Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE 100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

BARRIE	MISSISSAUGA	OSHAWA	NEWMARKET	MUSKOKA	HAMILTON
TEL: (705) 721-7863	TEL: (905) 542-7605	TEL: (905) 440-2040	TEL: (905) 853-0647	TEL: (705) 684-4242	TEL: (905) 777-7956
FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

A REPORT TO
CAVALLINO ESTATES INC.

A HYDROGEOLOGICAL ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT

0 AND 12319 CENTREVILLE CREEK ROAD
TOWN OF CALEDON

REFERENCE NO. 2508-W033

NOVEMBER 14, 2025

DISTRIBUTION

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ISSUES AND REVISIONS REGISTRY

SEL Reference No.	Report Description	Date	Description of Issued and/or Revision
2508-W033	Draft	November 14, 2025	Draft Hydrogeological Assessment Report
2508-W033	Final	November 14, 2025	Final Hydrogeological Assessment Report

1.0 EXECUTIVE SUMMARY

Soil Engineers Ltd. (SEL) was retained by Cavallino Estates Inc. to conduct a hydrogeological assessment for proposed residential development at 0 and 12139 Centreville Creek Road, in the Town of Caledon (the Subject Site).

The Subject Site is bounded by a residential property and agricultural properties to the north, agricultural properties and a watercourse to the east and south, and Centreville Creek Road and residential and agricultural properties to the west.

The Subject Site currently consists mainly of farm field with associated farm structures, residential dwelling and paved road toward Centreville Creek Road at southwest portion of the Subject Site.

The Site Plan prepared by Bousfield Inc., dated October 14, 2025 indicates that the proposed development will include the construction of thirty-one (31) townhouse blocks and two (2) medium density blocks, which will be provided with municipal services and paved roadways meeting urban standards, and three (3) future development blocks. The townhouse blocks are assumed to have a 1-level basement.

The current investigation revealed that:

- The subsoil investigations conducted by SEL and GEI Consultants Ltd. have revealed that beneath the topsoil veneer, the Subject Site is underlain by stratum of silty clay till, with localized deposits of silty clay, to a maximum termination depth of investigation at 10.9 meters below ground surface (mbgs).
- The finding of the groundwater monitoring indicates that shallow groundwater level elevation ranged from the EL. 230.5 masl to 236.2 masl at GEI-BH/MW 103 and GEI-BH/MW 104D, respectively.
- The findings of SWRTs reveal that the hydraulic conductivity (K) for the water bearing units underneath the Subject Site ranges from 3.7×10^{-8} at BH/MW 25-3 to 2.2×10^{-9} m/sec at GEI-BH/MW 105. However, as a conservative approach, 3.7×10^{-8} was utilized for the current assessment.
- The results indicate that the concentration of total manganese from the unfiltered sample collected from BH/MW 25-3 exceeded the applicable standards when compared against the Peel Storm Sewer Use By-law standards. However, the results indicate that the unfiltered sample meets the applicable standards when compared against the Peel Region Sanitary Sewer Use By-Law.
- The short-term construction dewatering flow rate for construction of the proposed townhouse blocks considering groundwater seepage with a safety factor of 1.5 and 2-year storm event with a duration of 3 hr/day ranges between 15,500 L/day and 31,200.0 L/day. It ranges between 4,600 L/day and 6,800.0 L/day for installation of the proposed underground services considering 5.0 m as a length of an open and active trench per day.

- Since the range of the anticipated short-term construction dewatering flow remains below the MECP EASR threshold limit of 50,000.0 L/day, assuming the construction of the townhouse blocks and underground services are completed over phases, an EASR filing with the MECP will not be required for the construction of the proposed townhouse blocks and underground services.
- The review of the long-term dewatering flow rates for the townhouse blocks that will be constructed below the shallow groundwater table ranges from 3,750.0 L/day to 10,700.00 L/day considering groundwater seepage with a safety factor of 1.5 and infiltration, which does not exceed 379,000 L/day for the proposed townhouse blocks. As such, filing PTTW with MECP is not required.
- The maximum conceptual ZOI for dewatering could reach up to 5.4 and 4.8 m away from the conceptual dewatering wells or array considered around the excavation box for of the installation of the proposed underground services and the construction of the proposed townhouse blocks, respectively. There are no existing structures located within the conceptual ZOI for dewatering. As such, no ground settlement for nearby structures are expected. Additionally, if the dewatering involves utilization of sump and pump, the ZoI for dewatering will be limited to the excavation area, and there won't be significant risk for ground settlement.
- The existing features within the Subject Site including unevaluated wetland, a ponded water and wooded areas are located within the footprint of the proposed blocks and roads. As such, it is assumed the features will be decommissioned in advance of construction. The existing headwater along the east limit of the Subject Site boundary is located within the footprint of the Blocks 34-36 (Future development). However, it may fall within the conceptual ZoI for dewatering for construction of the proposed Block 16, 18 and 31 as well as the proposed underground services. The existing natural features scattered around the Subject Site are located outside of the conceptual ZoI for dewatering. As such, potential impacts are not anticipated to those natural features with respect to the proposed development in the Subject Site. It is understood that these areas were assessed in the Environmental Impact Study completed by GeoProcess Research Associates and were determined to not be natural heritage features. For additional detail please refer to the EIS.
- A review of the MECP well records confirmed that there are eight (8) records for water supply wells that are registered within 500 m of the Subject Site. However, the records are located outside of the conceptual ZoI for dewatering. As such, significant impacts to the potential groundwater users are not anticipated if the wells exist and in service.

2.0 INTRODUCTION

2.1 Site Location and Project Description

Soil Engineers Ltd. (SEL) was retained by Cavallino Estates Inc. to conduct a hydrogeological assessment for proposed residential development at 0 and 12139 Centreville Creek Road, in the Town of Caledon (the Subject Site). The Subject Site is bounded by a residential property and agricultural properties to the north, agricultural properties and a watercourse to the east and south, and Centreville Creek Road and residential and agricultural properties to the west. The location of the Subject Site is shown on **Drawing 1**.

The Subject Site currently consists mainly of farm field with associated farm structures, residential dwelling and paved road toward Centreville Creek Road at southwest portion of the Subject Site.

The Site Plan prepared by Bousfield Inc., dated October 14, 2025 indicates that the proposed development will include the construction of thirty-one (31) townhouse blocks and two (2) medium density blocks, which will be provided with municipal services and paved roadways meeting urban standards, and three (3) future development blocks. The townhouse blocks are assumed to have a 1-level basement.

2.2 Project Objectives

The current hydrogeological assessment report presents the regional and local setting of the Subject Site. The findings of the fieldwork, including subsoil investigation, groundwater level monitoring, groundwater quality assessment, and hydraulic conductivity testing are presented in the report. Potential needs for preliminary short-term dewatering and preliminary long-term foundation drainage control are assessed, and hydrogeological impacts of the proposed development to the nearby groundwater receptors including water supply wells and natural heritage features, and structures are assessed (if applicable). This report provides comments on potential needs for mitigating the potential impacts of the proposed development to the groundwater receptors, and structures. Comments and recommendations are provided on any needs for applying for a Permit to Take Water (PTTW), or posting Environmental Activity and Sector Registry (EASR) with the Ministry of the Environment, Conservation and Parks (MECP).

2.3 Scope of Work

The scope of work for the hydrogeological assessment is summarized below:

- *Background Review:* Available background geological and hydrogeological information for the Subject Site including topographic mapping, surface geological, natural heritage features databases, Region of Peel official plans, Toronto Region and Conservation Authority (TRCA) regulated area plans, and MECP water well records were reviewed.

- *Fieldwork:* Fieldwork includes inspecting the Subject Site and surrounding properties with respect to the natural features, groundwater receptors, and structures, as well as installing and developing the monitoring wells. Additionally, groundwater levels within the installed monitoring wells by SEL and the previously installed monitoring wells by GEI Consultants were monitored over three (3) monitoring events, in-situ hydraulic conductivity testing was completed within the installed monitoring wells. One (1) set of groundwater samples was collected and submitted to a CALA laboratory to characterize groundwater quality in comparison with the Peel Region Sanitary and Storm Sewer Use By-Law (By-Law No. 53_2010) parameters.
- *Preliminary Short-Term Dewatering Flow Rate:* Based on a review of the available design drawings and findings of the current subsurface investigation, preliminary short-term dewatering flow rates including groundwater seepage, and anticipated water that should be collected over potential storm events were calculated. A mitigation plan was recommended to mitigate potential short-term dewatering impacts to the nearby groundwater receptors (including natural heritage features and water supply wells), and structures, if applicable.
- *Preliminary Long-term foundation Drainage Control Requirement:* Based on a review of the available design drawings, findings of the current subsurface investigation, and recommendations provided in the geotechnical investigation report, preliminary total long-term foundation drainage flow rate including groundwater seepage, and anticipated flow from infiltration source was estimated, if required.
- *Permit Requirements:* Considering the estimated preliminary short-term construction dewatering and preliminary long-term foundation drainage flow rates, recommendations were provided on any need for applying for a PTTW or posting on the EASR with the MECP, and the Peel Region, if required.

3.0 APPLICABLE REGULATIONS AND OFFICIAL PLANS

The regulations and policies are relevant to this hydrogeological assessment and the location of the Subject Site within the official plans are summarized below.

3.1 Toronto Region and Conservation Authority (TRCA) Policies and Regulation (O. Reg. 41/24)

Under Section 28 of the Conservation Authorities Act, local conservation authorities are mandated to protect the health and integrity of the regional greenspace system, and to maintain or improve the hydrological and ecological functions performed by valley and stream corridors. The TRCA, through its regulatory mandate, is responsible for issuing permits under O. Reg. 41/24, Development, Interference with Wetlands and Alterations to Shorelines and Watercourses for development proposal or Site alteration work to shorelines and watercourses within the regulated areas.

TRCA Regulated Area online mapping was reviewed on November 10, 2025. It is our understanding that the Subject Site is partially located within a TRCA Regulated Area (O. Reg. 41/24). As such, it is anticipated that obtaining a permit from the TRCA under O. Reg. 41/24 will be required for the proposed development.

3.2 Clean Water Act

The MECP mandates the protection of existing and future sources of drinking water under the Clean Water Act, 2006 (CWA). Initiatives under the CWA include the delineation of Wellhead Protection Areas (WHPAs), significant groundwater recharge areas (SGRAs) and Highly Vulnerable Aquifers (HVAs) as well as the assessment of drinking water quality and quantity threats within Source Protection Regions. Source Protection Plans are developed under the CWA and include the restriction and prohibition of certain types of activities and land uses within WHPAs.

Based on a regional-scale source water protection mapping (Source Water Protection Information Atlas) provided by the MECP updated on November 10, 2025, the Subject Site is not located within, a Significant Groundwater Recharge Area, an Issue Contributing Area, Intake Protection Zone, Event Based Area, Highly Vulnerable Aquifer, or Wellhead Protection Areas Q1 and Q2.

3.3 Region of Peel Official Plan

The Region of Peel Official Plan sets up policies that deal with legislative and administrative concerns, guides physical growth, and addresses social, economic, and environmental concerns. The Official Plan provides land use planning designations and identifies areas of environmental significance where more stringent policies may apply for development applications.

Region of Peel Official Plan maps were reviewed for the current study with the results summarized below:

- Schedule A-2 (Highly Vulnerable Aquifers) – A review of the map, dated April 2022, indicates that the Subject Site is not located within a Highly Vulnerable Aquifer.
- Schedule A-3 (Significant Groundwater Recharge Areas) – A review of the map, dated April 2022, indicates that the Subject Site is not located within an area designated as a Significant Groundwater Recharge Area.
- Schedule C-1 (Greenlands System) – A review of the map, dated April 2022, indicates that the Subject Site is not located within a Greenlands System.
- Schedule E-1 (Regional Structure) – A review of the map, dated November 4, 2022, indicates that the Subject Site is located within a 2051 New Urban Area.

4.0 METHODOLOGY

4.1 Borehole Advancement and Monitoring Well Installation

4.1.1 Monitoring Wells Installed by SEL

Drilling boreholes and construction of monitoring wells were conducted for the hydrogeological investigations by SEL on August 19, 2025. The program consisted of the drilling of four (4) boreholes (BH) and the installation of two (2) monitoring wells (BH/MW) for geotechnical and hydrogeological assessment purposes within the footprint of the proposed development of the Subject Site. The locations of the boreholes and monitoring wells are shown on **Drawing 2**.

Borehole drilling and monitoring well construction were completed by a licensed water well contractor, under the full-time supervision of SEL's geotechnical supervisor who logged the soil strata encountered during borehole advancement and collected representative soil samples for textural classification. The boreholes were drilled using a track-mounted drill rig equipped with continuous flight, solid-stem augers. Detailed descriptions of the encountered subsoil and groundwater conditions as well as a grain size distribution graph are provided by SEL and presented on the borehole and monitoring well logs, in the enclosed **Appendix AI**.

The monitoring wells were constructed using 50-mm diameter Trilock pipes and 1.5 or 3.0 m long 10-slot well screens, which were installed in each of the boreholes. The two (2) monitoring wells were equipped with monument protective casings.

The UTM coordinates and ground surface elevations at the monitoring wells' locations, as well as the monitoring well construction details, are presented in **Table 4-1**. The ground surface elevations and horizontal coordinates at the monitoring well locations were determined at the time of the investigation, using a handheld Global Navigation Satellite System survey equipment (Trimble TSC3) which has an accuracy of ±0.05 m.

Table 4-1- Monitoring Well Installation Details Installed by SEL

Monitoring Well ID	Installation Date	UTM Coordinates (m)		Ground El. (masl)	Screen Interval (mbgs)	Soil in the Screen Interval	Casing Dia. (mm)	Protective Casing Type
		Easting	Northing					
BH/MW 25-3	August 19, 2025	601072	4852697	236.6	4.6-7.6	Silty Clay Till	50	Monument
BH/MW 25-4	August 19, 2025	600754	4852315	236.1	4.6 -6.1	Silty Clay Till	50	Monument

Notes:
mbgs metres below ground surface
masl metres above sea level

4.1.2 Existing Monitoring Wells

SEL was provided with borehole logs for the boreholes and monitoring wells that were previously drilled and installed by GEI Consultants Ltd. A review of the borehole logs indicates that three (3) boreholes were

drilled at three (3) locations. A total of four (4) monitoring wells including one (1) pair for shallow and deep nested monitoring wells were installed at three (3) selected borehole locations. The location of the boreholes and monitoring wells are presented on **Drawing 2** and the borehole logs are included in **Appendix AII**. A summary of the monitoring well details is presented in **Table 4-2**.

Table 4-2- Monitoring Well Installation Details Installed by GEI

Monitoring Well ID	Installation Date	UTM Coordinates (m)		Ground El. (masl)	Screen Interval (mbgs)	Soil in the Screen Interval	Casing Dia. (mm)	Protective Casing Type
		Easting	Northing					
GEI-BH/MW 103[1]	July 16, 2024	600846	4852231	235.0	3.1-6.1	Silty Clay Till	50	Monument
GEI-BH/MW 104D[1]	July 16, 2024	600940	4852592	237.5	4.6-6.1	Silty Clay Till	50	Monument
GEI-BH/MW 104S[1]	July 16, 2024	600940	4852561	237.5	0.7-1.7	Silty Clay Till	50	Monument
GEI-BH/MW 105[1]	July 16, 2024	601218	4852708	234.9	3.1-6.1	Silty Clay Till	50	Monument

Notes:
mbgs metres below ground surface
masl metres above sea level
[1] Monitoring Well Installed by GEI Consultants LTD.
D: Deep nested monitoring well
S: Shallow nested monitoring well

4.2 MECP Water Well Records Review

MECP Water Well Records (WWRs) were reviewed for the registered wells located within 500 m radius of the Subject Site (Study Area). The water well records indicate that eleven (11) wells are located within the 500 m zone of influence Study Area relative to the Subject Site. The findings of the MECP well records are summarized in the **Section 5.6** of the current report.

4.3 Groundwater Monitoring

The two (2) monitoring wells installed by SEL in August 2025 and the four (4) monitoring wells previously installed by GEI Consultants Ltd. were utilized to measure and monitor groundwater levels. Monitoring wells were developed, and the groundwater monitoring program confirmed the stabilized groundwater level beneath the Subject Site. The stabilized groundwater levels were manually measured over three (3) monitoring events between September 4 and October 2, 2025 with the results presented in **Section 7.1**.

4.4 In-Situ Hydraulic Conductivity Test

SEL has conducted in-situ hydraulic conductivity tests (falling and rising head) at the two (2) monitoring wells installed by SEL and at three (3) of the four (4) monitoring wells previously installed by GEI

Consultants Ltd. In-situ hydraulic conductivity testing was not conducted in GEI BH/MW 104S due to insufficient groundwater levels.

The in-situ hydraulic conductivity test (falling head and rising head) provides estimated hydraulic conductivity (K) for subsoil strata at the depths of the well screens. The monitoring wells were developed in advance of the tests. Well development involves the purging and removal of groundwater from each monitoring well to remove remnants of clay, silt and other debris introduced into the monitoring well during construction, and to induce the flow of formation groundwater through the well screens, thereby improving the transmissivity of the subsoil strata formation at the well screen depths.

The in-situ falling head hydraulic conductivity test involves the placement of a slug of known volume into the monitoring well, below the water table, to displace the groundwater level upward. The in-situ rising head hydraulic conductivity test involves removing a volume of water from the monitoring well to displace the groundwater level downward. The rate at which the water level recovers to static conditions (rising head/falling head) is tracked manually using a water level tape and a data logger. Slug tests in the monitoring wells with partially submerged screens may exabit double straight-line effect due to the filter pack drainage. Therefore, the data that represent the filter pack around the screen is eliminated during the interpretation of the slug test. The rate at which the water table recovers to static conditions is used to estimate the K value for the water-bearing strata formation at the well screen depth using the Bouwer and Rice method (1976). The findings for the hydraulic conductivity testing are presented in **Section 7.3** of the current report.

4.5 Groundwater Quality Assessment

Groundwater quality assessment was completed by SEL on October 2, 2025. One (1) set of groundwater samples was collected from one (1) selected monitoring well (BH/MW 25-3) to characterize its quality for evaluation against the Peel Region Sanitary and Storm Sewer Use By-Law (By-Law Nos. 53_2010) parameters. This is performed to assess whether any anticipated dewatering effluent or long-term foundation drainage flow can be disposed of into the Peel Region sanitary and/or storm sewer system during construction. Based on the results, recommendations for any pre-treatment for any dewatering effluent or long-term foundation drainage flow can be developed, if required.

The sample analysis was performed by SGS Canada Inc. and the results of the analysis are discussed in **Section 7.3** of the current report.

4.6 Review of Regional Data and Available Reports for the Subject Site

The maps, data, and documents provided by the MECP, Ontario Geological Survey (OGS), Ministry of Natural Resources (MNR), Oak Ridges Moraine Groundwater Program (ORMGP), and TRCA were reviewed with the findings summarized in **Sections 5** and **6**.

5.0 REGIONAL AND LOCAL SITE SETTING

5.1 Regional Geology

The current understanding of the surface geological setting of the Subject Site is based on scientific work conducted by the OGS (OGS, 2003). The Subject Site is located within an area mapped as Till (5d), comprising of clay to silt-textured till. **Drawing 3** illustrates the mapped surficial geology for the Subject Site and the surrounding area.

The Oak Ridges Moraine Groundwater Program (ORMGP) produced a cross-sectional geological map to aid in the characterization of the general area. Considering the regional cross-section, it is understood that the overburden units prevalent in this area are as follows, with the youngest unit at the top:

- *Undifferentiated Sediments:* Undifferentiated sediments present in ground surface, with an approximate thickness ranging from 0.3 m to 1.7 m.
- *Halton Till (Upper Till):* The Halton Till is mainly comprised of sandy silt to clayey silt till interbedded with silt, clay, and a number of discontinuous sand and gravel lenses. It was deposited approximately 12,500 years ago. Based on cross-section, the Halton Till or equivalent can be contacted beneath the undifferentiated sediments with an approximate thickness ranging from 19.0 m to 21.9 m.
- *Oak Ridges Moraine:* The Oak Ridges Moraine Aquifer Complex (ORAC) is a regionally significant aquifer in southern Ontario. It is primarily composed of interbedded fine sand and silt deposits with localized coarse sand and gravel deposits. The ORAC has an approximate thickness up to 3.7 m.
- *Lower Newmarket Till:* The Lower Newmarket Till is a regionally extensive till formation that acts as an aquitard separating the Oak Ridges Aquifer Complex (ORAC) from the underlying Thorncliffe Formation. Based on the ORMGP cross-section, Newmarket Till is mapped beneath the ORAC. The Lower Newmarket Till is also expected beneath the Subject Site, and it has an approximate thickness ranging from 0.2 m to 5.8 m.
- *Thorncliffe Formation:* The Thorncliffe Formation consists of glaciofluvial and glaciolacustrine sand and silt deposited approximately 30,000 to 50,000 years ago. The Thorncliffe Formation shows a considerable variation in grain size and thickness, both locally and regionally. It acts as a regional aquifer. Based on the ORMGP cross-section, the Thorncliffe Formation has an approximate thickness of up to 1.0 m beneath the Subject Site.

