TDC Terra-Dynamics Consulting Inc.
432 Niagara Street, Unit 2 St. Catharines, ON L2M 4W3

November 20, 2024

Losani Homes
Attn: Daniel Borelli, M.PL.
430 McNeilly Road, Suite 203
Stoney Creek, ON L8E 5E3

Re: Hydrogeological Assessment/Dewatering Study – 127 Plains Road West, Burlington, Region of Halton, ON

Dear Mr. Borelli,

1.0 Introduction, Background Information and Purpose

Terra-Dynamics Consulting Inc. (Terra-Dynamics) respectfully submits this Hydrogeological Assessment/Dewatering Study for re-development of 127 Plains Road West, Burlington (Site, Figure 1). Losani Homes is planning to construct a 24-Story residential condominium building with three levels of underground parking (Chamberlain Architect Services Limited, 2022).

The City of Burlington (2023) have historically provided details of components to be included in the Hydrogeology Assessment/ Dewatering Study, and have included the following:

1. *Indicates if a Permit to Take Water would be required during construction.*
2. *Includes testing of groundwater to ensure it meets municipal stormwater discharge criteria.*
3. *Provides sufficient monitoring data to address groundwater level seasonality.*

This Hydrogeological Assessment/Dewatering Study has been completed in support of an Official Plan Amendment/Zoning By-Law Amendment application.

2.0 Methodology

The following methodologies were used to investigate the Site:

A. Assessment of regional information including topography, overburden soils, bedrock and Ministry of the Environment, Conservation and Parks (MECP) water well records;

B. Review of geotechnical and environmental reporting for the Site including calculation of soil hydraulic conductivity via grain-size analyses (Soil-Mat Engineers & Consultants Ltd., 2024);

C. Investigation of Site conditions through (i) groundwater level monitoring from late-spring to early fall 2024 , (ii) groundwater sampling to conform with the City of Burlington Stormsewer By-law criteria (2022) and (iii) in-situ hydraulic conductivity testing of on-site monitoring wells to characterize the permeability of subsurface geologic materials;

D. Preparation of a description of the hydrogeological setting using the geotechnical/geological information, water levels and *in-situ* hydraulic conductivity testing; and

E. Completion of a Groundwater Dewatering Assessment.

3.0 Physical Setting

The Site is municipally serviced (water and sewage) and within the City of Burlington and Halton Region.

The ground surface elevation is approximately between 102.5 and 103 metres above sea level (m ASL) (Figure 3, City of Burlington, 2021).

Conservation Halton (2019) have mapped a subwatershed divide through the Site, with most of the Site within (a) the West Aldershot Subwatershed of the Northshore Watershed Area and (b) a small portion of the western part of the Site within the Grindstone Creek Watershed 230 (Figure 1). The City of Burlington has mapped (a) the Aldershot watercourse as approximately 280 m east of the Site and (b) Grindstone Creek as 270 m northwest of the Site.

The Site is within Conservation Halton (CH), however no CH-mapped regulated vulnerable areas are located on-Site.

3.1 Regional Geology

The Site is located within the Iroquois Plain Physiographic Region (Chapman and Putnam, 1984) which is typically described as “covered in layers of fine silty sands” (Halton Region Source Protection Authority, 2022).

The regional surficial geology is mapped as a combination of beach gravel, and sand, in the western and eastern portions of the Site, respectively (Figure 2, OGS, 2003) and has been regionally estimated as about 23 metres thick (Charlesworth & Associates and SNC-Lavalin, 2006).

The underlying bedrock is Queenston Formation, comprised of shales with minor interbeds of siltstones and limestones averaging 100 m in thickness (Singer et al, 2003) and extending further than 200 metres radially from the Site (Armstrong and Dodge, 2007). The bedrock regionally dips towards Lake Ontario and was regionally estimated as at about 80 m ASL (Charlesworth & Associates and SNC-Lavalin, 2006).

3.1.1 Site Geology

On April 29 to May 7, 2024, eight boreholes were completed by Soil-Mat to between 14 and 32 metres below ground surface (m BGS), and eight monitoring wells were constructed (Figures 2 and 3, Appendix A, Soil-Mat, 2024). The following summarizes the drilling program:

1. Overburden boreholes were advanced by hollow-stem augers and split-spoon sampling. Beneath the pavement, the soils were generally sand/sand and gravel fill, underlain by sand and gravel to about 17 m BGS (Figure 2, Appendix A). However, in some cases a 1 to 3 m thick silty clay layer is present within this upper sand and gravel between 4 and 7 m BGS. Overlying the bedrock are a silty clay and a sandy silty gravel layer. Shale bedrock was encountered between 25.6 to 27.5 metres below ground surface (m BGS), or top of bedrock between 75.6 to 77.6 m ASL.

2. Bedrock boreholes were advanced in the shale using HQ coring (96 mm (2.5 inches) diameter). The shale bedrock was described as "*highly weathered in upper levels resembling a cohesive soil, becoming more sound with depth, hard*" (Soil-Mat, 2024). The calculated rock quality designation (RQD) was good (75-90%) to excellent (90-100%).

Geologic cross-sections were prepared using the above referenced borehole information to visualize the subsurface conditions (Figures 4, 5 and 6). Additional Ministry of the Environment, Conservation and Parks (MECP, 2024) monitoring well records were also incorporated to the southwest to further characterize the physical setting (Figure 2, Appendix A).

3.1.2 Geologic Units to be Excavated

Excavation for three basement levels is to proceed to approximately 10.3 m BGS (MHBC, 2024), or to an elevation of about 92.7 m ASL within sand, based upon an average ground surface of 103 m ASL (Figures 3, 4 and 5). The base of the sand unit was determined to be between 85.2 and 86.8 m ASL (Appendix A, Figures 3, 4 and 5), i.e. about 6 to 7.5 m below the estimated depth of excavation.

3.2 Groundwater

Eight groundwater monitoring wells were constructed with 3 m screens to monitor two groundwater systems (Figure 3, Table 1), these are the:

a) Sand Water Table Monitoring Wells (between 11 to 15.5 m BGS): 1B, 2, 3, 4, 5B and 6; and
b) Shale Potentiometric Surface Monitoring Wells (between 27.5 to 32 m BGS): 1A and 5A.

Manual groundwater level measurements were collected between late spring season and early fall season, 2024 (Table 1). Water level dataloggers were also installed for over three months to record groundwater levels at a 15-minute interval at three locations: (a) Sand Water Table (1B, 3 and 6).

3.2.1 Groundwater Levels

The sand groundwater table was manually monitored at six monitoring wells (MW1B, MW2, MW3, MW4, MW5B and MW6 (Figure 2). The depth to the water table was between 12.7 and 13.2 m BGS, or between 89.9 and 90.5 m ASL in elevation (Table 1, Figure 7).

Very little seasonal, or response to precipitation, variation was noted in the sand groundwater table over three months of water level datalogger monitoring (Appendix B). For example, groundwater levels at monitoring well MW1B varied less than 10 cm, at MW3 varied less than 20 cm and varied only 20 cm at MW6.

The deeper Shale Potentiometric Surface was measured at two monitoring wells (MW-1A and MW-6A, Figure 2). The groundwater level elevation of the potentiometric surface in the shale was between 13.2 and 15.3 m BGS, or between 87.8 and 89.0 m ASL in elevation (Table 1, Figure 7).

The vertical gradient between the Sand Water Table, and the Shale Potentiometric Surface was downwards as compared at two locations: MW1B/MW1A and MW5B/MW5A.

3.2.2 Groundwater Flow

Groundwater was observed to flow at a gradient of 0.009 m/m towards the south (Figure 3) in a similar direction to previous regional reporting (Charlesworth & Associates and SNC-Lavalin, 2006).

3.3 Hydraulic Conductivity Analyses

Two methods were used to determine on-site hydraulic conductivities (Figure 3, Appendix C):

(i) Laboratory grain size analyses and the Excel-tool HydrogeoSieveXL (Devlin, 2015, Table 2); and

(ii) In-situ hydraulic conductivity monitoring well testing (Table 3).

Table 2 – Grain-size Hydraulic Conductivity Analyses (Devlin, 2015)

Geologic Unit(s)	Location	Hydraulic Conductivity (m/s)	Depth (m BGS)
Poorly sorted sand with fines	BH2	$2x10^{-5}$	13.7
	BH4	$7x10^{-6}$	12.2
	BH6	$8x10^{-6}$	12.2
Geometric Mean		$1x10^{-5}$	
Poorly sorted clay with fines	BH1A	$1x10^{-9}$	19.8
	BH5A	$1x10^{-9}$	18.3
Poorly sorted sandy gravel with fines	BH1A	$2x10^{-6}$	24.4

Table 3 – In-situ Hydraulic Conductivity Analyses (Bouwer, 1989)

Geologic Unit	Location	Hydraulic Conductivity (m/s)	Depth (m BGS)
Sand	MW1B	$9x10^{-5}$	13.2-14.8
	MW2	$7x10^{-6}$	13.1-15.0
	MW3	$1x10^{-5}$	12.9-15.2
	MW4	$1x10^{-4}$	13.0-14.9
	MW5B	$3x10^{-6}$	12.9-13.9
	MW6	$6x10^{-5}$	13.1-14.4
Geometric Mean		$2x10^{-5}$	

The results presented in Tables 2 and 3 are shown on the hydrogeologic cross-sections (Figures 4, 5 and 6). The geometric mean value of $2x10^{-5}$ m/s for the sand is a reasonable value for this geologic unit (Fetter, 1994), with a maximum calculated value of $1x10^{-4}$ m/s at MW4. In-situ hydraulic conductivity testing of the monitoring wells was completed using a rising-head approach and analyzed in Aqtesolv™ using the Bouwer and Rice solution (Bouwer, 1989) as recommended when the water level is within the monitoring well screened interval (Bair, 2005).

3.4 Geologic Units to be Dewatered

Based on the proposed excavation depths, no geologic units should require dewatering for construction. The highest measured groundwater level of 90.5 m ASL is greater than 2 metres lower than the planned depth of construction to 92.7 m ASL.

3.5 Groundwater Quality Analyses

Unfiltered groundwater quality samples were collected June 20, 2024 from two sand water table monitoring wells: (i) MW-1B and (ii) MW-6. These groundwater samples were submitted to SGS Canada Inc. (an accredited Ontario laboratory) for laboratory analyses and comparison to the City of Burlington Sewer Use By-Law for Storm Sewer Discharge (Appendix D).

If dewatering from the sand was to occur, filtering would be required to meet the City of Burlington Storm Sewer Discharge criteria for total suspended solids (Appendix D). This filtering would be expected to also address only parameters which exceeded criteria when total but not for dissolved (Table 4).

Table 3 - Groundwater Quality Parameters Exceeding Storm Sewer Discharge Criteria

Parameter	Criterion	MW1B		MW6	
	(mg/L)	Total	Dissolved	Total	Dissolved
Arsenic	0.02	**0.0319**	0.0002	**0.0336**	<0.0002
Chromium	0.08	**0.106**	0.001	**0.157**	0.00192
Copper	0.04	**0.309**	0.001	**0.352**	<0.001
Manganese	0.05	**7.51**	0.0037	**9.82**	0.0007
Nickel	0.08	**0.171**	0.0007	**0.191**	0.0005
Phosphorus	0.4	**3.05**	<0.003	**4.23**	<0.003
Zinc	0.04	**0.385**	<0.002	**0.420**	<0.002

Notes: **Bolded values exceeded criterion**

3.6 Hydrogeologic Setting

The water table occurs within the sand and can be considered an unconfined unit. Excavation within the sand for the third underground parking level should not involve construction dewatering.

4.0 Groundwater Dewatering Assessment

As construction will occur above the water table, dewatering flow rates were not estimated for construction dewatering (Section 3.4).

As construction dewatering is not required, a Ministry of the Environment, Conservation & Parks (MECP) Environmental Activity and Sector Registry (EASR) temporary 'Construction Site Dewatering' application is also not required.

4.1 Other Dewatering Considerations

Ministry of the Environment, Conservation and Parks (MECP, 2023) water well records within 200 m were reviewed and the oldest records from 2011 were for monitoring wells not for water supplies, consequently no private water supplies are suggested to exist within this municipally serviced area for consideration in the dewatering assessment.

5.0 Conclusions and Recommendations

5.1 Conclusions

The following conclusions are provided:

1. Construction of 3 basement parking levels to 10.3 metres below ground surface, or to an elevation of about 92.7 m ASL, is predicted to be above the water table and should not require construction dewatering.

2. The water table at the Site is within an unconfined sand, observed to be as shallow as 12.7 metres below ground surface, or over 2 metres below the proposed depth of excavation; and

3. A Construction Dewatering EASR from the MECP is not required.

5.2 Recommendations

The following recommendation is provided for your consideration:

1. Prior to construction, the on-Site monitoring wells should be decommissioned using an MECP licensed well contractor.

6.0 Limitations

Subsurface dewatering assessments, by their nature, have inherent limitations and uncertainties primarily due to the heterogeneities in geologic conditions causing differences in hydraulic conductivity, hydraulic gradients and pressures in areas of a site not investigated by boreholes and/or monitoring wells. It is believed that these uncertainties have been addressed through conservative interpretation of other existing regional-based geologic conditions and site-specific data at the places investigated. Conditions may vary in the subsurface at places not investigated. The assessment of dewatering potential, including the evaluation of risk and/or impact, is valid only for the assumptions and conditions outlined in this report and the conditions as they were observed at the time of the investigation. Should knowledge of the site conditions change, the assessments of risks posed by the site may differ from that presented in this report.

This report was prepared by Terra-Dynamics Consulting Inc. for Losani Homes. The material in it reflects Terra-Dynamics' best judgment in light of the information available to Terra-Dynamics at the time of preparation of this report. Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibility of such third parties. Terra-Dynamics accepts no responsibility for damages, if any, suffered by any third parties as a result of decisions made, or actions taken, based on this report.

We trust this information is sufficient. Please do not hesitate to contact us if you have any questions or require additional information for your review.

Yours truly,

TERRA-DYNAMICS CONSULTING INC.



Jayme D. Campbell, P.Eng.
Senior Water Resource Engineer

Attachments
Figure 1 – Site Location
Figure 2 – Borehole/Monitoring Well Locations
Figure 3 – Site Details
Figure 4 – Hydrogeologic Cross Section A-A'
Figure 5 – Hydrogeologic Cross Section B-B'
Figure 6 – Hydrogeologic Cross Section C-C'
Figure 7 – Manual Groundwater Levels
Table 1 – Manual Groundwater Levels
Appendix A – Borehole/Monitoring Well Logs
Appendix B – Water Level Datalogger Plots
Appendix C – Hydraulic Conductivity Analyses
Appendix D – Laboratory Analyses

7.0 References

Armstrong, D.K., and Dodge, J.E.P., 2007. Paleozoic geology of southern Ontario; Ontario Geological Survey, Miscellaneous Release – Data 219.

