Preliminary Hydrogeological Investigation

Proposed Residential Development
3056 Neyagawa Boulevard
Oakville, ON

Prepared For:

NEATT Communities

Project #: 22-012-101
Date: September 8, 2023

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22-012-101 **September 8, 2023**

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Attention: Mr. Evan Kernaghan
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RE: Preliminary Hydrogeological Investigation – 3056 Neyagawa Boulevard, Oakville, Ontario

DS Consultants Limited (DS) was retained by NEATT Communities to complete a preliminary hydrogeological investigation for the proposed development located at 3056 Neyagawa Boulevard in Oakville, Ontario (Site). The Site is approximately 8 ha (19.77 acre) parcel of land located on the northwest corner of the intersection of Neyagawa Boulevard and Dundas Street West. It is DS's understanding that at this stage, the east portion of the subject property is to be developed for residential purposes and will include the construction of three (3) blocks (Block 1, 2 and 3) including 8-27 story towers with podium buildings with four (4) levels of underground parking (P4).

The ground elevation at the site ranges between 154 to 159 meters above sea level (masl). No below-grade design was available at the time of writing this report. The assumed finished floor elevation of P4 level as part of the preliminary design for proposed development considering the footing and elevator shaft would be approximately 14 meters below the existing ground surface (mbgs).

This preliminary 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 during the proposed development phase. This investigation is based on monitoring wells installed by DS in support of the preliminary geotechnical, hydrogeological 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).

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

1. Based on the MECP water well records search, there were thirty-one (31) water wells within a 500 m radius of the Site. All wells were noted as monitoring/test holes or not in use except for seven (7) records for domestic use purposes, one (1) well recorded as public supply and one (1) well listed for irrigation purpose. The study area is deemed to be fully serviced by municipal water and therefore, no groundwater users are expected in the area. Closer to construction, it is prudent to complete a door-to-door water well survey to confirm absence of any active water wells.
2. Between June 5 and 25, 2023, DS drilled twenty-one (21) boreholes as part of this hydrogeological investigation concurrently with the geotechnical and environmental investigation. Boreholes were

advanced to depths ranging from 1.4 to 18.8 meters below ground surface (mbgs). A total of ten (10) drilled boreholes were converted into monitoring wells and screened at depths ranging from 3.1 to 18.4 mbgs. DS also utilized five (5) existing monitoring wells installed by SHAD and Associates Inc. as part of preliminary geotechnical investigation in 2022. Boreholes were drilled to depths ranging from 8.2 to 9.4 mbgs and screened at depths ranging from 1.5 to 7.1 mbgs.

3. The surficial geology of the Site has been mapped as Till and consists of clay to silt-textured till derived from glaciolacustrine deposits or shale. The overburden geology at the Site generally consists of silty clay deposits, till/shale complex, and shale bedrock at approximate depths ranging from 2.3 to 3.3 m below existing ground surface, corresponding to elevations varying from 152.2 to 157.0 masl.
4. DS measured groundwater levels in all installed monitoring wells on June 26th and July 19th, 2023. Based on groundwater level measurements, the shallow groundwater table at the site was found at depths ranging from 2.66 to 5.01 mbgs (Elev. 150.83-157.04 masl) and deep groundwater levels were found at the depth ranging from 9.43 to 13.09 mbgs (141.16 -147.49 masl). Based on groundwater elevations, the flow direction within the Site is inferred to be southwesterly toward East Sixteen Mile Creek located approximately 350 meters west of the Site.
5. DS completed fourteen (14) Single Well Response Tests (SWRTs) in monitoring wells on June 26th and July 19th, 2023, to estimate hydraulic conductivity (k) for the representative geological units in which the wells were screened. The values of calculated hydraulic conductivity (k) range from 9.65×10^{-9} to 1.46×10^{-5} m/s. Due to the heterogeneous nature of soils and the hydrogeological setting of the site, the geomean K-value of of 6.17×10^{-7} m/s was considered in the dewatering assessment.
6. One (1) unfiltered groundwater sample was collected from monitoring well BH23-6 on June 27th, 2023. The sample was analyzed and compared against the parameters listed under the Town of Oakville and Halton Region sewer use by-laws and Provincial Water Quality Objectives (PWQO) for surface water. The reported analytical results indicate that only TSS exceeded the Halton sanitary sewer limits. There were no exceedances against the Halton Region storm limits. Comparing the results against Town of Oakville storm criteria indicated that parameters such as TSS and Manganese exceeded the Town's storm limits. Therefore, water cannot be discharged to the Region/Town's storm and sanitary sewers without treatment. Multiple parameters exceeded the Provincial Water Quality Objectives (PWQO) criteria for surface water. Therefore, groundwater at the Site is not suitable for direct discharge without pre-treatment into the nearby surface water systems. Higher concentrations of total metals are typically associated with suspended solids and can be reduced with water filtration.
7. Considering the unsealed excavation method, the recommended flow rates for the proposed buildings are summarised in table below. This estimated value incorporates a safety factor of x3 and a theoretical 10 mm storm event into the open excavation during construction.

Block #	Assumed deepest excavation Elevation	Flow Rate Q- without a safety factor (L/day)	Flow Rate Q- with a safety factor x3 (L/day)	Storm water (@ 10 mm/24 hrs.) (L/day)	Design Flow Rate Or Total Flow Rate (L/day)
Block 1	P4	86,000	258,000	100,000	358,000
Block 2		92,000	276,000	115,000	391,000
Block 3		78,000	234,000	77,000	311,000

8. Following the construction of the underground structure, long-term groundwater flow to the underfloor drainage system for the building will be a function of the upward flux and drainage along the foundation wall. Based on the assumed design, depth to water and given k-value, the estimated permanent theoretical flow for each block is summarised in table below:

Block #	Permanent Drainage- without a safety factor (L/day)	Permanent Drainage-with a safety factor x3 (L/day)
Block 1	6,000	18,000
Block 2	7,000	21,000
Block 3	5,000	15,000

9. Since the expected design dewatering rate considering unsealed excavation for Blocks 1, 2 and 3 is between the MECP water taking limit of 50,000 and 400,000 L/day, an EASR application is required to be submitted to the MECP for short-term dewatering prior to construction of each block. Based on current groundwater conditions, permanent groundwater flow or permanent drainage is expected to be less than the water-taking limit of 50,000 L/day. Therefore, a PTTW is not required to be submitted on a permanent basis.

10. A discharge permit will be required from the Halton Region and/or Town of Oakville if private water is to be sent to the sewer system. Unless the future development is designed as a water-tight structure, all groundwater (temporary and permanent) will be sent to the sewer system and therefore will require a discharge approval from the Halton Region and/or Town of Oakville.

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.

12. There are structures and utilities within the maximum predicted zone of influence (ZOI) about 95 meters when considering an unsealed excavation. Since the majority of proposed underground construction is anticipated to be constructed within the low permeable till deposits and bedrock, an effect of settlement due to dewatering would be negligible.

13. 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 contact the undersigned.

DS Consultants Ltd.

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1.0 IINTRODUCTION

DS Consultants Limited (DS) was retained by NEATT Communities to complete a preliminary hydrogeological investigation for the proposed development located at 3056 Neyagawa Boulevard in Oakville, Ontario (the Site). The Site is approximately 8 ha (19.77 acre) parcel of land located on the west corner of the intersection of Neyagawa Boulevard and Dundas Street West. It is DS's understanding that at this stage, the east portion of the subject property is to be developed for residential purposes and will include the construction of three (3) blocks (Block 1, 2 and 3) including 8-27 story towers with podium buildings with four (4) levels of underground parking (P4). **Figure 1** presents the site location map that highlights the location of the site and the surrounding area.

The ground elevation at the site ranged between 154 to 159 meters above sea level (masl). The assumed finished floor elevation of potential P4 Level as part of the conceptual proposed development considering the footing and elevator shaft would be approximately 14 meters below the existing ground surface (mbgs). No below-grade design was available at the time of writing this report.

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.

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). The hydrogeological investigation will also be needed in support of Site Plan Approval (SPA). 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) In-situ hydraulic conductivity testing of existing monitoring wells;

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

(v) Asses permanent drainage requirements;

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

(vii) Data analyses and report preparation.

2.0 FIELD INVESTIGATION

A total of twenty-one (21) boreholes were drilled at the subject site by DS as part of the hydrogeological investigation concurrently with the geotechnical and environmental investigation. All boreholes were advanced between June 5 and 25, 2023, to a depth ranging from 1.4 to 18.8 mbgs. A total of ten (10) drilled boreholes were converted into monitoring wells and screened at depths ranging from 3.1 to 18.4 mbgs. Monitoring wells were constructed using 50 mm diameter PVC riser pipes and screens, which were installed in each of the boreholes in accordance with O.Reg. 903. To help better understanding of geological setting, DS utilized five (5) existing monitoring wells installed by SHAD and Associates Inc. as part of preliminary geotechnical investigation in 2022. Boreholes were drilled to a depth ranging from 8.2 to 9.4 mbgs and screened at depths ranging from 1.5 to 7.1 mbgs. All monitoring wells were developed before use to allow for groundwater level monitoring, hydraulic conductivity testing, and assess groundwater quality. A total of fourteen (14) single well response tests (SWRTs) were completed by performing a rising head test to estimate hydraulic conductivity values of the overburden at the Site. One (1) unfiltered groundwater sample was collected and analyzed against the Town of Oakville and Halton Region sewer use by-laws and Provincial Water Quality Objectives (PWQO) to assess groundwater discharge options during construction. The locations of the BHs/MWs are shown in **Figure 3** and detailed subsurface conditions are presented on the geological cross-section **(Figure 5)** and the borehole Logs in **Appendix A**.

3.0 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 all investigations at the site as well as the MECP water well records (WWRs) were used to interpret the geological and hydrogeological conditions at the Site.

3.1 Physiography and Drainage

The site is situated within the Sixteen Mile Creek Watershed within the jurisdiction of the Conservation Halton. The area is characterised by gently rolling land, and slopes south towards Lake Ontario. The topography at the Site is relatively flat with a surface elevation ranging from approximately 154 to 159 masl. The nearest surface water body to the Site is East Sixteen Mile Creek which runs approximately 350 meters west of the Site and ultimately discharged into Lake Ontario**.** Drainage is generally controlled by streams, artificial channels, topography and underground utilities.

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 Till Plains (Drumlinized) physiographic region of Southern Ontario (as per OGS Earth). Quaternary geology characterized by Halton Till predominately consists of silt to silty clay matrix, high in carbonate content and clast poor deposits of Pleistocene. The surficial geology

of the Site has been mapped as Till consists of clay to silt-textured till derived from glaciolacustrine deposits or shale. 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 shale, limestone, dolostone, siltstone as part of the Queenston Formation (MNDM Map 2544 Bedrock Geology of Ontario. Bedrock was encountered during the current investigation at the depth ranging from 2.3 to 3.3 mbgs.

3.2.3 Site Geology

On-site subsurface soils were interpreted according to the preliminary geotechnical investigation report performed by DS (August 2023) based on the boreholes/monitoring wells (BHs/MWs) drilled by DS. 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 5.**

Topsoil: A surficial topsoil layer with thickness ranging from 150 to 250 mm was encountered at the ground surface in Boreholes BH23-5, BH23-6, and BH23-7.

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. Shallow hand-dug test-pits should be carried out to further explore the topsoil conditions.

Asphaltic Concrete and Granular Material: Asphaltic concrete with thickness of 150 mm was encountered at the ground surface in Borehole BH23-8 and a 50 mm thick layer of granular fill consisting of sand and gravel was present at the ground surface in BH23-2.

Fill Materials: Fill materials consisting of clayey silt to silty clay with occasional inclusions of rootlets/organics, organic staining, weathered shale, and cobble fragments were present in all boreholes, and extended to depths ranging from 0.8 to 1.5 m below existing ground surface. Trace asphalt fragments was present in the fill in BH23-6.

Silty Clay Till Deposit: Silty clay till was encountered in all boreholes and extended to depths ranging from 1.6 to 3.1 m below existing ground surface.

Silty Clay Till / Shale Complex: Overlying shale bedrock, silty clay till/shale complex with thicknesses ranging from 0.2 to 0.9 m was found in BH23-1, BH23-4, BH23-5, BH23-6, and BH23-8. This deposit consisted of glacial till with clayey texture mixed with highly weathered shale.

Shale Bedrock: Shale bedrock of Queenston Formation was found at approximate depths ranging from 2.3 to 3.3 m below existing ground surface, corresponding to elevations varying from 152.2 to 157.0 masl.

3.3 Hydrogeology

The hydrogeology at the Site was evaluated using the on-site monitoring wells installed by DS and other consultants, local domestic wells and existing hydrogeological and geotechnical reports for the area.

3.3.1 Local Groundwater Use

As part of the hydrogeological investigation, DS completed a search of the MECP water well records (WWRs) database. Based on the MECP WWR search, there are thirty-one (31) water wells within 500 meters of the site (**Appendix D**). All wells were noted as monitoring/test holes or not in use except for seven (7) records for domestic use purposes, one (1) well recorded as public supply and one (1) well listed for irrigation purpose. **Figure 1** shows the MECP water well location plan. The study area is deemed to be fully serviced by municipal water and therefore, no groundwater users are expected in the area. Closer to construction, it is prudent to complete a door-to-door water well survey to confirm absence of any active water wells.

3.3.2 Groundwater Conditions

DS measured groundwater levels in all available monitoring wells on June 26th and July 19th, 2023. **Table 2** presents the groundwater levels in all monitoring wells. Based on groundwater level measurements, the shallow groundwater table at the site was found at the depth ranging from 2.66 to 5.01 mbgs (Elev. 150.83-157.04 masl) and deep groundwater level was found at the depth ranging from 9.43 to 13.09 mbgs (141.16 - 147.49 masl). The interpreted groundwater contour map for the water level measurements is shown in **Figure 4**. Based on groundwater elevations, the flow direction within the Site is inferred to be southwesterly toward East Sixteen Mile Creek located approximately 350 meters west of the Site.

Table 2: Groundwater Levels in Monitoring Wells

Well ID	Ground Elevation (masl)	Screened Interval (mbgs)	June 26, 2023		July 19, 2023	
			Depth to Water (mbgs)	Groundwater Elevation (masl)	Depth to Water (mbgs)	Groundwater Elevation (masl)
BH23-1	158.13	12.2-18.3	4.33	153.8	4.38	153.75
BH23-2	159.56	9.1-12.2	2.52	157.04	2.78	156.78
BH23-3	158.19	7.6-15.2	3.02	155.17	3.12	155.07
BH23-4	156.92	7.6-15.2	9.43	147.49	10.51	146.41
BH23-5	157.62	7.6-15.2	4.18	153.44	4.12	153.5
BH23-6	155.41	7.6-15.2	4.09	151.32	4.19	151.22
BH23-7	157.58	4.6-12.2	5.01	152.57	5	152.58
BH23-8	154.25	9.1-15.2	12.94	141.31	13.09	141.16
BH23-9	158.21	3.1-6.2	4.07	154.14	4.12	154.09
BH23-17	154.51	3.1-6.2	3.68	150.83	3.67	150.84
BH1	158.19	2.4-5.4	3.24	154.95	3.02	155.17
BH2	159.56	4.1-7.1	-	-	3.28	156.28
BH3	158.13	1.5-3	2.71	155.42	2.66	155.47
BH4	158.13	3.1-6.1	3.53	154.6	3.49	154.64
BH5	156.92	2.3-5.3	4.07	152.85	3.21	153.71

3.3.3 Hydraulic Conductivity

A total of fourteen (14) Single Well Response Tests (SWRTs) were completed by DS in monitoring wells on June 26th and July 19th, 2023, to estimate hydraulic conductivity (k) for the representative geological units in which the wells were completed. SWRTs were completed by performing a rising head test (slug test) with

the use of Waterra® tubing to 'instantaneously' remove water from the well. A datalogger was placed at the bottom of the wells to monitor recovery. Hydraulic conductivity (k) values were calculated using the Hvorslev method. **Table 3-1** presents a summary of the hydraulic conductivity (k) results for the representative geological units. The values of calculated hydraulic conductivity (k) range from 9.65×10^{-9} to 1.46×10^{-5} m/s. The hydraulic testing results are provided in **Appendix B.** Due to the heterogeneous nature of soils and the hydrogeological setting of the site, the geo-mean K-value of 6.17×10^{-7} m/s was considered in the dewatering assessment.

Table 3-1: Summary of Hydraulic Conductivity (k) Test Results

Well ID	Screen Interval	Screened Formation	K- Value(m/s)	Geomean (m/s)
BH23-1	12.2-18.3	Shale Bedrock	1.13×10^{-7}	6.17×10^{-7}
BH23-2	9.1-12.2	Shale Bedrock	5.48×10^{-7}	
BH23-4	7.6-15.2	Shale Bedrock	9.65×10^{-9}	
BH23-5	7.6-15.2	Shale Bedrock	4.49×10^{-7}	
BH23-6	7.6-15.2	Shale Bedrock	2.11×10^{-7}	
BH23-7	4.6-12.2	Shale Bedrock	5.15×10^{-7}	
BH23-8	9.1-15.2	Shale Bedrock	3.47×10^{-7}	
BH23-9	3.1-6.2	Shale Bedrock	1.79×10^{-6}	
BH23-17	3.1-6.2	Shale Bedrock	2.94×10^{-7}	
BH1	2.4-5.4	Till-Shale Bedrock	5.13×10^{-6}	
BH2	4.1-7.1	Weathered Shale Bedrock	1.46×10^{-5}	
BH3	1.5-3	Silty Clay/Clayey Silt Till-Shale Bedrock	1.12×10^{-6}	
BH4	3.1-6.1	Weathered Shale Bedrock	4.11×10^{-6}	
BH5	2.3-5.3	Weathered Shale Bedrock	6.04×10^{-7}	

3.3.4 Groundwater Quality

To assess the suitability for discharge of groundwater to Halton Region's sanitary and storm sewer criteria and the Town of Oakville storm sewer criteria one (1) unfiltered groundwater sample was collected from monitoring well BH23-6 on June 27th, 2023. The samples were placed in pre-cleaned laboratory supplied vials and/or bottles provided with analytical test group-specific preservatives, as required. Dedicated nitrile gloves were used during sample handling. The groundwater samples were submitted to SGS Laboratories in Lakefield, Ontario. SGS is certified by the Canadian Association of Laboratory Accreditation Inc. (CALA) and the Canadian Standard Association (CSA). The analytical results were compared to the parameter limits listed under the Town of Oakville and Halton Region sewer use by-laws and Provincial Water Quality Objectives (PWQO) for surface water. The reported analytical results indicate that only TSS exceeded the Halton sanitary sewer limits. There were no exceedances against the Halton Region storm limits. Comparing the results against Town of Oakville storm criteria indicated that parameters such as TSS and Manganese exceeded the Town's storm limits. Therefore, water cannot be discharged to the Region/Town's storm and sanitary sewers without treatment. Multiple parameters exceeded the Provincial Water Quality Objectives (PWQO) criteria for surface water. Therefore, groundwater at the Site is not suitable for a discharge without pre-treatment into the nearby surface water systems. Higher concentrations of total metals are typically

associated with suspended solids and can be reduced with water filtration. **Table 3-2 and 3-3** presents a summary of the exceeded parameters, and the certificate of analysis is provided in **Appendix D.**

Table 3-2: Parameters in Groundwater Exceeding the Town of Oakville Storm Sewer Use Bylaw and Halton Region Storm and Sanitary Sewer Use Bylaw

Parameter	Unit	Halton Sanitary Sewer Use By-Law Criteria	Oakville Storm Sewer Use By-Law Criteria	Halton Storm Sewer Use By-Law Criteria	BH23-6
Total Suspended Solids (TSS)	mg/L	350	15	-	**446**
Manganese	mg/L	5	0.05	-	**0.222**
0.00-Exceeds Halton Region storm sewer criteria; **0.00**-Exceeds Halton Region sanitary sewer criteria; **0.00**-Exceeds Oakville storm sewer criteria					

Table 3-3: Parameters in Groundwater Exceeding the PWQO

Parameter	Unit	PWQO Criteria	BH23-6 Concentration
Cobalt	mg/L	0.0009	**0.00148**
Copper	mg/L	0.001	**0.0054**
Iron	mg/L	0.3	**2.20**
Phosphorus	mg/L	0.01	**0.165**
Silver	mg/L	0.0001	**0.00016**
4AAP Phenolics	mg/L	0.001	**0.004**

4.0 CONSTRUCTION DEWATERING

The proposed residential development consists of constructing multiple high-rise buildings. Based on the preliminary conceptual design, the project is divided into three (3) Blocks on the eastern portion of the Site. The current scope of the work includes Blocks 1, 2 and 3. It is anticipated to have four (4) separate levels of underground parking (P4) in each block. The ground elevation at the site ranged between 154 to 159 meters above sea level (masl). No below grade design was available at the time of writing this report. The assumed finished floor elevation of P4 level as part of the preliminary design for proposed development considering the footing and elevator shaft would be approximately 14 meters below the existing ground surface (mbgs). For construction dewatering purposes, the groundwater level should be lowered at least one (1) m below the footings and elevator shaft elevation. The unsealed construction excavation method for each separated block with separated excavation dimensions were considered for the proposed development. Since the proposed underground structure will be below the groundwater table, dewatering will be required during the excavation of overburden material. It is important to note that all dewatering values have to be re-assessed when detail design become available along with shoring design and construction sequencing.