The underlying bedrock at the Subject Site is the Georgian Bay Formation, which consists of shale, limestone, dolostone, and siltstone (OGS, 2007). A review of the ORMGP cross-section indicates that the bedrock could be contacted at an approximate elevation between 208.5 and 210.3 metres above sea level (masl) beneath the Subject Site.

5.2 Regional Physiography

The Subject Site lies within the South Slope physiographic region of Southern Ontario. The South Slope within the vicinity of the Subject Site comprises of Drumlinized Till Plains. **Drawing 4** shows the location of the Subject Site within the regional physiography map.

5.3 Regional Topography and Drainage

A review of a regional topography map presented on **Drawing 5** indicates that the topography of the Subject Site exhibits a gentle decline towards the south/southeast.

The ground surface elevation ranges approximately between 234.9 and 237.5 masl, based on ground surface elevations measured at the borehole and monitoring wells' locations installed by SEL and GEI Consultants Ltd.

5.4 Watershed Setting

The Subject Site is located within the Humber River watershed that falls in the Toronto Region and Conservation Authority (TRCA) jurisdiction.

5.5 Local Surface Water and Natural Heritage Features

MNR database was reviewed for any natural heritage features including, watercourses, bodies of water, wetland features, Area of Natural and Scientific Interest (ANSI) and wooded areas. Details are presented below. **Drawing 6** shows the location of the Subject Site within the surrounding Natural Heritage Features.

Record review indicates there is a record of a not evaluated wetland features as per Ontario Wetland Evaluation System (OWES), located at the central portion of the Subject Site. Additionally, there is one (1) waterhead drainage feature that traverse through the east most portion of the Subject Site from north to southeast and wooded areas at the west portion of the Subject Site. It is understood that these areas were assessed in the Environmental Impact Study completed by GeoProcess Research Associates and were determined to not be natural heritage features. For additional detail please refer to the EIS.

Record review also indicates there are records of wetland features, classified as unevaluated wetlands (as per OWES) located approximately 340 m southeast and southwest of the Subject Site, a water body located approximately 15 m north of the Subject Site, waterhead drainage features located adjacent east and south of the Subject Site, and a Tributary of West Humber River located approximately 270 m south of the Subject Site. A review of MNR database also shows that there is a waterbody located at the west portion of the Subject Site.

5.6 Ground Water Resources (MECP Well Records)

MECP well record database was reviewed for records located within a radius of 500 m from the approximate Subject Site (Study Area). The records indicate that eleven (11) well records are located within the Study Area relative to the Subject Site boundaries. A summary of the final status of the records, obtained from the records review is presented in **Table 5-1**.

The locations of the well records, based on the UTM coordinates provided by the records, are shown on **Drawing 7**. Details of the MECP water well records that were reviewed are provided in **Appendix B**.

Table 5-1 - MECP Well Record Summary

Water Use- Final Status	Number of Records
Water Supply	8
Unknown	2
Abandoned-Other	1

The above summary indicates that there are eight (8) records of water supply wells in the Study Area. However, there are no record of water supply wells within the Subject Site.

5.7 Active Permit to Take Water Application Record Review

MECP website was reviewed for any active PTTW application records within 1.0 km radius of the Subject Site on November 10, 2025. Record review indicates there are no active PTTW within 1 km radius of the Subject Site.

6.0 SOIL LITHOLOGY AND SUBSURFACE INVESTIGATION

The subsoil investigations conducted by SEL and GEI Consultants Ltd. have revealed that beneath the topsoil veneer, the Subject Site is underlain by stratum of silty clay till, with localized deposits of silty clay, to a maximum termination depth of investigation at 10.9 meters below ground surface (mbgs). Information regarding SEL and GEI Consultants Ltd's. borehole logs and grain size distributions are presented in **Appendix AI** and **AII**, respectively. The approximate locations of boreholes are shown on **Drawing 2**. Additionally, a key plan and subsoil profile are presented on **Drawings 8-1** and **8-2**, respectively. Based on a review of the borehole logs, the stratigraphy beneath the investigated areas of the Subject Site generally consists of the followings:

6.1 Topsoil

The investigation revealed that the thickness of the topsoil veneer, encountered at all BH and BH/MW locations, is approximately 13 cm to 36 cm.

6.2 Silty Clay Till

Silty clay till (classified as "Clay and Silt Glacial Till" in the GEI borehole logs) was encountered at all BH and BH/MW locations. The silty clay till layer consists of a random mixture of particle sizes ranging from clay to gravel, with silt and clay being the dominant fraction. There were variable amounts of sand and traces of gravel with occasional cobbles and boulders within the till layer. The consistency of the till is soft to hard and the moisture contents for the retrieved subsoil samples indicate generally damp to wet conditions.

6.3 Silty Clay

Silty clay layers were encountered at BH/MWs 25-2 and 25-3. The silty clay layer consists of a trace of sand and is laminated with wet silt seams and layers. The consistency of the silty clay is stiff to very stiff and the moisture contents for the retrieved subsoil samples indicate generally very moist conditions. Grain size analysis was performed on one (1) selected subsoil sample, and the gradations are plotted in **Appendix AI** (**Figure 5)**.

7.0 LOCAL HYDROGEOLOGICAL STUDY

7.1 Monitoring Well Development and Groundwater Level Monitoring

The groundwater levels in the monitoring wells were measured, manually between September 4 and October 2, 2025 to record the fluctuation of the shallow groundwater table beneath the Subject Site. Two (2) newly installed monitoring wells by SEL and four (4) existing monitoring wells installed by GEI Consultants Ltd. were considered for the groundwater monitoring program.

Monitoring wells were developed and groundwater levels were monitored over three (3) monitoring events. SEL measured the groundwater levels using an interface probe (Heron Water Tape Series #1900). A summary of the groundwater level observations and their corresponding elevations are provided in **Table 7-1**.

Table 7-1- A Summary of Groundwater Monitoring

MW ID	Unit	Groundwater Level		
		September 4, 2025	September 18, 2025	October 2, 2025
BH/MW 25-3	mbgs	2.0	2.3	2.3
	masl	234.6	234.3	234.3
BH/MW 25-4	mbgs	5.2	4.9	4.2
	masl	230.9	231.2	231.9
GEI-BH/MW 103[1]	mbgs	2.2	4.5	3.9
	masl	232.8	**230.5**	231.1
GEI-BH/MW 104D[1]	mbgs	1.3	4.3	3.6
	masl	**236.2**	233.2	233.9
GEI-BH/MW 104S[1]	mbgs	1.4	2.0	1.9
	masl	236.1	235.5	235.6
GEI-BH/MW 105[1]	mbgs	1.7	3.3	2.7
	masl	233.2	231.6	232.2

Notes:
mbgs metres below ground surface
masl metres above sea level
[1] Monitoring Wells Installed by GEI Consultants Ltd.
D: Deep nested monitoring well
S: Shallow nested monitoring well

The finding of the groundwater monitoring indicates that shallow groundwater level elevation ranged from the EL. 230.5 masl to 236.2 masl at GEI-BH/MW 103 and GEI-BH/MW 104D, respectively. A review of the groundwater table in the shallow and deep nested monitoring wells installed by GEI Consulting, indicates a downward vertical hydraulic gradient.

GEI Consultants Ltd. previously installed four (4) monitoring wells and conducted the groundwater level measurements on August 23, 2024. The groundwater levels measured by GEI Consultants Ltd. indicate that

the groundwater elevation ranged from EL. 231.1 masl to 232.6 masl at GEI-BH/MW 105 and GEI-BH/MW 103. The groundwater levels can be found on the GEI borehole logs enclosed in **Appendix AII**.

7.2 Shallow Groundwater Flow Pattern

The shallow groundwater flow pattern at the Subject Site is shown on **Drawing 9**. The recorded groundwater level measured on October 2, 2025 was considered for interpretation of the shallow groundwater direction beneath the Subject Site. A review of the interpreted shallow groundwater flow pattern indicates that shallow groundwater flows in a southeasterly direction.

7.3 Single Well Response Test

Two (2) BH/MWs installed by SEL and three (3) monitoring wells previously installed by GEI Consultants underwent a single well response testing (SWRTs), to assess the hydraulic conductivity (K) for saturated shallow aquifer or water bearing unit at the depths of the well screens. BH/MWs 25-3 and 25-4 and GEI-BH/MWs 103, 104D, and 105 underwent SWRTs on September 18, 2025. In-situ hydraulic conductivity testing was not conducted in GEI-BH/MW 104S due to insufficient groundwater. Each monitoring well was equipped with a digital transducer to record the fluctuation made to complete the SWRT. The results of the SWRT tests are presented in **Appendix C**, with a summary of the findings provided in **Table 7-2**.

Table 7-2- A Summary of In-Situ Hydraulic Conductivity Testing

Well ID	Ground El. (masl)	Monitoring Well Depth (mbgs)	Screen Interval (m)	Screened Soil Strata	Hydraulic Conductivity (K)-(m/sec)	Test Method
BH/MW 25-3	236.6	7.6	4.6-7.6	Silty Clay Till	3.7×10^{-8}	Falling Head Test
BH/MW 25-4	236.1	6.1	4.6 -6.1	Silty Clay Till	2.3×10^{-8}	Rising Head Test
GEI-BH/MW 103[1]	235.0	6.1	3.1-6.1	Silty Clay Till	8.6×10^{-9}	Falling Head Test
GEI-BH/MW 104D[1]	237.5	6.1	4.6-6.1	Silty Clay Till	2.7×10^{-9}	Falling Head Test
GEI-BH/MW 105[1]	234.9	6.1	3.1-6.1	Silty Clay Till	2.2×10^{-9}	Falling Head Test

Notes:
mbgs metres below ground surface
masl metres above sea level
[1] Monitoring Wells Installed by GEI Consultants Ltd.

The findings of SWRTs reveal that the hydraulic conductivity (K) for the water bearing units underneath the Subject Site ranges from 3.7×10^{-8} at BH/MW 25-3 to 2.2×10^{-9} m/sec at GEI-BH/MW 105.

7.4 Groundwater Quality

Groundwater quality assessment was completed by SEL on October 2, 2025. One (1) set of groundwater samples was collected from one (1) selected monitoring well (BH/MW 25-3) to characterize its quality for evaluation against Peel Region Sanitary and Storm Sewer Use By-Law (By-Law No. 53_2010) parameters. Upon sampling, all of the bottles were placed in a cooler for shipment to the analytical laboratory. Sample analysis was performed by SGS Canada Inc., which is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA). Results of the analysis are provided in **Appendix D**, with a discussion of the findings provided below. The chain of custody number for the submitted samples that underwent analysis is 045267.

As per the protocols for the Peel Region Sewer Use analysis, a complete set of unfiltered groundwater samples were submitted to the laboratory with the results being presented as totals for various analyzed parameters.

The results of analysis for the unfiltered groundwater samples indicate one (1) exceedance when compared and evaluated against Peel Region Sanitary Storm Sewer Use By-La. The exceedances are presented in **Table 7-3**.

Table 7-3- Groundwater Quality Exceedance Results (Unfiltered Samples)

Monitoring Well	Exceeded Parameter	Groundwater Quality Results (Unfiltered Sample) (mg/L)	Peel Region Storm Sewer Use Limits (mg/L)	Peel Region Sanitary Sewer Use Limits (mg/L)	Detection Limit (mg/L)
BH/MW 25-3	Total Manganese	**1.16**	0.05	5	0.00001

As shown above, the results indicate that the concentration for total manganese exceeds the Peel Region Storm Sewer Use By-Law limits, but meet the Peel Region Sanitary Sewer Use-By-Law limits for the unfiltered samples. These results suggest that any short-term construction dewatering, or long-term foundation drainage discharge would not be acceptable for disposal to the Peel Region storm sewer without pretreatment to lower the total manganese.

The assessment above is provided solely for comparing groundwater quality against the limits set by the Peel Region Sewer Use By-Law Standards. Any discharge should adhere to the respective policies of the jurisdiction. The final design for any dewatering effluent pre-treatment system is the responsibility of the contractors responsible for construction, or of the water treatment system design specialist, or mechanical engineer, if required, for any long-term foundation drainage system for the completed underground structure.

8.0 DISCHARGE WATER CONTROL

8.1 A review of Proposed Development Plans

The Site Plan prepared by Bousfield Inc., dated October 14, 2025 indicates that the proposed development will include the construction of thirty-one (31) townhouse blocks (Blocks 1-31) and two (2) medium density blocks (Blocks 32 and 33), which will be provided with municipal services and paved roadways meeting urban standards, and three (3) future development blocks (Blocks 34-36). The townhouse blocks are assumed to have a 1-level basement. **Appendix E** presents the reviewed plans.

8.2 Review of Geotechnical Report

A geotechnical investigation report, dated October 2025, (SEL Reference No. 2508-S033), was reviewed for the current assessment, with a summary of findings presented below:

- The topsoil must be removed, the disturbed soils and weathered soils must be subexcavated, sorted and further assessed for their suitability to reuse as engineered fill. Additionally, the earth fill must be subexcavated, sorted free of topsoil, organic or deleterious material, if any, and uniformly recompacted in layers as engineered fill.
- The native soils are weathered and/or disturbed extending to depths ranging from 0.8 to 2.0 m from the prevailing ground surface. It is weak and will consolidate under surcharge loads. To upgrade the weathered soils to engineered status suitable for normal footing construction, they must be subexcavated, sorted, aerated and properly compacted.
- The engineered fill and sound native soils are suitable for supporting the proposed structures on conventional footings and for construction of underground services and road pavement.
- The proposed structures can be supported on conventional spread and strip footing founded on the native soils or engineered fill below the frost penetration depth.
- Foundations exposed to weathering or in unheated areas should have at least 1.2 m of earth cover for protection against frost action.
- Excavations should be carried out in accordance with Ontario Regulation 213/91.

8.3 Short-Term Construction Dewatering Needs

The Site Plan prepared by Bousfield Inc., dated October 14, 2025 indicates that the proposed development will include the construction of thirty-one (31) townhouse blocks and two (2) medium density blocks, which will be provided with municipal services and paved roadways meeting urban standards, and three (3) future development blocks. The townhouse blocks are assumed to have a 1-level basement.

No details were available for the two (2) medium density blocks and the three (3) future development blocks. As such, discharge water control is not included in the following assessment for the above noted proposed blocks.

The following sections present preliminary short-term dewatering flow rates estimated for the excavation and construction of the proposed townhouse blocks and installation of the underground services, and preliminary long-term foundation drainage flow rate estimated for the proposed blocks.

8.4.1 Methodology

Short-Term Dewatering Calculation: The pumping rate calculation for the construction for the proposed development was performed based on the assumption with each excavation acting as trench considering the dimensions of the proposed excavation boxes. The calculation was based on the equations provided by Powers et al. (2007). For the purposes of this analysis, steady state flow into an open excavation is assumed. Additionally, the equations of radial flow have the following assumptions:

- Ideal aquifer conditions (homogeneous, isotropic, uniform thickness and has infinite areal extent)
- Fully penetrating pumping well
- Only lateral flow to the pumping well

The following equation was used for open trenches and is based on unconfined aquifer conditions (Powers et. al., 2007):

Where:

$$Q = \frac{\pi K (H^2 - h^2)}{\ln(R_0 / r_s)} + 2\left[\frac{xK(H^2 - h^2)}{2L}\right]$$

Q	=	Anticipated pumping Rate (m3/day)
K	=	Hydraulic Conductivity (m/day)
H	=	Distance from the static water level to the bottom of the saturated aquifer (m)
h	=	Depth of water in the well while pumping (m)
R_o	=	Distance from a point of greatest drawdown to a point where there is zero drawdown (radius of influence) (m)
r_s	=	Distance to the wellpoints from the centre of the trench, assumed to be half of the trench width (m) for Trench base calculation.
X	=	Trench Length (m)
L	=	Distance from a line source to the trench, Ro (m)/2

The calculated pumping rate was multiplied by a factor of safety of 1.5 to account for uncertainties and natural variability in the range of hydraulic conductivity.

Zone of Influence for Dewatering: An estimate of the Zone of Influence (ZOI) for dewatering in unconfined aquifers can be calculated using the following equation (Bear, 1979):

$$R_0 = 2.45\sqrt{\frac{HK}{S_y}}t$$

where,

R_o	=	Zone of Influence (m), beyond which there is negligible drawdown
H	=	Distance from initial static water level to bottom of saturated aquifer (m)
Sy	=	Specific yield of the aquifer formation
t	=	Time, in seconds, required to draw the static groundwater level to the desired level (assumed to be equivalent to 14 days)
K	=	Hydraulic Conductivity (m/s)

Stormwater flow Estimate: The amount of runoff that could accumulate in the excavation box was also considered for any construction dewatering needs assessment. Therefore, the dewatering flow rates at the Subject Site should also include removing stormwater from the excavation. Additionally, the anticipated flow through infiltration after storm event for the post-development site should be considered.

A review of intensity duration frequency curve (IDF curve) for the year 2010 for the coordinates 43° 49' 15" N, 79° 44' 45" W, the rainfall depth considering 2-year storm event over a 3-hour period per day is approximately 30.6 mm, and a 100-year storm event over a 12-hour period per day is 100.8 mm. The data was taken from the Ministry of Transportation's (MTO) website.

The accumulated runoff associated with rainfall events within the anticipated excavations for the proposed underground basements was calculated using the estimated rainfall depth multiplied by the estimated area of the proposed excavation footprint of the proposed development. The anticipated flow from infiltration source was also calculated considering the perimeter of the proposed basement multiplied by 0.5 m (catchment area).

8.4.2 Construction Dewatering Flow Rate Calculation

The proposed development comprises of the construction of townhouse blocks and installation of underground services.

The geotechnical investigation report suggests that the structures to be supported on conventional strip or spread footings founded on either engineered fill or native soils. Based on this recommendation, the dewatering flow calculations are performed assuming conventional footings for the townhouse blocks.

The following preliminary short-term dewatering and long-term foundation drainage flow rates, are based on the groundwater tables measured in the installed monitoring wells at the Subject Site.

Please note that the dewatering flow rates do not include any potential groundwater seepage that may be encountered during the grading program. The following sections present the estimated dewatering flow rates for the construction of the townhouse blocks and the underground services separately, post grading.

8.4.3 Preliminary Short-Term Dewatering -Proposed Underground Services

The following assumptions are considered for the dewatering assessment for the installation of the underground services;

- The BH/MW locations were utilized as the reference point for the dewatering assessment. Additionally, the actual measured groundwater elevations from the nearby monitoring wells were considered.
- As details of the underground services were not available, the dewatering assessment was prepared based on trenches excavated within the vicinity of each BH/MW.
- Hydraulic conductivity of 3.7 x 10^{-8} m/sec (in-situ hydraulic conductivity testing from BH/MW 25-3) was considered for the subsurface soil.
- The Site Plan prepared by Bousfield Inc., dated October 14, 2025 did not include the invert elevations for the proposed underground services. As such, a depth of 5 m was considered for the current assessment.
- The length of the active trench for underground services was considered to be 50 meters at a time (per day), and the width of the trench for the underground service installation was considered to be 2 meters.
- The storm event of 2 years was also considered for the short-term construction dewatering flow rate estimates.
- The dewatering target for the proposed excavation was considered 1.0 m below the deepest excavation to facilitate excavation and construction in dry and stable subsoil conditions.

The summary of construction dewatering flow rates for the underground services and a summary of the calculations are presented in **Appendix E** (**Page 1**). **Table 8-1** below, indicates the estimated dewatering flow rates for the assumed 50 m length sections of the underground services.

Table 8-1 – Short-Term Construction Dewatering Flow Rates - Proposed Underground Services

BH/MW References	Drawdown (m)	ZOI (m)	Groundwater Flow L/day- No S.F.	Groundwater Flow L/day - S.F. of 1.5	Anticipated Storm Flow L/day (2-year 3 Hr)	Total Estimated Short-Term Dewatering Flow Rates (with Storm event S.F of 1.5)
BH/MW 25-3	3.7	5.3	2,200.0	3,300.0	3,100.0	6,400.0
BH/MW 25-4	1.8	4.4	1,000.0	1,500.0	3,100.0	4,600.0
GEI-BH/MW 103[1]	2.1	4.5	1,200.0	1,800.0	3,100.0	4,900.0
GEI-BH/MW 104D[1]	4.1	5.4	2,500.0	3,750.0	3,100.0	6,850.0
GEI-BH/MW 105[1]	3.3	5.1	1,900.0	2,850.0	3,100.0	5,950.0

SF: Safety Factor [1] Monitoring Wells Installed by GEI Consultants Ltd.

The anticipated dewatering flow rates including groundwater seepage with a safety factor of 1.5 during storm events for 50 m length of an active excavation trench for the proposed underground service installation can range from 4,600.0 L/day to 6,850.0 L/day considering a safety factor of 1.5 and 2-year storm event with a duration of 3 hr/day.

Additionally, a potential 100-year storm event with a duration of 12 hours is expected to reach up to 10,100.0 L/day, considering the assumed trench dimensions as mentioned above (2.0 m x 50.0 m).

