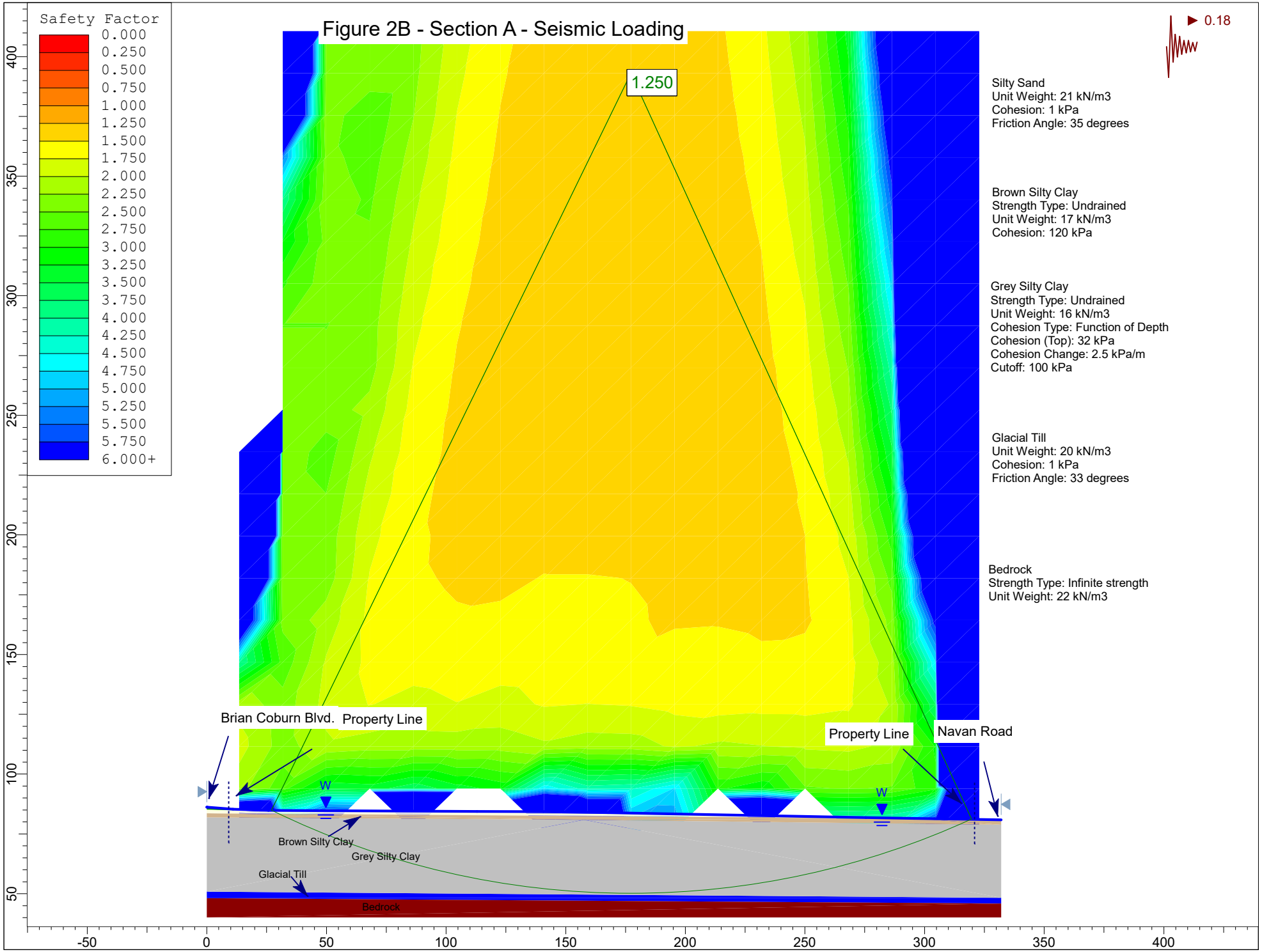
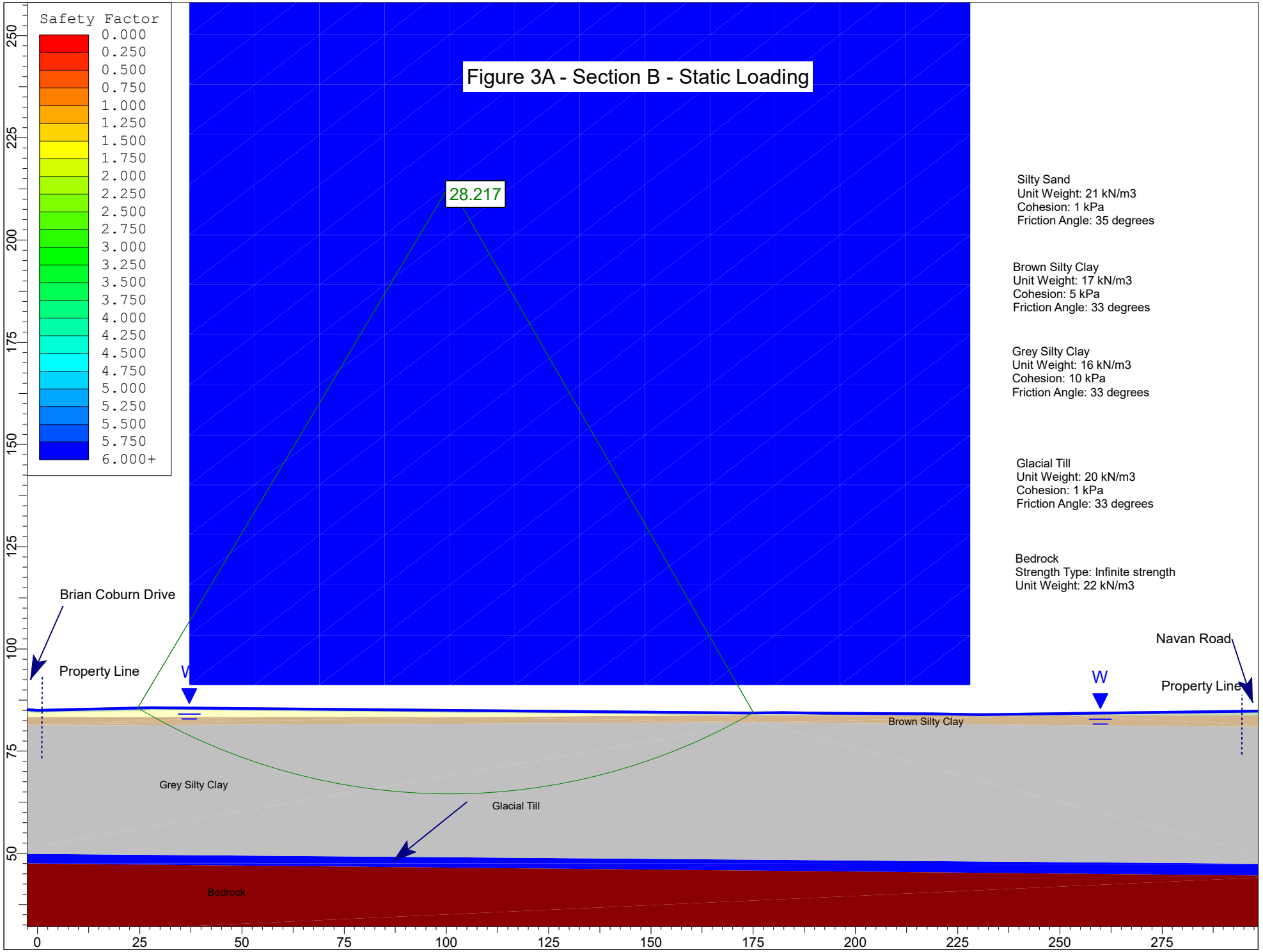


