Hydrogeological Investigation

Proposed Residential Development
5150 Ninth Line
Mississauga, Ontario

Prepared For:

Mattamy (5150 Ninth Line) Limited

Project #: 18-748-100
Date: Oct 5, 2020

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18-748-100 **October 5, 2020**

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Via email: flora.tang@mattamycorp.com

RE: Hydrogeological Assessment – 5150 Ninth Line, City of Mississauga, Ontario

DS Consultants Limited (DS) was retained by Mattamy (5150 Ninth Line) Limited to complete a hydrogeological assessment for the proposed development at 5150 Ninth Line in Mississauga, Ontario (Site). It is understood that the proposed development will be a residential subdivision including residential houses with one level of basement, roads and sewers. The average grade elevation at site is about 191 meters above sea level (masl). The assumed finished floor elevation of the basement and installation of underground service utilities for the proposed development would be approximately 3.0 and 5.0 meters below the existing ground surface (mbgs), respectively This hydrogeological assessment includes an overview of the existing geological and hydrogeological conditions at the Site and the surrounding area, an assessment of the hydrogeological constraints, impacts of the proposed development on the local groundwater and provides an estimation of construction dewatering requirements during the proposed development phase. This investigation is based on existing monitoring wells that were previously installed by others in support of geotechnical and environmental investigations at the Site.

If needed, the results of this investigation can be used in support of an application for a Category 3 Permit to Take Water (PTTW) or an Environmental Activity Sector Registry (EASR) for construction dewatering from the Ministry of the Environment Conservation and Parks (MECP) and discharge permitting from the Peel Region.

Based on the results of our investigation, the following conclusions and recommendations are presented:

1. Based on the MECP water well records search, there are records for thirty-one (31) water wells within 500 m of the Site (Fig. 1). Sixteen (16) wells were noted as domestic wells, nine (9) wells were noted as test holes/monitoring wells and six (6) wells were noted as not in use or unknown. The study area is partly serviced with municipal water. However, a door to door well survey is needed to confirm the presence or absence of private wells and groundwater users within a radius of 500 metres from the Site.
2. A total of six (6) boreholes (BH19-1 to BH19-6) were drilled by DS as part of geotechnical and environmental investigations concurrently with hydrogeological investigation. All boreholes were advanced in January 2019 to depths ranging from 2.1 m to 11.3 meters below ground surface

(mbgs). Two (2) monitoring wells (BH19-1 and BH19-4) were screened into silty clay till at depths ranging from 4.3 m to 8.55 mbgs. Also, Sirati and Partners Consultants Limited (Sirati) previously installed two (2) wells (BH9 and BH4) at the Site to a depth of 8.2 mbgs in January 2017 as part of environmental and geotechnical investigations.

3. The overburden geology at the Site and study area is dominated by silty clay till overlaid by sandy silt till deposits. Bedrock depth is more than 25 meters below ground surface (mbgs) and was not encountered during drilling.

4. Groundwater levels were measured at various occasions between March 2019 and March 2020, in all monitoring wells. Groundwater was found in monitoring wells ranging from 0.82 m to 1.55 mbgs, representing the groundwater elevation at the Site which can be subject to seasonal fluctuations.

5. Single Well Response Test (SWRT) was completed by DS in March 2020 in well BH9 which was screened into silty clay till unit to estimate hydraulic conductivity (k). For due diligence purposes, DS also compared its results to the results obtained from wells installed by others at south adjacent property. The value of calculated hydraulic conductivity (k) ranges from 1.86×10^{-8} m/s to 4.5×10^{-7} m/s in silty clay till, which is consistent with typical k-values 10^{-7} m/s to 10^{-9} m/s.

6. An unfiltered groundwater sample was collected from the well BH9 (On-Site) on March 5, 2020 and submitted to SGS Laboratories, a CALA-certified laboratory in Mississauga and analyzed for the parameters listed under City of Mississauga's Storm Sewer Discharge By-Law and the Provincial Water Quality Objectives (PWQO). The reported analytical results indicated that Total Suspended Solid (TSS), Aluminum (total), Manganese (total), Phosphorus (total) and Zinc (total) were in exceedance of the Mississauga's Sewer Discharge By-Law criteria. Also, all parameters met the PQWO By-Law criteria except Total Chlorine, Aluminum (total), Arsenic (total), Copper (total), Lead (total), Phosphorus (total), Zinc (total), 4AAP-Phenolics, Perylene, Anthracene, Benzo(a)anthracene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene and Phenanthrene. When compared against the PWQO guideline, concentrations of various total metals and phenols exceeded the PWQO standards. Higher concentrations of total metals are typically associated with suspended solids and can be reduced with water filtration. groundwater at the Site is not suitable for direct discharge without treatment into sewer system and nearby watercourse. Treatment options include but not limited to settlement and filtration of sediments.

7. Discharge permits and agreements may be required to be obtained from Peel Region and/or the City of Mississauga if private water is discharged to the sewer system for construction dewatering

8. The estimated dewatering rate during construction considering the unsealed excavation method for the residential dwellings with one level of basement (for a block of 150m X 100m) would be approximately 29,000 L/day (29 m^3/day) with the safety factor of 1.5. The estimated maximum steady-state flow rate for the installation of underground services for a trench of 30 x 3 m at any given time, would be approximately 11,400 L/day (11.4 m^3/day) including the safety factor of 1.5.

9. The estimated dewatering rate is above the MECP pumping limit of 50,000 L/day, as such, an Environmental Activity and Sector Registry (EASR) is required to be submitted to the MECP for short-term dewatering.

10. Structures such as residential dwellings, roads or utilities are not present within the predicted radius of influence of about 72 meters from the center of excavation. Also, the proposed construction is anticipated in low permeable silty clay till. Therefore, it is not expected any impact on structures or settlements because of any dewatering activities.
11. Once a groundwater dewatering system is set up at the Site, daily and weekly monitoring should be implemented to assess the groundwater conditions such as water levels, measurement of discharge flow, discharge water quality and any adverse impacts as a result of dewatering including settlement.
12. In conformance with Regulation 903 of the Ontario Water Resources Act, the decommissioning of any dewatering system and monitoring wells should be carried out by a licensed contractor under the supervision of a licensed water well technician.

Should you have any questions regarding these findings, please do not hesitate to contact the undersigned.

DS Consultants Ltd.

Prepared By:

Meysam Jafari, M.Sc., GIT
Geologist

Reviewed By:

Martin Gedeon, M.Sc., P.Geo.
Senior Hydrogeologist

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APPENDICES:

1. INTRODUCTION

DS Consultants Limited (DS) was retained by Mattamy (5150 Ninth Line) Limited to complete a hydrogeological assessment for the proposed development at 5150 Ninth Line, Mississauga (the Site). The Site is about 5-hectare (12.35 acres) parcel of land located at approximately 500 m northwest of the intersection of Ninth Line and Eglinton Ave West. It is understood that the proposed development will be a residential subdivision including residential houses with one level of basement, roads and sewers. The average grade elevation at site is about 191 meters above sea level (masl). The assumed finished floor elevation of the basement and installation of underground service utilities for the proposed development would be approximately 3.0 and 5.0 meters below the existing ground surface (mbgs), respectively. **Figure 1** shows the Site location.

This investigation includes an overview of the existing geological and hydrogeological conditions at the Site and the surrounding area, provides an assessment of the hydrogeological constraints and impacts of the proposed development on the local groundwater and estimation of construction dewatering requirements and groundwater permanent drainage.

1.1 Purpose

The purpose of this investigation was to review and determine the need for dewatering, estimate dewatering rates, assess groundwater quality and determine the need for a Permit to Take Water (PTTW) or an Environmental Activity Sector Registry (EASR) from the Ministry of Environment and Conservation and Parks (MECP) in addition to requirements to obtain discharge permits from the Peel Region. Potential impacts related to construction dewatering and associated monitoring/mitigation measures were also to be investigated.

1.2 Scope of Work

The scope of work for this investigation included:

(i) Site visits;

(ii) Collecting and interpreting available reports and data including the MECP Water Well Records (WWR), geotechnical, hydrogeological and environmental studies completed at the Site;

(iii) Groundwater Monitoring;

(iv) In-situ hydraulic conductivity testing of existing monitoring wells;

(v) Estimation of temporary groundwater flow rate during the construction;

(vi) Assessing groundwater quantity and quality to evaluate discharge options;

(vii) Assessment of impacts associated with construction dewatering; and,

(viii) Data analyses and report preparation.

2. FIELD INVESTIGATION

A total of six (6) boreholes (BH19-1 to BH19-6) were drilled by DS as part of geotechnical and environmental investigations concurrently with hydrogeological investigation. All boreholes were advanced in January 2019 to depths ranging from 2.1 m to 11.3 meters below ground surface (mbgs). Two (2) monitoring wells (BH19-1 and BH19-4) were screened into silty clay till at depths ranging from 4.3 m to 8.55 mbgs. Also, Sirati and Partners Consultants Limited (Sirati) previously installed two (2) wells (BH9 and BH4) at the Site to a depth of 8.2 mbgs in January 2017 as part of environmental and geotechnical investigations. At the time of preparing this report, none of above-mentioned wells were available to access for groundwater level monitoring and hydraulic conductivity testing except well BH9. Therefore, for due diligence purposes, DS compared its results to the results obtained from the monitoring wells installed by S2S Environmental Inc. at the south adjacent property (5080 Ninth Line). All these monitoring wells were developed prior to any use to allow for groundwater level monitoring, hydraulic conductivity testing, and to assess representative groundwater quality. A single well response test (SWRTs) were completed at monitoring well BH9 by performing a rising head test to estimate hydraulic conductivity values of formations/soils at the Site.

One (1) groundwater sample was collected and analyzed for the parameters listed under City of Mississauga's Sewer Use By-Law and Provincial Water Quality Objectives (PWQO) guideline to assess groundwater quality prior to any discharge to sewers system. The sample was submitted to SGS laboratories, a CALA-certified Lab, in Mississauga, Ontario. The locations of the BHs/MWs are shown in **Figure 3** and detailed subsurface conditions are presented on the geologic cross-section **(Figure 4)** and the borehole Logs in **Appendix A**.

3. PHYSICAL SETTING

Available topographic maps, environmental, geotechnical and hydrogeological reports were used to develop an understanding of the physical setting of the study area. The borehole logs from the previous and current geotechnical investigations by DS, Sirati and S2S at the Site as well as the Ministry of the Environment, Conservation and Parks Water Wells Records (MECP WWRs) were used to interpret the geological and hydrogeological conditions at the Site.

3.1 Physiography and Drainage

The topography at the Site is generally flat with a surface elevation of approximately 191 metres above sea level (masl). The topography within the study area generally slopes to the northeast, towards Sixteen Mile Creek. Drainage is generally controlled by streams and artificial channels. Sixteen Mile Creek is located about 3.5 km southwest of the Site.

3.2 Geology

The following presents a brief description of regional and Site geology based on the review of available information and Site-specific soil investigations.

3.2.1 Quaternary Geology

The study area (500 m radius) lies within the Halton Hill physiographic region of southern Ontario and characterized by Till Moraines physiographic landform. Based on the regional mapping, the surficial geology at the Site and study area is dominated by clay to silt-textured till, high carbonated content and clast poor deposits derived from glaciolacustrine deposits or shale (as per OGS Earth). The surficial geology map is shown in **Figure 2**.

3.2.2 Bedrock Geology

Available published mapping shows that bedrock in the area is predominantly shales, limestones, dolostone and siltstone of the Queenston Formation (MNDM Map 2544 Bedrock Geology of Ontario). Based on the review of existing boreholes logs and well record information, the depth to bedrock in the study area is estimated to be approximately 25 meters below the existing surface and was not encountered at the Site during drilling.

3.2.3 Site Geology

On-site subsurface soils were interpreted from the boreholes/monitoring wells (BHs/MWs) drilled by DS and Sirati. The locations of the BHs/MWs are shown in **Figure 3** and detailed subsurface conditions are presented on the borehole Logs in **Appendix A**. The subsurface conditions in the boreholes are summarized in the following paragraphs, and the geologic cross-sections are presented in **Figure 4**. The subsurface conditions in the boreholes are summarized in the following paragraphs.

