September 16, 2022 Report No. 210189-H1

11861808 CANADA CORPORATION
1060 Salk Road, Unit 1
Pickering, Ontario
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Attention: Mr. Nadeem Munir

HYDROGEOLOGICAL INVESTIGATION
PROPOSED RESIDENTIAL SUBDIVISION
1942 WOODVIEW AVENUE, PICKERING, ONTARIO

Prepared for:

11861808 CANADA CORPORATION

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1.0 INTRODUCTION

Canada Engineering Services Inc., (CESI) was authorized by Mr. Nadeem Munir, of 11861808 Canada Corporation, to carry out a Hydrogeological Assessment for the proposed residential subdivision at 1942 Woodview Avenue, Pickering, Ontario. Architectural drawings of proposed residential buildings are illustrated in Appendix A. CESI carried out a geotechnical investigation (Report Number 210189-G1, dated September 16, 2022), concurrently with this hydrogeological investigation. CESI also concurrently carried out a Phase I ESA (Report Number 210189-E1), dated September 16, 2022) for the same site. Data presented in these reports were combined with borehole data and well installation data obtained from the boreholes recently put down at the site. These reports provided the basic resources used in carrying out this assessment.

1.1 Scope of Work

1. The geological history of the site, the hydrogeological setting of the site and surroundings, and the watershed of the site.

2. Soil profile, bedrock below the site, water table levels and flow characteristics, including water flow directions and hydraulic gradients at the site.

3. Researches of water well records, of wells actively in use and that could be affected by de-watering at the site.

4. Site topography and surficial drainage.

5. The use of installed wells to conduct in-situ conductivity tests.

6. Estimation of temporary de-watering volumes and impact on surrounding properties and buildings.

7. Estimate the long term de-watering volumes from the installed Private Water Drainage System anticipated from the proposed structure and the potential impact to neighbouring structures.

8. Assess whether the volume of water to be extracted and discharged meets or exceeds the permitted volume by the Ministry of Environment, Conservation and Parks (MECP) and the Region of Durham Bylaws respectively. Carry out and prepare the hydrogeology review in accordance with the following regulations:

1. The Ontario Water Resources Act;

2. Ontario Regulation 347/04;

3. The Region of Durham Bylaw No. 55-2013

10. Establish the nearest surface water bodies, such as a river, a creek, or a lake present around the subject site and their approximate distance from the site.

11. Present the findings in the hydrogeological report.

1.2 Project Data

The proposed development is to consist of twenty one townhouses with service roads and open spaces. The total area of the site is approximately 4.9 acres. Based on the soils report, the proposed building can be founded on strip and spread footings on native silty and or the sandy silt till.

The ground elevation is referenced to the Topographic Plan of Survey by Omari B. Mwinyi, dated September 22, 2021. The ground elevation ranges from 132.91 masl to 135.05 masl with average elevation 133.50 masl. The proposed construction consists of twenty-one townhouses and with an accompanying service road. At this time the townhouses are expected to have one level of basements with finished floor level 1.8 m below ground level. Assuming 300 mm footing, the lowest level of excavation will be 2.1 m below ground level, or at elevation 131.40 masl.

The highest groundwater level obtained from the monitoring wells installed at the site was at 1.89 mbgl in Borehole Number 2, or at elevation 132.61 masl. Hence, the highest level of groundwater level at the site is 1.21 m above the lowest level of excavation. Adding another 0.5 m of additional de-watering to prevent base heave of excavation, the groundwater will have to be temporarily lowered to 130.90 masl and required drawdown will be 132.61 - 130.90 = 1.71 m.

If the townhouses are to be built above grade, without any basement level, then the footings will have to be minimum 1.2 m below the grade to prevent frost damage. Hence, the lowest level of excavation will be at elevation 132.3 masl which is 0.31 m's below the highest level of groundwater at site. Adding another 0.5 m de-watering to prevent base heave of the excavation floor, the groundwater will have to be temporarily lowered to elevation 131.8 masl and required drawdown will be 132.61 - 131.8 = 0.81 m.

The highest level of water observed at site is above the footing level of proposed townhouses basement, permanent de-watering will required at this site. In case of no basement, the water level is 0.89 m below average ground elevation and no permanent de-watering will be required. However, temporary de-watering will be required.

1.3 Site Description

The site is located at 1492 Woodview Avenue, Pickering, Ontario, in a rural residential area and comprises of an area of 4.9 acres of which 3.0 acres will be built on. It is bounded by Woodview Avenue on the east side, residential lots on the north side and vacant forested lands on the south and west side. Further east beyond Woodview Avenue is forested area and further north beyond the residential lots is a new residential subdivision under construction. The site and surrounding areas are shown on Drawing Number 1 in Appendix B.

1.4 Property Ownership

Canada Engineering Services Inc., was authorized by Mr. Nadeem Munir of 11861808 Canada Corporation, the owner of the property located at 1942 Woodview Avenue, Pickering Ontario to carry out this hydrogeological study. The agent representing the owner is Mr. Amer Nasir and his contact information is as follows:

Mr. Amer Nisar
11861808 Canada Corporation
1060 Salk Road, Unit 1,
Pickering, Ontario L1W 3C5
Ph : (416) 890-9811
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1.5 List of Reports Reviewed

1. Canada Engineering Services Inc., Report (Report Number 210189-G1) titled: Geotechnical Investigation, Proposed Residential Subdivision, 1942 Woodview Avenue, Pickering, Ontario, prepared for 11861808 Canada Corporation, dated September 9, 2022.

2. Canada Engineering Services Inc. Report (Report Number 210189-E1) titled: Phase One Environmental Site Assessment, Existing Residential Property, 1942 Woodview Avenue, Pickering, Ontario, prepared for 11861808 Canada Corporation, dated September 16, 2022.

2.0 HYDROGEOLOGICAL DATA

2.1 Physical Setting

As published by the Ontario Geological Survey, OGS Earth, the site area lies in the physiographic region of the Iroquois Plain. When the ice jam from the last glacial period in southern Ontario, about 12,500 years ago blocked the St. Lawrence Valley, the backup of water created a lake larger than the present day Lake Ontario, called Lake Iroquois (Archaeological Services Inc. Et al., 1994). When this ice jam melted away, the lacustrine and sandy deposits left by former Lake Iroquois created the Iroquois Plain, about 11,500 years ago (Archaeological Services Inc. Et al., 1994). The sediments in this plain range from coarse gravels, medium to fine sands and silts. The physiographic landforms of the site, as published by the Ontario Geological Survey, OGS Earth, consists of Sand Plains (Unit 11).

The physiographic regions and landforms of site and surrounding area are shown in Drawing Number 3 and 4 in Appendix B.

2.2 Water Bodies, Aquifers, Aquitards and Areas of Natural Significance

The site lies in the Petticoat Creek Watershed with wetlands and forested area around the site. The petticoat creek flows from north to south at about 500 m east from the site. Amos Pond is a pond at about 475 m north from the site across Finch Avenue. The Rouge National Urban Park is at about 1250 m west and the Rouge River is at about 1700 m west from the site which flows from north to south into Lake Ontario. Lake Ontario is at approximately 4.7 km southeast from the site. The general surface water flow direction in the site area is from north to south into Lake Ontario. The surface drainage of the site and surrounding areas are shown in Drawing Number 5 in Appendix B. Only one aquifer was found at the site within our drill depths.

Groundwater was encountered in all boreholes while drilling at average depth of 2.0 m, except in Borehole Number 1, where it was encountered at 4.8 m. The latest water level readings taken on August 08, 2022 were 2.79 m, 1.67 m, 2.38 m, 1.6 m below ground level in Borehole Number 2, 4, 7 and 8 respectively.

2.3 Topography and Ground Water Flow Direction

The general topography of the site is relatively flat and it slopes gently towards the east. The surface elevation of the site, as obtained from the Topographic Survey Plan by Omari B. Mwinyi, dated September 22, 2021, ranges from 132.7 masl to 134.5 masl with average elevation of 133.5 masl. The Topographic Survey Plan of the site is shown in Appendix B.

As observed from the monitoring wells installed in Borehole Numbers 2, 4, 7 and 8, the general groundwater flow direction is towards the east.

2.4 Geology of Site and Surrounding Area

As published by the Ontario Geological Survey, OGS Earth, the site area lies in the physiographic region of Iroquois Plain. When the ice jam from the last glacial period in southern Ontario, about 12,500 years ago blocked the St. Lawrence Valley, the backup of water created a lake larger than the present day Lake Ontario, called Lake Iroquois (Archaeological Services Inc. Et al., 1994). When this ice jam melted away, the lacustrine and sandy deposits left by former Lake Iroquois created the Iroquois Plain, about 11,500 years ago (Archaeological Services Inc. Et al., 1994). The sediments in this plain range from coarse gravels, medium to fine sands and silts. The physiographic landforms of the site, as published by the Ontario Geological Survey, OGS Earth, consists of Sand Plains (Unit 11).

The physiographic regions and landforms of site and surrounding area are shown in Drawing Number 4 and 5 in Appendix B.

As published by the Ontario Geological Survey, OGS Earth, the bedrock of the site area consists of Georgian Bay Formation; Blue Mountain Formation; Billings Formation; Collingwood Member; Eastview Member. This formation has wide extent over most part of the Greater Toronto Area covering City of Toronto, Vaughan, Stouffville, Uxbridge, all the way to Bowmanville in the east and a narrow strip on west side extending north all the way up to Georgian Bay. The lithology of this unit consists of Limestone, shale, dolostone (Ontario Geological Survey 2011. 1:250 000 scale Bedrock Geology of Ontario; Ontario Geological Survey, Miscellaneous Release - Data 126 - Revision 1).

The Quaternary geology of the site area, as published by the Ontario Geological Survey, belongs to the Unit Halton Till (17). The surficial geological unit is 5b - Stone poor, carbonate-derived silty to sandy till (Ontario Geological Survey 2010.

Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128-REV).

The geological maps of the site and surrounding area are shown in Drawing Numbers 6 and 7 in Appendix B.

2.5 Site Specific Geology

From the borehole investigation conducted by CESI, the stratigraphy of the site consists of following layers from top to bottom:

Topsoil
Silty Sand
Sandy Silt Till
Sand

The detail soil description are shown in Borehole Log Nos. 1-8 in Appendix B.

3.0 GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

The field work for the boreholes was carried out with a track-mounted drill rig with continuous flight solid stem auger equipment on October 14 and 18, 2021. The field work was supervised by an engineer from our office. A total of eight boreholes were put down at the site to depths of 5.0 m, 6.6 m, 5.0 m, 6.6 m, 5.0 m, 5.0 m, 6.6 m and 6.6 m in Borehole Numbers 1 to 8 respectively.

From the boreholes, soil samples were taken at 500 mm intervals between ground surface and a depth of 3.0 m and thereafter at 1.5 m intervals to the termination of the boreholes. The samples were taken by means of a split-spoon sampler, in accordance with the requirements of the Standard Penetration Test, (CSA test specifications A119.1).

Where practical, field penetrometer readings were taken on the samples from the boreholes to determine the different bearing values of the soils encountered. These are plotted on the borehole logs in the soil description column, in kPa.

Monitoring wells were installed in Borehole Numbers 2, 4, 7 and 8 for future water level readings.

All the samples taken were brought back to our laboratory where moisture content tests, grain size analyses and further visual observations were carried out. Our field and laboratory

findings are plotted on the Borehole Log Numbers 1 to 8. Grain size graphs are shown on Figure Number 1.

The locations of the boreholes and monitoring wells were established by staff from Canada Engineering Services Inc., and are shown on Drawing Number 2 in Appendix B. The ground surface elevation of each borehole was taken off the Topographic Survey Plan by Omari B. Mwinyi, dated September 22, 2022.

The site location, the borehole locations, the borehole logs, the grain size analysis graphs and the geotechnical terms and symbols used in this report are shown in Appendix "B".

3.1 Soil Descriptions

The soils found in the boreholes at this site were as described below:

3.1.1 Topsoil

A layer of topsoil was encountered at the surfaces of all the boreholes. This layer consisted of a dark grey to black silty sand, some organics. It was moist and in a loose state and varied in thickness from 150 mm to 750 mm thick.

3.1.2 Silty Sand

Below the topsoil layer in all the boreholes was a layer of sandy silt fill with trace clay and gravel. This layer was grey in colour, was moist and in a compact state. It extended down to depths of 2.4 m, 2.6 m, 0.9 m, 3.0 m, 2.3 m, 2.4 m, 4.5 m and 2.1 m in Borehole Numbers 1, 2, 3, 4, 5, 6, 7 and 8 respectively.

3.1.3 Sandy Silt Till

Below the silty sand layer was a layer of native sandy silt till, trace gravel in all boreholes except in Borehole Number 3. Occasional sand seams were found in this layer. This layer was grey in colour, was wet and in a loose to dense state. It extended down to depths of 5.0 m, 4.5 m, 4.2 m, 4.4 m, 5.0 m, 6.5 m and 4.2 m in Borehole Numbers 1, 2, 4, 5, 6, 7 and 8 respectively. Borehole Numbers 1, 6 and 7 were terminated in this layer.

3.1.4 Sand

A layer of grey sand was found at the bottom of four boreholes, immediately below the sandy silt till layer in Borehole Numbers 2, 4, 5 and 8, and below the silty sand layer in Borehole Number 3. This layer was wet and in a loose to dense state.

4.0 GROUNDWATER

Groundwater was encountered in all the boreholes upon completion at depths of 4.8 m, 2.1 m, 2.0 m, 2.1 m, 2.3 m, 1.5 m, 2.2 m and 1.5 m in Borehole Numbers 1 to 8 respectively. Four monitoring wells were installed in Borehole Numbers 2, 4, 7 and 8 and water level readings were taken on February 01, August 8 and 23, 2022. The highest recorded water level was at 1.89 m depth or at elevation 132.61 m, in Borehole Number 2,

Water is expected to be a major concern at this site. Temporary and permanent de-watering will be required to lower the groundwater level, both during and after and after construction.

4.1 Monitoring Well Installation Data

Monitoring wells were installed at the bottom of Borehole Numbers 2, 4, 7 and 8 and consisted of a 3.1 m screen at the bottom of the well with a 50-mm internal diameter. The screens were connected to PVC pipes also with internal diameters of 50 mm. The wells were backfilled with sand up to a depth of 3.6 m above the base of the screens and thereafter, were filled with bentonite pellets. The wells were raised well above ground level and protective metal casings with locks were installed, which could be opened and closed for future water level readings.

The locations of the wells are shown on Drawing Number 2, and their surface elevations are shown in Table Number 2. The elevations were referenced to the Topographic Plan of Survey by Omari B. Mwinyi, dated September 22, 2021.

Borehole Log Numbers 2, 4, 7 and 8 with monitoring wells are shown in Appendix B. Well identities, their dates of installations, their surface elevations, their depths, their base elevations, the lengths of their screens and the lengths of the sand backfill from the bases of the screens to just above the tops of the screens are shown in Table Number 2 below:

Table Number 2

Borehole ID	Date of Installation	Surface Elevation (masl)	Depth of Borehole (m)	Elevation of Base of Well (masl)	Length of Well Screen (m)	Length of Sand Backfill (m)
BH 2	Oct. 14, 2021	134.5	6.6	129.17	3.1	3.6
BH 4	Oct. 18, 2021	133.4	6.6	127.92	3.1	3.6
BH 7	Oct. 14, 2021	133.9	6.6	127.96	3.1	3.6
BH 8	Oct. 18, 2021	132.85	6.6	126.76	3.1	3.6

4.2 Dates of Water Level Reading, Depths and Elevations

Water level readings were taken on the following dates and their depths and elevations are recorded in Table Number 3 below.

Table Number 3

Borehole ID	Date of reading	Depth of Water Level (m)	Elevation of Water Level Reading (masl)	Remarks
BH 2	Oct. 14, 2021	2.1	132.4	Upon Completion
BH 4	Oct. 18, 2021	2.1	131.3	Upon Completion
BH 7	Oct. 14, 2021	2.2	131.7	Upon Completion
BH 8	Oct. 18, 2021	1.5	131.35	Upon Completion
BH 2	February 1, 2022	1.89	132.61	**Highest Water Level**
BH 4	February 1, 2022	1.2	132.2	
BH 7	February 1, 2022	1.78	132.12	
BH 8	February 1, 2022	0.98	131.87	
BH 2	August 8, 2022	2.79	131.71	
BH 4	August 8, 2022	1.67	131.73	High Water Level

BH 7	August 8, 2022	2.38	131.52	
BH 8	August 8, 2022	1.6	131.25	
BH 2	August 23, 2022	2.89	131.61	
BH 4	August 23, 2022	1.78	131.62	High Water Level
BH 7	August 23, 2022	2.51	131.39	
BH 8	August 23, 2022	1.69	131.16	

4.3 Ground Water Sampling

One groundwater sample was collected using a new dedicated low density polyethylene bailer and a new pair of nitrile powder-free gloves was worn during the sampling operations. The samples were placed in labeled coloured jars and vials of various sizes that were supplied by the laboratory and stored within individual bubble wrap bags in a cooler filled with ice packs to maintain a temperature of approximately 4°C. The samples were transported and temporarily stored in our laboratory and then submitted to Eurofin Laboratories in Ottawa, Ontario, within 7 days of collection. They were kept in a cooler or refrigerator, prior to shipment to the laboratory.

Due diligence was exercised in observing all technical procedures in putting down monitoring wells and sealing them so that there is no future cross-contamination or surface contamination, while following the Ontario Water Resources Act. When taking water from the ground or discharging to sewers, Ontario Regulation 387/04 should be followed.