Figure 2B - Section A - Seismic Loading
Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+
0.18
1.250
Silty Sand
Unit Weight: 21 kN/m3
Cohesion: 1 kPa
Friction Angle: 35 degrees
Brown Silty Clay
Strength Type: Undrained
Unit Weight: 17 kN/m3
Cohesion: 120 kPa
Grey Silty Clay
Strength Type: Undrained
Unit Weight: 16 kN/m3
Cohesion Type: Function of Depth
Cohesion (Top): 32 kPa
Cohesion Change: 2.5 kPa/m
Cutoff: 100 kPa
Glacial Till
Unit Weight: 20 kN/m3
Cohesion: 1 kPa
Friction Angle: 33 degrees
Bedrock
Strength Type: Infinite strength
Unit Weight: 22 kN/m3
Brian Coburn Blvd.
Property Line
Property Line
Navan Road
W
W
Brown Silty Clay
Grey Silty Clay
Glacial Till
Bedrock
400
350
300
250
200
150
100
50
-50
0
50
100
150
200
250
300
350
400


Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+
Figure 3A - Section B - Static Loading
28.217
Silty Sand
Unit Weight: 21 kN/m3
Cohesion: 1 kPa
Friction Angle: 35 degrees
Brown Silty Clay
Unit Weight: 17 kN/m3
Cohesion: 5 kPa
Friction Angle: 33 degrees
Grey Silty Clay
Unit Weight: 16 kN/m3
Cohesion: 10 kPa
Friction Angle: 33 degrees
Glacial Till
Unit Weight: 20 kN/m3
Cohesion: 1 kPa
Friction Angle: 33 degrees
Bedrock
Strength Type: Infinite strength
Unit Weight: 22 kN/m3
Brian Coburn Drive
Property Line
W
Navan Road
Property Line
W
Brown Silty Clay
Grey Silty Clay
Glacial Till
Bedrock
0
25
50
75
100
125
150
175
200
225
250
275
50
75
100
125
150
175
200
225
250

