Azure Group

April 3, 2024

Project No. 2209-004

2781798 Ontario Ltd. c/o AAA Architects Inc.
2121 Argentia Road, Suite 105
Mississauga, ON
L5N 2X4

Attention: Dr. Laith Al-Dabbagh c/o AAA Architects Inc.

Re: Preliminary Hydrogeological Assessment
141-153 Plains Road West
Burlington, Ontario

Dear Sir:

Azure Group Inc. (Azure) was retained by Dr. Laith Al-Dabbagh of 2781798 Ontario Ltd. c/o AAA Architects Inc. (The Client) to conduct a Hydrogeological Assessment at the property located at 141-153 Plains Road West in Burlington Ontario (The Subject Property). Azure thereby retained in partnership Azimuth Environmental Consulting, Inc. (Azimuth) to complete the Hydrogeological Assessment. As indicated in the completed report, the purpose of the Hydrogeological Assessment was to characterize the existing hydrogeological conditions at and in the vicinity of the Site, assess the need for, and options for, groundwater control in association with the proposed construction, evaluate potential impacts to the local groundwater regime resulting from the proposed construction, and identify appropriate mitigative measures, as warranted.

At the time of the site visit(s), the Site was residential/commercial land covered with bushes, shrubs and trees and a few site structures. There was vehicular access to the property at the time of the site visit via on-site driveways. Figures showing the approximate location of the boreholes are included in the following report completed by Azimuth.

CLOSURE

This report has been prepared for the benefit of 2781798 Ontario Inc. (The Client), and their clients.

Any other person or entity without the express written consent of Azure Group Inc. (Azure) and the client may not rely upon the report. Any use that a party makes of this report, or any reliance on decisions made based on it, are the responsibility of such parties. Azure accepts no liability and no responsibility whatsoever for damages, if any, suffered by any party as a result of decisions made or actions based on this report.

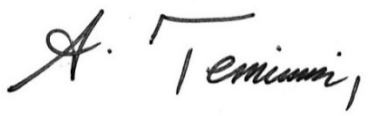
An environmental site characterization is a limited sampling of a site. The conclusions given herein are based on information gathered at the specific locations and can only be extrapolated to an undefined limited area around these locations. The extent of the limited area depends on the soil and groundwater conditions, as well as the history of the subject property reflecting natural, construction, and other activities. In addition, analyses have been carried out for a limited number of chemical parameters, and it should not be inferred that other chemical species are not present.

Due to the nature of the investigation and the limited data available, Azure cannot warrant against undiscovered environmental liabilities. No other warranty or representation, either expressed or implied, is included or intended in this report. Should any conditions at the site be encountered, which differ from those at the sampling locations and/or additional site information become available, Azure requests that this information be brought to our attention so that we may re-assess the conclusions presented herein. It should also be noted that current environmental Regulations, Guidelines, Policies, Standards, Protocols and Objectives are subject to change, and such changes, when put into effect, could alter the conclusions and recommendations noted throughout this report.

We trust this is satisfactory. Should any queries arise, please feel free to contact this office.

Yours truly,

AZURE GROUP INC.



Ahmed Al-Temimi, M.Sc., P.Eng., QP(ESA)
Ontario Designated Consulting Engineer
aaltemimi@azuregroup.ca

Hydrogeological Assessment

141-153 Plains Road West
Burlington, ON

Prepared for:
Azure Group

Prepared by:
Azimuth Environmental
Consulting, Inc.

April 2024

AEC 22-411

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Assessments & Approvals

April 3, 2024 AEC 22-411

Azure Group
6751 Professional Court, Suite 201
Mississauga, Ontario
L4V 1Y3

Attention: Samantha Desgrosseilliers

Re: **Hydrogeological Assessment**
141-153 Plains Road West, Burlington, ON

Dear Samantha:

Azimuth Environmental Consulting, Inc. (Azimuth) is pleased to provide our Hydrogeological Assessment for the property located at 141-153 Plains Road West within the City of Burlington, ON (the "Site"). This evaluation focused on the existing soil and ground water regime underlying the Site and the potential for the proposed development to impact the existing conditions.

Should you have any questions or wish to discuss the report in greater detail, please do not hesitate to contact the undersigned.

Yours truly,

AZIMUTH ENVIRONMENTAL CONSULTING, INC.



Colin Ross, B.Sc., P.Geo.
Senior Hydrogeologist

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1.0 INTRODUCTION

Azimuth Environmental Consulting, Inc. (Azimuth) has been retained by Azure Group to conduct a Preliminary Hydrogeological Assessment for the property located 141-153 Plains Road West within the City of Burlington, Ontario (the "Site") (Figure 1). The Site is approximately 0.24 ha in size. The Site is bound by Plains Road West to the south, a commercial property to the east, industrial lot to the north and residential to the west.

The development plan (Appendix B) illustrates access will be from Plains Road West with the development comprised of an 11 storey commercial / residential building with associated underground parking beneath the building (2 levels). The purpose of this assessment is to characterize the hydrogeological conditions at the Site and the potential for the proposed development to cause impact.

2.0 ENVIRONMENTAL SETTING

2.1 Soil

The soils at the Site are classified as Grimsby Sandy Loam (Wicklund *et al.*, 1971). This soil is grey brown luvisol that is well drained. The sand is classified within hydrologic soil group "A". Group A soils have low runoff potential and high infiltration rates even when thoroughly wet, and consist of deep, well to excessively drained sand or gravel.

2.2 Physiography

According to Chapman and Putnam (1984) the Site falls within the Iroquois Plain Physiography region, which extends around the western part of Lake Ontario, from the Niagara River to the Trent River. During the period when the last glacier was receding but still occupied the St. Lawrence Valley, the area was inundated by a body of water known as Lake Iroquois which emptied eastward at Rome, New York State. Its old shorelines, including cliffs, bars, beaches, and boulder pavements are easily identifiable features, while the undulating till plains above stand in strong contrast to the lake bottom which has been smoothed by wave action or lacustrine deposits.

2.3 Topography and Drainage

The Site has limited relief with elevations ranging between ~102.6 and 103.3 masl with the surrounding area having similarly limited relief with the exception of valley features associated with Grindstone Creek to the northwest and a small tributary to the southeast.

Surface runoff from the Site, which is mostly impervious due to buildings and paved parking lots is directed into local storm water infrastructure along Plains Road West.

2.4 Bedrock Geology

The Ontario Geologic Survey Earth Database shows that the uppermost bedrock unit at the Site consists of shale, siltstone, and minor limestone sand sandstone of the Queenston Formation (OGS, 2022). The Queenston Formation is Upper Ordovican in age.

2.5 Quaternary Geology

According to Barnett *et al.* (1991), the surficial material at the Site consists of glaciolacustrine deposits composed of coarse sand and gravel sand and gravel.

2.6 Well Records

The MECP Water Well Records were referenced for any recorded well information within the vicinity of the Site (approximately 300 m)(MECP, 2022). The area is municipally serviced; however historical well records can be used to gain subsurface information which can provide insight into shallow geological formation within the area. The well records found in the vicinity of the Site that are pertinent to this assessment are summarized in Table 1 and are shown on Figure 3. There are ten (10) well records found in the vicinity of the Site. These records which were available are summarized in Appendix C.

In general, the well records indicate a dominance of sand and gravel.

Table 1: MECP Water Well Database Summary (300 m radius from Site)

MECP Well Record / Tag No.	Well Type	Drill Date	Diameter (inches)	Depth (mbgs)
7256551 / A176643	Monitoring Well	11-Dec-15	2	5.5
7256550 / A176644	Monitoring Well	11-Dec-15	2	5.5
7256552 / A176645	Monitoring Well	11-Dec-15	2	6.1
4161239 / A101100	Monitoring Well	10-Feb-11	2	6.0
7157614 / A107376	Monitoring Well	14-Jan-11	2	6.1
7235983 / A168575	Monitoring Well	22-Dec-14	2	6.1
7231349	N/A	17-Feb-11	N/A	N/A
X7231350	N/A	20-Jul-11	N/A	N/A
7202143	N/A	4-Dec-12	N/A	N/A
7203894	N/A	10-Jul-12	N/A	N/A

The well records are for monitoring wells likely related to environmental / geotechnical work associated with local development projects.

3.0 SOURCE WATER PROTECTION

A review of the Source Water Protection Areas as identified on the MECP Source Protection Information Atlas website indicates the Site is located within the Halton Region Source Water Protection Area such that it is governed under the Halton / Hamilton Source Protection Plan (SPP). It is noted that the Site is not located within a Significant Ground Water Recharge Area (SGRA), Issues Contributing Area (ICA), Highly Vulnerable Aquifer, Wellhead Protection Area (WHPA-D), WHPA-Q2, or an Intake Protection Zone (IPZ). As such, no specific measures are required to address Source Water Protection Policy. The mapping is illustrated in Appendix F.

4.0 MONITORING

4.1 Geotechnical Assessment (2022)

Azure Group Inc. completed a geotechnical drilling program at the Site in 2022, which included advancing nine (9) boreholes to depths ranging between ~6.7 and 14.6 metres below ground surface (mbgs). Five (5) of the boreholes (BH1, BH2, BH4, BH5 and BH8) were completed as monitoring wells with depths of 6.1 to 14.5 mbgs.

The subsurface material encountered was comprised of mainly medium to coarse sand and gravel, although a thin (30 cm) clay lens was noted in a few boreholes at approximately 4 mbgs. The complete borehole logs can be found in Appendix D, while the borehole locations are illustrated on Figure 2.