4.1 Estimation of Flow Rate - Unsealed Excavation

This section calculates the estimated dewatering required during the construction of the proposed building based on the geo-mean k-value, the highest groundwater elevations at the site using the steady-state flow

equation for unsealed excavation as follows. The estimated flow rates for the proposed buildings are summarised in **Table 4-1**.

$$Q_R = K\,x\frac{H^2 - h^2}{0.733}\,x\,Log\,(R_0/r_e)$$

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

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

Table: 4-1 Estimation of Flow Rate (Short-term Discharge) - Unsealed Excavation

Parameters	Block 1	Block 2	Block 3
	P4 Level		
K -Hydraulic conductivity(geomean) (m/s)	6.17×10^{-7}		
H-Distance from water level to the bottom of an aquifer (m)	15.8	15.8	15.8
h -Depth of water in the well while pumping (m)	1	1	1
a- length of excavation (m)	130	125	110
b- Width of excavation (m)	77	92	70
r_e–equivalent radius, where a and b excavation dimensions (m)	56	60	49
R_o- Radius of the cone of depression	91	95	84
Estimated Flow Rate- L/day (without safety factor)	86,000	92,000	78,000

4.2 Estimation of Flow Rate- Storm Water Consideration

During construction, additional removal of stormwater from precipitation into the open excavation will be required. The estimated flow rate is based on the excavation dimensions for the phase of development and a theoretical 10 mm precipitation event in 24 hours. The total estimated dewatering that might be needed as a result of a 10 mm precipitation event for would be approximately 100,000 L/day for Block 1, 115,000 L/day for Block 2 and 77,000 L/day for Block 3.

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

Considering the unsealed excavation method, the recommended pumping rate for Block 1 would be approximately 383,000 L/day, for Block 2 would be 391,000 L/day and for Block 3 would be 311,000 L/day. These values incorporate a safety factor of x3 and account for stormwater as a result of a 10 mm precipitation event. The recommended flow rates for the proposed buildings are summarised in **Table 4-2**.

Table 4-2: Total Construction Dewatering (Short-term Discharge) - Unsealed Excavation

Block #	Assumed deepest excavation Elevation	Flow Rate Q- without a safety factor (L/day)	Flow Rate Q- with a safety factor x3 (L/day)	Storm water (@ 10 mm/24 hrs.) (L/day)	Designed Flow Rate Or Total Flow Rate (L/day)
Block 1	P4	86,000	258,000	100,000	358,000
Block 2		92,000	276,000	115,000	391,000

Block 3		78,000	234,000	77,000	311,000

It is expected that the initial dewatering rate will be higher to remove groundwater within the overburden formation. The dewatering rates are expected to decrease once the target water level is achieved in the excavation footprint as groundwater will have been removed locally from storage resulting in lower seepage rates into the excavation. The maximum flow calculation is intended to provide a conservative value to account for unforeseeable conditions that may arise during construction.

4.4 Permanent Drainage (Long-term Discharge)

Following the construction of the underground structure, long-term groundwater flow to the underfloor drainage system for the building will be a function of the upward flux and from drainage along the foundation wall. The horizontal hydraulic gradient was calculated based on the groundwater levels recorded on July 19th, 2023. The Darcy flow equation was used to estimate permanent drainage to the building as follows:

$$Q = K\,x\,i\,x\,A$$

Where,

K- Hydraulic Conductivity (m/day)
i- Hydraulic Gradient
A- Area (m^2)

Based on the assumed design, depth to water and given k-value, the estimated permanent theoretical flow rates for the development for each block are summarised in **Table 4-3**. The drainage control system around and beneath the buildings should be designed with enough capacity to handle the expected permanent volume. This value is recommended to be verified once the underground construction is completed and access is provided to DS to assess actual flow rates at the sumps.

Table 4-3: Permanent Drainage (Long-term Discharge)

Block #	Permanent Drainage-without a safety factor (L/day)	Permanent Drainage-with a safety factor x3 (L/day)
Block 1	6,000	18,000
Block 2	7,000	21,000
Block 3	5,000	15,000

4.5 Permit Requirements

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

An EASR is required to be submitted to the 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 only

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 considering unsealed excavation for Blocks 1, 2 and 3 is between the MECP water taking limit of 50,000 and 400,000 L/day, an EASR application is required to be submitted to the MECP for short-term dewatering prior to construction of each block. Based on current groundwater conditions, permanent groundwater flow or permanent drainage is expected to be less than the water-taking limit of 50,000 L/day. Therefore, a PTTW is not required on a permanent basis.

4.5.2 Discharge Permits (Construction Dewatering)

A discharge permit will be required from the Halton Region and/or Town of Oakville if private water is to be sent to the sewer system. Unless the future development is designed as a water-tight structure, all groundwater (temporary and permanent) will be sent to the sewer system and therefore will require a discharge approval from the Halton Region and/or Town of Oakville.

5.0 POTENTIAL IMPACTS

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

5.1 Local Groundwater Use

The study area is deemed to be fully serviced by municipal water and it is not expected that there will be any groundwater users within the zone of influence. Therefore, it is not anticipated that there will be short-term or long-term impacts on private water wells occurring from the proposed dewatering activities. Closer to construction, it is prudent to complete a door-to-door water well survey to confirm absence of any active water wells.

5.2 Point of Discharge and Groundwater Quality

The reported analytical results indicate that only TSS exceeded the Halton sanitary sewer limits. There were no exceedances against the Halton Region storm limits. Comparing the results against Town of Oakville storm criteria indicated that parameters such as TSS and Manganese exceeded the Town's storm limits. Therefore, water cannot be discharged to the Region/Town's storm and sanitary sewers without treatment. When compared against the PWQO guideline, concentrations of various total metals and phenols exceeded the PWQO standards. Therefore, groundwater at the Site is not suitable for a discharge without pre-treatment into the nearby surface water systems. Higher concentrations of total metals are typically associated with suspended solids and can be reduced with water filtration.

5.3 Settlement Due to Dewatering Activities

There are structures and utilities within the maximum predicted zone of influence (ZOI) about 95 meters when considering an unsealed excavation. Since the majority of proposed underground construction is anticipated to be constructed within the low permeable till deposits and bedrock, an effect of settlement due to dewatering would be negligible.

5.4 Well Decommissioning

Following the completion of construction activities, all dewatering wells, well points, eductors and monitoring wells installed at various stages of this project must be decommissioned. The installation and eventual decommissioning of the wells and the dewatering system must be carried out by a licenced water well contractor in accordance with Regulation 903 of the Ontario Water Resources Act.

6.0 MONITORING AND MITIGATION

Based on the preliminary hydrogeological investigation, the following monitoring and mitigation program is recommended:

- Baseline groundwater quality has been assessed and established prior to construction. However, groundwater quality can change based on several factors (land-use change, spills, etc.) and should be monitored during construction dewatering and after construction to ensure that water quality meets the guideline or regulations associated with any permits from the MECP and Halton Region.
- A discharge permit is required to be submitted to the Region for short-term dewatering if private water is sent to the sewer system.
- Once a groundwater dewatering system is set up at the Site, a daily and weekly monitoring program 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.

7.0 LIMITATIONS

This report was prepared for the sole use of the addressee to provide an assessment of the hydrogeological conditions on the property. The information presented in this report is based on information collected during the completion of the hydrogeological investigation. DS Consultants Limited was required to use and rely upon various information sources produced by other parties. The information provides in this report reflects DS' judgment in light of the information available at the time of report preparation. This report may not be relied upon by any other person or entity without the written authorization of DS Consultants Ltd. The scope of services performed in the execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or reuse of this documents or findings, conclusions, and recommendations represented herein, is at the sole risk of said users. The conclusions drawn from the Hydrogeological report were based on information at selected observation and sampling locations. Different conditions between and beyond these locations may become apparent during future investigations or on-site work, which could not be detected or anticipated at the time of this investigation. DS Consultants Ltd. cannot be held responsible for hydrogeological conditions at the site that was not apparent from the available information.

Should you have any questions regarding these findings, please contact the undersigned.

DS Consultants Ltd.

Prepared By:

Meysam Jafari, M.Sc., P.Geo
Project Manager

Reviewed By:

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

8.0 CONSULTANT QUALIFICATIONS

Martin Gedeon, M.Sc., P.Geo., is a Professional Geoscientist (P.Geo.) with over 26 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., P.Geo., is a Professional Geoscientist (P.Geo.) with DS Consultants Ltd. Meysam holds two master's degrees 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.

9.0 REFERENCES

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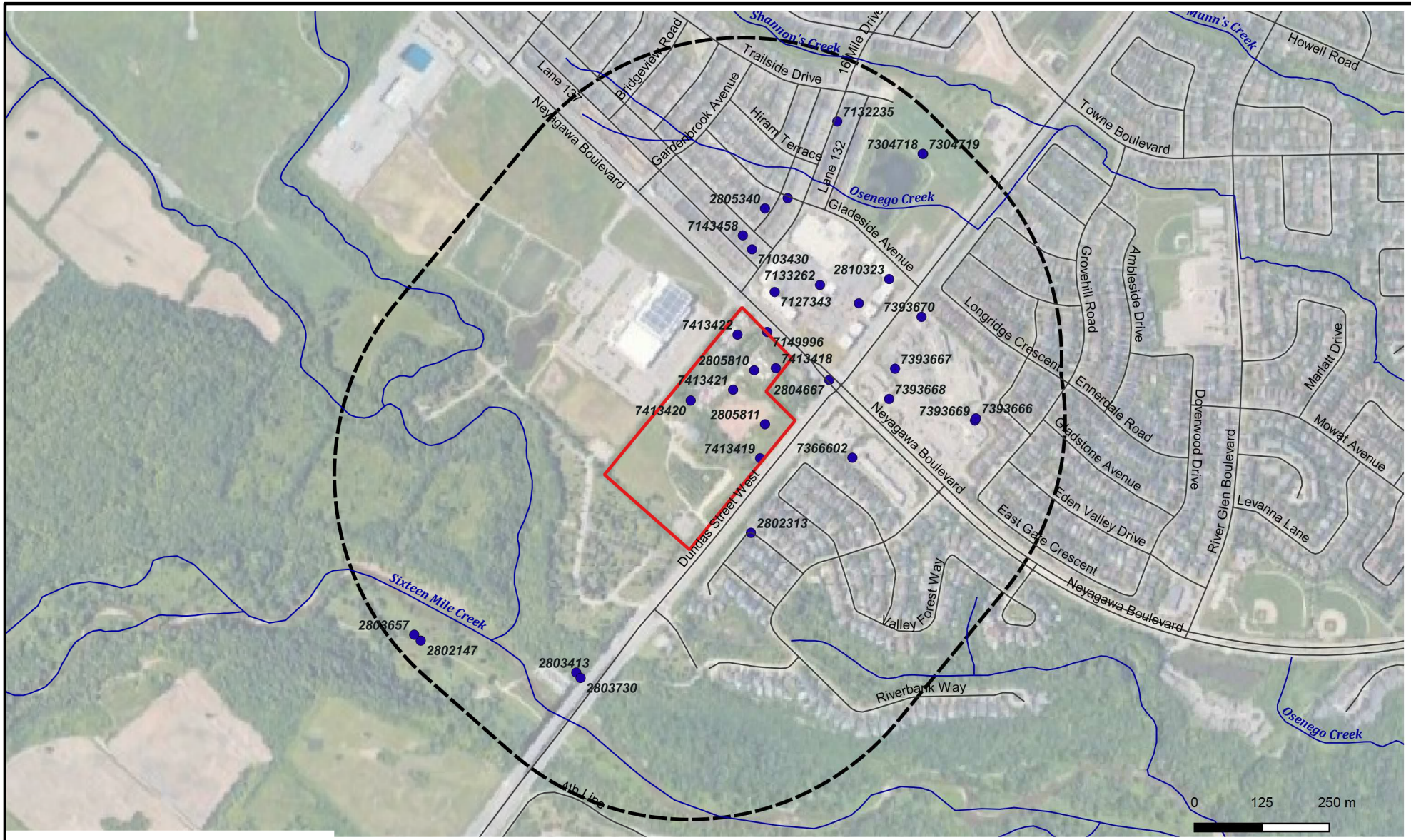
Pat M. Cashman and Martin Preene; Groundwater Lowering in Construction- Second Edition, CRC Press.

Figures

J:\-GIS\2022 PROJECTS\22-012-100 3056 Neyagawa Blvd., Oakville\1-QGIS\HydroG\Figure 1 – Site Location and MECP Well Records.qgs Aug-11 15:25



Legend

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

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www.dsconsultants.ca

Project: HYDROGEOLOGICAL INVESTIGATION ASSESSMENT
3056 Neyagawa Boulevard, Oakville, ON.

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

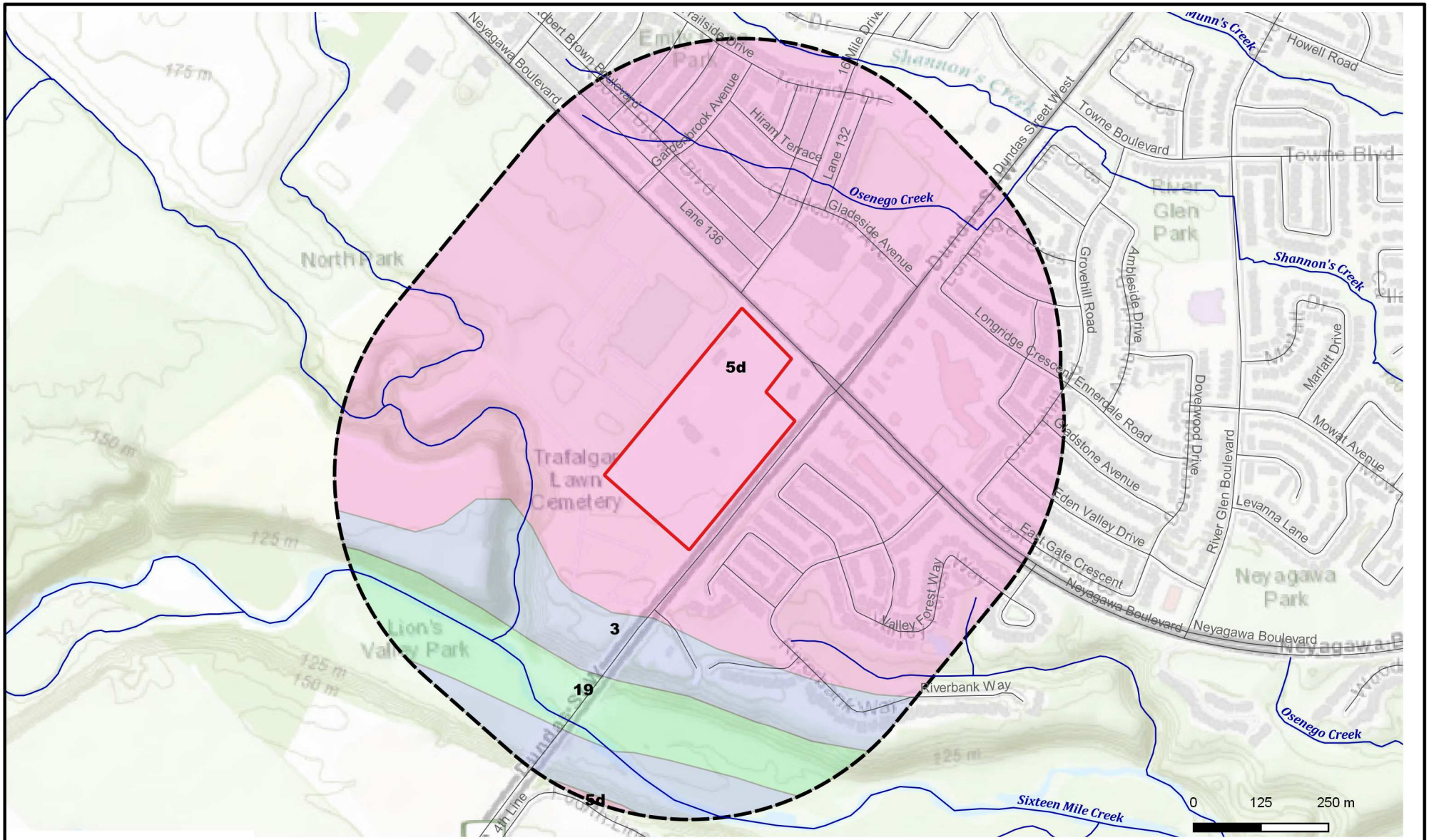
N

Client: NEATT COMMUNITIES

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	M.J	S.Y	August 2023
Rev: 0	Scale: As Shown	Project No.: 22-012-101	Figure No.: 1

Image/Map Source: *Google Satellite Image*

J:\-GIS\2022 PROJECTS\22-012-100 3056 Neyagawa Blvd., Oakville\1-QGIS\HydroG\Figure 2 – Surficial Geology Map.qgs Aug-11 15:26



Legend

- Approx Property Boundary
- 500m Buffer
- 19 - Stream deposits
- 3 - Bedrock
- 5d - Till

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3056 Neyagawa Boulevard, Oakville, ON.

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

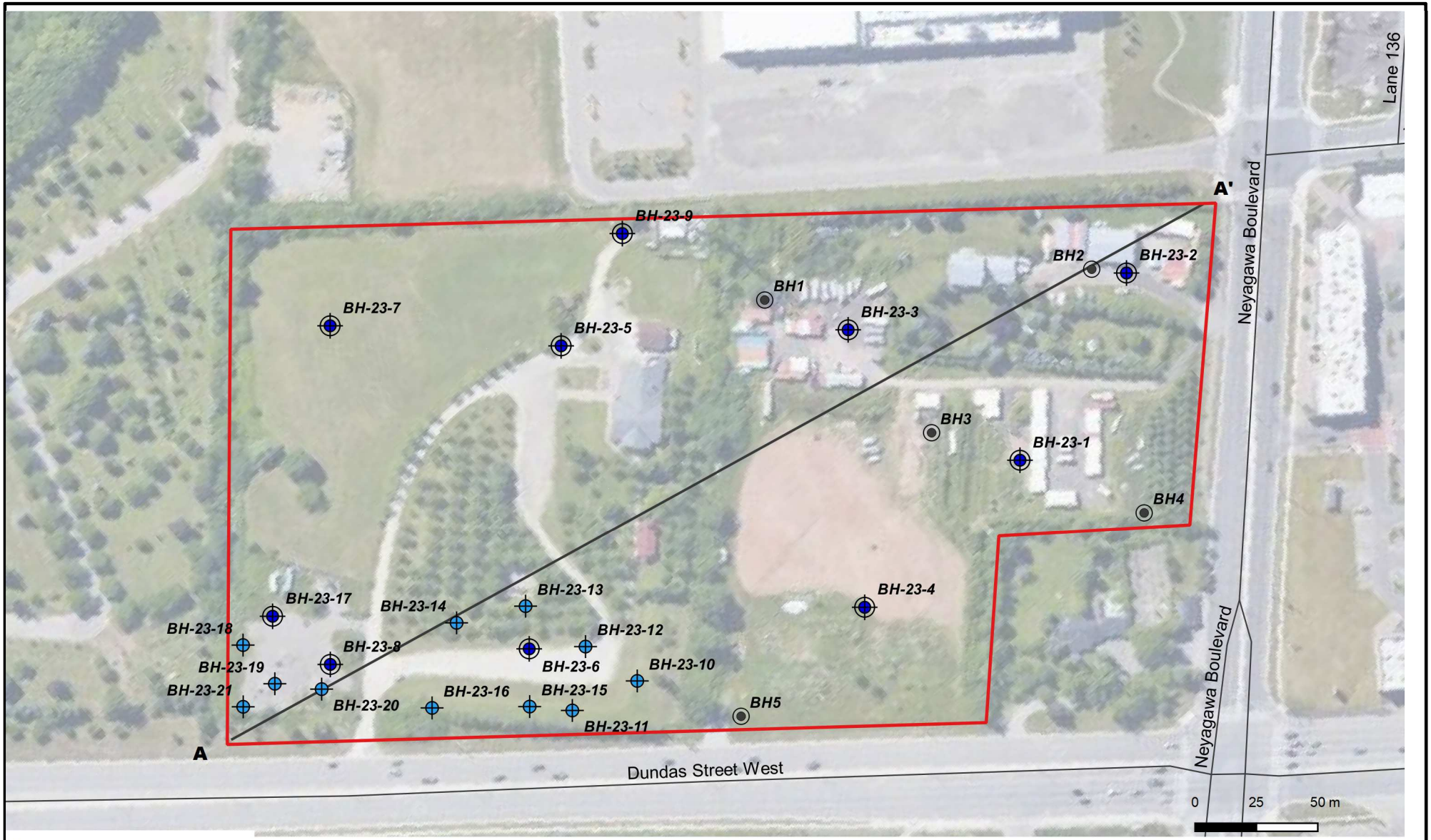
N

Client: NEATT COMMUNITIES

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	M.J	S.Y	August 2023
Rev: 0	Scale: As Shown	Project No.: 22-012-101	Figure No.: 2

Image/Map Source: *Esri Topo Map & https://www.mndm.gov.on.ca/*

J:\-GIS\2022 PROJECTS\22-012-100 3056 Neyagawa Blvd., Oakville\1-QGIS\HydroG\Figure 3 – Borehole and Monitoring Well Locations.qgs Aug-11 16:00



Legend

- Approx Property Boundary
- Borehole
- Monitoring Well
- Monitoring Well -Others
- Cross Section

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3056 Neyagawa Boulevard, Oakville, ON.