8.4.4 Preliminary Short-Term Dewatering-Townhouse Blocks with 1-Level Basement

Groundwater Seepage (Townhouse Blocks): The following sections present the estimated dewatering flow rates for the construction of the townhouse blocks.

A review of the provided plans compared to the shallow groundwater table and the below assumptions indicates that proposed basements of some townhouse blocks, will be constructed above shallow groundwater table. **Appendix E** (**Page 2**) presents the details. The proposed basements for the remaining townhouse blocks will be constructed below shallow groundwater.

The following are the assumptions and proposed development details for the short-term construction dewatering:

- The proposed residential development will include townhouse blocks as indicated in the Site Plan.
- The existing elevations were considered based on the Site Plan prepared by Sc Bousfield Inc., dated October 14, 2025.
- The shallow groundwater flow pattern map prepared based on the stabilized groundwater levels measured on October 2, 2025, was utilized for the assessment.
- It was assumed that 60% of the length would be utilized for the footprint of each townhouse unit, and this was taken into consideration for the dewatering assessment.
- The dewatering assessment was completed per single unit in each townhouse block, then multiplied by the number of units in each block to determine the total estimated short-term dewatering flow rate per townhouse block.
- Hydraulic conductivity of 3.7×10^{-8} m/sec (in-situ hydraulic conductivity testing from BH/MW 25-3) was considered for the subsurface soil.
- The base of excavation for the construction of the townhouse basements was assumed 3.0 m below the existing ground surface elevation, which includes 3.0 m as the underside of the Basement Finish Floor Elevation (FFE) resting on conventional footings as mentioned in the geotechnical assessment report.
- The storm event of 2 years -3 hr. was also considered for the short-term construction dewatering.

- The dewatering target for the proposed excavation was considered 1.0 m below the deepest excavation to facilitate excavation and construction in dry and stable subsoil conditions.

The comparison of the groundwater contour map against the Site Plan and the assumed base of the excavation and need for the dewatering are presented in **Appendix E** (**Page 2**) and **Table 8-2** below, indicates the expected blocks that will be constructed below shallow groundwater table.

Table 8-2- Dewatering Requirement Summary for Townhouse Blocks with Anticipated Dewatering Flow Rates

Block Number	Existing Lowest Grade Elevation (masl)	Assumed Depth of the Excavation (masl)	Approximate Nearest Interpreted Groundwater Contour (masl)	Dewatering Needs
Block 4	236.25	233.25	233.5	Yes
Block 11	236.5	233.5	234.0	Yes
Block 12	236.0	233.0	234.0	Yes
Block 13	235.5	232.5	233.0	Yes
Block 14	235.25	232.25	233.0	Yes
Block 15	235.25	232.25	234.0	Yes
Block 16	234.25	231.25	234.0	Yes
Block 17	234.75	231.75	233.0	Yes
Block 18	234.0	231.0	233.0	Yes
Block 29	234.75	231.75	232.0	Yes
Block 30	234.5	231.5	232.0	Yes
Block 31	234.5	231.5	232.0	Yes

The summary of construction dewatering flow rates for the townhouse blocks that require dewatering and a summary of the calculations are presented in **Appendix E** (**Page 3**). **Table 8-3** below, indicates the estimated dewatering flow rates for the proposed townhouse blocks.

Table 8-3- Short-Term Estimated Construction Dewatering Flow Rates-Townhouse Blocks

Block Number	ZOI* (m)	Groundwater Flow Per Single Unit in TH Block (L/day) without S.F.	Number of Units per TH Block	Groundwater Flow Per TH Block (L/day) without S.F.*	Groundwater Flow Per TH Block (L/day) S. F. 1.5	Anticipated Storm Flow Per TH Block L/day (2-year 3 Hr)	Total Estimated Short-term Dewatering Flow Rates Per TH Block (Storm event and S.F. 1.5)
Block 1	NE	NE	6	NE	NE	20,400.0	20,400.0
Block 2	NE	NE	7	NE	NE	23,800.0	23,800.0
Block 3	NE	NE	7	NE	NE	23,800.0	23,800.0
Block 4	3.5	600.0	7	4,200.0	6,300.0	23,800.0	30,100.0
Block 5	NE	NE	6	NE	NE	20,400.0	20,400.0
Block 6	NE	NE	7	NE	NE	23,800.0	23,800.0
Block 7	NE	NE	7	NE	NE	23,800.0	23,800.0
Block 8	NE	NE	7	NE	NE	23,800.0	23,800.0
Block 9	NE	NE	7	NE	NE	23,800.0	23,800.0
Block 10	NE	NE	6	NE	NE	20,400.0	20,400.0

Block Number	ZOI* (m)	Groundwater Flow Per Single Unit in TH Block (L/day) without S.F.	Number of Units per TH Block	Groundwater Flow Per TH Block (L/day) without S.F.*	Groundwater Flow Per TH Block (L/day) S. F. 1.5	Anticipated Storm Flow Per TH Block L/day (2-year 3 Hr)	Total Estimated Short-term Dewatering Flow Rates Per TH Block (Storm event and S.F. 1.5)
Block 11	3.7	600.0	7	4,200.0	6,300.0	23,800.0	30,100.0
Block 12	4.0	700.0	7	4,900.0	7,350.0	23,800.0	31,150.0
Block 13	3.7	600.0	7	4,200.0	6,300.0	23,800.0	30,100.0
Block 14	3.8	700.0	7	4,900.0	7,350.0	23,800.0	31,150.0
Block 15	4.4	900.0	6	5,400.0	8,100.0	20,400.0	28,500.0
Block 16	4.8	1,200.0	6	7,200.0	10,800.0	20,400.0	31,200.0
Block 17	4.1	800.0	6	4,800.0	7,200.0	20,400.0	27,600.0
Block 18	4.5	1,000.0	5	5,000.0	7,500.0	17,000.0	24,500.0
Block 19	NE	NE	6	NE	NE	18,600.0	18,600.0
Block 20	NE	NE	6	NE	NE	18,600.0	18,600.0
Block 21	NE	NE	6	NE	NE	18,600.0	18,600.0
Block 22	NE	NE	6	NE	NE	19,200.0	19,200.0
Block 23	NE	NE	6	NE	NE	19,200.0	19,200.0
Block 24	NE	NE	6	NE	NE	19,200.0	19,200.0
Block 25	NE	NE	6	NE	NE	19,200.0	19,200.0
Block 26	NE	NE	6	NE	NE	19,200.0	19,200.0
Block 27	NE	NE	5	NE	NE	15,500.0	15,500.0
Block 28	NE	NE	7	NE	NE	23,800.0	23,800.0
Block 29	3.5	600.0	7	4,200.0	6,300.0	23,800.0	30,100.0
Block 30	3.7	600.0	5	3,000.0	4,500.0	17,500.0	22,000.0
Block 31	3.7	600.0	5	3,000.0	4,500.0	17,500.0	22,000.0

S.F.: Safety Factor
NE: Not Expected
* Groundwater Flow Per Single Unit in TH Block Multiplied by Number of Units Per TH Block.

The anticipated dewatering flow rates including groundwater seepage with a safety factor of 1.5 during storm events for active excavation area for the proposed townhouse block developments can range from 15,500.0 L/day to 31,200.0 L/day considering a 2-year storm event with a duration of 3 hr/day.

Additionally, a potential 100-year storm event with a duration of 12 hours is expected to range from 51,000.0 L/day to 77,700.0 L/day, considering the active excavation area dimensions mentioned in the assumptions above.

8.5 Preliminary Long-Term Foundation Drainage

The same equation used to estimate the groundwater flow rates for short-term dewatering was utilized to estimate the long-term foundation drainage flow rates from groundwater sources for the townhouse blocks that will be constructed below the shallow groundwater table.

The following assumptions were used to estimate potential needs for the long-term foundation drainage flow control for the townhouse blocks;

- It was assumed that 60% of the length would be utilized for the footprint of each townhouse unit, and this was taken into consideration for the dewatering assessment.
- The dewatering assessment was completed per single unit in each townhouse block, then multiplied by the number of units in each block to determine the total estimated long-term dewatering flow rate per townhouse block.
- The shallow groundwater flow pattern map prepared based on the stabilized groundwater levels measured on October 22, 2025, was utilized for the assessment
- Hydraulic conductivity of 3.7 x 10^{-8} m/sec (in-situ hydraulic conductivity testing from BH/MW 25-3) was considered for the subsurface soil.
- The storm event of 2 years -3 Hr was also considered to estimate the infiltration around the perimeter of the proposed townhouse blocks to estimate the total long-term foundation drainage, where the lowest assumed FFE extends below the shallow groundwater table.

The summary of long-term foundation drainage flow rates for the townhouse blocks with anticipated long-term foundation drainage flow and a summary of the calculations are presented in **Appendix E** (**Page 4**). **Table 8-4** below, indicates the estimated long-term foundation drainage flow rates for the proposed townhouse blocks.

Table 8-4 –Summary of Estimated Long-Term Foundation Drainage Flow Rates

Block Number	ZOI (m)	Groundwater Flow Per Single Unit in TH Block (L/day) without S.F.	Number of Units Per TH Block	Groundwater Flow Per TH Block (L/day) without S.F.*	Groundwater Flow Per TH Block (L/day) S. F. 1.5	Anticipated Storm Flow L/day Per TH Block (2-year 3 Hr)	Total Estimated Long-Term Foundation Drainage Flow Rates Per TH Block (Storm event and S.F. 1.5)
Block 4	3.5	200.0	7	1,400.0	2,100.0	1,900.0	4,000.0
Block 11	3.7	300.0	7	2,100.0	3,150.0	1,900.0	5,050.0
Block 12	4.0	500.0	7	3,500.0	5,250.0	1,900.0	7,150.0
Block 13	3.7	300.0	7	2,100.0	3,150.0	1,900.0	5,050.0
Block 14	3.8	400.0	7	2,800.0	4,200.0	1,900.0	6,100.0
Block 15	4.4	700.0	6	4,200.0	6,300.0	1,700.0	8,000.0
Block 16	4.8	1,000.0	6	6,000.0	9,000.0	1,700.0	10,700.0
Block 17	4.1	500.0	6	3,000.0	4,500.0	1,700.0	6,200.0
Block 18	4.5	800.0	5	4,000.0	6,000.0	1,500.0	7,500.0
Block 29	3.5	200.0	7	1,400.0	2,100.0	1,900.0	4,000.0
Block 30	3.7	300.0	5	1,500.0	2,250.0	1,500.0	3,750.0
Block 31	3.7	300.0	5	1,500.0	2,250.0	1,600.0	3,850.0

S. F: Safety Factor

* Groundwater Flow Per Single Unit in TH Block Multiplied by Number of Units Per TH Block.

The anticipated long-term foundation drainage flow rates, including groundwater seepage with a safety factor of 1.5 and infiltration due to storm events for the proposed townhouse blocks that will be developed below the shallow groundwater table range from 3,700.0 L/day to 10,700.0 L/day.

8.6 Preliminary Permit Requirements

Preliminary Short -Term Construction Dewatering: As per the recent amendment to O.Reg. 63/16 that came into effect on July 1, 2025, EASR registration with the MECP will be required for water takings, including groundwater seepage and precipitation, of more than 50,000 L/day.

A review of the total estimated dewatering flow rates presented in **Tables 8-1, 8-3** and **Appendix E** (**Pages 1-3**) indicates that maximum total estimated dewatering flow rates during the construction of the proposed underground services (considering 50.0 m/day length of the active trench) and the proposed townhouse blocks could reach up to 6,850.0 L/day and 31,200.0 L/day, respectively, including precipitation and considering a safety factor of 1.5. As such, filing EASR with MECP is not required, assuming the construction of the townhouse blocks and underground services are completed over phases and the water taking remains below the 50,000.0 L/day.

Additionally, applying for a discharge permit with the Region of Peel is required if the collected water during construction is proposed to be conveyed to the sewer system.

Preliminary Long-Term Foundation Drainage: As per the recent amendment to O.Reg. 387/04 that came into effect on July 1, 2025, PTTW registration will be required if long-term foundation drainage flow rates exceed 379,000.0 L/day.

A review of the maximum total estimated long-term foundation flow rates presented in **Table 8-4** and **Appendix E** (**Page 4**) indicate that the maximum total estimated long-term foundation drainage flow rate reaches 10,700.0 L/day, including infiltration and groundwater with a safety factor of 1.5, which does not exceed 379,000 L/day for the proposed individual lots. As such, filing PTTW with MECP is not required.

However, obtaining a discharge agreement from the Region of Peel is required if long-term foundation drainage effluent is proposed to be conveyed to the sewer system.

8.7 Potential Dewatering Impacts and Mitigation Plan

8.7.1 Short-Term Discharge Water Quality

The dewatering system must be appropriately filtered in order to prevent the pumping of fines and loss of ground during the dewatering activities.

A review of the groundwater quality test results suggests groundwater quality meets the Peel Region Sanitary Sewer Use By-Laws without significant pre-treatment but exceeds the Peel Region Storm Sewer Use By-Laws for total manganese. As such, implementing specific pre-treatment to lower the exceeded parameters to meet the Peel Region Storm Sewer Use standards should permit disposal of the dewatering effluent to the Region storm sewer system. Alternatively, short-term dewatering effluent could be hauled

and disposed off-site using a licenced contractor if the excavation and construction is completed over phases.

The assessment above is provided solely for comparing groundwater quality against the limits set by the Peel Region Sewer Use By-Law Standards. Any discharge should adhere to the respective policies of the jurisdiction. The final design for any temporary or long-term construction dewatering effluent pre-treatment system is the responsibility of contractors responsible for construction, or the water treatment system design specialists, if required.

8.7.2 Ground Settlement

The maximum conceptual ZOI for dewatering could reach up to 5.4 and 4.8 m away from the conceptual dewatering wells or array considered around the excavation box for of the installation of the proposed underground services and the construction of the proposed townhouse blocks, respectively. There are no existing structures located within the conceptual ZOI for dewatering. As such no ground settlement for nearby structures are expected. Additionally, if the dewatering involves utilization of sump and pump, the ZoI for dewatering will be limited to the excavation area, and there won't be significant risk for ground settlement.

8.7.3 Surface Water, Wetlands and Areas of Natural Significance

Record review indicates there is a record of a not evaluated wetland feature (as per OWES), located at the central portion of the Subject Site, one (1) waterhead drainage feature that traverse through the east most portion of the Subject Site from north to southeast, and wooded areas at the west portion of the Subject Site. A review of MNR database also shows that there is a waterbody located at the west portion of the Subject Site. The existing features within the Subject Site including unevaluated wetland, a ponded water body, and wooded areas are located within the footprint of the proposed blocks and roads. It is understood that these areas were assessed in the Environmental Impact Study completed by GeoProcess Research Associates and were determined to not be natural heritage features. The existing waterhead drainage features along the east limit of the Subject Site boundary is located within the footprint of the Blocks 34-36 (Future development). However, it may fall within the conceptual ZoI for dewatering for construction of the proposed Block 16, 18 and 31 as well as the proposed underground services. The existing natural features scattered around the Subject Site are located outside of the conceptual ZoI for dewatering. As such, potential impacts are not anticipated to those natural features with respect to the proposed development in the Subject Site.

8.7.4 Water Supply Wells and Zone of Influence

A review of the MECP well records confirmed that there are eight (8) records for water supply wells that are registered within 500 m of the Subject Site. However, the records are located outside of the conceptual

ZoI for dewatering. As such, significant impacts to the potential groundwater users are not anticipated if the wells exist and in service.

9.0 CONCLUSIONS AND RECOMMENDATIONS

- The Subject Site lies within the South Slope physiographic region of Southern Ontario. The South Slope within the vicinity of the Subject Site comprises of Drumlinized Till Plains.
- The Subject Site is located within an area mapped as Till (5d), comprising of clay to silt-textured till.
- The subsoil investigations conducted by SEL and GEI Consultants Ltd. have revealed that beneath the topsoil veneer, the Subject Site is underlain by stratum of silty clay till, with localized deposits of silty clay, to a maximum termination depth of investigation at 10.9 meters below ground surface (mbgs).
- The finding of the groundwater monitoring indicates that shallow groundwater level elevation ranged from the EL. 230.5 masl to 236.2 masl at GEI-BH/MW 103 and GEI-BH/MW 104D, respectively.
- The findings of SWRTs reveal that the hydraulic conductivity (K) for the water bearing units underneath the Subject Site ranges from 3.7 x 10^{-8} at BH/MW 25-3 to 2.2 x 10^{-9} m/sec at GEI-BH/MW 105. However, as a conservative approach, 3.7 x 10^{-8} was utilized for the current assessment.
- The results indicate that the concentration of total manganese from the unfiltered sample collected from BH/MW 25-3 exceeded the applicable standards when compared against the Peel Storm Sewer Use By-law standards. However, the results indicate that the unfiltered sample meets the applicable standards when compared against the Peel Region Sanitary Sewer Use By-Law.
- The short-term construction dewatering flow rate for construction of the proposed townhouse blocks considering groundwater seepage with a safety factor of 1.5 and 2-year storm event with a duration of 3 hr/day ranges between 15,500 L/day and 31,200.0 L/day. It ranges between 4,600 L/day and 6,800.0 L/day for installation of the proposed underground services considering 50.0 m as a length of an open and active trench per day.
- Since the range of the anticipated short-term construction dewatering flow remains below the MECP EASR threshold limit of 50,000.0 L/day, assuming the construction of the townhouse blocks and underground services are completed over phases, an EASR filing with the MECP will not be required for the construction of the proposed townhouse blocks and underground services.
- The review of the long-term dewatering flow rates for the townhouse blocks that will be constructed below the shallow groundwater table ranges from 3,750.0 L/day to 10,700.00 L/day considering groundwater seepage with a safety factor of 1.5 and infiltration, which does not exceed 379,000 L/day for the proposed townhouse blocks. As such, filing PTTW with MECP is not required.
- The maximum conceptual ZOI for dewatering could reach up to 5.4 and 4.8 m away from the conceptual dewatering wells or array considered around the excavation box for of the installation

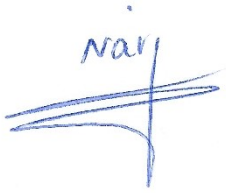
of the proposed underground services and the construction of the proposed townhouse blocks, respectively. There are no existing structures located within the conceptual ZOI for dewatering. As such, no ground settlement for nearby structures are expected. Additionally, if the dewatering involves utilization of sump and pump, the ZoI for dewatering will be limited to the excavation area, and there won't be significant risk for ground settlement.

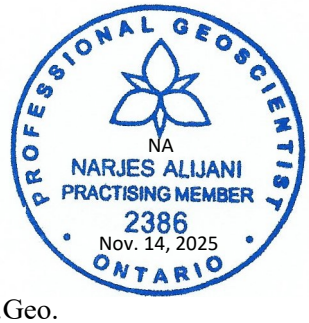
- The existing features within the Subject Site including unevaluated wetland, a ponded water and wooded areas are located within the footprint of the proposed blocks and roads. As such, it is assumed the features will be decommissioned in advance of construction. The existing headwater along the east limit of the Subject Site boundary is located within the footprint of the Blocks 34-36 (Future development). However, it may fall within the conceptual ZoI for dewatering for construction of the proposed Block 16, 18 and 31 as well as the proposed underground services. The existing natural features scattered around the Subject Site are located outside of the conceptual ZoI for dewatering. As such, potential impacts are not anticipated to those natural features with respect to the proposed development in the Subject Site. It is understood that these areas were assessed in the Environmental Impact Study completed by GeoProcess Research Associates and were determined to not be natural heritage features. For additional detail please refer to the EIS.
- A review of the MECP well records confirmed that there are eight (8) records for water supply wells that are registered within 500 m of the Subject Site. However, the records are located outside of the conceptual ZoI for dewatering. As such, significant impacts to the potential groundwater users are not anticipated if the wells exist and in service.

10.0 CLOSURE

We trust that the above-noted information is suitable for your review. If you have any questions regarding this information, please do not hesitate to contact the undersigned.

Yours truly,
SOIL ENGINEERS LTD.





Tarek Agha, E.I.T. PMP.
Project Manager-Hydrogeological Services

Narjes Alijani, M.Sc., P.Geo.
Department Manager-Hydrogeological Services

11.0 REFERENCES

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6. Ministry of Natural Recourses, 2025, Natural Heritage Interactive Map.
7. Toronto and Region Conservation Authority, 2025, Online Regulated Area Map.
8. Region of Peel Official Plans, 2025.

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FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

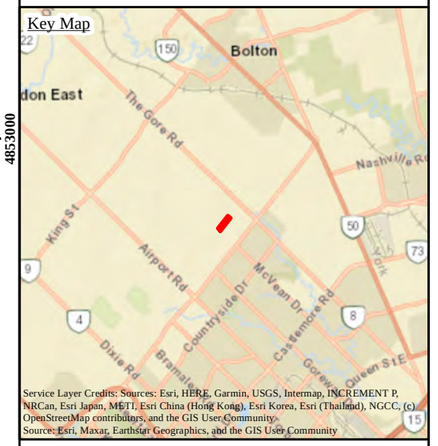
DRAWINGS 1 to 9

REFERENCE NO. 2508-W033

N

References: Ontario Ministry of Natural Resources and Forestry

Key Map



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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend

- Approximate Boundary of Subject Site
- Major Road
- Local Road
- Waterbody
- Watercourse

Soil Engineers Ltd.