4.2 Ground Water Level Monitoring

The water level at each of the monitoring wells was measured on November 24th, 2022 and June 1st, 2023. The ground water table levels are given in the below Table 2:

Based on the ground water elevations at the Site, local ground water flow direction is to the south (Figure 2), which corresponds to the more regional ground water flow pattern which is interpreted to follow local topography towards Lake Ontario to the south. The spring high water table conditions are represented by the data collected on June 1st, 2023, and are confirmed by the continuous datalogger data collected in monitoring wells BH2 and BH5, which collected continuous water level data (hourly) from November, 2022 to June, 2023 (Figure In order to delineate potentially more elevated water table conditions following spring freshet, two dataloggers have been installed in Site monitoring wells to collect continuous water levels between November 2022 and June 2023. Given the depth to water table, the proposed building design does not appear to encroach into the water table.

Table 2: Summary of Ground Water Measurements

Location	Ground Elevation (masl)	Monitoring Well Depth (mbgs)*	Date	Water Level (mbgs)	Ground Water Elevation (masl)
BH1	103.13	14.51	24-Nov-22	13.28	89.85
			1-Jun-23	13.16	89.97
BH2	102.74	14.45	24-Nov-22	13.09	89.65
			1-Jun-23	12.95	89.79
BH4	102.83	13.72	24-Nov-22	13.49	89.34
			1-Jun-23	13.35	89.48
BH5	103.31	14.53	24-Nov-22	13.78	89.53
			1-Jun-23	13.66	89.65
BH8	102.93	6.1	24-Nov-22	Dry	Dry
			1-Jun-23	Dry	Dry

* - measured by Azimuth

4.3 Hydraulic Conductivity Testing

In order to understand the hydraulic characteristics of the underlying overburden, a transient slug test can be performed within monitoring wells to determine the average hydraulic conductivity of the screened interval. A slug test involves the instantaneous injection or withdrawal of a volume or slug of water or solid cylinder of known volume. This is accomplished by adding or displacing a known volume to/from a well and measuring water level response time to return to equilibrium.

This testing was completed at the Site by Azimuth staff within BH1, 2 & 5 on November 24, 2022 through removal of water to create a measurable water level response in the well. Water level measurements were recorded both manually and with an automatic datalogger, which were programmed to record the pressure of water above the data logger every second. Data was analyzed using the Hvorslev Method (1951) for unconfined aquifers, which assumes a homogeneous, isotropic medium in which soil and water are incompressible. Hydraulic testing results are summarized in Table 3, and within Appendix E.

Table 3: Hydraulic Testing Results

Monitoring Well	Screen Depth (mbgs)	Hydraulic Conductivity (m/s)	Soil Description
BH-1	10.3 - 13.3	2.0×10^{-4}	Coarse Sand & Gravel
BH-2	10.1 - 13.1	8.1×10^{-5}	Coarse Sand & Gravel
BH-5	10.8 - 13.8	2.6×10^{-5}	Coarse Sand & Gravel

Slug test data indicates that the hydraulic conductivity of the deposits is between 8 $x10^{-5}$ and 2 $x10^{-4}$ m/sec. The measured hydraulic conductivity is within the published range for a sandy material (Freeze & Cherry, 1979).

Based on the hydraulic conductivity values collected at the Site, an infiltration rate of approximately 150 mm/hr is estimated based on the CVC / TRCA Lid Design Guideline, (Table C1).

5.0 WATER BALANCE

In order to determine the potential changes to the natural ground water recharge conditions, a pre- and post-development water balance assessment has been completed using the Thornthwaite and Mather method (1957). This method evaluates evapotranspiration based on precipitation and temperature. Residual soil saturation is a function of topography and soil type. Monthly data are tabulated from daily average temperature and precipitation, and the water budget is a continuous calculation over the period of record. To clarify, the method and the approach used by many individuals in examining infiltration resets annual conditions (moisture deficit, snow storage, etc) over the winter months because of the general lack of infiltration during the frost period. However, we maintain those records and carry them forward from month to month during the entire period of record.

Values were determined on a monthly basis, compiled from daily Environment Canada meteorological data station located in Hamilton, Ontario between 1960 and 2021 which represents an extensive and representative climate database for use in this water balance. The calculations are based on the average conditions during this period; the average precipitation was 875 mm, rainfall was 693 mm, evapotranspiration was 509 mm and the surplus was 386 mm.

5.1 Land Use

5.1.1 Pre-Development

The pre-development Site area was classified according to land use/vegetation type. Land within the pre-development area is provided in Table 4.

Table 4: Pre Development Area Classification

Land Use	Land Area (m^2)
Asphalt / Walkway *(impervious)*	1,195
Rooftop *(impervious)*	505
Landscaped *(pervious)*	700
TOTAL	**2,400**

Land within the pre-development scenario is considered 71% impervious. The pre-development areas are illustrated on Figure 2.

5.1.2 Post-Development

The land classification in the post-development scenario was classified based on the Site Plan (Appendix G). Land within the post-development Site is summarized in the below Table 5:

Table 5: Post Development Area Classification

Land Use	Land Area (m^2)
Asphalt / Walkway *(impervious)*	1,468
Rooftop *(impervious)*	932
Landscaped *(impervious)**	0
TOTAL	**2,400**

* landscaped areas overtop excavated foundation such that not considered pervious with respect to infiltration potential

Land within the post-development scenario is considered 100% impervious.

5.2 Infiltration

Infiltration is generated one of two ways: (1) directly from rainfall impact or snowmelt on pervious surfaces; and (2) indirectly when runoff from impervious surfaces is diverted into adjacent naturalized areas.

Infiltration factors for the Site were estimated based on the underlying soil, local topography, and ground cover as per Table 2 of the Ministry of Environment and Energy (MOEE) Hydrogeological Technical Information Requirements for Land Development Applications (1995).

The soil variable factor was determined by taking into account information obtained from the regional geologic mapping and the geotechnical program completed for the Site. This information suggests that the surficial material at the Site is primarily composed of fill over native sand. The infiltration factors utilized in the water balance assessment are summarized in Table 6 below.

Table 6: Summary of Pervious Land Infiltration Factor

Scenario	Land Use	Infiltration Factor	Assumption
Pre-Development	Landscaped	0.75	Flat land (0.25), medium to coarse sand (0.4), landscaped (0.1).
Post-Development	Landscaped	0.75	Flat land (0.25), compact silty sand soil (0.4), landscaped (0.1).

5.2.1 Pre-Development Infiltration

Pre-development direct infiltration was determined by multiplying the annual average surplus amount, the area of each land use, and the infiltration factor for each land use. The pre-development annual infiltration is therefore 203 m^3/year (Appendix G).

5.2.2 Post-Development Infiltration

Post-development infiltration (without mitigation) was determined by multiplying the annual average surplus amount, the area of each land use, and the infiltration factor for each land use. The post-development annual direct infiltration is therefore 0 m^3/year, given most of the development footprint will be covered by parking or rooftop with any landscaped areas being above the underground parking such that no infiltration is considered. There is therefore a decrease in infiltration of 203 m^3/year from pre- to post-development without mitigation measures employed. Given the footprint of the underground parking, it is unlikely that ground water infiltration mitigation measures are feasible at this Site unless constructed beneath the foundation. As noted in Section 4.3, an estimated infiltration rate of ~150 mm/hr for the soils at the Site would indicate subsurface ground water infiltration LID measures are functionally feasible at the Site.

6.0 DEWATERING ASSESSMENT

Although sub-surface construction will include municipal servicing connections and two levels of underground parking to depths of approximately 7 m, there is not an expectation that dewatering would be required given the depths to ground water at the Site are ~13 mbgs.

7.0 WATER QUALITY

A water sample was collected from BH-1 on November 24th, 2022 to determine the on-site ground water quality in preparation for potential dewatering activities. The Azimuth results are included in Appendix H and have been compared to the Provincial Water Quality Objectives (PWQO). All parameters met the PWQO with the exception of total phosphorus, which also exceeded Burlington Storm Sewer Use By-Law Criteria.

The total phosphorus concentrations is significantly elevated (4.71 mg/L), but is interpreted to be primarily sourced to the elevated sediment load in the sample as evidenced by the elevated turbidity (7,280 NTU). The nutrient analysis was completed on water that was unfiltered, and therefore contained a high concentration of sediment particles. The increased phosphorus is therefore likely attributed to the excess nutrients that are bound to the sediment grains in suspension and dissolved within the acidified nutrients bottle.

As noted in Section 6.0 above, dewatering is not anticipated for service or structure construction. Although there are elevated concentrations of some parameters within the ground water, the discharge of ground water to a surface water body or catch basin is not required.

8.0 SUMMARY AND CONCLUSIONS

Azimuth was retained by the Azure Group to conduct a Hydrogeological Assessment for the property located at 141 – 153 Plains Road West, in the City of Burlington, Ontario. The Site is approximately 0.24 ha in size, is currently developed with residential and commercial buildings and is bound by existing commercial, industrial and residential landuse.

Boreholes logs from the Site show the subsurface is composed of native medium to coarse sand and gravel to depths greater than 13 m. The inferred ground water flow direction is southwest based on measured ground water elevations at the Site, while more regional flow is interpreted to be south towards Lake Ontario. Ground water levels typically vary seasonally with high ground water conditions observed following spring freshet between March and May. However, this variation is observed to be quite limited with the variance between November, 2022 and June, 2023 being less than 15 cm. Given the depth of water table, it is unlikely that elevated spring ground water elevations will affect the design.

Hydraulic conductivity testing was completed at three of the monitoring wells which indicated a hydraulic conductivity values between 8×10^{-5} and 2×10^{-4} m/sec, which is considered representative of the sand overburden present at the Site.