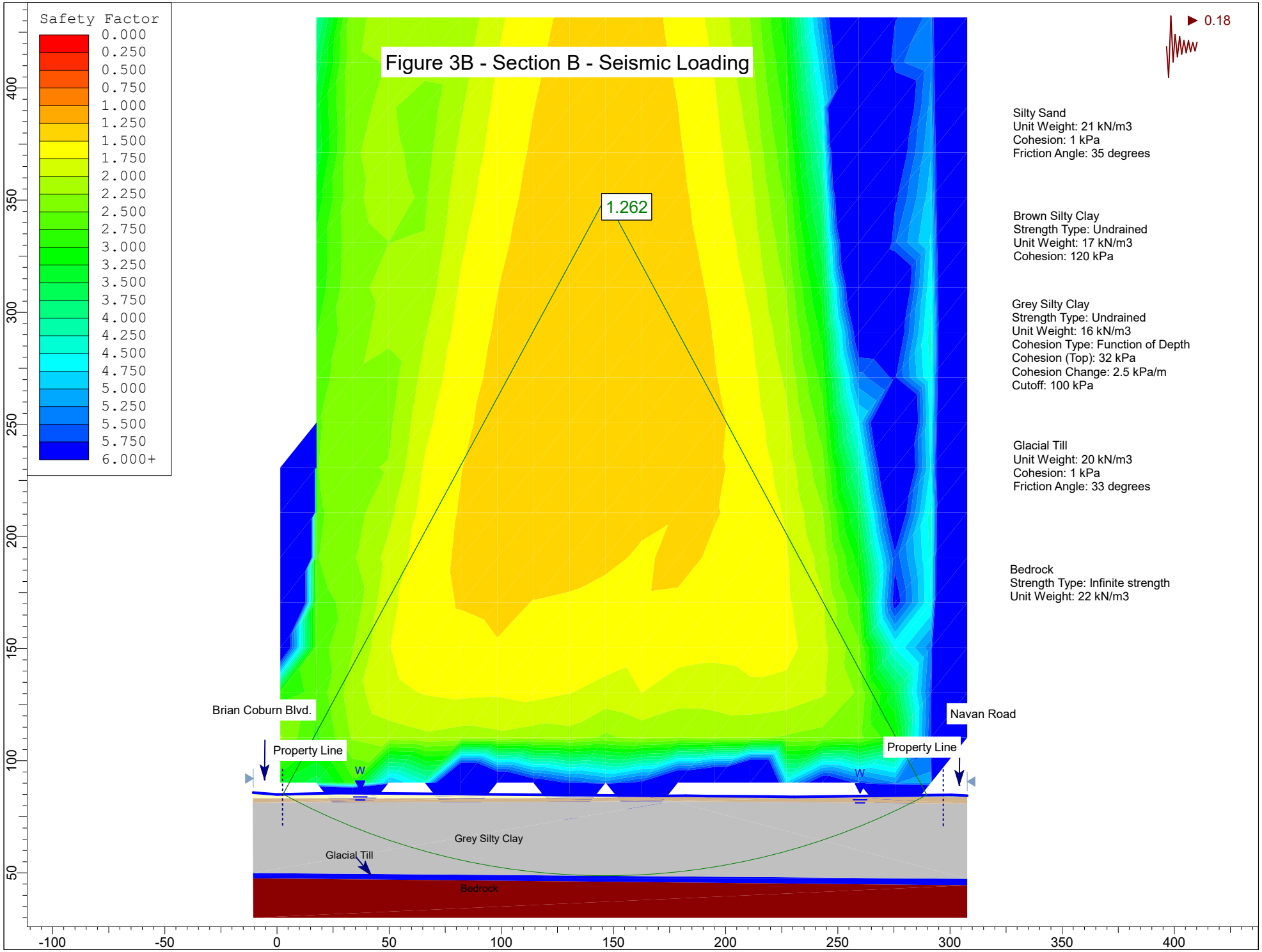


Figure 3B - Section B - Seismic Loading
Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+
0.18
1.262
Silty Sand
Unit Weight: 21 kN/m3
Cohesion: 1 kPa
Friction Angle: 35 degrees
Brown Silty Clay
Strength Type: Undrained
Unit Weight: 17 kN/m3
Cohesion: 120 kPa
Grey Silty Clay
Strength Type: Undrained
Unit Weight: 16 kN/m3
Cohesion Type: Function of Depth
Cohesion (Top): 32 kPa
Cohesion Change: 2.5 kPa/m
Cutoff: 100 kPa
Glacial Till
Unit Weight: 20 kN/m3
Cohesion: 1 kPa
Friction Angle: 33 degrees
Bedrock
Strength Type: Infinite strength
Unit Weight: 22 kN/m3
Brian Coburn Blvd.
Navan Road
Property Line
Property Line
W
W
Grey Silty Clay
Glacial Till
Bedrock
400
350
300
250
200
150
100
50
-100
-50
0
50
100
150
200
250
300
350
400