Topsoil & Fill Materials:

A 150 to 350 mm thick surficial layer of topsoil was found at borehole locations. It should be noted that the thickness of the topsoil explored at the borehole locations may not be representative for the site and should not be relied on to calculate the amount of topsoil at the site. Fill material consisting of clayey silt, sandy silt and silty sand was encountered in Sirati boreholes, extending to depths ranging from 0.8 to 2.3m. Fill materials in BH6 was reported to contain metal fragments.

Weathered/Disturbed Native:

Below the topsoil, a layer of weathered/disturbed native clayey silt to sandy silt was encountered in majority of the boreholes, extending to depths of 0.8 to 1.5m below existing grade. This weathered/disturbed soil layer contained trace to some topsoil/organics and was generally present in very loose to loose/soft to firm state.

Glacial Till Deposits:

Below the fill material or weathered/disturbed native, glacial till deposits consisting of sandy silt till and clayey silt to silty clay till were encountered in all the boreholes, extending to the maximum explored depths of boreholes. The till deposits were present in a firm to hard consistency and compact to dense state. Occasional cobble and boulder and wet sand seams were inferred within the till deposits.

3.3 Hydrogeology

The hydrogeology at the Study Site was evaluated using the on-Site and off-Site monitoring wells, local domestic wells and existing reports for the area.

3.3.1 Local Groundwater Use

As part of the hydrogeological study, DS completed a search of the Ministry of the Environment, Conservation and Parks (MECP) Water Well Records (WWRs) database. Based on the MECP water well records search, there are thirty-one (31) water wells within 500 meters of the Site (**Appendix D**). Sixteen (16) wells were noted as domestic wells, nine (9) wells were noted as test holes/monitoring wells and six (6) wells were noted as not in use or unknown. **Figure 1** shows the MECP water well location plan. The study area is partly serviced with municipal water. However, a door to door well survey is needed to confirm the presence or absence of domestically used wells in the study area.

3.3.2 Groundwater Condition

A total of four (4) boreholes/monitoring wells (MWs/BHs) were used for the current groundwater assessment. All wells were screened within the clayey silt to silty clay till unit. Groundwater levels were measured at various occasions in all monitoring wells. **Table 1** presents the groundwater levels in monitoring wells. Groundwater was found in monitoring wells ranging from 0.82 m to 1.55 mbgs, representing the groundwater elevation at the Site which can be subject to seasonal fluctuations. The groundwater flow direction within the site area is inferred to be south-westerly towards the Sixteen Mile.

Table 1: Groundwater Levels in Monitoring Wells

Well ID	Ground Elevation (masl)	Well Depth (mbgs)	Screened Interval (mbgs)	Date	Depth to Water (mbgs)	Groundwater Elevation (masl)
BH9 (On-Site)	194.00	8.2	5.2-8.2	March 5,2020	1.55	192.45
BH9 (Off-Site, S2S)	189.05	5.8	2.8-5.8	May 24,2019	1.00	188.05
BH11 (Off-Site, S2S)	189.61	6.3	3.3-6.3	March19, 2019 April 25, 2019 May 24,2019 March 18,2020	0.82 1.27 1.20 0.90	188.79 188.34 188.41 188.71
BH12 (Off-Site, S2S)	190.32	9.1	6.1-9.1	March19, 2019 April 25, 2019 May 24,2019 March 18,2020	1.30 1.20 1.48 1.23	189.02 189.12 188.84 189.09

3.3.3 Hydraulic Conductivity

Single Well Response Test (SWRTs) was completed by DS in well BH9 (On-Site), on March 5, 2020 to estimate hydraulic conductivity (k) for the representative geological units in which the well is completed. SWRT was completed by performing a rising head test and a data logger was placed in the well to monitor recovery. Since except BH9, the other on-site wells (BH19-4 and BH19-1) were not accessible at the time of writing this report, DS acquired the hydrogeological date from the wells BH9 and BH11 installed by S2S

Environmental Inc. at 5080 Ninth Line (south adjacent property) to compare with its data to access the hydrogeological condition of the study area. **Table 3** presents a summary of the Hydraulic Conductivity (k) results for the representative geological units. The value of calculated hydraulic conductivity (k) ranges from 1.86×10^{-8} m/s to 4.5×10^{-7} m/s in silty clay till, which is consistent with typical k-values 10^{-7} m/sec to 10^{-9} m/sec. The highest value of 4.50×10^{-7} m/s was used in the dewatering assessment as a conservative measure. The hydraulic testing results are provided in **Appendix B.**

Table 3: Summary of Hydraulic Conductivity (k) Test Results

Well ID	Screened Interval (mbgs)	Screened Formation	Analysis Method	K- Value(m/s)
BH9 (On-Site)	5.2-8.2	Silty clay till	Hvorslev	4.50×10^{-7}
BH9 (Off-Site, S2S)	2.8-5.8	Clay/Silt	Cooper-Jacob Analysis	7.04×10^{-8}
BH12(Off-Site, S2S)	6.1-9.1	Silt/Clay	Cooper-Jacob Analysis	1.86×10^{-8}

3.3.4 Groundwater Quality

An unfiltered groundwater sample was collected from the well BH9 (On-Site) on March 5, 2020 and submitted to SGS Laboratories, a CALA-certified laboratory in Mississauga and analyzed for the parameters listed under City of Mississauga's Storm Sewer Discharge By-Law and the Provincial Water Quality Objectives (PWQO). The reported analytical results indicated that Total Suspended Solid (TSS), Aluminum (total), Manganese (total), Phosphorus (total) and Zinc (total) were in exceedance of the Mississauga's Sewer Discharge By-Law criteria. Also, all parameters met the PQWO By-Law criteria except Total Chlorine, Aluminum (total), Arsenic (total), Copper (total), Lead (total), Phosphorus (total), Zinc (total), 4AAP-Phenolics, Perylene, Anthracene, Benzo(a)anthracene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene and Phenanthrene. When compared against the PWQO guideline, concentrations of various total metals and phenols exceeded the PWQO standards. Higher concentrations of total metals are typically associated with suspended solids and can be reduced with water filtration. **Table 3** presents a summary of exceeded parameters, and the certificate of analysis is provided in **Appendix C**.

Table 3: Parameters in Groundwater Exceeding the Mississauga's By-Law Discharge and PQWO Criteria

Parameter`	Unit	Mississauga's Storm Sewer Use Bylaw Criteria	PQWO Bylaw Criteria	BH9 Concentration
Total Suspended Solids (TSS)	mg/L	15	-	**24,000**
Metals and Inorganics				
Total Chlorine	mg/L	1	0.002	<0.02
Aluminum (total)	mg/L	1	0.015	**14.4**
Aluminum (0.2µm)	mg/L	-	0.015	0.537
Arsenic (total)	mg/L	0.02	0.005	0.0059
Copper (total)	mg/L	0.04	0.001	0.0152
Lead (total)	mg/L	0.12	0.001	0.00901
Manganese (total)	mg/L	0.05	-	**0.552**
Phosphorus (total)	mg/L	0.4	0.01	**0.641**
Zinc (total)	mg/L	0.04	0.02	**0.045**
Phenols				
4AAP-Phenolics	mg/L	0.008	0.001	<0.002

SVOCs				
Perylene	mg/L	-	$7e^{-8}$	<0.0005
SVOCs - PAHs				
Anthracene	mg/L	-	$8e^{-7}$	<0.0001
Benzo(a)anthracene	mg/L	-	$4e^{-7}$	<0.0001
Benzo(ghi)perylene	mg/L	-	$2e^{-8}$	<0.0002
Benzo(k)fluoranthene	mg/L	-	$2e^{-7}$	<0.0001
Chrysene	mg/L	-	$1e^{-7}$	<0.0001
Dibenzo(a,h)anthracene	mg/L	-	$2e^{-6}$	<0.0001
Fluoranthene	mg/L	-	$7e^{-8}$	<0.0001
Phenanthrene	mg/L	-	$3e^{-5}$	<0.0001
Bold- Exceeds Storm Sewer Use Bylaw Criteria Underlined- Exceeds PQWO Bylaw Criteria				

5. CONSTRUCTION DEWATERING

At the time of writing this report, design drawings were not available for the subdivision development and assumptions were made to estimate dewatering volumes. It is understood that the proposed construction will be completed using unsealed excavation and backfill. The depth of excavation required for constructing one (1) level of basement and installation of utilities was estimated to be about 3.0 m and 5.0 m below the existing ground surface, respectively. This section calculates the estimated dewatering needed during the construction considering open-cut excavation methods. Excavation dimensions of 150 m long and 100 m wide, and the highest groundwater elevation of 192.45 masl and k-value (4.5 x 10^{-7} m/sec) were considered to estimate the flow rate.

5.1 Estimation of Flow Rate- Unsealed Excavation (Residential Subdivision)

The predicted dewatering required for a block (150 m X 100 m) of houses with one level of basement was calculated based on the highest water level and hydraulic conductivity values obtained.

$$Q_R = K * (H^2 - h^2) / 0.733 * Log (R_0/r_e) = 19{,}300\ L/day$$

Where,

K – Hydraulic conductivity = 4.50 x 10^{-7} m/s
H – Distance from water level to the bottom of an aquifer = 3 m
h – Depth of water in the well while pumping = 1.5 m
r_e – equivalent radius, where a and b excavation dimensions (150 m x 100 m) = 70 m

$$r_e = \left(\frac{(a\,x\,b)}{\pi}\right)^{0.5}$$

R_0 – Radius of the cone of depression (150 m x 100 m) = 72 m

$$R_0 = (r_e + 3000)(H - h)(k^{0.5})$$

5.2 Estimation of Flow Rate- Subdivision (Local Services)

DS considered an unsealed excavation, a maximum installation depth of about 5 m and a section/trench (30 m long and 3 m wide at any given time) to estimate flow rate during the installation of local services. The trenches are expected to be dug mainly in the silty clay till deposit. Therefore, no major problems with groundwater are expected during excavation due to the low permeability of the soils. However, perched water is expected in materials which should be controllable with the conventional method of pumping from sumps. The highest groundwater elevation (192.45 masl) was used in the calculation.

$$Q = \pi K \left(H^2 - h^2\right) / Ln\left(R_0/R_S\right) + 2((XK\left(H^2 - h^2\right))/2L = 7{,}600\ L/Day$$

Where,

K – Hydraulic conductivity = 4.5 x 10^{-7} m/s
H – Distance from water level to the bottom of an aquifer = 5 m
h – Depth of water in the well while pumping = 1.5 m
X – Length of trench = 30 m
R_s – equivalent radius, where a and b excavation dimensions = 5.35 m
R_o – cone of depression radius, where a and b excavation dimensions = 12 m
L – $R_0/2$

R_s- Equivalent radius:

$$R_s = \left(\frac{(a\,x\,b)}{\pi}\right)^{0.5}$$

R_0 – Radius of Influence:

$$R_0 = 3(H - h)(\sqrt{K})$$

4.3 Estimation of Flow Rate- Storm Water Consideration

The additional flow rate may be required from precipitation into the open excavation during construction. The estimated flow rate is based on an excavation area about 150 meters long and 100 meters wide for residential area and in total 5 mm precipitation events in 24 hours. The total estimated dewatering that might be needed as a result of precipitation events would be approximately **75,000 L/day (75 m^3/day)**.

4.3 Total Estimation of Flow Rate (Short-Term/ Temporary Discharge

Considering the unsealed excavation method, the estimated maximum steady-state flow rate for the residential houses with one level of basement would be approximately **29,000 L/day (29 m^3/day)** with the safety factor. A high factor of safety x1.5 has been added to account for the variability in hydraulic

conductivity that may be encountered. The estimated maximum steady-state flow rate for the installation of underground services would be approximately **11,400 L/day (11.4 m^3/day)** with the safety factor of 1.5.

A highly conservative approach has been adopted while estimating the flow rates which can be significantly lower depending on the nature of soils encountered during the construction. The highest k-value and groundwater level are considered to estimate the flow rate. Based on the stratigraphy at the site, most of the construction will be ended into cohesive silty clay till which is considered a low permeable soil and the flow rates is expected low.