4.4 Ground Water Testing

The water sample was tested at Eurofin Laboratories against the Durham Region sanitary sewers and storm sewers Bylaw criteria. Eurofin Laboratories is a Canadian Association for Laboratory Accreditation (CALA) Accredited Laboratory in accordance with ISO/IEC 17025:2020 - "General Requirements for the Competence of Testing and Calibration Laboratories" for analysis of all parameters for the Durham Region Storm and Sanitary Sewer Bylaw testing of water. The results indicated that the Total Suspended Solids (TSS) had exceedance (observed 1020 mg/L against 350 mg/L permitted) for sanitary sewers. For the storm sewer, the

results indicated exceedances of Total Suspended Solids (observed 391 mg/L against 15 mg/L permitted), Manganese (observed 0.30 mg/L against 0.15 mg/L permitted) and Total Kjeldahl Nitrogen (observed 1.24 mg/L against 1gm/L permitted). The groundwater will have to be treated for exceeding parameters before discharging into the municipal sewers.

See Eurofin Test results in Appendix "D".

4.5 Surrounding Well Records

The Ministry of Environment, Ontario Well Record Database was searched for well information around the site. A total of 10 well records were found within 250 m of the site. The Borehole ID, Well ID, Completion date, and depth of the wells are shown in Table Number 4 below.

Table Number 4

Borehole ID	Well ID	Completed On	Depth	Static Water Level
10292615	4601246	30-May-1966	2.7	0.6
10295167	4603817	22-Aug-1968	4.3	1.8
11692180	1918488	09-Nov-2006	5.0	
11765008	7042514	16-Mar-2007		
23045981	7045981	17-May-2007		
1005913045	7259819	17-Aug-2015	6.1	
1005932216	7261537	18-Feb-2016		0.9
1007183151	7314868	04-Jun-2018		
1007183154	7314869	04-Jun-2018		
1007183157	7314870	04-Jun-2018		

None of these wells are used as drinking water supply well.

5.0 DE-WATERING ANALYSIS

5.1 De-watering Assessment

The highest stable water level found from the monitoring wells installed at the site was at 1.89 mbgl or at elevation 132.61 masl in Borehole Number 2. If the proposed townhouses are to have one level of basement, then the finished floor level of the

basement is assumed to be 1.8 m below the ground level. Assuming the footings will be another 300 mm below the floor level of the basement, the lowest level of excavation for this site will be at 2.1 mbgl or at elevation 131.40 masl. Adding another 0.5 meter de-watering to prevent the base heave of the excavated floor due to groundwater, the water will have to be lowered to elevation 130.90 masl during construction. The drawdown required will be 1.71 m. After construction, the groundwater level will have to permanently lowered to the elevation of footings at 131.40 masl, and required drawdown will be 1.21 m.

If the proposed townhouses are build without basement levels, then the footings will need to be at least 1.2 mbgl to prevent frost damage which is the lowest level of excavation expected, around elevation 132.30 masl. This is 0.31 m above the elevation of highest level of water observed in the monitoring wells installed at the site. Assuming another 0.5 de-watering required to prevent the base heave of the excavation floor, the groundwater will have to be temporarily lowered to 131.80 masl and the drawdown required will be 0.81 m. No permanent de-watering will be required if the proposed townhouses are to be without basement levels.

5.2 Determination of Hydraulic Conductivity

Rising head Slug tests were carried out in each of the monitoring wells and the results of the log of the drops of water levels were plotted against time for each of these wells using the Hvorslev, (1951) Method. The results are shown in Appendix C. Using T_0 obtained from the slug test results, the hydraulic conductivities were calculated using the relationship developed by Hvorslev (1951). The hydraulic conductivity was obtained for each of the wells tested and was found to be as follows:

Borehole / Monitoring Well Number 2 - 3.18 E-07
Borehole / Monitoring Well Number 4 - 1.58 E-07
Borehole / Monitoring Well Number 7 - 1.82 E-07
Borehole / Monitoring Well Number 8 - 1.28 E-06

The highest hydraulic conductivity was 1.28 E-06 in Borehole Number 2, which was used for de-watering calculations.

The slug test results are shown in Appendix C.

5.3 Radius of Influence

The Sichardt equation was used to calculate the maximum radius of influence of de-watering activity beyond the edge of excavation and it is give by the following formula.

$R_o = 3000(H-h)K^{1/2}$

Where (H-h) is the drawdown and K is the hydraulic conductivity of soil

Using this relation, the radius of influences from the edge of excavation for the whole site with and without basement levels were obtained as follows:

With one level of basement,
R_o = 5.80 m for temporary de-watering
R_o = 4.11 m for permanent de-watering

Without basement level,
R_o = 3.65 m for temporary de-watering

See calculation in Appendix C.

There are no structures, water wells or surface water bodies within the radius of influence around the proposed areas of the site that would have to be de-watered. As such, safe de-watering activity can be conducted with no adverse effect in the surrounding areas or structures.

5.4 Temporary and Permanent Volume of Water to be Taken from the Site.

Theoretically, the groundwater drawdown for a single well, and the volume of water to be extracted can be calculated from the following expressions:

$Q = 3.14K(H^2 - h_w^2)/Ln(R/r)$

$R_o = 3000\ (H-h_w)*K^{0.5}$

$r_s = ((a*b)/3.14)^{0.5}$ [when $a/b < 1.5$ and $R_o >> r_s$; $r = (a+b)/3.14^{0.5}$]

where:

Q is in (m^3/days) and is the rate of pumping extraction
K is (m/day) and is the hydraulic conductivity
H is in (m) and is depth from water table to depth of assumed impervious base
h_w is in (m) and is the depth of water table above an impervious base after drawdown
r is in (m) and is the equivalent radius of the site
R_o is in (m) and is the radius of influence from the edge of the excavation
R is in (m) and is the radius of influence from the center of site (R_o+r_s)
dH is in (m) is the maximum drawdown
a is in (m) and is the length of the excavation and
b is in (m) and is the width of the excavation

Using the above relations, the following values were obtained for temporary and permanent de-watering of the site for both options, with or without one level of basement.

Temporary De-watering

1) For temporary de-watering during construction for townhouses with basements:

Quantity of groundwater to be extracted = 16.18 m^3/day
Applying a Factor of Safety FS = 1.5,
Quantity of groundwater to be extracted = **24.27 m^3/day**

Considering 25mm peak rainfall intensity over the period of 24 hours,
additional quantity to be extracted = 48.61 m^3/day.

Total quantity to be extracted for
Temporary De-watering = Q = **72.87 m^3/day**

2) For temporary de-watering during construction for townhouses with slab on grade:

Quantity of groundwater to be extracted = 12.91 m^3/day
Factoring Factor of Safety FS = 1.5,
Quantity of groundwater to be extracted = **19.37 m^3/day**
Considering 25mm peak rainfall intensity over the period of 24 hours,
additional quantity to be extracted = 48.61 m^3/day.
Total quantity to be extracted for
Temporary De-watering = Q = **67.98 m^3/day**

As is evident from the volumes obtained above, there is not much more de-watering required if basements are used as in either case the actual volume of groundwater to be discharged to the city sewers is rather small, being **24.27 m^3/day** for houses with basements and **19.37 m^3/day** for houses built as slab on grade. The major component of de-watering is when there is rainfall which is 48.61 m^3/day.

Permanent De-watering

3) For permanent de-watering for townhouses with basements:

Quantity of groundwater to be extracted = 14.33 m^3/day
Factoring Factor of Safety FS = 1.5,
Quantity of groundwater to be extracted = **21.50 m^3/day**

4) For Permanent de-watering for townhouses on slab on grade

Quantity of groundwater to be extracted = 0 m^3/day

The details of de-watering calculations are shown in Appendix C.

Note: Permanent water discharge to the City of Pickering Sewers can be avoided by discharging water from sump pumps into the backyards of the townhouses and having the water recirculating from sump pump to backyard, then back into the soil and into the sump pump in a continuous circle.

5.5 Permit to Take Water

The Ministry of Environment, Conservation and Parks will require a permit to take water (PTTW) if the rate of extraction is between 50 m^3/day and 400 m^3/day. Since, the quantity of groundwater to be extracted from site during temporary de-watering is more than 50 m^3/day, in both cases, with or without one level of basement, a permit to take water will be required.

An Environmental Activity Sector Registration (EASR) may be required to discharge the water into the city sewers.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The geotechnical investigation and monitoring well installation indicated that the soil at the site is topsoil, underlain by a silty sand which in turn was underlain by a sandy silt till and this was underlain by a sand layer.

The highest groundwater level at the site was found to be at 1.89 mbgl or at elevation 132.61 masl in Borehole Number 2. If the proposed townhouses are to have one level of basement, the lowest level of excavation is expected to be 2.1 mbgl or at elevation 131.40 masl. The groundwater will have to be lowered to elevation 130.90 masl with required drawdown 1.71 m for temporary de-watering. The factored quantity of groundwater to be extracted during construction will be **24.27 m^3/day** without rainfall.

If the proposed townhouses are to be build without basement level, the groundwater will have to be temporarily lowered to elevation 131.80 masl with required drawdown 0.81 m. The factored quantity of groundwater to be extracted during construction will be **19.37 m^3/day** without rainfall.

As is evident from the volumes obtained above, there is not much more de-watering required if basements are used as in either case the actual volume of groundwater to be discharged to the city sewers is rather small, being **24.27 m^3/day** for houses with basements and **19.37 m^3/day** for houses built as slab on grade. The major component of de-watering is when there is rainfall which is 48.61 m^3/day. But rainfall is not expected to be a frequent occurrence.

Similarly, the factored volume of water to be discharged to the city sewers for houses with basements will be **21.50 m^3/day** and for houses without basements, it will be close to **0 m^3/day.**

The maximum radius of influence from temporary de-watering is 5.80 m and from permanent de-watering it is 4.11 m from the edge of the proposed excavation. Neither of these radii are excessive as there are no structures within these radii that would be affected. For permanent de-watering the discharge water from sump pumps can be as much as 7.5 m away from the rear of the townhouses if basements are used and this water can be re-circulated back into the ground, so that none need be discharged into the city sewers on a permanent basis.

The fact that the soils from the excavation for basements can be used to raise the whole site significantly above the water table and further reduce both temporary and permanent the de-watering is further supporting the use of basements.

The water sample tested against Durham Region Sewer Use Bylaw criteria showed exceedances of Total Suspended Solids (TSS) for storm sewer and of TSS, Manganese and Total Kjeldahl Nitrogen for storm sewer. The groundwater from the de-watering activity will have to be treated for these parameters before discharging into the city sewers.

A permit to take groundwater (PTTW) will be required from the MECP. An EASR may also be required.

The site is located in a rural residential area of City of Pickering which is serviced with a municipal water supply system and with storm and sanitary sewer systems. None of the wells around the site is used for drinking water purposes. Although the area lies next to a forested area and protected wetlands, there are no open water bodies or water supply wells within the radius of influence from the excavation and proposed de-watering site. As such, no adverse impact is expected to the surrounding area, aquifers, natural environment or water wells from proposed construction activity.

7.0 REFERENCES

Ontario Ministry of Northern Development and Mines, Mines and Minerals Division, Ontario Geology Survey, Bedrock Geology of Southern Ontario via OGSEarth, August 2012.

Ontario Ministry of Northern Development and Mines, Mines and Minerals Division, Ontario Geology Survey, Physiography of Southern Ontario via OGSEarth, August 2012.

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Drsicoll F.G., 1986, Groundwater and Wells, Second Edition, Johnson Filtration Systems Inc.

Ministry of Environment Records available through Freedom of Information

SooChan G., 2004, Central Lake Ontario Conservation Authority, Regional Groundwater Mapping Study, Groundwater Resource Inventory Paper, Technical Report

Canada Engineering Services Inc. Report (Report Number 210189-G1) titled: Geotechnical Investigation, Proposed Residential Subdivision, 1942 Woodview Avenue, Pickering, Ontario, prepared for 11861808 Canada Corporation, dated September 16, 2022.

Canada Engineering Services Inc. Report (Report Number 210189-E1) titled: Phase One Environmental Site Assessment, Existing Residential Property, 1942 Woodview Avenue, Pickering, Ontario, prepared for 11861808 Canada Corporation, dated September 16, 2022.

Google Earth 2022.

Google Maps 2022.

8.0 GENERAL COMMENTS

It is possible that the soil and water conditions between boreholes are quite different from those found at the borehole locations. Any interpretation of data for areas between boreholes should be viewed with this in mind. The accuracy of our report is limited to the findings at specific borehole locations.

The inspections and reviews of data described above were carried out based on the terms of reference as outlined earlier in this report. It was prepared specifically for the use of the owner and consultants of 11861808 Canada Corporation and their consultants.

In the course of carrying out this Hydrogeological Assessment, the possibility of obtaining imprecise, partial or incorrect data cannot be totally eliminated but only reduced to an acceptable level. This report was prepared with due care and diligence, and is based on information gathered and professional judgement of the best information available at the time of the investigation.

The Consultant makes no warranty, either expressed or implied, as to the Consultant's findings, recommendations, plans, specifications, or professional advice. The Consultant has endeavored to perform its services in accordance with generally accepted standards of practice in effect at the time of performance.

The Client recognizes that neither the Consultant nor any of the Consultant's subconsultants or subcontractors owes any fiduciary responsibility to the Client.

The use of this report or any part of it by any third party, other than the client to whom it is addressed, 11861808 Canada Corporation, and consultants retained by 11861808 Canada Corporation, for reviewing this report is the responsibility of the third party. Canada Engineering Services Incorporated is not responsible for any damages or losses incurred by any other third party arising from the use of this report or for any decisions or actions by any other third party based on this report.

This report was prepared from limited data. Should there be any design or construction changes that would require a review of the hydrogeological analyses or any questions regarding the hydrogeological aspects of any codes, standards or regulations, then this office should be consulted. This may necessitate a supplementary investigation and report for our recommendations to be reliable.

We trust that this report meets your requirements. Please call the undersigned at 647 829 6151 if you have any questions.

Sincerely,
CANADA ENGINEERING SERVICES INC.

Mahesh Khanal, M. Sc.,
Project Manager

Ram Jagdat. P. Eng., QP.
Consulting Engineer.
Principal

email: ram@cesi.ca
cell: 647 829 6151

APPENDIX A

BUILDING DATA

P S A
312 - 3701 Chesswood Drive
Toronto, Ontario, M3J 2P6
T: (416) 849-0991 F: (416) 849-0992
psarchitect.ca
info@psarchitect.ca
PS ARCHITECT