Site Location Plan

Hydrogeological Assessment
Proposed Residential Development
0 and 12319 Centreville Creek Road
Town of Caledon

Reference No. 2508-W033

Date: September 25, 2025

Scale:

0 40 80 160 240 320 400
Metres

Drawing No. 1

600600 600900 601200

4852600

4852300

N

References: Ontario Ministry of Natural Resources and Forestry
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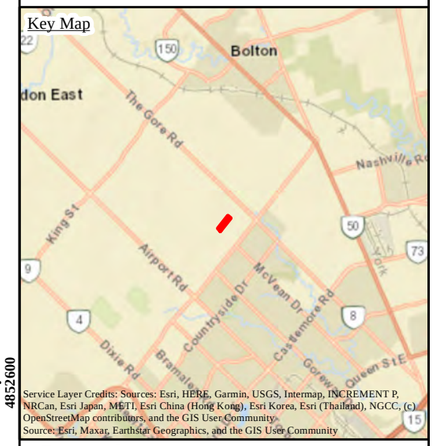
Key Map



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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend

- Approximate Boundary of Subject Site
- Local Road
- Waterbody
- Watercourse
- Borehole
- Borehole With Monitoring Well
- Borehole With Monitoring Well (Installed by GEI Consultants Ltd. in 2024)

Soil Engineers Ltd.

Borehole and Monitoring Well Location Plan

Hydrogeological Assessment
Proposed Residential Development
0 and 12319 Centreville Creek Road
Town of Caledon

Reference No. 2508-W033

Date: September 25, 2025

Scale:

0 15 30 60 90 120 150
Metres

Drawing No. 2

D:\Projects\2508-W033\

600000
600500
601000
601500
602000
4853000
4852500
4852000

THE GORE ROAD
GENTREVILLE CREEK ROAD
MARTIN BYRNE DRIVE
MAYFIELD ROAD
OPP CRESCENT
OBSERVATORY CRESCENT
JOHN CARROLL DRIVE
BERING ROAD
FANNING TRAIL
SQUIRE ELLIS DRIVE
VENUE ROAD

19
5d
8b

D:\Projects\2508-W033\

N

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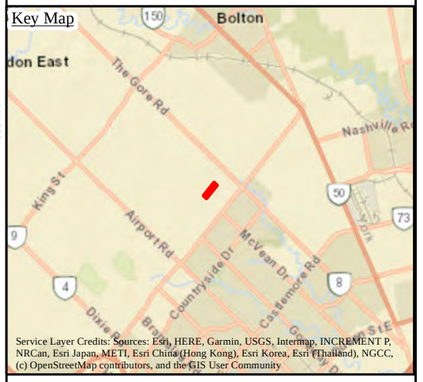
Key Map



Legend

- Approximate Boundary of Subject Site
- Major Road
- Local Road
- 5d: Halton Till; consisting of diamicton
- 8b: Lacustrine-Wildfield Complex; consisting of clay, silt diamicton: foreshore/basinal
- 19: Modern Alluvium; consisting of silt, sand, gravel

Soil Engineers Ltd.

Surface Geology Map

Hydrogeological Assessment
Proposed Residential Development
0 and 12319 Centreville Creek Road
Town of Caledon

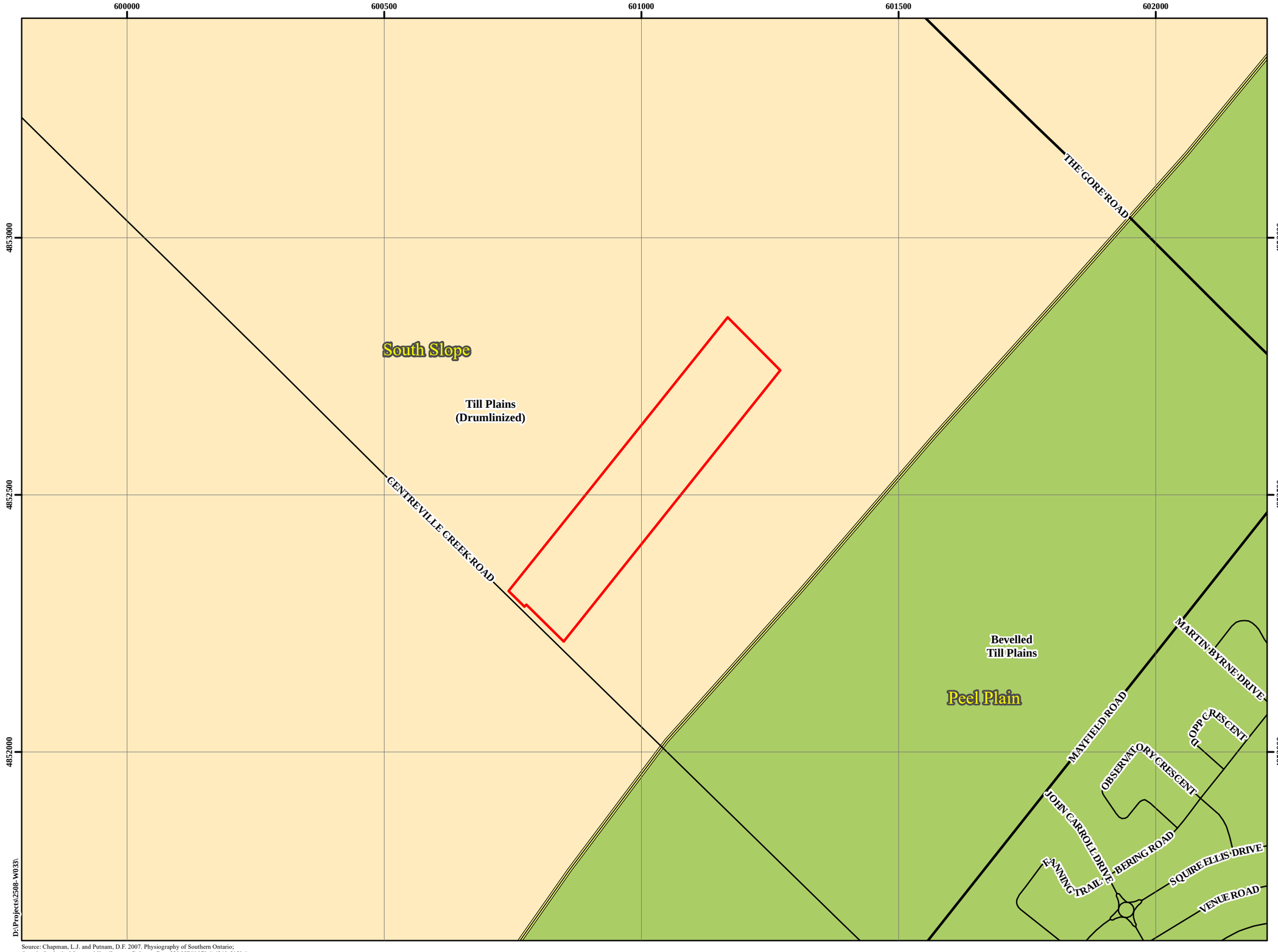
Reference No. 2508-W033

Date: September 25, 2025

Scale:

0 80 160 240 320 400
Metres

Drawing No. 3



Source: Chapman, L.J. and Putnam, D.F. 2007. Physiography of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 228 ISBN 978-1-4249-5158-1

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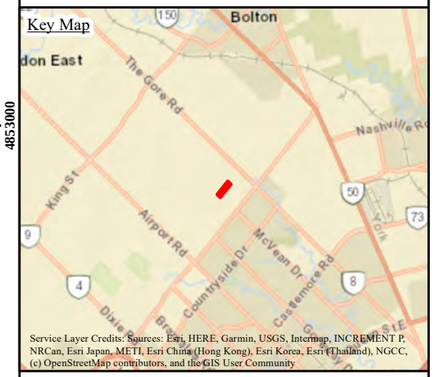

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Legend

- Approximate Boundary of Subject Site
- Major Road
- Local Road
- Region Boundary
- Till Plains (Drumlinized)
- Bevelled Till Plains

Soil Engineers Ltd.

Physiographic Map

Hydrogeological Assessment
Proposed Residential Development
0 and 12319 Centreville Creek Road
Town of Caledon

Reference No. 2508-W033

Date: September 25, 2025

Scale:
0 40 80 160 240 320 400
Metres

Drawing No. 4

600000 600500 601000 601500 602000

4853000 4852500 4852000

THE GORE ROAD
CENTREVILLE CREEK ROAD
MAYFIELD ROAD
MARTIN BYRNE DRIVE
OPP CRESCENT
OBSERVATORY CRESCENT
JOHN CARROLL DRIVE
BERING ROAD
FANNING TRAIL
SQUIRE ELLIS DRIVE
VENUE ROAD
West Humber River

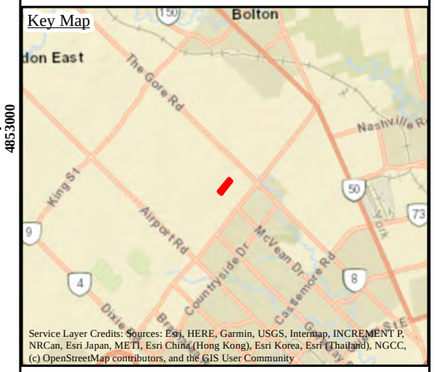
245 240 235 230 225 220 215

D:\Projects\2508-W033\

N

References: Ontario Ministry of Natural Resources and Forestry

Key Map



Legend

- Approximate Boundary of Subject Site
- Major Road
- Local Road
- Waterbody
- Watercourse
- Ontario - 5 m

Soil Engineers Ltd.

Topographic Map

Hydrogeological Assessment
Proposed Residential Development
0 and 12319 Centreville Creek Road
Town of Caledon

Reference No. 2508-W033

Date: September 25, 2025

Scale:

0 40 80 160 240 320 400
Metres

Drawing No. 5

600000
600500
601000
601500
602000
4853000
4852500
4852000
THE GORE ROAD
CENTREVILLE CREEK ROAD
West Humber River
MAYFIELD ROAD
MARTIN BYRNE DRIVE
OPPORTUNITY CRESCENT
OBSERVATORY CRESCENT
JOHN CARROLL DRIVE
BERING ROAD
SQUIRE ELLIS DRIVE
VENUE ROAD
FANNING TRAIL
D:\Projects\2508-W033\

N

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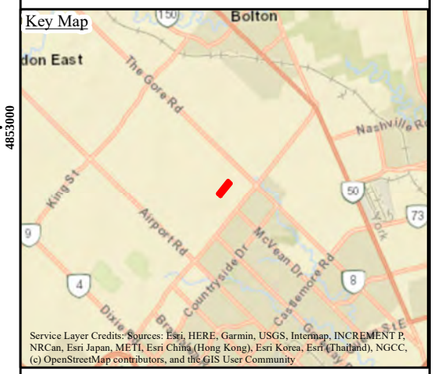
Key Map



Legend

- Approximate Boundary of Subject Site
- Major Road
- Local Road
- Watercourse
- Waterbody
- Wooded Area *Wooded Area*
- Wetland (Not evaluated per OWES)

Soil Engineers Ltd.

Natural Features and Protection Area Plan

Hydrogeological Assessment
Proposed Residential Development
0 and 12319 Centreville Creek Road
Town of Caledon

Reference No. 2508-W033

Date: September 25, 2025

Scale:

0 80 160 240 320 400
Metres

Drawing No. 6

600000 600500 601000 601500 602000

4853000 4852500 4852000

THE GORE ROAD
West Humber River
CENTREVILLE CREEK ROAD
MAYFIELD ROAD
MARTIN BYRNE DRIVE
BERING ROAD
STRENGTHS STREET
JOHN CARROLL DRIVE
SQUIRE ELLIS DRIVE
VENUE ROAD

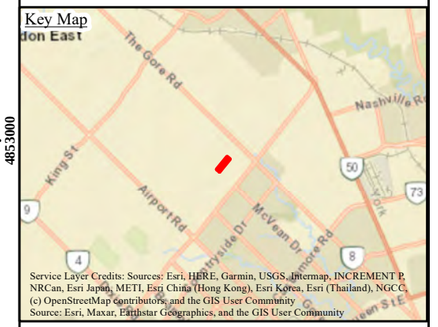
1 2 3 4 5 6 7 8 9 10 11

D:\Projects\2508-W033\

N

References: ESRI, DigitalGlobe, GeoEye, Earthstar Geograp -hics, CNES/Airbus Ds, USDA, USGS, AeroGRIS, IGN, and the GIS User Community produced by Soil Engineers Ltd. Copyright (c) King's Printer for Ontario, 2025. Water Well Information System Ministry of the Environment, Conservation and Parks, 2020

Key Map



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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend

- Approximate Boundary of Subject Site
- 500 Metres From Subject Site Boundary
- Major Road
- Local Road
- Waterbody
- Watercourse
- Unknown (2)
- Abandoned-Other (1)
- Water Supply (8)

Soil Engineers Ltd.

MECP Well Location Plan

Hydrogeological Assessment
Proposed Residential Development
0 and 12319 Centreville Creek Road
Town of Caledon

Reference No. 2508-W033

Date: September 25, 2025

Scale:

0 40 80 160 240 320 400
Metres

Drawing No. 7

600600 600800 601000 601200 601400

4852800 4852600 4852400 4852200

A

A'

BH/MW 25-3

BH 25-2
(Projected)

BH 25-1
(Projected)

BH/MW 25-4

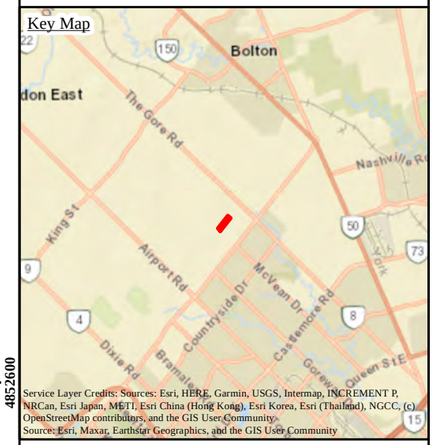
CENTREVILLE CREEK ROAD

D:\Projects\2508-W033\

N

References: Ontario Ministry of Natural Resources and Forestry

Key Map



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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend

- Approximate Boundary of Subject Site
- A A' Cross Section
- Local Road
- Waterbody
- Watercourse
- Borehole
- Borehole With Monitoring Well

Soil Engineers Ltd.

Subsurface Profile Cross-Section Key Plan

Hydrogeological Assessment
Proposed Residential Development
0 and 12319 Centreville Creek Road
Town of Caledon

Reference No. 2508-W033

Date: September 25, 2025

Scale:
0 15 30 60 90 120 150
Metres

Drawing No. 8-1

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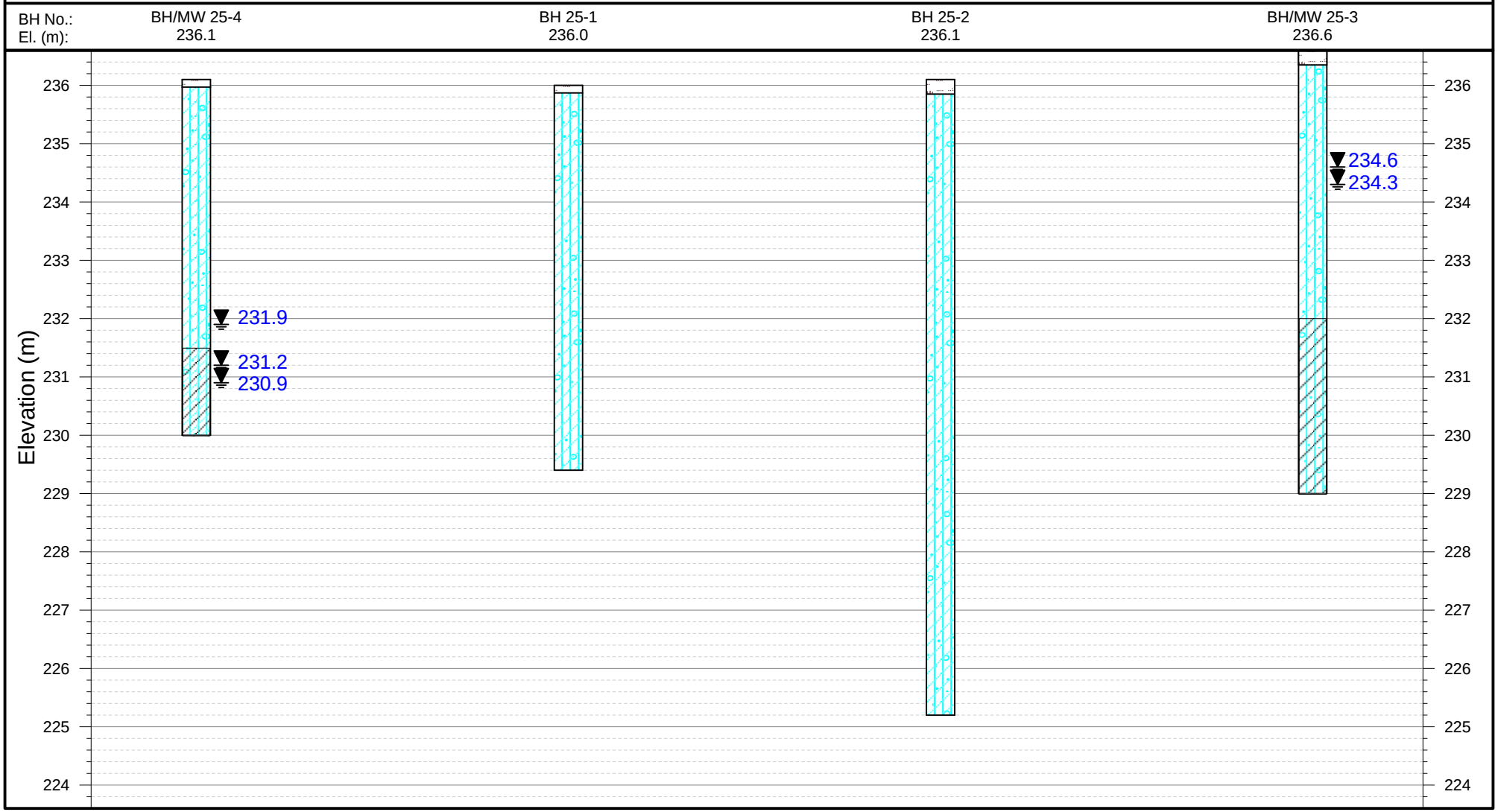
SUBSURFACE PROFILE
CROSS SECTION A-A'
DRAWING NO. 8-2A
SCALE: AS SHOWN

JOB NO.: 2508-W033
REPORT DATE: November 2025
PROJECT DESCRIPTION: Proposed Residential Development
PROJECT LOCATION: 0 and 12319 Centreville Creek Road, Town of Caledon

LEGEND
SILTY CLAY TILL | TOPSOIL | SCREEN

WATER LEVEL (STABILIZED)



600600
600900
601200
4852600
4852300

BLOCK 34 FUTURE DEVELOPMENT BLOCK 0.009 ha
BLOCK 35 FUTURE DEVELOPMENT BLOCK 0.016 ha
BLOCK 36 FUTURE DEVELOPMENT BLOCK 0.018 ha
BLOCK 33 MEDIUM DENSITY BLOCK 0.956 ha
BLOCK 32 MEDIUM DENSITY BLOCK 0.973 ha
BLOCK 37 ROAD WIDENING BLOCK 0.150ha

STREET 'A'
STREET 'C'
STREET 'D'
STREET 'E'
STREET 'F'
STREET 'G'
STREET 'H'
STREET 'I'
STREET 'J'
STREET 'K'
STREET 'L'

BH/MW 25-3 (234.3)
GEI BH/MW 104D (233.9)
GEI BH/MW 105 (232.2)
BH/MW 25-4 (231.9)
GEI BH/MW 103 (231.1)

234.0
233.5
233.0
232.5
232.0
231.5
235

CENTREVILLE CREEK ROAD

N

References: Ontario Ministry of Natural Resources and Forestry
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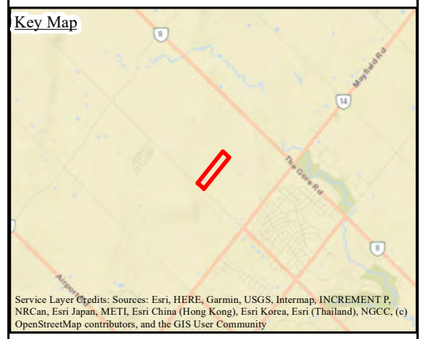
Key Map



Legend

- Approximate Boundary of Subject Site
- Borehole With Monitoring Well
- Local Road
- Ontario - 5 m
- Highest Interpreted Shallow Groundwater Elevation Contour
- Highest Inferred Shallow Groundwater Elevation Contour
- Interpreted Shallow Groundwater Flow Direction
- (233.9) Highest Shallow Groundwater Level Measured on October 02, 2025

Soil Engineers Ltd.