The pre-development infiltration volume is $203 m^3$/year. This assumes the Site is composed of the existing hardscaped and landscaped areas. The post-development without mitigation infiltration volume is 0 m^3/year, owing to the fact the building, parking area and underground parking footprint comprise the entire property area. This fact would also limit the potential for ground water infiltration mitigation measures to be employed unless they are installed beneath the building foundation. However, it is noted

that the deficit is not considered large, the Site is not located in an area identified in source water protection area mapping, there are no adjacent environmental features and no private or municipal water supply wells are located in the area.

The proposed development will include the construction of two levels of underground parking with associated underground servicing (water, sewer, storm water). However, due to the presence of deep ground water at the Site (>13 mbgs), dewatering is not expected to be required to maintain dry conditions during construction.

As per Ontario Regulation 903 requirements, all existing monitoring wells which are no longer utilized at the Site will need to be properly decommissioned as per O.Reg. 903 (Wells Regulation) prior to commencement of building construction.

9.0 REFERENCES

Azure Group, 2022. Geotechnical Investigation 141-153 Plains Road West, Burlington, ON

Barnett, P.J., Cowan, W.R. and Henry, A.P. 1991. Quaternary Geology of Ontario, Ontario Geological Survey, Map 2556, Scale 1:1,000,000.

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Wicklund, R.E., & Gillespie, J.E., 1971. The Soils of Halton County. Report No. 43 of the Ontario Soil Survey.

Ontario Geological Survey (OGS), 2022. OGS Earth Mapping. Obtained from: https://www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth

Ontario Ministry of the Environment and Climate Change (MOECC), 1995. MOEE Hydrogeological Technical Information Requirements for Land Development Applications.

Thornthwaite, C.W., and Mather, J.R., 1957. Instructions and tables for computing potential evapotranspiration and the water balance. Climatology, vol. 10.

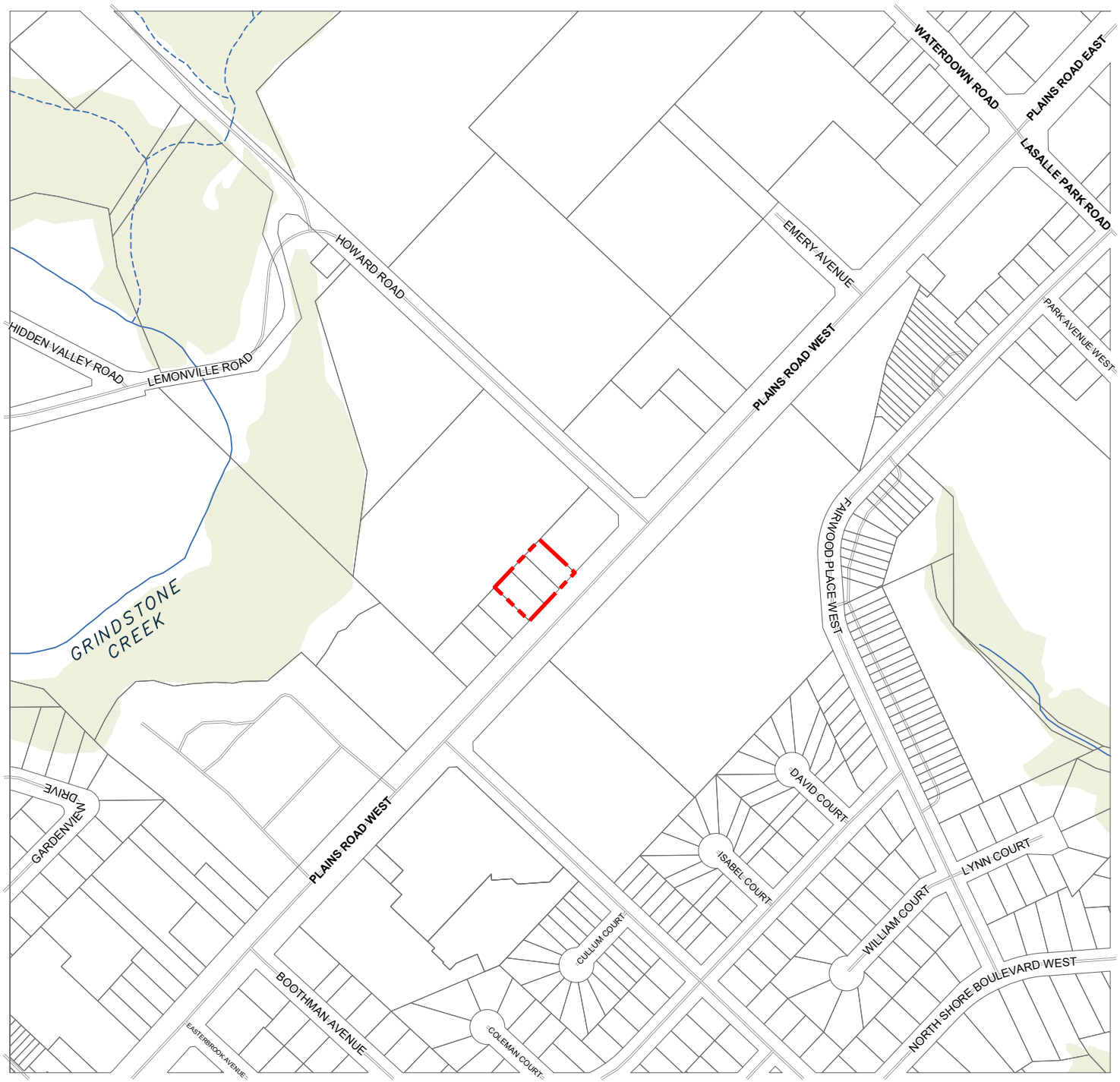
Toronto and Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC). 2010. Low Impact Development Stormwater Management Planning And Design Guide. Version 1.

APPENDICES

Appendix A: **Figures**
Appendix B: **Site Plan**
Appendix C: **MECP Well Records**
Appendix D: **Borehole Logs**
Appendix E: **Hydraulic Conductivity Testing Results**
Appendix F: **Source Water Protection Mapping**
Appendix G: **Water Balance Summary**
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APPENDIX A

Figures



LEGEND:

APPROX. PROPERTY BOUNDARY



REGIONAL MAP

SCALE 1:250000

0 125.0 250.0

HORIZONTAL SCALE 1:5000

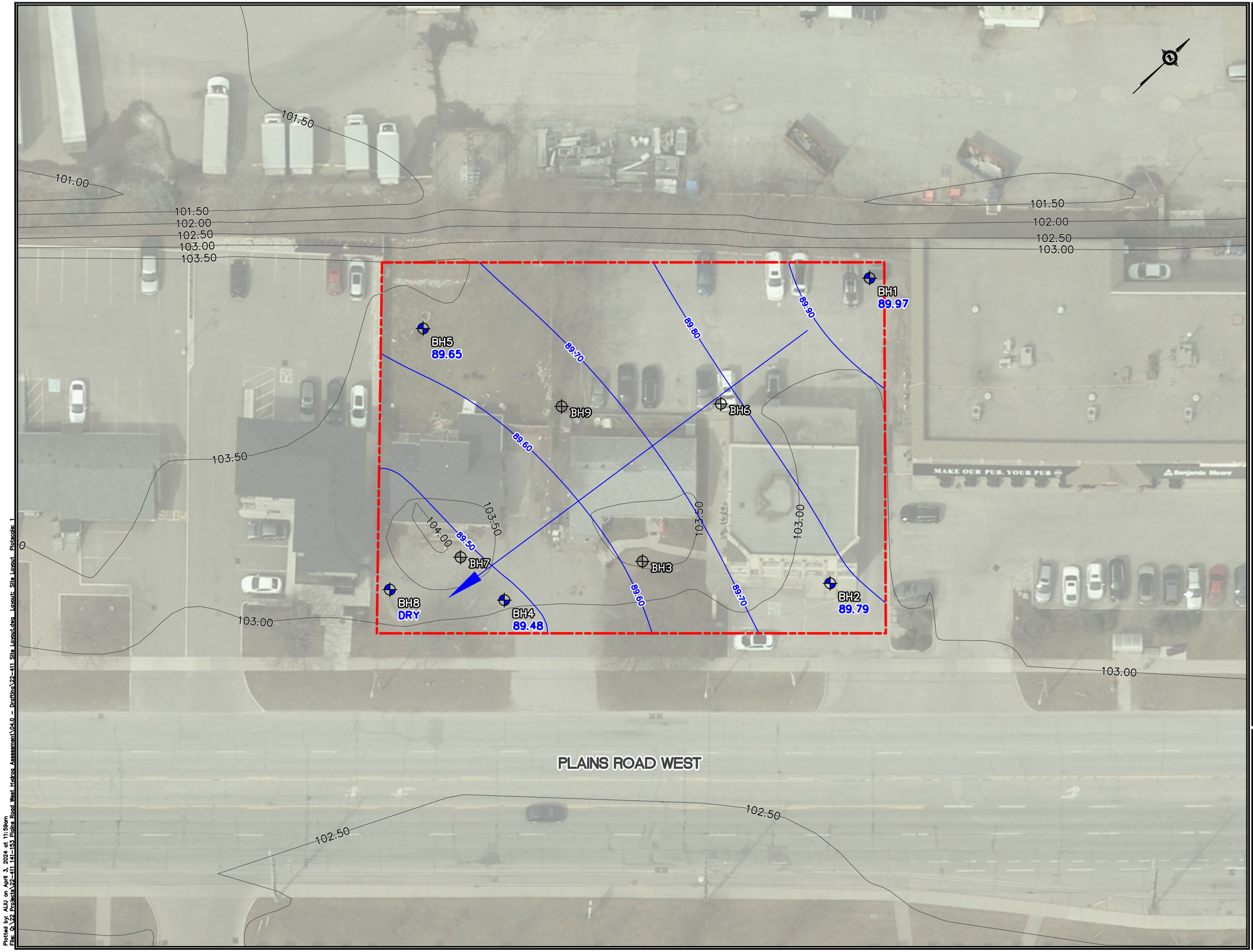
AZIMUTH ENVIRONMENTAL CONSULTING, INC.
ENVIRONMENTAL ASSESSMENTS & APPROVALS

SITE LOCATION

141-153 PLAINS ROAD WEST
BURLINGTON, ON

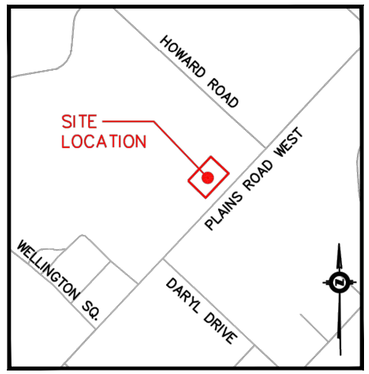
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CREATED BY: *A.L.*	
PROJECT NO.: *22-411*	1
REFERENCE: *CITY OF BURLINGTON*	