BH 2
76.94
(76.60)

BH 4
77.68
(76.91)

TP 6
78.50

TP 3
79.62

TP 1
80.15

BH 1
80.19
(79.43)

SITE

LEGEND:

APPROXIMATE PREVIOUS LANDSLIDE LOCATION
(BROOKS, G.R., 2019, SENSITIVE CLAY LANDSLIDE
INVENTORY MAP AND DATABASE FOR OTTAWA, ONTARIO)

SCALE: 1:2000

0 25 50 75 100 125 150m

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NO.	REVISIONS	DATE	INITIAL

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GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
2983, 3053 & 3079 NAVAN ROAD
OTTAWA, ONTARIO

Title:
APPROXIMATE LANDSLIDE LOCATION (1965 AERIAL)

Scale: 1:2000	Date: 02/2022
Drawn by: YA	Report No.: PG6142-1
Checked by: FC	Dwg. No.: **FIGURE 4**
Approved by: DJG	Revision No.:

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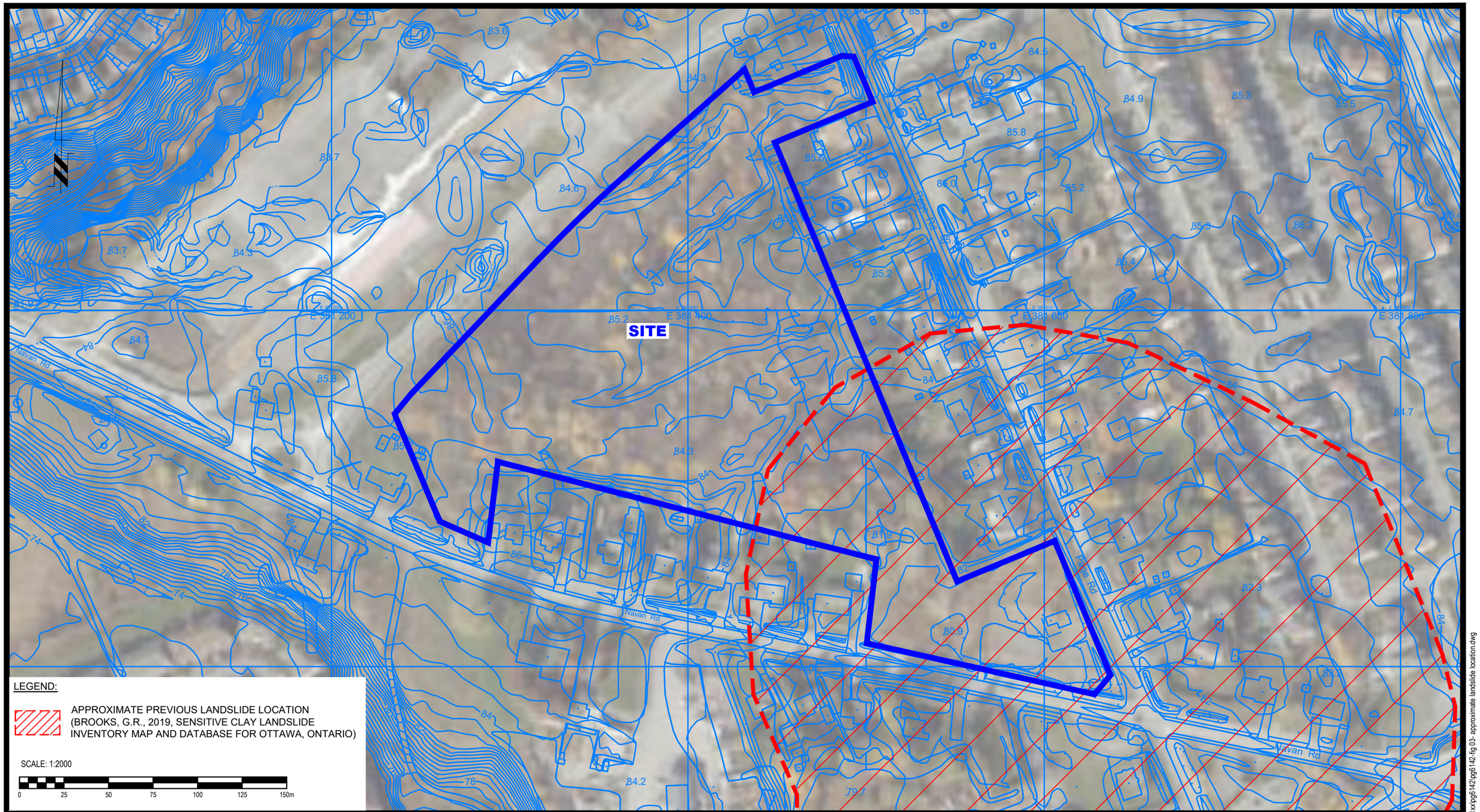