SITE CONTEXT

1942 WOODVIEW AVE RESIDENTIAL

PROJ. ID: 21012

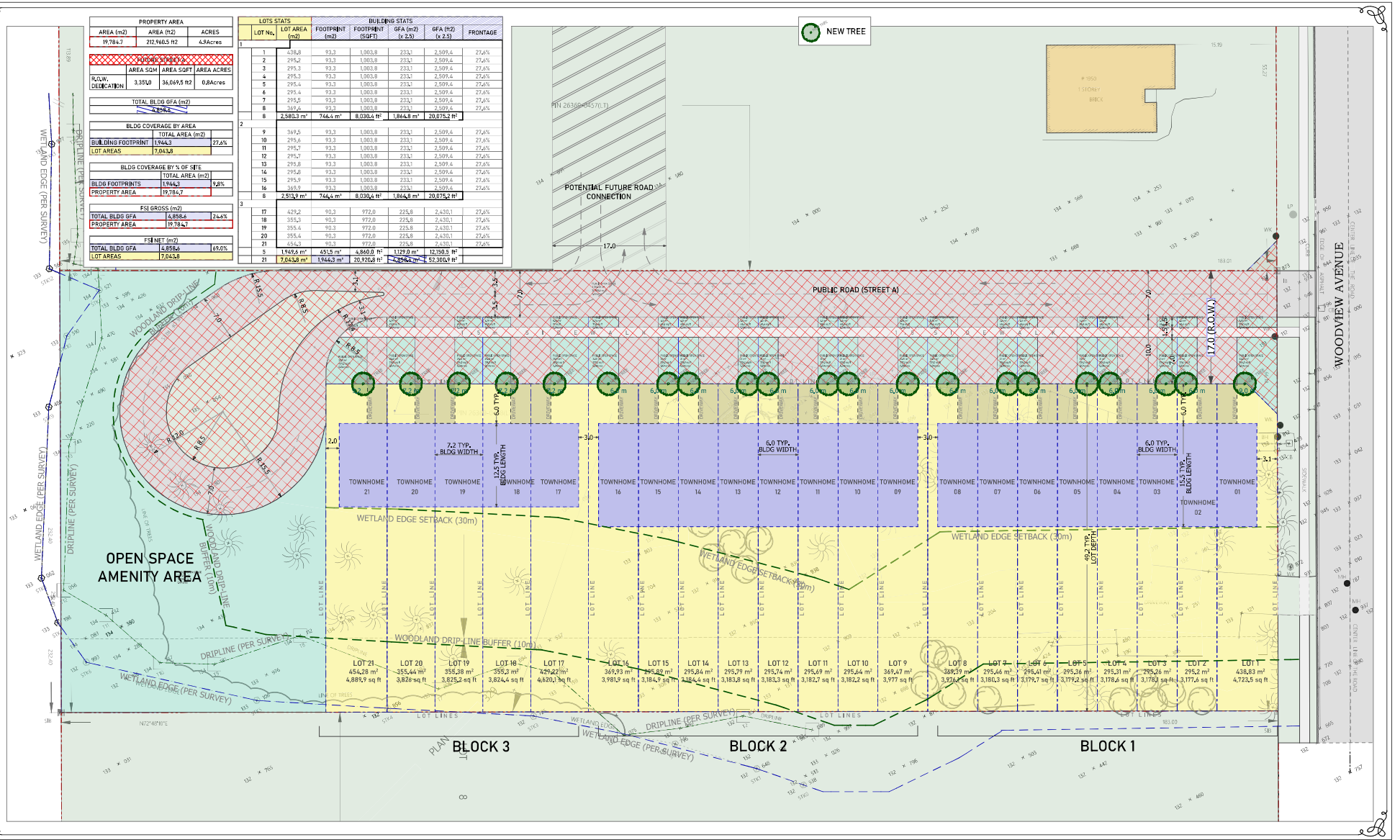
1942 WOODVIEW AVE
RESIDENTIAL

1942 WOODVIEW AVE PICKERING ONTARIO CANADA

SCALE: NTS

PLANNING VERSION: Ei

2022-07-20



PROPERTY AREA		
AREA (m2)	AREA (ft2)	ACRES
19,784.7	212,960.5 ft2	4.9Acres

PUBLIC ROAD AREA		
	AREA SQM	AREA SQFT	AREA ACRES
R.O.W. DEDICATION	3,351.0	36,069.5 ft2	0.8Acres

TOTAL BLDG GFA (m2)
4,858.6

BLDG COVERAGE BY AREA	TOTAL AREA (m2)	
BUILDING FOOTPRINT	1,944.3	27.6%
LOT AREAS	7,043.8	

BLDG COVERAGE BY % OF SITE	TOTAL AREA (m2)	
BLDG FOOTPRINTS	1,944.3	9.8%
PROPERTY AREA	19,784.7	

FSI GROSS (m2)		
TOTAL BLDG GFA	4,858.6	24.6%
PROPERTY AREA	19,784.7	

FSI NET (m2)		
TOTAL BLDG GFA	4,858.6	69.0%
LOT AREAS	7,043.8	

LOTS STATS		BUILDING STATS				
	LOT No.	LOT AREA (m2)	FOOTPRINT (m2)	FOOTPRINT (SQFT)	GFA (m2) (x 2.5)	GFA (ft2) (x 2.5)	FRONTAGE
1	1	438,8	93,3	1,003,8	233,1	2,509,4	27,6%
	2	295,2	93,3	1,003,8	233,1	2,509,4	27,6%
	3	295,3	93,3	1,003,8	233,1	2,509,4	27,6%
	4	295,3	93,3	1,003,8	233,1	2,509,4	27,6%
	5	295,4	93,3	1,003,8	233,1	2,509,4	27,6%
	6	295,4	93,3	1,003,8	233,1	2,509,4	27,6%
	7	295,5	93,3	1,003,8	233,1	2,509,4	27,6%
	8	369,4	93,3	1,003,8	233,1	2,509,4	27,6%
	8	2,580.3 m²	744.4 m²	8,030.4 ft²	1,864.8 m²	20,075.2 ft²	
2	9	369,5	93,3	1,003,8	233,1	2,509,4	27,6%
	10	295,6	93,3	1,003,8	233,1	2,509,4	27,6%
	11	295,7	93,3	1,003,8	233,1	2,509,4	27,6%
	12	295,7	93,3	1,003,8	233,1	2,509,4	27,6%
	13	295,8	93,3	1,003,8	233,1	2,509,4	27,6%
	14	295,8	93,3	1,003,8	233,1	2,509,4	27,6%
	15	295,9	93,3	1,003,8	233,1	2,509,4	27,6%
	16	369,9	93,3	1,003,8	233,1	2,509,4	27,6%
	8	2,513,9 m²	744.4 m²	8,030.4 ft²	1,864.8 m²	20,075.2 ft²	
3	17	429,2	90,3	972,0	225,8	2,430,1	27,6%
	18	355,3	90,3	972,0	225,8	2,430,1	27,6%
	19	355,4	90,3	972,0	225,8	2,430,1	27,6%
	20	355,4	90,3	972,0	225,8	2,430,1	27,6%
	21	454,3	90,3	972,0	225,8	2,430,1	27,6%
	5	1,949.4 m²	451.5 m²	4,860.0 ft²	1,129.0 m²	12,150.5 ft²	
	21	7,043.8 m²	1,944.3 m²	20,926.8 ft²	4,858.6 m²	52,300.9 ft²	

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PS ARCHITECT

PROPOSED SITE LAND USE PLAN

1942 WOODVIEW AVE RESIDENTIAL

PROJ. ID: 21012

N

1942 WOODVIEW AVE RESIDENTIAL

1942 WOODVIEW AVE PICKERING ONTARIO CANADA

SCALE: 1:250

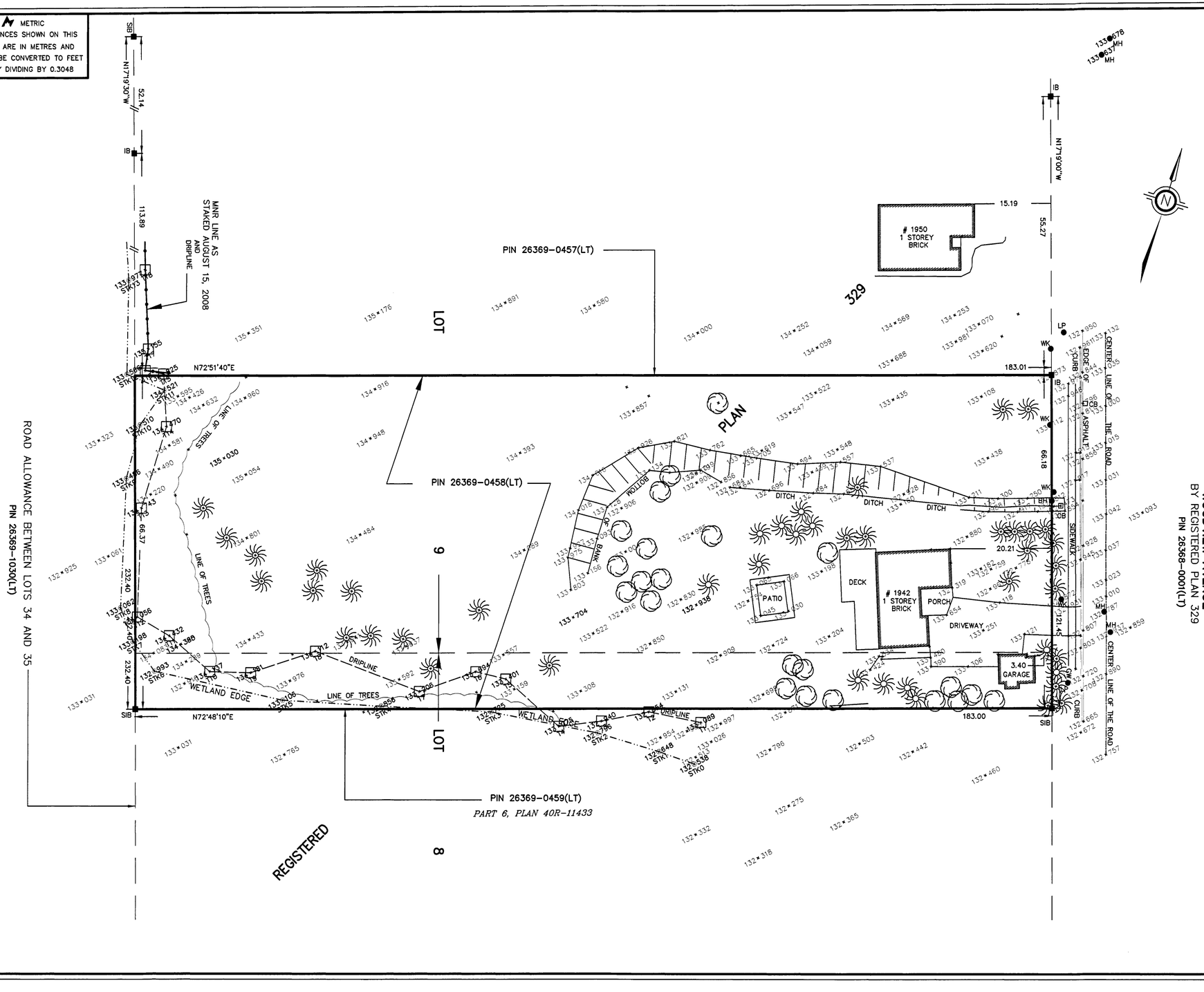
PLANNING VERSION: Ei

2022-07-20

APPENDIX B

PLAN OF SURVEY, KEYPLAN, BOREHOLE LOCATIONS, DRAINAGE MAP LOST RIVER, GEOLOGICAL MAPS BOREHOLE LOGS, GRAIN SIZE ANALYSIS

METRIC
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048



TOPOGRAPHICAL PLAN

PART OF LOTS 8 AND 9
REGISTERED PLAN 329
CITY OF PICKERING

REGIONAL MUNICIPALITY OF DURHAM

SCALE 1 : 500

0 2 4 6 8 10 20 30 Metres

LEGEND

■	DENOTES SURVEY MONUMENT FOUND
IB	DENOTES IRON BAR
SIB	DENOTES STANDARD IRON BAR
LP	DENOTES LAMP POST
MH	DENOTES MANHOLE
	DENOTES DECIDUOUS TREE
	DENOTES CONIFEROUS TREE
CB	DENOTES CATCH BASIN
WK	DENOTES WATER KEY
	DENOTES MNR LINE
	DENOTES WETLAND EDGE
	DENOTES DRIPLINE
GW	DENOTES GUY WIRE
BH	DENOTES BOREHOLE
N	DENOTES NORTH
E	DENOTES EAST
S	DENOTES SOUTH
W	DENOTES WEST

ELEVATIONS :

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE DERIVED FROM BENCH MARK NO. 1-089. BRASS TABLET SET HORIZONTALLY IN SOUTH FACE OF CONCRETE BASE OF HYDRO POLE, LOCATED 0.7KM SOUTH OF FINCH AVENUE, 67M EAST OF THE CENTRELINE OF WOODVIEW AVENUE AND 0.2M BELOW TOP OF CONCRETE. HAVING AN ELEVATION OF 131.236M.

BEARINGS:

BEARINGS HEREON ARE ASTRONOMIC AND ARE REFERRED TO THE WESTERLY LIMIT OF WOODVIEW AVENUE HAVING A BEARING OF N17°19'00"W AS SHOWN ON PLAN 40R-778.

SURVEYOR'S CERTIFICATE

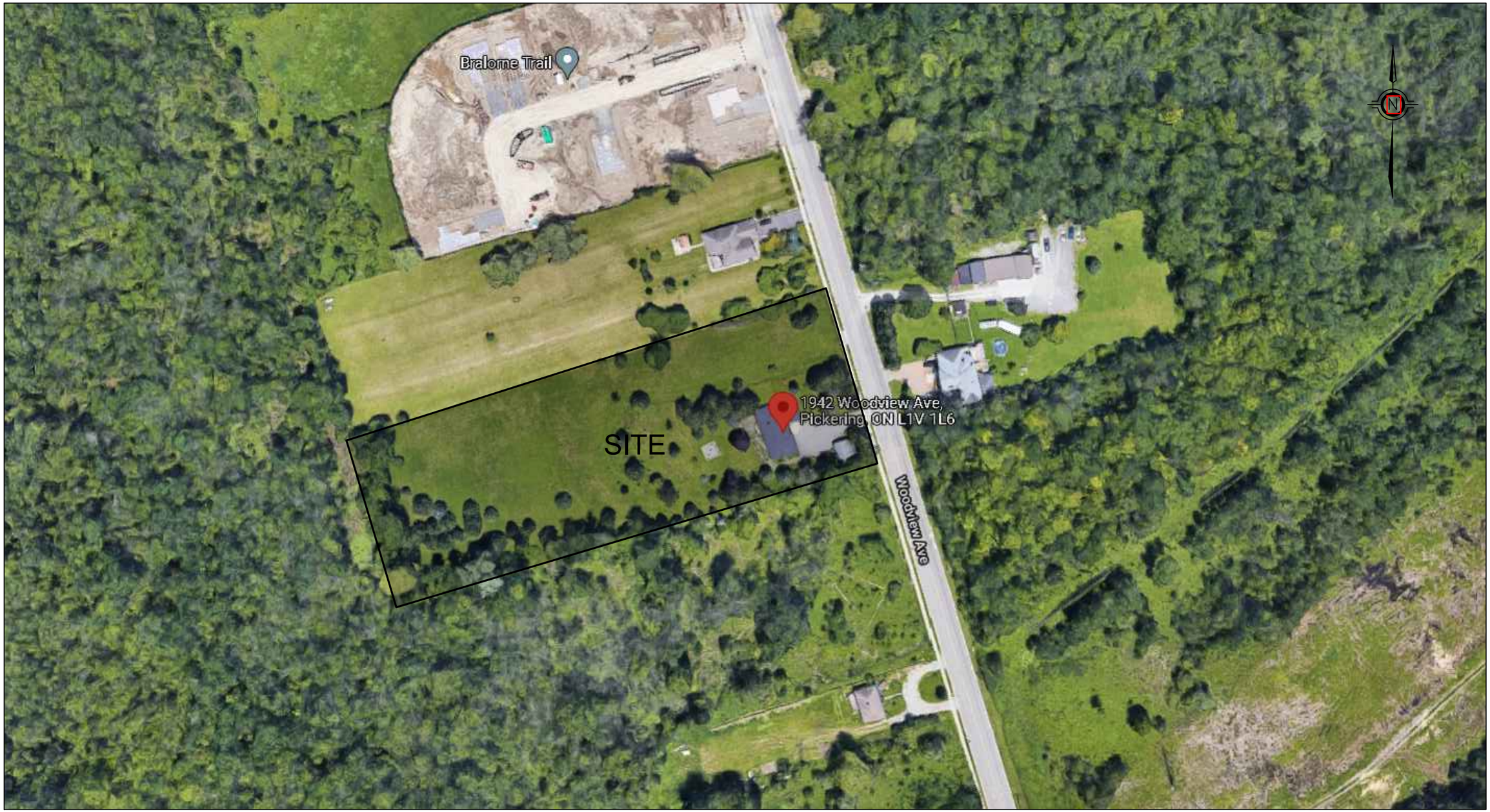
I CERTIFY THAT;

THE SURVEY WAS COMPLETED ON THE 16TH DAY OF SEPTEMBER 2021.

Sept. 22, 2021
DATE

OMARI B. MWINYI
ONTARIO LAND SURVEYOR

PROJECT		PROJECT No.
No.1942 WOODVIEW AVENUE		21-076-T
DRAFTSPERSON	CALCULATIONS	CHECKED BY
SUGI	E:\OMSL\21-076\21-076	O.M.



CLIENT: 11861808 CANADA CORP 1400 BAYLY STREET PICKERING, ON L1W 3R2	PROJECT: GEOTECHNICAL INVESTIGATION 1942 WOODVIEW AVENUE PICKERING, ON L1V 1L6	TITLE: KEY PLAN SHOWING SITE AND SURROUND AREA	SCALE: AS SHOWN DRAWING NO: 1	DATE: SEP 16/22 PROJECT No: 210189

CANADA ENGINEERING SERVICES INC.
39 DAVISBROOK BOULEVARD
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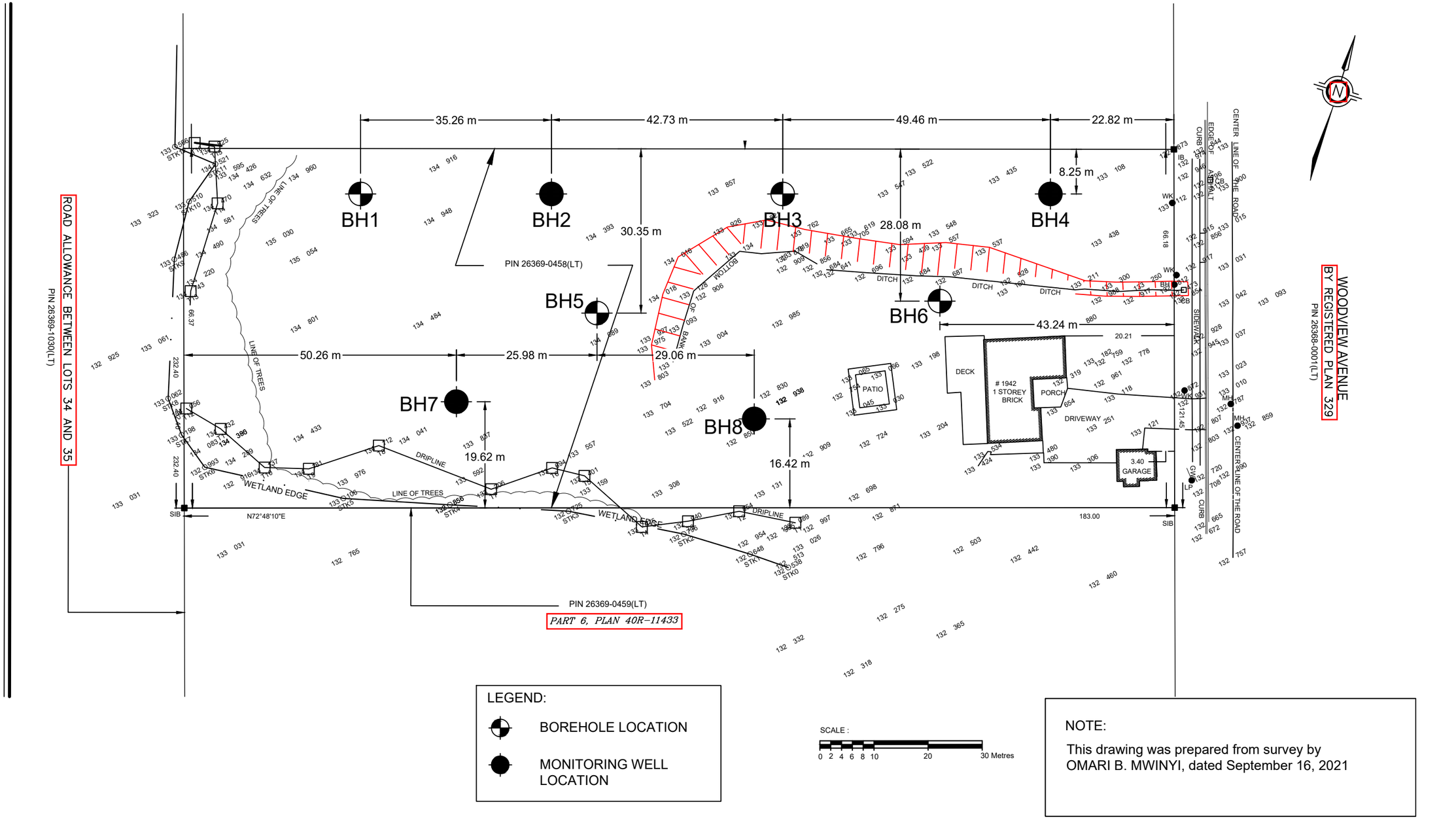