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File: Q:\22 Projects\22-411 141-153 Plains Road West Hydrog Assessment\04.0 - Drafting\22-411 Site Location.dwg Layout: Site Location Plotscale: 1



LEGEND:

- APPROX. PROPERTY BOUNDARY
- 100.00 — 0.5m CONTOURS (CITY OF BURLINGTON, RETRIEVED DEC. 2022)
- 100.00 — 0.1m GROUND WATER CONTOURS
- BOREHOLE LOCATION
- MONITORING WELL LOCATION & ELEV. (mASL; AZIMUTH, JUNE 1, 2023) — 100.00
- INFERRED DIRECTION OF GROUND WATER FLOW



LOCATION PLAN

0 10.00 20.0

HORIZONTAL SCALE 1: 400

AZIMUTH ENVIRONMENTAL CONSULTING, INC.
ENVIRONMENTAL ASSESSMENTS & APPROVALS

SITE LAYOUT

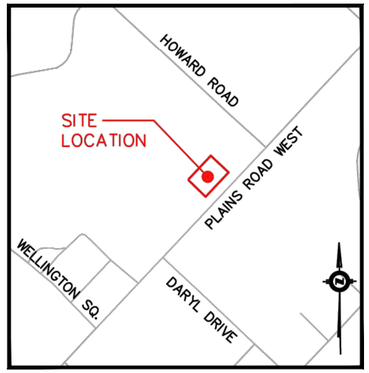
141-153 PLAINS ROAD WEST BURLINGTON, ON

DATE ISSUED:	APRIL 2024	Figure No. 2
CREATED BY:	A.L.	
PROJECT NO.:	22-411	
REFERENCE:	CITY OF BURLINGTON	

Plotted by: ALU on April 3, 2024 at 11:59am
File: G:\22 Projects\22-411 141-153 Plains Road West Hydros Assessment\04.0 - Drafting\22-411 Site Layout.dwg Layout: Site Layout Plotscale: 1

LEGEND:

- APPROX. PROPERTY BOUNDARY
- WATERCOURSE (MNRF, 2021)
- 300m RADIUS STUDY AREA
- 100.00 — 0.5m CONTOURS (CITY OF BURLINGTON, RETRIEVED DEC. 2022)
- # WATER WELL LOCATIONS / I.D. (MECP, 2022)