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OTTAWA, ONTARIO

Title:
APPROXIMATE LANDSLIDE LOCATION (2019 AERIAL)

Scale: 1:2000	Date: 02/2022
Drawn by: YA	Report No.: PG6142-1
Checked by: FC	Dwg. No.: **FIGURE 5**
Approved by: DJG	Revision No.:

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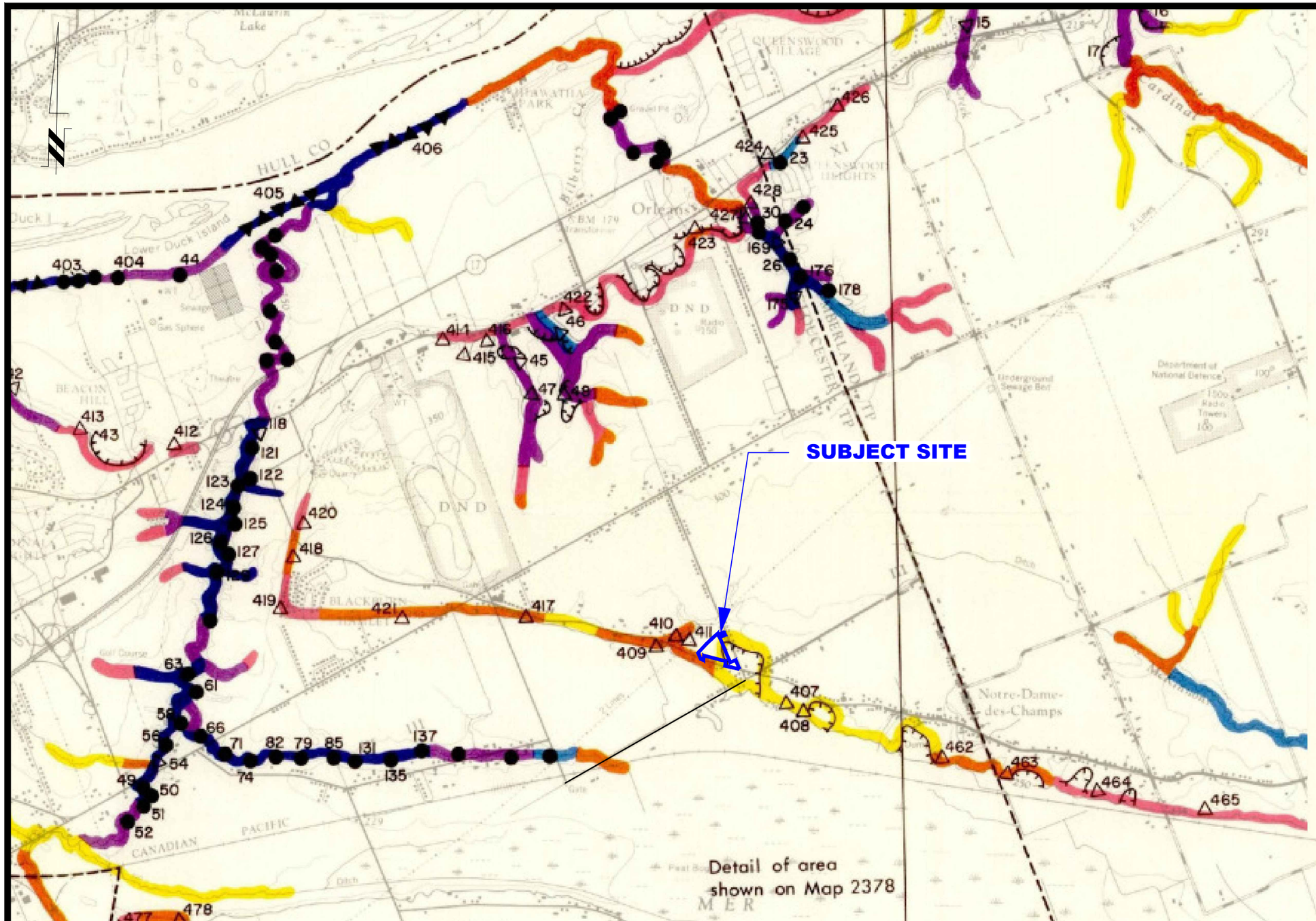

FACTOR OF SAFETY	GUIDELINES
<0.8	Unsuitable for construction or will require extreme remedial measures based upon careful geotechnical investigations.
0.8-1.2	Will require extensive remedial measures as dictated by detailed geotechnical studies.
1.2-1.5	Detailed geotechnical investigation necessary, with concomitant remedial measures.
1.5-2.0	Routine geotechnical investigation necessery.
2.0-2.5 or interpreted from field study	Routine inspection necessary.
>2.5 or interpreted from field study	Should be inspected but no remedial action likely to be required.