Shallow Groundwater Flow Pattern Plan

Hydrogeological Assessment
Proposed Residential Development
0 and 12319 Centreville Creek Road
Town of Caledon

Reference No. 2508-W033

Date: September 25, 2025

Scale:

0 15 30 60 90 120 150
Metres

Drawing No. 9

D:\Projects\2508-W033\

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FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

APPENDIX 'AI'

SEL BOREHOLE LOGS/MONITORING WELL LOGS AND GRAIN SIZE DISTRIBUTION GRAPH

REFERENCE NO. 2508-W033

LIST OF ABBREVIATIONS AND DESCRIPTION OF TERMS

The abbreviations and terms commonly employed on the borehole logs and figures, and in the text of the report, are as follows:

SAMPLE TYPES

AS Auger sample
CS Chunk sample
DO Drive open (split spoon)
DS Denison type sample
FS Foil sample
RC Rock core (with size and percentage recovery)
ST Slotted tube
TO Thin-walled, open
TP Thin-walled, piston
WS Wash sample

PENETRATION RESISTANCE

Dynamic Cone Penetration Resistance:

A continuous profile showing the number of blows for each foot of penetration of a 2-inch diameter, 90° point cone driven by a 140-pound hammer falling 30 inches.

Plotted as '—●—'

Standard Penetration Resistance or 'N' Value:

The number of blows of a 140-pound hammer falling 30 inches required to advance a 2-inch O.D. drive open sampler one foot into undisturbed soil.

Plotted as '○'

WH Sampler advanced by static weight
PH Sampler advanced by hydraulic pressure
PM Sampler advanced by manual pressure
NP No penetration

SOIL DESCRIPTION

Cohesionless Soils:

'N' (blows/ft)	Relative Density
0 to 4	very loose
4 to 10	loose
10 to 30	compact
30 to 50	dense
over 50	very dense

Cohesive Soils:

Undrained Shear Strength (ksf)	'N' (blows/ft)	Consistency
less than 0.25	0 to 2	very soft
0.25 to 0.50	2 to 4	soft
0.50 to 1.0	4 to 8	firm
1.0 to 2.0	8 to 16	stiff
2.0 to 4.0	16 to 32	very stiff
over 4.0	over 32	hard

Method of Determination of Undrained Shear Strength of Cohesive Soils:

x 0.0 Field vane test in borehole; the number denotes the sensitivity to remoulding

△ Laboratory vane test

☐ Compression test in laboratory

For a saturated cohesive soil, the undrained shear strength is taken as one half of the undrained compressive strength

METRIC CONVERSION FACTORS

1 ft = 0.3048 metres
1lb = 0.454 kg
1 inch = 25.4 mm
1ksf = 47.88 kPa

JOB NO.: 2508-W033

LOG OF BOREHOLE:BH 25-1

FIGURE NO.: 1

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: 0 and 12319 Centreville Creek Road, Town of Caledon

DRILLING DATE: August 19, 2025

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
236.0	Ground Surface							
0.0	**13 cm TOPSOIL**	1A	DO	23	0		14	
		1B						
	Stiff to very stiff **SILTY CLAY TILL** a trace to some sand a trace of gravel occ. cobbles and boulders — weathered	2	DO	25	1		18	
		3	DO	30	2		19	
		4	DO	26			22	
		5	DO	20	3		25	
	— brown / grey	6	DO	14	4 5		24	
229.4		7	DO	12	6		24	
6.6	**END OF BOREHOLE**				7 8 9 10 11 12			

Soil Engineers Ltd.

JOB NO.: 2508-W033

LOG OF BOREHOLE:BH 25-2

FIGURE NO.: 2

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: 0 and 12319 Centreville Creek Road, Town of Caledon

DRILLING DATE: August 19, 2025

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
236.1	Ground Surface							
0.0	**25 cm TOPSOIL**				0			
	Stiff to hard **SILTY CLAY TILL** a trace to some sand a trace of gravel occ. cobbles and boulders weathered	1	DO	10			11	
		2	DO	23	1		17	
		3	DO	14	2		18	
		4	DO	36			14	
		5	DO	25	3		24	
	brown grey silty clay layer	6	DO	16	4 5		24	
		7	DO	17	6		23	
		8	DO	22	7 8		18	
		9	DO	63	9		15	
225.2		10	DO	50/15	10		8	
10.9	**END OF BOREHOLE**				11 12			

Soil Engineers Ltd.

JOB NO.: 2508-W033

LOG OF BOREHOLE:BH/MW 25-3

FIGURE NO.: 3

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: 0 and 12319 Centreville Creek Road, Town of Caledon

DRILLING DATE: August 19, 2025

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
236.6 / 0.0	Ground Surface				
	25 cm TOPSOIL	1	DO	10	0
	Stiff to hard **SILTY CLAY TILL** a trace to some sand a trace of gravel occ. cobbles and boulders — weathered	2	DO	23	1
		3	DO	14	2
		4	DO	36	
		5	DO	25	3
	— brown grey silty clay layer	6	DO	16	4
		7	DO	17	5
229.0 / 7.6	**END OF AUGER HOLE**	8	DO	22	6
	Installed 50 mm Ø monitoring well to 7.6 m completed with 3.0 m screen Sand backfill from 4.0 to 7.6 m Bentonite seal from 0.0 m to 4.0 m Provided with a momument steel casing	9	DO	63	7
		10	DO	50/15	8
					9
					10
					11
					12

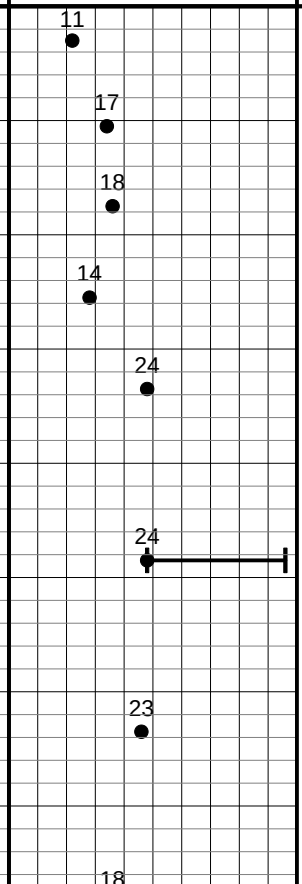
Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40



WATER LEVEL

Water level reading:
W.L. @ El. 234.6 masl on Sep 04, 2025
W.L. @ El. 234.3 masl on Sep 18, 2025
W.L. @ El. 234.3 masl on Oct 02, 2025

Soil Engineers Ltd.

JOB NO.: 2508-W033

LOG OF BOREHOLE:BH/MW 25-4

FIGURE NO.: 4

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: 0 and 12319 Centreville Creek Road, Town of Caledon

DRILLING DATE: August 19, 2025

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
236.1	Ground Surface							
0.0 0.1	**13 cm TOPSOIL**	1A 1B	DO	23	0		14	
	Stiff to very stiff **SILTY CLAY TILL** a trace to some sand a trace of gravel occ. cobbles and boulders — weathered	2	DO	25	1		18	
		3	DO	30	2		19	
		4	DO	26	3		22	
		5	DO	20	4		25	
	— brown grey	6	DO	14	5		24	
230.0 6.1	**END OF AUGER HOLE**	7	DO	12	6		24	
	Installed 50 mm Ø monitoring well to 6.1 m completed with 1.5 m screen Sand backfill from 4.0 to 6.1 m Bentonite seal from 0.0 m to 4.0 m Provided with a momument steel casing				7			
					8			
					9			
					10			
					11			
					12			

Water level reading:
W.L. @ El. 230.9 masl on Sep 04, 2025
W.L. @ El. 231.2 masl on Sep 18, 2025
W.L. @ El. 231.9 masl on Oct 02, 2025

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GRAIN SIZE DISTRIBUTION

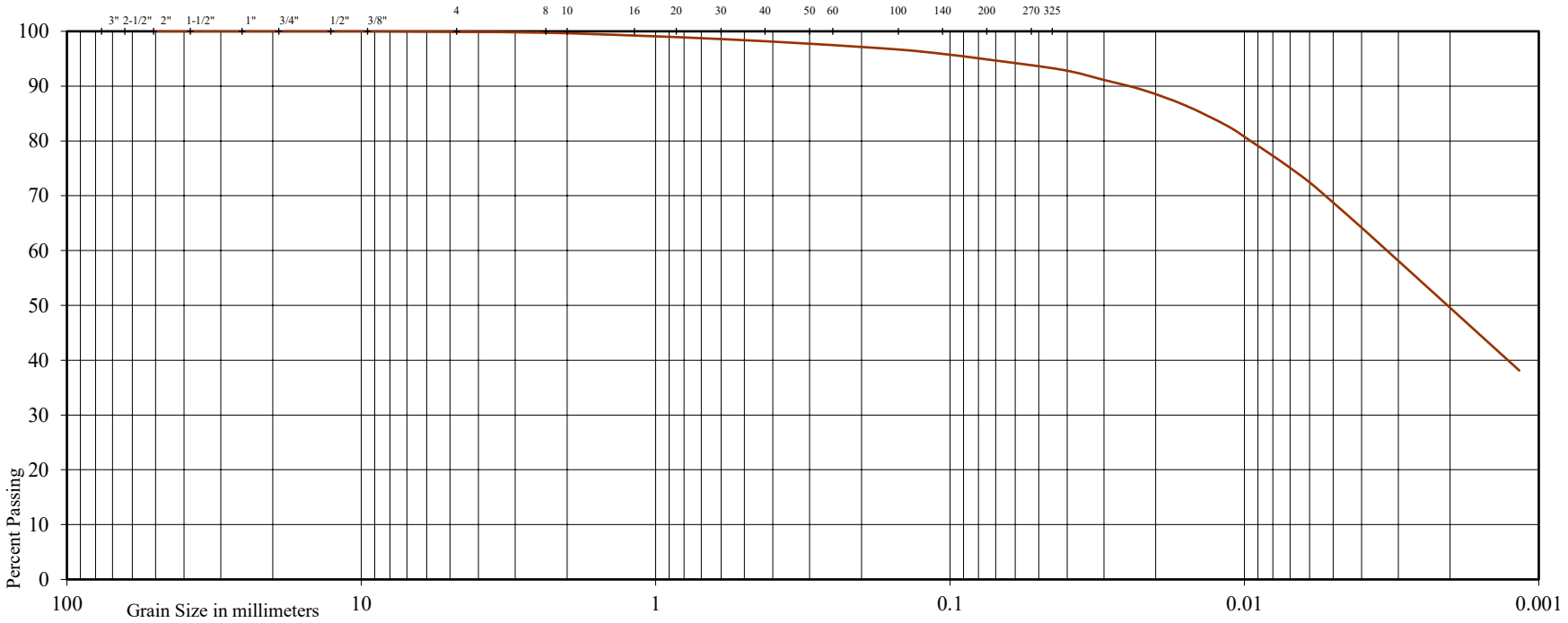
Reference No: 2508-S033

U.S. BUREAU OF SOILS CLASSIFICATION

GRAVEL		SAND				SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	V. FINE		

UNIFIED SOIL CLASSIFICATION

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Project: Proposed Residential Development

Location: 0 and 12319 Centreville Creek Road, Town of Caledon

Borehole No: 25-2

Sample No: 6

Depth (m): 4.9

Elevation (m): 231.2

Liquid Limit (%) = 48

Plastic Limit (%) = 24

Plasticity Index (%) = 24

Moisture Content (%) = 24

Estimated Permeability (cm./sec.) = 10^{-7}

Classification of Sample [& Group Symbol]: SILTY CLAY
a trace of sand

Figure: 5

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FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

APPENDIX 'AII'

GEI CONSULTANTS LTD. BOREHOLE LOGS/MONITORING WELL LOGS

REFERENCE NO. 2508-W033

RECORD OF BOREHOLE No. 103

Project Number: **2100463**
Project Client: **Wildfield Village Landowners Group Inc.**
Project Name: **Wildfield Village**
Project Location: **Town of Caledon, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **Geodetic**

Drilling Method: **Solid Stem Auger** Drilling Machine: **Track Mount**
Logged By: **BH/AB** Northing: **4852231** Date Started: **Jul 16/24**
Reviewed By: **RW/AB** Easting: **600846** Date Completed: **Jul 16/24**

GEI Consultants

LITHOLOGY PROFILE		SOIL SAMPLING					FIELD TESTING	LAB TESTING		COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m) / ELEVATION (m)	Shear Strength Testing (kPa): Other Test, Pocket Penetrometer, Field Vane (Intact), Field Vane (Remolded); Penetration Testing: SPT, DCPT	Combustible Organic Vapour - Hex, Combustible Organic Vapour - IBL, Total Organic Vapour (ppm); Atterberg Limits; Water Content (%)	Instrumentation Installation	GR	SA	SI	CL
	Geodetic 0.0 / 235.0												
	0.2 / 234.8 TOPSOIL: 150 mm					0							
	WEATHERED/DISTURBED: Soft, grey-brown, moist	SS	1	75	3		3	22					
	0.8 / 234.2					234		19					
	CLAY AND SILT GLACIAL TILL: Trace sand, trace gravel, inferred cobbles and boulders, very stiff, brown to grey, moist	SS	2	100	17		17			0	9	40	51
		SS	3	89	24	1.5	24	18					
		SS	4	100	30	232.5	30	18					
		SS	5	100	20	3	20	20					
		SS	6	100	15	231	15	18					
						4.5							
		SS	7	78	19	229.5	19	18					
	6.6 / 228.4					6							
	Borehole Terminated at 6.6 m												

Groundwater depth encountered on completion of drilling: Dry
Groundwater depth observed on: Aug 23/24 at depth of: 2.4 m.
Cave depth after auger removal: Open
Groundwater Elevation: 232.6 m

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Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: **1 :75**
Page: **1 of 1**

RECORD OF BOREHOLE No. 104-D

Project Number: **2100463**
Project Client: **Wildfield Village Landowners Group Inc.**
Project Name: **Wildfield Village**
Project Location: **Town of Caledon, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **Geodetic**

Drilling Method: **Solid Stem Augers** Drilling Machine: **Track Mount**
Logged By: **BH/AB** Northing: **4852592** Date Started: **Jul 16/24**
Reviewed By: **RW/AB** Easting: **600940** Date Completed: **Jul 16/24**

Geodetic	Depth (m)	Elevation (m)	Description	Sample Type	Sample Number	Recovery (%)	SPT "N" Value
	0.0	237.5					
	0.3	237.2	TOPSOIL: 305 mm	SS	1	75	5
	0.8	236.7	WEATHERED/DISTURBED: Firm, grey-brown, moist				
			CLAY AND SILT GLACIAL TILL: Trace sand, trace gravel, inferred cobbles and boulders, stiff to very stiff, brown/grey, moist	SS	2	100	10
				SS	3	100	20
				SS	4	100	24
				SS	5	100	15
				SS	6	100	12
	6.6	230.9		SS	7	100	13
			Borehole Terminated at 6.6 m				

FIELD TESTING: Shear Strength Testing (kPa) — Other Test; Pocket Penetrometer; Field Vane (Intact); Field Vane (Remolded); 40 80 120 160. Penetration Testing: SPT, DCPT; 10 20 30 40.

LAB TESTING: Combustible Organic Vapour - Hex; Combustible Organic Vapour - IBL; Total Organic Vapour (ppm); 100 200 300 400. Atterberg Limits: PL, LL. Water Content (%); 10 20 30 40.

Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%): GR SA SI CL

Groundwater depth encountered on completion of drilling: Dry
Groundwater depth observed on: Aug 23/24 at depth of: 5.4 m.
Cave depth after auger removal: Open
Groundwater Elevation: 232.1 m

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Scale: **1 :75**
Page: **1 of 1**

RECORD OF BOREHOLE No. 104-S

Project Number: **2100463**
Project Client: **Wildfield Village Landowners Group Inc.**
Project Name: **Wildfield Village**
Project Location: **Town of Caledon, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **Geodetic**

Drilling Method: **Solid Stem Augers** Drilling Machine: **Track Mount**
Logged By: **BH/AB** Northing: **4852561** Date Started: **Jul 16/24**
Reviewed By: **RW/AB** Easting: **600940** Date Completed: **Jul 16/24**

GEI Consultants

LITHOLOGY PROFILE		SOIL SAMPLING					FIELD TESTING	LAB TESTING		COMMENTS & GRAIN SIZE DISTRIBUTION (%)				
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m) / ELEVATION (m)	Shear Strength Testing (kPa); Penetration Testing (SPT ○, DCPT ●)	Combustible Organic Vapour - Hex; Combustible Organic Vapour - IBL; Total Organic Vapour (ppm); Atterberg Limits (PL, LL); Water Content (%)	Instrumentation Installation	GR	SA	SI	CL
	Geodetic 0.0 / 237.5													
	TOPSOIL: 305 mm 0.3 / 237.2	SS	1	75	5	0 / 237	5	26						
	WEATHERED/DISTURBED: Firm, grey-brown, moist 0.8 / 236.7	SS	2	100	10	1.5 / 235.5	10	14						
	CLAY AND SILT GLACIAL TILL: Trace sand, trace gravel, inferred cobbles and boulders, stiff to very stiff, brown/grey, moist	SS	3	100	20		20	21						
	2.7 / 234.8	SS	4	100	24		24	21						
	Borehole Terminated at 2.7 m													

Groundwater depth encountered on completion of drilling: Dry
Groundwater depth observed on: Aug 23/24 at depth of: Dry
Cave depth after auger removal: Open
Groundwater Elevation:

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Scale: **1 :75**

RECORD OF BOREHOLE No. 105

Project Number: **2100463**
Project Client: **Wildfield Village Landowners Group Inc.**
Project Name: **Wildfield Village**
Project Location: **Town of Caledon, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **Geodetic**

Drilling Method: **Solid Stem Augers** Drilling Machine: **Track Mount**
Logged By: **BH/AB** Northing: **4852708** Date Started: **Jul 16/24**
Reviewed By: **RW/AB** Easting: **601218** Date Completed: **Jul 16/24**

GEI Consultants

LITHOLOGY PROFILE		SOIL SAMPLING					FIELD TESTING	LAB TESTING		COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m) / ELEVATION (m)	Shear Strength Testing (kPa): Other Test, Pocket Penetrometer, Field Vane (Intact), Field Vane (Remolded); Penetration Testing: SPT, DCPT	Combustible Organic Vapour - Hex, Combustible Organic Vapour - IBL, Total Organic Vapour (ppm); Atterberg Limits; Water Content (%)	Instrumentation Installation	GR	SA	SI	CL
	Geodetic 0.0 / 234.9												
	0.2 / 234.8 TOPSOIL: 150 mm												
	WEATHERED/DISTURBED: Firm, grey-brown, moist	SS	1	75	4								
	0.8 / 234.2 CLAY AND SILT GLACIAL TILL: Trace sand, trace gravel, inferred cobbles and boulders, stiff to very stiff, brown/grey, moist	SS	2	100	18	0 / 234							
		SS	3	100	27	1.5 / 232.5							
	- - - Brown to grey - - -	SS	4	100	21					0	6	41	53
		SS	5	100	19	3 / 231							
		SS	6	22	11	4.5 / 229.5							
	6.6 / 228.4	SS	7	100	14	6							
	Borehole Terminated at 6.6 m												

Groundwater depth encountered on completion of drilling: Dry
Groundwater depth observed on: Aug 23/24 at depth of: 3.8 m.
Cave depth after auger removal: Open
Groundwater Elevation: 231.1 m

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Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: **1 :75**
Page: **1 of 1**

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APPENDIX 'B'

MECP WATER WELL RECORDS SUMMARY

REFERENCE NO. 2508-W033

MECP Well Records Summary

WELL ID	MECP* WWR ID	Construction Method	Well Depth (m)**	Well Usage		Static Water Level (m)**	Top of Screen Depth (m)**	Bottom of Screen Depth (m)**	Date Completed
				Final Status	First Use				
1	4900072	Boring	21.0	Water Supply	Domestic	9.1	-	-	1962-01-22
2	4904148	Boring	19.5	Water Supply	Domestic	6.1	-	-	1973-07-09
3	4903985	Cable Tool	23.5	Water Supply	Domestic	9.1	-	-	1972-11-30
4	4904329	Cable Tool	23.5	Water Supply	Not Used	12.2	-	-	1972-12-05
5	4904776	Boring	20.1	Water Supply	Domestic	6.1	-	-	1975-10-23
6	4905077	Boring	25.9	Water Supply	Domestic	15.2	-	-	1977-03-17
7	4905079	Boring	22.9	Water Supply	Domestic	12.2	-	-	1977-03-21
8	4905154	Cable Tool	42.7	Water Supply	Domestic	15.2	-	-	1977-06-23
9	7188414	-	-	-	-	-	-	-	2012-09-14
10	7190285	-	-	Abandoned-Other	-	-	-	-	2012-10-04
11	7421512	-	-	-	-	-	-	-	2022-06-02