LOCATION PLAN

0 62.50 125.0

HORIZONTAL SCALE 1:2500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.
ENVIRONMENTAL ASSESSMENTS & APPROVALS

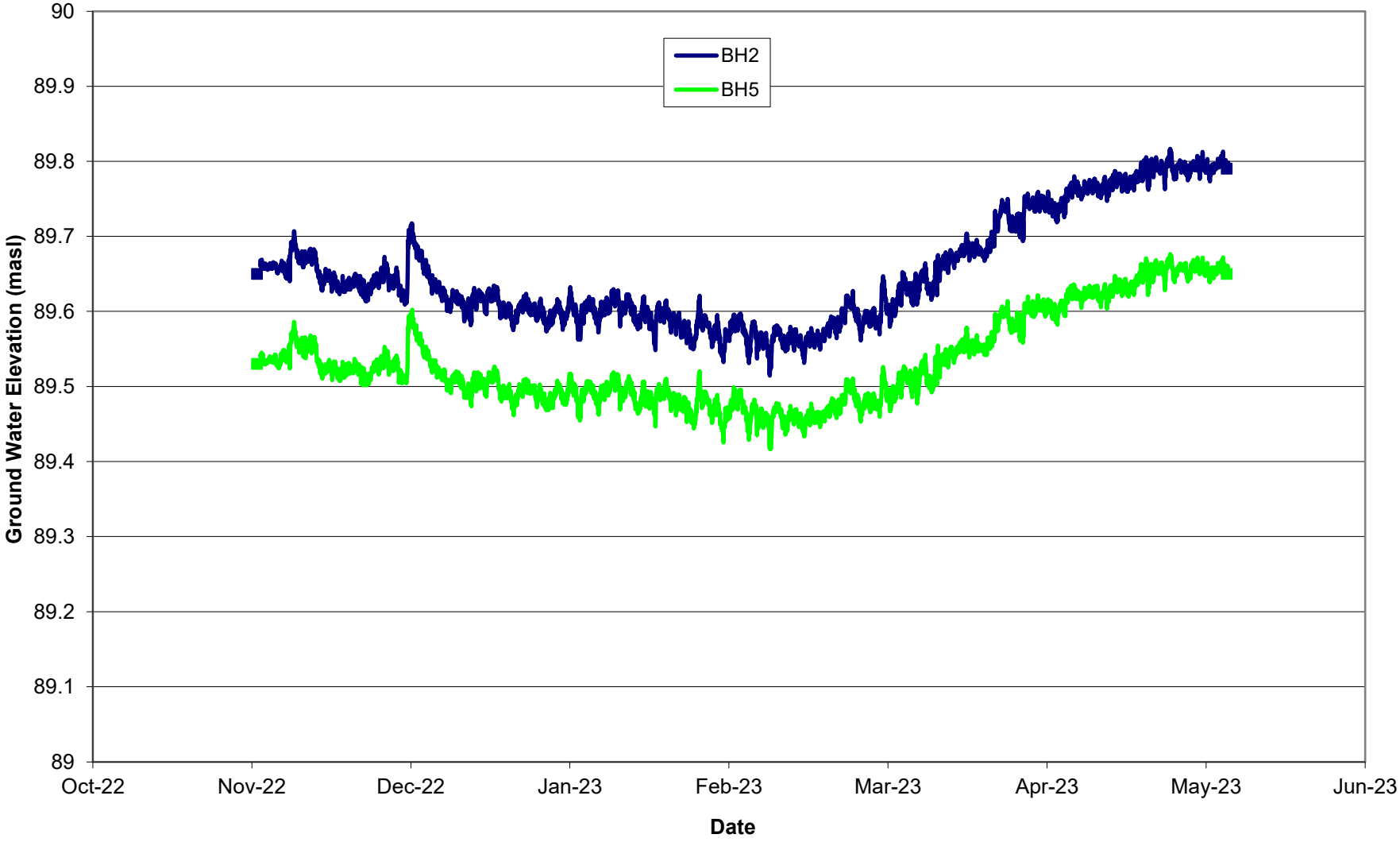
MECP WELL RECORDS

141-153 PLAINS ROAD WEST BURLINGTON, ON

DATE ISSUED:	*MONTH YEAR*	Figure No. 3
CREATED BY:	*A.L.*	
PROJECT NO.:	*22-411*	
REFERENCE:	*CITY OF BURLINGTON*	

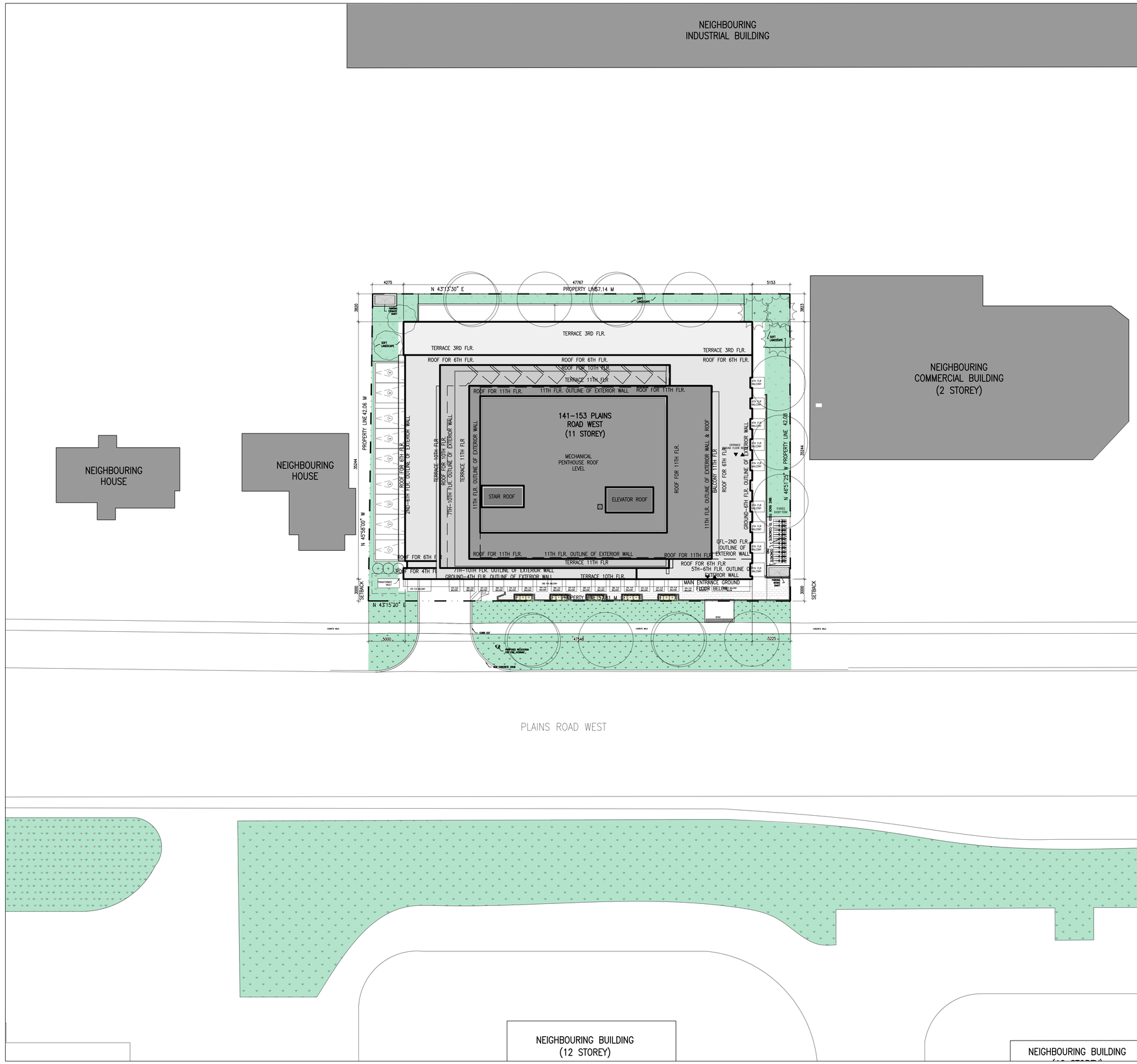
Plotted by: ALil on December 15, 2022 at 6:00pm
File: G:\22 Projects\22-411 141-153 Plains Road West Hydrog Assessment\04.0 - Drafting\22-411 Study Area.dwg Layout: Well Records Plotscale: 1

Figure 4 - 141-153 Plains Road West Hydrograph



APPENDIX B

Development Plan



1 SITE PLAN CONCEPT
Scale: 1:200

CONSTRUCTION NORTH
TRUE NORTH

No.	DATE	ISSUES / REVISIONS
5	-	-
4	-	-
3	-	-
2	2023-04-25	ISSUED FOR ZONING
1	2022-12-02	PROGRESS DRAWING FOR REVIEW

aaa architects
2121 Argentia Road, Suite 105, Mississauga ON, L5N 2X4
T: (647) 951-9573 F: (647) 951-9574
W: www.aaa-architects.ca

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THE DRAWINGS SHOW GENERAL ARRANGEMENT OF ARCHITECTURAL ELEMENTS AND SERVICES. FOLLOW AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION WILL PERMIT.
OBTAIN APPROVAL FROM CONSULTANT FOR RELOCATION OF SERVICES BEFORE COMMENCEMENT OF WORK.

Project:
PLAINS ROAD APARTMENT
141 -153 Plains Road West
Burlington ON
Canada

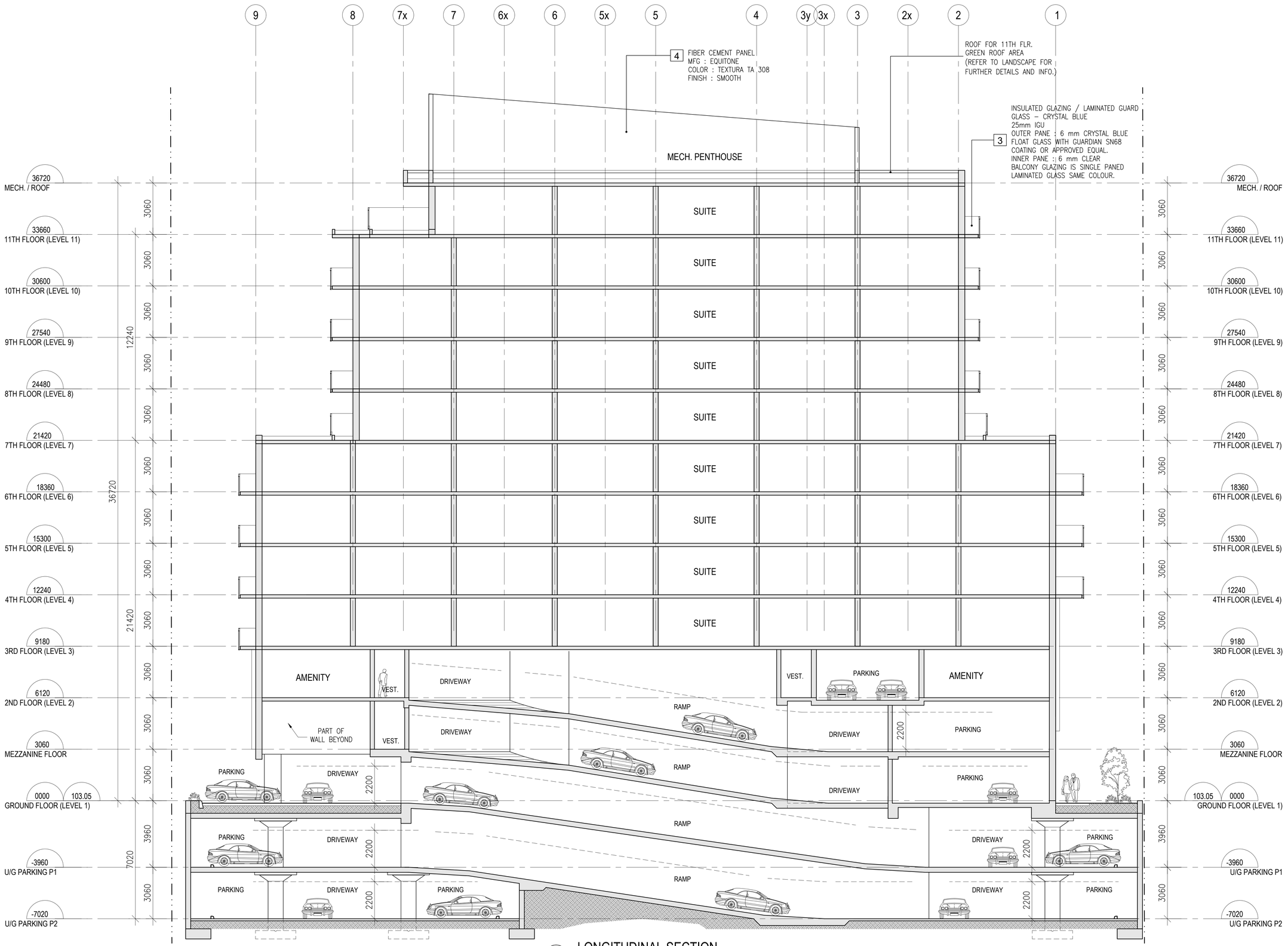
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Date Plotted: April 25, 2023
Drawn by: FC
Scale:

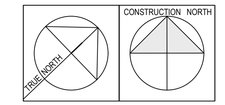
ONTARIO ASSOCIATION OF ARCHITECTS
MUHAMMAD ATIF AQEEL
LICENCE
7889

SITE PLAN CONCEPT

A101a



1 LONGITUDINAL SECTION
Scale: 1:100



No.	DATE	ISSUES / REVISIONS
5	-	-
4	-	-
3	-	-
2	2023-04-25	ISSUED FOR ZONING
1	2022-12-02	PROGRESS DRAWING FOR REVIEW

aaa architects
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Project:
PLAINS ROAD APARTMENT BLDG.
141-153 Plains Road West
Burlington, ON
Canada