LEGEND:

- BOREHOLE LOCATION
- MONITORING WELL LOCATION

SCALE : 0 2 4 6 8 10 20 30 Metres

NOTE:

This drawing was prepared from survey by OMARI B. MWINYI, dated September 16, 2021

CLIENT: 11861808 CANADA CORP 1400 BAYLY STREET PICKERING, ON L1W 3R2	PROJECT: GEOTECHNICAL INVESTIGATION 1942 WOODVIEW AVENUE PICKERING, ON L1V 1L6	TITLE: SITE PLAN SHOWING BOREHOLE LOCATIONS	SCALE: AS SHOWN DATE: SEP 16/22 DRAWING NO: 2 PROJECT No: 210189

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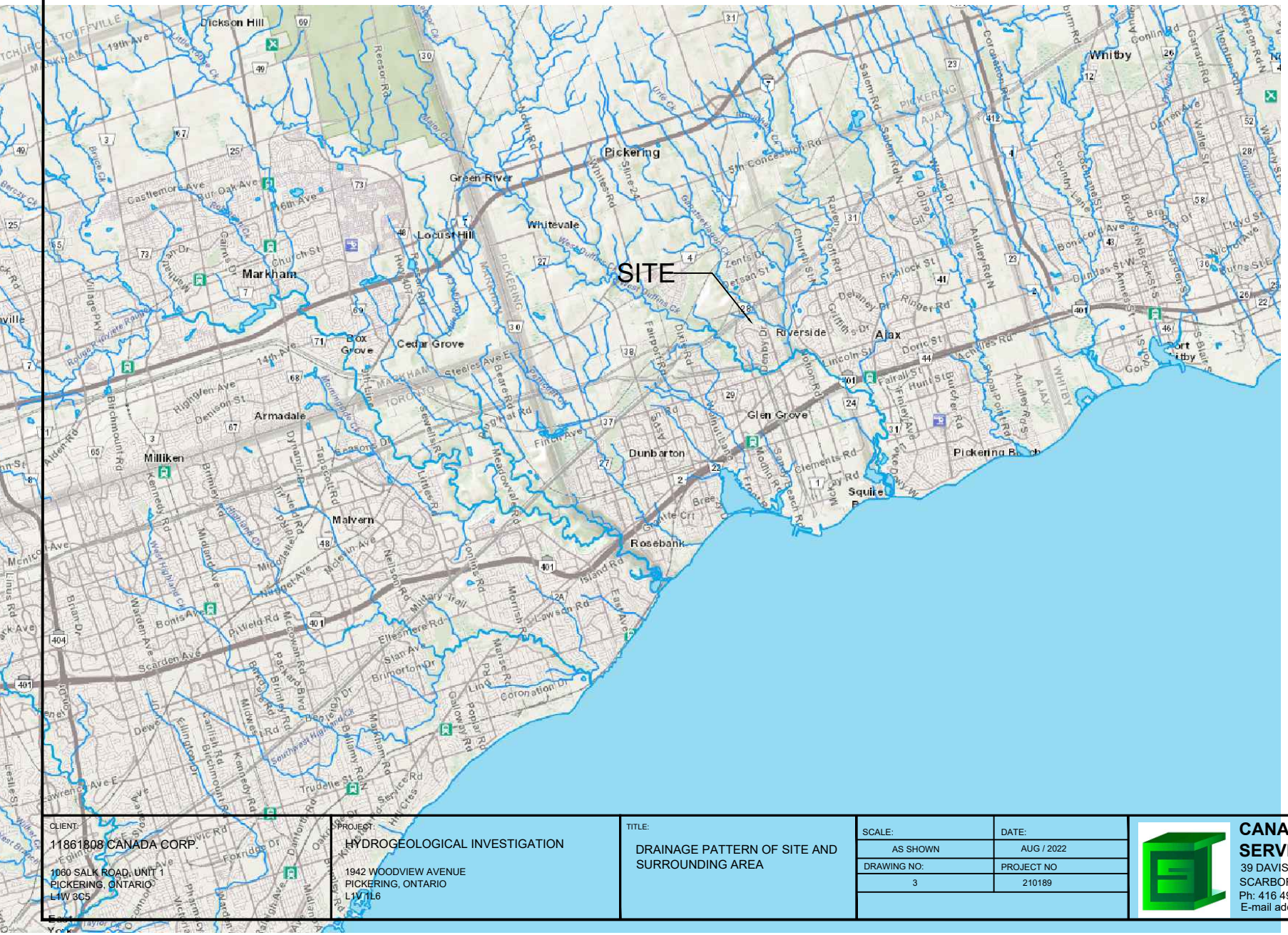

CLIENT: 11861808 CANADA CORP. 1060 SALK ROAD, UNIT 1 PICKERING, ONTARIO L1W 3C5	PROJECT: HYDROGEOLOGICAL INVESTIGATION 1942 WOODVIEW AVENUE PICKERING, ONTARIO L1V 1L6	TITLE: DRAINAGE PATTERN OF SITE AND SURROUNDING AREA	SCALE: AS SHOWN DRAWING NO: 3	DATE: AUG / 2022 PROJECT NO 210189

CANADA ENGINEERING SERVICES INC.
39 DAVISBROOK BOULEVARD
SCARBOROUGH, ONTARIO M1T 2H6
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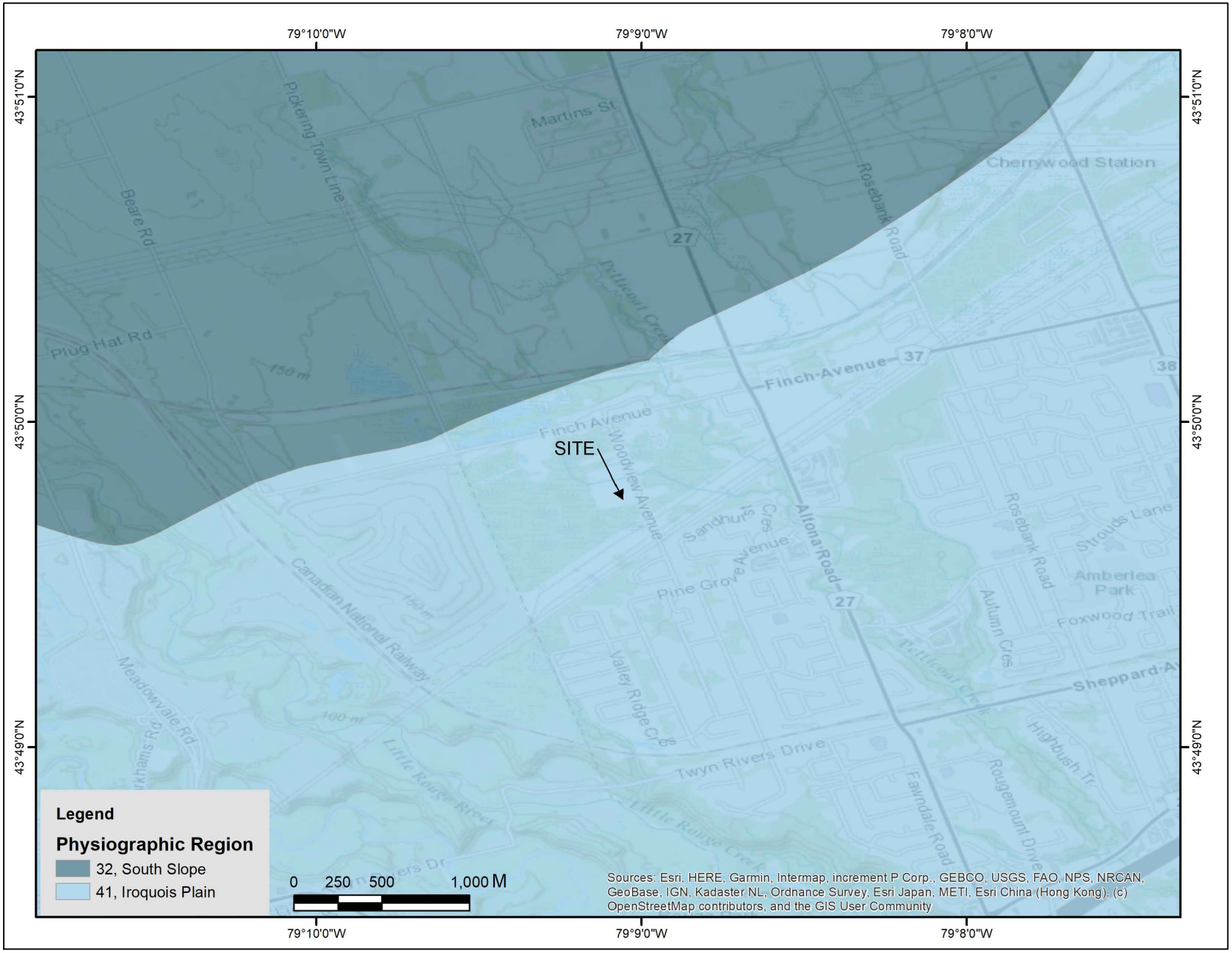

CLIENT:
11861808 CANADA CORP.

1060 SALK ROAD, UNIT 1
PICKERING, ONTARIO
L1W 3C5

PROJECT:
HYDROGEOLOGICAL INVESTIGATION

1942 WOODVIEW AVENUE
PICKERING, ONTARIO
L1V 1L6

TITLE:
PHYSIOGRAPHIC REGIONS OF SITE AND SURROUNDING AREA

SCALE:	DATE:
AS SHOWN	AUG / 2022
DRAWING NO:	PROJECT NO
4	210189

CANADA ENGINEERING SERVICES INC.
39 DAVISBROOK BOULEVARD
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Ph: 416 492 4000 Fax: 416 492 4001
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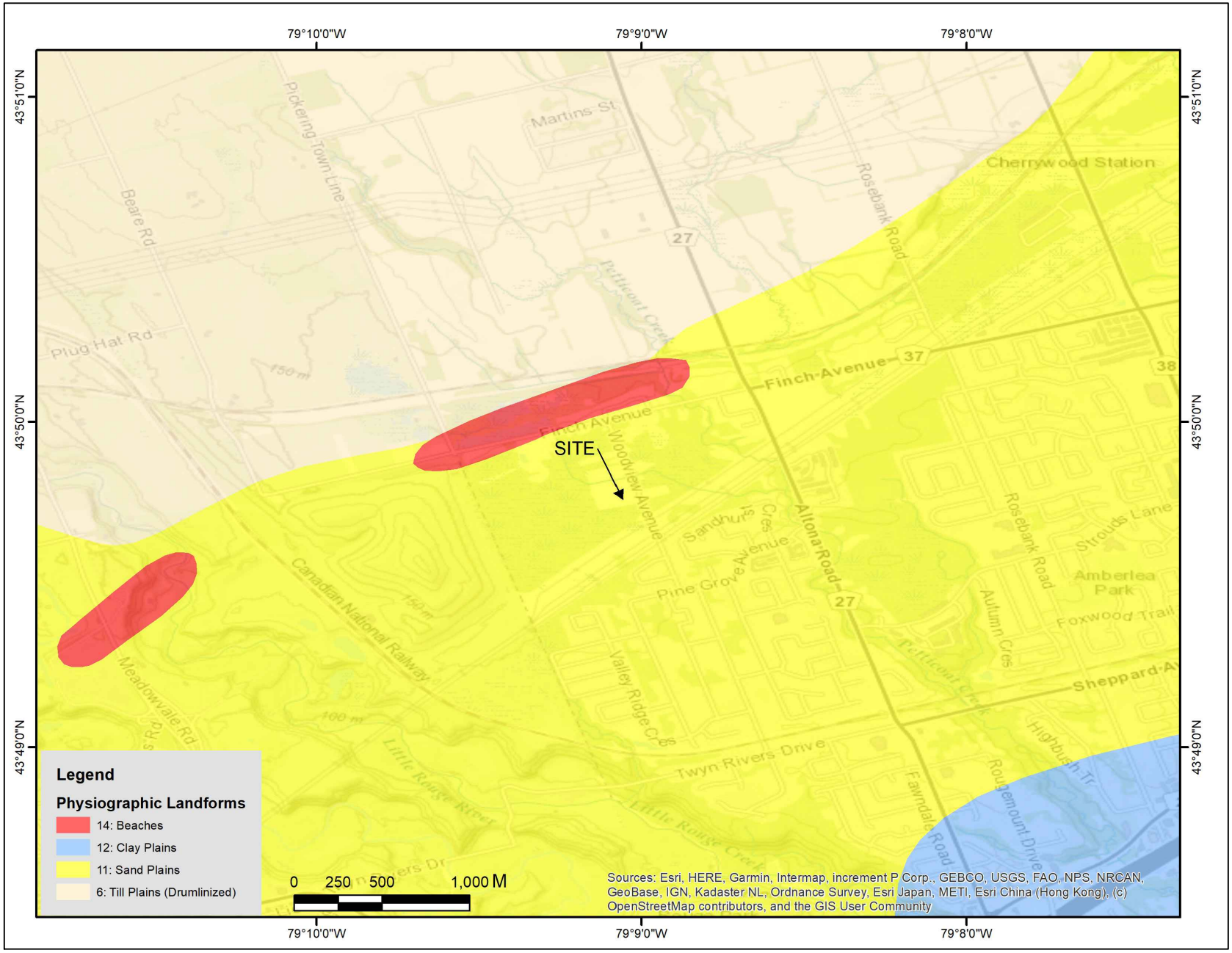

CLIENT:
11861808 CANADA CORP.