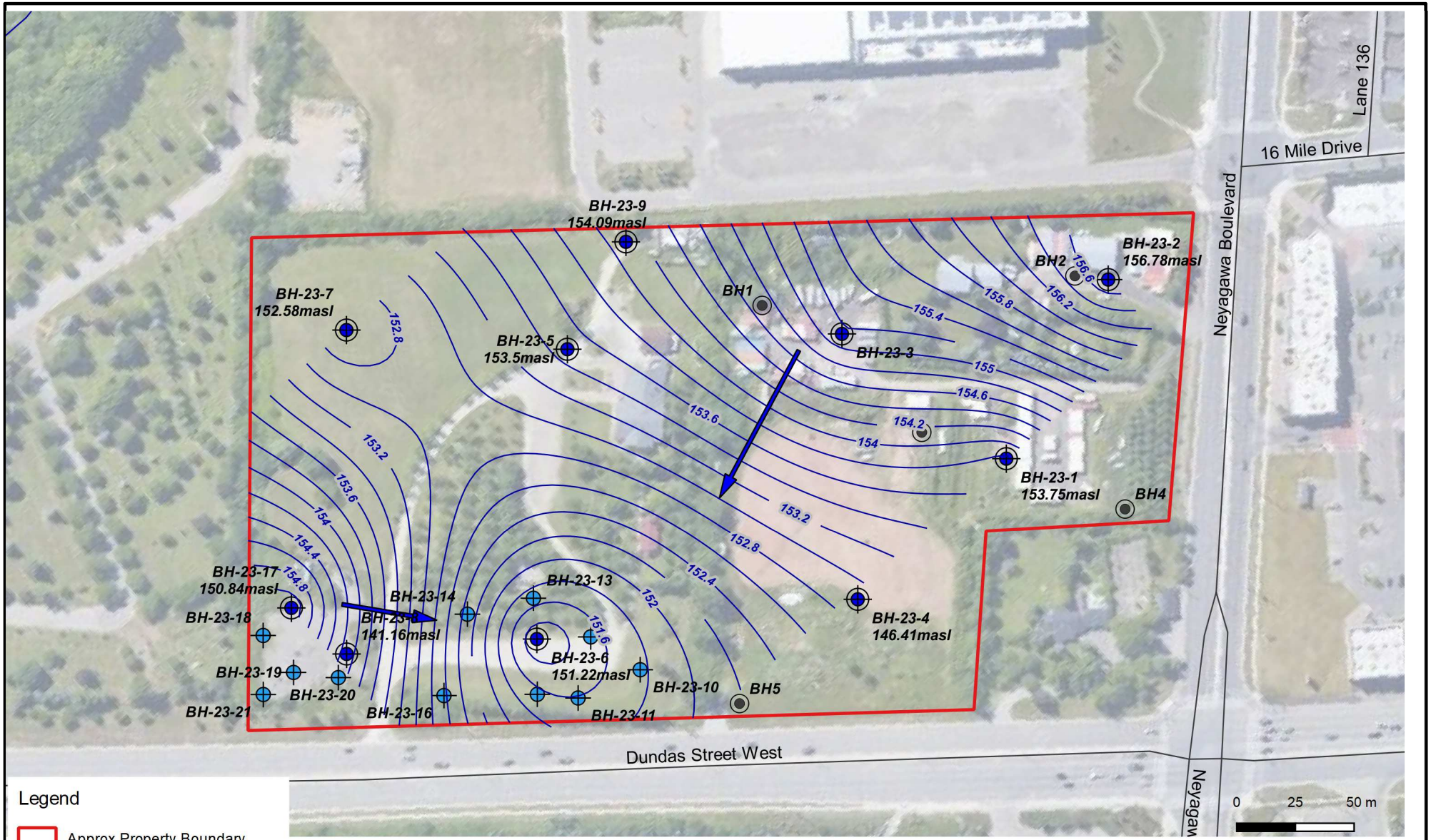
Title: **BOREHOLE AND MONITORING WELL LOCATIONS**

Client: NEATT COMMUNITIES

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	M.J	S.Y	August 2023
Rev: 0	Scale: As Shown	Project No.: 22-012-101	Figure No.: 3

Image/Map Source: *Google Satellite Image*

J:\-GIS\2022 PROJECTS\22-012-100 3056 Neyagawa Blvd., Oakville\1-QGIS\HydroG\Figure 4 - Groundwater Elevation Contours and Flow Direction.qgs Aug-11 15:59



Legend

- Approx Property Boundary
- Borehole
- Monitoring Well
- Monitoring Well -Others
- Groundwater Flow Direction
- Groundwater Elevation Contour
  July 19, 2023

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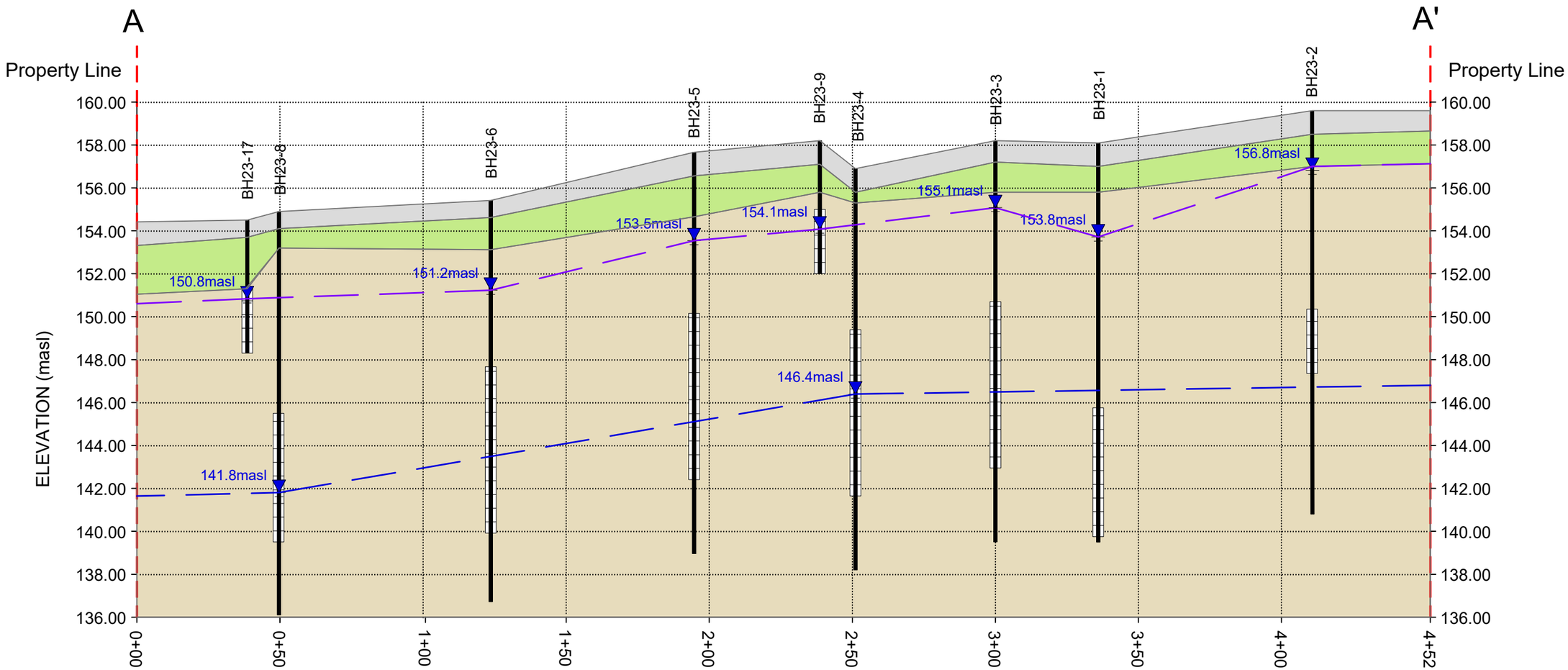
Project: HYDROGEOLOGICAL INVESTIGATION ASSESSMENT
3056 Neyagawa Boulevard, Oakville, ON

Title: **GROUNDWATER ELEVATION CONTOURS AND FLOW DIRECTION**

Client: NEATT COMMUNITIES

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	M.J	S.Y	August 2023
Rev: 0	Scale: As Shown	Project No.: 22-012-101	Figure No.: 4

Image/Map Source: *Google Satellite Image*



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Project: HYDROGEOLOGICAL INVESTIGATION ASSESSMENT
3056 Neyagawa Boulevard, Oakville, ON

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

Client: NEATT COMMUNITIES

Size:	Approved By:	Drawn By:	Date:
11 X 17	M.J	S.Y	September 2023
Rev.	Scale: As Shown	Project No: 22-012-101	Figure No. 5

Path:j:\-gis\2022 projects\22-012-100 3056 neyagawa blvd., oakville\7-misc\cad\geological cross section 22-012.dwg

Appendices

Appendix A: Borehole Logs

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LOG OF BOREHOLE BH23-1

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4813210.47 E 601359.2

DRILLING DATA
Method: Hollow Stem Auger/Mud Rotary
Diameter: 200mm
Date: Jun-06-2023

REF. NO.: 22-012-101
ENCL NO.: 2

(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
158.1												
0.0 / 157.3	**FILL:** clayey silt to silty clay, trace rootlets, trace gravel, trace sand, reddish brown, moist, stiff		1	SS	9		158					
0.8 / 155.8	**SILTY CLAY TILL:** sandy, trace gravel, reddish brown, moist, very stiff to hard weathered shale pieces at 1.5m		2	SS	18		157					4 21 49 26
			3	SS	37							
155.6 / 2.5	**SILTY CLAY TILL/SHALE COMPLEX:** trace sand, reddish brown, moist, hard		4	SS	50/ 130mm		156					
	SHALE BEDROCK: Queenston Formation, reddish brown, weathered		5	SS	50/ 25mm		155					
153.4						▽	154					
4.7 / 153.0	TCR=94%, SCR=77%, RQD=55% Hard layers=11%, Maximum hard layer thickness=50mm		6 R1	SS RC	50/ 30mm		153	W. L. 153.7 m Jul 19, 2023				
5.1	TCR=96%, SCR=83%, RQD=46% Hard layers=25%, Maximum hard layer thickness=75mm		R2	RC			152					
151.5												
6.6	TCR=96%, SCR=81%, RQD=72% Hard layers=14%, Maximum hard layer thickness=50mm		R3	RC			151					
150.1												
8.0	TCR=95%, SCR=63%, RQD=51% Hard layers=10%, Maximum hard layer thickness=60mm		R4	RC			150					
148.5							149					
9.6	TCR=100%, SCR=88%, RQD=86% Hard layers=25%, Maximum hard layer thickness=75mm		R5	RC			148					
147.0												
11.1	TCR=92%, SCR=75%, RQD=64% Hard layers=11%, Maximum hard layer thickness=75mm		R6	RC			147					
145.4							146					
12.7	TCR=100%, SCR=93%, RQD=55% Hard layers=20%, Maximum hard layer thickness=60mm		R7	RC			145					
144.0												
14.1	TCR=91%, SCR=91%, RQD=88% Hard layers=18%, Maximum hard layer thickness=75mm		R8	RC			144					
142.5							143					
15.6	TCR=98%, SCR=95%, RQD=95% Hard layers=16%, Maximum hard layer thickness=150mm		R9	RC			142					
141.0												
17.1	TCR=95%, SCR=90%, RQD=77% Hard layers=10%, Maximum hard layer thickness=130mm		R10	RC			141					
139.5							140					
18.6	**END OF BOREOLE:** Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbgl): June 26, 2023 4.3 July 19, 2023 4.4											

DS SOIL LOG-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

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 BH23-2

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4813293.29 E 601330.07

DRILLING DATA
Method: Hollow Stem Auger/Mud Rotary
Diameter: 200mm
Date: Jun-05-2023

REF. NO.: 22-012-101
ENCL NO.: 3

ELEV / DEPTH (m)	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
159.6												
159.6 / 0.0	**GRANULAR FILL:** sand and gravel, 50mm		1	SS	13		159					
158.8 / 0.8	**FILL:** clayey silt to silty clay, trace gravel, reddish brown, moist, stiff		2	SS	27							
	SILTY CLAY TILL: some sand, trace gravel, brown to reddish brown, moist, very stiff to hard		3	SS	29		158					
157.0	trace shale fragments at 2.3m		4	SS	62							
2.6	**SHALE BEDROCK:** Queenston Formation, reddish brown, weathered		5	SS	50/ 130mm	▽	157	W. L. 156.8 m Jul 19, 2023				
154.9							156					
154.7 / 4.7	TCR=94%, SCR=64%, RQD=23%		6	SS	50/							
154.5 / 5.1	Hard layers=11%, Maximum hard layer thickness=50mm		R1	SS	100mm		155					
	TCR=90%, SCR=81%, RQD=68% Hard layers=11%, Maximum hard layer thickness=50mm		R2	RC			154					
153.0 / 6.6	TCR=91%, SCR=85%, RQD=66% Hard layers=16%, Maximum hard layer thickness=75mm		R3	RC			153					
151.5 / 8.1	TCR=100%, SCR=93%, RQD=75% Hard layers=19%, Maximum hard layer thickness=78mm		R4	RC			152					
149.9 / 9.7	TCR=95%, SCR=91%, RQD=91% Hard layers=15%, Maximum hard layer thickness=50mm		R5	RC			151					
148.4 / 11.2	TCR=93%, SCR=93%, RQD=90% Hard layers=25%, Maximum hard layer thickness=78mm		R6	RC			150					
146.9 / 12.7	TCR=100%, SCR=93%, RQD=82% Hard layers=14%, Maximum hard layer thickness=55mm		R7	RC			149					
145.3 / 14.3	TCR=98%, SCR=93%, RQD=88% Hard layers=23%, Maximum hard layer thickness=78mm		R8	RC			148					
143.8 / 15.8	TCR=96%, SCR=96%, RQD=93% Hard layers=27%, Maximum hard layer thickness=78mm		R9	RC			147					
142.4 / 17.2	TCR=100%, SCR=100%, RQD=94% Hard layers=22%, Maximum hard layer thickness=127mm		R10	RC			146					
140.8 / 18.8	**END OF BOREHOLE:**						145					
	Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbgl): June 26, 2023 2.5 July 19, 2023 2.8						144					
							143					
							142					
							141					

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 BH23-3

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4813192.51 E 601273.15

DRILLING DATA
Method: Hollow Stem Auger/Mud Rotary
Diameter: 200mm
Date: Jun-06-2023

REF. NO.: 22-012-101
ENCL NO.: 4

(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
158.2												
0.0	**FILL:** clayey silt to silty clay, some sand, trace cobble fragments, trace weathered shale, reddish brown, moist, stiff to very stiff		1	SS	26		158					
157.2												
1.0	**SILTY CLAY TILL:** some sand, trace gravel, reddish brown, moist, stiff		2	SS	8		157					
2			3	SS	13							1 12 58 29
155.8							156					
2.4	weathered shale inclusions at 2.3m		4	SS	50/ 130mm							
3	**SHALE BEDROCK:** Queenston Formation, reddish brown, weathered		5	SS	50/ 130mm	▽						
							W. L. 155.2 m Jun 26, 2023					
4							154					
153.5												
4.7	TCR=78%, SCR=57%, RQD=28%		6	SS	50/ 130mm							
153.1			R1	RC								
5.1	Hard layers=5%, Maximum hard layer thickness=25mm						153					
6	TCR=94%, SCR=89%, RQD=54%		R2	RC								
151.7	Hard layers=10%, Maximum hard layer thickness=50mm						152					
6.5	TCR=98%, SCR=95%, RQD=95%		R3	RC								
7	Hard layers=24%, Maximum hard layer thickness=100mm						151					
150.1												
8.1	TCR=98%, SCR=98%, RQD=95%		R4	RC			150					
9	Hard layers=18%, Maximum hard layer thickness=50mm											
148.6							149					
9.6	TCR=100%, SCR=100%, RQD=95%		R5	RC								
10	Hard layers=20%, Maximum hard layer thickness=75mm						148					
147.1												
11.1	TCR=96%, SCR=96%, RQD=88%		R6	RC			147					
12	Hard layers=20%, Maximum hard layer thickness=50mm											
145.6							146					
12.6	TCR=94%, SCR=93%, RQD=74%		R7	RC								
13	Hard layers=24%, Maximum hard layer thickness=130mm						145					
144.2												
14.0	TCR=96%, SCR=94%, RQD=88%		R8	RC			144					
15	Hard layers=28%, Maximum hard layer thickness=100mm											
142.6							143					
15.6	TCR=100%, SCR=100%, RQD=88%		R9	RC								
16	Hard layers=16%, Maximum hard layer thickness=100mm						142					
17												
141.0							141					
17.2	TCR=100%, SCR=100%, RQD=76%		R10	RC								
18	Hard layers=12%, Maximum hard layer thickness=50mm						140					
139.5												
18.7	**END OF BOREHOLE:**											

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date:	Water Level(mbgl):
June 26, 2023	3.0

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

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

DS SOIL LOG-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH23-4

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4813123.32 E 601363.01

DRILLING DATA
Method: Hollow Stem Auger/Mud Rotary
Diameter: 200mm
Date: Jun-07-2023

REF. NO.: 22-012-101
ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
156.9							
0.0 / 156.1	**FILL:** clayey silt to silty clay, trace sand, trace rootlets, reddish brown, moist, stiff		1	SS	11		156
0.8 / 155.3	**SILTY CLAY TILL:** some sand, trace gravel, reddish brown, moist, very stiff		2	SS	18		
1.6 / 154.5	**SILTY CLAY TILL/SHALE COMPLEX:** trace sand, trace gravel, reddish brown, moist, hard		3	SS	50/ 100mm		155
2.4	**SHALE BEDROCK:** Queenston Formation, reddish brown, weathered		4	SS	50/ 75mm		154
			5	SS	50/ 75mm		153
152.2							
4.7 / 151.8	TCR=98%, SCR=77%, RQD=66% Hard layers=19%, Maximum hard layer thickness=50mm		6 / R1	SS / RC	50/ 75mm		152
5.1	TCR=98%, SCR=93%, RQD=73% Hard layers=20%, Maximum hard layer thickness=50mm		R2	RC			151
150.3							
6.6	TCR=100%, SCR=98%, RQD=93% Hard layers=20%, Maximum hard layer thickness=60mm		R3	RC			150
148.8							
8.1	TCR=100%, SCR=100%, RQD=98% Hard layers=11%, Maximum hard layer thickness=50mm		R4	RC			149
147.3							148
9.6	TCR=100%, SCR=98%, RQD=89% Hard layers=22%, Maximum hard layer thickness=130mm		R5	RC			147
145.8						W. L. 146.4 m Jul 19, 2023	
11.1	TCR=98%, SCR=98%, RQD=84% Hard layers=11%, Maximum hard layer thickness=50mm		R6	RC			145
144.3							
12.6	TCR=94%, SCR=94%, RQD=89% Hard layers=25%, Maximum hard layer thickness=100mm		R7	RC			144
142.9							143
14.0	TCR=96%, SCR=96%, RQD=93% Hard layers=12%, Maximum hard layer thickness=50mm		R8	RC			142
141.3							
15.6	TCR=100%, SCR=91%, RQD=67% Hard layers=19%, Maximum hard layer thickness=150mm		R9	RC			141
139.7							140
17.2	TCR=100%, SCR=100%, RQD=91% Hard layers=25%, Maximum hard layer thickness=100mm		R10	RC			139
138.2							
18.7	**END OF BOREHOLE:**						