Notes:
*MECP WWID: Ministry of the Environment, Conservation and Parks Water Well Records Identification

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FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

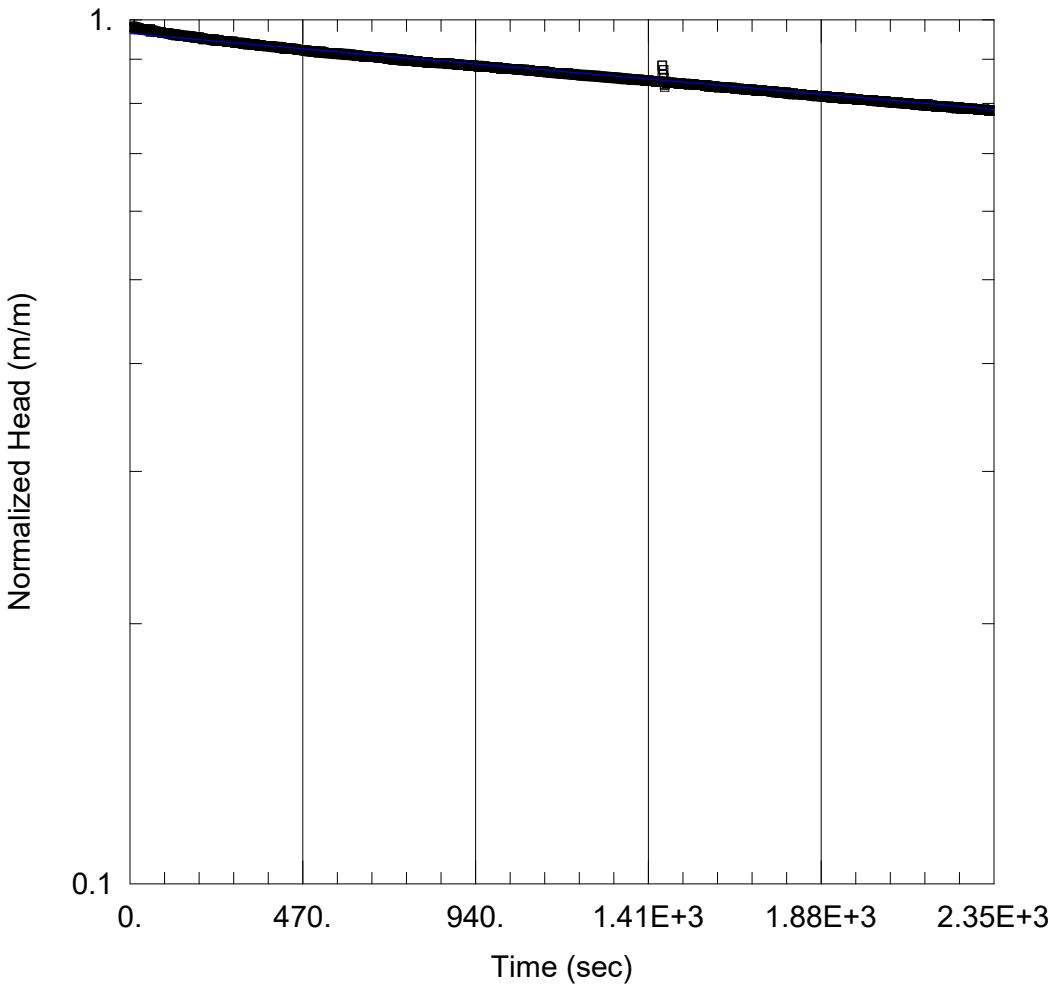
APPENDIX 'C'

IN-SITU HYDRAULIC CONDUCTIVITY TESTING DETAILS

REFERENCE NO. 2508-W033

Falling Head SWRT of BHMW 25-3

Prepared By:	Prepared For:
Soil Engineers Ltd.	Cavallino Estates Inc.
Project:	**Location:**
2508-W033	0 and12319 Centreville Creek Rd



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 3.745E-8 m/sec y0 = 0.4462 m

AQUIFER DATA

Saturated Thickness: 5.4 m Anisotropy Ratio (Kz/Kr): 1.

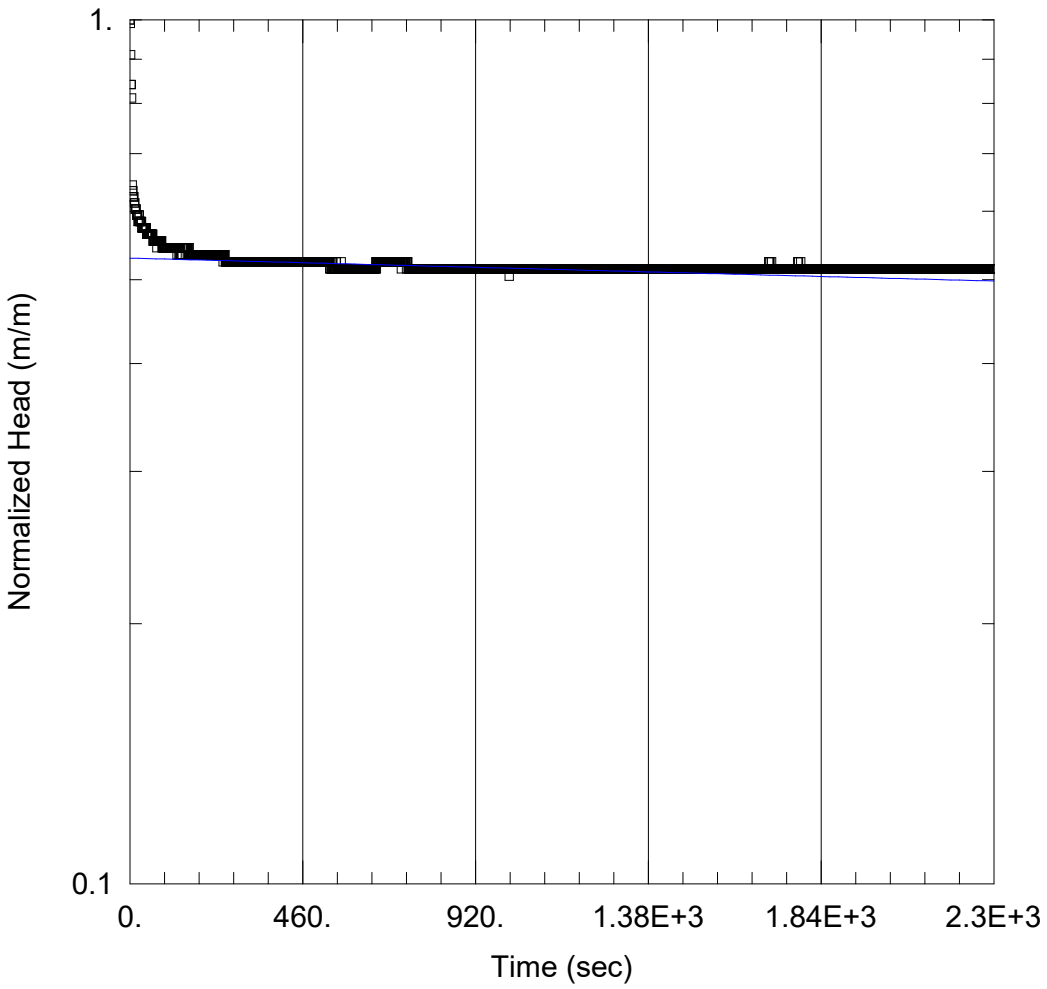
WELL DATA (BHMW 25-3)

Initial Displacement: 0.463 m
Static Water Column Height: 5.4 m
Total Well Penetration Depth: 5.4 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.0254 m

Soil Engineers Ltd.

Rising Head SWRT of BHMW 25-4

Prepared By:	Prepared For:
Soil Engineers Ltd.	Cavallino Estates Inc.
Project:	**Location:**
2508-W033	0 and 12319 Centreville Creek Rd



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 2.256E-8 m/sec y0 = 0.1605 m

AQUIFER DATA

Saturated Thickness: 1.3 m Anisotropy Ratio (Kz/Kr): 1.

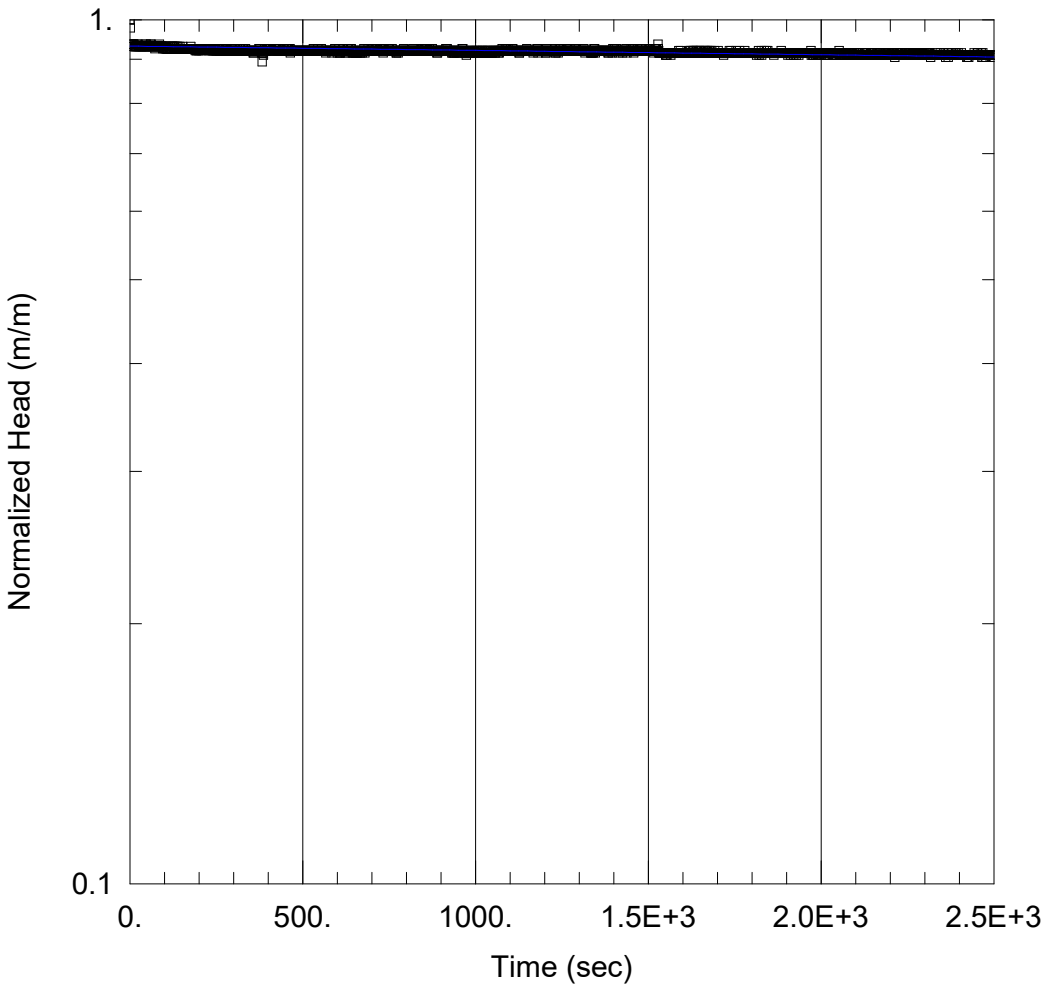
WELL DATA (BHMW 25-4)

Initial Displacement: 0.303 m
Static Water Column Height: 1.3 m
Total Well Penetration Depth: 2.5 m
Screen Length: 1.5 m
Casing Radius: 0.0254 m
Well Radius: 0.0254 m

Soil Engineers Ltd.

Falling Head SWRT of BHMW 103

Prepared By:	Prepared For:
Soil Engineers Ltd.	Cavallino Estates Inc.
Project:	**Location:**
2508-W033	0 and 12319 Centreville Creek Rd



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 8.618E-9 m/sec y0 = 0.1762 m

AQUIFER DATA

Saturated Thickness: 1.7 m Anisotropy Ratio (Kz/Kr): 1.

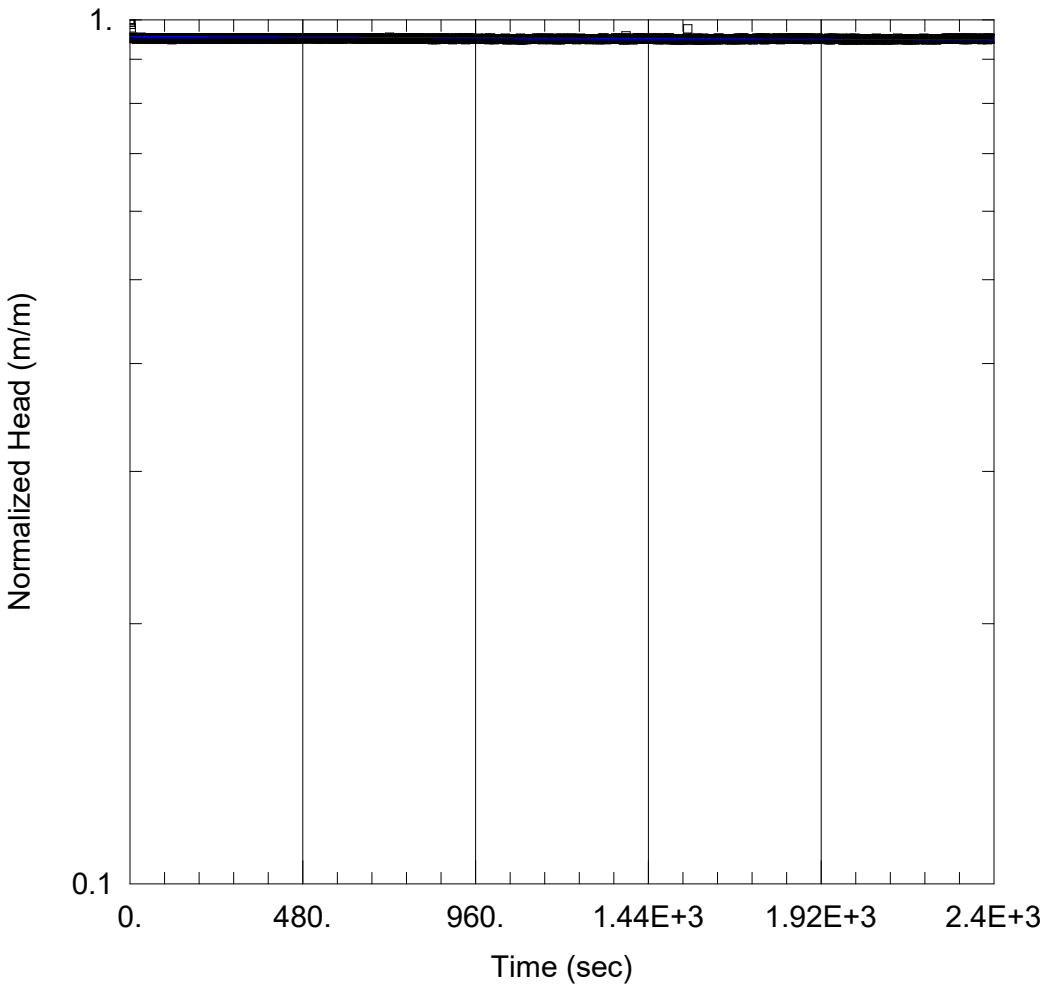
WELL DATA (BHMW 103)

Initial Displacement: 0.189 m
Static Water Column Height: 1.7 m
Total Well Penetration Depth: 2.5 m
Screen Length: 1.5 m
Casing Radius: 0.0254 m
Well Radius: 0.0254 m

Soil Engineers Ltd.

Falling Head SWRT of BHMW 104D

Prepared By:	Prepared For:
Soil Engineers Ltd.	Cavallino Estates Inc.
Project:	**Location:**
2508-W033	0 and12319 Centreville Creek Rd



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 2.734E-9 m/sec y0 = 0.4811 m

AQUIFER DATA

Saturated Thickness: 1.9 m Anisotropy Ratio (Kz/Kr): 1.

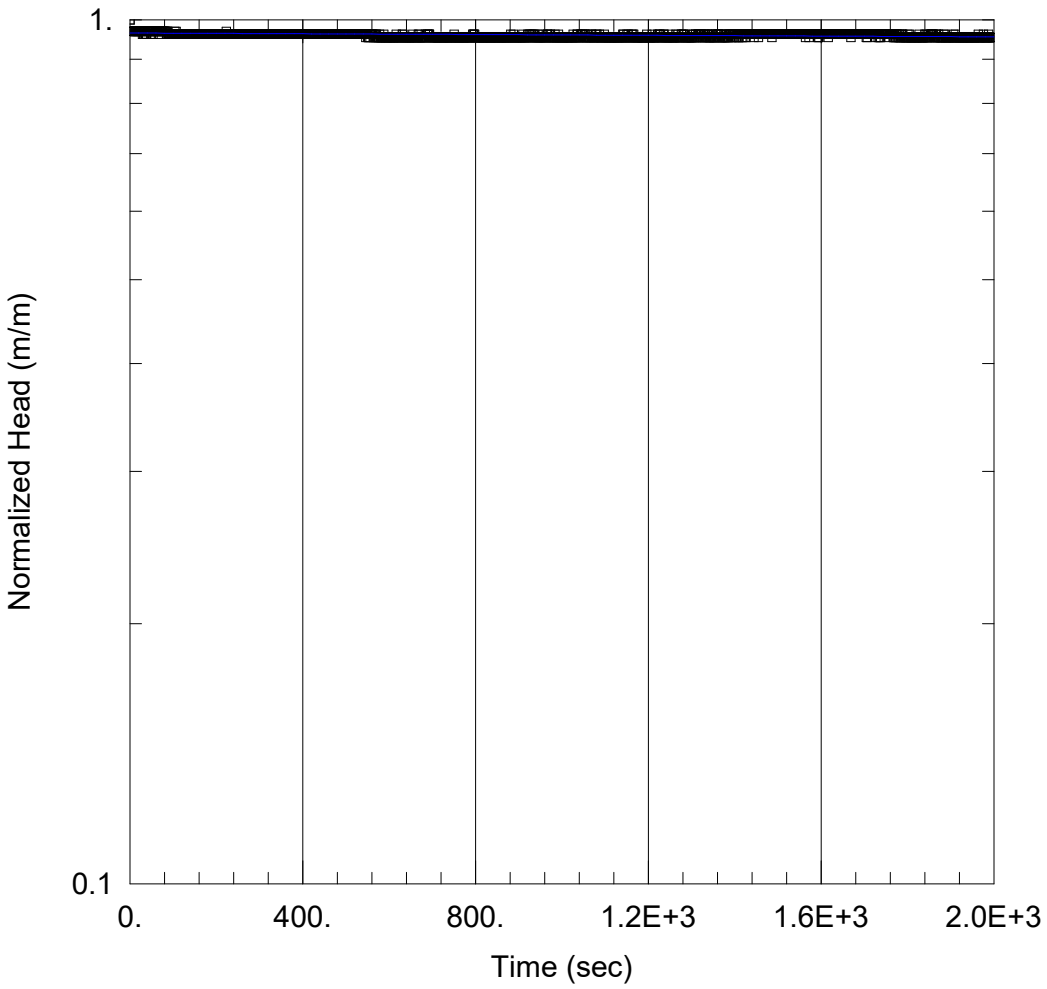
WELL DATA (BHMW 104D)

Initial Displacement: 0.503 m
Static Water Column Height: 1.9 m
Total Well Penetration Depth: 1.9 m
Screen Length: 1.5 m
Casing Radius: 0.0254 m
Well Radius: 0.0254 m

Soil Engineers Ltd.

Falling Head SWRT of BHMW 105

Prepared By:	Prepared For:
Soil Engineers Ltd.	Cavallino Estates Inc.
Project:	**Location:**
2508-W033	0 and 12319 Centreville Creek Rd



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 2.207E-9 m/sec y0 = 0.3764 m

AQUIFER DATA

Saturated Thickness: 2.9 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BHMW 105)

Initial Displacement: 0.39 m
Static Water Column Height: 2.9 m
Total Well Penetration Depth: 4. m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.0254 m

Soil Engineers Ltd.

Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE 100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

BARRIE	MISSISSAUGA	OSHAWA	NEWMARKET	MUSKOKA	HAMILTON
TEL: (705) 721-7863	TEL: (905) 542-7605	TEL: (905) 440-2040	TEL: (905) 853-0647	TEL: (705) 684-4242	TEL: (905) 777-7956
FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

APPENDIX 'D'

WATER QUALITY TEST RESULTS

REFERENCE NO. 2508-W033

FINAL REPORT

CA40031-OCT25 R1

2508-W033, 0 and 12319 Centreville Creek Rd, C.aledon

Prepared for

Soil Engineers Ltd.