1060 SALK ROAD, UNIT 1
PICKERING, ONTARIO
L1W 3C5

PROJECT:
HYDROGEOLOGICAL INVESTIGATION

1942 WOODVIEW AVENUE
PICKERING, ONTARIO
L1V 1L6

TITLE:
PHYSIOGRAPHIC LANDFORMS OF SITE AND SURROUNDING AREA

SCALE:	DATE:
AS SHOWN	AUG / 2022
DRAWING NO:	PROJECT NO
5	210189

CANADA ENGINEERING SERVICES INC.
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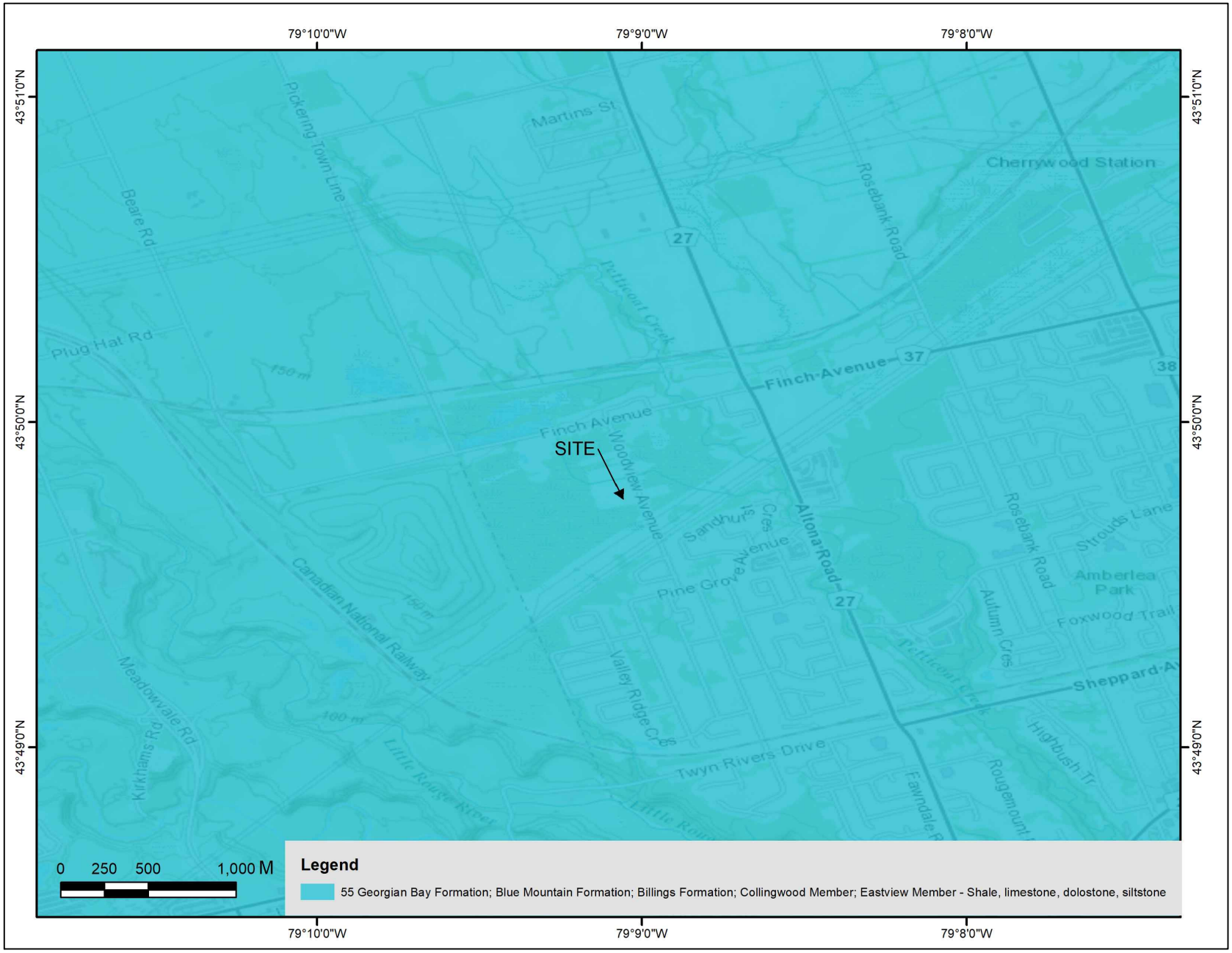
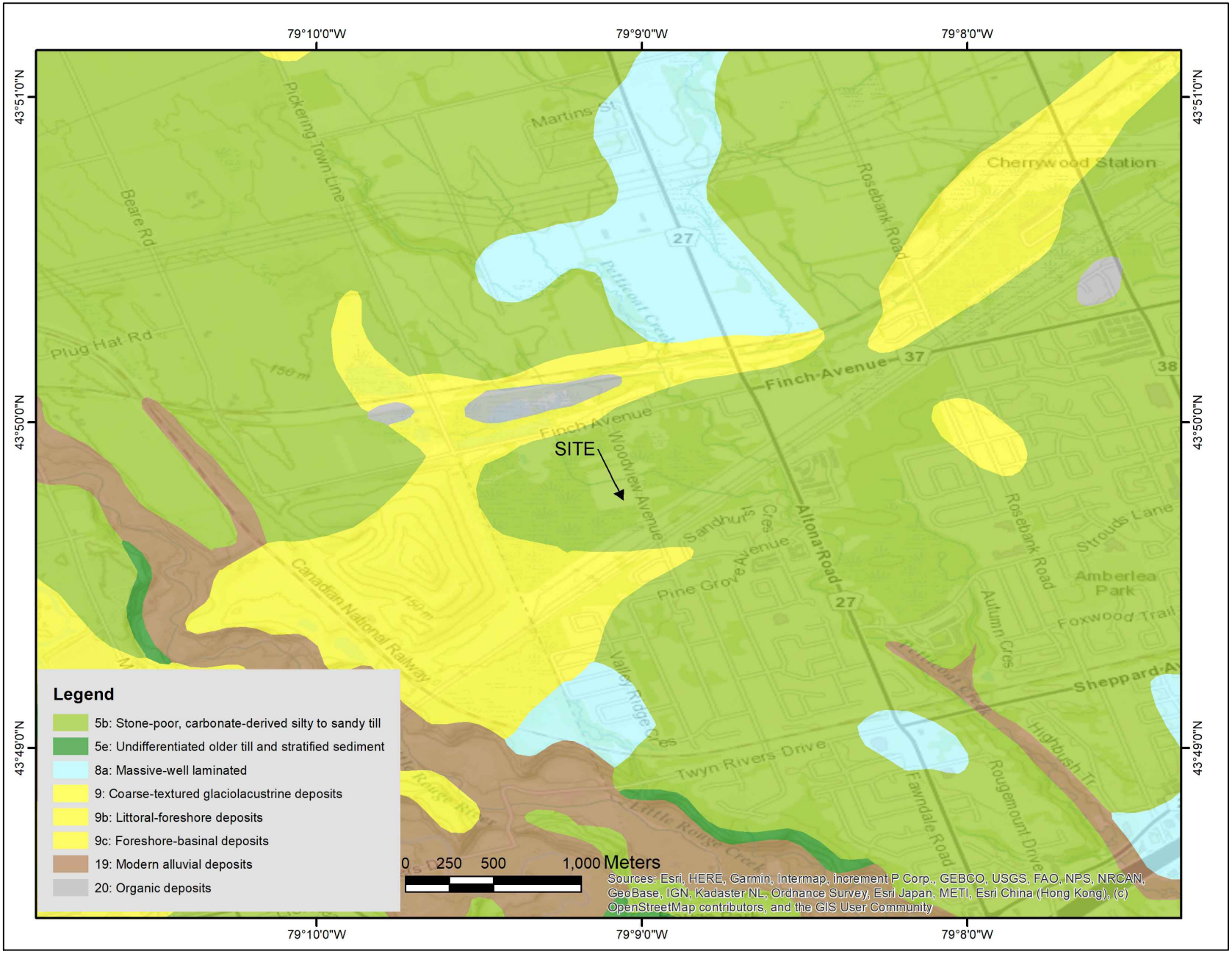


CLIENT: 11861808 CANADA CORP. 1060 SALK ROAD, UNIT 1 PICKERING, ONTARIO L1W 3C5	PROJECT: HYDROGEOLOGICAL INVESTIGATION 1942 WOODVIEW AVENUE PICKERING, ONTARIO L1V 1L6	TITLE: BEDROCK GEOLOGY OF SITE AND SURROUNDING AREA	SCALE: AS SHOWN DRAWING NO: 6 DATE: AUG / 2022 PROJECT NO 210189	**CANADA ENGINEERING SERVICES INC.** 39 DAVISBROOK BOULEVARD SCARBOROUGH, ONTARIO M1T 2H6 Ph: 416 492 4000 Fax: 416 492 4001 E-mail address: cesi@cesi.ca



CLIENT:
11861808 CANADA CORP.

1060 SALK ROAD, UNIT 1
PICKERING, ONTARIO
L1W 3C5

PROJECT:
HYDROGEOLOGICAL INVESTIGATION

1942 WOODVIEW AVENUE
PICKERING, ONTARIO
L1V 1L6

TITLE:
SURFICIAL GEOLOGY OF SITE AND SURROUNDING AREA

SCALE:	DATE:
AS SHOWN	AUG / 2022
DRAWING NO:	PROJECT NO
7	210189

CANADA ENGINEERING SERVICES INC.
39 DAVISBROOK BOULEVARD
SCARBOROUGH, ONTARIO M1T 2H6
Ph: 416 492 4000 Fax: 416 492 4001
E-mail address: cesi@cesi.ca

Project No: 210189

Log of Borehole No. 1

Project: Proposed Residential Development

Client: 11861808 Canada Corp.

Engineer: AG

Location: 1942 Woodview Avenue, Pickering, Ontario

Depth (ft)	Depth (m)	Symbol	Description	Depth/Elev.	NUMBER	Sample Type (SS)	Blows/ft	RECOVERY	SPT (10 20 30 40 50 60 70)	Moisture Content % (5 10 15 20 25 30 35 40 45)
			Ground Surface	134.95						
0–2	0		TOP SOIL Dark grey sandy silt, some organics, moist, loose	134.19	1	SS	7	100		12.57
3–7	1–2		SILTY SAND Brown silty fine sand,moist, loose to compact	132.51	2	SS	15	100		16.9
					3	SS	6	100		17.05
8–16	3–5		SANDY SILT TILL Grey sandy silt till,cohesive, wet, compact Occasional sand seams in between Pocket penetrometer reading at 3.5 m = 450 kPa Pocket penetrometer reading at 4.5 m = 200 kPa	129.92	4	SS	13	100		13.32
					5	SS	19	100		11.18
					6	SS	19	100		15.82
17–18			END OF BOREHOLE Borehole open up to 5.1 m upon completion Water level upon completion = 4.8 m							

Drill Method: Track mounted drill rig

Drill Date: 14 Oct 2021

Hole Size: 150 mm diameter

Canada Engineering Services Inc.
39 Davisbrook Blvd.
Scarborough, Ontario
M1T 2H6

Checked By: RJ

Datum: Geodetic elevation of boreholes obtained from survey map by Omari B. Mwinyi, dated Sept 22, 2021

Project No: 210189

Log of Borehole No. 2

Project: Proposed Residential Development

Client: 11861808 Canada Corp.

Technologist: AG

Location: 1942 Woodview Avenue, Pickering, Ontario

Depth (ft / m)	Description	Depth/Elev.	NUMBER	Sample Type (SS)	Blows/ft	RECOVERY
0 / 0	Ground Surface	134.50				
0–1 / 0	**TOP SOIL** Dark grey sandy silt, some organics, moist, loose	134.04	1	SS	6	100
2–8 / 1–2	**SILTY SAND** Brown to mottled silty sand with organics, moist, loose to compact Water encountered at 2.1 m Pocket penetrometer reading at 2.2 m = 350 kPa	131.91	2 3 4	SS SS SS	8 5 22	100 100 100
8–15 / 2–4	**SANDY SILT TILL** Grey sandy silt till,cohesive, wet, dense Occasional sand seams in between Pocket penetrometer reading at 3.5 m = 450 kPa	129.93	5	SS	42	100
15–21 / 4–6	**SAND** Grey sand, some gravel, trace silt, wet, dense to compact	127.95	6 7	SS SS	44 18	100 100
21–25 / 6–7	**END OF BOREHOLE** Borehole open up to 4.5 m upon completion Water level upon completion = 2.1 m					

WELL: SEAL; BACKFILL; SEAL; SAND FILLING

Standard Penetration Test (10 20 30 40 50)

Moisture Content (% — 10 20 30 40 50): 8.76, 19.82, 25.39, 8, 8.67, 11.36, 7.78

Drill Method: Track mounted drill rig

Drill Date: 14 Oct 2021

Hole Size: 150 mm diameter

Canada Engineering Services Inc.
39 Davisbrook Blvd.
Scarborough, Ontario
M1T 2H6

Checked By: RJ

Datum: Geodetic elevation of boreholes obtained from survey map by Omari B. Mwinyi, dated Sept 22, 2021

Project No: 210189

Log of Borehole No. 3

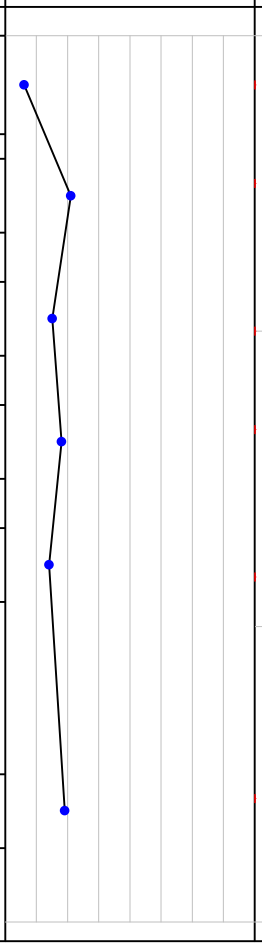
Project: Proposed Residential Development

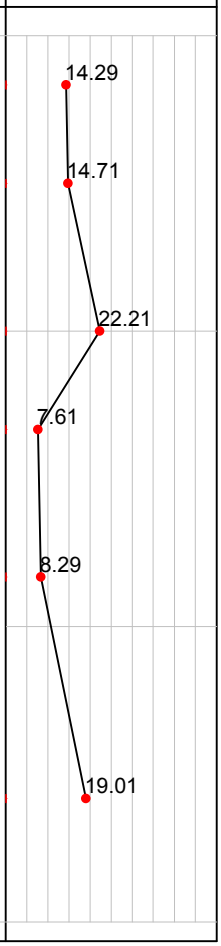
Client: 11861808 Canada Corp.

Engineer: AG

Location: 1942 Woodview Avenue, Pickering, Ontario

Depth (ft)	Depth (m)	Symbol	Description	Depth/Elev.	NUMBER	Sample Type (SS)	Blows/ft	RECOVERY
			Ground Surface	133.82				
0	0		**TOP SOIL** Grey sandy silt, some organics, moist, loose	133.67	1	SS	6	100
1			**SILTY SAND** Brown silty sand, trace gravel, moist, compact					
2								
3	1		**SAND** Coarse sand, some gravel, trace silt, moist to wet, compact	132.91	2	SS	21	100
4								
5					3	SS	15	100
6	2		Water encountered at 2.0 m					
7								
8					4	SS	18	100
9								
10	3				5	SS	14	100
11								
12								
13	4							
14								
15					6	SS	19	100
16	5			128.79				
17			**END OF BOREHOLE** Borehole open upon completion Water level upon completion = 2.0 m					
18								





Drill Method: Track mounted drill rig

Drill Date: 18 Oct 2021

Hole Size: 150 mm diameter

Canada Engineering Services Inc.
39 Davisbrook Blvd.
Scarborough, Ontario
M1T 2H6

Checked By: RJ

Datum: Geodetic elevation of boreholes obtained from survey map by Omari B. Mwinyi, dated Sept 22, 2021

Project No: 210189

Log of Borehole No. 4

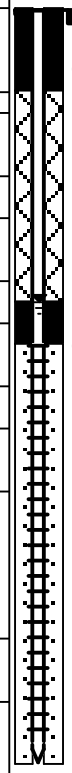
Project: Proposed Residential Development

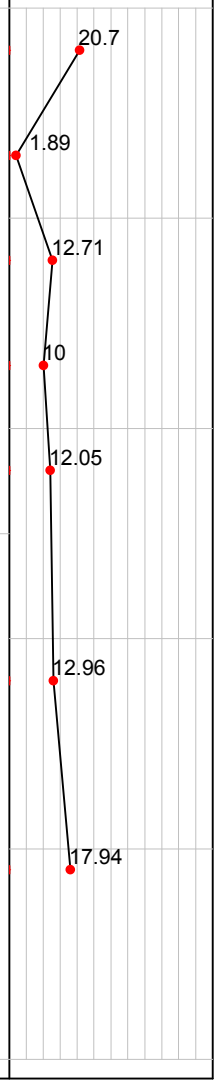
Client: 11861808 Canada Corp.

Technologist: AG

Location: 1942 Woodview Avenue, Pickering, Ontario

Depth (ft / m)	Description	Depth/Elev.	NUMBER	Sample Type (SS)	Blows/ft	RECOVERY
0 / 0	Ground Surface	133.40				
0–3 / 0–1	**TOP SOIL** Grey silty sand, some organics, moist, loose		1	SS	9	100
3–10 / 1–3	**SILTY SAND** Grey silty sand, moist to wet, compact to loose Water encountered at 2.1 m	130.35	2 3 4	SS SS SS	12 8 7	100 100 100
10–14 / 3–4	**SANDY SILT** Grey sandy silt, trace gravel, wet, compact	129.13	5	SS	27	100
14–21 / 4–6	**SAND** Sand, some gravel, trace silt, wet, compact	126.85	6 7	SS SS	25 17	100 100
22–23 / 7	**END OF BOREHOLE** Borehole open upon completion Water level upon completion = 2.1 m					





Drill Method: Track mounted drill rig

Drill Date: 18 Oct 2021

Hole Size: 150 mm diameter

Canada Engineering Services Inc.
39 Davisbrook Blvd.
Scarborough, Ontario
M1T 2H6

Checked By: RJ

Datum: Geodetic elevation of boreholes obtained from survey map by Omari B. Mwinyi, dated Sept 22, 2021

Project No: 210189

Log of Borehole No. 5

Project: Proposed Residential Development

Client: 11861808 Canada Corp.

Engineer: AG

Location: 1942 Woodview Avenue, Pickering, Ontario

Depth (ft / m)	Symbol	Description	Depth/Elev.	NUMBER	Sample Type (SS)	Blows/ft	RECOVERY	SPT (10 20 30 40 50 60 70)	Moisture Content (% 5 10 15 20 25 30 35 40 45)
0 / 0		Ground Surface	134.08						
0		TOP SOIL Grey silty sand with trace gravel, some organics, moist, loose	133.93	1	SS	8	100		9.14
1		SILTY SAND Grey silty sand, moist to wet, loose Water encountered at 2.3 m		2	SS	11	100		6.73
2 / 1				3	SS	10	100		18.54
2			131.79						
2		SANDY SILT TILL Grey sandy silt till, wet, loose		4	SS	8	100		20.82
3				5	SS	15	100		15.23
3 / 4			129.66						
4		SAND Grey sand, some gravel, trace silt, wet, loose to compact		6	SS	10	100		19.18
5			129.05						
5		END OF BOREHOLE Borehole open upon completion Water level upon completion = 2.3 m							

Drill Method: Track mounted drill rig

Drill Date: 18 Oct 2021

Hole Size: 150 mm diameter

Canada Engineering Services Inc.
39 Davisbrook Blvd.
Scarborough, Ontario
M1T 2H6

Checked By: RJ

Datum: Geodetic elevation of boreholes obtained from survey map by Omari B. Mwinyi, dated Sept 22, 2021

Project No: 210189

Log of Borehole No. 6

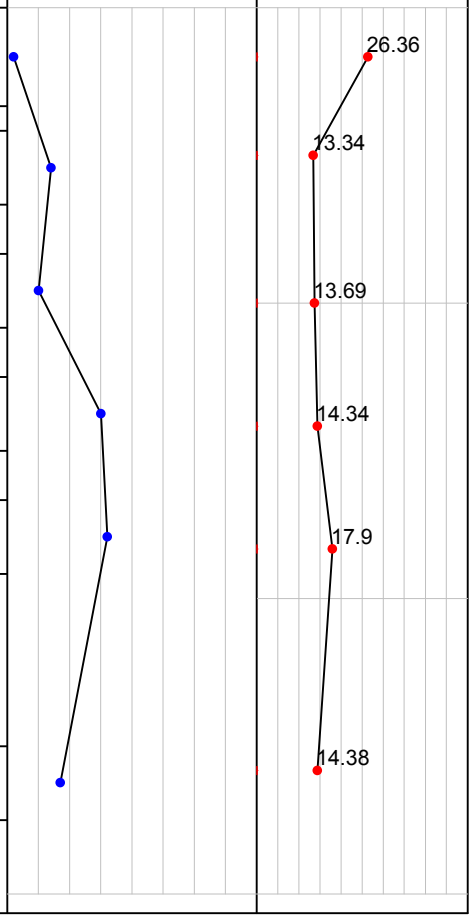
Project: Proposed Residential Development

Client: 11861808 Canada Corp.