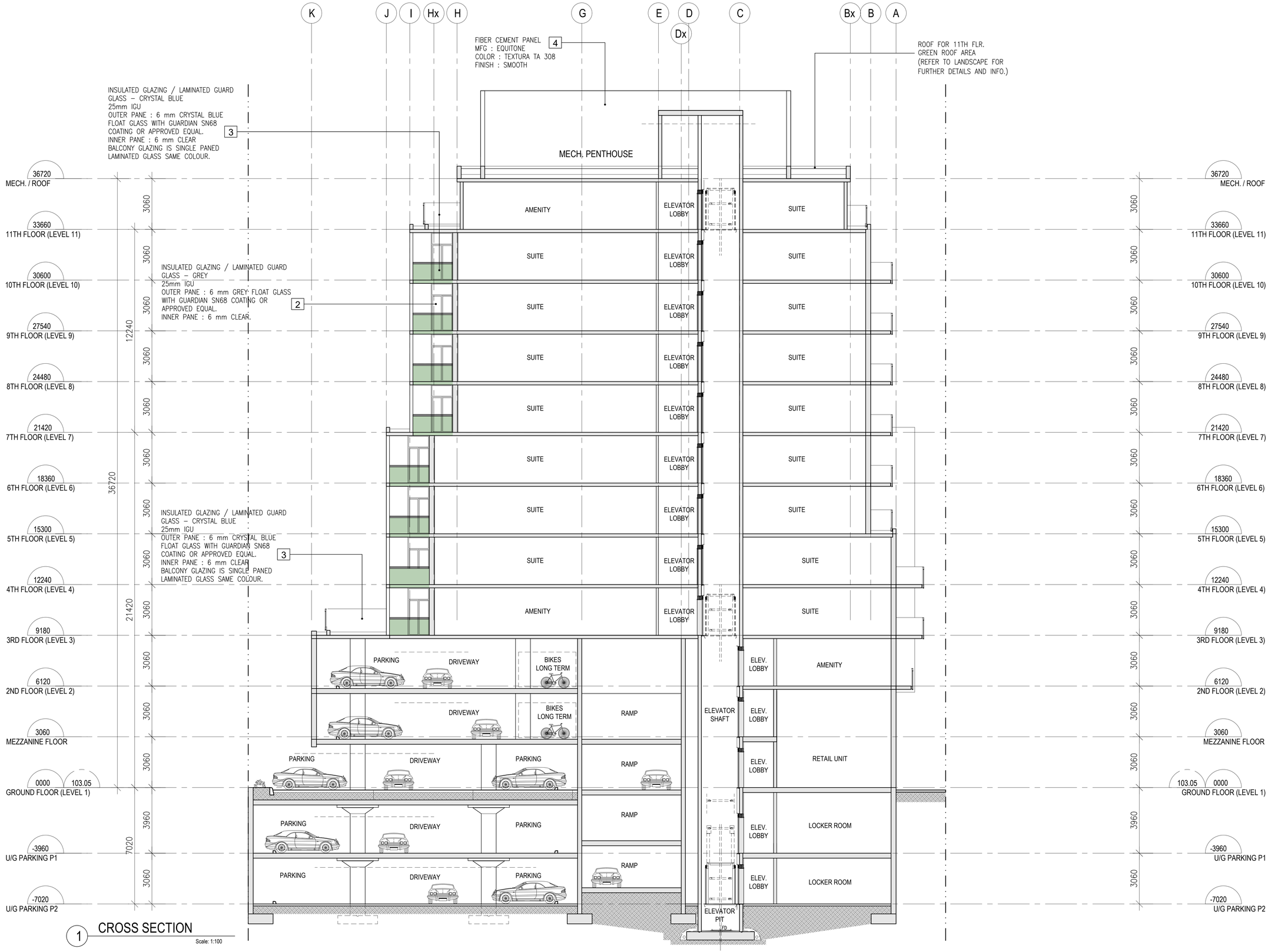
0 2m 4m

Date Plotted: April 25, 2023
Drawn by: —
Scale: 1:100

ONTARIO ASSOCIATION OF ARCHITECTS
MUHAMMAD ATIF AQEEL
LICENCE
7889

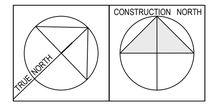
LONGITUDINAL SECTION

A401



1 CROSS SECTION

Scale: 1:100



No.	DATE	ISSUES / REVISIONS
5	-	-
4	-	-
3	-	-
2	2023-04-25	ISSUED FOR ZONING
1	2022-12-02	PROGRESS DRAWING FOR REVIEW

aaa architects
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Project:
PLAINS ROAD APARTMENT BLDG.
141-153 Plains Road West
Burlington, ON
Canada

0 2m 4m

Date Plotted: April 25, 2023
Drawn by: ----
Scale: 1:100

ONTARIO ASSOCIATION OF ARCHITECTS
MUHAMMAD ATIF AQEEL
LICENCE
7889

CROSS SECTION

A402

APPENDIX C

MECP Well Records

Ontario Ministry of the Environment

Well A107376 Below)

A107376

Well Record

Regulation 903 Ontario Water Resources Act

[redacted]

Well Location

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

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	592500	4795011		

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	sand, gravel	moist	0'	4'
Brown	silty clay	sand	moist - wet	4'	18'
Brown	gravel	sand	moist	18'	20'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
20'	9'	Sand	
9'	1'	Bentonite	
1'	0'	Sand, casing, concrete	

Method of Construction

- [ ] Cable Tool
- [x] Rotary (Conventional)
- [ ] Rotary (Reverse)
- [ ] Boring
- [ ] Air percussion
- [ ] Other, specify
- [ ] Diamond
- [ ] Jetting
- [ ] Driving
- [ ] Digging

Well Use

- [ ] Public
- [ ] Domestic
- [ ] Livestock
- [ ] Irrigation
- [ ] Industrial
- [ ] Other, specify
- [ ] Commercial
- [ ] Municipal
- [x] Test Hole
- [ ] Cooling & Air Conditioning
- [ ] Not used
- [ ] Dewatering
- [ ] Monitoring

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	Sch 40	10'	0'

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
2"	plastic	10	20'	10'

Status of Well

- [ ] Water Supply
- [ ] Replacement Well
- [x] 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	
	☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify
	☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify
	☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
20'	1'	4"
1'	0'	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)

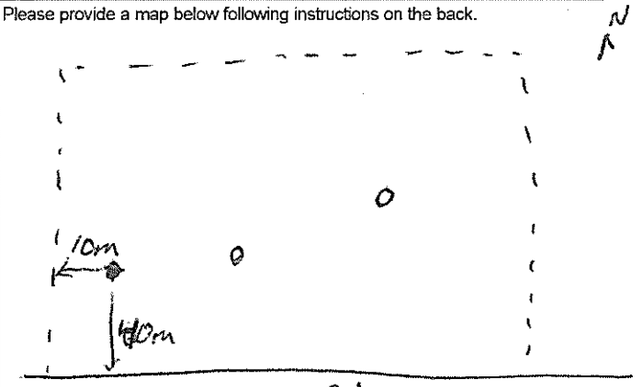
Well production (l/min / GPM)

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:

* Not to scale

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Profile Drilling Inc.	7215

Business Address (Street Number/Name)	Municipality
149 Norfinch Dr.	North York

Province	Postal Code	Business E-mail Address
ONT.	M3N1X2	jason@profiledrilling.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
4166504644	Slocki, Jason

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
2978		2010/12/15

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No		2010/12/16

Ministry Use Only

Audit No. Z122212

Received JAN 14 2011

Structural Insp. 110218 Feb-11/11

Ontario Ministry of the Environment

A 101100 (Sticker and/or Print Below)

A101100

Master Well Record for Cluster Well Construction

Regulation 903 Ontario Water Resources Act

[redacted] Page 1 of 2

Master Well Owner's and Land Owner's Information

First Name	Last Name	E-mail Address
DAWN VICTORIA	HOMES	

Mailing Address (Street Number/Name, RR)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
18 - 1550 Yorkton Crt.	Burlington	ON	L7P5B7	9056371772

Location and Construction of the Master Well in the Cluster

Address of Well Location (Street Number/Name, RR)	Township	Lot	Concession
181 Plains rd west			

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

UTM Coordinates	Zone	Easting	Northing	GPS Unit Make	Model	Mode of Operation
NAD 83	17	592454	4785100	magellan	sportrak	☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

Overburden and Bedrock Materials *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	Depth (Metres) To
BH 1	Fill			0	1.5
	sand			1.5	3.0
	sand		wet	3.0	6.0

Hole Details

Depth (Metres) From	Depth (Metres) To	Diameter (Centimetres)
0	6.0	15cm.

Water Use

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

Method of Construction

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

Status of Well

☑ Test Hole ☐ Abandoned, Insufficient Supply
☐ Replacement Well ☐ Abandoned, Poor Water Quality
☐ Dewatering Well ☐ Other, specify
☐ Alteration (Construction) ☐ Abandoned, other, specify

Construction Details

Inside Diameter (Centimetres)	Material (steel, plastic, fibreglass, concrete, galvanized)	Wall Thickness	Depth (Metres) From	Depth (Metres) To
5.1	Plastic	.65	0	3.0

No Casing and Screen Used

Open Hole ☐ Yes ☑ No

Static Water Level Test

[ ] Metres

Screen

☐ Galvanized ☐ Steel ☐ Fibreglass ☐ Concrete ☐ Plastic

Outside Diameter (Centimetres)	Slot No.
6.4	.10

Annular Space/Abandonment Sealing Record

Depth Set at (Metres) From	Depth Set at (Metres) To	Type of Sealant Used (Material and Type)	Volume Used (Cubic Metres)
0	.3	Concrete	
.3	2.4	Bentonite	

Water Details

Water found at Depth	Kind of Water
3.0 Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Disinfected ☐ Yes ☑ No If no, provide reason:

Date Master Well Completed (yyyy/mm/dd): 2011/02/10

Cluster Information *(Please also fill out the additional Cluster Well Information for Well Construction for each parcel of land and cluster.)*

Total Wells in Cluster	Please indicate Number of Cluster Well Information Log Sheets Submitted
2	
Total Wells on this Property: 2	

Location of Well Cluster

Detailed Map must be provided as an attachment no larger than legal size (8.5" x 14"). Sketches are not allowed.

☐ Check box to confirm detailed map is provided as per Section 11.1 (3)

Consent to release additional information concerning the cluster to the Director upon request

Signature of Technician/Contractor	Date (yyyy/mm/dd)
Paquett	2011/02/10

Master Well Owner's/Land Owner's consent to use Cluster Form

Signature	Date (yyyy/mm/dd)

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Geo-Environmental	6607

Business Address (Street No./Name, number, RR)	Municipality
340 Market Dr.	Milton

Province	Postal Code	Business E-mail Address
Ont	L9T5A4	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
9058763388	Jeff Paquette

Well Technician's Licence No.	Signature of Technician	Date Submitted (yyyy/mm/dd)
2386	Paquett	2011/02/10

Ministry Use Only

Audit No.	Well Contractor No.
M 08433	
Date Received (yyyy/mm/dd) APR 04 2011	Date of Inspection (yyyy/mm/dd)
Remarks	

1992 (11/2006)

Ministry's Copy

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Ontario — Ministry of the Environment

Well Tag No. *(Place Sticker and/or Print Below)*: A168575

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☑ Imperial

Page 1 of 1

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
LANDTEK LTD.			