FINAL REPORT

CA40031-OCT25 R1

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Soil Engineers Ltd.	Project Specialist	Jill Campbell, B.Sc.,GISAS
		Laboratory	SGS Canada Inc.
Address	90 West Beaver Creek Rd Richmond, ON M1S 3A7. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Tarek Agha	Telephone	2165
Telephone	437-215-8966	Facsimile	705-652-6365
Facsimile		Email	jill.campbell@sgs.com
Email	tarek.agha@soilengineersltd.com	SGS Reference	CA40031-OCT25
Project	2508-W033, 0 and 12319 Centreville Creek Rd, C.aledon	Received	10/03/2025
Order Number		Approved	10/10/2025
Samples	Ground Water (1)	Report Number	CA40031-OCT25 R1
		Date Reported	10/10/2025

COMMENTS

RL - SGS Reporting Limit
Temperature of Sample upon Receipt: 5 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:045267

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

TABLE OF CONTENTS

Client: Soil Engineers Ltd.
Project: 2508-W033, 0 and 12319 Centreville Creek Rd, C.aledon
Project Manager: Tarek Agha
Samplers: Jalil Ghalamghash

MATRIX: WATER

L1 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010

L2 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Storm Sewer Discharge - BL_53_2010

Sample Number	8
Sample Name	MW-25-3
Sample Matrix	Ground Water
Sample Date	02/10/2025

Parameter	Units	RL	L1	L2	Result
General Chemistry					
Biochemical Oxygen Demand (BOD5)	mg/L	2	300	15	< 4 ↑
Total Suspended Solids	mg/L	2	350	15	4
Total Kjeldahl Nitrogen	as N mg/L	0.5	100	1	< 0.5
Metals and Inorganics					
Fluoride	mg/L	0.06	10		0.23
Cyanide (total)	mg/L	0.01	2	0.02	< 0.01
Sulphate	mg/L	1	1500		810
Aluminum (total)	mg/L	0.001	50		0.098
Antimony (total)	mg/L	0.0009	5		< 0.0009
Arsenic (total)	mg/L	0.0002	1	0.02	0.0020
Cadmium (total)	mg/L	0.000003	0.7	0.008	0.000099
Chromium (total)	mg/L	0.00008	5	0.08	0.00516
Copper (total)	mg/L	0.001	3	0.05	0.003
Cobalt (total)	mg/L	0.000004	5		0.00211
Lead (total)	mg/L	0.00009	3	0.12	0.00029
Manganese (total)	mg/L	0.00001	5	0.05	1.16
Molybdenum (total)	mg/L	0.0004	5		0.0104
Nickel (total)	mg/L	0.0001	3	0.08	0.0034
Phosphorus (total)	mg/L	0.003	10	0.4	0.051
Selenium (total)	mg/L	0.00004	1	0.02	0.00124
Silver (total)	mg/L	0.00005	5	0.12	< 0.00005
Tin (total)	mg/L	0.00006	5		0.00089

Client: Soil Engineers Ltd.
Project: 2508-W033, 0 and 12319 Centreville Creek Rd, C.aledon
Project Manager: Tarek Agha
Samplers: Jalil Ghalamghash

MATRIX: WATER

Sample Number	8
Sample Name	MW-25-3
Sample Matrix	Ground Water
Sample Date	02/10/2025

L1 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010

L2 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Storm Sewer Discharge - BL_53_2010

Parameter	Units	RL	L1	L2	Result
Metals and Inorganics (continued)					
Titanium (total)	mg/L	0.0001	5		0.0046
Zinc (total)	mg/L	0.002	3	0.04	0.040
Microbiology					
Ecoli	mpn/100mL	0		200	0
Nonylphenol and Ethoxylates					
Nonylphenol	mg/L	0.001	0.02		< 0.001
Nonylphenol Ethoxylates	mg/L	0.01	0.2		< 0.01
Nonylphenol diethoxylate	mg/L	0.01			< 0.01
Nonylphenol monoethoxylate	mg/L	0.01			< 0.01
Oil and Grease					
Oil & Grease (total)	mg/L	2			< 2
Oil & Grease (animal/vegetable)	mg/L	4	150		< 4
Oil & Grease (mineral/synthetic)	mg/L	4	15		< 4

Client: Soil Engineers Ltd.
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Project Manager: Tarek Agha
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MATRIX: WATER

L1 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010

L2 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Storm Sewer Discharge - BL_53_2010

Sample Number	8
Sample Name	MW-25-3
Sample Matrix	Ground Water
Sample Date	02/10/2025

Parameter	Units	RL	L1	L2	Result
Other (ORP)					
pH	No unit	0.05	10	9	7.31
Mercury (total)	mg/L	0.00001	0.01	0.0004	0.00003
PCBs					
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.0001	0.001	0.0004	< 0.0001
Phenols					
4AAP-Phenolics	mg/L	0.001	1	0.008	< 0.001
SVOCs					
di-n-Butyl Phthalate	mg/L	0.002	0.08	0.015	< 0.002
Bis(2-ethylhexyl)phthalate	mg/L	0.002	0.012	0.0088	0.002
VOCs					
Chloroform	mg/L	0.0005	0.04	0.002	< 0.0005
1,2-Dichlorobenzene	mg/L	0.0005	0.05	0.0056	< 0.0005
1,4-Dichlorobenzene	mg/L	0.0005	0.08	0.0068	< 0.0005
cis-1,2-Dichloroethene	mg/L	0.0005	4	0.0056	< 0.0005
trans-1,3-Dichloropropene	mg/L	0.0005	0.14	0.0056	< 0.0005
Methylene Chloride	mg/L	0.0005	2	0.0052	< 0.0005
1,1,2,2-Tetrachloroethane	mg/L	0.0005	1.4	0.017	< 0.0005
Methyl ethyl ketone	mg/L	0.02	8		< 0.02
Styrene	mg/L	0.0005	0.2		< 0.0005
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	1	0.0044	< 0.0005
Trichloroethylene	mg/L	0.0005	0.4	0.008	< 0.0005

Client: Soil Engineers Ltd.
Project: 2508-W033, 0 and 12319 Centreville Creek Rd, C.aledon
Project Manager: Tarek Agha
Samplers: Jalil Ghalamghash

MATRIX: WATER

Sample Number	8
Sample Name	MW-25-3
Sample Matrix	Ground Water
Sample Date	02/10/2025

L1 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010

L2 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Storm Sewer Discharge - BL_53_2010

Parameter	Units	RL	L1	L2	Result
VOCs - BTEX					
Benzene	mg/L	0.0005	0.01	0.002	< 0.0005
Ethylbenzene	mg/L	0.0005	0.16	0.002	< 0.0005
Toluene	mg/L	0.0005	0.27	0.002	< 0.0005
Xylene (total)	mg/L	0.0005	1.4	0.0044	< 0.0005
m-p-xylene	mg/L	0.0005			< 0.0005
o-xylene	mg/L	0.0005			< 0.0005

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010 L1	SANSEW / WATER / - - Peel Sewer Use ByLaw - Storm Sewer Discharge - BL_53_2010 L2
MW-25-3					
Manganese	SM 3030/EPA 200.8	mg/L	1.16		0.05

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 375.4 | Internal ref.: ME-CA-[ENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphate	DIO8011-OCT25	mg/L	1	<2	0	20	104	80	120	95	75	125

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-[ENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0008-OCT25	mg/L	2	< 2	8	30	103	70	130	83	70	130

Cyanide by SFA

Method: SM 4500 | Internal ref.: ME-CA-[ENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cyanide (total)	SKA0062-OCT25	mg/L	0.01	<0.01	ND	10	98	90	110	98	75	125

QC SUMMARY

Fluoride by Specific Ion Electrode

Method: SM 4500 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-014

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Fluoride	EWL0149-OCT25	mg/L	0.06	<0.06	ND	10	90	90	110	95	75	125

Mercury by CVAAS

Method: EPA 7471A/SM 3112B I Internal ref.: ME-CA-[ENV]SPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0018-OCT25	mg/L	0.00001	< 0.00001	ND	20	115	80	120	114	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0072-OCT25	mg/L	0.00005	<0.00005	ND	20	100	90	110	NV	70	130
Aluminum (total)	EMS0072-OCT25	mg/L	0.001	<0.001	3	20	101	90	110	91	70	130
Arsenic (total)	EMS0072-OCT25	mg/L	0.0002	<0.0002	ND	20	98	90	110	85	70	130
Cadmium (total)	EMS0072-OCT25	mg/L	0.000003	<0.000003	0	20	98	90	110	79	70	130
Cobalt (total)	EMS0072-OCT25	mg/L	0.000004	<0.000004	3	20	100	90	110	80	70	130
Chromium (total)	EMS0072-OCT25	mg/L	0.00008	<0.00008	5	20	104	90	110	89	70	130
Copper (total)	EMS0072-OCT25	mg/L	0.001	<0.001	ND	20	102	90	110	96	70	130
Manganese (total)	EMS0072-OCT25	mg/L	0.00001	<0.00001	0	20	99	90	110	96	70	130
Molybdenum (total)	EMS0072-OCT25	mg/L	0.0004	<0.0004	6	20	98	90	110	81	70	130
Nickel (total)	EMS0072-OCT25	mg/L	0.0001	<0.0001	12	20	102	90	110	91	70	130
Lead (total)	EMS0072-OCT25	mg/L	0.00009	<0.00009	ND	20	100	90	110	84	70	130
Phosphorus (total)	EMS0072-OCT25	mg/L	0.003	<0.003	2	20	99	90	110	NV	70	130
Antimony (total)	EMS0072-OCT25	mg/L	0.0009	<0.0005	ND	20	105	90	110	83	70	130
Selenium (total)	EMS0072-OCT25	mg/L	0.00004	<0.00004	ND	20	101	90	110	84	70	130
Tin (total)	EMS0072-OCT25	mg/L	0.00006	<0.00006	ND	20	99	90	110	NV	70	130
Titanium (total)	EMS0072-OCT25	mg/L	0.0001	<0.0001	9	20	100	90	110	NV	70	130
Zinc (total)	EMS0072-OCT25	mg/L	0.002	<0.002	1	20	102	90	110	101	70	130

QC SUMMARY

Microbiology

Method: SM 9223B | Internal ref.: ME-CA-IENVIMIC-LAK-AN-021

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ecoli	BAC9082-OCT25	mpn/100mL	-	ACCEPTED	ACCEPTED							

Nonylphenol and Ethoxylates

Method: ASTM D7065-06 | Internal ref.: ME-CA-IENVIGC-LAK-AN-015

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nonylphenol diethoxylate	GCM0078-OCT25	mg/L	0.01	<0.01			78	55	120			
Nonylphenol monoethoxylate	GCM0078-OCT25	mg/L	0.01	<0.01			80	55	120			
Nonylphenol	GCM0078-OCT25	mg/L	0.001	<0.001			78	55	120			

QC SUMMARY

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (total)	GCM0132-OCT25	mg/L	2	<2	NSS	20	95	75	125			

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (animal/vegetable)	GCM0132-OCT25	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0132-OCT25	mg/L	4	< 4	NSS	20	NA	70	130			

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0148-OCT25	No unit	0.05	NA	0		100			NA		

QC SUMMARY

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-[ENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0055-OCT25	mg/L	0.001	<0.001	ND	10	100	80	120	99	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-[ENVIGC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0076-OCT25	mg/L	0.0001	<0.0001	NSS	30	87	60	140	NSS	60	140

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Bis(2-ethylhexyl)phthalate	GCM0107-OCT25	mg/L	0.002	< 0.002	NSS	30	106	50	140	NSS	50	140
di-n-Butyl Phthalate	GCM0107-OCT25	mg/L	0.002	< 0.002	NSS	30	105	50	140	NSS	50	140

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0173-OCT25	mg/L	2	< 2	4	10	92	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0091-OCT25	as N mg/L	0.5	<0.5	7	10	97	90	110	94	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENV]GC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,2,2-Tetrachloroethane	GCM0135-OCT25	mg/L	0.0005	<0.0005	ND	30	95	60	130	107	50	140
1,2-Dichlorobenzene	GCM0135-OCT25	mg/L	0.0005	<0.0005	ND	30	96	60	130	108	50	140
1,4-Dichlorobenzene	GCM0135-OCT25	mg/L	0.0005	<0.0005	ND	30	94	60	130	107	50	140
Benzene	GCM0135-OCT25	mg/L	0.0005	<0.0005	ND	30	96	60	130	104	50	140
Chloroform	GCM0135-OCT25	mg/L	0.0005	<0.0005	ND	30	96	60	130	102	50	140
cis-1,2-Dichloroethene	GCM0135-OCT25	mg/L	0.0005	<0.0005	ND	30	97	60	130	103	50	140
Ethylbenzene	GCM0135-OCT25	mg/L	0.0005	<0.0005	5	30	95	60	130	107	50	140
m-p-xylene	GCM0135-OCT25	mg/L	0.0005	<0.0005	7	30	92	60	130	106	50	140
Methyl ethyl ketone	GCM0135-OCT25	mg/L	0.02	<0.02	ND	30	97	50	140	103	50	140
Methylene Chloride	GCM0135-OCT25	mg/L	0.0005	<0.0005	ND	30	85	60	130	90	50	140
o-xylene	GCM0135-OCT25	mg/L	0.0005	<0.0005	6	30	96	60	130	110	50	140
Styrene	GCM0135-OCT25	mg/L	0.0005	<0.0005	ND	30	95	60	130	106	50	140
Tetrachloroethylene (perchloroethylene)	GCM0135-OCT25	mg/L	0.0005	<0.0005	ND	30	95	60	130	102	50	140
Toluene	GCM0135-OCT25	mg/L	0.0005	<0.0005	ND	30	96	60	130	104	50	140
trans-1,3-Dichloropropene	GCM0135-OCT25	mg/L	0.0005	<0.0005	ND	30	97	60	130	101	50	140
Trichloroethylene	GCM0135-OCT25	mg/L	0.0005	<0.0005	ND	30	97	60	130	106	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS	Insufficient sample for analysis.
RL	Reporting Limit.
↑	Reporting limit raised.
↓	Reporting limit lowered.
NA	The sample was not analysed for this analyte
ND	Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 045267 Page _____ of _____

Laboratory Information Section - Lab use only

Received By: Mojeed Almanoke
Received Date: OCT 03 2025 (mm/dd/yy)
Received Time: 10:00 (hr : min)
Received By (signature): Mojeed Almanoke
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☐ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: Ice
Temperature Upon Receipt (°C) 5°C x3
LAB LIMS #: CA-40031-Oct 25 NP

REPORT INFORMATION	INVOICE INFORMATION
Company: Soil Engineers Ltd.	☐ (same as Report Information)
Contact: Tarek Agha	Company:
Address: 90 W Beaver Creek St. suite #100, Richmond Hill, ON	Contact:
Phone: 416-779-1853	Address:
Fax:	Phone:
Email: Tarek.agha@soilEngineersltd.com	Email:

Quotation #: _____ P.O. #: _____
Project #: 2508-W033 Site Location/ID: 0 and 12319 Centreville Creek Rd., Caledon

TURNAROUND TIME (TAT) REQUIRED
☐ Client Regular TAT ☑ Regular TAT (5-7days)
TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day
RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION
Specify Due Date: _____
*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS
☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture: ☐ Coarse
☐ Table 2 ☐ Ind/Com ☐ Medium/Fine
☐ Table 3 ☐ Agri/Other
☐ Table _____ Appx. _____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations: ☐ Reg 347/558 (3 Day min TAT) ☐ PWQO ☐ MMER ☐ CCME ☐ Other: ☐ MISA ☐ ODWS Not Reportable *See note
Sewer By-Law: ☐ Sanitary ☑ Storm Municipality: Peel Region

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN, Hg pH,(B(HWS),EC,SAR–soil) (Cl, Na-water))	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI	M&I: ICP Metals only (Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Tl,U,V,Zn)	SVOC: PAHs only	SVOC: SVOCs all incl PAHs, ABNs, CPs	PCB: PCBs Total ☐ Arocolor ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only no BTEX	VOC: VOCs all incl BTEX	VOC: BTEX only	Pest: Pesticides Organochlorine or specify other	Other (please specify): Peel Region / Sewer Use by-law	Sewer Use: Specify pkg:	Water Characterization Pkg General ☐ Extended ☐	SPLP: Specify tests	TCLP: Specify tests
1	MW-25-3	10/02/2025	15:00	18	GW	N																
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

COMMENTS:

Observations/Comments/Special Instructions

Sampled By (NAME): Jalil Ghalamghash Signature: Ghalam Ghash Date: 10/02/2025 (mm/dd/yy)
Relinquished by (NAME): JG Signature: _____ Date: _____/_____/_____ (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.8

Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE 100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

BARRIE	MISSISSAUGA	OSHAWA	NEWMARKET	MUSKOKA	HAMILTON
TEL: (705) 721-7863	TEL: (905) 542-7605	TEL: (905) 440-2040	TEL: (905) 853-0647	TEL: (705) 684-4242	TEL: (905) 777-7956
FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

APPENDIX 'E'

SHORT-TERM DEWATERING AND LONG-TERM FOUNDATION DRAINAGE FLOW RATE ESTIMATES AND REVIEWED PLANS

REFERENCE NO. 2508-W033

SOLMAR DRAFT PLAN

BLOCK 37
ROAD WIDENING BLOCK
0.150ha

BLOCK 32
MEDIUM DENSITY BLOCK
0.973 ha

BLOCK 33
MEDIUM DENSITY BLOCK
0.956 ha

BLOCK 34
FUTURE DEVELOPMENT BLOCK
0.009 ha

BLOCK 35
FUTURE DEVELOPMENT BLOCK
0.016 ha

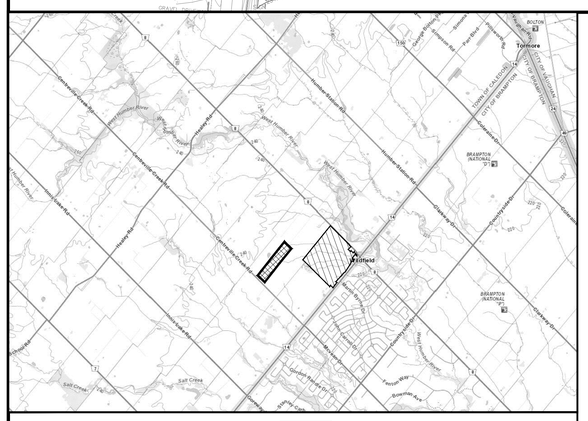
BLOCK 36
FUTURE DEVELOPMENT BLOCK
0.018 ha

STREET 'A' | STREET 'B' | STREET 'C' | STREET 'D' | STREET 'E' | STREET 'F' | STREET 'G' | STREET 'H' | STREET 'I' | STREET 'J' | STREET 'K'

BLOCK 1 6.1m DFTH 0.134 ha 6 units
BLOCK 2 6.1m DFTH 0.137 ha 7 units
BLOCK 3 6.1m DETH 0.137 ha 7 units
BLOCK 4 6.1m DFTH 0.137 ha 7 units
BLOCK 5 6.1m DFTH 0.131 ha 6 units
BLOCK 6 6.1m DFTH 0.150 ha 7 units
BLOCK 7 6.1m DFTH 0.137 ha 7 units
BLOCK 8 6.1m DFTH 0.137 ha 7 units
BLOCK 9 6.1m DFTH 0.137 ha 7 units
BLOCK 10 6.1m DFTH 0.132 ha 6 units
BLOCK 11 6.1m DFTH 0.142 ha 7 units
BLOCK 12 6.1m DFTH 0.142 ha 7 units
BLOCK 13 6.1m DFTH 0.142 ha 7 units
BLOCK 14 6.1m DFTH 0.141 ha 7 units
BLOCK 15 6.1m DFTH 0.121 ha 6 units
BLOCK 16 6.1m DFTH 0.116 ha 6 units
BLOCK 17 6.1m DFTH 0.121 ha 6 units
BLOCK 18 6.1m DFTH 0.101 ha 5 units
BLOCK 19 6.1m OSTH 0.118 ha 6 units
BLOCK 20 6.1m OSTH 0.109 ha 6 units
BLOCK 21 6.1m OSTH 0.116 ha 6 units
BLOCK 22 6.1m OSTH 0.121 ha 6 units
BLOCK 23 6.1m OSTH 0.111 ha 6 units
BLOCK 24 6.1m OSTH 0.110 ha 6 units
BLOCK 25 6.1m OSTH 0.110 ha 6 units
BLOCK 26 6.1m OSTH 0.109 ha 6 units
BLOCK 27 6.1m OSTH 0.100 ha 5 units
BLOCK 28 6.1m OSTH 0.139 ha 7 units
BLOCK 29 6.1m OSTH 0.142 ha 7 units
BLOCK 30 6.1m OSTH 0.106 ha 5 units
BLOCK 31 6.1m OSTH 0.104 ha 5 units

CENTREVILLE CREEK ROAD (NAMED BY BY-LAW No. 93-65, INST. No. RO1059219) (ALSO KNOWN AS THIRD LINE) (ROAD ALLOWANCE BETWEEN CONCESSIONS 2 AND 3, ALBION)

PART 2, PLAN 43R-3525
LOT 3
CONCESSION 3
PART 5, PLAN 43R-3496
PART 6 PLAN 43R-3496
P.I.N. 14348 - 0161
P.I.N. 14348 - 0188
PART 1, PLAN 43R-13565
P.I.N. 14348 - 0481
P.I.N. 14348 - 0444
P.I.N. 14348 - 16789



KEYPLAN — Subject Property — Other Lands Owned by Applicant

LEGEND

Subject Property

NOTES

All dimensions are in metres.
All area measurements are computer generated.
All elevations refer to Geodetic Datum.