SYMBOLS

- . . . Earth flow slide
- △ . . . Survey point
- ▲ . . . Sheet slide
- ● . . . Rotation slide
- ■ . . . Failing slope
- △234 ●456 . . . Recorded data

LEGEND:

SCALE: 1:4000

0 50 100 150 200 250m

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Title:
OGS MISCELLANEOUS PAPER MP 68 - REGIONAL SLOPE STABILITY STUDY

Scale: 1:2000	Date: 02/2022
Drawn by: YA	Report No.: PG6142-1
Checked by: FC	Dwg. No.: FIGURE 6
Approved by: DJG	Revision No.:

LEGEND:

PRE-HISTORIC LANDSLIDE INVENTORIED BY GSC UNDER OPEN FILE G8600,2019

SCALE: 1:75000

0 1000 2000 3000 5000m

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OTTAWA, ONTARIO

Title:

PALEO ISLAND FROM PROTO - OTTAWA RIVER

Scale: 1:75000	Date: 02/2022
Drawn by: YA	Report No.: PG6142-1
Checked by: FC	Dwg. No.: FIGURE 7A
Approved by: DJG	Revision No.:

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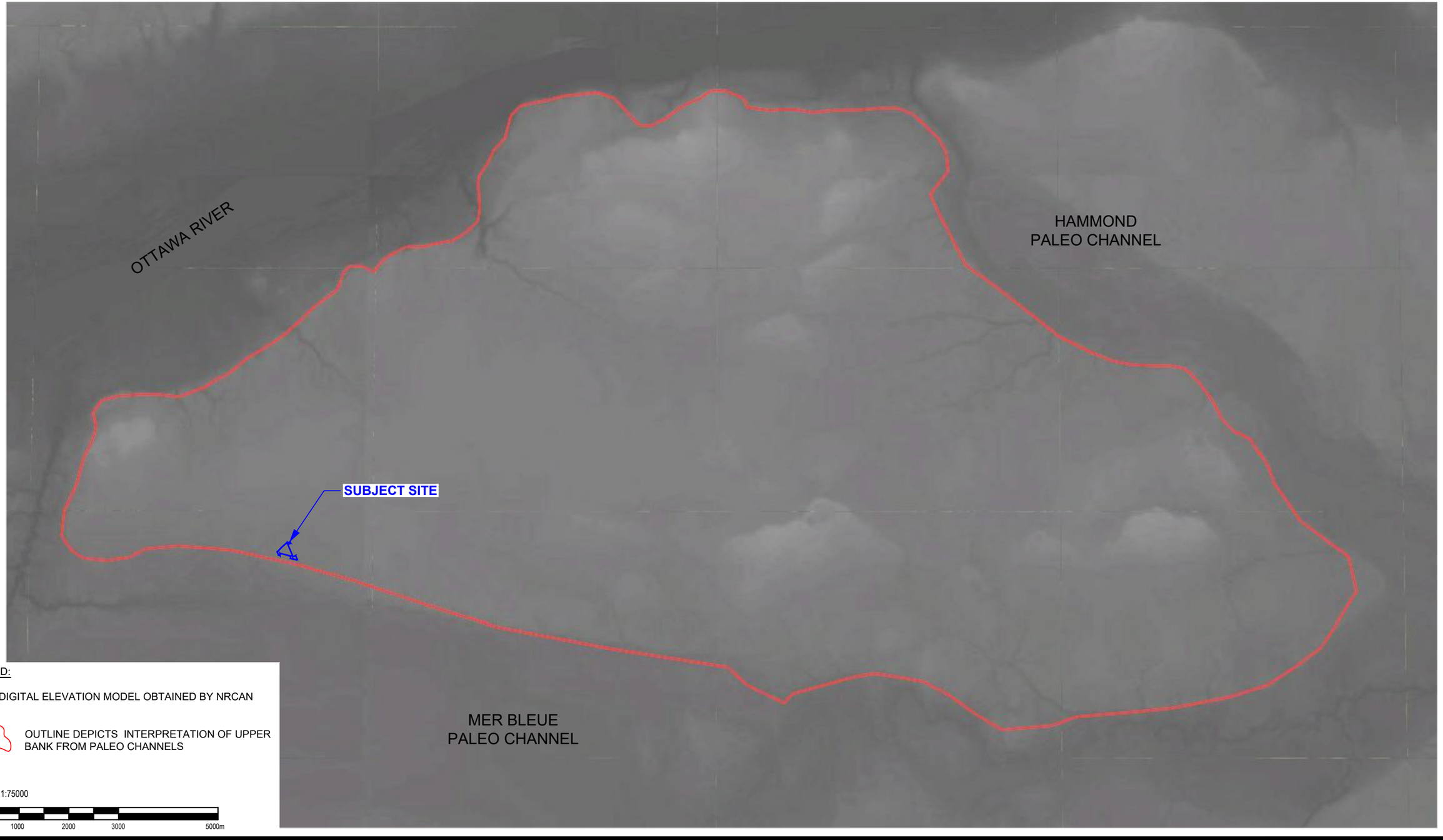