Engineer: AG

Location: 1942 Woodview Avenue, Pickering, Ontario

Depth (ft)	Depth (m)	Symbol	Description	Depth/Elev.	NUMBER	Sample Type (SS)	Blows/ft	RECOVERY
			Ground Surface	132.68				
0–2	0		**TOP SOIL** Grey black silty sand, loose, moist	131.92	1	SS	2	100
3–8	1–2		**SILTY SAND** Brown to grey silty sand, loose, moist Stone encountered at 0.9 m Pocket penetrometer reading at 2.1 m = 200kPa Water encountered at 2.4 m	130.24	2 3	SS SS	14 10	100 100
8–16	3–5		**SANDY SILT TILL** Grey sandy silt till, some gravel, non-cohesive, wet, compact	127.65	4 5 6	SS SS SS	30 32 17	100 100 100
17–18			**END OF BOREHOLE** Borehole open upon completion Water level upon completion = 1.5 m					



Drill Method: Track mounted drill rig

Drill Date: 14 Oct 2021

Hole Size: 150 mm diameter

Canada Engineering Services Inc.
39 Davisbrook Blvd.
Scarborough, Ontario
M1T 2H6

Checked By: RJ

Datum: Geodetic elevation of boreholes obtained from survey map by Omari B. Mwinyi, dated Sept 22, 2021

Project No: 210189

Log of Borehole No. 7

Project: Proposed Residential Development

Client: 11861808 Canada Corp.

Technologist:

Location: 1942 Woodview Avenue, Pickering, Ontario

Depth (ft / m)	Description	Depth/Elev.	NUMBER	Sample Type (SS)	Blows/ft	RECOVERY
0 / 0	Ground Surface	133.90				
0–3 / 0–1	**TOP SOIL** Dark grey silty sand, trace gravel, some organics, moist, loose		1	SS	5	100
		133.14				
3–15 / 1–4	**SILTY SAND** Grey silty sand,non-cohesive, moist to wet, loose to compact Water encountered at 2.2 m Occasional sand seams in between		2 3 4 5	SS SS SS SS	5 18 1 11	100 100 100 100
		129.33				
15–21 / 5–6	**SANDY SILT TILL** Grey sandy silt till, cohesive, compact, wet Occasional sand seams in between		6 7	SS SS	20 32	100 100
		127.35				
22–25 / 7	**END OF BOREHOLE** Borehole open up to 5.9 m upon completion Water level upon completion = 2.2 m					

WELL: SEAL; BACKFILL; SEAL; SAND FILLING

Standard Penetration Test (10 20 30 40 50)

Moisture Content % (10 20 30 40 50): 13.88; 12.59; 16.38; 21.03; 23.14; 13.27; 8.82

Drill Method: Track mounted drill rig

Drill Date: 14 Oct 2021

Hole Size: 150 mm diameter

Canada Engineering Services Inc.
39 Davisbrook Blvd.
Scarborough, Ontario
M1T 2H6

Checked By: RJ

Datum: Geodetic elevation of boreholes obtained from survey map by Omari B. Mwinyi, dated Sept 22, 2021

Project No: 210189

Log of Borehole No. 8

Project: Proposed Residential Development

Client: 11861808 Canada Corp.

Technologist: AG

Location: 1942 Woodview Avenue, Pickering, Ontario

Depth (ft / m)	Description	Depth/Elev.	NUMBER	Sample Type (SS)	Blows/ft	RECOVERY
0 / 0	Ground Surface	132.85				
0–3 / 0–1	**TOP SOIL** Dark grey silty sand, some organics, moist, loose	132.55	1	SS	3	100
3–7 / 1–2	**SILTY SAND** Brown silty sand, trace gravel, moist to wet, loose to compact		2	SS	7	100
			3	SS	13	100
7–13 / 2–4	**SANDY SILT** Grey sandy silt, wet, compact to dense	130.72	4	SS	17	100
			5	SS	33	100
13–20 / 4–6	**SAND** Grey sand, some gravel, trace silt, wet, compact	128.58	6	SS	27	100
			7	SS	20	100
20–23 / 6–7	**END OF BOREHOLE** Borehole open upon completion Water level upon completion = 1.5 m	126.30				

WELL: SEAL; BACKFILL; SEAL; SAND FILLING

Standard Penetration Test (10 20 30 40 50)

Moisture Content (% — 10 20 30 40 50): 18.88, 21.03, 19.03, 16.82, 16.87, 11.31, 19.69

Drill Method: Track mounted drill rig

Drill Date: 18 Oct 2021

Hole Size: 150 mm diameter

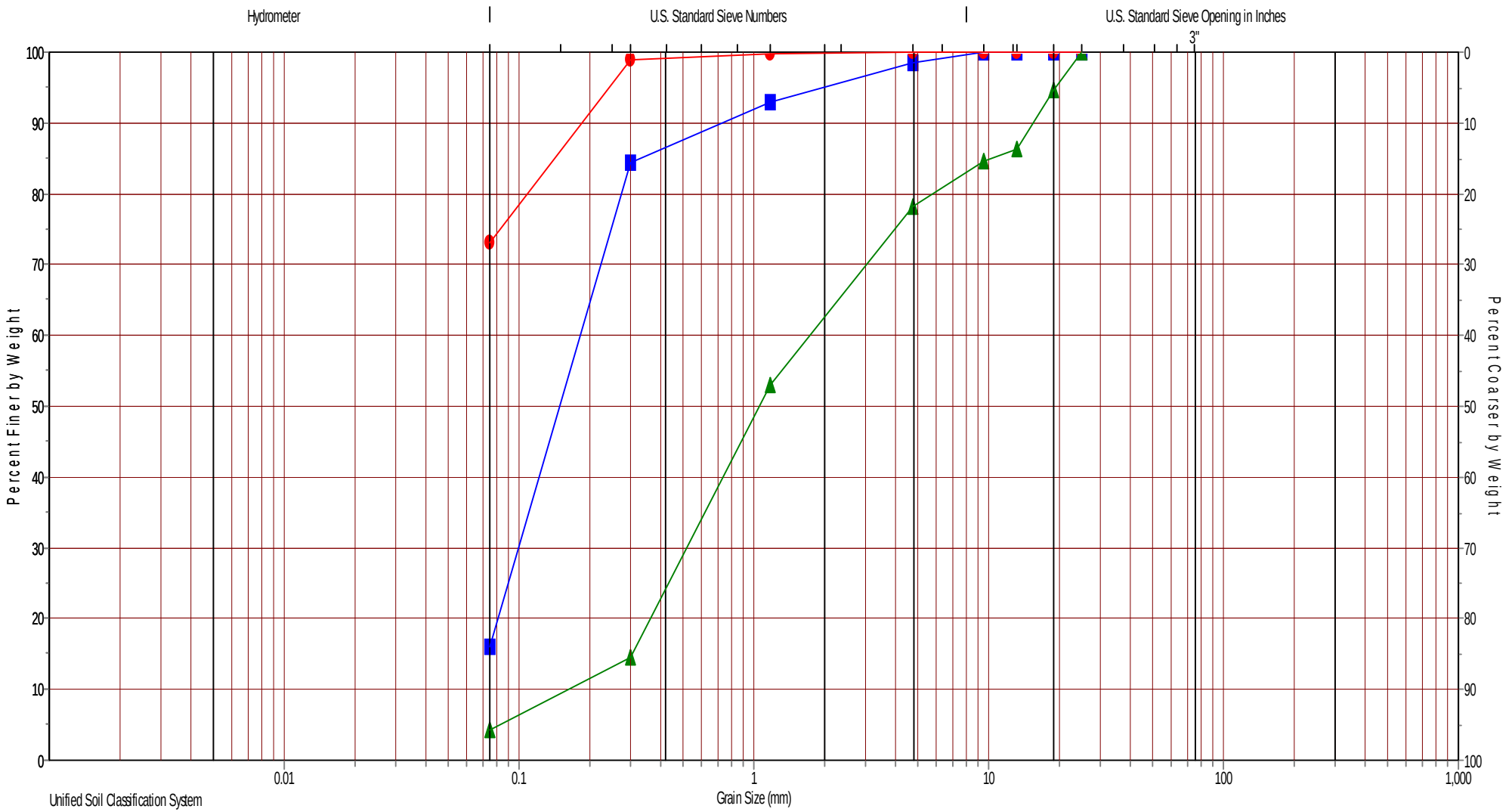
Canada Engineering Services Inc.
39 Davisbrook Blvd.
Scarborough, Ontario
M1T 2H6

Checked By: RJ

Datum: Geodetic elevation of boreholes obtained from survey map by Omari B. Mwinyi, dated Sept 22, 2021

Figure 1	Project No.: 210189	GRAINSIZE DISTRIBUTION GRAPH
	Location: 1942 Woodview Avenue	Tested By: SK
	Client: 10861808 Canada Corp.	Test Date: 21-Oct-2021

Symbol	Sample No.	% Clay	% Silt	% Fine Sand	% Medium Sand	% Coarse Sand	% Fine Gravel	% Coarse Gravel	% Cobbles
■	BH8 SA3	<16.0	<16.0	68.3	8.7	5.7	1.5	0.0	0.0
●	BH8 SA5	<73.2	<73.2	25.8	0.9	0.3	0.0	0.0	0.0
▲	BH8 SA6	<4.3	<4.3	10.2	38.6	25.1	16.4	5.4	0.0



Unified Soil Classification System

SILT or CLAY		SAND			GRAVEL		COBBLES	BOULDERS
Clay	Silt	fine	medium	coarse	fine	coarse		

GEOTECHNICAL SYMBOLS AND TERMS USED IN BOREHOLE/TEST PIT LOGS

Soil Description

Terminology describing soil types:

Topsoil	-	Mixture of soil and humus capable of supporting good vegetative growth
Peat	-	Fibrous fragments of visible and invisible decayed organic matter
Till	-	Unstratified and unsorted glacial deposit which may include any particle sizes Such as clay, silt, sand, stone, cobbles and boulders
Fill	-	Materials not identified as deposited by natural geological processes

Terminology describing soil structure:

Desiccated	-	Having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
Fissured	-	Material breaks along plane of fracture
Varved	-	Composed of regular alternating layers of silt and clay
Laminated	-	Alternating layers of beds less than 6 mm thick
Stratified	-	Alternating layers of beds greater than 6 mm thick
Blocky	-	Material can be broken into small and hard angular lumps
Lensed	-	Irregular shaped pockets of soil having different particle size, texture, or colour from materials above and below
Well Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes
Uniformly Graded		Predominantly one grain size

Soil descriptions and classification are based on the Unified Soil Classification System (USCS) (ASTM D-2488), which classifies soils on the basis of engineering properties. The system divides soils into three major categories: (1) coarse grained, (2) fine-grained, and (3) highly organic. The soil is then subdivided based on either gradation or plasticity characteristics. This system provides a group symbol (eg. SM) and group name (eg. silty sand) for identification. The classification excludes particles larger than 76 mm.

Terminology describing materials outside the USCS, (eg. particles larger than 76 mm, visible organic matter, construction debris) is based upon the proportion of these materials present:

Trace	- Trace sand, trace silt, etc.	Less than 10%
Some	- Some sand, some silt, etc.	10 - 20%
Adjective	- Gravelly, sandy, silty, clayey, etc.	20 - 30%
“And”	- and gravel, and silt, etc.	> 35%
Noun	- Gravel, Sand, Silt, Clay	> 35% and main fraction

The standard terminology to describe cohesionless soils includes the compactness as determined by the Standard Penetration Test “N” -value.

Compactness	**“N” Value**
Very Loose	< 4
Loose	4 - 10
Compact	10 - 30
Dense	30 - 50
Very Dense	> 50

GEOTECHNICAL SYMBOLS AND TERMS USED IN BOREHOLE/TEST PIT LOGS

The standard terminology to describe cohesive soils includes consistency, which is based on undrained shear strength as measured by in-situ vane tests, penetrometer tests, unconfined compression tests or similar field and laboratory analysis. Standard Penetration Test "N" values can also be used to provide an approximate indication of the consistency and shear strength of fine grained, cohesive soils.

Consistency	Undrained Shear Strength (kPa)	"N" Value	Field Identification
Very Soft	< 12.5	< 2	Easily penetrated several cm by the fist
Soft	12.5 - 25	2 - 4	Easily penetrated several cm by the thumb
Firm	25 - 50	4 - 8	Can be penetrated several cm by the thumb with moderate effort
Stiff	50 - 100	8 - 15	Readily indented by the thumb but penetrated only with great effort
Very Stiff	100 - 200	15 - 30	Readily indented by the thumb nail
Hard	> 200	> 30	Indented with difficulty by the thumbnail

Note: "N" Value - The Standard Penetration Test records the number of blows of a 140 lb (64 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler 1 foot (305 mm). For split spoon samples where full penetration is not achieved, the number of blows is reported over the sampler penetration in millimeters (eg. 50/75).

STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols:

Asphalt Concrete Topsoil Fill Peat Clay Silt Sand Gravel

WATER LEVEL MEASUREMENTS

Open Borehole or Test Pit

Monitoring Well, Piezometer or Standpipe

SAMPLE TYPE

SS Split spoon sample (obtained from the Standard Penetration Test)