5.5 Permit Requirements

5.5.1 Environmental Activity and Sector Registry (EASR) /Permit to Take Water (PTTW) Application

An Environmental Activity Sector Registration (EASR) is required to be submitted to the Ministry of the Environment, Conservation and Parks (MECP) if the taking of groundwater and stormwater for a temporary construction project is between 50,000 L/day and 400,000 L/ day. The EASR application is an online registry and should be submitted to the MECP before any construction dewatering. A PTTW is required to be submitted to the MECP if the taking of groundwater and stormwater for a temporary construction project is more than 400,000 L/ day.

Since the expected design dewatering rate for the unsealed excavations is anticipated to be between 50,000 L/day and 400,000 L/day, an EASR application is required to be submitted to the MECP for short-term dewatering. All permitting requirements will be revised based on detail design and all necessary permits will be obtained.

5.5.2 Discharge Permits (Construction Dewatering and Permanent Drainage)

A discharge permit will be required from the Peel Region/City of Mississauga if private water is to be sent to the sewer system.

6. POTENTIAL IMPACTS

The following are the predicted potential impacts as a result of development:

6.1 Impacts Associated with Dewatering Activities

6.2.1 Local Groundwater Use

The study area is partly serviced with municipal water. However, a door to door well survey is needed to confirm the presence or absence of private wells and groundwater users within a radius of 500 metres from the Site.

6.2.2 Point of Discharge and Groundwater Quality

Groundwater quality analysis indicates that various parameters listed in the Mississauga's Sewer Discharge By-Law criteria and the PWQO guideline exceeded the criteria/guideline concentrations. Therefore, groundwater cannot be discharged into the sewer system without treatment. However, there are parameters listed in the City's Storm Sewer Discharge By-Law criteria which has no guideline limit, the City should be consulted for further requirements. Treatment options include but not limited to

settlement and filtration of sediments. Discharge permits and agreements are required from the Peel Region and/or City of Mississauga for short-term discharge.

6.2.4 Geotechnical Consideration- Settlement

Structures such as residential dwellings, roads or utilities are not located within the predicted radius of influence of about 72 meters from the center of excavation. Also, the proposed construction is anticipated in low permeable silty clay till unit. Therefore, it is not expected any impact on structures or settlements because of any dewatering activities.

7. MONITORING AND MITIGATION

Based on the finding of hydrogeological assessment and associated potential impacts due to development, the following monitoring and mitigation program is provided:

1. A door to door private well survey and post-construction water level monitoring program is recommended to confirm the groundwater users in the area.
2. Based on the dewatering assessment, an EASR application is required. Additional monitoring may be required by the MECP to be implemented during the design stage.
3. Baseline groundwater quality has been assessed and established before the construction. Groundwater quality should be monitored during construction dewatering and after the construction to ensure that water quality meets the guideline or regulations associated with any permits from the MECP and the Halton Region.
4. Once a groundwater dewatering system is set up at the Site, a daily and weekly monitoring should be implemented to assess the groundwater conditions such as water levels, measurement of discharge flow, discharge water quality.
5. Following the completion of construction activities, all dewatering wells, well points, eductors and monitoring wells installed at various stages of this project shall be decommissioned. The installation and eventual decommissioning of the wells and the dewatering system will be carried out by a licensed water well contractor in accordance with Regulation 903 of the Ontario Water Resources Act.

Should you have any questions regarding these findings, please do not hesitate to contact the undersigned.

DS Consultants Ltd.

Prepared By:

Reviewed By:

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Geologist

Martin Gedeon, M.Sc., P.Geo.
Senior Hydrogeologist

8. CONSULTANTS QUALIFICATIONS

Martin Gedeon, M.Sc., P.Geo., is a Professional Geoscientist (P.Geo.) with over 24 years of experience as an environmental/hydrogeological consultant in the areas of groundwater and soil monitoring, environmental Site assessments, environmental due diligence, and remediation. Martin has significant experience in physical and contaminant hydrogeology across Canada and overseas and has provided hydrogeological/environmental technical support on various projects. Martin has prepared hundreds of hydrogeological reports in support of permit applications for a private sector development application, municipal dewatering operations and provincial infrastructure projects across the province.

Meysam Jafari, M.Sc., GIT is a Geoscientist in Training working as a Geologist with DS Consultants Ltd. Meysam holds master's in engineering Geology and geology (soil & groundwater) and has several years of experience working in the geoscience industry. Meysam has experience with conducting Phase One and Phase Two Environmental Site Assessments, hydrogeological and geotechnical investigations in the Greater Toronto Area (GTA), and has been involved with project coordination, field assessments, data interpretation and reporting.

9. REFERENCES

Chapman, L.J., and D.F. Putnam; The Physiography of Southern Ontario, Third Edition, Ontario Geological Survey Special Volume 2; 1984, & 2007.

Freeze, R.A. and J.A. Cherry. “Groundwater”. Prentice-Hall, Inc. Englewood Cliffs, NJ. 1979.

Ontario Regulation 153/04 made under the Environmental Protection Act, July 1, 2011.

The Peel Region Sewers By-law.

Ontario Regulation 245/11- Environmental Activity and Sector Registry.

Powers, J. Patrick, P.E. (1992); Construction Dewatering: New Methods and Applications - Second Edition, New York: John Wiley & Sons.

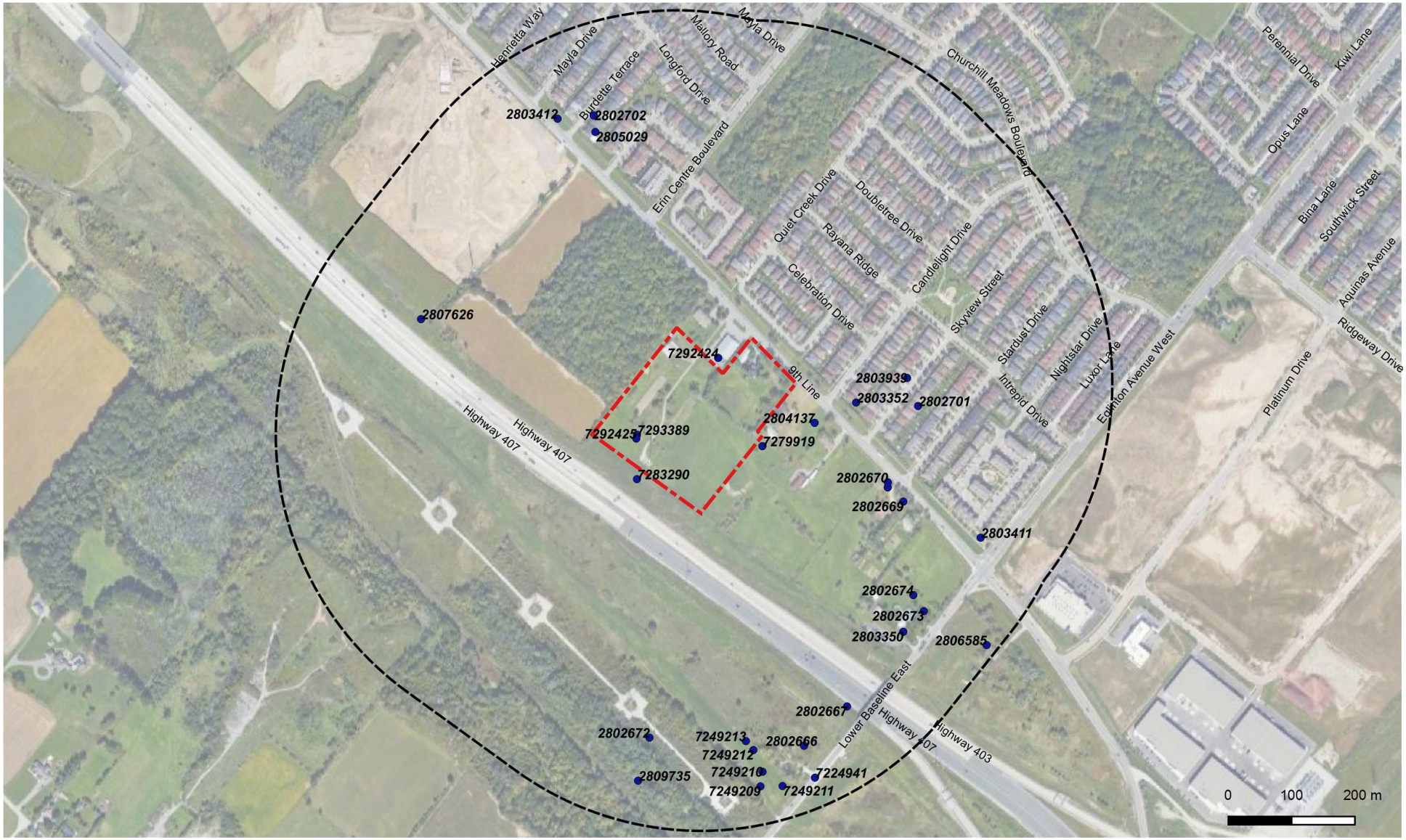
Pat M. Cashman and Martin Preene; Groundwater Lowering in Construction- Second Edition, CRC Press.

Preliminary Report on Geotechnical Investigation, Proposed Residential Development, 5150 Ninth Line, Mississauga, Ontario by Sirati and Partners, February 2017.

Report on Preliminary Geotechnical Investigation, proposed Residential Development, 5150 Ninth Line, Mississauga, Ontario by DS, August 2019.

Figures

C:\0Sharon\18-748 5150 Ninth line\1-QGIS\HydroG\Figure 1 – Site Location and MECP Well Records.qgs



Legend

- Approx Boundary
- 500m Buffer
- Registered Water Well (MECP WWR)

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Project: HYDROGEOLOGICAL INVESTIGATION
5150 Ninth Line, Mississauga,ON

Title: **SITE LOCATION AND MECP WELL RECORDS**

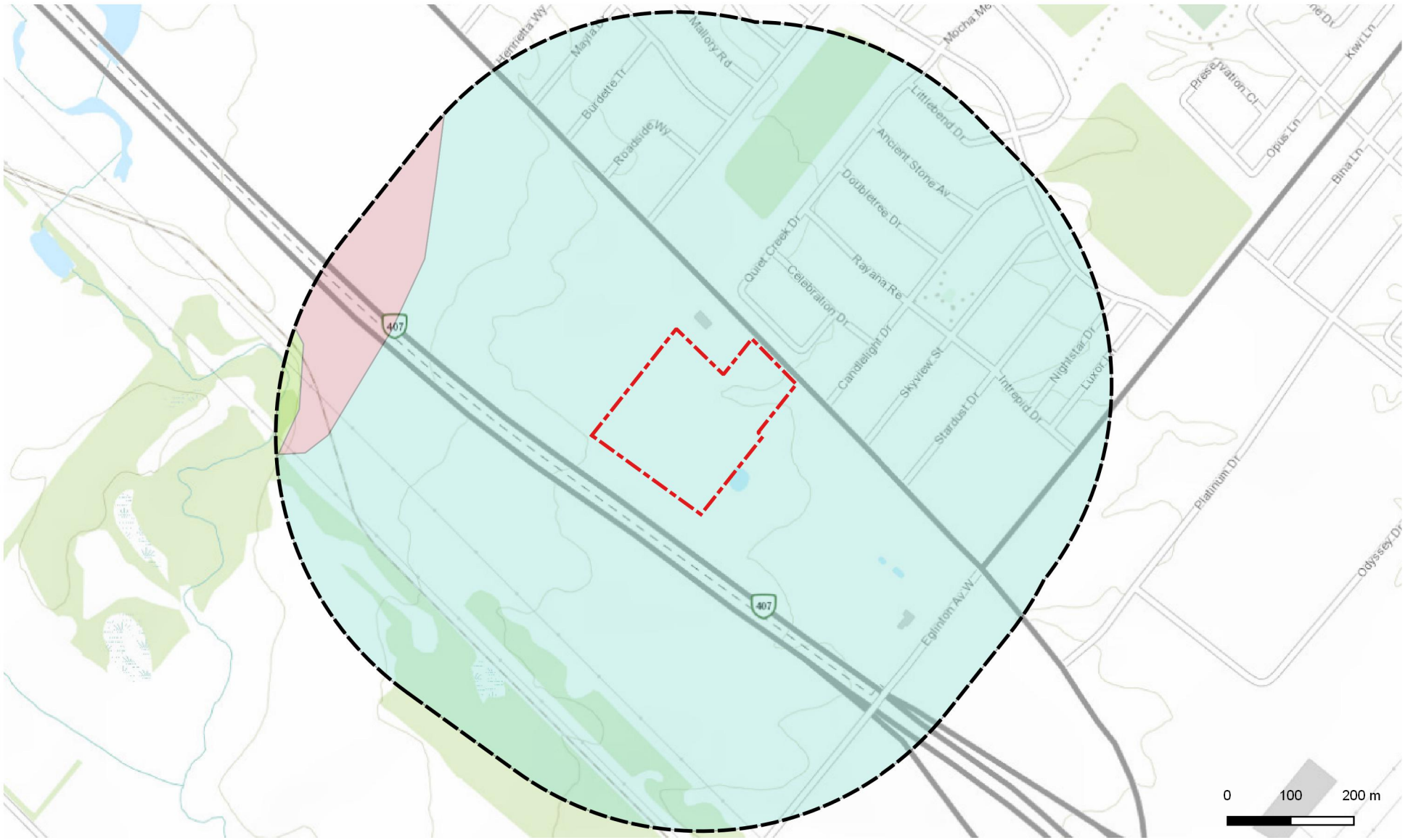
N

Client: MATTAMY (5150 NINTH LINE) LIMITED

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	M.J	S.Y	March 2020
Rev: 0	Scale: As Shown	Project No.: 18-748-100	Figure No.: 1