LEGEND:

LIDAR DIGITAL ELEVATION MODEL OBTAINED BY NRCAN

OUTLINE DEPICTS INTERPRETATION OF UPPER BANK FROM PALEO CHANNELS

SCALE: 1:75000

0 1000 2000 3000 5000m

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OTTAWA, ONTARIO

Title:

PALEO ISLAND FROM PROTO - OTTAWA RIVER

Scale: 1:75000	Date: 02/2022
Drawn by: YA	Report No.: PG6142-1
Checked by: FC	Dwg. No.: **FIGURE 7B**
Approved by: DJG	Revision No.:

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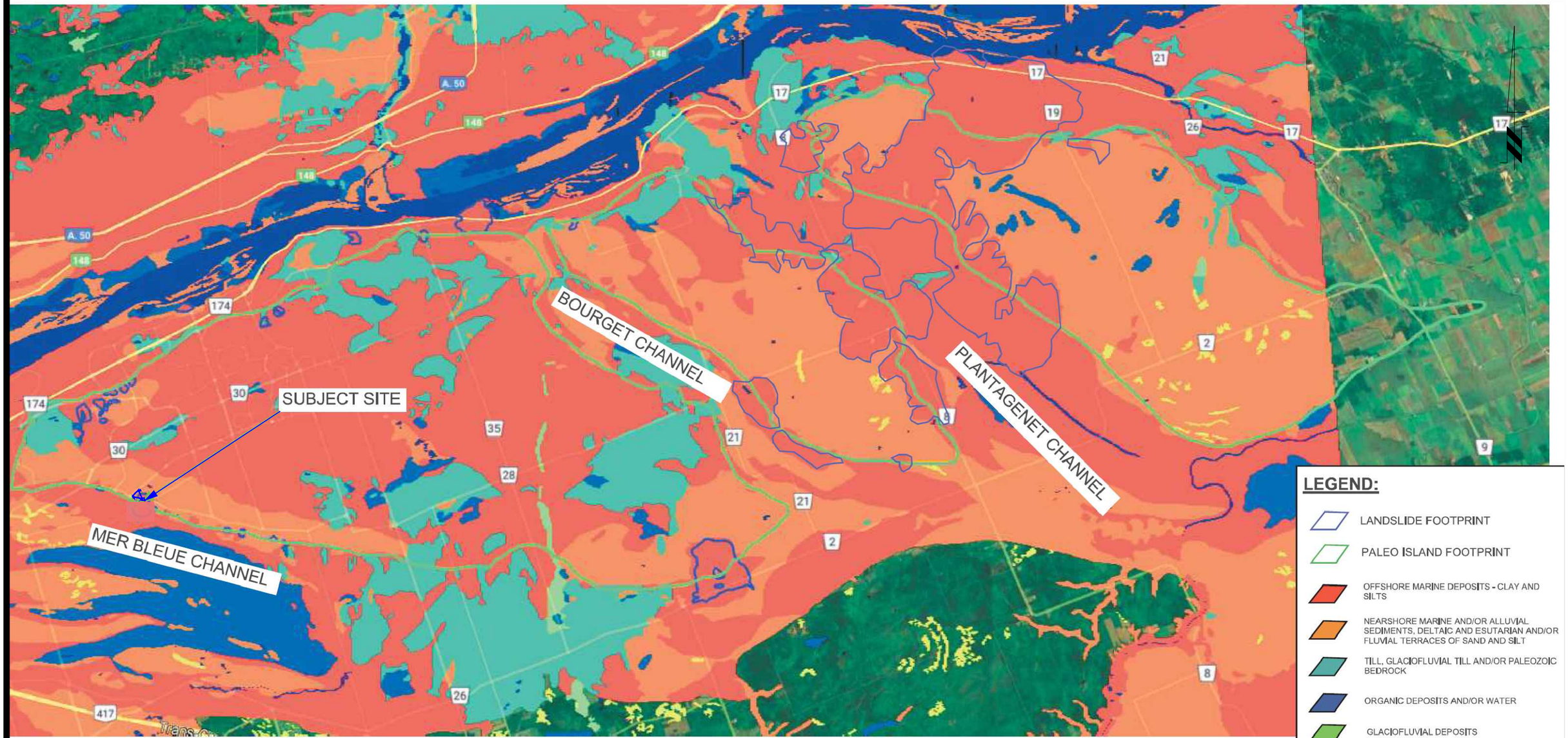