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date:	Water Level(mbgl):
June 26, 2023	9.4
July 19, 2023	10.5

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)

REMARKS 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-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH23-5

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4813099.92 E 601201.33

DRILLING DATA
Method: Hollow Stem Auger/Mud Rotary
Diameter: 200mm
Date: Jun-13-2023

REF. NO.: 22-012-101
ENCL NO.: 6

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	GR	SA	SI	CL
157.6								
157.3 0.3	**TOPSOIL:** 250mm	1	SS	8				
156.5 1.1	**FILL:** clayey silt to silty clay, trace gravel, trace organic staining, trace sand, trace rootlets, brown to reddish brown, moist, firm to stiff	2	SS	7				
2	**SILTY CLAY TILL:** some sand to sandy, trace gravel, reddish brown, moist, firm to hard	3	SS	38	4	18	52	26
154.5 3	weathered shale inclusions at 2.3m	4	SS	50/ 25mm				
153.3 3.3	**SILTY CLAY TILL/SHALE COMPLEX:** trace sand, trace gravel, reddish brown, moist, hard	5	SS	50/ 150mm				
4	**SHALE BEDROCK:** Queenston Formation, reddish brown, weathered							
152.9 4.7		6	SS	50/ 150mm				
152.4 5.2	TCR=98%, SCR=83%, RQD=22% Hard layers=33%, Maximum hard layer thickness=50mm	R1	RC					
6	TCR=84%, SCR=52%, RQD=29% Hard layers=15%, Maximum hard layer thickness=100mm	R2	RC					
151.0 6.6	TCR=98%, SCR=98%, RQD=90% Hard layers=20%, Maximum hard layer thickness=60mm	R3	RC					
7 149.5 8.1	TCR=100%, SCR=100%, RQD=95% Hard layers=18%, Maximum hard layer thickness=50mm	R4	RC					
9 148.0 9.6	TCR=100%, SCR=100%, RQD=94% Hard layers=25%, Maximum hard layer thickness=50mm	R5	RC					
10 146.5 11.1	TCR=98%, SCR=93%, RQD=90% Hard layers=16%, Maximum hard layer thickness=50mm	R6	RC					
12 144.9 12.7	TCR=95%, SCR=95%, RQD=95% Hard layers=20%, Maximum hard layer thickness=150mm	R7	RC					
13 143.4 14.2	TCR=100%, SCR=100%, RQD=100% Hard layers=33%, Maximum hard layer thickness=100mm	R8	RC					
15 141.9 15.7	TCR=100%, SCR=100%, RQD=100% Hard layers=20%, Maximum hard layer thickness=100mm	R9	RC					
16 140.4 17.2	TCR=100%, SCR=100%, RQD=100% Hard layers=13%, Maximum hard layer thickness=100mm	R10	RC					
17 138.9 18.7	**END OF BOREHOLE:**							

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date:	Water Level(mbgl):
June 26, 2023	4.2
July 19, 2023	4.1

W. L. 153.5 m
Jul 19, 2023

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)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH23-6

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4813009.03 E 601286.1

DRILLING DATA
Method: Hollow Stem Auger/Mud Rotary
Diameter: 200mm
Date: Jun-09-2023

REF. NO.: 22-012-101
ENCL NO.: 7

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION
155.4					
155.2 / 0.2	**TOPSOIL:** 180mm	1	SS	12	155
154.6 / 0.8	**FILL:** clayey silt to silty clay, trace sand, trace rootlets, trace asphalt fragment, brown, moist, stiff	2	SS	54	
153.1 / 2.3	**SILTY CLAY TILL:** some sand, trace gravel, weathered shale inclusions, reddish brown, moist, hard	3	SS	50/ 130mm	154
152.2 / 3.2	**SILTY CLAY TILL/SHALE COMPLEX:** trace sand, reddish brown, moist, hard	4	SS	50/ 130mm	153
150.7 / 4.7	**SHALE BEDROCK:** Queenston Formation, reddish brown, weathered	5	SS	50/ 75mm	152
150.2 / 5.2	TCR=89%, SCR=89%, RQD=68% Hard layers=10%, Maximum hard layer thickness=50mm	6	SS	50/ 75mm	
148.7 / 6.7	TCR=100%, SCR=96%, RQD=96% Hard layers=21%, Maximum hard layer thickness=100mm	R1	RC		151
147.3 / 8.1	TCR=100%, SCR=98%, RQD=90% Hard layers=11%, Maximum hard layer thickness=50mm	R2	RC		150
145.8 / 9.6	TCR=90%, SCR=90%, RQD=83% Hard layers=20%, Maximum hard layer thickness=50mm	R3	RC		149
144.3 / 11.1	TCR=98%, SCR=95%, RQD=95% Hard layers=16%, Maximum hard layer thickness=60mm	R4	RC		148
142.8 / 12.6	TCR=96%, SCR=96%, RQD=90% Hard layers=25%, Maximum hard layer thickness=200mm	R5	RC		147
141.2 / 14.2	TCR=100%, SCR=100%, RQD=83% Hard layers=24%, Maximum hard layer thickness=50mm	R6	RC		146
139.7 / 15.7	TCR=100%, SCR=100%, RQD=100% Hard layers=16%, Maximum hard layer thickness=50mm	R7	RC		145
138.2 / 17.2	TCR=98%, SCR=98%, RQD=98% Hard layers=21%, Maximum hard layer thickness=100mm	R8	RC		144
136.7 / 18.7	TCR=100%, SCR=100%, RQD=85% Hard layers=10%, Maximum hard layer thickness=50mm	R9	RC		143
	END OF BOREHOLE:	R10	RC		142
					141
					140
					139
					138
					137

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date: Water Level(mbgl):
June 26, 2023 4.1
July 19, 2023 4.2

W. L. 151.2 m
Jul 19, 2023

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)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)	GR	SA	SI	CL
	3	14	61	22

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

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

DS CONSULTANTS LTD.
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LOG OF BOREHOLE BH23-7

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4813034.31 E 601133.46

DRILLING DATA
Method: Hollow Stem Auger/Mud Rotary
Diameter: 200mm
Date: Jun-14-2023

REF. NO.: 22-012-101
ENCL NO.: 8

(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
157.6												
157.4	**TOPSOIL:** 150mm											
0.2	**FILL:** silty clay, trace to some organics, trace rootlets, reddish brown, moist, firm to stiff		1	SS	10		157					
1			2	SS	7							
156.1							156					
1.5	**SILTY CLAY TILL:** sandy, trace clay, trace weathered shale fragments, brown to reddish brown, moist, very stiff to hard		3	SS	19							
2			4	SS	32		155					3 20 53 24
154.3												
3.3	**SHALE BEDROCK:** Queenston Formation, reddish brown, weathered		5	SS	50/ 130mm		154					
4												
152.9							153					
4.7	TCR=100%, SCR=75%, RQD=0%		6	SS	50/							
152.5	Hard layers=25%, Maximum hard		R1	RC	25mm	▽						
5.1	layer thickness=100mm						W. L. 152.6 m Jul 19, 2023					
6	TCR=100%, SCR=82%, RQD=61% Hard layers=31%, Maximum hard layer thickness=100mm		R2	RC			152					
151.0							151					
6.6	TCR=100%, SCR=100%, RQD=80% Hard layers=34%, Maximum hard layer thickness=75mm		R3	RC								
7							150					
149.5												
8.1	TCR=95%, SCR=95%, RQD=90% Hard layers=13%, Maximum hard layer thickness=50mm		R4	RC			149					
9												
148.0							148					
9.6	TCR=100%, SCR=97%, RQD=52% Hard layers=21%, Maximum hard layer thickness=50mm		R5	RC								
10							147					
146.5												
11.1	TCR=100%, SCR=100%, RQD=98% Hard layers=16%, Maximum hard layer thickness=100mm		R6	RC			146					
12												
144.9							145					
12.7	TCR=98%, SCR=95%, RQD=93% Hard layers=15%, Maximum hard layer thickness=60mm		R7	RC								
13							144					
143.4												
14.2	TCR=100%, SCR=98%, RQD=97% Hard layers=31%, Maximum hard layer thickness=100mm		R8	RC			143					
15												
141.9							142					
15.7	TCR=100%, SCR=98%, RQD=93% Hard layers=20%, Maximum hard layer thickness=100mm		R9	RC								
16							141					
140.4												
17.2	TCR=100%, SCR=100%, RQD=100% Hard layers=10%, Maximum hard layer thickness=50mm		R10	RC			140					
17												
138.8							139					
18.8	**END OF BOREHOLE:**											

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date:	Water Level(mbgl):
June 26, 2023	5.0
July 19, 2023	5.0

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

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

DS SOIL LOG-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH23-8

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4812943.74 E 601237.76

DRILLING DATA
Method: Hollow Stem Auger/Mud Rotary
Diameter: 200mm
Date: Jun-15-2023

REF. NO.: 22-012-101
ENCL NO.: 9

(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
154.9												
154.8 0.2	**ASPHALT:** 150mm		1	SS	13							
154.1 0.8	**FILL:** silty clay, trace rootlets, trace gravel, brown, moist, stiff		2	SS	23		154					9 20 48 23
153.2 1.7	**SILTY CLAY TILL:** sandy, trace gravel, reddish brown, moist, very stiff		3	SS	50/ 130mm		153					
152.5 2.4	**SILTY CLAY TILL/SHALE COMPLEX:** trace sand, reddish brown, moist, hard		4	SS	50/ 75mm		152					
	SHALE BEDROCK: Queenston Formation, reddish brown, weathered		5	SS	50/ 100mm		151					
150.2 4.7	TCR=98%, SCR=75%, RQD=35%		6	SS	50/ 50mm		150					
149.8 5.1	Hard layers=9%, Maximum hard layer thickness=25mm		R1	RC								
	TCR=93%, SCR=93%, RQD=85% Hard layers=10%, Maximum hard layer thickness=30mm		R2	RC			149					
148.3 6.6	TCR=100%, SCR=97%, RQD=66% Hard layers=18%, Maximum hard layer thickness=50mm		R3	RC			148					
146.8 8.1	TCR=100%, SCR=100%, RQD=90% Hard layers=19%, Maximum hard layer thickness=50mm		R4	RC			147					
145.3 9.6	TCR=89%, SCR=63%, RQD=54% Hard layers=10%, Maximum hard layer thickness=50mm		R5	RC			146					
143.9 11.0	TCR=100%, SCR=100%, RQD=84% Hard layers=13%, Maximum hard layer thickness=50mm		R6	RC			145					
142.3 12.6	TCR=100%, SCR=94%, RQD=94% Hard layers=16%, Maximum hard layer thickness=50mm		R7	RC		W. L. 141.8 m Jul 19, 2023	144					
140.7 14.2	TCR=100%, SCR=100%, RQD=93% Hard layers=20%, Maximum hard layer thickness=50mm		R8	RC			143					
139.2 15.7	TCR=99%, SCR=99%, RQD=91% Hard layers=15%, Maximum hard layer thickness=50mm		R9	RC			142					
137.7 17.2	TCR=100%, SCR=100%, RQD=100% Hard layers=16%, Maximum hard layer thickness=150mm		R10	RC			141					
136.1 18.8	**END OF BOREHOLE:** Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level (mbgl): June 26, 2023 12.9 July 19, 2023 13.1						140					
							139					
							138					
							137					

DS SOIL LOG-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

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

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

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH23-9

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4813148.75 E 601183.14

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jun-19-2023

REF. NO.: 22-012-101
ENCL NO.: 10

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION
158.2 / 0.0	**TOPSOIL:** 100mm				
158.1 / 0.1	**FILL:** limestone screening, sand and gravel, surface vegetation, brown, moist, compact	1	SS	22	158
157.4 / 0.8	**SILTY CLAY TILL:** some sand, trace gravel, weathered shale inclusions, reddish brown, moist, hard	2	SS	31	157
		3	SS	46	
155.8 / 2.4	**SILTY CLAY TILL/SHALE COMPLEX:** some sand, reddish brown, moist, hard	4	SS	50/ 130mm	156
155.0 / 3.2	**SHALE BEDROCK:** Queenston Formation, reddish brown, weathered	5	SS	50/ 130mm	155
		6	SS	50/ 50mm	153
152.0 / 6.2	**END OF BOREHOLE:**	7	SS	50/ 50mm	

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date: Water Level(mbgl):
June 26, 2023 4.1
July 19, 2023 4.1

W. L. 154.1 m
Jul 19, 2023

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)
REMARKS 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-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH23-10

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4813033.64 E 601324.81

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jun-20-2023

REF. NO.: 22-012-101
ENCL NO.: 11

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
156.0							156
0.0 / 155.8	**TOPSOIL:** 250mm						
0.3 / 155.2	**FILL:** clayey silt, trace sand, trace gravel, reddish brown, moist, stiff		1	SS	7		
0.8 / 155.0	**SILTY CLAY TILL:** some sand, trace gravel, reddish brown, moist, hard						
1.0	**SILTY CLAY TILL/SHALE COMPLEX:** trace sand, reddish brown, moist, hard		2	SS	40		155
			3	SS	50/ 130mm		
153.6							154
2.4 / 153.4	**SHALE BEDROCK:** Queenston Formation, reddish brown, weathered		4	SS	50/ 130mm		
2.6	**END OF BOREHOLE:** Notes: 1) Borehole dry at the bottom 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)

REMARKS 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-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH23-11

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4813005.79 E 601316.57

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jun-20-2023

REF. NO.: 22-012-101
ENCL NO.: 12

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
155.4							
0.0 / 155.3	**TOPSOIL:** 150mm						
0.2	**FILL:** silty clay, trace rootlets, dark brown to brown, moist, stiff		1	SS	8		155
154.6							
0.8 / 154.4	**SILTY CLAY TILL:** some sand, trace gravel, reddish brown, moist, hard						
1.0	**SILTY CLAY TILL/SHALE COMPLEX:** some sand, trace gravel, reddish brown, moist, hard		2	SS	39		
154.0							154
1.4	**END OF BOREHOLE:** Notes: 1) Borehole dry at the bottom 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)
REMARKS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

DS SOIL LOG-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

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 BH23-12

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4813026.93 E 601300.44

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jun-20-2023

REF. NO.: 22-012-101
ENCL NO.: 13

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS / 0.3 m	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
155.9												
0.0	**FILL:** silty sand, some clay, some gravel, trace asphalt pieces, trace rootlets, brown, moist, loose		1	SS	9				○			
155.1												
0.8	**SILTY CLAY TILL:** some sand, trace gravel, trace shale fragments, brown to reddish brown, moist, very stiff		2	SS	26		155		○			
154.5												
1.4	**END OF BOREHOLE:** Notes: 1) Borehole is dry at the bottom upon completion.											

DS SOIL LOG-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

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 BH23-13

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4813019.33 E 601271.99

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jun-20-2023

REF. NO.: 22-012-101
ENCL NO.: 14

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS / 0.3 m	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
0.0 / 155.8	**TOPSOIL:** 180mm										
0.2 / 155.1	**FILL:** silty clay, trace rootlets, dark brown to reddish brown, moist, firm		1	SS	5				○		
0.8 / 154.5	**SILTY CLAY TILL:** some sand, trace gravel, reddish brown, moist, stiff		2	SS	13		155		○		
1.4	**END OF BOREHOLE:** Notes: 1) Borehole dry at the bottom upon completion.										

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 BH23-14

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4812993.67 E 601258.7

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jun-20-2023

REF. NO.: 22-012-101
ENCL NO.: 15

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS / 0.3 m	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
155.0											
0.0 154.7	**TOPSOIL:** 230mm										
0.2 154.2	**FILL:** silty clay, trace rootlets, reddish brown, moist, firm		1	SS	6						
0.8 1 153.6	**SILTY CLAY TILL:** some sand, trace gravel, reddish brown, moist, hard		2	SS	32		154				
1.4	**END OF BOREHOLE:** Notes: 1) Borehole dry at the bottom upon completion.										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

DS CONSULTANTS LTD.
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LOG OF BOREHOLE BH23-15

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4812993.73 E 601303.98

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jun-16-2023

REF. NO.: 22-012-101
ENCL NO.: 16

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)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
155.0											
0.0 154.8	**TOPSOIL:** 150mm										
0.2 154.2	**FILL:** silty clay, trace rootlets, reddish brown, moist, stiff		1	SS	9				○		
0.8 153.6	**SILTY CLAY TILL:** some sand, trace gravel, reddish brown, moist, very stiff		2	SS	27		154		○		
1.4	**END OF BOREHOLE:** Notes: 1) Borehole dry at the bottom upon completion.										

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

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

DS SOIL LOG-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

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LOG OF BOREHOLE BH23-16

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4812963.39 E 601278.32

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jun-16-2023

REF. NO.: 22-012-101
ENCL NO.: 17

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)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
154.7											
0.0	**TOPSOIL:** 230mm										
154.5											
0.2	**FILL:** silty clay, trace rootlets, reddish brown, moist, firm to stiff		1	SS	7			○ at 30			
							154				
	trace organics, trace concrete pieces at 0.8m		2	SS	11			○ at 20			
1											
153.3											
1.4	**END OF BOREHOLE:** Notes: 1) Borehole was dry at the bottom upon completion.										

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 BH23-17

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4812938.88 E 601207.53

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jun-16-2023

REF. NO.: 22-012-101
ENCL NO.: 18

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
154.5							
0.0 / 154.2	**TOPSOIL:** 280mm						
0.3 / 153.7	**FILL:** silty clay, trace rootlets, trace asphalt, trace organics, black to brown, moist, stiff		1	SS	11		154
0.8	**SILTY CLAY TILL:** some sand, trace gravel, reddish brown, moist, very stiff to hard		2	SS	26		
			3	SS	21		153
			4	SS	50/100mm		152
151.4							
3.1	**SHALE BEDROCK:** Queentson Formation, reddish brown, weathered		5	SS	50/75mm	▽	151
							150
			6	SS	50/130mm		
148.3							149
6.2	**END OF BOREHOLE:**		7	SS	50/50mm		

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date: Water Level(mbgl):
June 26, 2023 3.7
July 19, 2023 3.7

W. L. 150.8 m
Jul 19, 2023

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)

REMARKS 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-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

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Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH23-18

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4812922.1 E 601208.51

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jun-16-2023

REF. NO.: 22-012-101
ENCL NO.: 19

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS / 0.3 m	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
154.3											
0.0	**FILL:** silty clay, trace organics, sand and gravel, brown, moist, firm		1	SS	7		154				
153.5											
0.8	**SILTY CLAY TILL:** some sand, trace gravel, reddish brown, moist, very stiff		2	SS	28						
1							153				
152.9											
1.4	**END OF BOREHOLE:** Notes: 1) Borehole dry at the bottom upon completion.										