Image/Map Source: *Google Satellite Image*

C:\0Sharon\18-748 5150 Ninth line\1-QGIS\HydroG\Figure 2 – Surficial Geology Map.qgs



Legend

- Approx Boundary
- 500m Buffer
- 19 - Modern Alluvium
- 5d - Till
- 8b - Glaciolacustrine Deposits

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5150 Ninth Line, Mississauga,ON

Title: **SURFICIAL GEOLOGY MAP**

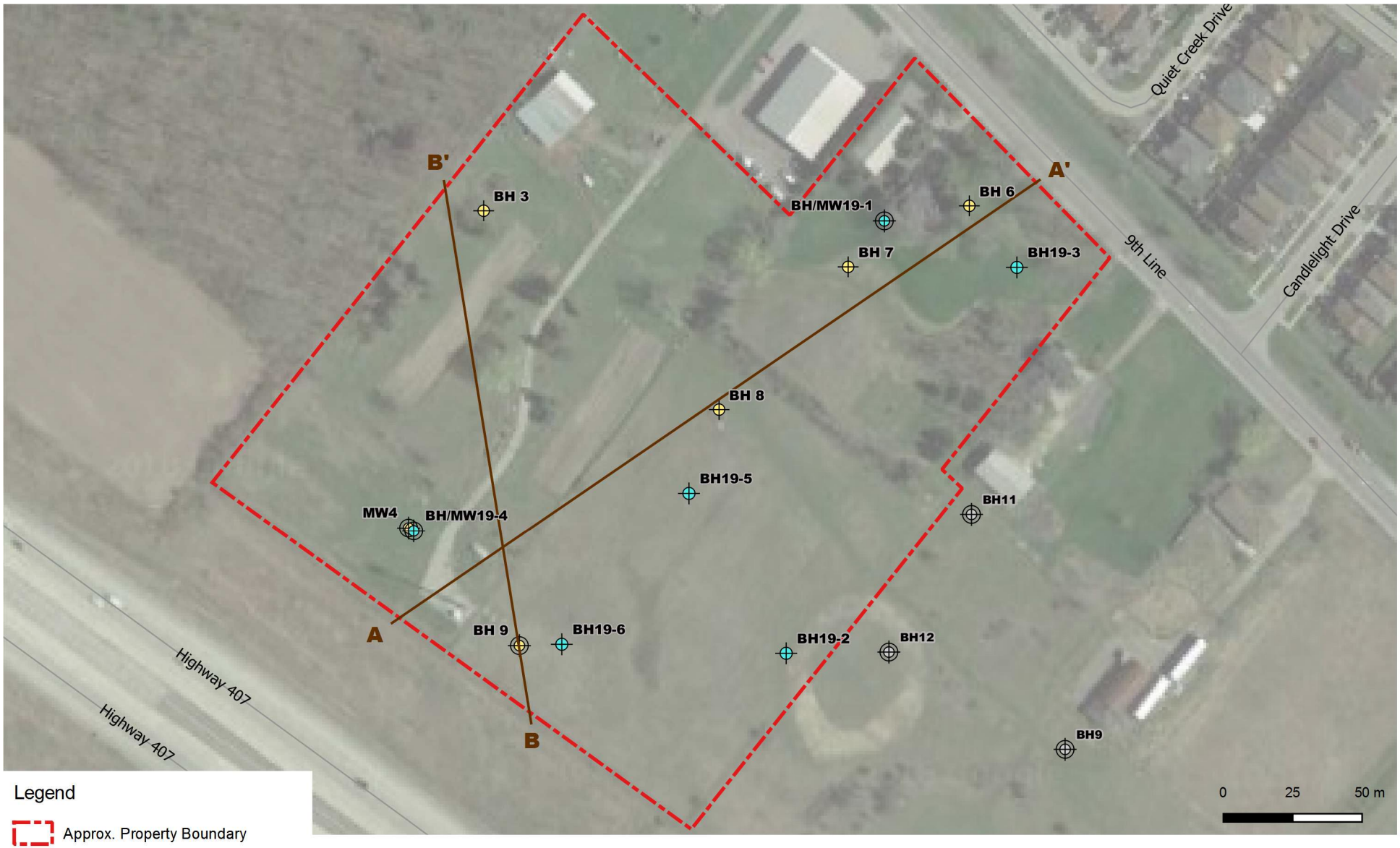
N

Client: MATTAMY (5150 NINTH LINE) LIMITED

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	M.J	S.Y	March 2020
Rev: 0	Scale: As Shown	Project No.: 18-748-100	Figure No.: 2

Image/Map Source: *Google Satellite Image*

J:\-GIS\18-748 5150 Ninth line\1-QGIS\HydroG\Figure 3 – Borehole and Monitoring Well Locations.qgs



Legend

- Approx. Property Boundary
- Borehole by DS
- Monitoring Well by DS
- Monitoring Well Location by Others
- Borehole Location by Others
- Monitoring Well by S2S
- Cross Section

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Client: MATTAMY (5150 NINTH LINE) LIMITED

Project: HYDROGEOLOGICAL INVESTIGATION
5150 Ninth Line, Mississauga,ON

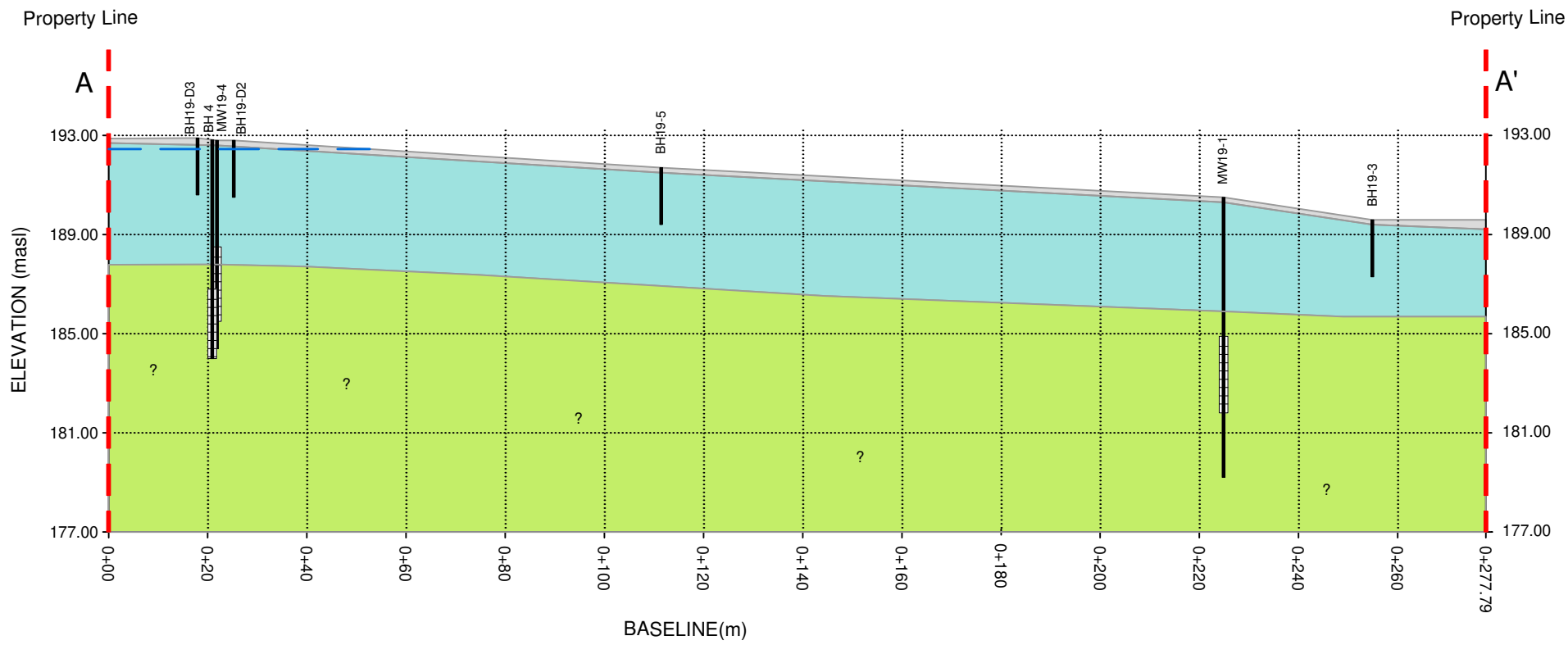
Title: **BOREHOLE AND MONITORING WELL LOCATIONS**

N

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	M.J	S.Y	March 2020
Rev: 0	Scale: As Shown	Project No.: 18-748-100	Figure No.: 3

Image/Map Source: *Google Satellite Image*

Path:j:\-gis\18-748 5150 ninth line\7-misc\cad\geological cross sections-9th line.dwg



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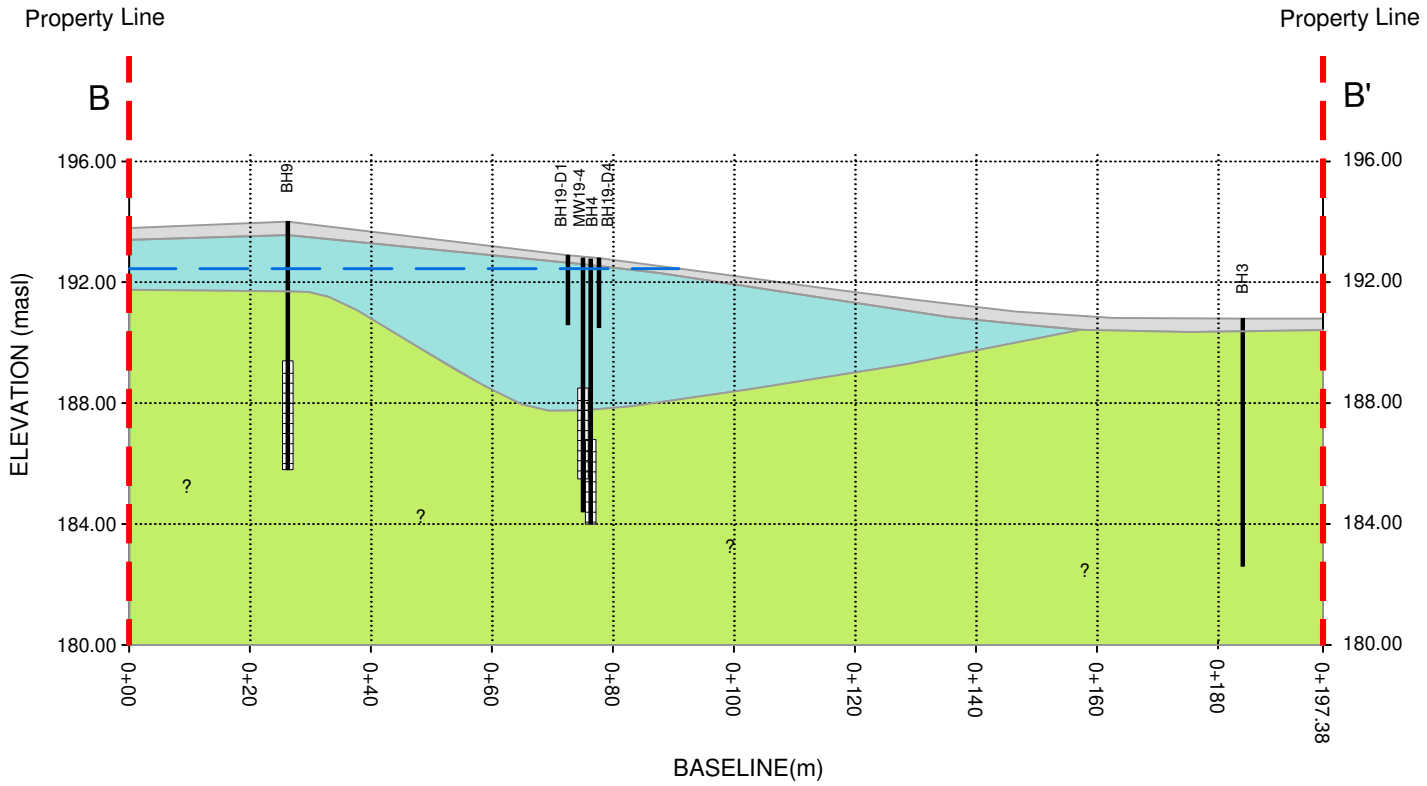
Project: HYDROGEOLOGICAL INVESTIGATION
5150 Ninth Line, Mississauga,ON