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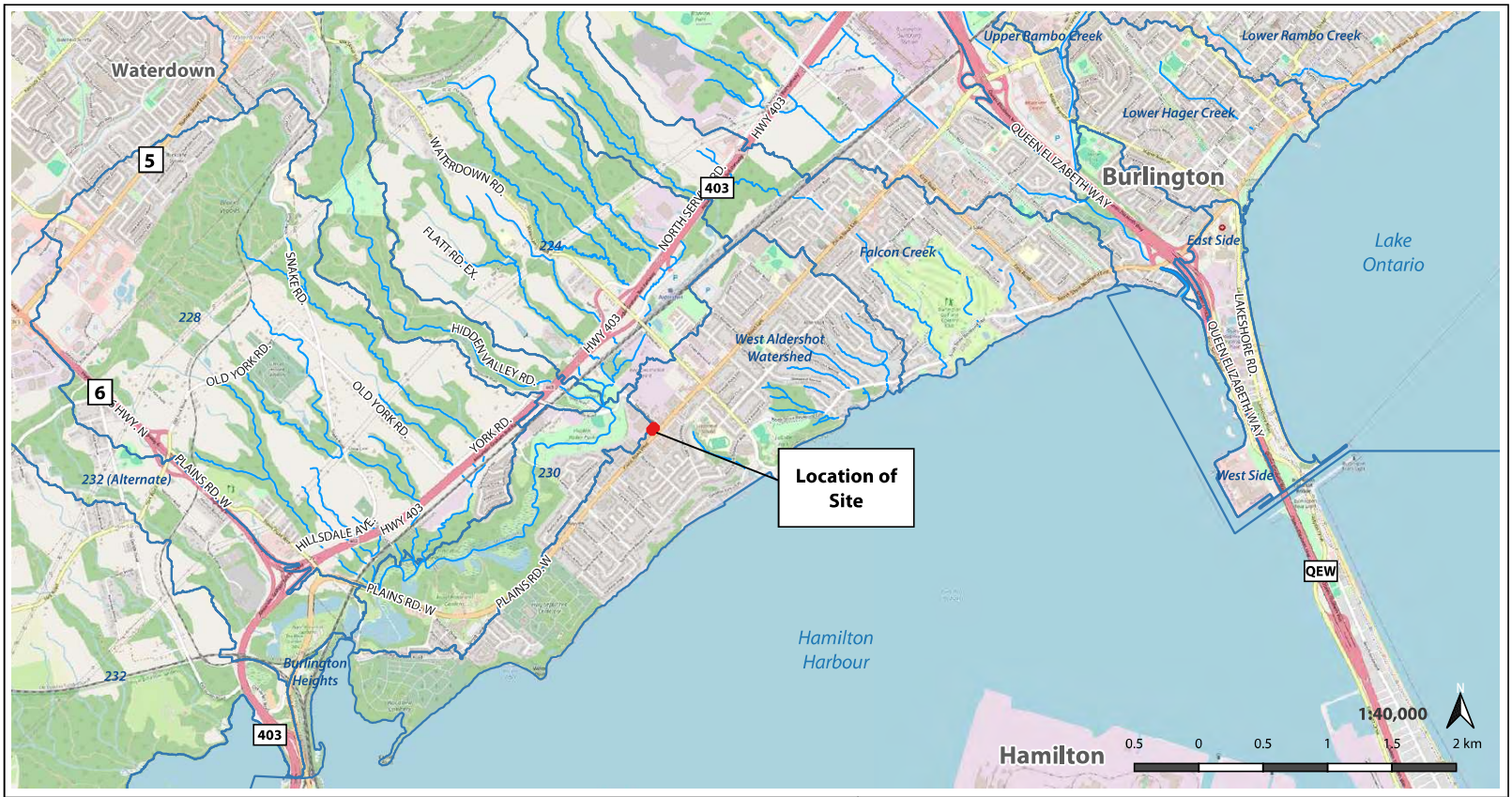
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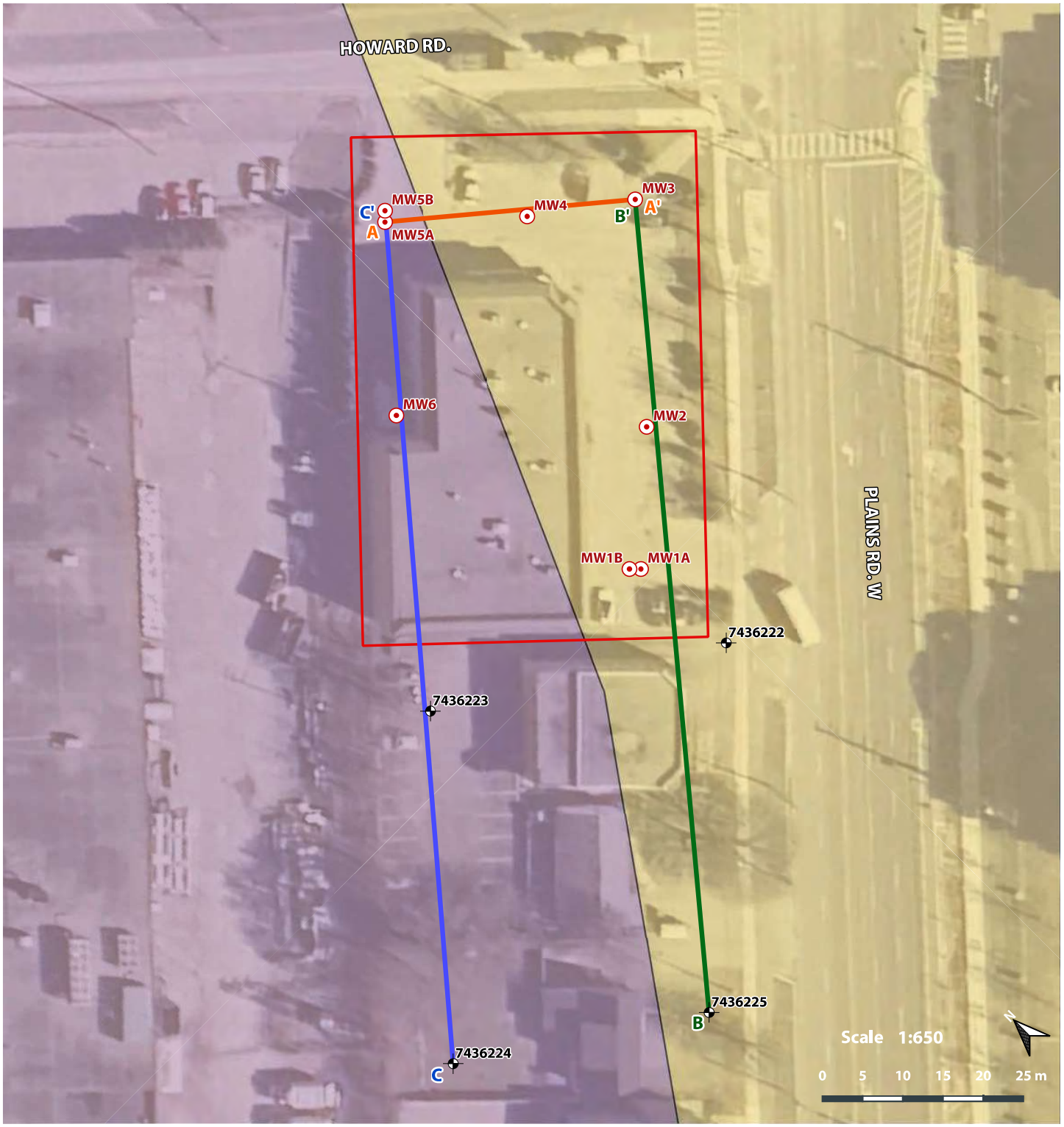
Map Date: 2024-06-26
D:\TerraDynamics\Projects\127 Plains Road\ProjectFiles\Figure 1 - Site Location.qgz

Location of Site

127 Plains Road West, Burlington, ON
Hydrogeological Assessment/Dewatering Study

Terra-Dynamics Consulting Inc.

Figure 1



- On-Site Boreholes
- MECP Water Well Records Used in Cross-Sections
- Site

Hydrogeologic Cross-Sections
- A-A'
- B-B'
- C-C'

Surficial Geology
- Gravel
- Sand

References: Ministry of Environment, Conservation and Parks: Drilled Water Wells, 2024. Ontario Geological Survey: Surficial Geology

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Map Date: 2024-07-03

Borehole/Monitoring Well Locations

127 Plains Road West, Burlington, ON
Hydrogeological Assessment/Dewatering Study

Terra-Dynamics Consulting Inc.

Prepared For:
Losani Homes

Figure 2



On-Site Boreholes with Groundwater Water Levels

- Sand Water Table Monitoring Well
- Shale Monitoring Well
- Water Table Contours (mASL, June 20, 2024)
- Ground Surface Countours (0.5m)
- Site

Water Table Groundwater Flow Direction

127 Plains Road West, Burlington, ON
Hydrogeological Assessment/Dewatering Study

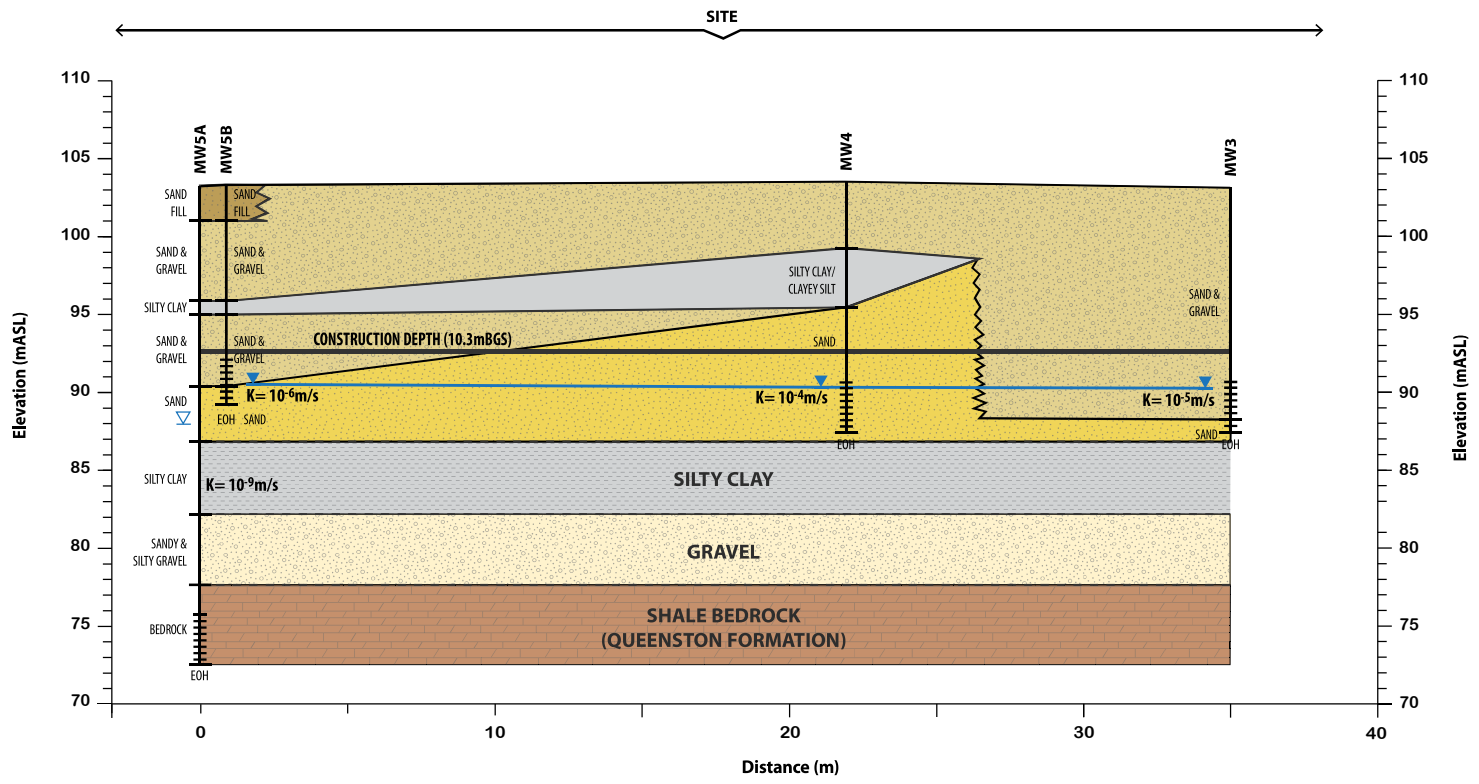
Terra-Dynamics Consulting Inc.

Prepared For:
Losani Homes

Figure 3

References: City of Burlington Open data: Contours at https://navburl-burlington.opendata.arcgis.com/datasets/Burlington::contours/explore
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Map Date: 2024-07-03



Groundwater Level June 20, 2024

- Water Table
- Potentiometric Surface
- Water Table
- EOH End of Hole
- K = Hydraulic Conductivity (m/s)

- Sand Fill
- Sand & Gravel
- Silty Clay/Clayey Silt
- Sand
- Silty Clay
- Gravel
- Shale Bedrock

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November 19, 2024

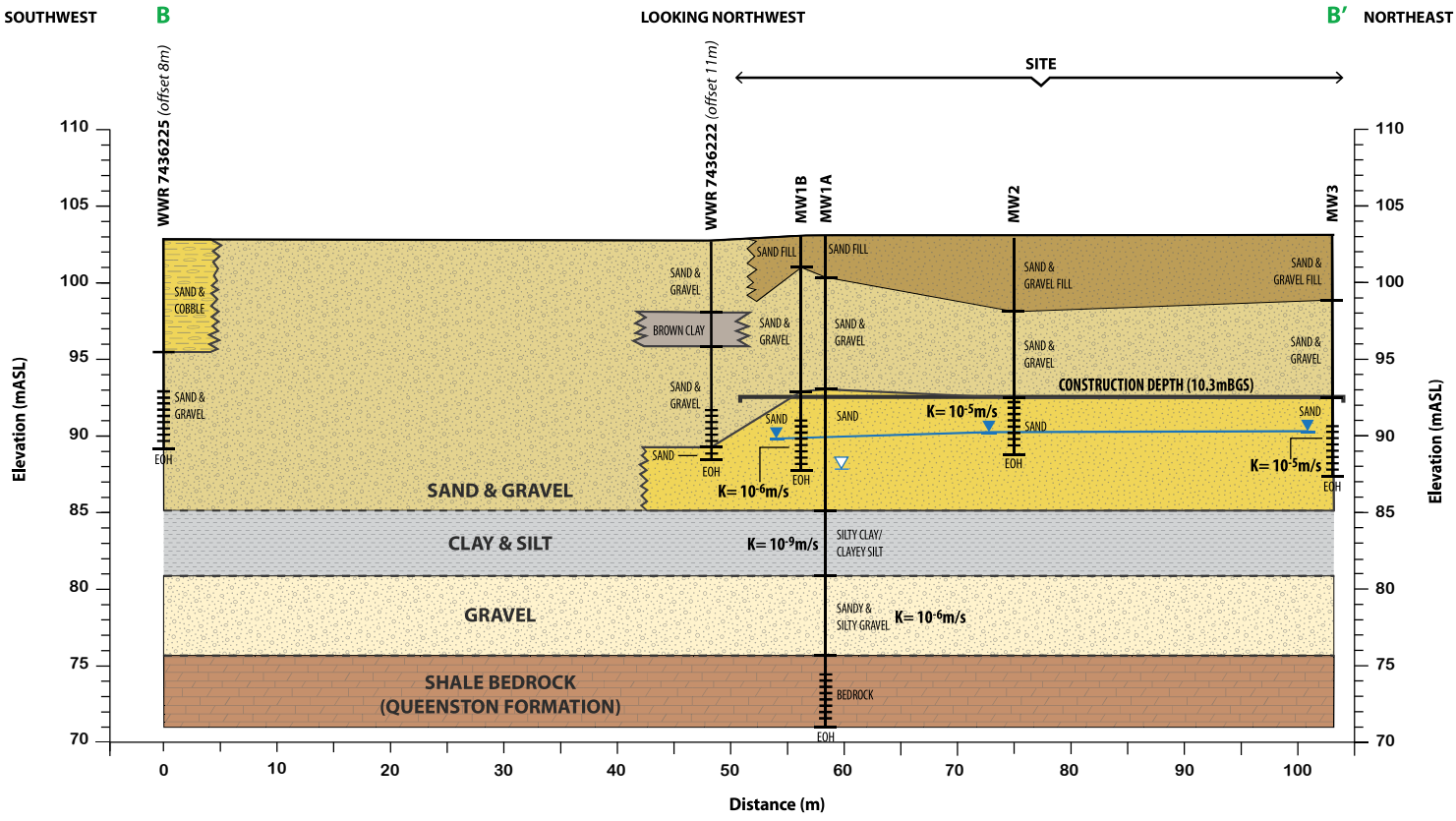
Hydrogeologic Cross-Section A-A'

127 Plains Road West, Burlington, ON
Hydrogeological Assessment/Dewatering Study

Terra-Dynamics Consulting Inc.

Prepared For: Losani Homes

Figure 4



Groundwater Level June 20, 2024

- Water Table
- Potentiometric Surface
- Water Table
- EOH End of Hole
- K = Hydraulic Conductivity (m/s)

- Sand & Cobble
- Sand & Sand/Gravel Fill
- Sand & Gravel
- Brown Clay
- Sand
- Silt & Clay
- Gravel
- Shale Bedrock

Hydrogeologic Cross-Section B-B′

127 Plains Road West, Burlington, ON
Hydrogeological Assessment/Dewatering Study

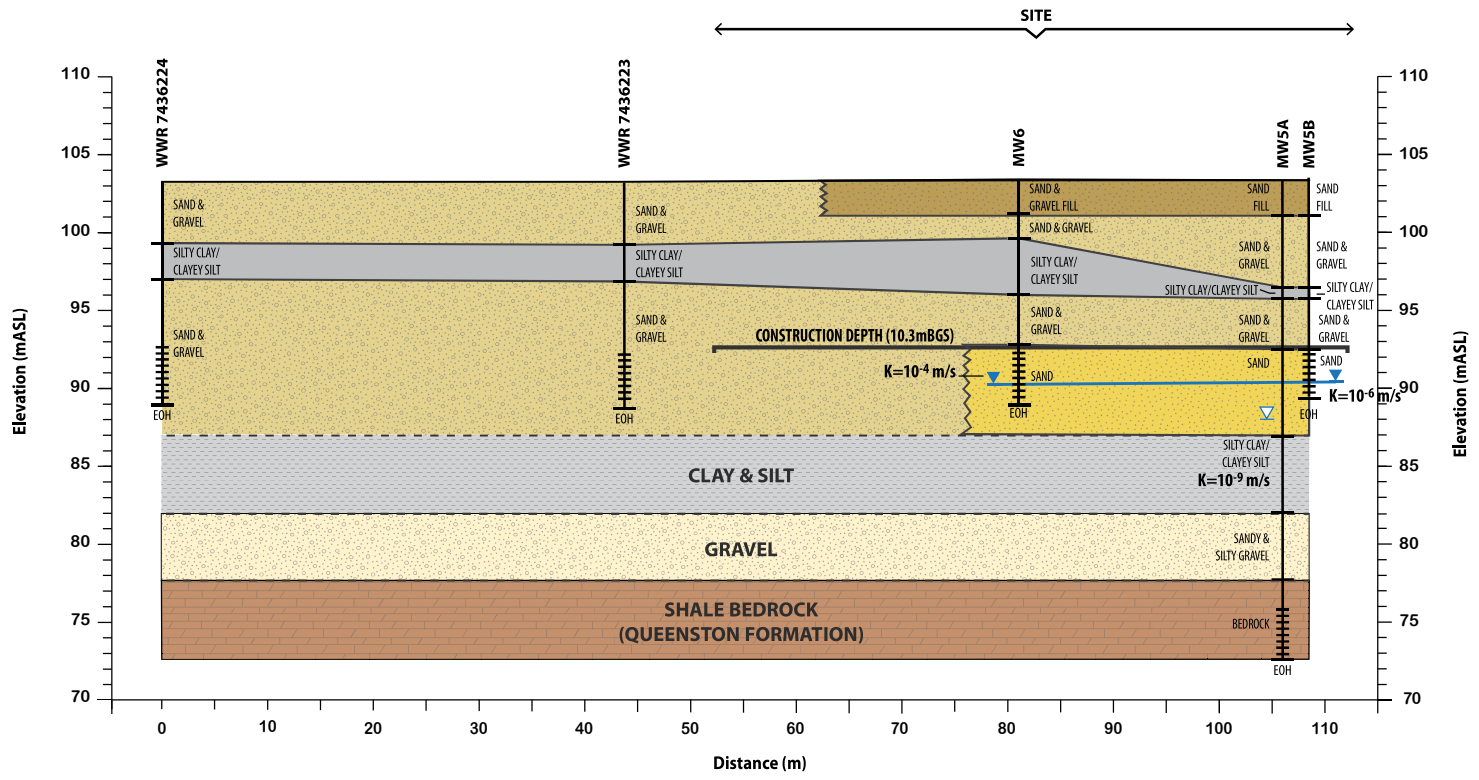
Terra-Dynamics Consulting Inc.