AS Auger sample

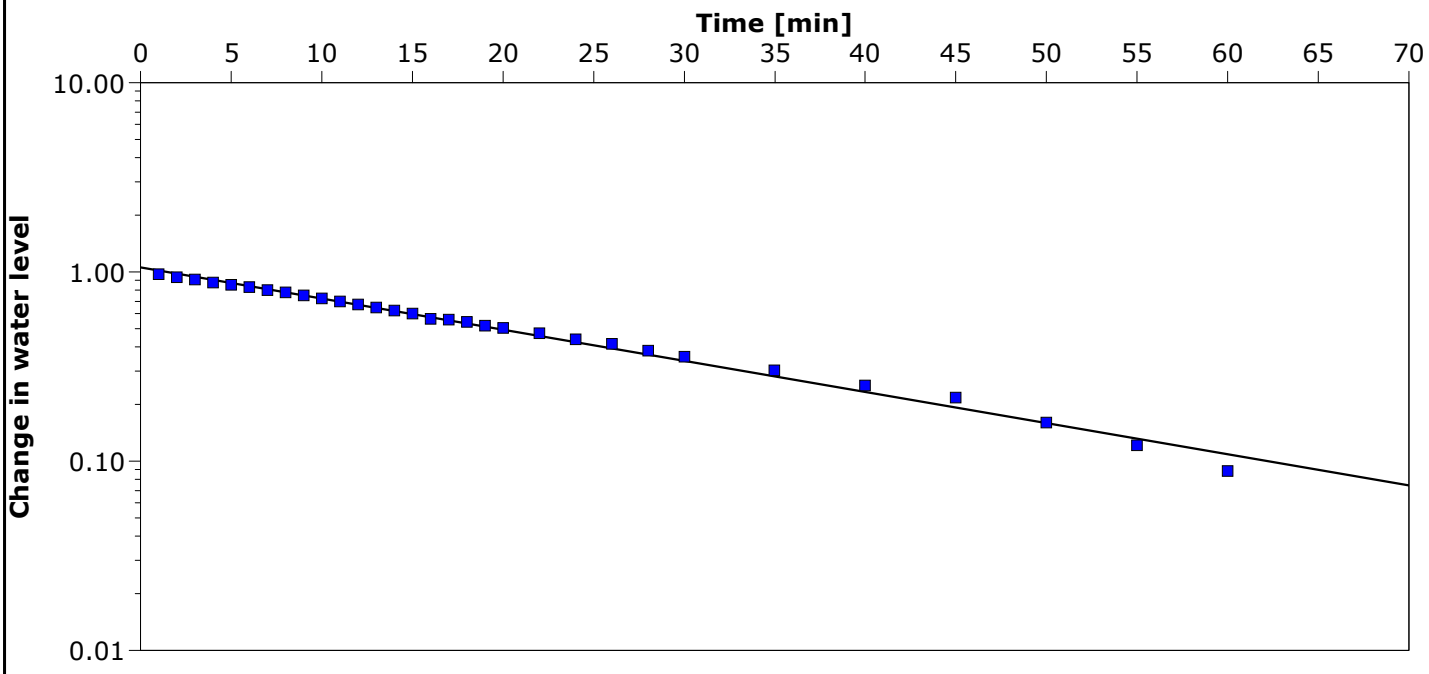
ST Thin Wall Sample or Shelby Tube

VS Shovel sample

APPENDIX C

HYDRAULIC CONDUCTIVITY AND DEWATERING CALCULATIONS

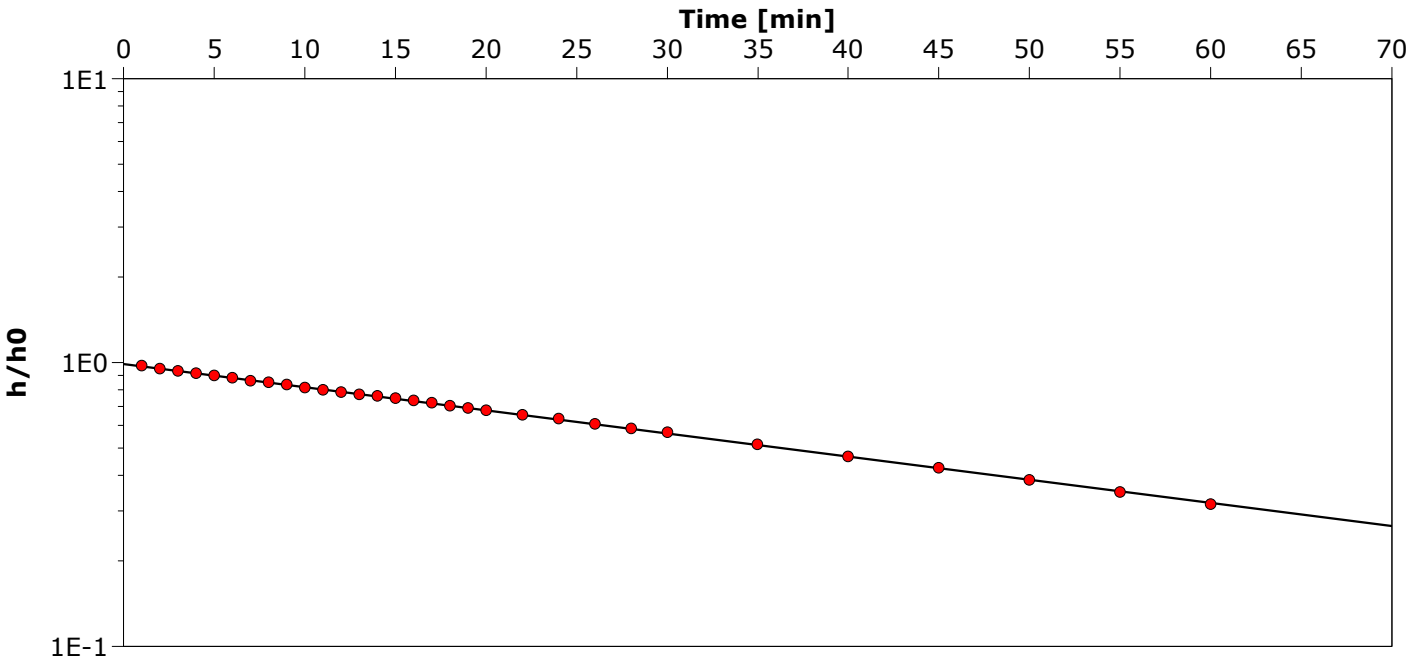
Location:	Slug Test: BH2	Test Well: BH2
Test Conducted by: JL		Test Date: 09-Aug Tue
Analysis Performed by: MK	SLUG TEST 1	Analysis Date: 09-Aug Tue
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH2	3.18×10^{-7}	

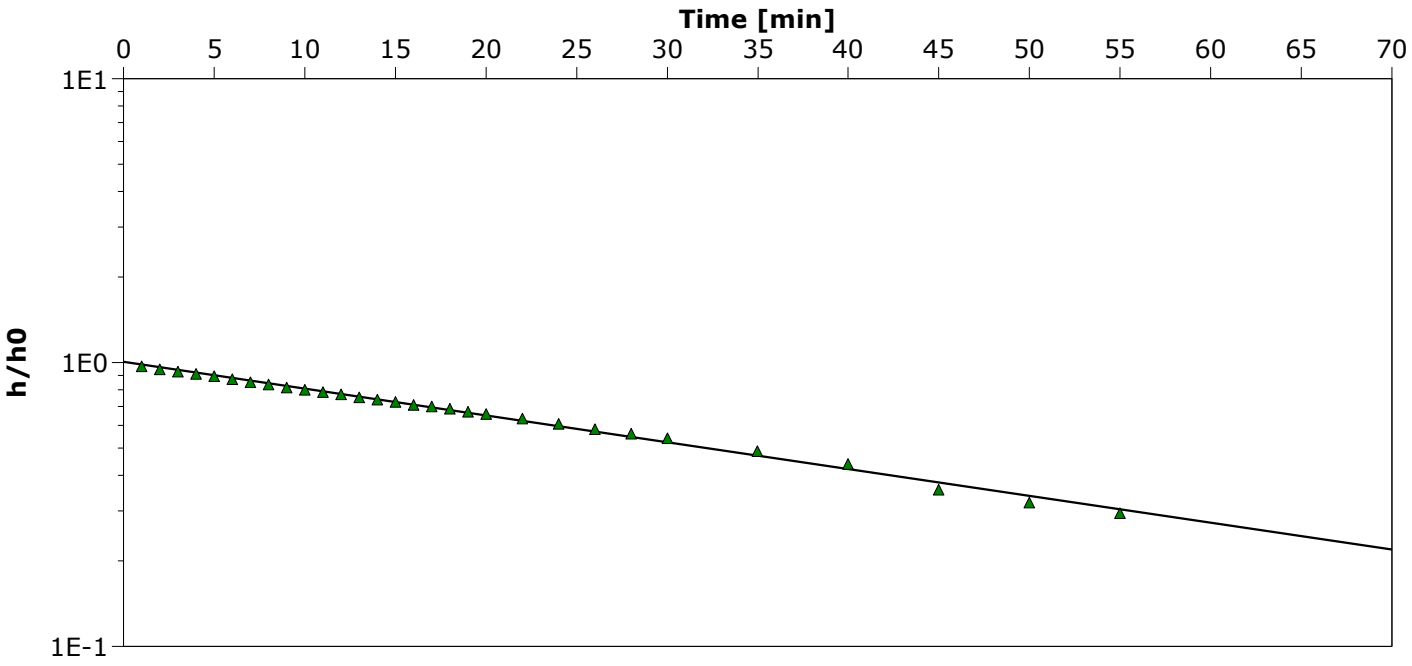
Location:	Slug Test: BH4	Test Well: BH4
Test Conducted by: JL		Test Date: 09-Aug Tue
Analysis Performed by: MK	BH4	Analysis Date: 09-Aug Tue
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH4	1.58×10^{-7}	

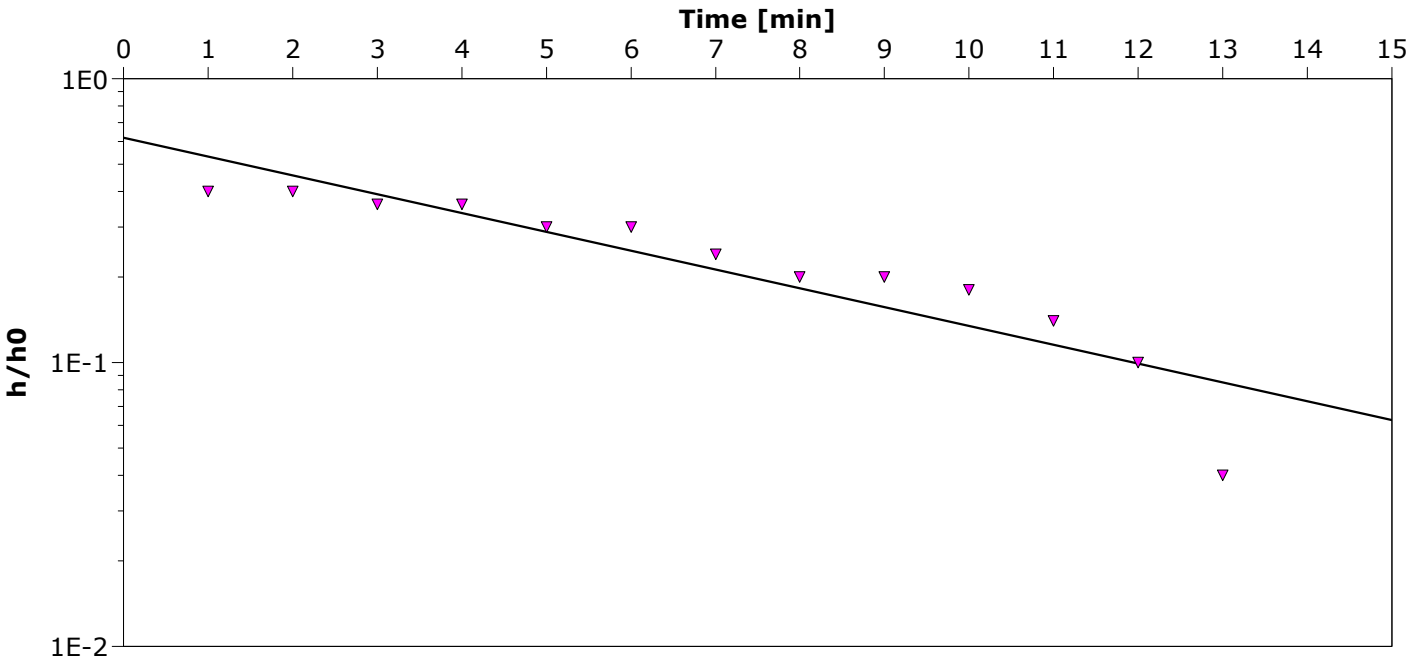
Location:	Slug Test: BH7	Test Well: BH7
Test Conducted by: JL		Test Date: 09-Aug Tue
Analysis Performed by: MK	BH7	Analysis Date: 09-Aug Tue
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH7	1.82×10^{-7}	

Location:	Slug Test: BH8	Test Well: BH8
Test Conducted by:		Test Date: 09-Aug Tue
Analysis Performed by:	BH8	Analysis Date: 09-Aug Tue
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH8	1.28×10^{-6}	

1942 Woodview Avenue

Dewatering Calculation (With One Level Basement)

Average Ground Level		133.50
Highest Groundwater level		132.61
FFE of basement		131.70
Lowest level of excavation (300 mm below FFE of basement)		131.40
Dewatering target elevation (Lowest level of excavation -0.5m)		130.90
Elevation of assumed impervious layer		128.90
Height between static water level and assumed impervious layer		3.71
Height between required water level and assumed impervious layer		2.00

TEMPORARY DEWATERING CALCULATION

Permeability (Highest from 4 slug tests)	K	1.28E-06
Depth of Existing groundwater level to impervious layer	H	3.71
Depth of Required groundwater level to impervious layer after drawdown	h	2.00
Excavation Area	A	1944.30
Radius of influence from edge of excavation	$R_{sichardt}$	5.80
Effective Radius of excavation $\sqrt{(ab/\pi)}$	R_{eff}	24.88
Total Radius of Influence ($R_{sichardt} + R_{eff}$)	R_{total}	30.68
Discharge (m^3/sec)		
$Q = (\pi K(H^2-h^2))/Ln(R_{total}/R_{eff})$	**Q**	1.87E-04
Discharge (m^3/day)		16.18
Discharge (m^3/day) with FS=1.5		24.27
Considering max daily rainfall 25mm, Q =m^3/Day		48.61
Total Temporary Dewatering Quantity (m^3/day)	**Q_{temp}**	**72.87**

1942 Woodview Avenue

Dewatering Calculation (With One Level Basement)

Average Ground Level		133.50
Highest Groundwater level		132.61
FFE of basement		131.70
Gravel layer below basement slab		131.40
Dewatering target elevation		131.40
Elevation of assumed impervious layer		129.40
Height between static water level and assumed impervious layer		3.21
Height between required water level and assumed impervious layer		2.00

PERMANENT DEWATERING CALCULATION

Permeability (Highest from 4 slug tests)	K	1.28E-06
Depth of Existing groundwater level to impervious layer	H	3.21
Depth of Required groundwater level to impervious layer after drawdown	h	2.00
Excavation Area	A	1944.30
Radius of influence from edge of excavation	$R_{sichardt}$	4.11
Effective Radius of excavation √(ab/π)	R_{eff}	24.88
Total Radius of Influence ($R_{sichardt}$ + R_{eff})	R_{total}	28.98
Discharge (m^3/sec)		
$Q = (\pi K(H^2-h^2))/Ln(R_{total}/R_{eff})$	**Q**	1.66E-04
Discharge (m^3/day)		14.33
Discharge (m^3/day) with FS=1.5		21.50
Total Permanent Dewatering Quantity (m^3/day)	**Q_{perm}**	**21.50**

1942 Woodview Avenue

Dewatering Calculation (Without Basement)

Average Ground Level		133.50
Highest Groundwater level		132.61
Lowest level of excavation (1.2m below FFE of basement)		132.30
Dewatering target elevation (Lowest level of excavation -0.5m)		131.80
Elevation of assumed impervious layer		129.80
Height between static water level and assumed impervious layer		2.81
Height between required water level and assumed impervious layer		2.00

TEMPORARY DEWATERING CALCULATION

Permeability (Highest from 4 slug tests)	K	1.28E-06
Depth of Existing groundwater level to impervious layer	H	2.81
Depth of Required groundwater level to impervious layer after drawdown	h	2.00
Excavation Area	A	1944.30
Radius of influence from edge of excavation	$R_{sichardt}$	2.75
Effective Radius of excavation $\sqrt{(ab/\pi)}$	R_{eff}	24.88
Total Radius of Influence ($R_{sichardt} + R_{eff}$)	R_{total}	27.63
Discharge (m^3/sec)		
$Q = (\pi K(H^2-h^2))/Ln(R_{total}/R_{eff})$	**Q**	1.49E-04
Discharge (m^3/day)		12.91
Discharge (m^3/day) with FS=1.5		19.37
Considering max daily rainfall 25mm, Q =m^3/Day		48.61
Total Temporary Dewatering Quantity (m^3/day)	**Q_{temp}**	**67.98**

APPENDIX D

GROUND WATER CHEMISTRY PLOTTED AGAINST REGION OF DURHAM SEWER USE BYLAW

Certificate of Analysis

Client: Canada Engineering Services Limited
39 Davisbrook Blvd
Scarborough, Ontario
M1T 2H6
Attention: Mr. Ram Jagdat
PO#:
Invoice to: Canada Engineering Services Limited

Report Number: 1965249
Date Submitted: 2021-10-19
Date Reported: 2021-11-02
Project: 1942 Woodview Ave., Pickering, ON
COC #: 212533

Dear Ram Jagdat:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Revision 1: This is an amendment and supersedes all other copies of this report issued on 2021-10-27. The project has been revised to "1942 Woodview Ave., Pickering, ON" as per client's request.