DS SOIL LOG-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

DS CONSULTANTS LTD.
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LOG OF BOREHOLE BH23-19

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4812921.54 E 601228.89

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jun-16-2023

REF. NO.: 22-012-101
ENCL NO.: 20

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	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
154.4											
0.0 154.2	**GRANULAR FILL:** sand and gravel, 150mm										
0.2	**FILL:** silty clay, organic staining, black, moist, stiff to very stiff		1	SS	26		154	○ at 10			
153.4											
1.0 153.0	**SILTY CLAY TILL:** some sand, trace gravel, reddish brown, moist, stiff		2	SS	12		153	○ at 20			
1.4	**END OF BOREHOLE:** Notes: 1) Borehole dry at the bottom upon completion.										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

DS SOIL LOG-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

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LOG OF BOREHOLE BH23-20

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4812934.48 E 601243.05

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jun-16-2023

REF. NO.: 22-012-101
ENCL NO.: 21

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
154.6							
0.0 / 154.4	**GRANULAR FILL:** sand and gravel,180mm						
0.2 / 153.8	**FILL:** silty clay, trace sand, trace gravel, brown, moist, very stiff		1	SS	16		154
0.8 / 152.3	**SILTY CLAY TILL:** some sand, trace gravel, reddish brown, moist, very stiff to hard		2	SS	22		
			3	SS	38		153
2.3 / 152.2	**SHALE BEDROCK:** reddish brown, weathered		4	SS	50/ 130mm		
2.4	**END OF BOREHOLE:** Notes: 1) Borehole is dry at the bottom 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)

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

DS SOIL LOG-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

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 BH23-21

PROJECT: Geotechnical Investigation
CLIENT: NEATT Communities
PROJECT LOCATION: 3065 Neyagawa Blvd., Oakville, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4812905.65 E 601227.53

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jun-16-2023

REF. NO.: 22-012-101
ENCL NO.: 22

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
154.2							
0.0 154.0	**GRANULAR FILL:** sand and gravel, 200mm						154
0.2 153.4	**FILL:** silty clay, trace organics, trace sand, dark brown, moist, very stiff		1	SS	15		
0.8 151.9	**SILTY CLAY TILL:** some sand, trace gravel, reddish brown, moist, very stiff to hard		2	SS	20		153
			3	SS	38		152
2.3 151.4	**SILTY CLAY TILL/SHALE COMPLEX:** trace sand, trace gravel, reddish brown, moist, hard		4	SS	50/ 75mm		
2.8	**END OF BOREHOLE:** Notes: 1) Borehole is dry 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)

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

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

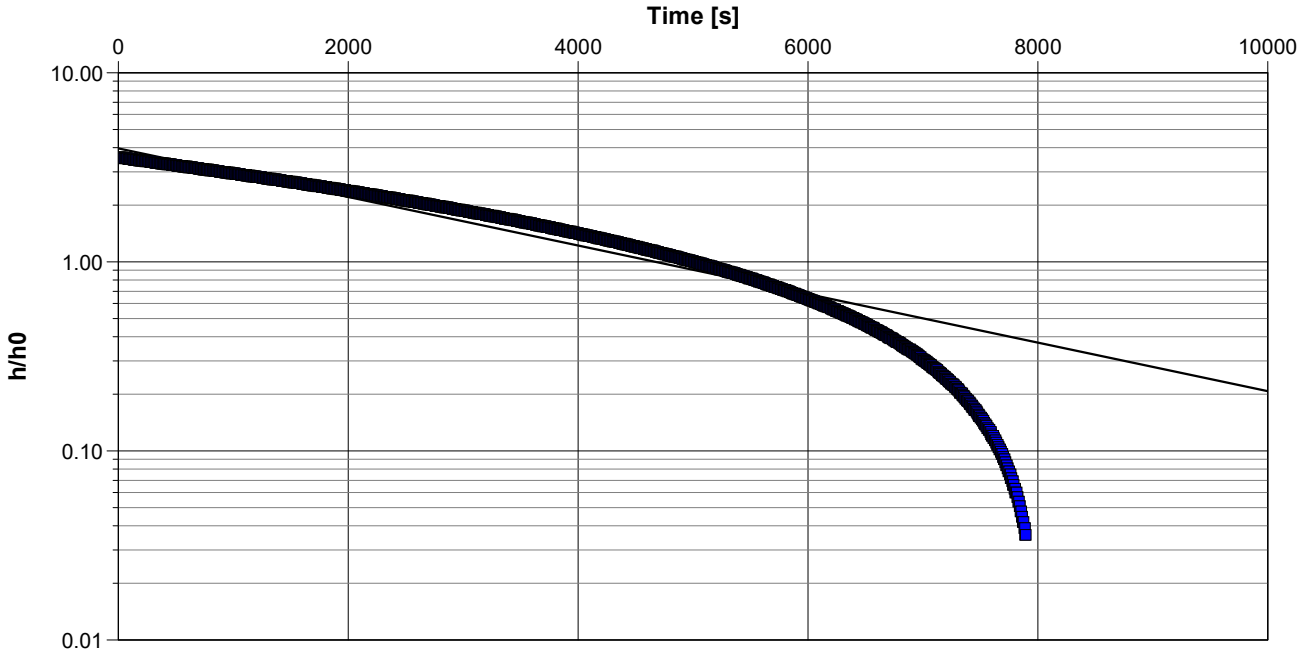
GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG-2021-FINAL 22-012-101GEO.GPJ DS.GDT 23-8-11

Appendix B: Hydraulic Conductivity Analysis

	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 22-012-101
	Client: NEATT Communities

Location: 3056 Nayagawa Blvd., Oakville	Slug Test: BH23-1	Test Well: BH23-1
Test Conducted by: AQ		Test Date: 6/26/2023
Analysis Performed by: MJ	Hvorslev	Analysis Date: 7/28/2023
Aquifer Thickness:		

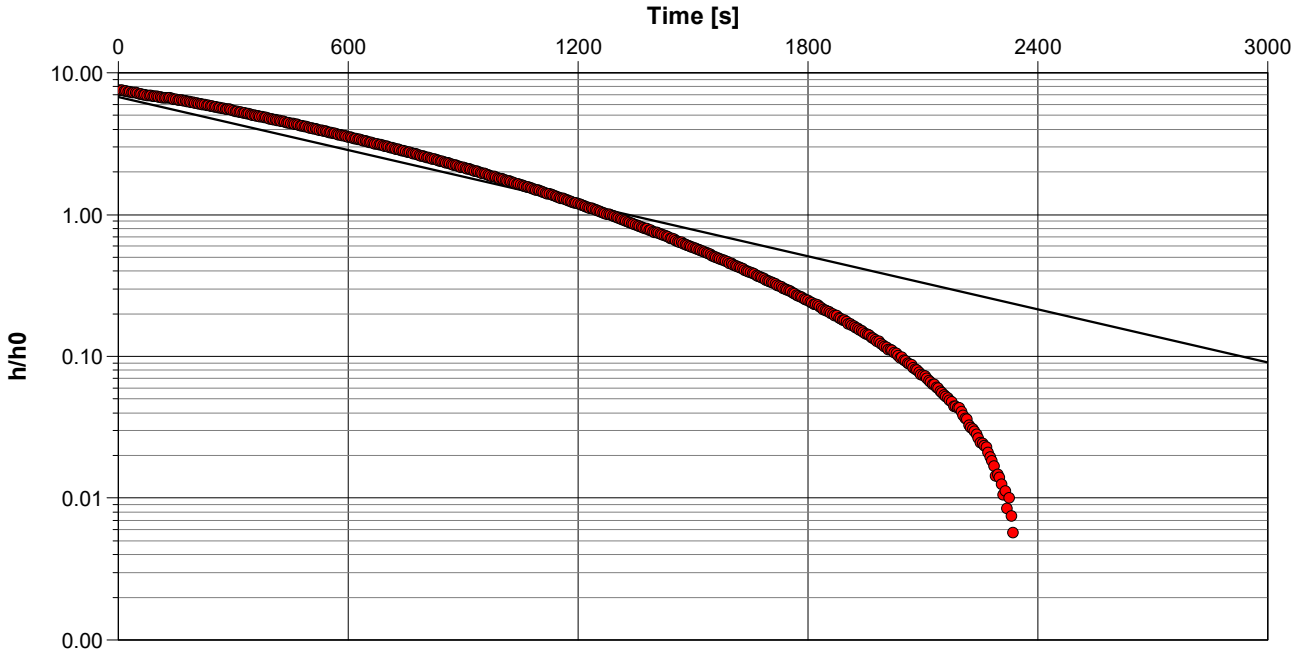


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH23-1	1.13×10^{-7}	

Slug Test Analysis Report	
Project: Hydrogeological Investigation	
Number: 22-012-101	
Client: NEATT Communities	

Location: 3056 Nayagawa Blvd., Oakville	Slug Test: BH23-2	Test Well: BH23-2
Test Conducted by: AQ		Test Date: 6/26/2023
Analysis Performed by: MJ	Hvorslev	Analysis Date: 7/28/2023
Aquifer Thickness:		

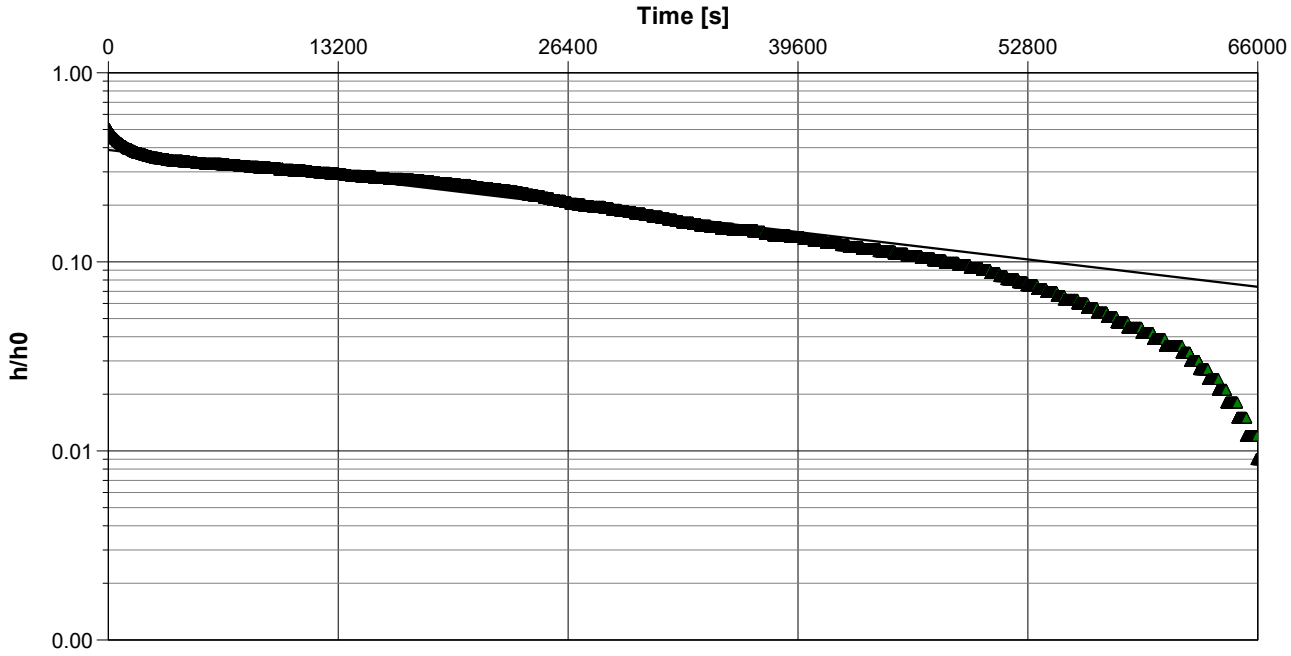


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH23-2	5.48×10^{-7}	

	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 22-012-101
	Client: NEATT Communities

Location: 3056 Nayagawa Blvd., Oakville	Slug Test: BH23-4	Test Well: BH23-4
Test Conducted by: AQ		Test Date: 6/26/2023
Analysis Performed by: MJ	Hvorslev	Analysis Date: 7/28/2023
Aquifer Thickness:		

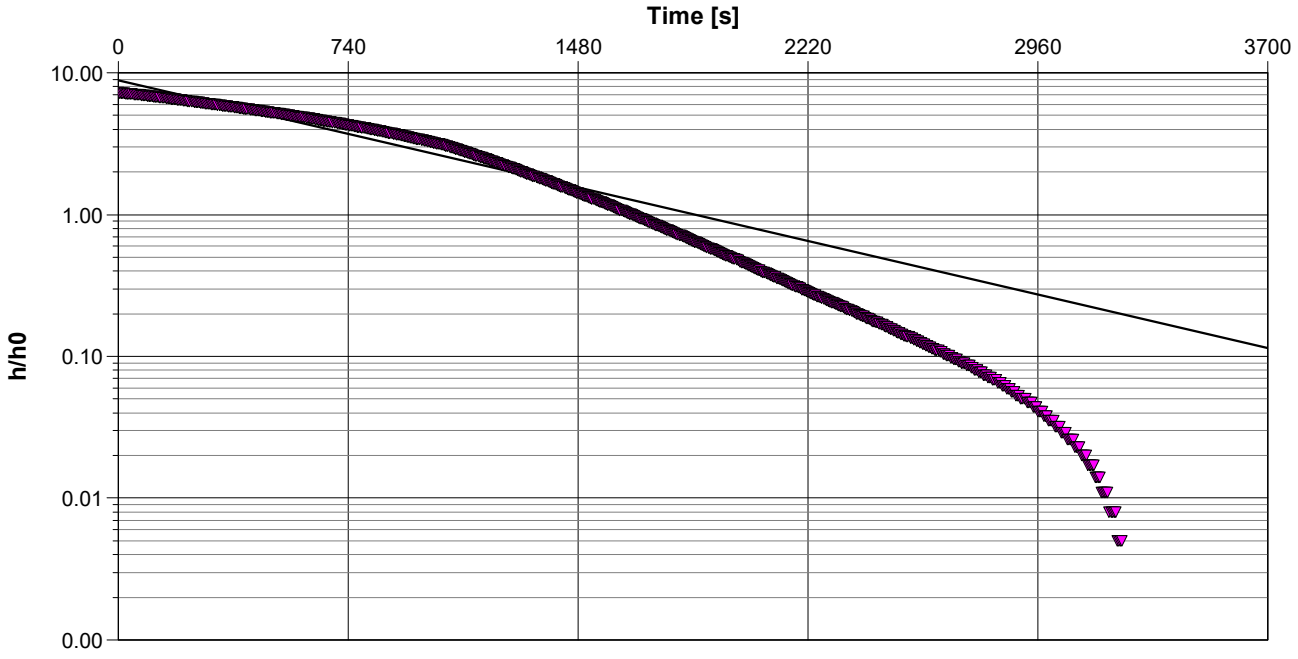


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH23-4	9.65×10^{-9}	

Slug Test Analysis Report	
Project: Hydrogeological Investigation	
Number: 22-012-101	
Client: NEATT Communities	

Location: 3056 Nayagawa Blvd., Oakville	Slug Test: BH23-5	Test Well: BH23-5
Test Conducted by: AQ		Test Date: 6/26/2023
Analysis Performed by: MJ	Hvorslev	Analysis Date: 7/28/2023
Aquifer Thickness:		

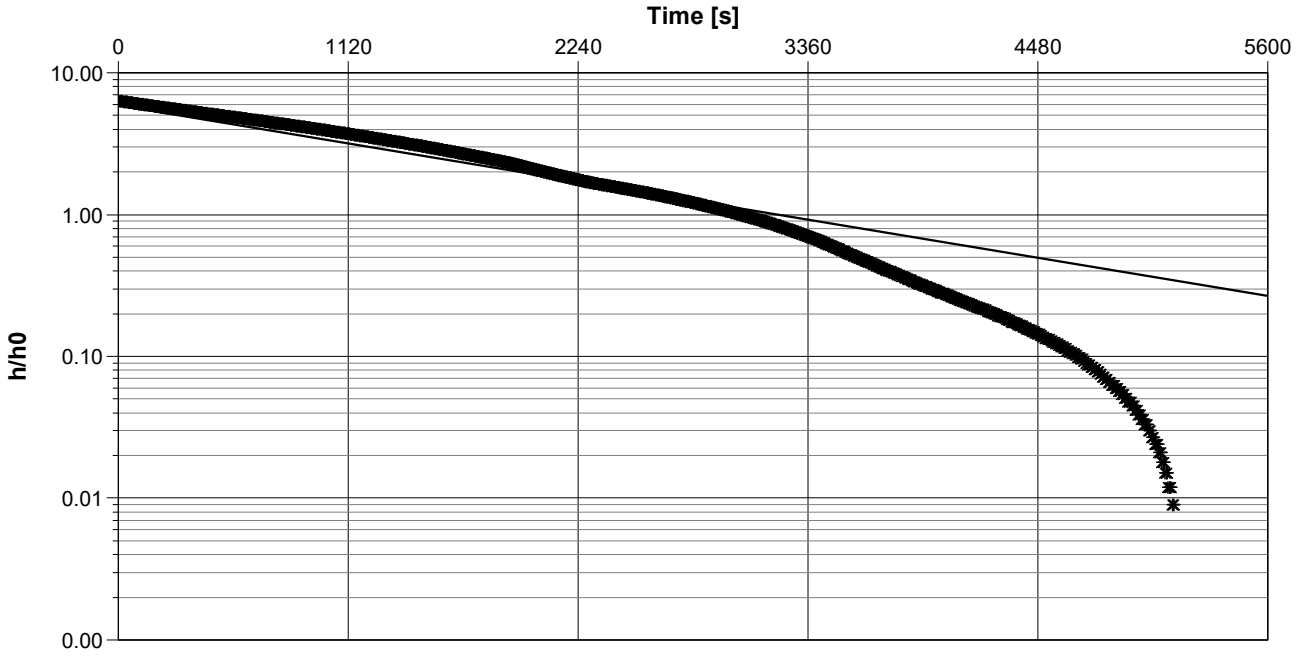


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH23-5	4.49×10^{-7}	

	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 22-012-101
	Client: NEATT Communities

Location: 3056 Nayagawa Blvd., Oakville	Slug Test: BH23-6	Test Well: BH23-6
Test Conducted by: AQ		Test Date: 6/26/2023
Analysis Performed by: MJ	Hvorslev	Analysis Date: 7/28/2023
Aquifer Thickness:		

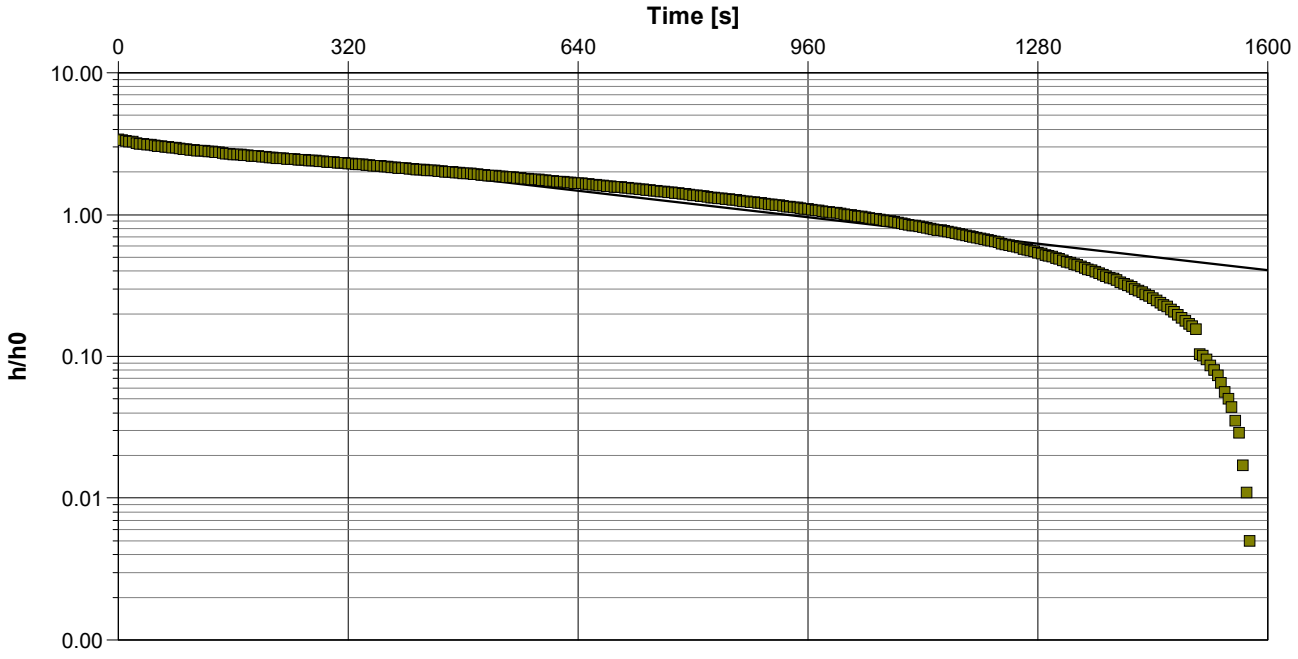


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH23-6	2.11×10^{-7}	

	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 22-012-101
	Client: NEATT Communities

Location: 3056 Nayagawa Blvd., Oakville	Slug Test: BH23-7	Test Well: BH23-7
Test Conducted by: AQ		Test Date: 6/26/2023
Analysis Performed by: MJ	Hvorslev	Analysis Date: 7/28/2023
Aquifer Thickness:		