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2983, 3053 & 3079 NAVAN ROAD
OTTAWA, ONTARIO

Title:
SURFICIAL GEOLOGY AND PALEO ISLAND FOOTPRINTS

Scale: N.T.S.	Date: 02/2022
Drawn by: YA	Report No.: PG6142-1
Checked by: FC	Dwg. No.: **FIGURE 8**
Approved by: DJG	Revision No.:

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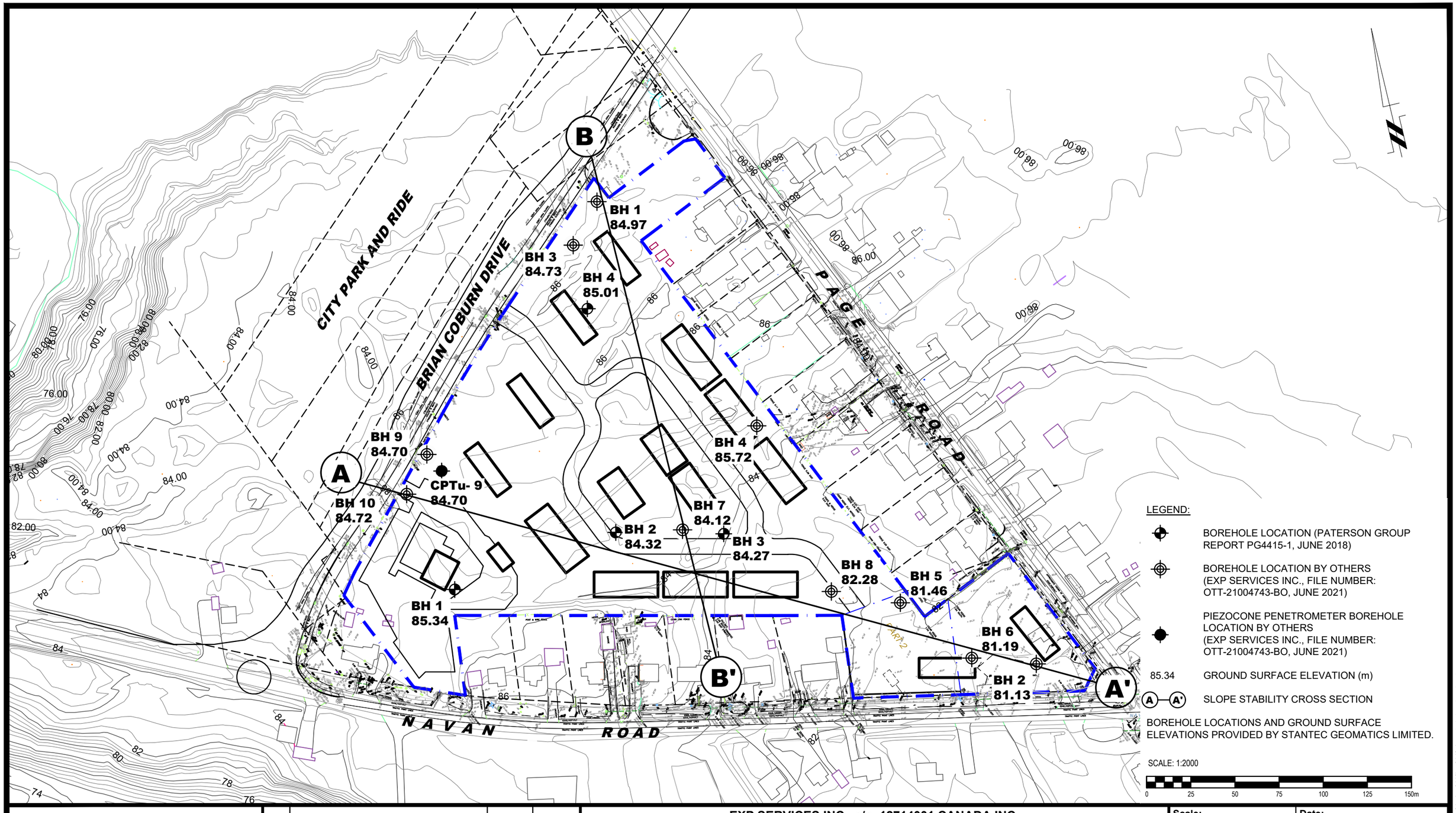

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OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:1500	Date: 02/2022
Drawn by: YA	Report No.: PG6142-1
Checked by: FC	Dwg. No.: PG6142-1
Approved by: DJG	Revision No.:

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