Prepared For: Losani Homes

Figure 5

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November 19, 2024



Groundwater Level June 20, 2024

- Water Table
- Potentiometric Surface
- Water Table
- EOH End of Hole
- K = Hydraulic Conductivity (m/s)

- Sand & Sand/Gravel Fill
- Sand & Gravel
- Silty Clay/Clayey Silt
- Sand
- Clay & Silt
- Gravel
- Shale Bedrock

Hydrogeologic Cross-Section C-C'

127 Plains Road West, Burlington, ON
Hydrogeological Assessment/Dewatering Study

Terra-Dynamics Consulting Inc.

Prepared For: Losani Homes

Figure 6

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November 19, 2024

Figure 7 - Manual Groundwater Levels

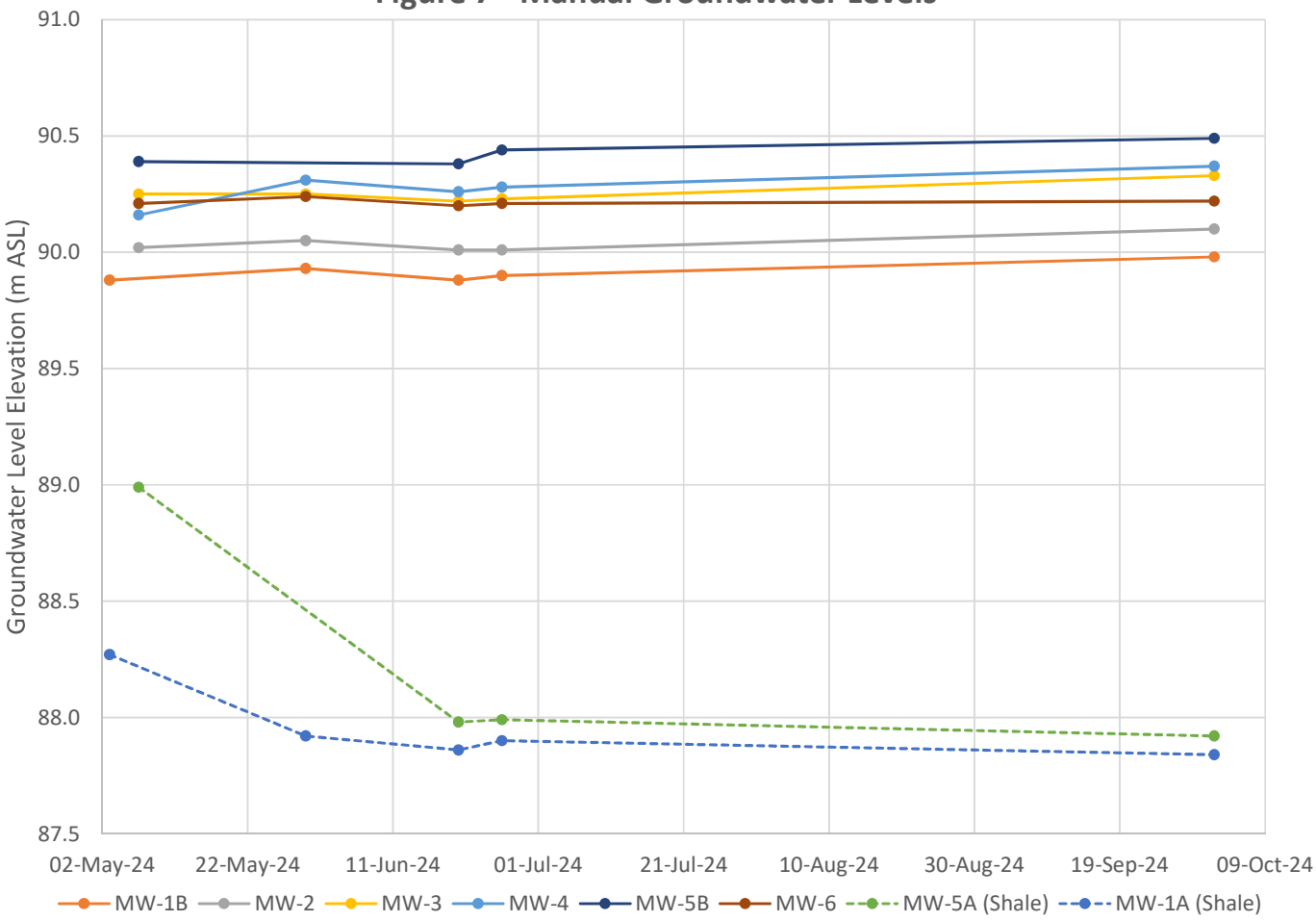


Table 1
Monitoring Location Details and Manual Water Levels

Well I.D.	Ground Elevation (m ASL)	Stick-Up (m)	TOC Elevation (m ASL)	Measured Well Depth Below TOC (m)	Well Depth below ground (m)	Date	Water level (m below TOC)	Water Level below ground (m)	Water Level Elevation (m ASL)
Water Table Sand									
MW-1B	103.08	-0.10	102.98	14.73	14.83	03-May-24	13.10	13.20	89.88
						30-May-24	13.05	13.15	89.93
						20-Jun-24	13.10	13.20	89.88
						26-Jun-24	13.08	13.18	89.90
						2-Oct-24	13.00	13.10	89.98
MW-2	103.12	-0.08	103.04	14.87	14.95	07-May-24	13.02	13.10	90.02
						30-May-24	12.99	13.07	90.05
						20-Jun-24	13.03	13.11	90.01
						26-Jun-24	13.03	13.11	90.01
						2-Oct-24	12.94	13.02	90.10
MW-3	103.15	-0.14	103.01	15.10	15.24	07-May-24	12.76	12.90	90.25
						30-May-24	12.76	12.90	90.25
						20-Jun-24	12.79	12.93	90.22
						26-Jun-24	12.78	12.92	90.23
						2-Oct-24	12.68	12.82	90.33
MW-4	103.26	-0.09	103.17	14.79	14.88	07-May-24	13.01	13.10	90.16
						30-May-24	12.86	12.95	90.31
						20-Jun-24	12.91	13.00	90.26
						26-Jun-24	12.89	12.98	90.28
						2-Oct-24	12.80	12.89	90.37
MW-5B	103.23	-0.06	103.17	13.84	13.90	07-May-24	12.78	12.84	90.39
						30-May-24	13.13	13.19	90.04*
						20-Jun-24	12.79	12.85	90.38
						26-Jun-24	12.73	12.79	90.44
						2-Oct-24	12.68	12.74	90.49
MW-6	103.31	-0.11	103.20	14.31	14.42	07-May-24	12.99	13.10	90.21
						30-May-24	12.96	13.07	90.24
						20-Jun-24	13.00	13.11	90.20
						26-Jun-24	12.99	13.10	90.21
						2-Oct-24	12.98	13.09	90.22
Potentiometric Surface Shale									
MW-1A	103.07	-0.11	102.96	32.10	32.21	03-May-24	14.69	14.80	88.27
						30-May-24	15.04	15.15	87.92
						20-Jun-24	15.10	15.21	87.86
						26-Jun-24	15.06	15.17	87.90
						2-Oct-24	15.12	15.23	87.84
MW-5A	103.19	-0.09	103.10	30.60	30.69	07-May-24	14.11	14.20	88.99
						30-May-24	13.10	13.19	90.00*
						20-Jun-24	15.12	15.21	87.98
						26-Jun-24	15.11	15.20	87.99
						2-Oct-24	15.18	15.27	87.92

Notes: MW=Monitoring well; TOC= Top of Casing; m ASL=metres above sea level;*-Values may not represent static conditions

Depth from Soil-Mat well logs

Appendix A

Soil-Mat and MECP Borehole/

Monitoring Well Logs



LEGEND

BH# Bedrock Monitoring Well

BH# Groundwater Monitoring Well

BM Temporary Benchmark
Top of catchbasin with geodetic elevation of 102.89m

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 230581-G.

2. Borehole locations are approximate.

SOIL-MAT
ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
127 Plains Road West
Burlington, Ontario

Preliminary Borehole Location Plan

Project No. SM 230581-G

Date: May 2024

Drawn: BS

Checked: AR

Drawing No. 1

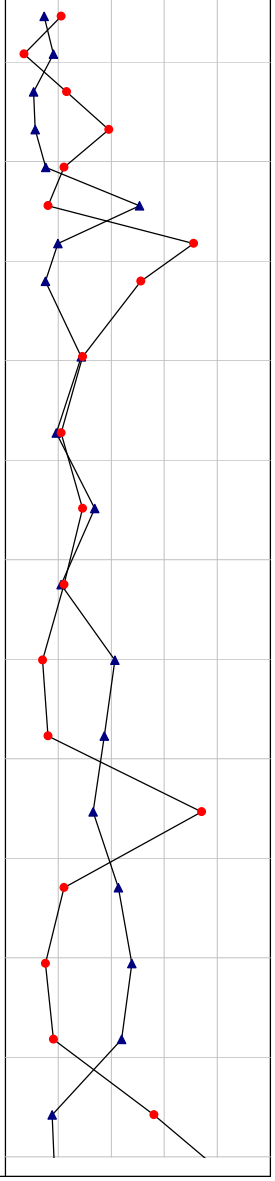
Log of Borehole No. 1A

Project No: SM 230581-G
Project: Proposed 26-Storey Building
Location: 127 Plains Rd. W, Burlington
Client: Losani Homes

Project Manager: Adam Roemmele, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4795146
E: 592661

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	103.07	Ground Surface							
0 / 0	102.50	**Pavement Structure** Approximately 125 millimetres of asphaltic concrete overlying 450 millimetres of compact granular base.							
6 / 2	100.90	**Sand Fill** Brown, trace to some silt and gravel, compact to loose.	SS	1	8,12,9,6	21			
			SS	2	4,4,3,3	7			
			SS	3	6,8,15,29	23			
12 / 4	98.60		SS	4	12,14,25,25	39			
		Sand and Gravel Brown, varying gravel content throughout, trace silt and clay, occasional to frequent cobbles, compact to very dense.	SS	5	5,10,12,15	22			
			SS	6	2,3,13,25	16		1.5	
			SS	7	20,33,38,35	71			
			SS	8	19,27,24,26	51			
		Seam of reddish brown silty clay	SS	9	7,13,16,34	29			
32 / 10	92.90		SS	10	13,11,10,9	21			
		Sand Brown, trace to some silt and gravel, with silty layers in the lower levels, compact to very dense.	SS	11	12,12,17,16	29			
			SS	12	11,9,13,18	22			
			SS	13	3,6,8,17 Wet spoon	14			
			SS	14	6,7,9,5 Wet spoon	16			
			SS	15	18,36,38,37	74			
58 / 18	85.20	**Silty Clay/Clayey Silt** Grey, trace gravel in the upper levels, stiff to very stiff.	SS	16	6,10,12,14	22		2.0	
			SS	17	5,7,8,10	15		1.0	
72 / 22	80.70		SS	18	3,8,10,28	18		3.0	
			SS	19	14,27,29,20	56			

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



Drill Method: Hollow Stem Augers
Drill Date: April 29, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 1A

Project No: SM 230581-G
Project: Proposed 26-Storey Building
Location: 127 Plains Rd. W, Burlington
Client: Losani Homes

Project Manager: Adam Roemmele, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4795146
E: 592661

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
25			**Sandy and Silty Gravel** Red to reddish grey, high gravel content in the upper levels, trace clay increasing with depth, very dense.		SS	20	18,31,59,41	90			
26					SS	21	27,50/5"	100			
27	75.60				SS	22	50/2"	100			
28			**Queenston Shale** Highly weathered in upper levels resembling a cohesive soil, becoming more sound with depth, hard.		HQ	1	RQD = 82%				
29					HQ	2	RQD = 89%				
30					HQ	3	RQD = 90%				
31	71.00										
32			End of Borehole								
33			NOTES: 1. Borehole was advanced using hollow stem auger equipment on April 29, 2024 to termination at a depth of 27.5 metres. Bedrock was cored to a depth of 32.1 metres. 2. Soil samples will be discarded after 3 months unless otherwise directed by our client. 3. A monitoring well was installed. The following free groundwater level readings have been measured: May 3, 2024 - 14.8 metres May 30, 2024 - 15.2 metres								
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											
45											
46											
47											
48											

Moisture Content w%
10 20 30 40

Standard Penetration Test blows/300mm
20 40 60 80

Compressive Strength 55.7 MPa
Compressive Strength 58.5 MPa
Compressive Strength 56.5 MPa
Compressive Strength 63.9 MPa

Drill Method: Hollow Stem Augers
Drill Date: April 29, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Sheet: 2 of 2

Log of Borehole No. 1B

Project No: SM 230581-G
Project: Proposed 26-Storey Building
Location: 127 Plains Rd. W, Burlington
Client: Losani Homes

Project Manager: Adam Roemmele, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4795147
E: 592660

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE: Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
0 / 0	103.08	Ground Surface									
0 / 0	102.50	**Pavement Structure** Approximately 125 millimetres of asphaltic concrete overlying 450 millimetres of compact granular base.									
6 / 2	100.90	**Sand Fill** Brown, trace to some silt and gravel, compact to loose.									
14 / 4	98.60	**Sand and Gravel** Brown, varying gravel content throughout, trace silt and clay, occasional to frequent cobbles, compact to very dense. Seam of reddish brown silty clay									
33 / 10	92.90	**Sand** Brown, trace to some silt and gravel, with silty layers in the lower levels, compact to very dense.									
50 / 15	87.80	End of Borehole									

Note: Soil stratums inferred from BH1A

NOTES:

1. Borehole was advanced using hollow stem auger equipment on April 30, 2024 to termination at a depth of 15.2 metres.

2. Soil samples will be discarded after 3 months unless otherwise directed by our client.

3. A monitoring well was installed. The following free groundwater level readings have been measured:
May 3, 2024 - 13.2 metres
May 30, 2024 - 13.2 metres

Drill Method: Hollow Stem Augers
Drill Date: April 30, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 2

Project No: SM 230581-G
Project: Proposed 26-Storey Building
Location: 127 Plains Rd. W, Burlington
Client: Losani Homes

Project Manager: Adam Roemmele, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4795158
E: 592674

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	103.12	Ground Surface							
0 / 0	102.50	**Pavement Structure** Approximately 125 millimetres of asphaltic concrete overlying 450 millimetres of compact granular base.							
		Sand and Gravel Fill Brown, varying gravel content throughout, occasional clayey seams in the lower levels, trace to some silt, occasional cobbles, loose to dense.	SS	1	8,18,11,8	29			
			SS	2	3,2,2,1	4			
			SS	3	14,17,14,12	31			
			SS	4	9,10,6,6	16			
14 / 4	98.40		SS	5	1,8,24,20	32			
		Sand and Gravel Brown, varying gravel content throughout, trace silt and clay, occasional to frequent cobbles, compact to very dense.	SS	6	6,20,36,38	56			
			SS	7	6,32,20,18	52			
			SS	8	10,24,26,29	50			
			SS	9	6,11,11,10	22			
33 / 10	92.90		SS	10	12,16,14,10	30			
		Sand Brown, trace to some silt and gravel, with silty layers in the lower levels, compact to very dense.	SS	11	12,18,18,18	36			
			SS	12	12,12,16,12	28			
			SS	13	16,30,34,36 Wet spoon	64			
49 / 15	87.90								
		End of Borehole							

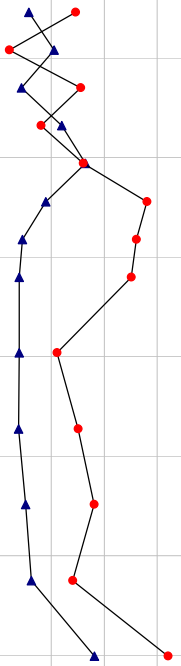
NOTES:

1. Borehole was advanced using hollow stem auger equipment on May 7, 2024 to termination at a depth of 15.2 metres.

2. Soil samples will be discarded after 3 months unless otherwise directed by our client.

3. A monitoring well was installed. The following free groundwater level readings have been measured:
May 7, 2024 - 13.1 metres
May 30, 2024 - 13.1 metres

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



Drill Method: Hollow Stem Augers
Drill Date: May 7, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 3

Project No: SM 230581-G
Project: Proposed 26-Storey Building
Location: 127 Plains Rd. W, Burlington
Client: Losani Homes

Project Manager: Adam Roemmele, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4795179
E: 592693

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	103.15	Ground Surface							
0 / 0	102.60	**Pavement Structure** Approximately 125 millimetres of asphaltic concrete overlying 450 millimetres of compact granular base.							
		Sand and Gravel Fill Brown, varying gravel content throughout, occasional clayey seams in the lower levels, trace to some silt, occasional cobbles, very loose to loose.	SS	1	2,5,2,2	7			
			SS	2	2,3,2,16	5			
			SS	3	8,3,4,4	7			
			SS	4	5,4,6,7	10			
			SS	5	1,1,2,9	3			
			SS	6	9,23,29,35	52			
		Sand and Gravel Brown, varying gravel content throughout, trace silt and clay, occasional to frequent cobbles, very dense to compact.	SS	7	17,20,26,23	46			
			SS	8	15,19,23,21	42			
			SS	9	8,11,9,11	20			
10 / 3	99.00								
	92.90	**Sand** Brown, trace to some silt and gravel, dense to compact.	SS	10	17,20,16,17	36			
			SS	11	9,10,11,10	21			
			SS	12	9,10,15,27 Wet spoon	25			
	87.30	End of Borehole	SS	13	7,8,9,14 Wet spoon	17			