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
205 NEBO RD	HAMILTON	ONTARIO	L8W 2E1	9053833733

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
159 PLAINS RD WEST.			

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	595128	4318097		

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	SAND	COBBLE		0'	20'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0'	8'	3/8 BENTONITE CHIPS	

Method of Construction

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

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
1.8"	PLASTIC	.2"	0'	10'

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
2"	PLASTIC	10	10'	20'

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*

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)

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)*

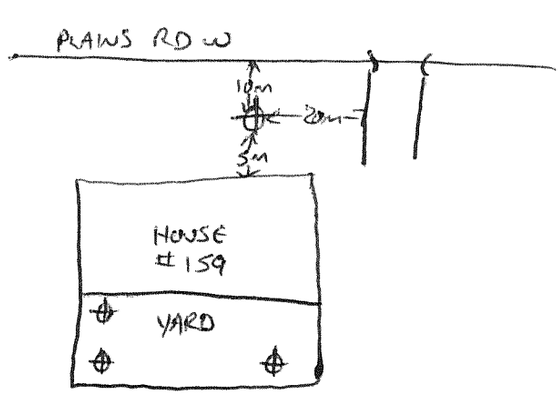
Well production *(l/min / GPM)*

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.



Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
DETERMINATION DRILLING	7295

Business Address (Street Number/Name)	Municipality
2493 HENDERSHOT RD	HAMILTON

Province	Postal Code	Business E-mail Address
ONTARIO	L0R 1C0	DAN@DETERMINATIONDRILLING.COM

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
9056922481	ANDERSON, NICK

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
2696		2014 12 23

Comments: LANDTEK - KEVIN

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

Date Package Delivered:

Date Work Completed: 2014 12 22

Ministry Use Only

Audit No Z 192954

AN 20 2015

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Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. *(Place Sticker and/or Print Below)*: Tag#: A176644 A176644

Well Record

Regulation 903 Ontario Water Resources Act

S-17985 Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
CBM	Burlington Plant		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
1093 Howard rd.	Burlington	On.	L7P0T7	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1093 Howard rd.			

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	592568	4795343		

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
Grey	Concrete		Hard	0	1
Brown	Silt	fine Sand	Soft	1	18

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used *(Material and Type)*	Volume Placed (m^3/ft^3)
0	1	Concrete	
1	7	Bentonite	
7	18	Silica Sand	

Method of Construction

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

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	PVC	.125	0	8

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
2.25	PVC	10	8	18

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	18	6

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.

See Map

MW-103

Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Strata Soil Sampling Inc.	7241

Business Address (Street Number/Name)	Municipality	Province	Postal Code	Business E-mail Address
165 Shields ct.	Markham	On.	L3R8V2	wrecords@stratasoil.com

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)	Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
9057649304	Hellyer, Nathan	3779		2016/01/07

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No		2015/12/11

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Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. *(Place Sticker and/or Print Below)* **Tag#: A176643** A176643

Well Record

Regulation 903 Ontario Water Resources Act

S-17985 Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	CBM Burlington Plant		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
1093 Howard rd.	Burlington	On	L7P0T7	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1093 Howard rd.			

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	592711	4795327		

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	Gravel	fine Sand	Soft	0	2
Brown	fine Sand	Silt	Soft	2	18

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used *(Material and Type)*	Volume Placed (m^3/ft^3)
0	1	Concrete	
1	7	Bentonite	
7	18	Silica Sand	

Method of Construction

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

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☒ 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	PVC	.125	0	8

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
2.25	PVC	10	8	18

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)	☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, *specify*

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	18	6

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.

See Map

MW-102

Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Strata Soil Sampling Inc.	7214

Business Address (Street Number/Name)	Municipality
165 Shields ct.	Markham

Province	Postal Code	Business E-mail Address
On	L3R8V2	wrecords@stratasoil.com

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
9057649304	Hellyer, Nathan

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3779		2016/01/07

Well owner's information package delivered ☐ Yes ☐ No

Date Package Delivered

Date Work Completed 2015/12/11

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Audit No: Z 209922

Received JAN 21 2016

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Ontario — Ministry of the Environment and Climate Change

Well Tag No. *(Place Sticker and/or Print Below)* **Tag#: A176645** A176645

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☒ Imperial

S-17985 Page _____ of _____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
CBM	Burlington Plant		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
1093 Howard rd.	Burlington	On	L7P 0T7	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1093 Howard rd.			

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	592656	4795463		

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	fine Sand	Silt / Gravel	Soft	0	20

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	1	Concrete	
1	9	Bentonite	
9	20	Silica Sand	

Method of Construction

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

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	PVC	.125	0	10

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
2.25	PVC	10	10	20

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	20	6

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.

See Map

MW-104

Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Strata Soil Sampling Inc.	7241

Business Address (Street Number/Name)	Municipality
165 Sheilds Ct.	Markham

Province	Postal Code	Business E-mail Address
On	L3R8V2	wrecords@stratasoil.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
9057649304	Hellyer, Nathan

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3779		2016/01/07 (Y/M/D)

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
☐ Yes ☐ No		Audit No: Z 209923
	Date Work Completed: 2015/12/16 (Y/M/D)	Received: JAN 21 2016

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APPENDIX D

Borehole Logs

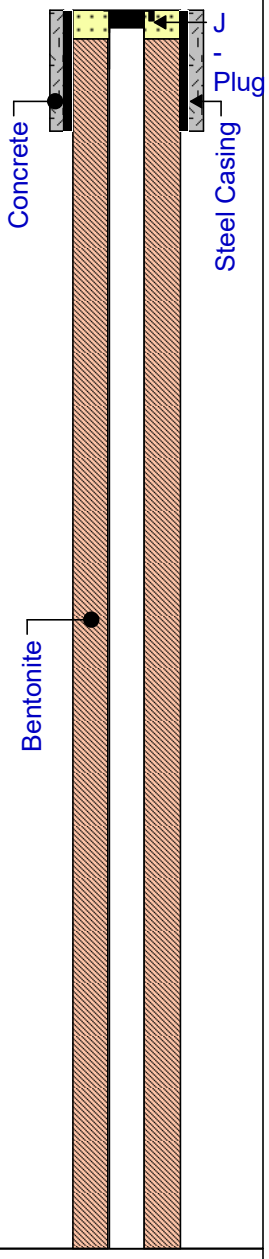
Log of Borehole: BH1

Azure Group

Project No.: 2209-004
Project: 2209-004
X Coordinate: -79.857876
Y Coordinate: 43.303504
Status: Water well
UTM Coordinates:

Elevation: 103.13
Total Depth: 14.73
Project Manager: AP

Depth (ft)	Depth (m)	Elevation	% Recovery	Soil Sample ID	Soil Analysis	SUBSURFACE PROFILE: Graphic	SUBSURFACE PROFILE: Type	SUBSURFACE PROFILE: Material Description	Hexane (ppm)		Well Diagram
		103.1						**Ground Surface**			
0.0	0.0		40	1			CS	4"Asphalt	<25	<5	
2.0			50	2	M&I		CS	Dark brown sand & silt, some cobbles, moist	<25	<5	
4.0		102.0	40	3			CS		<25	<5	
6.0	2.0		40	4			CS		<25	<5	
8.0			30	5			CS		<25	<5	
10.0		100.0	40	6			CS		<25	<5	
12.0	4.0		50	7			CS		<25	<5	
14.0			40	8			CS	Reddish silty clay and sand, trace cobbles, moist to wet	<25	<5	
16.0		98.0	40	9			CS		<25	<5	
18.0			50	10			CS		<25	<5	
20.0	6.0		30	11			CS	Brown silty sand and gravel, trace cobbles, moist	<25	<5	
22.0		96.0	20	12			CS		<25	<5	
24.0			40	13			CS		<25	<5	
26.0	8.0		40	14			CS		<25	<5	
28.0			50	15			CS		<25	<5	
30.0		94.0	50	16			CS		<25	<5	
32.0			30	17			CS		<25	<5	



Drilled By: Terra Firma
Drill Method: Hollow Stem/Continous Sampling
Drill Date: 2022-11-17

Hole Size: 150 mm
Datum:
Sheet: 1 of 2

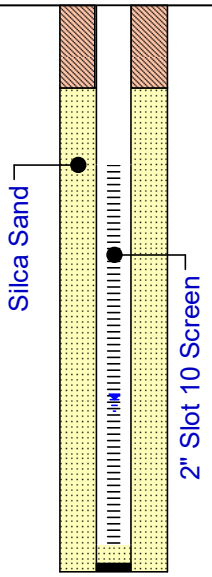
Log of Borehole: BH1A

Azure Group

Project No.: 2209-004
Project: 2209-004
X Coordinate: -79.857876
Y Coordinate: 43.303504
Status: Water well
UTM Coordinates:

Elevation: 103.13
Total Depth: 14.73
Project Manager: AP

Depth		% Recovery	Soil Sample ID	Soil Analysis	SUBSURFACE PROFILE: Graphic	SUBSURFACE PROFILE: Type	SUBSURFACE PROFILE: Material Description	Hexane (ppm)		Well Diagram
34.0			17							
36.0		40	18			CS		<25	<5	
	92.0	40	19			CS		<25	<5	
38.0		30	20			CS		<25	<5	
40.0	12.0	40	21			CS		<25	<5	
42.0		20	22	PHC/VOC, PAH,DUP-1,pH		CS	Light brown, wet	<25	<5	
44.0	90.0	20	23			CS		<25	<5	
46.0	14.0	20	24			CS		<25	<5	
48.0										
50.0	88.0									
52.0	16.0									
54.0										
56.0	86.0									
58.0	18.0									
60.0										
62.0										
64.0	84.0									