Title: **GEOLOGICAL CROSS SECTION A-A'**

Client:	Size:	Approved By:	Drawn By:	Date:
MATTAMY (5150 NINTH LINE) LIMITED	8.5 x 11	M.J	S.Y	March 2020
	Rev.	Scale: As Shown	Project No: 18-748-100	Figure No. 4A

Path:j:\-gis\18-748 5150 ninth line\7-misc\cad\geological cross sections-9th line.dwg



Topsoil | Sandy Silt Till/Sandy Silt | Clayey Silt Till/Silty Clay Till

Horizontal Scale: 1:1250
Vertical Scale: 1:250

Groundwater Level (Mar 5 - 2020)

Well
Screen

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Project: HYDROGEOLOGICAL INVESTIGATION
5150 Ninth Line, Mississauga,ON

Title: **GEOLOGICAL CROSS SECTION B-B'**

Client:	Size:	Approved By:	Drawn By:	Date:
MATTAMY (5150 NINTH LINE) LIMITED	8.5 x 11	M.J	S.Y	March 2020
	Rev.	Scale: As Shown	Project No: 18-748-100	Figure No. 4B

Appendices

Appendix A: Borehole Logs

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LOG OF BOREHOLE BH19-2

PROJECT: Geotechnical Investigation
CLIENT: Mattamy (5150 Ninth Line) Limited
PROJECT LOCATION: 5150 & 5170 Ninth Line, Mississauga, Ontario
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4821148.928 E 601945.2

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jan-24-2019

REF. NO.: 18-748-100
ENCL NO.: 3

ELEV / DEPTH (m)	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
191.3 / 0.0	**TOPSOIL:** 150mm						
191.1 / 0.2	**SANDY SILT:** trace clay, brown, moist, loose(weatherly disturbed)		1	SS	6		191
190.5 / 0.8	**SANDY SILT TILL:** some clay, trace gravel, greyish brown, moist, compact to dense		2	SS	18		190
			3	SS	22		
			4	SS	34		189
188.4 / 2.9	**END OF BOREHOLE** Notes: 1) Borehole open and dry upon completion. 2) Borehole backfilled with bentonite upon completion.						

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

DS SOIL LOG 5150 NINTH LINE - MATTAMY HOMES.GPJ DS.GDT 19-7-10

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH19-3

PROJECT: Geotechnical Investigation
CLIENT: Mattamy (5150 Ninth Line) Limited
PROJECT LOCATION: 5150 & 5170 Ninth Line, Mississauga, Ontario
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4821288.223 E 602026.882

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jan-24-2019

REF. NO.: 18-748-100
ENCL NO.: 4

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" / 0.3 m							GR SA SI CL
189.6 0.0	**TOPSOIL:** 150mm											
189.4 0.2	**SANDY SILT:** trace clay, dark brown, moist, loose(weatherly disturbed))		1	SS	6		189					
188.8 0.8	**SILT TILL:** trace clay, trace sand, greyish brown, moist, compact		2	SS	19							
188			3	SS	22							
187.5 2.1	**END OF BOREHOLE** Notes: 1) Borehole open and dry upon completion. 2) Borehole backfilled with bentonite upon completion.											

DS SOIL LOG 5150 NINTH LINE - MATTAMY HOMES.GPJ DS.GDT 19-7-10

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH19-5

PROJECT: Geotechnical Investigation
CLIENT: Mattamy (5150 Ninth Line) Limited
PROJECT LOCATION: 5150 & 5170 Ninth Line, Mississauga, Ontario
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4821205.549 E 601909.149

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jan-23-2019

REF. NO.: 18-748-100
ENCL NO.: 6

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
191.7							
191.6 0.0	**TOPSOIL:** 150mm						
0.2	**CLAYEY SILT:** trace gravel, some rootlets, very moist, loose(weatherly disturbed)		1	SS	6		
190.9							191
0.8	**SANDY SILT:** trace clay, brown and grey, moist, dense		2	SS	34		
190.2							
1.5	**SANDY SILT TILL:**trace gravel, grey, moist, compact		3	SS	22		190
189.6							
2.1	**END OF BOREHOLE**						

Notes:
1) Borehole open and dry upon completion.
2) Borehole backfilled with bentonite upon completion.

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

DS SOIL LOG 5150 NINTH LINE - MATTAMY HOMES.GPJ DS.GDT 19-7-10

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH19-6

PROJECT: Geotechnical Investigation
CLIENT: Mattamy (5150 Ninth Line) Limited
PROJECT LOCATION: 5150 & 5170 Ninth Line, Mississauga, Ontario
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4821150.513 E 601864.924

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jan-24-2019

REF. NO.: 18-748-100
ENCL NO.: 7

ELEV / DEPTH (m)	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION
192.0							
192.0 / 0.0	**TOPSOIL:** 150mm						
0.2 / 191.2	**CLAYEY SILT:** trace sand, brown orange and grey seams, moist, loose(weatherly disturbed)		1	SS	8		
0.8 / 190.5	**CLAYEY SILT:** trace sand, trace gravel, greyish brown, moist, compact		2	SS	12		191
1.5 / 189.9	**SILT TILL:** trace sand, trace gravel, greyish brown, moist, dense		3	SS	36		
190							
2.1	**END OF BOREHOLE** Notes: 1) Borehole open and dry upon completion. 2) Borehole backfilled with bentonite upon completion.						

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

DS SOIL LOG 5150 NINTH LINE - MATTAMY HOMES.GPJ DS.GDT 19-7-10

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH19-D1

PROJECT: Geotechnical Investigation
CLIENT: Mattamy (5150 Ninth Line) Limited
PROJECT LOCATION: 5150 & 5170 Ninth Line, Mississauga, Ontario
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4821188.497 E 601813.962

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jan-23-2019

REF. NO.: 18-748-100
ENCL NO.: 8

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
192.9							
192.7 0.0	**TOPSOIL** 150mm						
0.2	**CLAYEY SILT:** trace gravel, brown with orange seams, moist, loose(weatherly disturbed)		1	SS	8		
192.1							
0.8	**SANDY SILT:** trace clay, trace gravel, brown with orange seams, moist, compact(weatherly disturbed)		2	SS	15		192
			3	SS	23		191
190.8							
2.1	**END OF BOREHOLE**						

Notes:
1) Borehole open and dry upon completion.
2) Borehole backfilled with bentonite upon completion.

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
$+^3$, $\times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 5150 NINTH LINE - MATTAMY HOMES.GPJ DS.GDT 19-7-10

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LOG OF BOREHOLE BH19-D2

PROJECT: Geotechnical Investigation
CLIENT: Mattamy (5150 Ninth Line) Limited
PROJECT LOCATION: 5150 & 5170 Ninth Line, Mississauga, Ontario
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4821193.931 E 601812.739

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jan-23-2019

REF. NO.: 18-748-100
ENCL NO.: 9

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
192.8											
192.6 0.0	**TOPSOIL** 150mm										
0.2	**CLAYEY SILT:** trace gravel, brown, moist, loose(weatherly disturbed)		1	SS	5		192				
192.0 0.8	**SANDY SILT TILL:** trace clay, trace gravel, brown, moist, compact		2	SS	17						
1			3	SS	22		191				
190.7 2.1	**END OF BOREHOLE** Notes: 1) Borehole open and dry upon completion. 2) Borehole backfilled with bentonite upon completion.										

DS SOIL LOG 5150 NINTH LINE - MATTAMY HOMES.GPJ DS.GDT 19-7-10

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH19-D3

PROJECT: Geotechnical Investigation
CLIENT: Mattamy (5150 Ninth Line) Limited
PROJECT LOCATION: 5150 & 5170 Ninth Line, Mississauga, Ontario
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4821186.899 E 601808.017

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jan-23-2019

REF. NO.: 18-748-100
ENCL NO.: 10

ELEV / DEPTH (m)	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION
192.9							
192.8 / 0.0	**TOPSOIL** 150mm						
0.2 / 192.1	**CLAYEY SILT:** some sand to sandy, brown, moist, compact(weatherly disturbed)		1	SS	11		
0.8 / 190.8	**SANDY SILT TILL:** trace clay, trace gravel, brown, moist, compact		2	SS	15		192
			3	SS	22		191
2.1	**END OF BOREHOLE** Notes: 1) Borehole open and dry upon completion. 2) Borehole backfilled with bentonite upon completion.						

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)
METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

DS SOIL LOG 5150 NINTH LINE - MATTAMY HOMES.GPJ DS.GDT 19-7-10

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; $\circ^{\varepsilon=3\%}$ Strain at Failure

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LOG OF BOREHOLE BH19-D4

PROJECT: Geotechnical Investigation
CLIENT: Mattamy (5150 Ninth Line) Limited
PROJECT LOCATION: 5150 & 5170 Ninth Line, Mississauga, Ontario
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4821192.626 E 601806.278

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jan-23-2019

REF. NO.: 18-748-100
ENCL NO.: 11

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"							GR SA SI CL
192.8												
192.7 0.0	**TOPSOIL** 150mm											
0.2	**CLAYEY SILT:** trace gravel, brown, moist, compact(weatherly disturbed)		1	SS	14							
192.0 0.8	**SANDY SILT:** trace clay, trace gravel, brown, moist, compact		2	SS	15		192					
			3	SS	24		191					
190.7 2.1	**END OF BOREHOLE**											

Notes:
1) Borehole open and dry upon completion.
2) Borehole backfilled with bentonite upon completion.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS SOIL LOG 5150 NINTH LINE - MATTAMY HOMES.GPJ DS.GDT 19-7-10

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LOG OF BOREHOLE MW19-1

PROJECT: Geotechnical Investigation
CLIENT: Mattamy (5150 Ninth Line) Limited
PROJECT LOCATION: 5150 & 5170 Ninth Line, Mississauga, Ontario
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4821304.684 E 601978.502

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jan-24-2019

REF. NO.: 18-748-100
ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"
190.5				
190.0 0.0	**TOPSOIL:** 150mm			
0.2	**SANDY SILT:** trace clay, brown, moist, very loose(weatherly disturbed)	1	SS	2
189.7				
0.8	**CLAYEY SILT:** trace clay, dark brown, moist to very moist, loose(weatherly disturbed)	2	SS	8
189.0				
1.5	**SANDY SILT:** trace clay, trace sand, brown and grey, moist, compact	3	SS	19
		4	SS	30
187.4				
3.1	**SANDY SILT TILL:** greyish brown, moist, dense	5	SS	32
185.9				
4.6	**CLAYEY SILT TILL:** trace sand, trace gravel, grey, moist, stiff	6	SS	12
184.4				
6.1	moist to very moist	7	SS	11
182.9				
7.6	**SILTY CLAY TILL:** trace gravel, grey, very moist, firm	8	SS	7
181.4				
9.1	**CLAYEY SILT TILL** trace sand, trace gravel, grey, moist, stiff	9	SS	15
179.8				
10.7	**SILTY CLAY TILL:** trace sand, trace gravel, grey, very moist, very stiff	10	SS	18
179.2				
11.3	**END OF BOREHOLE**			

Notes:
1) 50mm monitoring well installed upon completion.