APPROVAL: _____
Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: http://www.cala.ca/scopes/2602.pdf.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

eurofins | Environment Testing

Client: Canada Engineering Services Limited
39 Davisbrook Blvd
Scarborough, Ontario
M1T 2H6
Attention: Mr. Ram Jagdat
PO#:
Invoice to: Canada Engineering Services Limited

Report Number: 1965249
Date Submitted: 2021-10-19
Date Reported: 2021-11-02
Project: 1942 Woodview Ave., Pickering, ON
COC #: 212533

				Lab I.D.	1590274
				Sample Matrix	WW
				Sample Type	
				Sampling Date	2021-10-18
				Sample I.D.	Sample 1 BH8
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
General Chemistry	BOD5	1	mg/L	MAC 15	1
	Cyanide (total)	0.005	mg/L	MAC 0.020	<0.005
	pH	1.00		6.0-9.0	7.81
	Total Suspended Solids	2	mg/L	MAC 15	391*
Mercury	Hg	0.0001	mg/L	MAC 0.0004	0.0001
Metals	Ag	0.01	mg/L	MAC 0.120	<0.01
	Aqua-Regia Digest				Y
	As	0.02	mg/L	MAC 0.020	<0.02
	Cd	0.008	mg/L	MAC 0.008	<0.008
	Cr	0.05	mg/L	MAC 0.080	<0.05
	Cu	0.01	mg/L	MAC 0.050	0.02
	Mn	0.01	mg/L	MAC 0.150	0.30*
	Ni	0.01	mg/L	MAC 0.080	<0.01
	Pb	0.01	mg/L	MAC 0.120	<0.01
	Se	0.02	mg/L	MAC 0.020	<0.02
	Zn	0.04	mg/L	MAC 0.040	<0.04
Microbiology	Escherichia Coli	0	ct/100mL	MAC 200	0
Nutrients	Total Kjeldahl Nitrogen	0.100	mg/L	MAC 1	1.24*
	Total P	0.020	mg/L	MAC 0.400	0.058
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	MAC 0.4	<0.1
Semi-Volatiles	Bis(2-ethylhexyl)phthalate	0.4	ug/L	MAC 8.8	0.5
	Di-n-butylphthalate	1.3	ug/L	MAC 15.0	<1.3
Subcontract-Inorg	Phenols	0.004	mg/L	MAC 0.008	<0.004
VOCs Surrogates	1,2-dichloroethane-d4	0	%		76
	4-bromofluorobenzene	0	%		98

Guideline = Storm Sewer - Durham

*** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

eurofins | Environment Testing

Client: Canada Engineering Services Limited
39 Davisbrook Blvd
Scarborough, Ontario
M1T 2H6
Attention: Mr. Ram Jagdat
PO#:
Invoice to: Canada Engineering Services Limited

Report Number: 1965249
Date Submitted: 2021-10-19
Date Reported: 2021-11-02
Project: 1942 Woodview Ave., Pickering, ON
COC #: 212533

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. 1590274 WW 2021-10-18 Sample 1 BH8
VOCs Surrogates	Toluene-d8	0	%		92
Volatiles	1,1,2,2-tetrachloroethane	0.5	ug/L	MAC 17.0	<0.5
	1,2-dichlorobenzene	0.4	ug/L	MAC 5.6	<0.4
	1,4-dichlorobenzene	0.4	ug/L	MAC 6.8	<0.4
	Benzene	0.5	ug/L	MAC 2.0	<0.5
	c-1,2-Dichloroethylene	0.4	ug/L	MAC 5.6	<0.4
	Chloroform	0.5	ug/L	MAC 2.0	<0.5
	Dichloromethane	4.0	ug/L	MAC 5.2	<4.0
	Ethylbenzene	0.5	ug/L	MAC 2.0	<0.5
	m/p-xylene	0.4	ug/L		<0.4
	o-xylene	0.4	ug/L		<0.4
	t-1,3-Dichloropropylene	0.2	ug/L	MAC 5.6	<0.2
	Tetrachloroethylene	0.3	ug/L	MAC 4.4	<0.3
	Toluene	0.5	ug/L	MAC 2.0	<0.5
	Trichloroethylene	0.3	ug/L	MAC 8.0	<0.3
	Xylene; total	0.5	ug/L	MAC 4.4	<0.5

Guideline = Storm Sewer - Durham *** = Guideline Exceedence**

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Client: Canada Engineering Services Limited
39 Davisbrook Blvd
Scarborough, Ontario
M1T 2H6
Attention: Mr. Ram Jagdat
PO#:
Invoice to: Canada Engineering Services Limited

Report Number: 1965249
Date Submitted: 2021-10-19
Date Reported: 2021-11-02
Project: 1942 Woodview Ave., Pickering, ON
COC #: 212533

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 410652 **Analysis/Extraction Date** 2021-10-25 **Analyst** C M **Method** B 625/P 8270			
Bis(2-ethylhexyl)phthalate	<0.4 ug/L	104	20-140
Di-n-butylphthalate	<1.3 ug/L	92	20-140
Run No 410677 **Analysis/Extraction Date** 2021-10-21 **Analyst** L V **Method** AMBCOLM1			
Escherichia Coli			
Run No 410781 **Analysis/Extraction Date** 2021-10-21 **Analyst** AaN **Method** M SM3112B-3500B			
Mercury	<0.0001 mg/L	114	76-123
Run No 410785 **Analysis/Extraction Date** 2021-10-26 **Analyst** AK **Method** SM 5210B			
BOD5	<1 mg/L	76	75-125
Run No 410817 **Analysis/Extraction Date** 2021-10-21 **Analyst** YH **Method** EPA 8260			
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	100	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	82	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	85	60-130
Benzene	<0.5 ug/L	88	60-130

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Dichloroethylene, 1,2-cis-	<0.4 ug/L	87	60-130
Chloroform	<0.5 ug/L	90	60-130
Methylene Chloride	<4.0 ug/L	117	60-130
Ethylbenzene	<0.5 ug/L	82	60-130
m/p-xylene	<0.4 ug/L	84	60-130
o-xylene	<0.4 ug/L	91	60-130
Dichloropropene,1,3-trans-	<0.2 ug/L	84	60-130
Tetrachloroethylene	<0.3 ug/L	81	60-130
Toluene	<0.5 ug/L	88	60-130
Trichloroethylene	<0.3 ug/L	88	60-130
Run No 410819 **Analysis/Extraction Date** 2021-10-22 **Analyst** YH **Method** EPA 8260			
Xylene Mixture	<0.5 ug/L		
Run No 410831 **Analysis/Extraction Date** 2021-10-22 **Analyst** AET **Method** EPA 365.1			
Total P	<0.020 mg/L	103	80-120
Run No 410859 **Analysis/Extraction Date** 2021-10-22 **Analyst** AaN **Method** EPA 200.8			
Silver	<0.01 mg/L	80	70-130

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Aqua-Regia Digest			
Arsenic	<0.02 mg/L	89	70-130
Cadmium	<0.008 mg/L	99	70-130
Chromium Total	<0.05 mg/L	96	70-130
Copper	<0.01 mg/L	105	70-130
Manganese	<0.01 mg/L	95	70-130
Nickel	<0.01 mg/L	98	70-130
Lead	<0.01 mg/L	93	70-130
Selenium	<0.02 mg/L	101	70-130
Zinc	<0.04 mg/L	62	70-130
Run No 410896 **Analysis/Extraction Date** 2021-10-22 **Analyst** AET **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	102	70-130
Run No 410910 **Analysis/Extraction Date** 2021-10-24 **Analyst** AK **Method** C SM2540			
Total Suspended Solids	<2 mg/L	97	90-110
Run No 410988 **Analysis/Extraction Date** 2021-10-25 **Analyst** AsA **Method** SM2320,2510,4500H/F			
pH		99	90-110

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 410995 **Analysis/Extraction Date** 2021-10-25 **Analyst** AET **Method** SUBCONTRACT P-INORG			
Phenols	<0.001 mg/L	92	69-132
Run No 410996 **Analysis/Extraction Date** 2021-10-25 **Analyst** Z S **Method** SM4500-CNC/MOE E3015			
Cyanide (total)	<0.005 mg/L	108	61-139
Run No 411032 **Analysis/Extraction Date** 2021-10-26 **Analyst** R G **Method** EPA 8081B			
Polychlorinated Biphenyls	<0.1 ug/L	116	60-140

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Sample Comment Summary

Sample ID: 1590274	Sample 1 BH8	Devation from standard protocol. Bacteria analysis is past the 48 hour hold time if taken was taken prior to 12:00 on October 18 2021.	

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Date Reported: 2021-11-02
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COC #: 212533

Dear Ram Jagdat:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Revision 1: This is an amendment and supersedes all other copies of this report issued on 2021-10-27. The project has been revised to "1942 Woodview Ave., Pickering, ON" as per client's request.

APPROVAL: _____
Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: http://www.cala.ca/scopes/2602.pdf.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

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Report Number: 1965109
Date Submitted: 2021-10-19
Date Reported: 2021-11-02
Project: 1942 Woodview Ave., Pickering, ON
COC #: 212533

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1590273 WW 2021-10-18 Sample 1 BH8
Anions	F	0.10	mg/L	MAC 10	0.10
	SO4	1	mg/L	MAC 1500	29
General Chemistry	BOD5	1	mg/L	MAC 300	<1
	Cyanide (total)	0.005	mg/L	MAC 2	<0.005
	pH	1.00		6.0-10.5	7.57
	Total Suspended Solids	2	mg/L	MAC 350	1020*
Mercury	Hg	0.0001	mg/L	MAC 0.01	0.0001
Metals	Ag	0.01	mg/L	MAC 5	<0.01
	Al	0.1	mg/L	MAC 50	22.1
	Aqua-Regia Digest				Y
	As	0.02	mg/L	MAC 1	<0.02
	Cd	0.008	mg/L	MAC 0.7	<0.008
	Co	0.01	mg/L	MAC 5	0.01
	Cr	0.05	mg/L	MAC 2	<0.05
	Cu	0.01	mg/L	MAC 3	0.05
	Mn	0.01	mg/L	MAC 5	1.03
	Mo	0.01	mg/L	MAC 5	<0.01
	Ni	0.01	mg/L	MAC 2	0.03
	Pb	0.01	mg/L	MAC 1	0.02
	Sb	0.01	mg/L	MAC 5	<0.01
	Se	0.02	mg/L	MAC 1	<0.02
	Sn	0.1	mg/L	MAC 5	<0.1
	Ti	0.1	mg/L	MAC 5	0.1
	Zn	0.04	mg/L	MAC 2	<0.04
Nutrients	Total Kjeldahl Nitrogen	0.500	mg/L	MAC 100	1.84

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				Lab I.D.	1590273
				Sample Matrix	WW
				Sample Type	
				Sampling Date	2021-10-18
				Sample I.D.	Sample 1 BH8
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
Nutrients	Total P	0.020	mg/L	MAC 10	1.33
Oil and Grease	Oil & Grease - Mineral	1	mg/L	MAC 15	<1
	Oil & Grease - Non-mineral	1	mg/L	MAC 150	<1
	Oil & Grease - Total	1	mg/L		<1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	MAC 1	<0.1
Semi-Volatiles	Bis(2-ethylhexyl)phthalate	0.4	ug/L	MAC 12	<0.4
	Di-n-butylphthalate	1.3	ug/L	MAC 80	<1.3
Subcontract	Nonylphenol Ethoxalate (Total)	2.0	ug/L	MAC 200	<2.0
	Nonylphenols (Total)	1.0	ug/L	MAC 20	<1.0
Subcontract-Inorg	Phenols	0.004	mg/L	MAC 1.0	<0.004
VOCs Surrogates	1,2-dichloroethane-d4	0	%		74
	4-bromofluorobenzene	0	%		99
	Toluene-d8	0	%		92
Volatiles	1,1,2,2-tetrachloroethane	0.5	ug/L	MAC 1400	<0.5
	1,2-dichlorobenzene	0.4	ug/L	MAC 50	<0.4
	1,4-dichlorobenzene	0.4	ug/L	MAC 80	<0.4
	Benzene	0.5	ug/L	MAC 10	<0.5
	c-1,2-Dichloroethylene	0.4	ug/L	MAC 4000	<0.4
	Chloroform	0.5	ug/L	MAC 40	<0.5
	Dichloromethane	4.0	ug/L	MAC 2000	<4.0
	Ethylbenzene	0.5	ug/L	MAC 160	<0.5
	m/p-xylene	0.4	ug/L		<0.4
	Methyl Ethyl Ketone (MEK)	10	ug/L	MAC 8000	<10
	o-xylene	0.4	ug/L		<0.4
	Styrene	0.5	ug/L	MAC 200	<0.5

Guideline = Sanitary Sewer - Durham

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. 1590273 WW 2021-10-18 Sample 1 BH8
Volatiles	t-1,3-Dichloropropylene	0.2	ug/L	MAC 140	<0.2
	Tetrachloroethylene	0.3	ug/L	MAC 1000	<0.3
	Toluene	0.5	ug/L	MAC 270	<0.5
	Trichloroethylene	0.3	ug/L	MAC 400	<0.3
	Xylene; total	0.5	ug/L	MAC 1400	<0.5

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 410652 **Analysis/Extraction Date** 2021-10-25 **Analyst** C M **Method** B 625/P 8270			
Bis(2-ethylhexyl)phthalate	<0.4 ug/L	104	20-140
Di-n-butylphthalate	<1.3 ug/L	92	20-140
Run No 410785 **Analysis/Extraction Date** 2021-10-26 **Analyst** AK **Method** SM 5210B			
BOD5	<1 mg/L	76	75-125
Run No 410813 **Analysis/Extraction Date** 2021-10-21 **Analyst** RHH **Method** SM 5520B/F			
Oil & Grease - Mineral	<1 mg/L	80	60-120
Oil & Grease - Non-mineral	<1 mg/L		60-120
Oil & Grease - Total	<1 mg/L	85	60-120
Run No 410817 **Analysis/Extraction Date** 2021-10-21 **Analyst** YH **Method** EPA 8260			
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	100	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	82	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	85	60-130
Benzene	<0.5 ug/L	88	60-130
Dichloroethylene, 1,2-cis-	<0.4 ug/L	87	60-130

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Chloroform	<0.5 ug/L	90	60-130
Methylene Chloride	<4.0 ug/L	117	60-130
Ethylbenzene	<0.5 ug/L	82	60-130
m/p-xylene	<0.4 ug/L	84	60-130
Methyl Ethyl Ketone	<10 ug/L	100	60-130
o-xylene	<0.4 ug/L	91	60-130
Styrene	<0.5 ug/L	87	60-130
Dichloropropene,1,3-trans-	<0.2 ug/L	84	60-130
Tetrachloroethylene	<0.3 ug/L	81	60-130
Toluene	<0.5 ug/L	88	60-130
Trichloroethylene	<0.3 ug/L	88	60-130
Run No 410819 **Analysis/Extraction Date** 2021-10-22 **Analyst** YH **Method** EPA 8260			
Xylene Mixture	<0.5 ug/L		
Run No 410831 **Analysis/Extraction Date** 2021-10-22 **Analyst** AET **Method** EPA 365.1			
Total P	<0.020 mg/L	103	80-120
Run No 410854 **Analysis/Extraction Date** 2021-10-22 **Analyst** AaN **Method** M SM3112B-3500B			

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Mercury	<0.0001 mg/L	115	76-123
Run No 410859 **Analysis/Extraction Date** 2021-10-22 **Analyst** AaN **Method** EPA 200.8			
Silver	<0.01 mg/L	80	70-130
Aluminum	<0.1 mg/L	90	70-130
Aqua-Regia Digest			
Arsenic	<0.02 mg/L	89	70-130
Cadmium	<0.008 mg/L	99	70-130
Cobalt	<0.01 mg/L	94	70-130
Chromium Total	<0.05 mg/L	96	70-130
Copper	<0.01 mg/L	105	70-130
Manganese	<0.01 mg/L	95	70-130
Molybdenum	<0.01 mg/L	87	70-130
Nickel	<0.01 mg/L	98	70-130
Lead	<0.01 mg/L	93	70-130
Antimony	<0.01 mg/L	92	70-130
Selenium	<0.02 mg/L	101	70-130
Sn	<0.1 mg/L	72	70-130

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Zinc	<0.04 mg/L	62	70-130
Run No 410887 **Analysis/Extraction Date** 2021-10-24 **Analyst** SWS **Method** SM 4110			
SO4	<1 mg/L	95	90-110
Run No 410896 **Analysis/Extraction Date** 2021-10-22 **Analyst** AET **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	102	70-130
Run No 410902 **Analysis/Extraction Date** 2021-10-24 **Analyst** SD **Method** EPA 200.8			
Titanium	<0.1 mg/L		80-120
Run No 410903 **Analysis/Extraction Date** 2021-10-22 **Analyst** AsA **Method** SM2320,2510,4500H/F			
F	<0.10 mg/L	110	90-110
pH		99	90-110
Run No 410910 **Analysis/Extraction Date** 2021-10-24 **Analyst** AK **Method** C SM2540			
Total Suspended Solids	<2 mg/L	97	90-110
Run No 410995 **Analysis/Extraction Date** 2021-10-25 **Analyst** AET **Method** SUBCONTRACT P-INORG			

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Phenols	<0.001 mg/L	92	69-132
Run No 410996 **Analysis/Extraction Date** 2021-10-25 **Analyst** Z S **Method** SM4500-CNC/MOE E3015			
Cyanide (total)	<0.005 mg/L	108	61-139
Run No 411032 **Analysis/Extraction Date** 2021-10-26 **Analyst** R G **Method** EPA 8081B			
Polychlorinated Biphenyls	<0.1 ug/L	116	60-140
Run No 411147 **Analysis/Extraction Date** 2021-10-26 **Analyst** AET **Method** SUBCONTRACT-A			
Nonylphenol Ethoxalate (Total)			
Nonylphenols (Total)	<1.0 ug/L	94	

Guideline = Sanitary Sewer - Durham *** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

eurofins 212533

STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

Eurofins Workorder #: 1465109

CLIENT INFORMATION

Company: Canada Engineering Services Inc
Contact: Ram Jagdat , Lawrence Yu
Address: 39 Davis brook blvd
Telephone: 416 642 4000 Cell:
Email: #1: Ram@CESI.ca
Email: #2: lawrence@CESI.ca
Project: 600 Queen St S Quote #:

INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☐ NO ☐)

Company: Fax:
Contact: Email: #1:
Address: Email: #2:
Telephone: PO #:

TURN-AROUND TIME (Business Days)

☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☒ 5-7 Days (Standard)

Please contact Lab in advance to determine rush availability.
*For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.
**For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

REGULATION/GUIDELINE REQUIRED

☑ Sanitary Sewer, City:
☑ Storm Sewer, City:
☐ ODWSOG
☐ PWQO
☐ O. Reg 347/558
☐ Other:
☐ None

☐ O. Reg 153

Table # ___, Course / Fine, Surface / subsurface.
Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment

☐ Excess Soil, Table: Type:

The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04
☐ Yes ☐ No

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. **Note that this COC is not to be used for drinking water samples.** The COC must be complete upon submission of the samples, there will be a $25 surcharge if required information is missing (required fields are shaded in grey).

Sample ID	Date/Time Collected	Sample Matrix	# of Containers	O.Reg.153 parameters: PHC F1 - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganics	Metals only	Sanitary Sewer	Storm Sewer	RN# (Lab Use Only)
Sample 1 BH8	Oct/18/21	WW	11								X		1590273
Sample 1 BH8	Oct/18/21	WW	10									X	274

Region of Durham

	PRINT	SIGN	DATE/TIME	TEMP (°C)
Sampled By:	Surya Kadam		18 Oct, 2021	
Relinquished By:	Ram Jagdat			
Received By:	Victor Gallardo		10/19/21 4:02 p.m.	17.8°C

COMMENTS: As per Lawrence NC

CUSTODY SEAL: ☐ YES ☐ NO Ice packs submitted: ☑ Yes ☐ No