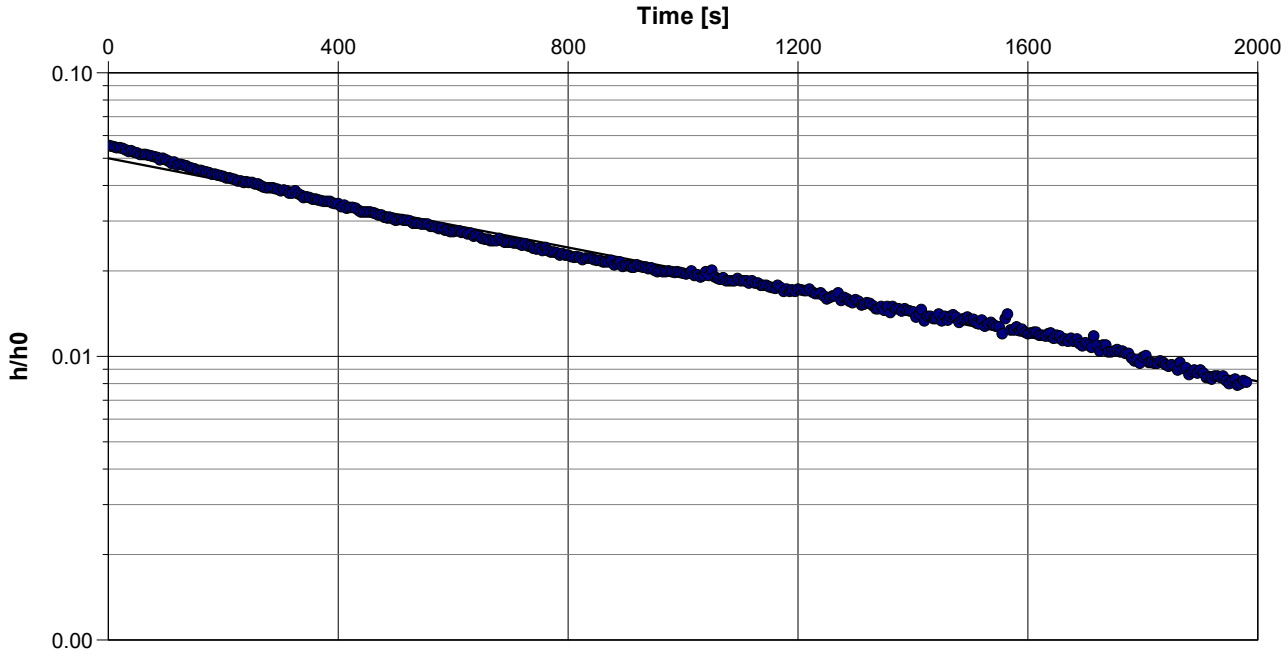


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH23-7	5.15×10^{-7}	

	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 22-012-101
	Client: NEATT Communities

Location: 3056 Nayagawa Blvd., Oakville	Slug Test: BH23-8	Test Well: BH23-8
Test Conducted by: CL		Test Date: 7/19/2023
Analysis Performed by: MJ	Hvorslev	Analysis Date: 7/28/2023
Aquifer Thickness:		

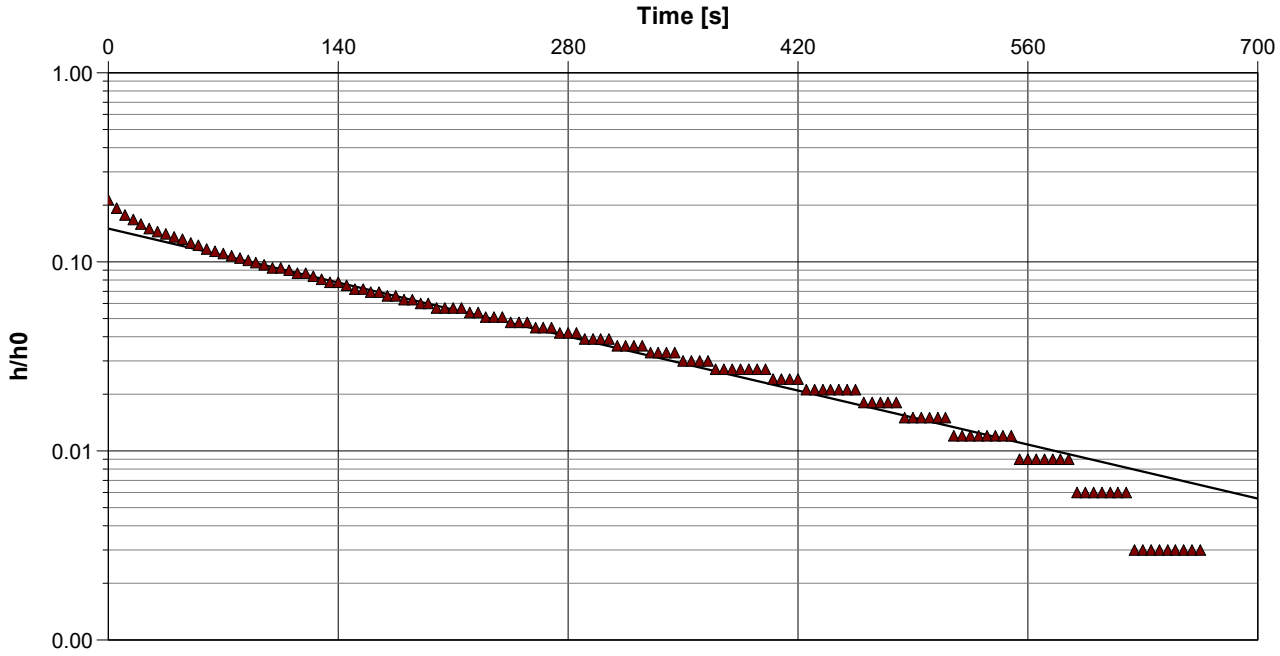


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH23-8	3.47×10^{-7}	

	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 22-012-101
	Client: NEATT Communities

Location: 3056 Nayagawa Blvd., Oakville	Slug Test: BH23-9	Test Well: BH23-9
Test Conducted by: AQ		Test Date: 6/26/2023
Analysis Performed by: MJ	Hvorslev	Analysis Date: 7/28/2023
Aquifer Thickness:		

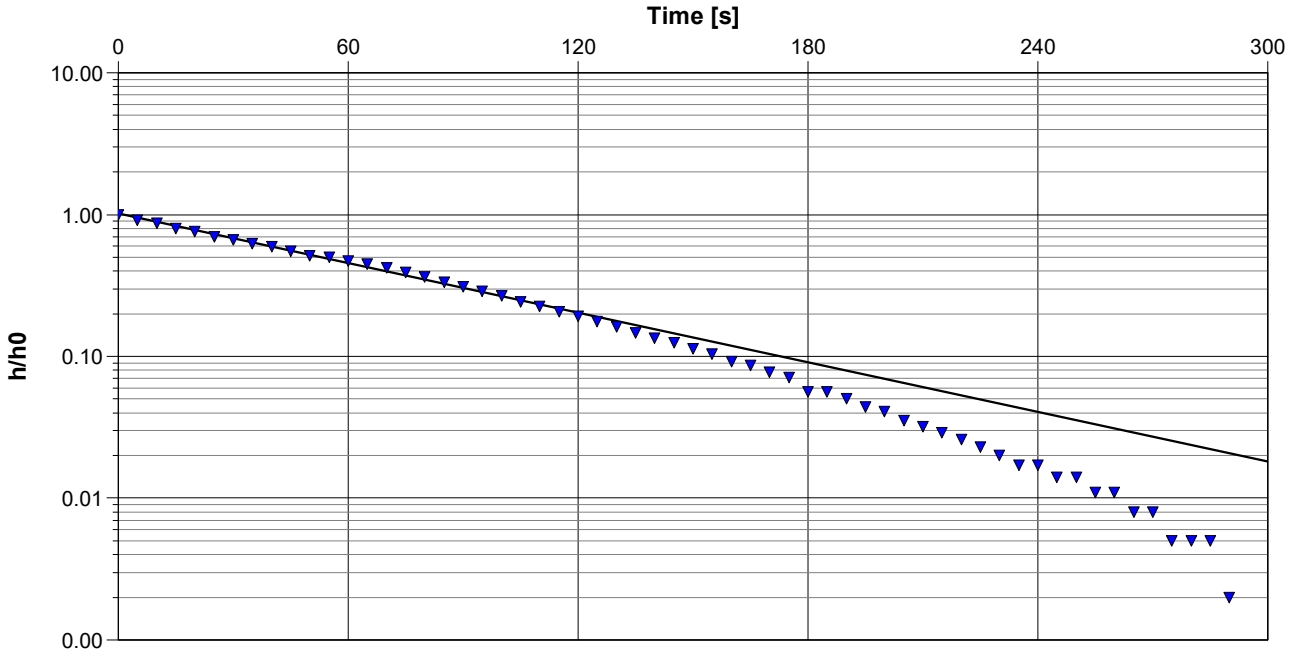


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH23-9	1.79×10^{-6}	

Slug Test Analysis Report	
Project: Hydrogeological Investigation	
Number: 22-012-101	
Client: NEATT Communities	

Location: 3056 Nayagawa Blvd., Oakville	Slug Test: BH1	Test Well: BH1
Test Conducted by: AQ		Test Date: 6/26/2023
Analysis Performed by: MJ	Hvorslev	Analysis Date: 7/28/2023
Aquifer Thickness:		

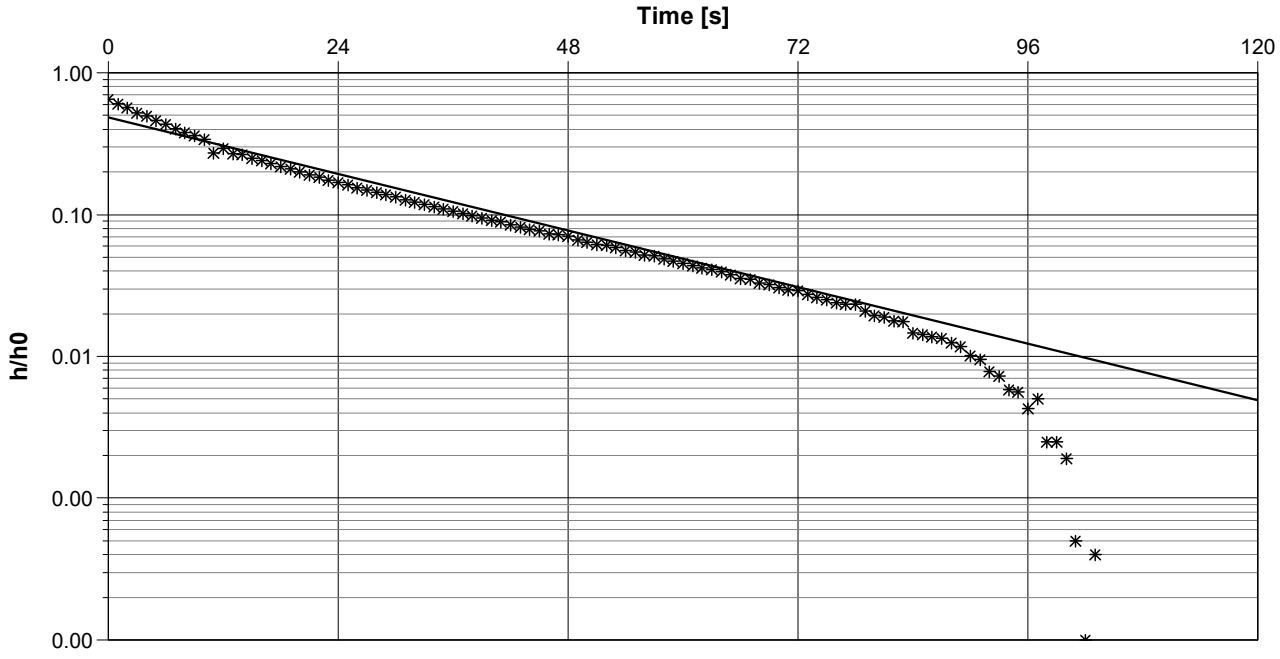


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH1	5.13×10^{-6}	

	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 22-012-101
	Client: NEATT Communities

Location: 3056 Nayagawa Blvd., Oakville	Slug Test: BH2	Test Well: BH2
Test Conducted by: CL		Test Date: 7/19/2023
Analysis Performed by: MJ	Hvorslev	Analysis Date: 7/28/2023
Aquifer Thickness:		

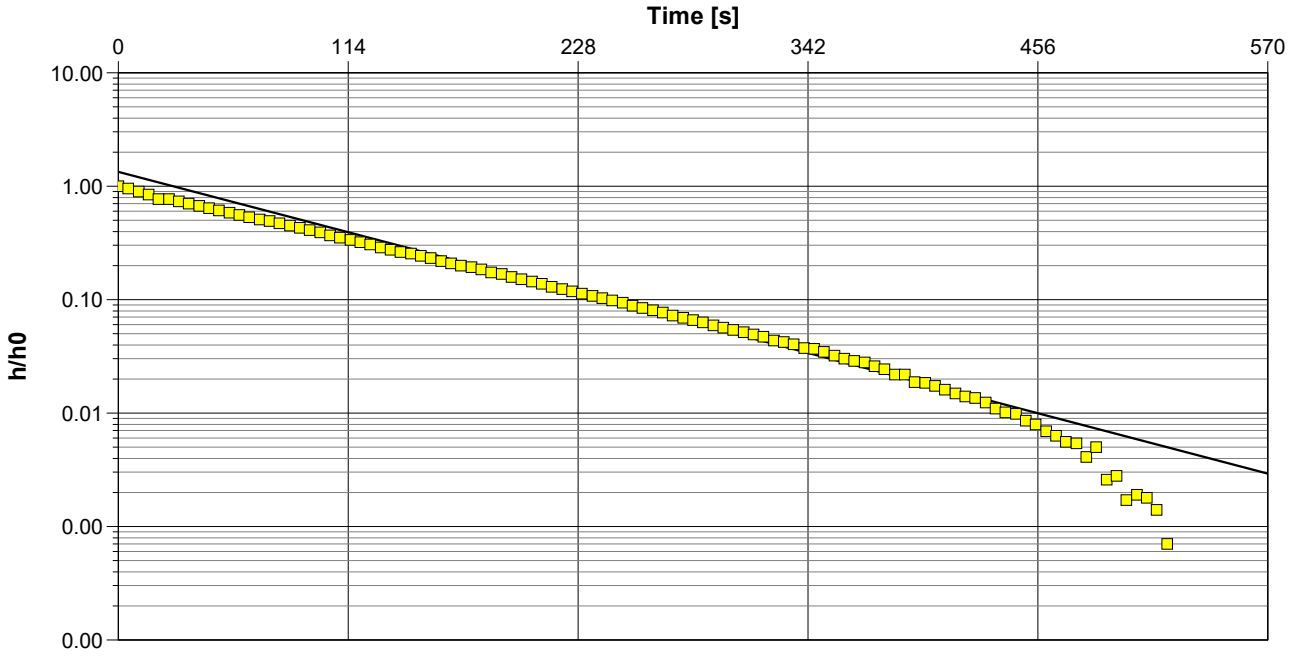


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH2	1.46×10^{-5}	

	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 22-012-101
	Client: NEATT Communities

Location: 3056 Nayagawa Blvd., Oakville	Slug Test: BH4	Test Well: BH4
Test Conducted by: CL		Test Date: 7/19/2023
Analysis Performed by: MJ	Hvorslev	Analysis Date: 7/28/2023
Aquifer Thickness:		

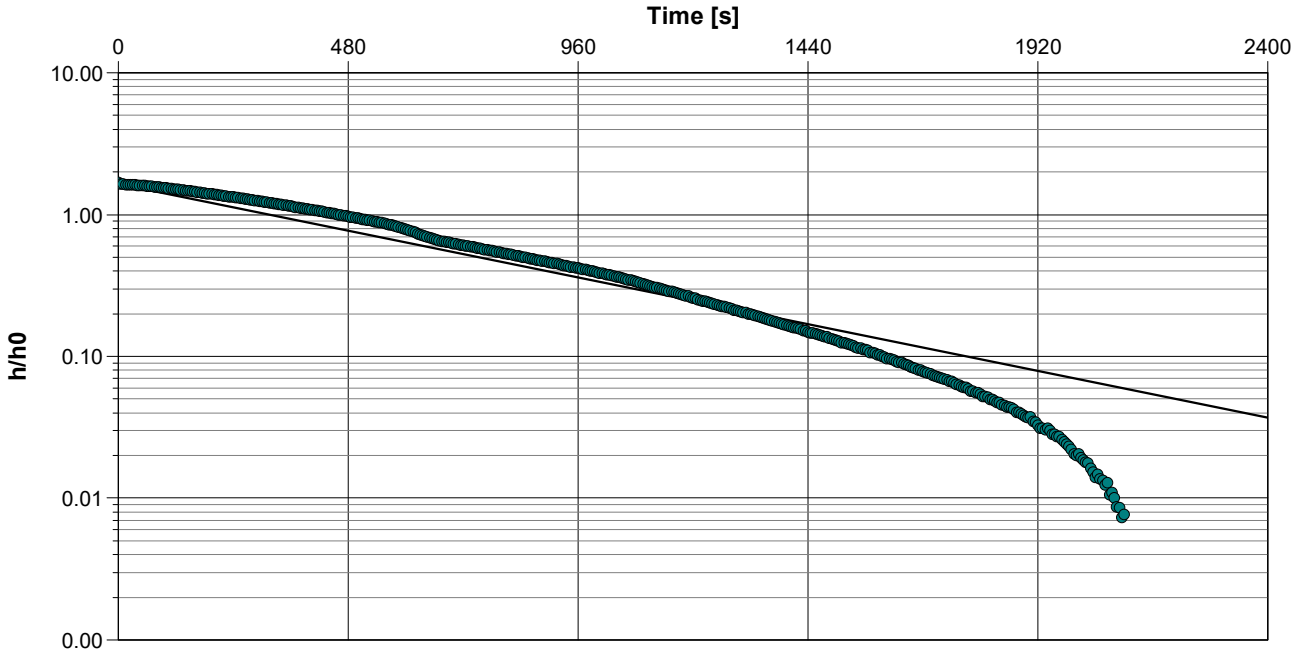


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH4	4.11×10^{-6}	

	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 22-012-101
	Client: NEATT Communities

Location: 3056 Nayagawa Blvd., Oakville	Slug Test: BH5	Test Well: BH5
Test Conducted by: CL		Test Date: 7/19/2023
Analysis Performed by: MJ	Hvorslev	Analysis Date: 7/28/2023
Aquifer Thickness:		

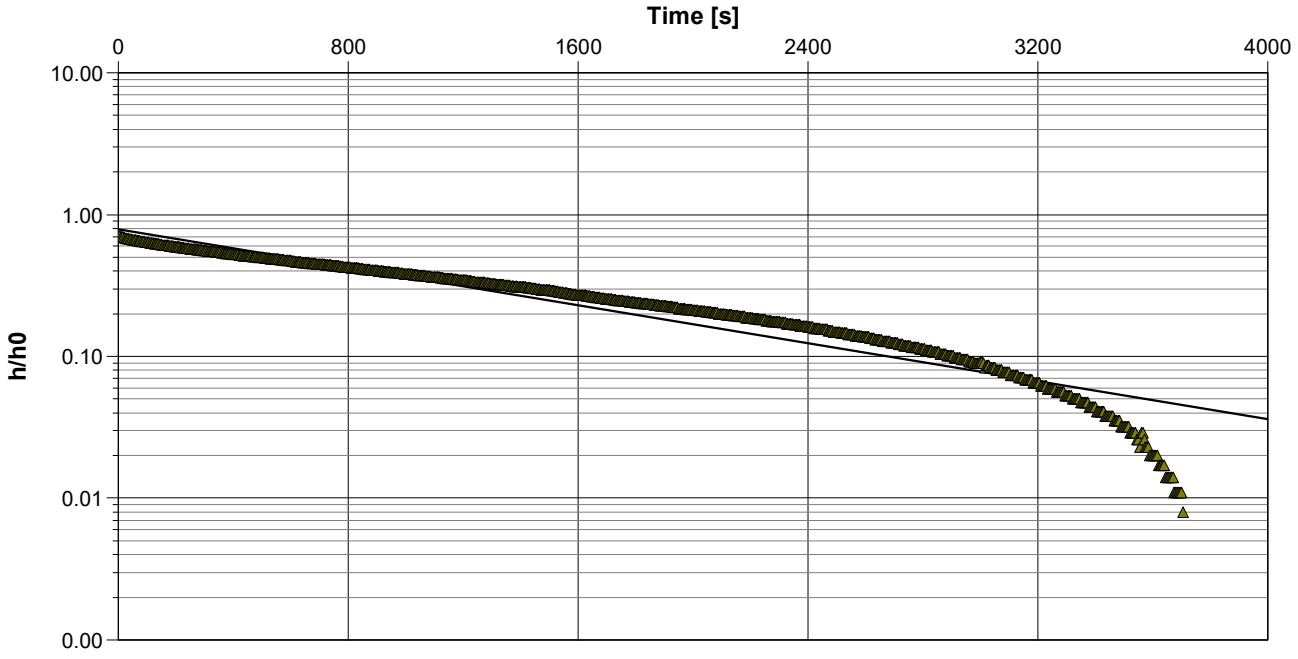


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH5	6.04×10^{-7}	

	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 22-012-101
	Client: NEATT Communities

Location: 3056 Nayagawa Blvd., Oakville	Slug Test: BH23-17	Test Well: BH23-17
Test Conducted by: AQ		Test Date: 6/26/2023
Analysis Performed by: MJ	Hvorslev	Analysis Date: 7/28/2023
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH23-17	2.94×10^{-7}	

Appendix C: Groundwater Quality Certificate of Analysis

FINAL REPORT

CA40311-JUN23 R1

23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St West, Oakville, ON.