W. L. 184.0 m
Feb 04, 2019

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)
METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 5150 NINTH LINE - MATTAMY HOMES.GPJ DS.GDT 19-7-10

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE MW19-4

PROJECT: Geotechnical Investigation
CLIENT: Mattamy (5150 Ninth Line) Limited
PROJECT LOCATION: 5150 & 5170 Ninth Line, Mississauga, Ontario
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4821190.173 E 601810.369

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jan-23-2019

REF. NO.: 18-748-100
ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
192.8							
192.6	**TOPSOIL:** 150mm						
0.2	**CLAYEY SILT:** trace gravel, brown with orange seams, moist, compact(weatherly disturbed)		1	SS	14		
192.0							192
0.8	**SANDY SILT:** trace clay, trace gravel, brown with orange seams, moist, compact(weatherly disturbed)		2	SS	16		
1							
			3	SS	21		191
2							
190.5							
2.3	**SILT TILL:** some sand, trace gravel, greyish brown, moist, compact to dense		4	SS	21		
3							190
			5	SS	35		
4							189
188.2							
4.6	**SILTY CLAY TILL:** trace sand, trace gravel, grey, very moist, compact		6	SS	18		188
5							
187.6							
5.2	**CLAYEY SILT TILL:** grey, very moist, stiff						187
6							
			7	SS	13		
							W. L. 186.6 m Feb 04, 2019
7							186
	moist below 7.6 m						
			8	SS	11		185
8							
184.6							
8.2	**END OF BOREHOLE**						

Notes:
1) 50mm monitoring well installed upon completion.

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

DS SOIL LOG 5150 NINTH LINE - MATTAMY HOMES.GPJ DS.GDT 19-7-10

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ε=3% Strain at Failure

Sirati & Partners Consultants Ltd.
Geotechnical & Environmental Services
Engineering Solutions

LOG OF BOREHOLE BH9

PROJECT: Preliminary Geotechnical Investigation
CLIENT: Mattamy Homes
PROJECT LOCATION: 5150 9th Line, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150mm
Date: Jan-30-2017

REF. NO.: SP17-109-10
ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
194.0												
193.8	**TOPSOIL:** 200mm											
0.2	**FILL:** sandy silt, trace rootlets, brown, moist, loose		1	SS	5							
193.2												
1 0.8	**POSSIBLE FILL:** sandy silt to silty sand, brown, very moist, loose		2	SS	8		193					
			3	SS	8							
2 191.7							192					
2.3	**SILTY CLAY TILL:** some sand, trace gravel, grey, moist, stiff		4	SS	10							
3			5	SS	10		191					
4							190					
5			6	SS	8		189					
6							188					
			7	SS	8							
7						W. L. 187.2 m Feb 08, 2017						
8 185.8			8	SS	10		186					wet spoon @ 7.6 m
8.2	**END OF BOREHOLE** Notes: 1)Monitoring well installed in the borehole upon completion 2) Water level in monitoring well at 6.8m on 09Feb ,2017											

SPCL SOIL LOG SP17-109-10 - 5150 NINTH LINE, MISSISSAUGA.GPJ SPCL.GDT 17-2-22

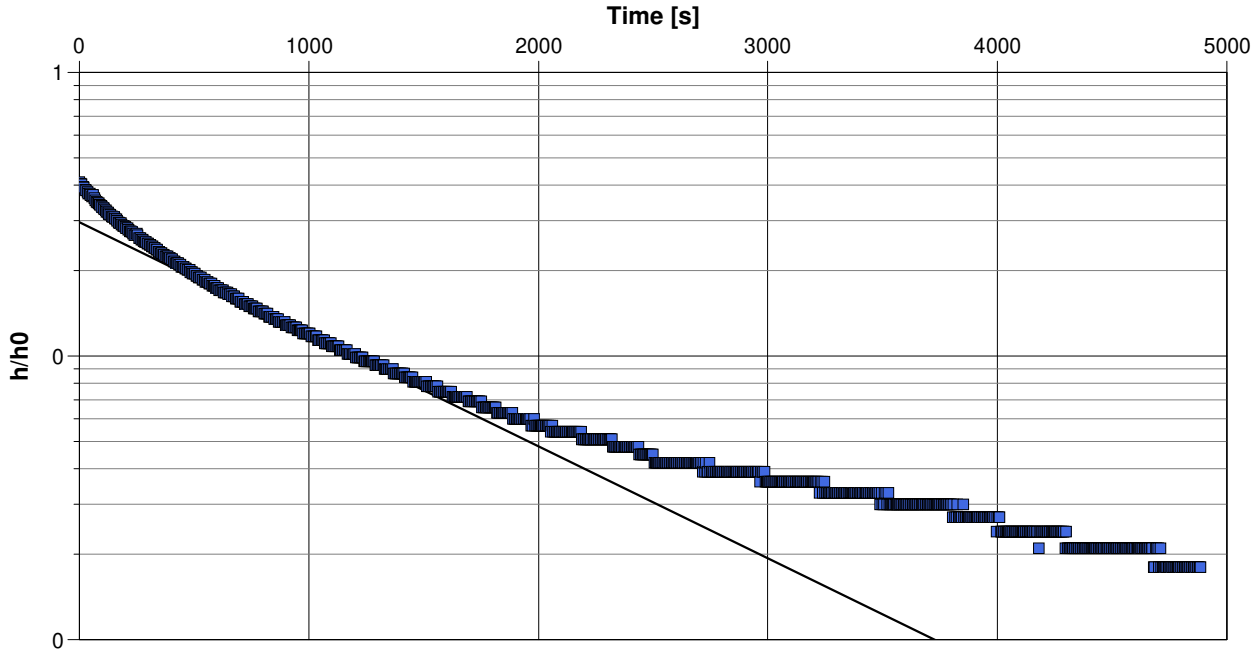
GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

Appendix B: Hydraulic Conductivity Analysis

Slug Test Analysis Report	
Project: 5150 Ninth Line	
Number: 18-748-100	
Client: Mattamy Limited	

Location: 5150 Ninth Line, Mississauga	Slug Test: BH9	Test Well: BH9
Test Conducted by: MJ		Test Date: 2020-03-27
Analysis Performed by: MJ	Hvorslev	Analysis Date: 2020-03-27
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH9	4.50×10^{-7}	

Appendix C: Groundwater Quality Certificate of Analysis

FINAL REPORT

CA14296-MAR20 R1

18-748-100

Prepared for

DS Consultants

FINAL REPORT

CA14296-MAR20 R1

First Page

CLIENT DETAILS

Client	DS Consultants
Address	6221 Highway 7 Unit 16 Vaughan, Ontario L4H 0K8, Canada
Contact	Meysam Jafari
Telephone	905-264-9393
Facsimile	905-264-2685
Email	meysam.jafari@dsconsultants.ca
Project	18-748-100
Order Number	
Samples	Ground Water (3)

LABORATORY DETAILS

Project Specialist	Brad Moore Hon. B.Sc
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2143
Facsimile	705-652-6365
Email	brad.moore@sgs.com
SGS Reference	CA14296-MAR20
Received	03/05/2020
Approved	03/12/2020
Report Number	CA14296-MAR20 R1
Date Reported	03/12/2020

COMMENTS

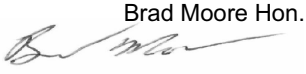
RL - SGS Reporting Limit

Temperature of Sample upon Receipt: 6 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:016135

SIGNATORIES

Brad Moore Hon. B.Sc



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FINAL REPORT

CA14296-MAR20 R1

Client: DS Consultants
Project: 18-748-100
Project Manager: Meysam Jafari
Samplers: Meysam Jafari

PACKAGE: **PWQO - General Chemistry** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Parameter	Units	RL	L1	L2	Sample Number: 7
					Sample Name: BH9
					Sample Matrix: Ground Water
					Sample Date: 05/03/2020
General Chemistry					
Biochemical Oxygen Demand (BOD5)	mg/L	2		15	< 4↑
Total Suspended Solids	mg/L	2		15	**24000**
Total Kjeldahl Nitrogen	as N mg/L	0.5		1	< 0.5

PACKAGE: **PWQO - Metals and Inorganics** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Parameter	Units	RL	L1	L2	Sample Number: 7	8	9
					Sample Name: BH9	BH9 Dissolved	BH9 Cl
					Sample Matrix: Ground Water	Ground Water	Ground Water
					Sample Date: 05/03/2020	05/03/2020	11/03/2020
Metals and Inorganics							
Cyanide (total)	mg/L	0.01		0.02	< 0.01		
Total Chlorine	mg/L	0.02	0.002	1			**< 0.02**
Aluminum (total)	mg/L	0.001	0.015	1	**14.4**		
Aluminum (0.2µm)	mg/L	0.001	0.015			**0.537**	
Arsenic (total)	mg/L	0.0002	0.005	0.02	**0.0059**		
Cadmium (total)	mg/L	0.000003	0.0001	0.008	0.000060		
Chromium (total)	mg/L	0.00008		0.08	0.0198		
Copper (total)	mg/L	0.0002	0.001	0.04	**0.0152**		
Lead (total)	mg/L	0.00001	0.001	0.12	**0.00901**		
Manganese (total)	mg/L	0.00001		0.05	**0.552**		
Nickel (total)	mg/L	0.0001	0.025	0.08	0.0200		
Phosphorus (total)	mg/L	0.003	0.01	0.4	**0.641**		
Selenium (total)	mg/L	0.00004	0.1	0.02	0.00017		

PACKAGE: **PWQO - Metals and Inorganics** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

				Sample Number	7	8	9
				Sample Name	BH9	BH9 Dissolved	BH9 Cl
				Sample Matrix	Ground Water	Ground Water	Ground Water
				Sample Date	05/03/2020	05/03/2020	11/03/2020
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	**Result**	**Result**
Metals and Inorganics (continued)							
Silver (total)	mg/L	0.00005	0.0001	0.12	< 0.00005		
Zinc (total)	mg/L	0.002	0.02	0.04	**0.045**		

PACKAGE: **PWQO - Microbiology** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

				Sample Number	7	
				Sample Name	BH9	
				Sample Matrix	Ground Water	
				Sample Date	05/03/2020	
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	
Microbiology						
E. Coli	cfu/100mL	-	100	200	< 5↑	

PACKAGE: **PWQO - Other (ORP)** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

				Sample Number	7	
				Sample Name	BH9	
				Sample Matrix	Ground Water	
				Sample Date	05/03/2020	
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	
Other (ORP)						
pH	no unit	0.05	8.5	9	7.58	
Chromium VI	mg/L	0.0002	0.001	0.04	< 0.0002	
Mercury (total)	mg/L	0.00001	0.0002	0.0004	0.00006	

PACKAGE: **PWQO - PAHs** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

Parameter	Units	RL	L1	L2	Result
PAHs					
Benzo(b+j)fluoranthene	mg/L	0.0001			< 0.0001

PACKAGE: **PWQO - Phenols** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

Parameter	Units	RL	L1	L2	Result
Phenols					
4AAP-Phenolics	mg/L	0.002	0.001	0.008	**< 0.002**

PACKAGE: **PWQO - SVOCs** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

Parameter	Units	RL	L1	L2	Result
SVOCs					
PAHs (Total)	mg/L	-		0.002	< 0.001
Perylene	mg/L	0.0005	7e-008		**< 0.0005**

PACKAGE: **PWQO - SVOCs - PAHs** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

Parameter	Units	RL	L1	L2	Result

Client: DS Consultants
Project: 18-748-100
Project Manager: Meysam Jafari
Samplers: Meysam Jafari

PACKAGE: **PWQO - SVOCs - PAHs** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