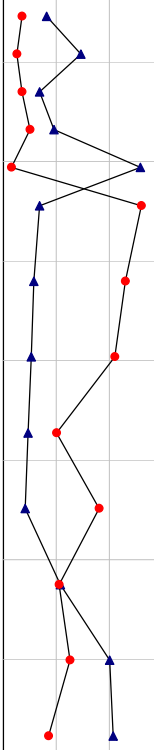
NOTES:

1. Borehole was advanced using hollow stem auger equipment on May 7, 2024 to termination at a depth of 15.9 metres.

2. Soil samples will be discarded after 3 months unless otherwise directed by our client.

3. A monitoring well was installed. The following free groundwater level readings have been measured:
May 7, 2024 - 12.9 metres
May 30, 2024 - 12.9 metres

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



Drill Method: Hollow Stem Augers
Drill Date: May 6, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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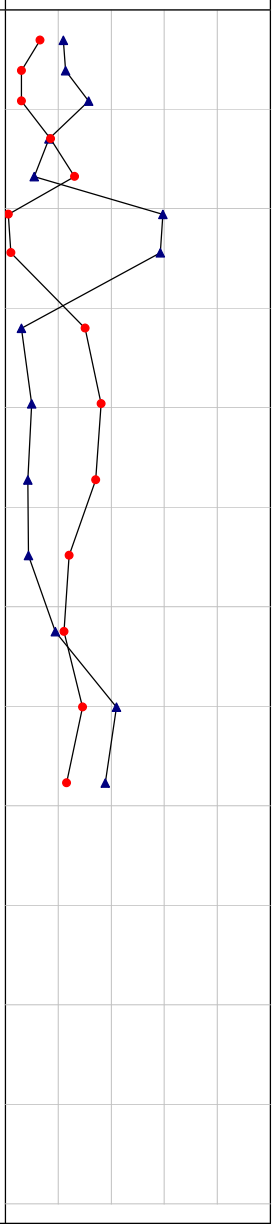
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Log of Borehole No. 4

Project No: SM 230581-G
Project: Proposed 26-Storey Building
Location: 127 Plains Rd. W, Burlington
Client: Losani Homes

Project Manager: Adam Roemmele, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4795187
E: 592682

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	103.26	Ground Surface							
0 / 0	102.80	**Pavement Structure** Approximately 125 millimetres of asphaltic concrete overlying 300 millimetres of compact granular base.	SS	1	4,7,6,3	13			
2 / 1			SS	2	4,3,3,1	6			
3 / 1			SS	3	1,3,3,2	6			
6 / 2	100.70	**Sand and Gravel Fill** Brown, varying gravel content throughout, trace to some silt, occasional cobbles, loose to compact	SS	4	5,7,10,12	17			
9 / 3			SS	5	11,14,12,12	26			
12 / 4	99.20		SS	6	1,1,0,1	1		<1.0	
15 / 5	97.70	**Sand and Gravel** Brown, varying gravel content throughout, trace silt and clay, occasional to frequent cobbles, compact to very dense.	SS	7	1,1,1,1 Wet spoon	2		<1.0	
18 / 6			SS	8	7,17,13,15	30			
21 / 7			SS	9	16,20,16,15	36			
24 / 8		**Silty Clay/Clayey Silt** Reddish brown, trace to some sand, very soft.	SS	10	24,18,16,14	34			
27 / 9		**Sand** Brown, trace to some silt and gravel, with silty layers in the lower levels, compact to dense.	SS	11	10,12,12,16	24			
30 / 10			SS	12	8,11,11,16	22			
33 / 11			SS	13	7,18,11,11 Wet spoon	29			
36 / 12									
39 / 13									
42 / 14									
45 / 15									
48 / 15	87.40		SS	14	2,6,17,24 Wet spoon	23			
51 / 16		End of Borehole NOTES: 1. Borehole was advanced using hollow stem auger equipment on May 7, 2024 to termination at a depth of 15.8 metres. 2. Soil samples will be discarded after 3 months unless otherwise directed by our client. 3. A monitoring well was installed. The following free groundwater level readings have been measured: May 30, 2024 - 13.0 metres							
54 / 17									
57 / 18									
60 / 18									
63 / 19									
66 / 20									
69 / 21									
72 / 22									
75 / 23									
78 / 24									



Drill Method: Hollow Stem Augers
Drill Date: May 7, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 5A

Project No: SM 230581-G
Project: Proposed 26-Storey Building
Location: 127 Plains Rd. W, Burlington
Client: Losani Homes

Project Manager: Adam Roemmele, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4795199
E: 592669

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	103.19	Ground Surface							
0 / 0	102.60	**Pavement Structure** Approximately 125 millimetres of asphaltic concrete overlying 450 millimetres of compact granular base.							
6 / 2	101.00	**Sand Fill** Brown, trace to some silt and gravel, very loose to loose.	SS	1	1,2,1,1	3			
			SS	2	2,2,4,10	6			
			SS	3	9,18,20,27	38			
12 / 4	99.30	**Sand and Gravel** Brown, varying gravel content throughout, trace silt and clay, occasional to frequent cobbles, dense.	SS	4	16,19,20,18	39			
			SS	5	4,2,2,2	4		<1.0	
			SS	6	2,1,2,2	3		<1.0	
23 / 7	96.00	**Silty Clay/Clayey Silt** Reddish brown, trace sand increasing with depth, soft to firm.	SS	7	2,4,5,9	9		1.0	
			SS	8	9,15,15,19	30			
33 / 10	93.00	**Sand and Gravel** Brown, varying gravel content throughout, trace silt, occasionl to moderate cobbles, dense to very dense.	SS	9	9,35,22,25	57			
			SS	10	10,14,16,21	30			
		Sand Brown, trace to some silt and gravel, with silty layers in the lower levels, compact to very dense.	SS	11	10,12,14,14	26			
			SS	12	6,10,10,12	20			
			SS	13	7,14,29,39	43			
53 / 16	86.80	**Silty Clay/Clayey Silt** Grey, trace gravel in the upper levels, very stiff to stiff.	SS	14	4,8,10,13	18		3.0	
			SS	15	3,4,6,6	10		<1.0	
66 / 20	82.30		SS	16	4,4,6,8	10		<1.0	
69 / 21		**Sandy and Silty Gravel** Red to reddish grey, high gravel content in the upper levels, trace clay increasing with depth, very dense.	SS	17	35,41,40,42	81			
76 / 23			SS	18	65,50/4"	100			

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

Drill Method: Hollow Stem Augers
Drill Date: May 2, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 5A

Project No: SM 230581-G
Project: Proposed 26-Storey Building
Location: 127 Plains Rd. W, Burlington
Client: Losani Homes

Project Manager: Adam Roemmele, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4795199
E: 592669

Depth	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
25	77.60		SS	19	44,31,37,50/5	68			
			SS	20	50/4"	100			
26		**Queenston Shale**	HQ	1	RQD = 0%				
27		Highly weathered in upper levels resembling a cohesive soil, becoming more sound with depth, hard.	HQ	2	RQD = 86%				
28			HQ	3	RQD = 76%				
29			HQ	4	RQD = 95%				
30	72.60								
31		End of Borehole							
32		NOTES:							
33		1. Borehole was advanced using hollow stem auger equipment on May 2, 2024 to termination at a depth of 25.6 metres. Bedrock was cored to a depth of 30.6 metres.							
34		2. Soil samples will be discarded after 3 months unless otherwise directed by our client.							
35		3. A monitoring well was installed. The following free groundwater level readings have been measured: May 7, 2024 - 14.2 metres May 30, 2024 - 15.2 metres							
36									
37									
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

Compressive Strength 58.4 MPa
Compressive Strength 80.5 MPa
Compressive Strength 57.5 MPa
Compressive Strength 47.5 MPa

Drill Method: Hollow Stem Augers
Drill Date: May 2, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 5B

Project No: SM 230581-G
Project: Proposed 26-Storey Building
Location: 127 Plains Rd. W, Burlington
Client: Losani Homes

Project Manager: Adam Roemmele, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4795200
E: 592670

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	SAMPLE PP (kgf/cm2)	SAMPLE U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
ft / m	103.23	Ground Surface									
0 / 0	102.70	**Pavement Structure** Approximately 125 millimetres of asphaltic concrete overlying 450 millimetres of compact granular base.									
6 / 2	101.00	**Sand Fill** Brown, trace to some silt and gravel, very loose to loose.									
13 / 4	99.30	**Sand and Gravel** Brown, varying gravel content throughout, trace silt and clay, occasional to frequent cobbles, dense.									
23 / 7	96.00	**Silty Clay/Clayey Silt** Reddish brown, trace sand increasing with depth, soft to firm.									
33 / 10	93.00	**Sand and Gravel** Brown, varying gravel content throughout, trace silt, occasionl to moderate cobbles, dense to very dense.									
46 / 14	89.20	**Sand** Brown, trace to some silt and gravel, with silty layers in the lower levels, compact to very dense.									
		End of Borehole									

Note: Soil stratums inferred from BH5A

NOTES:

1. Borehole was advanced using solid stem auger equipment on May 3, 2024 to termination at a depth of 14.0 metres.

2. Soil samples will be discarded after 3 months unless otherwise directed by our client.

3. A monitoring well was installed. The following free groundwater level readings have been measured:
May 7, 2024 - 12.8 metres
May 30, 2024 - 13.2 metres

Drill Method: Hollow Stem Augers
Drill Date: May 2, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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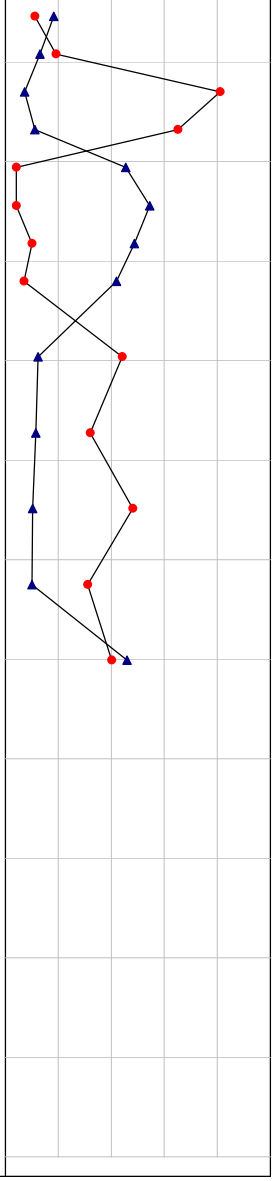
Datum: Geodetic
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Log of Borehole No. 6

Project No: SM 230581-G
Project: Proposed 26-Storey Building
Location: 127 Plains Rd. W, Burlington
Client: Losani Homes

Project Manager: Adam Roemmele, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4795181
E: 592653

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	103.31	Ground Surface							
0 / 0	102.70	**Pavement Structure** Approximately 125 millimetres of asphaltic concrete overlying 450 millimetres of compact granular base.							
6 / 2	101.10	**Sand and Gravel Fill** Brown, varying gravel content throughout, trace to some silt, occasional to moderate cobbles, compact.	SS	1	6,6,5,2	11			
			SS	2	5,7,12,15	19			
			SS	3	18,46,35,63	81			
13 / 4	99.20		SS	4	16,30,35,21	65			
			SS	5	3,3,1,3	4		<1.0	
			SS	6	1,2,2,2	4		<1.0	
		Sand and Gravel Brown, varying gravel content throughout, trace silt and clay, occasional to frequent cobbles, compact to very dense.	SS	7	0,5,5,7	10		1.5	
23 / 7	96.20		SS	8	2,3,4,7	7		1.5	
		Silty Clay/Clayey Silt Reddish brown, trace to some sand, very soft.	SS	9	9,20,24,33	44			
			SS	10	7,14,18,22	32			
33 / 10	93.10	**Sand and Gravel** Brown, varying gravel content throughout, trace silt, occasional cobbles, dense.	SS	11	31,26,22,21	48			
		Sand Brown, trace to some silt and gravel, with silty layers in the lower levels, compact to dense.	SS	12	9,14,17,20	31			
			SS	13	5,27,13,13 Wet spoon	40			
49 / 15	88.10	End of Borehole							



NOTES:

1. Borehole was advanced using hollow stem auger equipment on May 1, 2024 to termination at a depth of 15.2 metres.

2. Soil samples will be discarded after 3 months unless otherwise directed by our client.

3. A monitoring well was installed. The following free groundwater level readings have been measured:
May 30, 2024 - 13.1 metres

Drill Method: Hollow Stem Augers
Drill Date: May 1, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road · Hamilton, Ontario · L8E 2Z3
T: 905.318.7440 · TF: 800.243.1922 · F: 905.318.7455
www.soil-mat.ca · E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: AR
Sheet: 1 of 1

Ontario — Ministry of the Environment, Conservation and Parks

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. (Place Sticker and/or Print Below): A366855

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	2391798 Ontario Ltd.		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
3408 Lakeshore Rd.	Burlington	ON	L7N 1B3	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
141 Plains Rd W.			

County/District/Municipality	City/Town/Village	Province	Postal Code
	Burlington	Ontario	L7T 1G1

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	592662	4791532		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Brown	Fill	gravel	Dry	0	3
Brown	Sand	gravel/cobble	~~Cobble~~ Dry	3	14
Brown	Clay	Silt	wet	14	20
Brown	Sand	gravel	Dry	20	40
Brown	Sand		wet	40	47

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	35	Bentonite	11.55
35	47	Sand	3.96

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, specify: Auger

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☑ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
2	Plastic	.188	0	37

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
2.376	Plastic	10	37	47

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☑ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

Water Details

Water found at Depth (m/ft)	Kind of Water	Hole Diameter Depth From	To	Diameter (cm/in)
☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify	0	47	8
Water found at Depth (m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify			
Water found at Depth (m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify			

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ____ hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min/GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min/GPM)

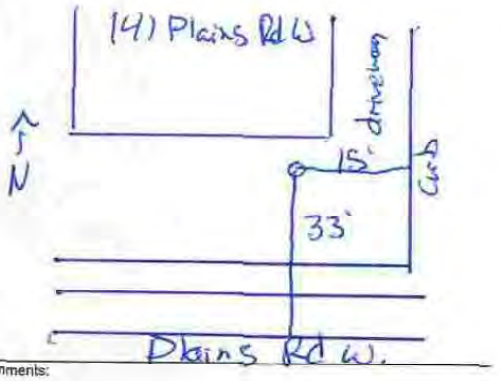
Well production (l/min/GPM)

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor: Terra Firma Environmental Services Ltd.
Well Contractor's Licence No.: 6946
84 Martin Ross Ave. Toronto, ON M3J 2L4
Bus #: 416.450.6244, E: info@terrafirmaservices.com
Well Tech & Licence #: Gudkov, Sergey, #: 4182

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
4189		2022/11/30

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☑ Yes ☐ No	2022/11/30	2022/11/17

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Received DEC 05 2022

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Ontario — Ministry of the Environment, Conservation and Parks

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. (Place Sticker and/or Print Below): A366273

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	2381798 Ontario Ltd.		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
3408 Lakeshore Rd.	Burlington	ON	L7N 1B3	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
141 Plains Rd W.			