Prepared for

DS Consultants

FINAL REPORT

CA40311-JUN23 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	23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St We
Order Number	
Samples	Ground Water (1)

LABORATORY DETAILS

Project Specialist	Jill Campbell, B.Sc.,GISAS
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	2165
Facsimile	705-652-6365
Email	jill.campbell@sgs.com
SGS Reference	CA40311-JUN23
Received	06/27/2023
Approved	07/06/2023
Report Number	CA40311-JUN23 R1
Date Reported	07/06/2023

COMMENTS

RL - SGS Reporting Limit

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: 032469

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

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Client: DS Consultants
Project: 23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St West, Oa
Project Manager: Meysam Jafari
Samplers: Ken Kim

MATRIX: WATER

L1 = SANSEW / WATER / - - Halton Sewer Use ByLaw - Sanitary and Combined Sewer Discharge - BL_2_03

L2 = SANSEW / WATER / - - Halton Sewer Use ByLaw - Storm Sewer Discharge - BL_2_03

Sample Number	8
Sample Name	BH23-6
Sample Matrix	Ground Water
Sample Date	27/06/2023

Parameter	Units	RL	L1	L2	Result
General Chemistry					
Carbonaceous Biochemical Oxygen Demand	mg/L	2			4
Total Suspended Solids	mg/L	2	350		446
Total Kjeldahl Nitrogen	as N mg/L	0.5	100		1.2
Metals and Inorganics					
Cyanide (total)	mg/L	0.01	2		< 0.01
Fluoride	mg/L	0.06	10		0.31
Sulphate	mg/L	2	1500		400
Aluminum (0.2µm)	mg/L	0.001			0.007
Aluminum (total)	mg/L	0.001	50		1.95
Antimony (total)	mg/L	0.0009	5		0.0014
Arsenic (total)	mg/L	0.0002	1		0.0035
Beryllium (total)	mg/L	0.000007	5		0.000092
Cadmium (total)	mg/L	0.000003	1		0.000032
Chromium (total)	mg/L	0.00008	3		0.00467
Cobalt (total)	mg/L	0.000004	5		0.00148
Copper (total)	mg/L	0.0002	3		0.0054
Iron (total)	mg/L	0.007	50		2.20
Lead (total)	mg/L	0.00009	3		0.00128
Manganese (total)	mg/L	0.00001	5		0.222
Molybdenum (total)	mg/L	0.00004	5		0.0119

Client: DS Consultants

Project: 23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St West, Oa

Project Manager: Meysam Jafari

Samplers: Ken Kim

MATRIX: WATER

L1 = SANSEW / WATER / - - Halton Sewer Use ByLaw - Sanitary and Combined Sewer Discharge - BL_2_03

L2 = SANSEW / WATER / - - Halton Sewer Use ByLaw - Storm Sewer Discharge - BL_2_03

Sample Number	8
Sample Name	BH23-6
Sample Matrix	Ground Water
Sample Date	27/06/2023

Parameter	Units	RL	L1	L2	Result
Metals and Inorganics (continued)					
Nickel (total)	mg/L	0.0001	3		0.0042
Phosphorus (total)	mg/L	0.003	10		0.165
Selenium (total)	mg/L	0.00004	5		0.00023
Silver (total)	mg/L	0.00005	5		0.00016
Tin (total)	mg/L	0.00006	5		0.00148
Titanium (total)	mg/L	0.00007	5		0.0378
Zinc (total)	mg/L	0.002	3		0.017
Microbiology					
E. Coli	cfu/100mL	0		200	6
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: DS Consultants

Project: 23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St West, Oa

Project Manager: Meysam Jafari

Samplers: Ken Kim

MATRIX: WATER

L1 = SANSEW / WATER / - - Halton Sewer Use ByLaw - Sanitary and Combined Sewer Discharge - BL_2_03

L2 = SANSEW / WATER / - - Halton Sewer Use ByLaw - Storm Sewer Discharge - BL_2_03

Sample Number	8
Sample Name	BH23-6
Sample Matrix	Ground Water
Sample Date	27/06/2023

Parameter	Units	RL	L1	L2	Result
Other (ORP)					
pH	No unit	0.05	10	8.5	7.50
Mercury (total)	mg/L	0.00001	0.05		< 0.00001
Mercury (dissolved)	mg/L	0.00001			< 0.00001
Phenols					
4AAP-Phenolics	mg/L	0.002	1		0.004
SVOCs - PAHs					
Naphthalene	mg/L	0.0005	0.14		< 0.0005
VOCs					
Chloroform	mg/L	0.0005	0.04		0.0010
1,4-Dichlorobenzene	mg/L	0.0005	0.08		< 0.0005
Methylene Chloride	mg/L	0.0005	2		< 0.0005
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	1		< 0.0005
Trichloroethylene	mg/L	0.0005	0.4		< 0.0005

Client: DS Consultants

Project: 23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St West, Oa

Project Manager: Meysam Jafari

Samplers: Ken Kim

MATRIX: WATER

Sample Number	8
Sample Name	BH23-6
Sample Matrix	Ground Water
Sample Date	27/06/2023

L1 = SANSEW / WATER / - - Halton Sewer Use ByLaw - Sanitary and Combined Sewer Discharge - BL_2_03

L2 = SANSEW / WATER / - - Halton Sewer Use ByLaw - Storm Sewer Discharge - BL_2_03

Parameter	Units	RL	L1	L2	Result
VOCs - BTEX					
Benzene	mg/L	0.0005	0.01		< 0.0005
Ethylbenzene	mg/L	0.0005	0.16		< 0.0005
Toluene	mg/L	0.0005	0.016		< 0.0005

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	SANSEW / WATER / - - Halton Sewer Use ByLaw - Sanitary and Combined Sewer Discharge - BL_2_03 L1	SANSEW / WATER / - - Halton Sewer Use ByLaw - Storm Sewer Discharge - BL_2_03 L2
BH23-6					
Total Suspended Solids	SM 2540D	mg/L	446	350	

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	DIO5104-JUN23	mg/L	2	<2	ND	20	111	80	120	105	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
Carbonaceous Biochemical Oxygen Demand	BOD0058-JUN23	(CBOD5) mg/L	2	< 2	8	30	93	70	130	NV	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)	SKA0286-JUN23	mg/L	0.01	<0.01	ND	10	96	90	110	77	75	125

QC SUMMARY

Fluoride by Specific Ion Electrode

Method: SM 4500 I Internal ref.: ME-CA-[ENVIEWL-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	EWL0672-JUN23	mg/L	0.06	<0.06	1	10	100	90	110	101	75	125

Mercury by CVAAS

Method: EPA 7471A/SM 3112B I Internal ref.: ME-CA-[ENVISPE-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)	EHG0059-JUN23	mg/L	0.00001	< 0.00001	ND	20	82	80	120	85	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
Selenium (total)	EMS0024-JUL23	mg/L	0.00004	<0.00004	4	20	103	90	110	99	70	130
Silver (total)	EMS0259-JUN23	mg/L	0.00005	<0.00005	ND	20	100	90	110	89	70	130
Aluminum (total)	EMS0259-JUN23	mg/L	0.001	<0.001	2	20	98	90	110	108	70	130
Aluminum (0.2µm)	EMS0259-JUN23	mg/L	0.001	<0.001	2	20	98	90	110	108	70	130
Arsenic (total)	EMS0259-JUN23	mg/L	0.0002	<0.0002	3	20	104	90	110	104	70	130
Beryllium (total)	EMS0259-JUN23	mg/L	0.000007	<0.000007	4	20	98	90	110	109	70	130
Cadmium (total)	EMS0259-JUN23	mg/L	0.000003	<0.000003	5	20	102	90	110	111	70	130
Cobalt (total)	EMS0259-JUN23	mg/L	0.000004	<0.000004	3	20	102	90	110	90	70	130
Chromium (total)	EMS0259-JUN23	mg/L	0.00008	0.003989	1	20	102	90	110	82	70	130
Copper (total)	EMS0259-JUN23	mg/L	0.0002	<0.0002	1	20	103	90	110	107	70	130
Iron (total)	EMS0259-JUN23	mg/L	0.007	<0.007	2	20	105	90	110	95	70	130
Manganese (total)	EMS0259-JUN23	mg/L	0.00001	<0.00001	2	20	107	90	110	111	70	130
Molybdenum (total)	EMS0259-JUN23	mg/L	0.00004	<0.00004	2	20	104	90	110	103	70	130
Nickel (total)	EMS0259-JUN23	mg/L	0.0001	<0.0001	5	20	105	90	110	88	70	130
Lead (total)	EMS0259-JUN23	mg/L	0.00009	<0.00009	1	20	101	90	110	106	70	130
Phosphorus (total)	EMS0259-JUN23	mg/L	0.003	<0.003	3	20	103	90	110	NV	70	130
Antimony (total)	EMS0259-JUN23	mg/L	0.0009	<0.0009	ND	20	109	90	110	77	70	130
Tin (total)	EMS0259-JUN23	mg/L	0.00006	<0.00006	8	20	100	90	110	NV	70	130
Titanium (total)	EMS0259-JUN23	mg/L	0.00007	<0.00005	13	20	105	90	110	NV	70	130
Zinc (total)	EMS0259-JUN23	mg/L	0.002	<0.002	1	20	100	90	110	94	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	BAC9467-JUN23	cfu/100mL	-	ACCEPTED	ACCEPTED							

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-IENVIGC-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)	GCM0453-JUN23	mg/L	2	<2	NSS	20	106	75	125			

QC SUMMARY

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)	GCM0453-JUN23	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0453-JUN23	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	EWL0668-JUN23	No unit	0.05	NA	1		100			NA		

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-[ENV]SFA-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	SKA0288-JUN23	mg/L	0.002	<0.002	ND	10	98	80	120	100	75	125

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENVIGC-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
Naphthalene	GCM0025-JUL23	mg/L	0.0005		ND	30				88	50	140

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-[ENVIEWL-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	EWL0737-JUN23	mg/L	2	< 2	7	10	101	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-[ENVISFA-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	SKA0294-JUN23	as N mg/L	0.5	<0.5	2	10	102	90	110	102	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENVIGC-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
1,4-Dichlorobenzene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	96	60	130	93	50	140
Benzene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	100	60	130	100	50	140
Chloroform	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	98	60	130	97	50	140
Ethylbenzene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	100	60	130	100	50	140
Methylene Chloride	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	100	60	130	98	50	140
Tetrachloroethylene (perchloroethylene)	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	98	60	130	97	50	140
Toluene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	100	60	130	99	50	140
Trichloroethylene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	99	60	130	96	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: 032469 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Sukhpreet Kaur
Received Date: 06/27/2023 (mm/dd/yy)
Received Time: 14:15 (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): 9°C x 3
LAB LIMS #: CA 40311-Jun23

REPORT INFORMATION	INVOICE INFORMATION
Company: DS Consultants	☐ (same as Report Information)
Contact: Meysam Jaffari	Company: Accounting
Address: 6221 Hwy 7, Unit 16, Vaughan, ON	Contact:
Phone: 204-951-8164	Address:
Fax:	Phone:
Email: meysam.jaffari@dsconsultants.ca	Email:

Quotation #:
Project #: 23-012-101
P.O. #:
Site Location/ID: 3056 Neyagawa Blvd & 1013 1039 Dundas St West Oakville, ON

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

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park ☐ Soil Texture:
☐ Table 2 ☐ Ind/Com ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ Medium/Fine
☐ 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: Halton

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,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 (please specify)	Other (please specify)	Other (please specify)	Other (please specify)	Sewer Use: Halton storm Sanitary	Water Characterization Pkg Specify pkg: General ☐ Extended ☐	SPLP Specify tests	TCLP Specify tests	COMMENTS:
1 BH23-6	27/June/2023	AM	16	GW	N																✓				Non filtered
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Ken Kim Signature: Date: 06/27/23 (mm/dd/yy) 06/27/2023
Relinquished by (NAME): Ken Kim Signature: Date: 06/27/23 (mm/dd/yy) 06/27/2023

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.6
Date of Issue: 02 May 2022

FINAL REPORT

CA40311-JUN23 R1

23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St West, Oakville, ON.

Prepared for

DS Consultants

FINAL REPORT

CA40311-JUN23 R1

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	DS Consultants	Project Specialist	Jill Campbell, B.Sc.,GISAS
		Laboratory	SGS Canada Inc.
Address	6221 Highway 7 Unit 16 Vaughan, Ontario L4H 0K8. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Meysam Jafari	Telephone	2165
Telephone	905-264-9393	Facsimile	705-652-6365
Facsimile	905-264-2685	Email	jill.campbell@sgs.com
Email	meysam.jafari@dsconsultants.ca	SGS Reference	CA40311-JUN23
Project	23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St We	Received	06/27/2023
Order Number		Approved	07/06/2023
Samples	Ground Water (1)	Report Number	CA40311-JUN23 R1
		Date Reported	07/18/2023

COMMENTS

RL - SGS Reporting Limit

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: 032469

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

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Client: DS Consultants

Project: 23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St West, Oa

Project Manager: Meysam Jafari

Samplers: Ken Kim

MATRIX: WATER

L1 = SANSEW / WATER / - - Oakville Sewer Use By Law - Storm Sewer Discharge - BL_2009_031

Sample Number	8
Sample Name	BH23-6
Sample Matrix	Ground Water
Sample Date	27/06/2023

Parameter	Units	RL	L1	Result
General Chemistry				
Carbonaceous Biochemical Oxygen Demand	mg/L	2		4
Total Suspended Solids	mg/L	2	15	446
Total Kjeldahl Nitrogen	as N mg/L	0.5		1.2
Metals and Inorganics				
Cyanide (total)	mg/L	0.01	0.02	< 0.01
Fluoride	mg/L	0.06		0.31
Sulphate	mg/L	2		400
Aluminum (0.2µm)	mg/L	0.001		0.007
Aluminum (total)	mg/L	0.001		1.95
Antimony (total)	mg/L	0.0009		0.0014
Arsenic (total)	mg/L	0.0002	0.02	0.0035
Beryllium (total)	mg/L	0.000007		0.000092
Cadmium (total)	mg/L	0.000003	0.008	0.000032
Chromium (total)	mg/L	0.00008	0.08	0.00467
Cobalt (total)	mg/L	0.000004		0.00148
Copper (total)	mg/L	0.0002	0.04	0.0054
Iron (total)	mg/L	0.007		2.20
Lead (total)	mg/L	0.00009	0.12	0.00128
Manganese (total)	mg/L	0.00001	0.05	0.222
Molybdenum (total)	mg/L	0.00004		0.0119
Nickel (total)	mg/L	0.0001	0.08	0.0042

Client: DS Consultants

Project: 23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St West, Oa

Project Manager: Meysam Jafari

Samplers: Ken Kim

MATRIX: WATER

L1 = SANSEW / WATER / - - Oakville Sewer Use By Law - Storm Sewer Discharge - BL_2009_031

Sample Number	8
Sample Name	BH23-6
Sample Matrix	Ground Water
Sample Date	27/06/2023

Parameter	Units	RL	L1	Result
Metals and Inorganics (continued)				
Phosphorus (total)	mg/L	0.003	0.4	0.165
Selenium (total)	mg/L	0.00004	0.02	0.00023
Silver (total)	mg/L	0.00005	0.12	0.00016
Tin (total)	mg/L	0.00006		0.00148
Titanium (total)	mg/L	0.00007		0.0378
Zinc (total)	mg/L	0.002	0.04	0.017
Microbiology				
E. Coli	cfu/100mL	0	200	6
Oil and Grease				
Oil & Grease (total)	mg/L	2		< 2
Oil & Grease (animal/vegetable)	mg/L	4		< 4
Oil & Grease (mineral/synthetic)	mg/L	4		< 4
Other (ORP)				
pH	No unit	0.05	8.5	7.50
Mercury (total)	mg/L	0.00001	0.0004	< 0.00001
Mercury (dissolved)	mg/L	0.00001		< 0.00001

Client: DS Consultants

Project: 23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St West, Oa

Project Manager: Meysam Jafari

Samplers: Ken Kim

MATRIX: WATER

L1 = SANSEW / WATER / - - Oakville Sewer Use By Law - Storm Sewer Discharge - BL_2009_031

Sample Number	8
Sample Name	BH23-6
Sample Matrix	Ground Water
Sample Date	27/06/2023

Parameter	Units	RL	L1	Result
Phenols				
4AAP-Phenolics	mg/L	0.002	0.008	0.004
SVOCs - PAHs				
Naphthalene	mg/L	0.0005		< 0.0005
VOCs				
Chloroform	mg/L	0.0005	0.002	0.0010
1,4-Dichlorobenzene	mg/L	0.0005	0.0068	< 0.0005
Methylene Chloride	mg/L	0.0005	0.0052	< 0.0005
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	0.0044	< 0.0005
Trichloroethylene	mg/L	0.0005	0.0076	< 0.0005
VOCs - BTEX				
Benzene	mg/L	0.0005	0.002	< 0.0005
Ethylbenzene	mg/L	0.0005	0.002	< 0.0005
Toluene	mg/L	0.0005	0.002	< 0.0005

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	SANSEW / WATER / - - Oakville Sewer Use By Law - Storm Sewer Discharge - BL_2009_031 L1
BH23-6				
Total Suspended Solids	SM 2540D	mg/L	446	15
Manganese	SM 3030/EPA 200.8	mg/L	0.222	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	DIO5104-JUN23	mg/L	2	<2	ND	20	111	80	120	105	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
Carbonaceous Biochemical Oxygen Demand	BOD0058-JUN23	(CBOD5) mg/L	2	< 2	8	30	93	70	130	NV	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)	SKA0286-JUN23	mg/L	0.01	<0.01	ND	10	96	90	110	77	75	125

QC SUMMARY

Fluoride by Specific Ion Electrode

Method: SM 4500 I Internal ref.: ME-CA-[ENVIEWL-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	EWL0672-JUN23	mg/L	0.06	<0.06	1	10	100	90	110	101	75	125

Mercury by CVAAS

Method: EPA 7471A/SM 3112B I Internal ref.: ME-CA-[ENVISPE-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)	EHG0059-JUN23	mg/L	0.00001	< 0.00001	ND	20	82	80	120	85	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
Selenium (total)	EMS0024-JUL23	mg/L	0.00004	<0.00004	4	20	103	90	110	99	70	130
Silver (total)	EMS0259-JUN23	mg/L	0.00005	<0.00005	ND	20	100	90	110	89	70	130
Aluminum (total)	EMS0259-JUN23	mg/L	0.001	<0.001	2	20	98	90	110	108	70	130
Aluminum (0.2µm)	EMS0259-JUN23	mg/L	0.001	<0.001	2	20	98	90	110	108	70	130
Arsenic (total)	EMS0259-JUN23	mg/L	0.0002	<0.0002	3	20	104	90	110	104	70	130
Beryllium (total)	EMS0259-JUN23	mg/L	0.000007	<0.000007	4	20	98	90	110	109	70	130
Cadmium (total)	EMS0259-JUN23	mg/L	0.000003	<0.000003	5	20	102	90	110	111	70	130
Cobalt (total)	EMS0259-JUN23	mg/L	0.000004	<0.000004	3	20	102	90	110	90	70	130
Chromium (total)	EMS0259-JUN23	mg/L	0.00008	0.003989	1	20	102	90	110	82	70	130
Copper (total)	EMS0259-JUN23	mg/L	0.0002	<0.0002	1	20	103	90	110	107	70	130
Iron (total)	EMS0259-JUN23	mg/L	0.007	<0.007	2	20	105	90	110	95	70	130
Manganese (total)	EMS0259-JUN23	mg/L	0.00001	<0.00001	2	20	107	90	110	111	70	130
Molybdenum (total)	EMS0259-JUN23	mg/L	0.00004	<0.00004	2	20	104	90	110	103	70	130
Nickel (total)	EMS0259-JUN23	mg/L	0.0001	<0.0001	5	20	105	90	110	88	70	130
Lead (total)	EMS0259-JUN23	mg/L	0.00009	<0.00009	1	20	101	90	110	106	70	130
Phosphorus (total)	EMS0259-JUN23	mg/L	0.003	<0.003	3	20	103	90	110	NV	70	130
Antimony (total)	EMS0259-JUN23	mg/L	0.0009	<0.0009	ND	20	109	90	110	77	70	130
Tin (total)	EMS0259-JUN23	mg/L	0.00006	<0.00006	8	20	100	90	110	NV	70	130
Titanium (total)	EMS0259-JUN23	mg/L	0.00007	<0.00005	13	20	105	90	110	NV	70	130
Zinc (total)	EMS0259-JUN23	mg/L	0.002	<0.002	1	20	100	90	110	94	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	BAC9467-JUN23	cfu/100mL	-	ACCEPTED	ACCEPTED							

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-IENVIGC-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)	GCM0453-JUN23	mg/L	2	<2	NSS	20	106	75	125			

QC SUMMARY

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)	GCM0453-JUN23	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0453-JUN23	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	EWL0668-JUN23	No unit	0.05	NA	1		100			NA		

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-[ENV]SFA-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	SKA0288-JUN23	mg/L	0.002	<0.002	ND	10	98	80	120	100	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
Naphthalene	GCM0025-JUL23	mg/L	0.0005		ND	30				88	50	140

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	EWL0737-JUN23	mg/L	2	< 2	7	10	101	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	SKA0294-JUN23	as N mg/L	0.5	<0.5	2	10	102	90	110	102	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENVIGC-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
1,4-Dichlorobenzene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	96	60	130	93	50	140
Benzene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	100	60	130	100	50	140
Chloroform	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	98	60	130	97	50	140
Ethylbenzene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	100	60	130	100	50	140
Methylene Chloride	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	100	60	130	98	50	140
Tetrachloroethylene (perchloroethylene)	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	98	60	130	97	50	140
Toluene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	100	60	130	99	50	140
Trichloroethylene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	99	60	130	96	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: 032469 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Sukhpreet Kaur
Received Date: 06/27/2023 (mm/dd/yy)
Received Time: 14:15 (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): 9°C x 3
LAB LIMS #: CA 40311-Jun23

REPORT INFORMATION	INVOICE INFORMATION
Company: DS Consultants	☐ (same as Report Information)
Contact: Meysam Jaffari	Company: Accounting
Address: 6221 Hwy 7, Unit 16, Vaughan, ON	Contact:
Phone: 204-951-8164	Address:
Fax:	Phone:
Email: meysam.jaffari@dsconsultants.ca	Email:

Quotation #:
Project #: 23-012-101
P.O. #:
Site Location/ID: 3056 Neyagawa Blvd & 1013 1039 Dundas St West Oakville, ON

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

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park ☐ Soil Texture:
☐ Table 2 ☐ Ind/Com ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ Medium/Fine
☐ 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: Halton

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,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 (please specify)	Other (please specify)	Other (please specify)	Other (please specify)	Sewer Use: Halton storm Sanitary	Water Characterization Pkg Specify pkg: General ☐ Extended ☐	SPLP Specify tests	TCLP Specify tests	COMMENTS:
1 BH23-6	27/June/2023	AM	16	GW	N																✓				Non filtered
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Ken Kim Signature: Date: 06/27/23 (mm/dd/yy) 06/27/2023
Relinquished by (NAME): Ken Kim Signature: Date: 06/27/23 (mm/dd/yy) 06/27/2023

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.6
Date of Issue: 02 May 2022

FINAL REPORT

CA40311-JUN23 R1

23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St West, Oakville, ON.