SVOCs - PAHs

Parameter	Units	RL	L1	L2	Result
7Hdibenzo(c,g)carbazole	mg/L	0.0001			< 0.0001
Anthracene	mg/L	0.0001	8e-007		< 0.0001
Benzo(a)anthracene	mg/L	0.0001	4e-007		< 0.0001
Benzo(a)pyrene	mg/L	0.0001			< 0.0001
Benzo[e]pyrene	mg/L	0.0001			< 0.0001
Benzo(ghi)perylene	mg/L	0.0002	2e-008		< 0.0002
Benzo(k)fluoranthene	mg/L	0.0001	2e-007		< 0.0001
Chrysene	mg/L	0.0001	1e-007		< 0.0001
Dibenzo(a,h)anthracene	mg/L	0.0001	2e-006		< 0.0001
Dibenzo(a,i)pyrene	mg/L	0.0001			< 0.0001
Dibenzo(a,j)acridine	mg/L	0.0001			< 0.0001
Fluoranthene	mg/L	0.0001	8e-007		< 0.0001
Indeno(1,2,3-cd)pyrene	mg/L	0.0002			< 0.0002
Phenanthrene	mg/L	0.0001	3e-005		0.0001
Pyrene	mg/L	0.0001			< 0.0001

PACKAGE: **PWQO - VOCs - BTEX** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

Parameter	Units	RL	L1	L2	Result
VOCs - BTEX					
Benzene	mg/L	0.0005	0.1	0.002	< 0.0005
Ethylbenzene	mg/L	0.0005	0.008	0.002	< 0.0005
Toluene	mg/L	0.0005	0.0008	0.002	< 0.0005
Xylene (total)	mg/L	0.0005		0.0044	< 0.0005
m-p-xylene	mg/L	0.0005	0.002		< 0.0005
o-xylene	mg/L	0.0005	0.04		< 0.0005

PACKAGE: **SANSEW - General Chemistry** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

Parameter	Units	RL	L1	L2	Result
General Chemistry					
Biochemical Oxygen Demand (BOD5)	mg/L	2		15	< 4↑
Total Suspended Solids	mg/L	2		15	24000
Total Kjeldahl Nitrogen	as N mg/L	0.5		1	< 0.5

Client: DS Consultants
Project: 18-748-100
Project Manager: Meysam Jafari
Samplers: Meysam Jafari

PACKAGE: **SANSEW - Metals and Inorganics**
(WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

				Sample Number	7	8	9
				Sample Name	BH9	BH9 Dissolved	BH9 CI
				Sample Matrix	Ground Water	Ground Water	Ground Water
				Sample Date	05/03/2020	05/03/2020	11/03/2020
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	**Result**	**Result**
Metals and Inorganics							
Cyanide (total)	mg/L	0.01		0.02	< 0.01		
Total Chlorine	mg/L	0.02	0.002	1			**< 0.02**
Aluminum (total)	mg/L	0.001	0.015	1	**14.4**		
Aluminum (0.2µm)	mg/L	0.001	0.015			**0.537**	
Arsenic (total)	mg/L	0.0002	0.005	0.02	**0.0059**		
Cadmium (total)	mg/L	0.000003	0.0001	0.008	0.000060		
Chromium (total)	mg/L	0.00008		0.08	0.0198		
Copper (total)	mg/L	0.0002	0.001	0.04	**0.0152**		
Lead (total)	mg/L	0.00001	0.001	0.12	**0.00901**		
Manganese (total)	mg/L	0.00001		0.05	**0.552**		
Nickel (total)	mg/L	0.0001	0.025	0.08	0.0200		
Phosphorus (total)	mg/L	0.003	0.01	0.4	**0.841**		
Selenium (total)	mg/L	0.00004	0.1	0.02	0.00017		
Silver (total)	mg/L	0.00005	0.0001	0.12	< 0.00005		
Zinc (total)	mg/L	0.002	0.02	0.04	**0.045**		

PACKAGE: **SANSEW - Microbiology** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

Parameter	Units	RL	L1	L2	Result
Microbiology					
E. Coli	cfu/100mL	-	100	200	< 5↑

PACKAGE: **SANSEW - Other (ORP)** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

Parameter	Units	RL	L1	L2	Result
Other (ORP)					
pH	no unit	0.05	8.5	9	7.58
Chromium VI	mg/L	0.0002	0.001	0.04	< 0.0002
Mercury (total)	mg/L	0.00001	0.0002	0.0004	0.00006

PACKAGE: **SANSEW - PAHs** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

Parameter	Units	RL	L1	L2	Result
PAHs					
Benzo(b+j)fluoranthene	mg/L	0.0001			< 0.0001

PACKAGE: **SANSEW - Phenols** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

Parameter	Units	RL	L1	L2	Result
Phenols					
4AAP-Phenolics	mg/L	0.002	0.001	0.008	**< 0.002**

PACKAGE: **SANSEW - SVOCs** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

Parameter	Units	RL	L1	L2	Result
SVOCs					
PAHs (Total)	mg/L	-		0.002	< 0.001
Perylene	mg/L	0.0005	7e-008		**< 0.0005**

PACKAGE: **SANSEW - SVOCs - PAHs** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E
L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

Parameter	Units	RL	L1	L2	Result
SVOCs - PAHs					
7Hdibenzo(c,g)carbazole	mg/L	0.0001			< 0.0001
Anthracene	mg/L	0.0001	8e-007		**< 0.0001**
Benzo(a)anthracene	mg/L	0.0001	4e-007		**< 0.0001**
Benzo(a)pyrene	mg/L	0.0001			< 0.0001
Benzo[e]pyrene	mg/L	0.0001			< 0.0001
Benzo(ghi)perylene	mg/L	0.0002	2e-008		**< 0.0002**

Client: DS Consultants
Project: 18-748-100
Project Manager: Meysam Jafari
Samplers: Meysam Jafari

PACKAGE: **SANSEW - SVOCs - PAHs** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

SVOCs - PAHs (continued)

Parameter	Units	RL	L1	L2	Result
Benzo(k)fluoranthene	mg/L	0.0001	2e-007		< 0.0001
Chrysene	mg/L	0.0001	1e-007		< 0.0001
Dibenzo(a,h)anthracene	mg/L	0.0001	2e-006		< 0.0001
Dibenzo(a,i)pyrene	mg/L	0.0001			< 0.0001
Dibenzo(a,j)acridine	mg/L	0.0001			< 0.0001
Fluoranthene	mg/L	0.0001	8e-007		< 0.0001
Indeno(1,2,3-cd)pyrene	mg/L	0.0002			< 0.0002
Phenanthrene	mg/L	0.0001	3e-005		0.0001
Pyrene	mg/L	0.0001			< 0.0001

Client: DS Consultants
Project: 18-748-100
Project Manager: Meysam Jafari
Samplers: Meysam Jafari

PACKAGE: **SANSEW - VOCs - BTEX** (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

L2 = SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05

Sample Number	7
Sample Name	BH9
Sample Matrix	Ground Water
Sample Date	05/03/2020

VOCs - BTEX

Parameter	Units	RL	L1	L2	Result
Benzene	mg/L	0.0005	0.1	0.002	< 0.0005
Ethylbenzene	mg/L	0.0005	0.008	0.002	< 0.0005
Toluene	mg/L	0.0005	0.0008	0.002	< 0.0005
Xylene (total)	mg/L	0.0005		0.0044	< 0.0005
m-p-xylene	mg/L	0.0005	0.002		< 0.0005
o-xylene	mg/L	0.0005	0.04		< 0.0005

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E L1	SANSEW / WATER / - - Mississauga - Storm Sewer - BL_259_05 L2
BH9					
Anthracene	EPA 3510C/8270D	µg/L	< 0.0001	8e-007	
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.0001	4e-007	
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.0002	2e-008	
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.0001	2e-007	
Chrysene	EPA 3510C/8270D	µg/L	< 0.0001	1e-007	
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.0001	2e-006	
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.0001	8e-007	
Perylene	EPA 3510C/8270D	µg/L	< 0.0005	7e-008	
Phenanthrene	EPA 3510C/8270D	µg/L	0.0001	3e-005	
Total Suspended Solids	SM 2540D	mg/L	24000		15
Aluminum	SM 3030/EPA 200.8	µg/L	14.4	0.015	
Arsenic	SM 3030/EPA 200.8	µg/L	0.0059	0.005	
Copper	SM 3030/EPA 200.8	µg/L	0.0152	0.001	
Lead	SM 3030/EPA 200.8	µg/L	0.00901	0.001	
Manganese	SM 3030/EPA 200.8	mg/L	0.552		0.05
Phosphorus	SM 3030/EPA 200.8	µg/L	0.641	0.01	
Zinc	SM 3030/EPA 200.8	µg/L	0.045	0.02	
4AAP-Phenolics	SM 5530B-D	mg/L	< 0.002	0.001	
BH9 Dissolved					
Aluminum (dissolved)	SM 3030/EPA 200.8	µg/L	0.537	0.015	
BH9 Cl					
Chlorine	SM 4500	µg/L	< 0.02	0.002	

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 I Internal ref.: ME-CA-IENVIEWL-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)	BOD0011-MAR20	mg/L	2	< 2	20	30	94	70	130	78	70	130

Chlorine

Method: SM 4500 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-008

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 Chlorine	EWL0086-MAR20	mg/L	0.02	< 0.02	NV	20	100	90	110	NA		
Total Chlorine	EWL0171-MAR20	mg/L	0.02	< 0.02	ND	20	93	90	110	NA		

Cyanide by SFA

Method: SM 4500 I Internal ref.: ME-CA-IENVISFA-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)	SKA0070-MAR20	mg/L	0.01	<0.01	ND	10	95	90	110	92	75	125

QC SUMMARY

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A | Internal ref.: ME-CA-IENVISKA-LAK-AN-012

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
Chromium VI	SKA0074-MAR20	mg/L	0.0002	<0.0002	5	20	103	80	120	NV	75	125

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-IENVISPE-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)	EHG0009-MAR20	mg/L	0.00001	< 0.00001	ND	20	113	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)	EMS0045-MAR20	mg/L	0.00005	<0.00005	ND	20	103	90	110	96	70	130
Aluminum (total)	EMS0045-MAR20	mg/L	0.001	<0.001	1	20	104	90	110	110	70	130
Aluminum (0.2µm)	EMS0045-MAR20	mg/L	0.001	<0.001	1	20	104	90	110	110	70	130
Arsenic (total)	EMS0045-MAR20	mg/L	0.0002	<0.0002	10	20	102	90	110	98	70	130
Cadmium (total)	EMS0045-MAR20	mg/L	0.000003	<0.000003	3	20	99	90	110	101	70	130
Chromium (total)	EMS0045-MAR20	mg/L	0.00008	<0.00008	17	20	107	90	110	106	70	130
Copper (total)	EMS0045-MAR20	mg/L	0.0002	<0.0002	1	20	103	90	110	107	70	130
Manganese (total)	EMS0045-MAR20	mg/L	0.00001	<0.00001	0	20	103	90	110	102	70	130
Nickel (total)	EMS0045-MAR20	mg/L	0.0001	<0.0001	1	20	102	90	110	100	70	130
Lead (total)	EMS0045-MAR20	mg/L	0.00001	<0.00001	1	20	100	90	110	117	70	130
Phosphorus (total)	EMS0045-MAR20	mg/L	0.003	<0.003	1	20	100	90	110	NV	70	130
Selenium (total)	EMS0045-MAR20	mg/L	0.00004	<0.00004	ND	20	102	90	110	101	70	130
Zinc (total)	EMS0045-MAR20	mg/L	0.002	<0.002	9	20	102	90	110	130	70	130

QC SUMMARY

Microbiology

Method: SM 9222D | Internal ref.: ME-CA-IENVIMIC-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
E. Coli	BAC9114-MAR20	cfu/100mL	-	ACCEPTED	ACCEPTED							

pH

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-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	EWL0118-MAR20	no unit	0.05	NA	0		101			NA		

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-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	SKA0072-MAR20	mg/L	0.002	<0.002	NV	10	105	90	110	NV	75	125

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-IENVIGC-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
7Hdibenzo(c,g)carbazole	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	104	50	140	NSS	50	140
Anthracene	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	91	50	140	NSS	50	140
Benzo(a)anthracene	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	92	50	140	NSS	50	140
Benzo(a)pyrene	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	91	50	140	NSS	50	140
Benzo(b+j)fluoranthene	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	102	50	140	NSS	50	140
Benzo[e]pyrene	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	84	50	140	NSS	50	140
Benzo(ghi)perylene	GCM0109-MAR20	mg/L	0.0002	< 0.0002	NSS	30	94	50	140	NSS	50	140
Benzo(k)fluoranthene	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	87	50	140	NSS	50	140
Chrysene	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	93	50	140	NSS	50	140
Dibenzo(a,h)anthracene	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	92	50	140	NSS	50	140
Dibenzo(a,i)pyrene	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	94	50	140	NSS	50	140
Dibenzo(a,j)acridine	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	102	50	140	NSS	50	140
Fluoranthene	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	93	50	140	NSS	50	140
Indeno(1,2,3-cd)pyrene	GCM0109-MAR20	mg/L	0.0002	< 0.0002	NSS	30	94	50	140	NSS	50	140
Perylene	GCM0109-MAR20	mg/L	0.0005	< 0.0005	NSS	30	89	50	140	NSS	50	140
Phenanthrene	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	90	50	140	NSS	50	140
Pyrene	GCM0109-MAR20	mg/L	0.0001	< 0.0001	NSS	30	92	50	140	NSS	50	140

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-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	EWL0122-MAR20	mg/L	2	< 2	0	10	NV	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-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	SKA0087-MAR20	as N mg/L	0.5	<0.5	2	10	104	90	110	102	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-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
Benzene	GCM0103-MAR20	mg/L	0.0005	<0.0005	ND	30	100	60	130	93	50	140
Ethylbenzene	GCM0103-MAR20	mg/L	0.0005	<0.0005	ND	30	102	60	130	95	50	140
m-p-xylene	GCM0103-MAR20	mg/L	0.0005	<0.0005	ND	30	103	60	130	95	50	140
o-xylene	GCM0103-MAR20	mg/L	0.0005	<0.0005	ND	30	101	60	130	94	50	140
Toluene	GCM0103-MAR20	mg/L	0.0005	<0.0005	ND	30	101	60	130	95	50	140

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.