County/District/Municipality	City/Town/Village	Province	Postal Code
	Burlington	Ontario	L7T 1G1

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	592630	4791512		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	fill	gravel	Dry	0	3
Brown	Sand	gravel/cobble	Dry	3	14
Brown	Clay	silt	wet	14	20
Brown	Sand	gravel	Dry	20	40
Brown	Sand		Wet	40	47

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	35	Bentonite	11.55
35	47	Sand	3.96

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☑ Other, specify: Auger

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☑ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
2	Plastic	.188	0	37

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☑ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
1.376	Plastic	10	37	47

Water Details

Water found at Depth (m/ft)	Kind of Water	Hole Diameter Depth From	Hole Diameter Depth To	Hole Diameter (cm/in)
☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify	0	47	8
☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify			
☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify			

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping: hrs + min

Final water level end of pumping (m/ft)

If flowing give rate (l/min/GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min/GPM)

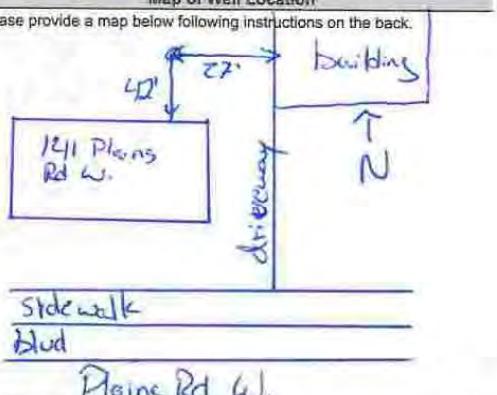
Well production (l/min/GPM)

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor: Terra Firma Environmental Services Ltd.
Well Contractor's Licence No.: 6946
84 Martin Ross Ave. Toronto, ON M3J 2L4
Bus #: 416.450.6244, E: info@terrafirmaservices.com
Well Tech & Licence #: Gudkov, Sergey, #: 4182

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
4182		2022/11/30

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☑ Yes ☐ No	2022/11/30	2022/11/30

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Audit No. Z400161

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Ontario — Ministry of the Environment, Conservation and Parks

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. (Place Sticker and/or Print Below): A366856

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	2381798 Ontario Ltd.		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
3408 Lakeshore Rd.	Burlington	ON	L7N1B3	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
153 Plains Rd W			

County/District/Municipality	City/Town/Village	Province	Postal Code
	Burlington	Ontario	L7T1G1

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	592601	4795119		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Fill	gravel	Dry	0	3
Brown	sand	gravel / cobble	Dry	3	14
Brown	Clay	Silt	wet	14	20
Brown	Sand	gravel	Dry	20	40
Brown	Sand		Wet	40	47

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	35	Bentonite	11.55
35	47	sand	3.96

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☑ Other, specify: Auger

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☑ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
2	Plastic	.188	0	37

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
2.376	Plastic	10	37	47

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☑ Dewatering Well
☑ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ____ hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min/GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min/GPM)

Well production (l/min/GPM)

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Water Details

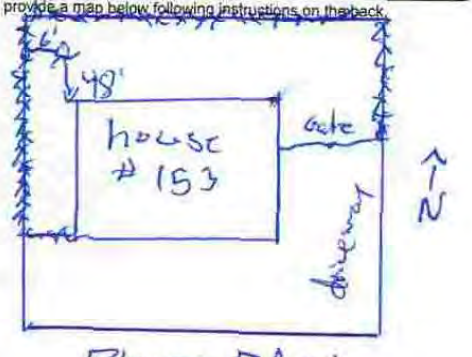
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	47	8

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor: Terra Firma Environmental Services Ltd.
Well Contractor Licence #: 6946
84 Martin Ross Ave. Toronto, ON M3J 2L4
Bus #: 416.450.6244, E: info@terrafirmaservices.com
Well Tech & Licence #: Gudkov, Sergey, #: 4182

Well Technician's Licence No. | Signature of Technician and/or Contractor | Date Submitted: 2022/11/30

Well owner's information package delivered: ☑ Yes ☐ No

Date Package Delivered: 2022/11/30

Date Work Completed: 2022/11/18

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Audit No. Z400159

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Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. (Place Sticker and/or Print Below): A366272

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	2381798 Ontario Ltd.		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
3408 Lakeshore Rd.	Burlington	ON	L7N1B3	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
153 Plains Rd W			

County/District/Municipality	City/Town/Village	Province	Postal Code
	Burlington	Ontario	L7T1G1

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	592628	4795101		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Fill	gravel	Dry	0	3
Brown	Sand	Cobble	Dry	3	20
Brown	Sand	gravel	Dry	20	45

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	33	Bentonite	10.89
33	45	Sand	3.96

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, specify Auger

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☑ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
2	Plastic	.188	0	35

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
2.38	Plastic	10	35	45

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☑ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

Water Details

Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	45	8

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ____ hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min/GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min/GPM)

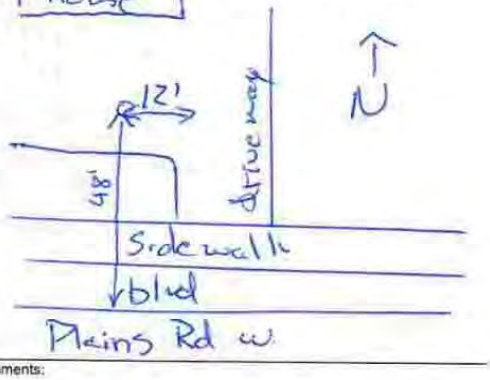
Well production (l/min/GPM)

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor: Terra Firma Environmental Services Ltd.
Well Contractor Licence #: 6946
84 Martin Ross Ave. Toronto, ON M3J 2L4
Bus #: 416.450.6244, E: info@terrafirmaservices.com
Well Tech & Licence #: Gudkov, Sergey, #: 4182

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
4182		2022/11/30

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☑ Yes ☐ No	2022/11/30	2022/11/16

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Audit No. Z400162

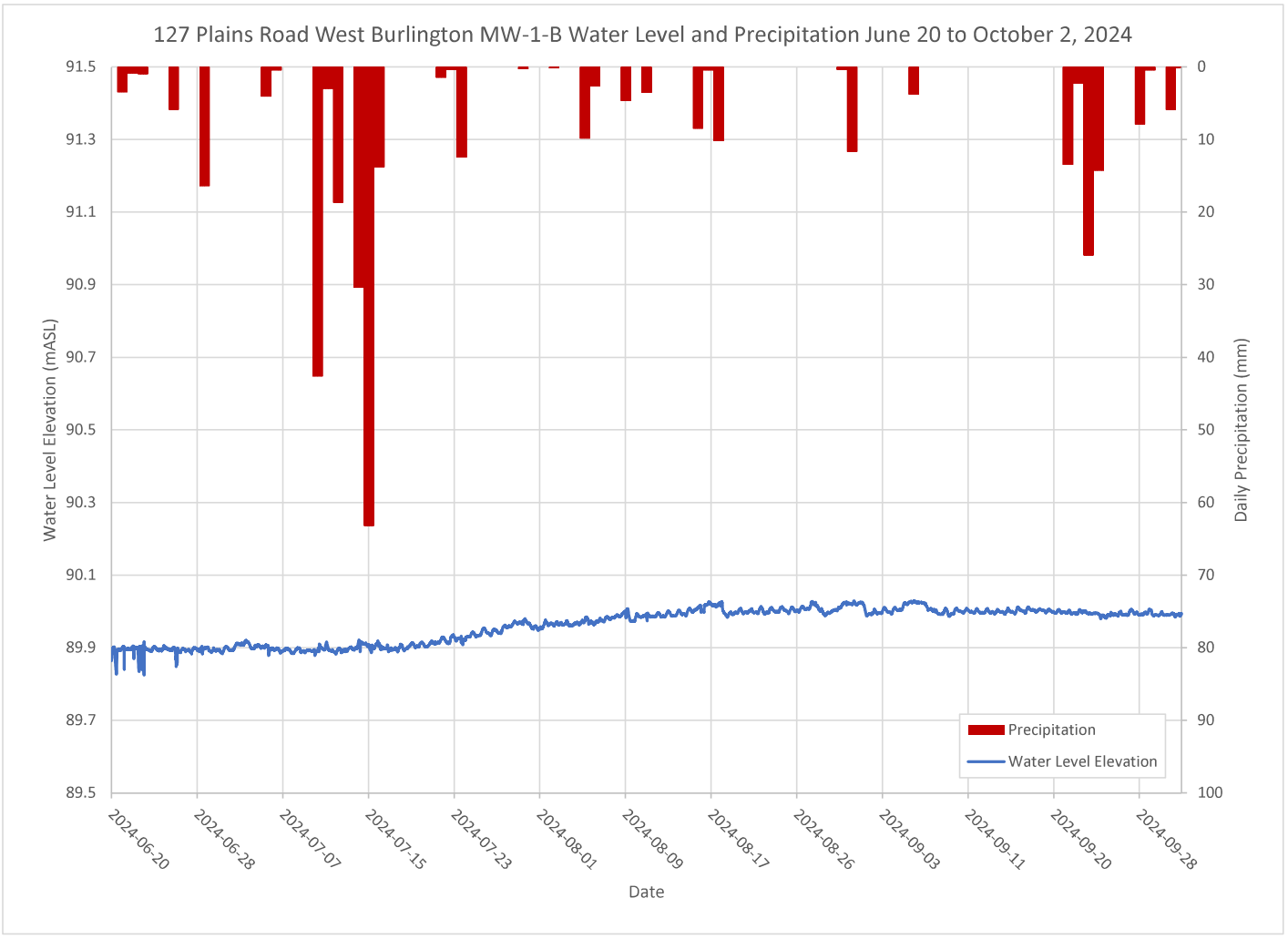
Received DEC 05 2022

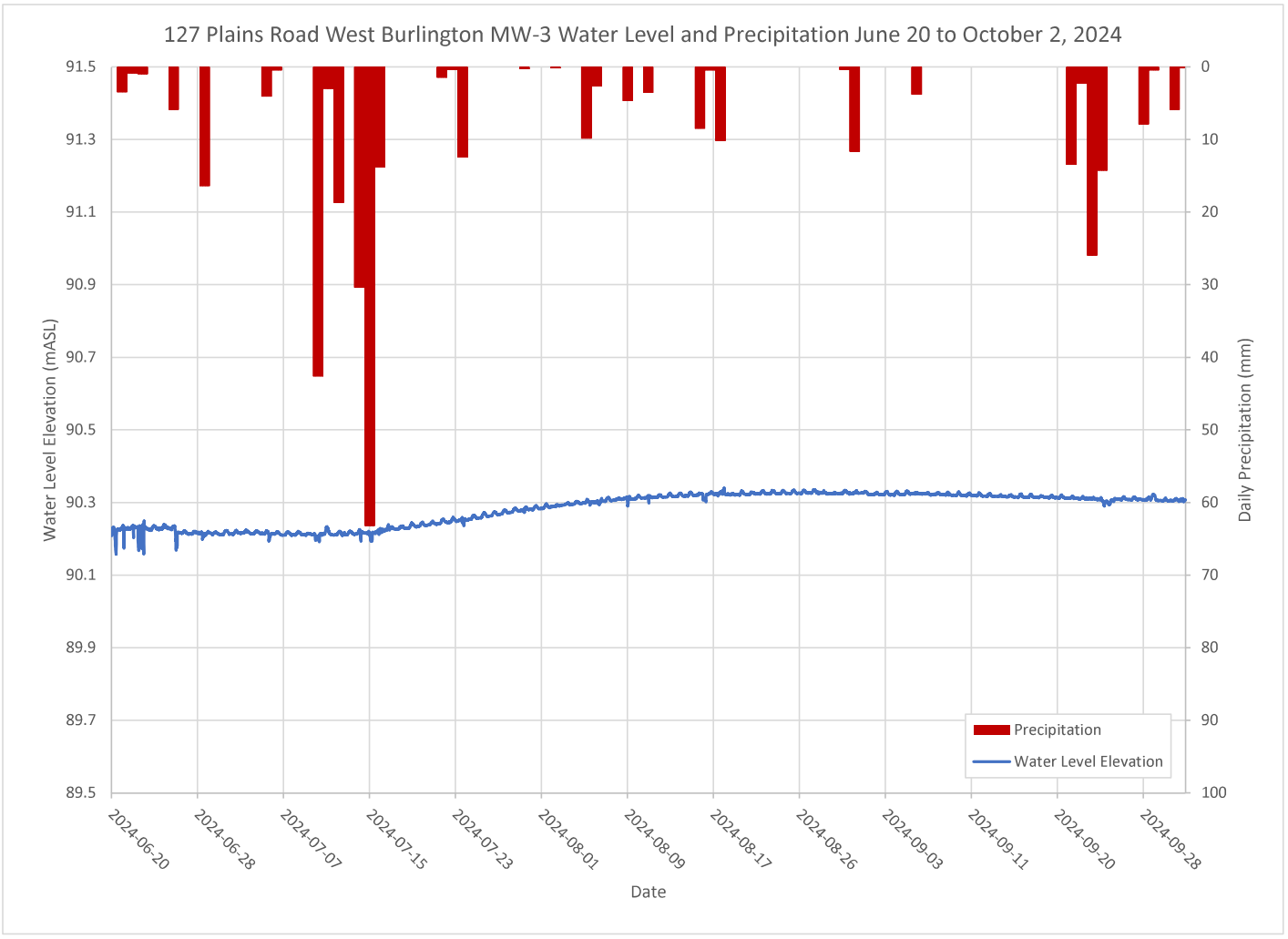
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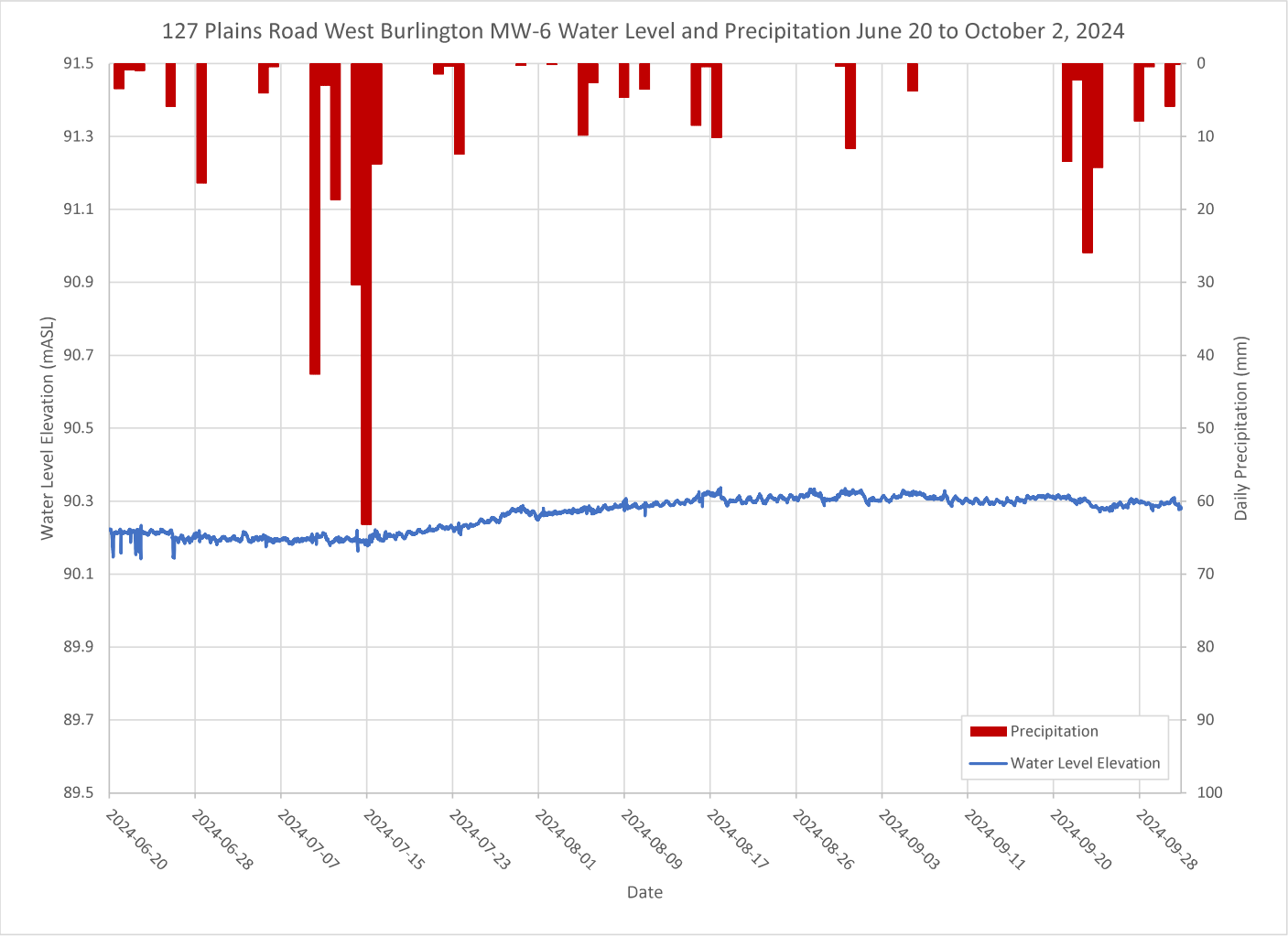
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Appendix B

Water Level Datalogger Plots


127 Plains Road West Burlington MW-1-B Water Level and Precipitation June 20 to October 2, 2024
Water Level Elevation (mASL)
Daily Precipitation (mm)
91.5
91.3
91.1
90.9
90.7
90.5
90.3
90.1
89.9
89.7
89.5
0
10
20
30
40
50
60
70
80
90
100
2024-06-20
2024-06-28
2024-07-07
2024-07-15
2024-07-23
2024-08-01
2024-08-09
2024-08-17
2024-08-26
2024-09-03
2024-09-11
2024-09-20
2024-09-28
Date
Precipitation
Water Level Elevation


127 Plains Road West Burlington MW-3 Water Level and Precipitation June 20 to October 2, 2024
Water Level Elevation (mASL)
Daily Precipitation (mm)
91.5
91.3
91.1
90.9
90.7
90.5
90.3
90.1
89.9
89.7
89.5
0
10
20
30
40
50
60
70
80
90
100
2024-06-20
2024-06-28
2024-07-07
2024-07-15
2024-07-23
2024-08-01
2024-08-09
2024-08-17
2024-08-26
2024-09-03
2024-09-11
2024-09-20
2024-09-28
Date
Precipitation
Water Level Elevation


127 Plains Road West Burlington MW-6 Water Level and Precipitation June 20 to October 2, 2024
Water Level Elevation (mASL)
Daily Precipitation (mm)
91.5
91.3
91.1
90.9
90.7
90.5
90.3
90.1
89.9
89.7
89.5
0
10
20
30
40
50
60
70
80
90
100
2024-06-20
2024-06-28
2024-07-07
2024-07-15
2024-07-23
2024-08-01
2024-08-09
2024-08-17
2024-08-26
2024-09-03
2024-09-11
2024-09-20
2024-09-28
Date
Precipitation
Water Level Elevation