Prepared for

DS Consultants

FINAL REPORT

CA40311-JUN23 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	23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St We
Order Number	
Samples	Ground Water (1)

LABORATORY DETAILS

Project Specialist	Jill Campbell, B.Sc.,GISAS
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	2165
Facsimile	705-652-6365
Email	jill.campbell@sgs.com
SGS Reference	CA40311-JUN23
Received	06/27/2023
Approved	07/06/2023
Report Number	CA40311-JUN23 R1
Date Reported	07/06/2023

COMMENTS

RL - SGS Reporting Limit

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: 032469

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

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Client: DS Consultants
Project: 23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St West, Oa
Project Manager: Meysam Jafari
Samplers: Ken Kim

MATRIX: WATER

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

Sample Number	8
Sample Name	BH23-6
Sample Matrix	Ground Water
Sample Date	27/06/2023

Parameter	Units	RL	L1	Result
General Chemistry				
Carbonaceous Biochemical Oxygen Demand	mg/L	2		4
Total Suspended Solids	mg/L	2		446
Total Kjeldahl Nitrogen	as N mg/L	0.5		1.2
Metals and Inorganics				
Cyanide (total)	mg/L	0.01		< 0.01
Fluoride	mg/L	0.06		0.31
Sulphate	mg/L	2		400
Aluminum (0.2µm)	mg/L	0.001	0.075	0.007
Aluminum (total)	mg/L	0.001		1.95
Antimony (total)	mg/L	0.0009	0.02	0.0014
Arsenic (total)	mg/L	0.0002	0.005	0.0035
Beryllium (total)	mg/L	0.000007	0.011	0.000092
Cadmium (total)	mg/L	0.000003	0.0001	0.000032
Chromium (total)	mg/L	0.00008	0.1	0.00467
Cobalt (total)	mg/L	0.000004	0.0009	0.00148
Copper (total)	mg/L	0.0002	0.001	0.0054
Iron (total)	mg/L	0.007	0.3	2.20
Lead (total)	mg/L	0.00009	0.005	0.00128
Manganese (total)	mg/L	0.00001		0.222
Molybdenum (total)	mg/L	0.00004	0.04	0.0119
Nickel (total)	mg/L	0.0001	0.025	0.0042

Client: DS Consultants
Project: 23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St West, Oa
Project Manager: Meysam Jafari
Samplers: Ken Kim

MATRIX: WATER

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

Sample Number	8
Sample Name	BH23-6
Sample Matrix	Ground Water
Sample Date	27/06/2023

Parameter	Units	RL	L1	Result
Metals and Inorganics (continued)				
Phosphorus (total)	mg/L	0.003	0.01	0.165
Selenium (total)	mg/L	0.00004	0.1	0.00023
Silver (total)	mg/L	0.00005	0.0001	0.00016
Tin (total)	mg/L	0.00006		0.00148
Titanium (total)	mg/L	0.00007		0.0378
Zinc (total)	mg/L	0.002	0.02	0.017
Microbiology				
E. Coli	cfu/100mL	0	100	6
Oil and Grease				
Oil & Grease (total)	mg/L	2		< 2
Oil & Grease (animal/vegetable)	mg/L	4		< 4
Oil & Grease (mineral/synthetic)	mg/L	4		< 4
Other (ORP)				
pH	No unit	0.05	8.6	7.50
Mercury (total)	mg/L	0.00001	0.0002	< 0.00001
Mercury (dissolved)	mg/L	0.00001	0.0002	< 0.00001

Client: DS Consultants
Project: 23-012-101, 3056 Neyagawa Blvd & 1013, 1059 Dundas St West, Oa
Project Manager: Meysam Jafari
Samplers: Ken Kim

MATRIX: WATER

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

Sample Number	8
Sample Name	BH23-6
Sample Matrix	Ground Water
Sample Date	27/06/2023

Parameter	Units	RL	L1	Result
Phenols				
4AAP-Phenolics	mg/L	0.002	0.001	0.004
SVOCs - PAHs				
Naphthalene	mg/L	0.0005	0.007	< 0.0005
VOCs				
Chloroform	mg/L	0.0005		0.0010
1,4-Dichlorobenzene	mg/L	0.0005		< 0.0005
Methylene Chloride	mg/L	0.0005	0.1	< 0.0005
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	0.05	< 0.0005
Trichloroethylene	mg/L	0.0005	0.02	< 0.0005
VOCs - BTEX				
Benzene	mg/L	0.0005	0.1	< 0.0005
Ethylbenzene	mg/L	0.0005	0.008	< 0.0005
Toluene	mg/L	0.0005	0.0008	< 0.0005

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E L1
BH23-6				
Cobalt	SM 3030/EPA 200.8	mg/L	0.00148	0.0009
Copper	SM 3030/EPA 200.8	mg/L	0.0054	0.001
Iron	SM 3030/EPA 200.8	mg/L	2.20	0.3
Phosphorus	SM 3030/EPA 200.8	mg/L	0.165	0.01
Silver	SM 3030/EPA 200.8	mg/L	0.00016	0.0001
4AAP-Phenolics	SM 5530B-D	mg/L	0.004	0.001

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	DIO5104-JUN23	mg/L	2	<2	ND	20	111	80	120	105	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
Carbonaceous Biochemical Oxygen Demand	BOD0058-JUN23	(CBOD5) mg/L	2	< 2	8	30	93	70	130	NV	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)	SKA0286-JUN23	mg/L	0.01	<0.01	ND	10	96	90	110	77	75	125

QC SUMMARY

Fluoride by Specific Ion Electrode

Method: SM 4500 I Internal ref.: ME-CA-[ENVIEWL-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	EWL0672-JUN23	mg/L	0.06	<0.06	1	10	100	90	110	101	75	125

Mercury by CVAAS

Method: EPA 7471A/SM 3112B I Internal ref.: ME-CA-[ENVISPE-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)	EHG0059-JUN23	mg/L	0.00001	< 0.00001	ND	20	82	80	120	85	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
Selenium (total)	EMS0024-JUL23	mg/L	0.00004	<0.00004	4	20	103	90	110	99	70	130
Silver (total)	EMS0259-JUN23	mg/L	0.00005	<0.00005	ND	20	100	90	110	89	70	130
Aluminum (total)	EMS0259-JUN23	mg/L	0.001	<0.001	2	20	98	90	110	108	70	130
Aluminum (0.2µm)	EMS0259-JUN23	mg/L	0.001	<0.001	2	20	98	90	110	108	70	130
Arsenic (total)	EMS0259-JUN23	mg/L	0.0002	<0.0002	3	20	104	90	110	104	70	130
Beryllium (total)	EMS0259-JUN23	mg/L	0.000007	<0.000007	4	20	98	90	110	109	70	130
Cadmium (total)	EMS0259-JUN23	mg/L	0.000003	<0.000003	5	20	102	90	110	111	70	130
Cobalt (total)	EMS0259-JUN23	mg/L	0.000004	<0.000004	3	20	102	90	110	90	70	130
Chromium (total)	EMS0259-JUN23	mg/L	0.00008	0.003989	1	20	102	90	110	82	70	130
Copper (total)	EMS0259-JUN23	mg/L	0.0002	<0.0002	1	20	103	90	110	107	70	130
Iron (total)	EMS0259-JUN23	mg/L	0.007	<0.007	2	20	105	90	110	95	70	130
Manganese (total)	EMS0259-JUN23	mg/L	0.00001	<0.00001	2	20	107	90	110	111	70	130
Molybdenum (total)	EMS0259-JUN23	mg/L	0.00004	<0.00004	2	20	104	90	110	103	70	130
Nickel (total)	EMS0259-JUN23	mg/L	0.0001	<0.0001	5	20	105	90	110	88	70	130
Lead (total)	EMS0259-JUN23	mg/L	0.00009	<0.00009	1	20	101	90	110	106	70	130
Phosphorus (total)	EMS0259-JUN23	mg/L	0.003	<0.003	3	20	103	90	110	NV	70	130
Antimony (total)	EMS0259-JUN23	mg/L	0.0009	<0.0009	ND	20	109	90	110	77	70	130
Tin (total)	EMS0259-JUN23	mg/L	0.00006	<0.00006	8	20	100	90	110	NV	70	130
Titanium (total)	EMS0259-JUN23	mg/L	0.00007	<0.00005	13	20	105	90	110	NV	70	130
Zinc (total)	EMS0259-JUN23	mg/L	0.002	<0.002	1	20	100	90	110	94	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	BAC9467-JUN23	cfu/100mL	-	ACCEPTED	ACCEPTED							

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-IENVIGC-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)	GCM0453-JUN23	mg/L	2	<2	NSS	20	106	75	125			

QC SUMMARY

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-IENVIGC-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)	GCM0453-JUN23	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0453-JUN23	mg/L	4	< 4	NSS	20	NA	70	130			

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	EWL0668-JUN23	No unit	0.05	NA	1		100			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	SKA0288-JUN23	mg/L	0.002	<0.002	ND	10	98	80	120	100	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
Naphthalene	GCM0025-JUL23	mg/L	0.0005		ND	30				88	50	140

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	EWL0737-JUN23	mg/L	2	< 2	7	10	101	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	SKA0294-JUN23	as N mg/L	0.5	<0.5	2	10	102	90	110	102	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENVIGC-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
1,4-Dichlorobenzene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	96	60	130	93	50	140
Benzene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	100	60	130	100	50	140
Chloroform	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	98	60	130	97	50	140
Ethylbenzene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	100	60	130	100	50	140
Methylene Chloride	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	100	60	130	98	50	140
Tetrachloroethylene (perchloroethylene)	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	98	60	130	97	50	140
Toluene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	100	60	130	99	50	140
Trichloroethylene	GCM0060-JUL23	mg/L	0.0005	<0.0005	ND	30	99	60	130	96	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

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Laboratory Information Section - Lab use only

Received By: Sukhpreet Kaur
Received Date: 06/27/2023 (mm/dd/yy)
Received Time: 14:15 (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): 9°C x 3
LAB LIMS #: CA 40311-Jun23

REPORT INFORMATION	INVOICE INFORMATION
Company: DS Consultants	☐ (same as Report Information)
Contact: Meysam Jaffari	Company: Accounting
Address: 6221 Hwy 7, Unit 16, Vaughan, ON	Contact:
Phone: 204-951-8164	Address:
Fax:	Phone:
Email: meysam.jaffari@dsconsultants.ca	Email:

Quotation #:
Project #: 23-012-101
P.O. #:
Site Location/ID: 3056 Neyagawa Blvd & 1013 1039 Dundas St West Oakville, ON

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

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park ☐ Soil Texture:
☐ Table 2 ☐ Ind/Com ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ Medium/Fine
☐ 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: Halton

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,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 (please specify)	Other (please specify)	Other (please specify)	Other (please specify)	Sewer Use: Halton storm Sanitary	Water Characterization Pkg Specify pkg: General ☐ Extended ☐	SPLP Specify tests	TCLP Specify tests	COMMENTS:
1 BH23-6	27/June/2023	AM	16	GW	N																✓				Non filtered
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Ken Kim Signature: Date: 06/27/23 (mm/dd/yy) 06/27/2023
Relinquished by (NAME): Ken Kim Signature: Date: 06/27/23 (mm/dd/yy) 06/27/2023

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.6
Date of Issue: 02 May 2022

Appendix D: MECP Water Wells Records

Preliminary Hydrogeological Investigation- 3056 Neyagawa Boulevard, Oakville, ON												
TOWNSHIP C	**UTM**	**E**	**N**	**DATE CNTR**	**CASING**	**WATER**	**PUMP TEST**	**WELL USE**	**SCREEN**	**WELL**	**1**	**FORMATION**
OAKVILLE TOWN	17 W	601668	4813624	2017-11 6607	2			TH MO	0003 5	7304719	(Z255619) A241224	BRWN LOAM 0001 BRWN SILT TILL SHLE 0008
OAKVILLE TOWN	17 W	601667	4813624	2017-11 6607	2			TH MO	0010 10	7304718	(Z255618) A232587	BRWN LOAM 0001 BRWN SILT TILL DRY 0007 BRWN SHLE 0020
OAKVILLE TOWN	17 W	601393	4813368	2007-11 7241						7127343	() A	
OAKVILLE TOWN	17 W	601351	4813447	2007-12 7230	1.97	UK 0010		NU	0011 6	7103430	(Z70162) A054855	BRWN LOAM LOOS 0001 BRWN CLAY SILT DNSE 0013 RED SHLE DNSE 0016
OAKVILLE TOWN	17 W	601537	4813061	2020-03 6988						7366602	(C49166) A276677 P	
OAKVILLE TOWN 01 020	17 W	601605	4813392	2005-02 1663	2.6		10///:	NU		2810323	(Z23996) A	27
OAKVILLE TOWN 01 021	17 W	601379	4813294	2010-07 7407	6			DO		7149996	(Z115148) A100856	
OAKVILLE TOWN DS N 01 020	17 W	601549	4813347	1955-08 2415	6 6	FR 0021	5/15/5/:	DO		2802138	()	LOAM CLAY 0008 RED SHLE 0025
OAKVILLE TOWN DS N 01 020	17 W	601375	4813523	1978-05 1458	6	FR 0065	5/80/4/1:0	DO		2805340	()	LOAM 0002 RED CLAY 0020 RED SHLE 0086
OAKVILLE TOWN DS N 01 020	17 W	601509	4813684	2009-10 7219				NU		7132235	(Z098408) A085717 A	
OAKVILLE TOWN DS N 01 020	17 W	601417	4813542	2009-10 7219	36		10///:	NU		7132236	(Z098407) A085725 A	0012 0013 0014
OAKVILLE TOWN DS N 01 020	17 W	601477	4813381	2009-08 3030						7133262	(Z104591) A	---- 0032
OAKVILLE TOWN DS N 01 020	17 W	601334	4813473	2010-03 3030						7143458	(Z112011) A	FILL 0007 0009 0063
OAKVILLE TOWN DS N 01 021	17 W	601494	4813205	1974-09 1660	6 6	FR 0030	12/30/4/1:0	DO		2804667	()	BRWN CLAY LOAM 0009 RED SHLE 0040
OAKVILLE TOWN DS N 01 021	17 W	601366	4813060	2022-01 7472	2		///:	MO	0008 10	7413419	(RTAFHK2L) A341695	GREY CLAY SILT PCKD 0008 GREY SHLE HARD 0018
OAKVILLE TOWN DS N 01 021	17 W	601395	4813227	2022-01 7472	2		///:	MO	0009 10	7413418	(YO8OM2BY) A341687	GREY CLAY SILT PCKD 0008 GREY SHLE HARD 0019
OAKVILLE TOWN DS N 01 021	17 W	601324	4813289	2022-01 7472	2		///:	MO	0013 10	7413422	(SFLTM6DL) A341663	GREY CLAY SILT PCKD 0008 GREY SHLE HARD 0023
OAKVILLE TOWN DS N 01 021	17 W	601237	4813167	2022-01 7472	2		///:	MO	0008 10	7413420	(HSJPOVCT) A341693	GREY CLAY SILT PCKD 0008 GREY SHLE HARD 0018

OAKVILLE TOWN DS N 01 021	17 W	601316	4813187	2022-01 7472	2		///:	MO	0005 5	7413421	(G3J5BEBB) A334377	GREY CLAY SILT PCKD 0008 GREY SHLE HARD 0010
OAKVILLE TOWN DS N 01 021	17 W	601375	4813123	1981-12 2803	6	FR 0012	7/50/6/2:0	DO		2805811	()	LOAM 0003 BRWN CLAY 0005 RED SHLE 0053
OAKVILLE TOWN DS N 01 021	17 W	601355	4813223	1981-12 2803	6	FR 0018	6/35/15/1:0	DO		2805810	()	LOAM 0003 BRWN CLAY 0006 RED SHLE 0045
OAKVILLE TOWN DS N 01 023	17 W	600737	4812722	1955-08 1642	6 6	FR 0065	12///:	PS		2802147	()	CLAY 0018 RED SHLE 0067
OAKVILLE TOWN DS N 01 023	17 W	601025	4812663	1970-02 3903	2 1	FR 0017	12/39/21/0:4	NU	0046 2	2803413	()	BRWN CLAY STNS 0002 RED CLAY 0012 RED SHLE 0050
OAKVILLE TOWN DS N 01 023	17 W	600725	4812733	1971-07 4602	6	MN 0023	7/18/15/1:0	DO		2803657	()	RED CLAY 0005 RED SHLE 0023
OAKVILLE TOWN DS N 01 023	17 W	601033	4812653	1971-08 9999	2 1		17///:	NU	0048 2	2803730	()	BRWN CLAY STNS 0002 RED CLAY 0010 RED SHLE 0051
OAKVILLE TOWN DS S 01 020	17 W	601605	4813170	2021-05 7282	2		///:	MO	0005 10	7393668	(M7LF9ZQU) A326943	BRWN CLAY 0005 RED SILT CLAY TILL 0007 WHIT ROCK WTHD 0015
OAKVILLE TOWN DS S 01 020	17 W	601764	4813130	2021-05 7282	2		///:	MO	0002 5	7393669	(MQPGZ9OX) A326944	BRWN CLAY 0005 RED SILT CLAY TILL 0006
OAKVILLE TOWN DS S 01 020	17 W	601766	4813134	2021-05 7282	2		///:	MO	0040 10	7393666	(QR3JJDTW) A326941	BRWN CLAY 0005 RED SILT CLAY TILL 0007 WHIT ROCK WTHD 0050
OAKVILLE TOWN DS S 01 020	17 W	601665	4813322	2021-05 7282	2		///:	MO	0003 5	7393670	(DUVN8MND) A326945	BRWN CLAY 0005 RED SILT CLAY TILL 0007 WHIT ROCK WTHD 0008
OAKVILLE TOWN DS S 01 020	17 W	601616	4813226	2021-05 7282	2		///:	MO	0004 5	7393667	(FRIVK9QE) A326942	BRWN CLAY 0005 RED SILT CLAY TILL 0007 WHIT ROCK WTHD 0010
OAKVILLE TOWN DS S 01 021	17 W	601349	4812922	1965-11 1307	30	FR 0015	5//10/:	IR		2802313	()	BRWN LOAM 0002 RED SHLE 0015