QC SUMMARY

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

Samples analysed as received. 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” published by the Ministry and dated March 9, 2004 as amended.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

No: 016135

Page _____ of _____

SGS Environment, Health & Safety - 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

Laboratory Information Section - Lab use only

Received By: Kim Sheard
Received Date: 03/05/20 (mm/dd/yy)
Received Time: 16:55 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☐ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ice
Temperature Upon Receipt (°C) 6 , 6 , 6
CA 14296 - MAR20
LAB LIMS #:

REPORT INFORMATION	INVOICE INFORMATION
Company: DS Consultants	☐ (same as Report Information)
Contact: Meysam Jafari	Company:
Address: 6221 Hwy 7. Unit 16 Vaughan	Contact:
Phone: 6478315596	Address:
Fax:	Phone:
Email: meysam.jafari@dsconsultants.ca	Email: accounting@dsconsultants.ca

Quotation #:
Project #: 18-748-100
P.O. #:
Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☑ 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

Regulation 153/04: ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ____ ☐ Res/Park ☐ Ind/Com ☐ Agri/Other Soil Texture: ☐ Coarse ☐ Medium ☐ Fine

Other Regulations: ☐ Reg 347/558 (3 Day min TAT) ☑ PWQO ☐ MMER ☐ CCME ☐ Other: ☐ MISA

Sewer By-Law: ☑ Sanitary ☑ Storm Municipality: Mississauga

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	M&I: 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,Ti,U,V,Zn	SVOC: PAHs only	SVOC: SVOCs all incl PAHs, ABNs, CPs	PCB: PCBs Total ☐ Aroclor ☐	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: Sanitary/Storm Mississaga	Other: PWQO	Other	Other	Other	Other	Other	Other	TCLP: Specify TCLP tests ☐M&I ☐VOC ☐PCB ☐B(a)P ☐ABN ☐Ignit.	COMMENTS:
1	BH9	March 5.2020	12:00		GW	N												✓	✓								
2																											
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											
11																											
12																											

Observations/Comments/Special Instructions

Sampled By (NAME): Meysam Jafari Signature: Meysam Jafari Date: 3 / 5 / 2020 (mm/dd/yy)

Relinquished by (NAME): Signature: Date: / / (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.2
Date of Issue: 09 Sept, 2019

Appendix D: MECP Water Wells Records

5150 9th Line, Mississauga, ON												
TOWNSHIP C	UTM	E	N	DATE CNTR	CASING	WATER	PUMP TEST	WELL USE	SCREEN	WELL	1	FORMATION
MILTON TOWN (TRAFALG	17 W	602099	4820671	2014/06 7472	2.04			MO	0020 10	7224941	(Z192696) A166033	BRWN FILL LOOS 0005 BRWN CLAY FSND PCKD 0030
MILTON TOWN (TRAFALG	17 W	602013	4820656	2015/09 7241	2			MT	0015 10	7249209	(Z213484) A179266	BRWN SAND SILT CLAY 0005 BRWN CLAY 0017 GREY CLAY DNSE 0025
MILTON TOWN (TRAFALG	17 W	602016	4820679	2015/09 7241	2			MT	0015 10	7249210	(Z213485) A179267	BRWN SAND SILT CLAY 0005 BRWN CLAY 0017 GREY CLAY DNSE 0025
MILTON TOWN (TRAFALG	17 W	602048	4820657	2015/09 7241	2			MT	0015 10	7249211	(Z213488) A179268	BRWN SAND SILT CLAY 0005 BRWN CLAY 0017 GREY CLAY 0025
MILTON TOWN (TRAFALG	17 W	602001	4820713	2015/09 7241	2			MT	0015 10	7249212	(Z213487) A179269	BRWN SILT SAND CLAY 0005 BRWN CLAY 0017 GREY CLAY DNSE 0025
MILTON TOWN (TRAFALG	17 W	601809	4821137	2017/02 7472	2			MO	0015 10	7283290	(Z252633) A222847	BRWN CLAY TILL PCKD 0025
MILTON TOWN (TRAFALG DS N 02 00	17 W	602367	4820884	1987/02 3030	36	FR 0017 FR	17///:	DO		2806585	-6252	BRWN LOAM 0001 BRWN SAND CLAY 0017 BLUE CLAY SILT LYRD 0040 GREY SILT STNS HARD 0060 BLUE CLAY SILT LYRD 0065 GREY SAND 0065
MILTON TOWN (TRAFALG NS 01 001	17 W	602207	4821130	1988/06 4868	30 30	FR 0020	28/49/3/1:0	DO		2806945	-7770	BRWN LOAM SOFT 0001 BRWN CLAY STNS HARD 0014 GREY CLAY STNS HARD 0045 RED CLAY STNS HARD 0050 GREY CLAY SAND STNS 0055
MILTON TOWN (TRAFALG NS 09 001	17 W	602232	4821108	1964/01 1612	4	FR 0086	19/80/2/1:0	DO		2802669	()	LOAM 0002 CLAY BLDR 0055 CLAY MSND 0083 GRVL 0086
MILTON TOWN (TRAFALG NS 09 001	17 W	602090	4821230	1972/08 3637	30 32	FR 0074	18/72/2/2:0	DO		2804137	()	BRWN LOAM 0002 BRWN CLAY 0014 GREY CLAY 0050 RED CLAY 0052 GREY CLAY 0062 BRWN SAND STNS 0074 BLCK SAND 0075
MILTON TOWN (TRAFALG NS 09 001	17 W	602207	4821138	1965/05 1612	5 5	FR 0110	16/111/1/2:3	DO		2802670	()	LOAM 0002 BLUE CLAY 0062 MSND GRVL 0083 RED SHLE 0111
MILTON TOWN (TRAFALG NS 09 001	17 W	601835	4820730	1966/12 1307	30	FR 0065	30//2/:	DO		2802672	()	BRWN LOAM CLAY 0018 GREY CLAY 0063 MSND
MILTON TOWN (TRAFALG NS 09 001	17 W	602267	4820936	1967/07 1612	6					2802673	() A	LOAM 0001 BLUE CLAY 0054 GRVL MSND 0093 RED SHLE 0140
MILTON TOWN (TRAFALG NS 09 001	17 W	601818	4820662	2003/04 6974				DO		2809735	-258793 A	
MILTON TOWN (TRAFALG NS 09 001	17 W	602235	4820903	1970/04 1307	30	FR 0063	15/57/6/1:0	DO		2803350	()	BRWN CLAY 0010 GREY CLAY STNS 0062 GRVL BLDR 0063
MILTON TOWN (TRAFALG NS 09 001	17 W	601808	4821207	7360						7293389	(C38677) A227427 P	
MILTON TOWN (TRAFALG NS 09 001	17 W	602148	4820784	1956/11 1642	6	FR 0078	24///:	DO		2802667	()	PRDG 0030 CLAY MSND 0080
MILTON TOWN (TRAFALG NS 09 001	17 W	602250	4820961	1967/07 1612	5 5	FR 0105	25/108/0/48	DO		2802674	()	LOAM 0001 BRWN CLAY 0068 GRVL FSND 0090 RED SHLE 0108
MILTON TOWN (TRAFALG NS 09 001	17 W	602081	4820721	1956/09 1642	6	FR 0069	18///:	DO		2802666	()	PRDG 0015 CLAY 0070
MILTON TOWN (TRAFALG NS 09 001	17 W	601989	4820727	2015/09 7241	2			MT	0015 10	7249213	(Z213486) A188762	BRWN SAND SILT CLAY 0005 BRWN CLAY 0017 GREY CLAY 0025
MILTON TOWN (TRAFALG NS 09 001	17 W	602008	4821192	7147						7279919	(C35694) A216288 P	

MILTON TOWN (TRAFALG NS 09 001	17 W	601936	4821330	2017/06 7472	2			MO	0015 10	7292424	(Z259507) A227426	BRWN LOAM LOOS 0002 BRWN CLAY SAND PCKD 0014 GREY CLAY SAND PCKD 0025
MILTON TOWN (TRAFALG NS 09 001	17 W	601807	4821201	2017/06 7472	2			MO	0015 10	7292425	(Z259508) A227427	BRWN LOAM LOOS 0002 BRWN CLAY SAND PCKD 0014 GREY CLAY SAND PCKD 0025
MILTON TOWN (TRAFALG NS 09 002	17 W	601464	4821384	1990/07 4005	6	UK 0077	34/75/2/2:0	PS		2807626	-76656	BRWN CLAY SAND LOOS 0025 GREY CLAY SAND LOOS 0076 BRWN GRVL SAND LOOS 0077
MISSISSAUGA CITY (TR NS 10 001	17 W	602355	4821053	1970/03 3903	6 1	FR 0073 SA	32/125/8/0:1	NU	0126 2	2803411	()	BRWN LOAM 0002 BRWN CLAY STNS 0073 BRWN CLAY MSND GRVL 0074 BRWN CLAY STNS 0080 BRWN MSND CLAY GRVL 0100 RED SHLE
MISSISSAUGA CITY (TR NS 10 001	17 W	602235	4821303	1972/09 1307	30	FR 0065	35/62/0/1:0	DO		2803939	()	BRWN OBDN SAND 0015 GREY CLAY 0055 GREY CLAY SAND 0063 SAND 0065
MISSISSAUGA CITY (TR NS 10 001	17 W	602155	4821263	1970/04 4602	6	MN 0067	18/72//:	DO		2803352	()	CLAY 0019 GREY CLAY 0055 GREY CLAY GRVL 0067 RED CLAY 0073 RED SHLE 0076
MISSISSAUGA CITY (TR NS 10 001	17 W	602253	4821259	1967/09 4602	6 6	FR 0080 FR	21/111/2/2:0	DO		2802701	()	PRDG 0032 GREY CLAY 0044 GREY CLAY GRVL 0068 RED CLAY 0073 RED SHLE 0111
MISSISSAUGA CITY (TR NS 10 002	17 W	601675	4821703	1970/03 3903	2 1	FR 0063	29/94/11/0:1	NU	0095 2	2803412	()	BRWN LOAM 0002 BRWN CLAY STNS 0012 GREY CLAY STNS SILT 0063 GREY CLAY SILT 0073 RED
MISSISSAUGA CITY (TR NS 10 002	17 W	601732	4821709	1964/11 1307	30	FR 0076	40//0/:	DO		2802702	()	BRWN LOAM CLAY 0018 GREY CLAY 0050 RED CLAY 0068 RED SHLE 0076
MISSISSAUGA CITY (TR NS 10 002	17 W	601735	4821683	1976/08 1307	30	FR 0050	52/72/1/1:0	DO		2805029	()	BRWN LOAM 0018 GREY CLAY STNS 0050 SAND 0052 RED CLAY 0074 RED SHLE 0074