Appendix C

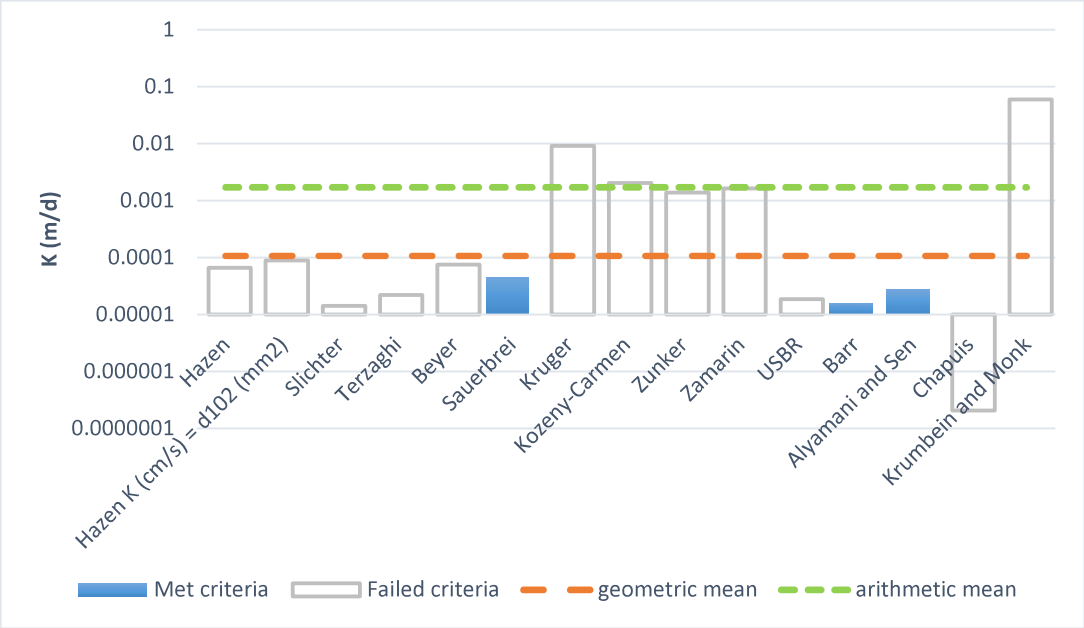
Hydraulic Conductivity Analyses

K from Grain Size Analysis Report Date: 13-May-24

Sample Name: BH-1A (65') (127 Plains Rd West, Burlington ON)

Mass Sample (g): 100 T (oC) 20

Poorly sorted clay with fines



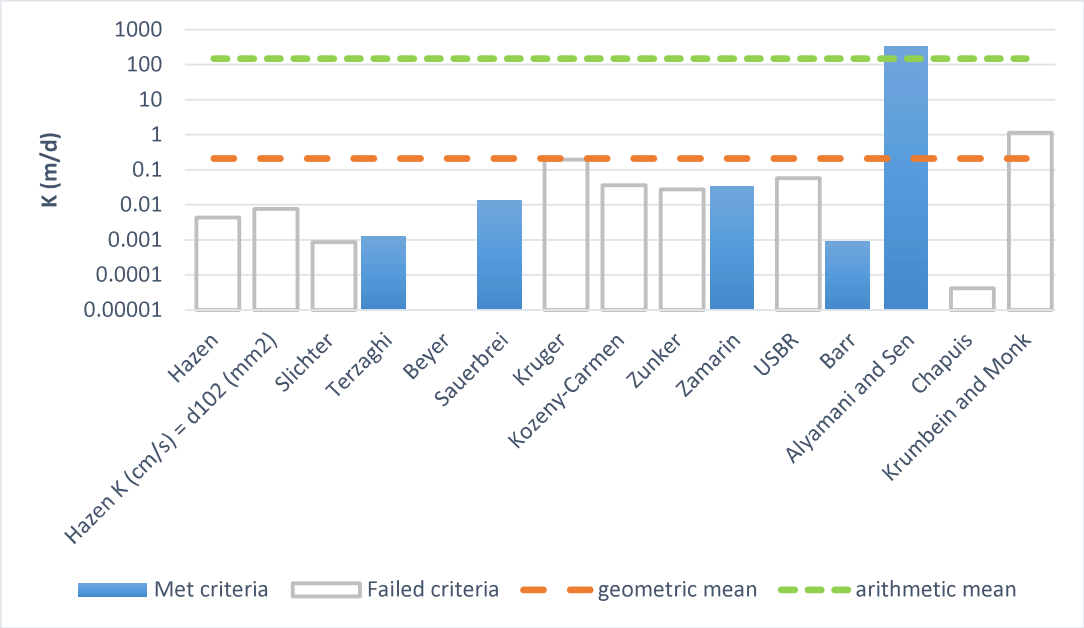
Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	8.E-08	8.E-10	0.00	
Hazen K (cm/s) = d_{10} (mm)	1.E-07	1.E-09	0.00	
Slichter	2.E-08	2.E-10	0.00	
Terzaghi	3.E-08	3.E-10	0.00	
Beyer	9.E-08	9.E-10	0.00	
Sauerbrei	5.E-08	5.E-10	0.00	
Kruger	1.E-05	1.E-07	0.01	
Kozeny-Carmen	2.E-06	2.E-08	0.00	
Zunker	2.E-06	2.E-08	0.00	
Zamarin	2.E-06	2.E-08	0.00	
USBR	2.E-08	2.E-10	0.00	
Barr	2.E-08	2.E-10	0.00	
Alyamani and Sen	3.E-08	3.E-10	0.00	
Chapuis	2.E-10	2.E-12	0.00	
Krumbein and Monk	7.E-05	7.E-07	0.06	
Shepherd	8.E-06	8.E-08	0.01	
geometric mean	1.E-07	1.E-09	0.00	
arithmetic mean	2.E-06	2.E-08	0.00	

K from Grain Size Analysis Report Date: 13-May-24

Sample Name: BH-1A (80') (127 Plains Rd West, Burlington ON)

Mass Sample (g): 100 T (oC) 20

Poorly sorted sandy gravel with fines



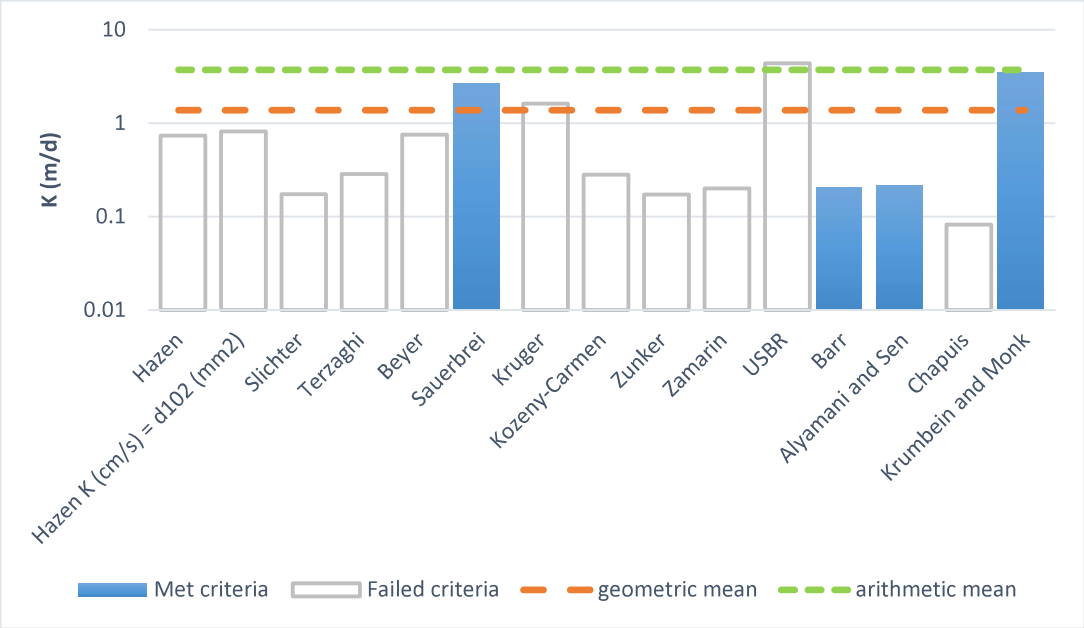
Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	5.E-06	5.E-08	0.00	
Hazen K (cm/s) = d_{10} (mm)	9.E-06	9.E-08	0.01	
Slichter	1.E-06	1.E-08	0.00	
Terzaghi	1.E-06	1.E-08	0.00	
Beyer	-2.E-06	-2.E-08	0.00	
Sauerbrei	2.E-05	2.E-07	0.01	
Kruger	2.E-04	2.E-06	0.20	
Kozeny-Carmen	4.E-05	4.E-07	0.04	
Zunker	3.E-05	3.E-07	0.03	
Zamarin	4.E-05	4.E-07	0.03	
USBR	7.E-05	7.E-07	0.06	
Barr	1.E-06	1.E-08	0.00	
Alyamani and Sen	4.E-01	4.E-03	339.00	
Chapuis	5.E-08	5.E-10	0.00	
Krumbein and Monk	1.E-03	1.E-05	1.14	
Shepherd	6.E-01	6.E-03	558.63	
geometric mean	2.E-04	2.E-06	0.21	
arithmetic mean	2.E-01	2.E-03	149.61	

K from Grain Size Analysis Report Date: 13-May-24

Sample Name: BH-2 (45') (127 Plains Rd West, Burlington ON)

Mass Sample (g): 100 T (oC) 20

Poorly sorted sand low in fines



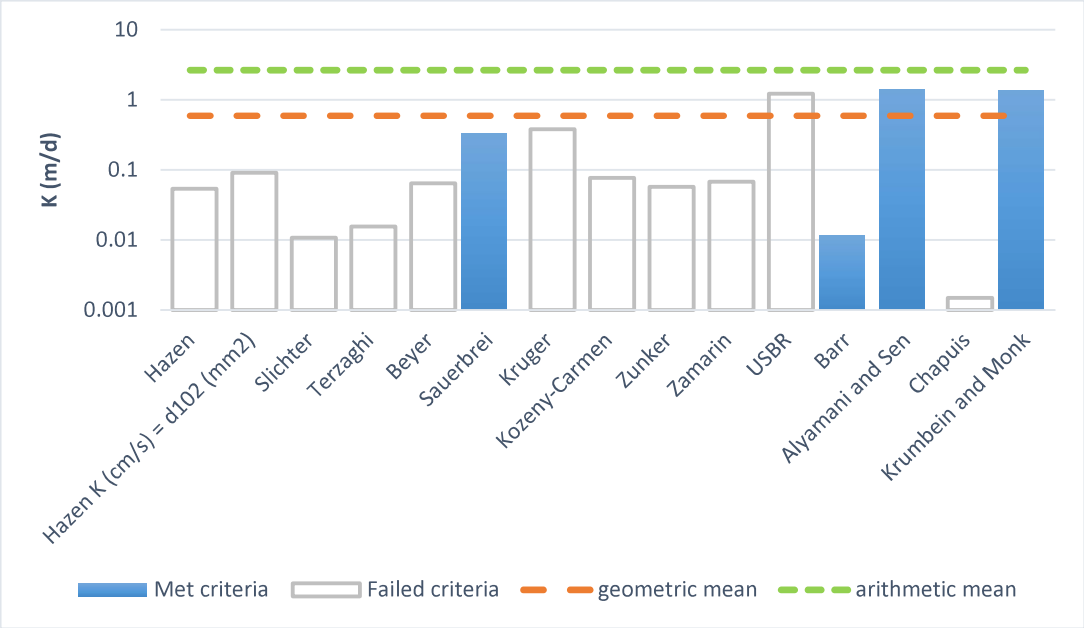
Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	8.E-04	8.E-06	0.73	
Hazen K (cm/s) = d_{10} (mm)	9.E-04	9.E-06	0.81	
Slichter	2.E-04	2.E-06	0.17	
Terzaghi	3.E-04	3.E-06	0.28	
Beyer	9.E-04	9.E-06	0.75	
Sauerbrei	3.E-03	3.E-05	2.67	
Kruger	2.E-03	2.E-05	1.62	
Kozeny-Carmen	3.E-04	3.E-06	0.28	
Zunker	2.E-04	2.E-06	0.17	
Zamarin	2.E-04	2.E-06	0.20	
USBR	5.E-03	5.E-05	4.36	
Barr	2.E-04	2.E-06	0.21	
Alyamani and Sen	2.E-04	2.E-06	0.21	
Chapuis	9.E-05	9.E-07	0.08	
Krumbein and Monk	4.E-03	4.E-05	3.47	
Shepherd	1.E-02	1.E-04	12.11	
geometric mean	2.E-03	2.E-05	1.38	
arithmetic mean	4.E-03	4.E-05	3.73	

K from Grain Size Analysis Report Date: 13-May-24

Sample Name: BH-4 (40') (127 Plains Rd West, Burlington ON)

Mass Sample (g): 100 T (oC) 20

Poorly sorted sand low in fines



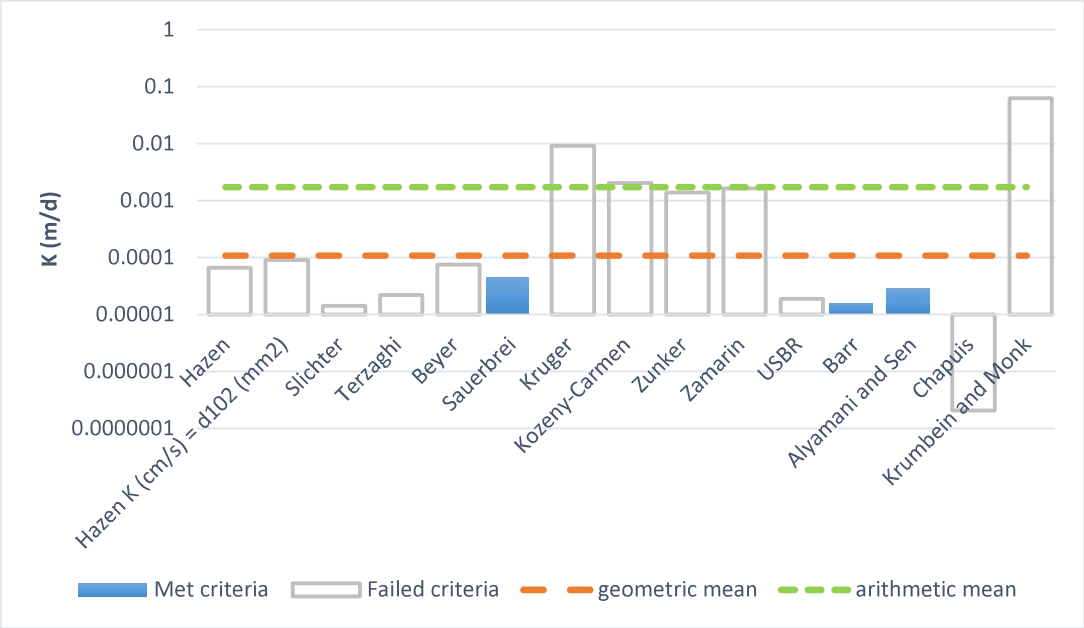
Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	6.E-05	6.E-07	0.05	
Hazen K (cm/s) = d_{10} (mm)	1.E-04	1.E-06	0.09	
Slichter	1.E-05	1.E-07	0.01	
Terzaghi	2.E-05	2.E-07	0.02	
Beyer	7.E-05	7.E-07	0.06	
Sauerbrei	4.E-04	4.E-06	0.33	
Kruger	4.E-04	4.E-06	0.38	
Kozeny-Carmen	9.E-05	9.E-07	0.08	
Zunker	7.E-05	7.E-07	0.06	
Zamarin	8.E-05	8.E-07	0.07	
USBR	1.E-03	1.E-05	1.22	
Barr	1.E-05	1.E-07	0.01	
Alyamani and Sen	2.E-03	2.E-05	1.41	
Chapuis	2.E-06	2.E-08	0.00	
Krumbein and Monk	2.E-03	2.E-05	1.33	
Shepherd	1.E-02	1.E-04	10.21	
geometric mean	7.E-04	7.E-06	0.59	
arithmetic mean	3.E-03	3.E-05	2.66	

K from Grain Size Analysis Report Date: 13-May-24

Sample Name: BH-5A (60') (127 Plains Rd West, Burlington ON)

Mass Sample (g): 100 T (oC) 20

Poorly sorted clay with fines



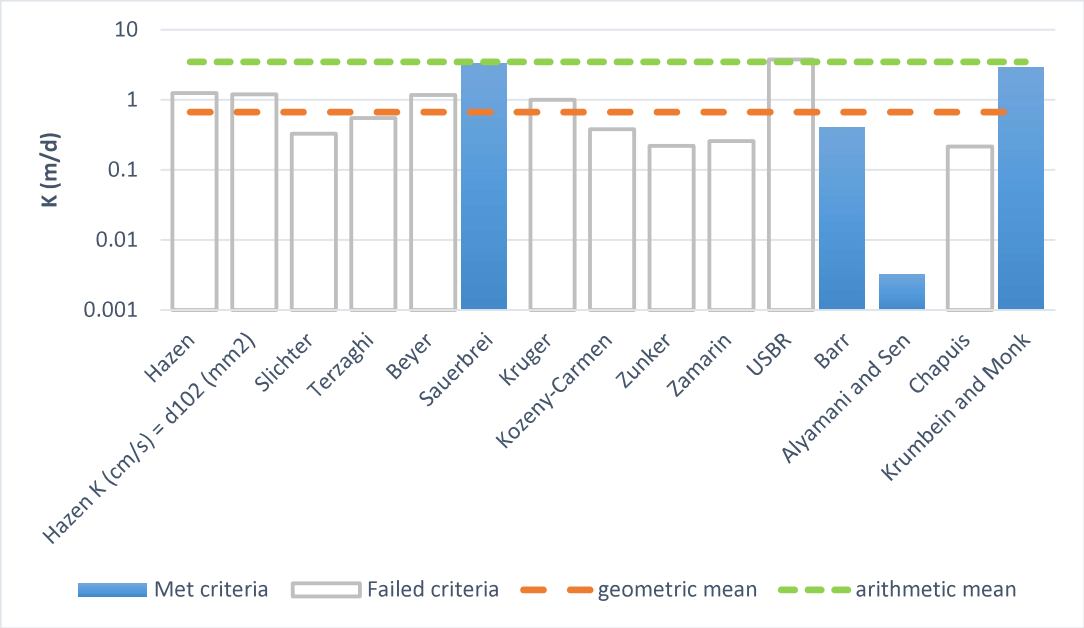
Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	8.E-08	8.E-10	0.00	
Hazen K (cm/s) = d_{10} (mm)	1.E-07	1.E-09	0.00	
Slichter	2.E-08	2.E-10	0.00	
Terzaghi	3.E-08	3.E-10	0.00	
Beyer	9.E-08	9.E-10	0.00	
Sauerbrei	5.E-08	5.E-10	0.00	
Kruger	1.E-05	1.E-07	0.01	
Kozeny-Carmen	2.E-06	2.E-08	0.00	
Zunker	2.E-06	2.E-08	0.00	
Zamarin	2.E-06	2.E-08	0.00	
USBR	2.E-08	2.E-10	0.00	
Barr	2.E-08	2.E-10	0.00	
Alyamani and Sen	3.E-08	3.E-10	0.00	
Chapuis	2.E-10	2.E-12	0.00	
Krumbein and Monk	7.E-05	7.E-07	0.06	
Shepherd	8.E-06	8.E-08	0.01	
geometric mean	1.E-07	1.E-09	0.00	
arithmetic mean	2.E-06	2.E-08	0.00	