15 0 5 10 25 50 m

LAND USE - AREA TABLE	24107-4A	12dp	Oct 14, 2025	
Double Frontage Townhouses	Blocks	1-18	23%	2.397 ha±
On-Street Townhouses	Blocks	19-31	15%	1.498
Medium Density Blocks	Blocks	32-33	19%	1.929
Future Development Blocks	Blocks	34-36	0%	0.043
Road Widening	Block	37	1%	0.150
Roads			41%	4.261
Total			100%	**10.278 ha±**

ROADS			
26.0m Public R.O.W.	656	m	1.766
23.5m Public R.O.W.	124	m	0.294
18.0m Public R.O.W.	1,192	m	2.201
Total	**1,316**	**m**	**4.261 ha**

PRELIMINARY UNIT COUNT		
6.1m Double Frontage Townhouses	118	units
6.1m On-Street Townhouses	77	
Medium Density Apartment Units (conceptual)	TBD	*
Total	**195**	**units***

* Final Unit Count to be determined at the time of Site Plan application

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT

A, B, E, F, G, J, L - As Shown on Plan
C. Additional lands owned by the applicant as shown on the key plan.
D. On-Street Townhouses, Double Frontage Townhouses, Medium Density Blocks, Roads and Road Widening.
H. Piped water to be provided.
I. Clay loam soil.
K. Sanitary & storm sewers to be provided.

SURVEYOR'S CERTIFICATE

I certify that: the boundaries of the lands to be subdivided and their relationship to the adjacent lands are correctly shown.

S. Goonewardena, O.L.S. Day Month Year
R-PE Surveying Ltd.

OWNER'S AUTHORIZATION

I/we, CAVALLINO ESTATES INC.
being the registered owner(s) of the subject lands hereby authorize BOUSFIELDs INC. to prepare and submit a draft plan of subdivision for approval.

Mauro Baldassarra Day Month Year

DRAFT PLAN OF PROPOSED SUBDIVISION PART OF LOT 2 CONCESSION 3 (GEOGRAPHIC TOWNSHIP OF ALBION) TOWN OF CALEDON

BOUSFIELDs INC.
3 Church Street, Suite 200
Toronto, Ontario M5E 1M2
P (416) 947-9744
F (416) 947-0781

1 : 1250	October 14, 2025	24107-4A 12dp
Scale	Date	Drawing Number

SHORT TERM DEWATERING FLOW RATES FOR THE UNDERGROUND SERVICES INSTALLATION

Dewatering Rate Formula for an Unconfined Aquifer (Powers et al., 2007):

$$Q = \frac{\pi K (H^2 - h^2)}{\ln(R_0 / r_s)} + 2\left[\frac{xK(H^2 - h^2)}{2L}\right]$$

Where:

- Q = Anticipated pumping rate (m^3/day)
- K = Hydraulic Conductivity (m/day)
- H = Initial Hight of static groundwater level to bottom of the saturated aquifer (m)
- h = Depth of water in the well while pumping (m)
- R_0 = Distance from a point of greatest drawdown to a point where there is no drawdown (Radius of influence) (m)
- r_s = Distance to the wellpoints from the centre of the trench (m), assumed to be half of the trench width
- x = Trench Length (m)
- L = Distance from a line source to the trench, R_o (m)/2

Radius of Influence Formula (Bear, 1979):

$$R_0 = 2.45\sqrt{\frac{HK}{S_y}}t$$

Where:

- R_0 = Radius of Influence (m), beyond which there is negligible drawdown
- H = Distance from initial static water level to bottom of saturated aquifer (m)
- K = Hydraulic conductivity (m/s)
- S_y = Specific yield of the aquifer formation
- t =Time (s) required to draw the static groundwater level to the desired level (assumed to be equivalent to 14 days)

Parameter	Units	BH/MW 25-3	BH/MW 25-4	GEI BH/MW 103	GEI BH/MW 104S	GEI BH/MW 105
Total Anticipated Short Term Dewatering Flow including Storm Event and Safety Factor	**L/day**	**6,400.0**	**4,600.0**	**4,900.0**	**6,850.0**	**5,950.0**
Anticipated Storm Flow (2Year-3Hr event)	**L/day**	**3,100.0**	**3,100.0**	**3,100.0**	**3,100.0**	**3,100.0**
Storm Event (2Year-3Hr event)	**m**	0.0303	0.0303	0.0303	0.0303	0.0303
Proposed Heighest Grading Elevation	**masl**	228.82	229.03	229.23	229.65	230.12
Existing Ground Surface Elevation	**masl**	236.60	236.10	235.00	237.50	234.90
Highest Interpreted Groundwater Elevation	**masl**	234.30	231.90	231.10	235.60	232.20
Proposed Invert Elevation for the Excavation	**masl**	231.60	231.10	230.00	232.50	229.90
Width	**m**	2.0	2.0	2.0	2.0	2.0
Length	**m**	50.0	50.0	50.0	50.0	50.0
Area	**m2**	100.0	100.0	100.0	100.0	100.0
Perimeter	**m**	104.0	104.0	104.0	104.0	104.0
Q s.f. 1.5	**L/day**	**3,300.0**	**1,500.0**	**1,800.0**	**3,750.0**	**2,850.0**
Q	**L/day**	**2,200.0**	**1,000.0**	**1,200.0**	**2,500.0**	**1,900.0**
Q	**m^3/day**	2.1	1.0	1.1	2.4	1.9
K	**m/day**	0.0032	0.0032	0.0032	0.0032	0.0032
H	**m**	6.2	4.3	4.6	6.6	5.8
h	**m**	2.5	2.5	2.5	2.5	2.5
R_0	**m**	5.3	4.4	4.5	5.4	5.1
Trench width (b)	**m**	2.0	2.0	2.0	2.0	2.0
r_s	**m**	1.0	1.0	1.0	1.0	1.0
x (a)	**m**	50.0	50.0	50.0	50.0	50.0
L	**m**	2.6	2.2	2.3	2.7	2.5
	a/b	25.0	25.0	25.0	25.0	25.0

Parameter	Units					
R_0	**m**	5.3	4.4	4.5	5.4	5.1
H	**m**	6.2	4.3	4.6	6.6	5.8
K	**m/s**	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08
S_Y (Johnson,1967)		0.06	0.06	0.06	0.06	0.06
t	**s**	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0

	Type of House	Townhouse Unit or Lot Widths (b)	Townhouse Unit Lot Length (a)	Existing Lowest Grading (masl)	Assumed Depth of the excavation (masl)	Approximate Nearest Highest GW Contour Map or Highest GW elevation (masl)	difference between the Groundwater contour and Base of the excavation (m)	dewatering Required	Total Lot Area	60% of the Lot Area	Actual width of the excavation (b')	Actual Trench Length (for Building Excavation/foundations) (a')	Actual Perimeter	a/b
Block 1	TH BLK	6.1	30.0	237.00	234.0	232.50	-1.5	No	183.0	109.8	6.1	18.0	48.2	3.0
Block 2	TH BLK	6.1	30.0	237.00	234.0	233.00	-1.0	No	183.0	109.8	6.1	18.0	48.2	3.0
Block 3	TH BLK	6.1	30.0	237.00	234.0	233.00	-1.0	No	183.0	109.8	6.1	18.0	48.2	3.0
Block 4	TH BLK	6.1	30.0	236.25	233.3	233.50	0.3	Yes	183.0	109.8	6.1	18.0	48.2	3.0
Block 5	TH BLK	6.1	30.0	237.00	234.0	233.50	-0.5	No	183.0	109.8	6.1	18.0	48.2	3.0
Block 6	TH BLK	6.1	30.0	236.25	233.3	232.0	-1.3	No	183.0	109.8	6.1	18.0	48.2	3.0
Block 7	TH BLK	6.1	30.0	235.75	232.8	232.5	-0.3	No	183.0	109.8	6.1	18.0	48.2	3.0
Block 8	TH BLK	6.1	30.0	236.00	233.0	232.50	-0.5	No	183.0	109.8	6.1	18.0	48.2	3.0
Block 9	TH BLK	6.1	30.0	236.50	233.5	232.5	-1.0	No	183.0	109.8	6.1	18.0	48.2	3.0
Block 10	TH BLK	6.1	30.0	236.50	233.5	232.5	-1.0	No	183.0	109.8	6.1	18.0	48.2	3.0
Block 11	TH BLK	6.1	30.0	236.50	233.5	234.0	0.5	Yes	183.0	109.8	6.1	18.0	48.2	3.0
Block 12	TH BLK	6.1	30.0	236.00	233.0	234.0	1.0	Yes	183.0	109.8	6.1	18.0	48.2	3.0
Block 13	TH BLK	6.1	30.0	235.50	232.5	233.0	0.5	Yes	183.0	109.8	6.1	18.0	48.2	3.0
Block 14	TH BLK	6.1	30.0	235.25	232.3	233.0	0.8	Yes	183.0	109.8	6.1	18.0	48.2	3.0
Block 15	TH BLK	6.1	30.0	235.25	232.3	234.0	1.8	Yes	183.0	109.8	6.1	18.0	48.2	3.0
Block 16	TH BLK	6.1	30.0	234.25	231.3	234.0	2.8	Yes	183.0	109.8	6.1	18.0	48.2	3.0
Block 17	TH BLK	6.1	30.0	234.75	231.8	233.0	1.3	Yes	183.0	109.8	6.1	18.0	48.2	3.0
Block 18	TH BLK	6.1	30.0	234.00	231.0	233.0	2.0	Yes	183.0	109.8	6.1	18.0	48.2	3.0
Block 19	TH BLK	6.1	27.5	236.50	233.5	232.0	-1.5	No	167.8	100.7	6.1	16.5	45.2	2.7
Block 20	TH BLK	6.1	27.5	235.25	232.3	232.0	-0.3	No	167.8	100.7	6.1	16.5	45.2	2.7
Block 21	TH BLK	6.1	27.5	234.75	231.8	231.5	-0.3	No	167.8	100.7	6.1	16.5	45.2	2.7
Block 22	TH BLK	6.1	28.3	235.25	232.3	231.5	-0.8	No	172.6	103.6	6.1	17.0	46.2	2.8
Block 23	TH BLK	6.1	28.3	235.75	232.8	231.5	-1.3	No	172.6	103.6	6.1	17.0	46.2	2.8
Block 24	TH BLK	6.1	27.8	235.75	232.8	231.5	-1.3	No	169.6	101.7	6.1	16.7	45.6	2.7
Block 25	TH BLK	6.1	27.8	236.00	233.0	231.5	-1.5	No	169.6	101.7	6.1	16.7	45.6	2.7
Block 26	TH BLK	6.1	27.7	235.75	232.8	231.5	-1.3	No	169.0	101.4	6.1	16.6	45.4	2.7
Block 27	TH BLK	6.1	27.6	236.25	233.3	231.5	-1.8	No	168.4	101.0	6.1	16.6	45.3	2.7
Block 28	TH BLK	6.1	29.5	235.00	232.0	232.0	0.0	No	180.0	108.0	6.1	17.7	47.6	2.9
Block 29	TH BLK	6.1	29.5	234.75	231.8	232.0	0.3	Yes	180.0	108.0	6.1	17.7	47.6	2.9
Block 30	TH BLK	6.1	30.7	234.50	231.5	232.0	0.5	Yes	187.3	112.4	6.1	18.4	49.0	3.0
Block 31	TH BLK	6.1	31.1	234.50	231.5	232.0	0.5	Yes	189.7	113.8	6.1	18.7	49.5	3.1

Dewatering Rate Formula for an Unconfined Aquifer (Powers et al., 2007):

$$Q = \frac{\pi K(H^2 - h^2)}{\ln(R_0 / r_s)} + 2\left[\frac{xK(H^2 - h^2)}{2L}\right]$$

Where:

Q = Anticipated pumping rate (m^3/day)
K = Hydraulic Conductivity (m/day)
H = Initial Hight of static groundwater level to bottom of the saturated aquifer (m)
h = Depth of water in the well while pumping (m)
R_0 = Distance from a point of greatest drawdown to a point where there is no drawdown (Radius of influence) (m)
r_s = Distance to the wellpoints from the centre of the trench (m), assumed to be half of the trench width
x = Trench Length (m)
L = Distance from a line source to the trench, R_0 (m)/2

Radius of Influence Formula (Bear, 1979):

$$R_0 = 2.45\sqrt{\frac{HK}{S_y}}t$$

Where:

R_0 = Radius of Influence (m), beyond which there is negligible drawdown
H = Distance from initial static water level to bottom of saturated aquifer (m)
K = Hydraulic conductivity (m/s)
S_y = Specific yield of the aquifer formation
t =Time (s) required to draw the static groundwater level to the desired level (assumed to be equivalent to 14 days)

SHORT-TERM DEWATERING FLOW RATES FOR TOWNHOUSE BLOCKS

Parameter		Block 4	Block 11	Block 12	Block 13	Block 14	Block 15	Block 16	Block 17	Block 18	Block 29	Block 30	Block 31
Total Anticipated Short-Term Dewatering Flow, including Storm Event and Safety Factor, Townhouse Block	**L/Day**	**30,100.0**	**30,100.0**	**31,150.0**	**30,100.0**	**31,150.0**	**28,500.0**	**31,200.0**	**27,600.0**	**24,500.0**	**30,100.0**	**22,000.0**	**22,000.0**
Total Anticipated Short-Term Dewatering Flow, including Storm Event and Safety Factor, Single unit	**L/Day**	**4,300.0**	**4,300.0**	**4,450.0**	**4,300.0**	**4,450.0**	**4,750.0**	**5,200.0**	**4,600.0**	**4,900.0**	**4,300.0**	**4,400.0**	**4,400.0**
Number of Units in townhouse BLK		**7**	**7**	**7**	**7**	**7**	**6**	**6**	**6**	**5**	**7**	**5**	**5**
Anticipated Storm Flow (2Year-3Hr event) Per TH Block	**L/Day**	**23,800**	**23,800**	**23,800**	**23,800**	**23,800**	**20,400**	**20,400**	**20,400**	**17,000**	**23,800**	**17,500**	**17,500**
Anticipated Storm Flow (2Year-3Hr event) Per Single Unit	**L/Day**	**3,400.0**	**3,400.0**	**3,400.0**	**3,400.0**	**3,400.0**	**3,400.0**	**3,400.0**	**3,400.0**	**3,400.0**	**3,400.0**	**3,500.0**	**3,500.0**
Storm Event (2Year-3Hr event)	**m**	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306
Existing Ground Surface Elevation from Site Plan	**masl**	236.25	236.50	236.00	235.50	235.25	235.25	234.25	234.75	234.00	234.75	234.50	234.50
Highest Interpreted Groundwater Elevation	**masl**	233.50	234.00	234.00	233.00	233.00	234.00	234.00	233.00	233.00	232.00	232.00	232.00
Assumed Invert Elevation for the Excavation	**masl**	233.25	233.50	233.00	232.50	232.25	232.25	231.25	231.75	231.00	231.75	231.50	231.50
Width	**m**	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Length	**m**	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	17.7	18.4	18.7
Area	**m2**	109.8	109.8	109.8	109.8	109.8	109.8	109.8	109.8	109.8	108.0	112.4	113.8
Perimeter	**m**	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	47.6	49.0	49.5
Q s.f. 1.5	**L/Day**	**900.0**	**900.0**	**1,050.0**	**900.0**	**1,050.0**	**1,350.0**	**1,800.0**	**1,200.0**	**1,500.0**	**900.0**	**900.0**	**900.0**
Q	**L/Day**	**600.0**	**600.0**	**700.0**	**600.0**	**700.0**	**900.0**	**1,200.0**	**800.0**	**1,000.0**	**600.0**	**600.0**	**600.0**
Q	**m^3/day**	0.5548	0.5810	0.6759	0.5810	0.6240	0.8610	1.1493	0.7336	0.9293	0.5519	0.5860	0.5888
K	**m/day**	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032
H	**m**	2.8	3.0	3.5	3.0	3.3	4.3	5.3	3.8	4.5	2.8	3.0	3.0
h	**m**	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
R_0	**m**	3.5	3.7	4.0	3.7	3.8	4.4	4.8	4.1	4.5	3.5	3.7	3.7
Trench width (b)	**m**	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
r_s	**m**	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
x (a)	**m**	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	17.7	18.4	18.7
L	**m**	1.8	1.8	2.0	1.8	1.9	2.2	2.4	2.0	2.2	1.8	1.8	1.8
	a/b	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.9	3.0	3.1

Parameter	Units												
R_0	**m**	3.5	3.7	4.0	3.7	3.8	4.4	4.8	4.1	4.5	3.5	3.7	3.7
H	**m**	2.8	3.0	3.5	3.0	3.3	4.3	5.3	3.8	4.5	2.8	3.0	3.0
K	**m/s**	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08
S_y (Johnson,1967)		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
t	**s**	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0

LONG-TERM DEWATERING FLOW RATES FOR TOWNHOUSE BLOCKS

Parameter		Block 4	Block 11	Block 12	Block 13	Block 14	Block 15	Block 16	Block 17	Block 18	Block 29	Block 30	Block 31
Total Anticipated Short-Term Dewatering Flow, including Storm Event and Safety Factor	**L/Day**	**4,000.0**	**5,050.0**	**7,150.0**	**5,050.0**	**6,100.0**	**8,000.0**	**10,700.0**	**6,200.0**	**7,500.0**	**4,000.0**	**3,750.0**	**3,850.0**
Anticipated Storm Flow (2Year-3Hr event)	**L/Day**	**1,900.0**	**1,900.0**	**1,900.0**	**1,900.0**	**1,900.0**	**1,700.0**	**1,700.0**	**1,700.0**	**1,500.0**	**1,900.0**	**1,500.0**	**1,600.0**
Storm Event (2Year-3Hr event)	**m**	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306
Q s.f. 1.5 (Whole lot or BLK)	**L/Day**	**2,100.0**	**3,150.0**	**5,250.0**	**3,150.0**	**4,200.0**	**6,300.0**	**9,000.0**	**4,500.0**	**6,000.0**	**2,100.0**	**2,250.0**	**2,250.0**
Q for the Whole lot or BLK	**L/Day**	**1,400.0**	**2,100.0**	**3,500.0**	**2,100.0**	**2,800.0**	**4,200.0**	**6,000.0**	**3,000.0**	**4,000.0**	**1,400.0**	**1,500.0**	**1,500.0**
Number of Units in townhouse BLK		**7**	**7**	**7**	**7**	**7**	**6**	**6**	**6**	**5**	**7**	**5**	**5**
Q for single unit	**L/Day**	**200.0**	**300.0**	**500.0**	**300.0**	**400.0**	**700.0**	**1,000.0**	**500.0**	**800.0**	**200.0**	**300.0**	**300.0**
Q	**m^3/day**	0.1371	0.2367	0.4055	0.2367	0.3237	0.6432	0.9677	0.4852	0.7228	0.1364	0.2387	0.2399
K	**m/day**	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032	0.0032
Existing Ground Surface Elevation from Site Plan	**masl**	229.02	231.41	231.41	231.41	231.41	231.41	231.41	231.41	231.41	231.41	231.41	231.41
Existing Ground Surface Elevation	**masl**	236.25	236.50	236.00	235.50	235.25	235.25	234.25	234.75	234.00	234.75	234.50	234.50
Highest Interpreted Groundwater Elevation	**masl**	233.50	234.00	234.00	233.00	233.00	234.00	234.00	233.00	233.00	232.00	232.00	232.00
Assumed Invert Elevation for the Excavation	**masl**	233.25	233.50	233.00	232.50	232.25	232.25	231.25	231.75	231.00	231.75	231.50	231.50
Width	**m**	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Length	**m**	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	17.7	18.4	18.7
Area	**m2**	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	23.8	24.5	24.8
Perimeter	**m**	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	47.6	49.0	49.5
H	**m**	2.8	3.0	3.5	3.0	3.3	4.3	5.3	3.8	4.5	2.8	3.0	3.0
h	**m**	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
R_0	**m**	3.5	3.7	4.0	3.7	3.8	4.4	4.8	4.1	4.5	3.5	3.7	3.7
Trench width (b)	**m**	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
r_s	**m**	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
x (a)	**m**	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	17.7	18.4	18.7
L	**m**	1.8	1.8	2.0	1.8	1.9	2.2	2.4	2.0	2.2	1.8	1.8	1.8
	a/b	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.9	3.0	3.1

Parameter	Units												
R_0	**m**	3.5	3.7	4.0	3.7	3.8	4.4	4.8	4.1	4.5	3.5	3.7	3.7
H	**m**	2.8	3.0	3.5	3.0	3.3	4.3	5.3	3.8	4.5	2.8	3.0	3.0
K	**m/s**	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08	3.70E-08
S_Y (Johnson,1967)		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
t	**s**	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0