K from Grain Size Analysis Report Date: 13-May-24

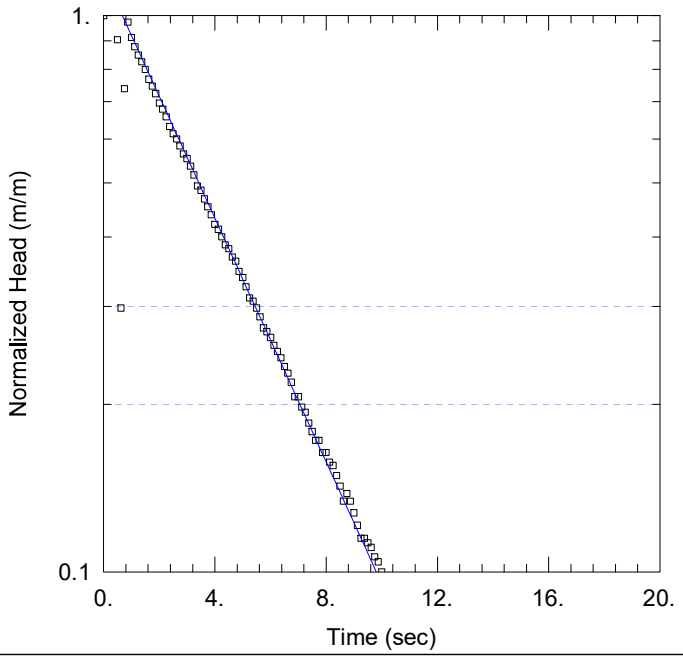
Sample Name: BH-6 (40') (127 Plains Rd West, Burlington ON)

Mass Sample (g): 100 T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	1.E-03	1.E-05	1.24	
Hazen K (cm/s) = d_{10} (mm)	1.E-03	1.E-05	1.19	
Slichter	4.E-04	4.E-06	0.33	
Terzaghi	6.E-04	6.E-06	0.55	
Beyer	1.E-03	1.E-05	1.17	
Sauerbrei	4.E-03	4.E-05	3.24	
Kruger	1.E-03	1.E-05	1.00	
Kozeny-Carmen	4.E-04	4.E-06	0.38	
Zunker	3.E-04	3.E-06	0.22	
Zamarin	3.E-04	3.E-06	0.26	
USBR	4.E-03	4.E-05	3.75	
Barr	5.E-04	5.E-06	0.40	
Alyamani and Sen	4.E-06	4.E-08	0.00	
Chapuis	2.E-04	2.E-06	0.21	
Krumbein and Monk	3.E-03	3.E-05	2.90	
Shepherd	1.E-02	1.E-04	10.80	
geometric mean	8.E-04	8.E-06	0.67	
arithmetic mean	4.E-03	4.E-05	3.47	



WELL TEST ANALYSIS

Data Set: C:\...\MW1B.aqt
Date: 06/25/24 Time: 14:08:28

PROJECT INFORMATION

Company: Terra-Dynamics Consulting Inc.
Client: Losani Homes
Location: 127 Plains Rd W,Burlington,ON
Test Well: MW-1B
Test Date: June 20, 2024

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

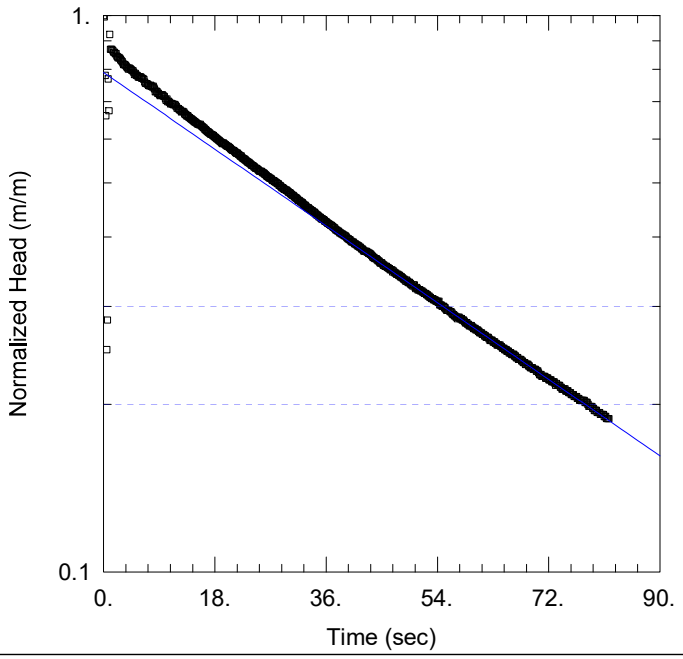
K = 8.753E-5 m/sec
y0 = 0.5572 m

AQUIFER DATA

Saturated Thickness: 2.34 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-3)

Initial Displacement: 0.47 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.34 m
Screen Length: 3.05 m
Well Radius: 0.1 m



WELL TEST ANALYSIS

Data Set: C:\...\MW2.aqt
Date: 06/25/24 Time: 14:27:23

PROJECT INFORMATION

Company: Terra-Dynamics Consulting Inc.
Client: Losani Homes
Location: 127 Plains Rd W,Burlington,ON
Test Well: MW-2
Test Date: June 20, 2024

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

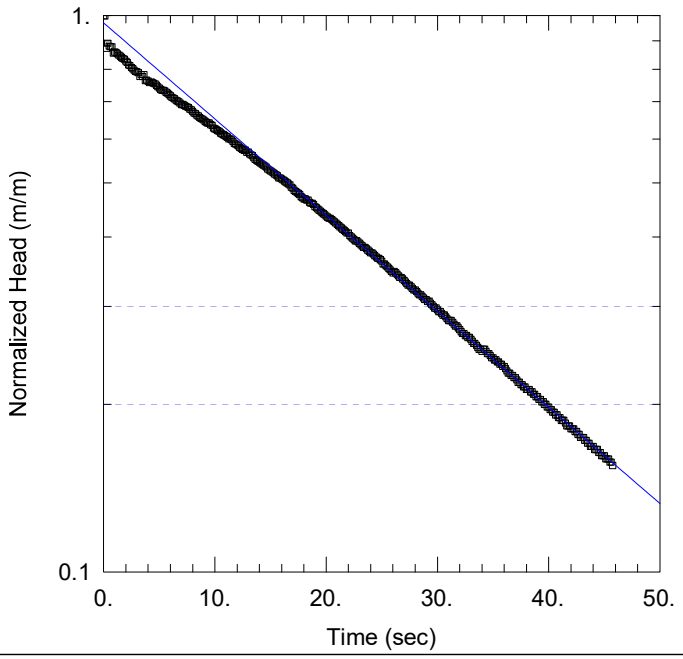
K = 7.482E-6 m/sec
y0 = 0.4819 m

AQUIFER DATA

Saturated Thickness: 1.86 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-2)

Initial Displacement: 0.61 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 1.86 m
Screen Length: 3.05 m
Well Radius: 0.1 m



WELL TEST ANALYSIS

Data Set: C:\...\MW3.aqt
Date: 06/25/24 Time: 13:59:31

PROJECT INFORMATION

Company: Terra-Dynamics Consulting Inc.
Client: Losani Homes
Location: 127 Plains Rd W,Burlington,ON
Test Well: MW-3
Test Date: June 20, 2024

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

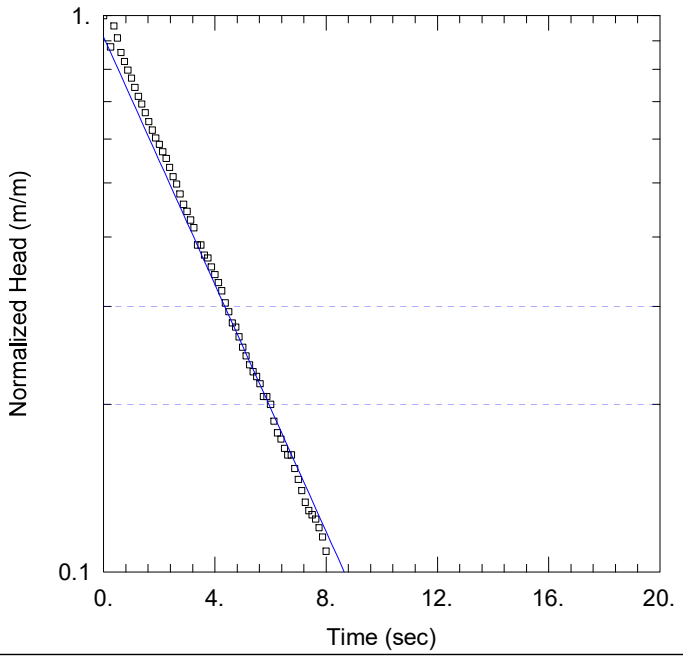
K = 1.381E-5 m/sec
y0 = 0.4559 m

AQUIFER DATA

Saturated Thickness: 2.34 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-3)

Initial Displacement: 0.47 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.34 m
Screen Length: 3.05 m
Well Radius: 0.1 m



WELL TEST ANALYSIS

Data Set: C:\...\MW4.aqt
Date: 06/25/24 Time: 13:51:12

PROJECT INFORMATION

Company: Terra-Dynamics Consulting Inc.
Client: Losani Homes
Location: 127 Plains Rd W,Burlington,ON
Test Well: MW-4
Test Date: June 20, 2024

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

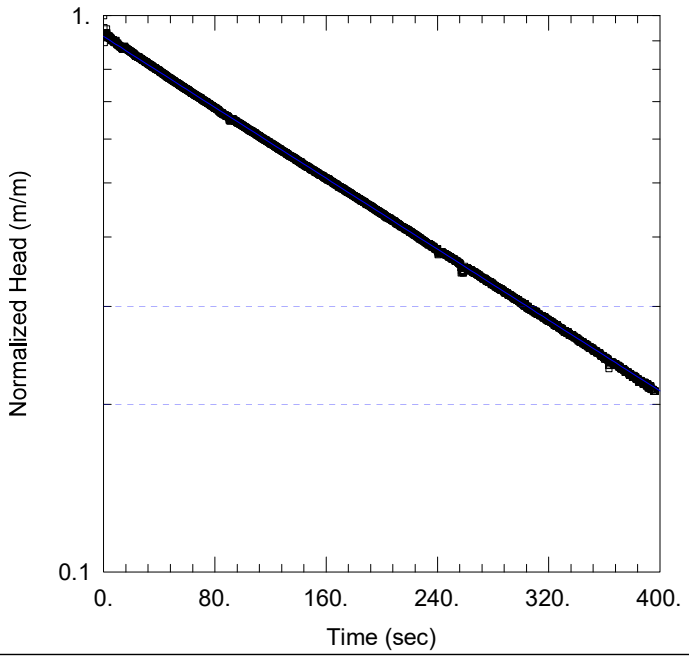
K = 0.0001188 m/sec
y0 = 0.4886 m

AQUIFER DATA

Saturated Thickness: 1.89 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-4)

Initial Displacement: 0.45 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 1.89 m
Screen Length: 3.05 m
Well Radius: 0.1 m



WELL TEST ANALYSIS

Data Set: C:\...\MW5B.aqt
Date: 06/25/24 Time: 14:35:21

PROJECT INFORMATION

Company: Terra-Dynamics Consulting Inc.
Client: Losani Homes
Location: 127 Plains Rd W,Burlington,ON
Test Well: MW-5B
Test Date: June 20, 2024

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

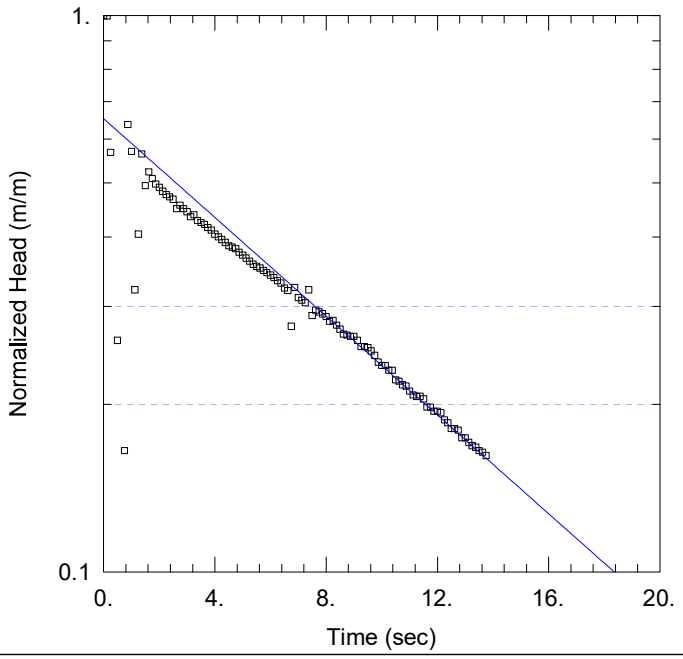
K = 2.524E-6 m/sec
y0 = 0.5776 m

AQUIFER DATA

Saturated Thickness: 1.05 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-5B)

Initial Displacement: 0.63 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 1.05 m
Screen Length: 3.05 m
Well Radius: 0.1 m



WELL TEST ANALYSIS

Data Set: C:\...\MW6.aqt
Date: 06/25/24 Time: 13:39:02

PROJECT INFORMATION

Company: Terra-Dynamics Consulting Inc.
Client: Losani Homes
Location: 127 Plains Rd W,Burlington,ON
Test Well: MW-6
Test Date: June 20, 2024

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 5.767E-5 m/sec
y0 = 0.5806 m

AQUIFER DATA

Saturated Thickness: 1.33 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-6)

Initial Displacement: 0.89 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 1.33 m
Screen Length: 3.05 m
Well Radius: 0.1 m

Appendix D

Laboratory Analyses



FINAL REPORT

CA15219-JUN24 R2

Prepared for

Terra-Dynamics Consulting Inc.

First Page

CLIENT DETAILS

Client	Terra-Dynamics Consulting Inc.
Address	432 Niagara Street, Unit 2 St. Catharines, ON L2M 4W3, Canada
Contact	David Slaine
Telephone	905-646-7931
Facsimile	
Email	dslaine@terra-dynamics.com; kslaine@terra-dynamics.com; br
Project	
Order Number	
Samples	Solution (2)

LABORATORY DETAILS

Project Specialist	Alisha Kelly, B.Sc.,
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2000
Facsimile	705-652-6365
Email	
SGS Reference	CA15219-JUN24
Received	06/21/2024
Approved	07/04/2024
Report Number	CA15219-JUN24 R2
Date Reported	07/10/2024

COMMENTS

Revised to include Total Metals data

RL - SGS Reporting Limit

Nonylphenol Ethoxylates is the sum of nonylphenol monoethoxylate and nonylphenol diethoxylate.

Note: Elevated reporting limit for E.coli due to high sediment in the sample.

QC Batch - GCM373 - JUN24 - 3,3-Dichlorobenzidine LCS; Recovery is outside of control limits. The overall quality control has been assessed and determined to be acceptable.

SIGNATORIES

Alisha Kelly, B.Sc.,

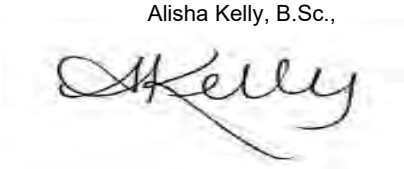


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FINAL REPORT

CA15219-JUN24 R2

Client: Terra-Dynamics Consulting Inc.
Project:
Project Manager: David Slaine
Samplers: Scott Falk

MATRIX: WATER

L1 = SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022

Sample Number	7	8
Sample Name	MW-1-B	MB-6
Sample Matrix	Solution	Solution
Sample Date	20/06/2024	20/06/2024

Parameter	Units	RL	L1	Result	Result
General Chemistry					
Biochemical Oxygen Demand (BOD5)	mg/L	2	15	< 4 ↑	< 4 ↑
Total Suspended Solids	mg/L	2	15	4180	20400
Metals and Inorganics					
Cyanide (total)	mg/L	0.01	0.02	< 0.01	< 0.01
Arsenic (total)	mg/L	0.0002	0.02	0.0319	0.0336
Arsenic (dissolved)	mg/L	0.0002		0.0002	< 0.0002
Cadmium (total)	mg/L	0.000003	0.008	0.000730	0.000910
Cadmium (dissolved)	mg/L	0.000003		< 0.000003	< 0.000003
Chromium (total)	mg/L	0.00008	0.08	0.106	0.157
Chromium (dissolved)	mg/L	0.00008		0.00100	0.00192
Copper (total)	mg/L	0.001	0.04	0.309	0.352
Copper (dissolved)	mg/L	0.001		0.001	< 0.001
Lead (total)	mg/L	0.00009	0.12	0.0720	0.0866
Lead (dissolved)	mg/L	0.00009		< 0.00009	< 0.00009
Manganese (total)	mg/L	0.00001	0.05	7.51	9.82
Manganese (dissolved)	mg/L	0.00001		0.00371	0.00070
Nickel (total)	mg/L	0.0001	0.08	0.171	0.191
Nickel (dissolved)	mg/L	0.0001		0.0007	0.0005
Phosphorus (total)	mg/L	0.003	0.4	3.05	4.23
Phosphorus (dissolved)	mg/L	0.003		< 0.003	< 0.003
Selenium (total)	mg/L	0.00004	0.02	0.00235	0.00195
Selenium (dissolved)	mg/L	0.00004		0.00058	0.00019

Client: Terra-Dynamics Consulting Inc.
Project:
Project Manager: David Slaine
Samplers: Scott Falk

MATRIX: WATER

L1 = SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022

Sample Number	7	8
Sample Name	MW-1-B	MB-6
Sample Matrix	Solution	Solution
Sample Date	20/06/2024	20/06/2024

Parameter	Units	RL	L1	Result	Result
Metals and Inorganics (continued)					
Silver (total)	mg/L	0.00005	0.12	0.00009	0.00013
Silver (dissolved)	mg/L	0.00005		< 0.00005	< 0.00005
Zinc (total)	mg/L	0.002	0.04	0.385	0.420
Zinc (dissolved)	mg/L	0.002		< 0.002	< 0.002
Microbiology					
E. Coli	cfu/100mL	0	200	< 20↑	< 20↑
Nonylphenol and Ethoxylates					
Nonylphenol	mg/L	0.001	0.001	< 0.001	< 0.001
Nonylphenol Ethoxylates	mg/L	0.01	0.01	< 0.01	< 0.01
Nonylphenol diethoxylate	mg/L	0.01		< 0.01	< 0.01
Nonylphenol monoethoxylate	mg/L	0.01		< 0.01	< 0.01
Other (ORP)					
pH	No unit	0.05	8.5	7.48	7.42
Chromium VI	mg/L	0.0002	0.04	0.0005	0.0006
Mercury (total)	mg/L	0.00001	0.0004	< 0.00001	< 0.00001

Client: Terra-Dynamics Consulting Inc.
Project:
Project Manager: David Slaine
Samplers: Scott Falk

MATRIX: WATER

L1 = SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022

Sample Number	7	8
Sample Name	MW-1-B	MB-6
Sample Matrix	Solution	Solution
Sample Date	20/06/2024	20/06/2024

Parameter	Units	RL	L1	Result	Result
PAHs					
Benzo(b+j)fluoranthene	mg/L	0.0001		< 0.0001	< 0.0001
PCBs					
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.0001	0.0004	< 0.0001	< 0.0001
Phenols					
4AAP-Phenolics	mg/L	0.002	0.008	< 0.002	< 0.002
SVOCs					
PAHs (Total)	mg/L		0.002	< 0.001	< 0.001
Perylene	mg/L	0.0005		< 0.0005	< 0.0005
di-n-Butyl Phthalate	mg/L	0.002	0.015	< 0.002	< 0.002
Bis(2-ethylhexyl)phthalate	mg/L	0.002	0.0088	< 0.002	< 0.002
Pentachlorophenol	mg/L	0.0005	0.002	< 0.0005	< 0.0005
3,3-Dichlorobenzidine	mg/L	0.0005	0.0008	< 0.0005	< 0.0005
SVOCs - PAHs					
7Hdibenzo(c,g)carbazole	mg/L	0.0001		< 0.0001	< 0.0001
Anthracene	mg/L	0.0001		< 0.0001	< 0.0001
Benzo(a)anthracene	mg/L	0.0001		< 0.0001	< 0.0001
Benzo(a)pyrene	mg/L	0.0001		< 0.0001	< 0.0001
Benzo(e)pyrene	mg/L	0.0001		< 0.0001	< 0.0001
Benzo(ghi)perylene	mg/L	0.0002		< 0.0002	< 0.0002
Benzo(k)fluoranthene	mg/L	0.0001		< 0.0001	< 0.0001
Chrysene	mg/L	0.0001		< 0.0001	< 0.0001

Client: Terra-Dynamics Consulting Inc.
Project:
Project Manager: David Slaine
Samplers: Scott Falk

MATRIX: WATER

L1 = SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022

Sample Number	7	8
Sample Name	MW-1-B	MB-6
Sample Matrix	Solution	Solution
Sample Date	20/06/2024	20/06/2024

Parameter	Units	RL	L1	Result	Result
SVOCs - PAHs (continued)					
Dibenzo(a,h)anthracene	mg/L	0.0001		< 0.0001	< 0.0001
Dibenzo(a,i)pyrene	mg/L	0.0001		< 0.0001	< 0.0001
Dibenzo(a,j)acridine	mg/L	0.0001		< 0.0001	< 0.0001
Fluoranthene	mg/L	0.0001		< 0.0001	< 0.0001
Indeno(1,2,3-cd)pyrene	mg/L	0.0002		< 0.0002	< 0.0002
Phenanthrene	mg/L	0.0001		< 0.0001	< 0.0001
Pyrene	mg/L	0.0001		< 0.0001	< 0.0001
VOCs					
Chloroform	mg/L	0.0005	0.002	< 0.0005	< 0.0005
1,2-Dichlorobenzene	mg/L	0.0005	0.0056	< 0.0005	< 0.0005
1,4-Dichlorobenzene	mg/L	0.0005	0.0068	< 0.0005	< 0.0005
cis-1,2-Dichloroethene	mg/L	0.0005		< 0.0005	< 0.0005
trans-1,3-Dichloropropene	mg/L	0.0005	0.0056	< 0.0005	< 0.0005
Methylene Chloride	mg/L	0.0005	0.0052	< 0.0005	< 0.0005
1,1,2,2-Tetrachloroethane	mg/L	0.0005	0.017	< 0.0005	< 0.0005
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	0.0044	< 0.0005	< 0.0005
Trichloroethylene	mg/L	0.0005	0.0076	< 0.0005	< 0.0005

Client: Terra-Dynamics Consulting Inc.
Project:
Project Manager: David Slaine
Samplers: Scott Falk

MATRIX: WATER

L1 = SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022

Sample Number	7	8
Sample Name	MW-1-B	MB-6
Sample Matrix	Solution	Solution
Sample Date	20/06/2024	20/06/2024

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

EXCEEDANCE SUMMARY

MW-1-B

Parameter	Method	Units	Result	SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022 L1
Total Suspended Solids	SM 2540D	mg/L	4180	15
Arsenic	SM 3030/EPA 200.8	mg/L	0.0319	0.02
Chromium	SM 3030/EPA 200.8	mg/L	0.106	0.08
Copper	SM 3030/EPA 200.8	mg/L	0.309	0.04
Manganese	SM 3030/EPA 200.8	mg/L	7.51	0.05
Nickel	SM 3030/EPA 200.8	mg/L	0.171	0.08
Phosphorus	SM 3030/EPA 200.8	mg/L	3.05	0.4
Zinc	SM 3030/EPA 200.8	mg/L	0.385	0.04

MB-6

Total Suspended Solids	SM 2540D	mg/L	20400	15
Arsenic	SM 3030/EPA 200.8	mg/L	0.0336	0.02
Chromium	SM 3030/EPA 200.8	mg/L	0.157	0.08
Copper	SM 3030/EPA 200.8	mg/L	0.352	0.04
Manganese	SM 3030/EPA 200.8	mg/L	9.82	0.05
Nickel	SM 3030/EPA 200.8	mg/L	0.191	0.08
Phosphorus	SM 3030/EPA 200.8	mg/L	4.23	0.4
Zinc	SM 3030/EPA 200.8	mg/L	0.420	0.04

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0048-JUN24	mg/L	2	< 2	5	30	89	70	130	NV	70	130

Cyanide by SFA

Method: SM 4500 I Internal ref.: ME-CA-[ENV]SFA-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)	SKA0218-JUN24	mg/L	0.01	<0.01	ND	10	91	90	110	NV	75	125

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A I Internal ref.: ME-CA-[ENV]SKA-LAK-AN-012

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chromium VI	SKA0212-JUN24	mg/L	0.0002	<0.0002	ND	20	98	80	120	94	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | 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)	EHG0052-JUN24	mg/L	0.00001	< 0.00001	ND	20	103	80	120	99	70	130

Metals in aqueous samples - ICP-MS

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0223-JUN24	mg/L	0.00005	<0.00005	ND	20	99	90	110	75	70	130
Arsenic (total)	EMS0223-JUN24	mg/L	0.0002	<0.0002	6	20	100	90	110	101	70	130
Cadmium (total)	EMS0223-JUN24	mg/L	0.000003	<0.000003	13	20	102	90	110	96	70	130
Chromium (total)	EMS0223-JUN24	mg/L	0.00008	<0.00008	8	20	100	90	110	117	70	130
Copper (total)	EMS0223-JUN24	mg/L	0.001	<0.001	9	20	101	90	110	117	70	130
Manganese (total)	EMS0223-JUN24	mg/L	0.00001	<0.00001	0	20	101	90	110	96	70	130
Nickel (total)	EMS0223-JUN24	mg/L	0.0001	<0.0001	7	20	99	90	110	101	70	130
Lead (total)	EMS0223-JUN24	mg/L	0.00009	<0.00009	8	20	102	90	110	99	70	130
Phosphorus (total)	EMS0223-JUN24	mg/L	0.003	<0.003	1	20	98	90	110	NV	70	130
Selenium (total)	EMS0223-JUN24	mg/L	0.00004	<0.00004	16	20	104	90	110	104	70	130
Zinc (total)	EMS0223-JUN24	mg/L	0.002	<0.002	6	20	98	90	110	108	70	130

QC SUMMARY

Microbiology

Method: SM 9222D | Internal ref.: ME-CA-[ENV]MIC-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	BAC9353-JUN24	cfu/100mL	-	ACCEPTED	ACCEPTED							

Nonylphenol and Ethoxylates

Method: ASTM D7065-06 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-015

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nonylphenol diethoxylate	GCM0381-JUN24	mg/L	0.01	< 0.01			89	55	120			
Nonylphenol Ethoxylates	GCM0381-JUN24	mg/L	0.01	< 0.01								
Nonylphenol monoethoxylate	GCM0381-JUN24	mg/L	0.01	< 0.01			89	55	120			
Nonylphenol	GCM0381-JUN24	mg/L	0.001	< 0.001			86	55	120			

QC SUMMARY

pH

Method: SM 4500 I 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	EWL0568-JUN24	No unit	0.05	NA	0		100			NA		

Phenols by SFA

Method: SM 5530B-D I 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	SKA0209-JUN24	mg/L	0.002	<0.002	ND	10	106	80	120	102	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A I Internal ref.: ME-CA-[ENV]GC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0401-JUN24	mg/L	0.0001	<0.0001	NSS	30	95	60	140	NSS	60	140

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
3,3-Dichlorobenzidine	GCM0373-JUN24	mg/L	0.0005	< 0.0005	NSS	30	140	30	130	NSS	30	130
7Hdibenzo(c,g)carbazole	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	88	50	140	NSS	50	140
Anthracene	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	92	50	140	NSS	50	140
Benzo(a)anthracene	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	92	50	140	NSS	50	140
Benzo(a)pyrene	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	93	50	140	NSS	50	140
Benzo(b+j)fluoranthene	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	96	50	140	NSS	50	140
Benzo(e)pyrene	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	86	50	140	NSS	50	140
Benzo(ghi)perylene	GCM0423-JUN24	mg/L	0.0002	< 0.0002	NSS	30	97	50	140	NSS	50	140
Benzo(k)fluoranthene	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	92	50	140	NSS	50	140
Bis(2-ethylhexyl)phthalate	GCM0423-JUN24	mg/L	0.002	< 0.002	NSS	30	101	50	140	NSS	50	140
Chrysene	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	94	50	140	NSS	50	140
di-n-Butyl Phthalate	GCM0423-JUN24	mg/L	0.002	< 0.002	NSS	30	99	50	140	NSS	50	140
Dibenzo(a,h)anthracene	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	94	50	140	NSS	50	140
Dibenzo(a,i)pyrene	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	91	50	140	NSS	50	140
Dibenzo(a,j)acridine	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	87	50	140	NSS	50	140
Fluoranthene	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	94	50	140	NSS	50	140
Indeno(1,2,3-cd)pyrene	GCM0423-JUN24	mg/L	0.0002	< 0.0002	NSS	30	96	50	140	NSS	50	140
Pentachlorophenol	GCM0423-JUN24	mg/L	0.0005	< 0.0005	NSS	30	114	50	140	NSS	50	140
Perylene	GCM0423-JUN24	mg/L	0.0005	< 0.0005	NSS	30	93	50	140	NSS	50	140
Phenanthrene	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	91	50	140	NSS	50	140

QC SUMMARY

Semi-Volatile Organics (continued)

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
Pyrene	GCM0423-JUN24	mg/L	0.0001	< 0.0001	NSS	30	92	50	140	NSS	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	EWL0583-JUN24	mg/L	2	< 2	2	10	94	90	110	NA		

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,2,2-Tetrachloroethane	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	92	60	130	106	50	140
1,2-Dichlorobenzene	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	100	60	130	95	50	140
1,4-Dichlorobenzene	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	101	60	130	94	50	140
Benzene	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	100	60	130	92	50	140
Chloroform	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	99	60	130	92	50	140
cis-1,2-Dichloroethene	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	99	60	130	93	50	140
Ethylbenzene	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	101	60	130	91	50	140
m-p-xylene	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	98	60	130	90	50	140
Methylene Chloride	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	98	60	130	92	50	140
o-xylene	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	99	60	130	92	50	140
Tetrachloroethylene (perchloroethylene)	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	98	60	130	90	50	140
Toluene	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	100	60	130	91	50	140
trans-1,3-Dichloropropene	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	99	60	130	94	50	140
Trichloroethylene	GCM0347-JUN24	mg/L	0.0005	<0.0005	ND	30	104	60	130	88	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.

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This report supersedes all previous versions.

-- End of Analytical Report --

Cooler 1/2

SGS

Request for Laboratory Services and CHAIN OF CUSTODY (General)

SGS Environmental Services - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Toll Free: 877-747-7658 Fax: 705-652-6365 Web: www.ca.sgs.com

SGS Environmental Services - London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361 Web: www.ca.sgs.com

Laboratory Information Section

Received Date (mm/dd/yyyy): 06/21/2024	LAB LIMS #: Jun-13219
Received Time (After Hours Only): ___:___	Temperature Upon Receipt (°C): 11x3

Billing & Reporting Information

Invoice/Receipt to {3}:			
Company:	Terra-Dynamics Consulting	Quote #:	
Attention:	David Slaine	Attached Parameter List:	☐ YES ☑ NO
Address:	432 Niagara St, Unit 2 St. Catharines, ON L2M 4W3	**Turnaround Time**	
		Is *Rush Turnaround Time Required?	☐ YES ☑ NO
Email:	Dslaine@Terra-Dynamics.Com & Kslaine@Terra-Dynamics.com & Bmacintyre@terra-dynamics.com & jcampbell@terra-dynamics.com	Specify:	
		* Rush TA Requests Require Lab Approval	
Project Name/Number:	127 Plains Road, Burlington	P.O. #:	

Client Information/Report To:

				Client Lab #:	
Company Name:	Same as above		Phone Number:		
Contact Name:	Same as above		Fax Number:		
Address:	Same as above		E-mail:		
Copy to:	Same as above				

Sample Information

Sample Identifier	Date Sampled (mm/dd/yy) ✓	Time Sampled	# of Bottles	Analysis Requested (please enter the analysis required below and check off which analysis applies to each sample) Samples to be analyzed for the City of Burlington Stormsewar By-Law Sanstorm-Burlington
~~MW-1A~~ MW-1-B	06/20/24	8:40	20	Note: Second Total Metals Bottle was Field Filtered. Bottle is marked
MW-6	06/20/24	9:00	20	Note: Second Total Metals Bottle was Field Filtered. Bottle is marked

Note: 2 coolers this cooler contains MW-6 please use 0 detection limit E.coli colourmetric total phos

Sampled By {1}:	(Name) Scott FNK	(Signature)		Date: 06/20/24	(mm/dd/yy)
Relinquished by {2}:	(Name) Scott FNK	(Signature)		Date: 06/20/24	(mm/dd/yy)

Note: {1} Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request.

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6088490105 25 6088296462 64
10:30 AM

Cooler 2/2

SGS

Request for Laboratory Services and CHAIN OF CUSTODY (General)

SGS Environmental Services - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Toll Free: 877-747-7658 Fax: 705-652-6365 Web: www.ca.sgs.com {4}

SGS Environmental Services - London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361 Web: www.ca.sgs.com {4}

Laboratory Information Section

Received Date (mm/dd/yyyy): __/__/____	LAB LIMS #:
Received Time (After Hours Only): __:__	Temperature Upon Receipt (°C):

Billing & Reporting Information

Invoice/Receipt to {3}:	Company:		Quote #:
	Attention:		Attached Parameter List: ☐ YES ☐ NO
	Address:		**Turnaround Time**
			Is *Rush Turnaround Time Required? ☐ YES ☐ NO
	Email:		Specify:
Project Name/Number:		P.O. #:	* Rush TA Requests Require Lab Approval

Client Information/Report To:

				Client Lab #:
Company Name:			**Phone Number:**	
Contact Name:			**Fax Number:**	
Address:			**E-mail:**	
Copy to:				

Sample Information

Sample Identifier	Date Sampled (mm/dd/yy)	Time Sampled	# of Bottles	Analysis Requested (please enter the analysis required below and check off which analysis applies to each sample)
				SEE COC in cooler 1 this is cooler 2, contains MW-1-5

Sampled By {1}:	(Name)	(Signature)	**Date:** __/__/__	(mm/dd/yy)
Relinquished by {2}:	(Name)	(Signature)	**Date:** __/__/__	(mm/dd/yy)

Note: {1} Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. {4} Completion of work may require the subcontracting of samples between the London and Lakefield laboratories.

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