Drilled By: Terra Firma
Drill Method: Hollow Stem/Continous Sampling
Drill Date: 2022-11-17

Hole Size: 150 mm
Datum:
Sheet: 2 of 2

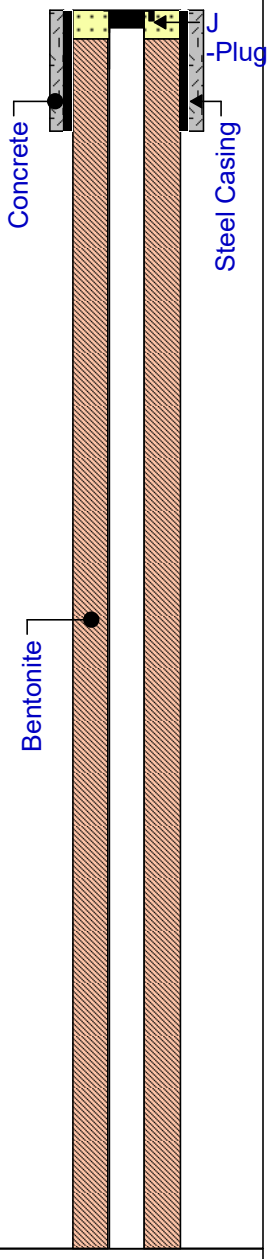
Log of Borehole: BH2

Azure Group

Project No.: 2209-004
Project: 2209-004
X Coordinate: -79.857607
Y Coordinate: 43.30332
Status: Water well
UTM Coordinates:

Elevation: 103.13
Total Depth: 14.73
Project Manager: AP

Depth (ft)	Depth (m)	Elevation	% Recovery	Soil Sample ID	Soil Analysis	SUBSURFACE PROFILE: Graphic	SUBSURFACE PROFILE: Type	SUBSURFACE PROFILE: Material Description	Hexane (ppm)		Well Diagram
		102.7						**Ground Surface**			
0.0	0.0		40	1			CS	4"Asphalt	<25	<5	
2.0		102.0	50	2	M&I, PHC/VOC, DUP-3		CS	Dark brown medium sand & silt, some cobbles, moist	<25	<5	
4.0			40	3			CS		<25	<5	
6.0	2.0		40	4			CS		<25	<5	
8.0		100.0	30	5			CS		<25	<5	
10.0			40	6			CS		<25	<5	
12.0	4.0		50	7			CS		<25	<5	
14.0			40	8			CS	Brown coarse sand and gravel, moist	<25	<5	
16.0		98.0	40	9			CS		<25	<5	
18.0			50	10			CS		<25	<5	
20.0	6.0		30	11			CS		<25	<5	
22.0		96.0	20	12			CS		<25	<5	
24.0			40	13			CS		<25	<5	
26.0	8.0		40	14			CS		<25	<5	
28.0		94.0	50	15			CS		<25	<5	
30.0			50	16			CS		<25	<5	
32.0			30	17			CS		<25	<5	



Drilled By: Terra Firma
Drill Method: Hollow Stem/Continous Sampling
Drill Date: 2022-11-17

Hole Size: 150 mm
Datum:
Sheet: 1 of 2

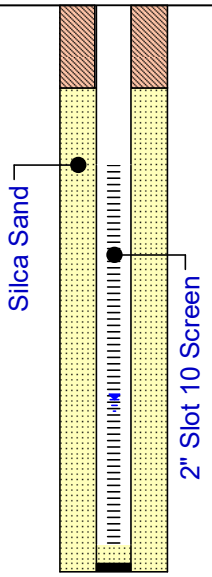
Log of Borehole: BH2

Azure Group

Project No.: 2209-004
Project: 2209-004
X Coordinate: -79.857607
Y Coordinate: 43.30332
Status: Water well
UTM Coordinates:

Elevation: 103.13
Total Depth: 14.73
Project Manager: AP

Depth		% Recovery	Soil Sample ID	Soil Analysis	SUBSURFACE PROFILE: Graphic	SUBSURFACE PROFILE: Type	SUBSURFACE PROFILE: Material Description	Hexane (ppm)		Well Diagram
34.0			17							
36.0	92.0	40	18			CS		<25	<5	
38.0		40	19			CS		<25	<5	
40.0	12.0	30	20			CS		<25	<5	
42.0		40	21			CS		<25	<5	
44.0	90.0	20	22	PHC/VOC, PAH, M&I		CS	Light brown, wet	<25	<5	
46.0		20	23			CS		<25	<5	
48.0	14.0	20	24			CS		<25	<5	
50.0	88.0									
52.0										
54.0	16.0									
56.0	86.0									
58.0										
60.0	18.0									
62.0	84.0									
64.0										



Drilled By: Terra Firma
Drill Method: Hollow Stem/Continous Sampling
Drill Date: 2022-11-17

Hole Size: 150 mm
Datum:
Sheet: 2 of 2

Azure Group

Log of Borehole: BH3

Project No.: 2209-004
Project: 2209-004
X Coordinate: -79.857804
Y Coordinate: 43.303189
Status: Proposed

Elevation: 102.85
Total Depth: 6.7
Project Manager: AP

Depth (ft)	Depth (m)	Elevation	% Recovery	Soil Sample ID	Soil Analysis	SUBSURFACE PROFILE: Graphic	SUBSURFACE PROFILE: Type	SUBSURFACE PROFILE: Material Description	Hexane (ppm)		Well Diagram
		102.9						**Ground Surface**			
0.0	0.0		40	1			CS	4" Asphalt Dark Brown silty sand with cobbles, trace gravel, moist	<25	<5	
2.0		102.0	50	2	M&I		CS		<25	<5	
4.0			40	3			CS		<25	<5	
6.0	2.0		40	4			CS		<25	<5	
8.0		100.0	30	5			CS		<25	<5	
10.0			40	6			CS		<25	<5	
12.0	4.0		50	7			CS		<25	<5	
14.0			40	8			CS		<25	<5	
16.0		98.0	40	9			CS	Brown coarse sand and gravel	<25	<5	
18.0			50	10			CS		<25	<5	
20.0	6.0		30	11			CS		<25	<5	
22.0		96.0									
24.0											
26.0	8.0										
28.0											
30.0		94.0									
32.0											

Drilled By: Terra Firma
Drill Method: Hollow Stem/Continous Sampling
Drill Date: 2022-11-17

Hole Size: 50 mm
Datum:
Sheet: 1 of 1

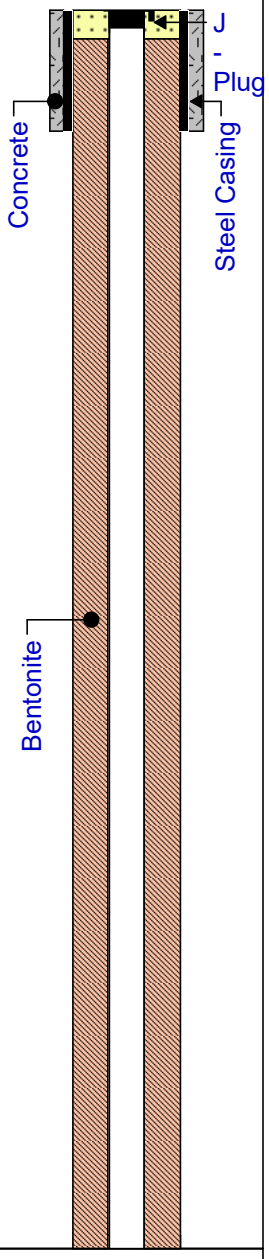
Log of Borehole: BH4

Azure Group

Project No.: 2209-004
Project: 2209-004
X Coordinate: -79.857902
Y Coordinate: 43.303062
Status: Water well

Elevation: 102.832
Total Depth: 13.93
Project Manager: AP

Depth (ft)	Depth (m)		% Recovery	Soil Sample ID	Soil Analysis	Graphic	Type	Material Description	Hexane (ppm)		Well Diagram
						SUBSURFACE PROFILE					
0.0	0.0	102.8						Ground Surface			
			40	1			CS	6" Topsoil Dark brown medium sand & silt, some cobbles, moist	<25	<5	
2.0		102.0	50	2	M&I		CS		<25	<5	
4.0			40	3			CS		<25	<5	
6.0	2.0		40	4			CS		<25	<5	
8.0		100.0	30	5			CS		<25	<5	
10.0			40	6			CS		<25	<5	
12.0			50	7			CS	Mottled	<25	<5	
14.0	4.0		40	8			CS	Brown coarse sand and gravel	<25	<5	
16.0		98.0	40	9			CS		<25	<5	
18.0			50	10			CS		<25	<5	
20.0	6.0		30	11			CS		<25	<5	
22.0		96.0	20	12			CS		<25	<5	
24.0			40	13			CS		<25	<5	
26.0	8.0		40	14			CS		<25	<5	
28.0		94.0	50	15			CS		<25	<5	
30.0			50	16			CS		<25	<5	
32.0			30	17			CS		<25	<5	



Drilled By: Terra Firma
Drill Method: Hollow Stem/Continous Sampling
Drill Date: 2022-11-16

Hole Size: 150 mm
Datum:
Sheet: 1 of 2

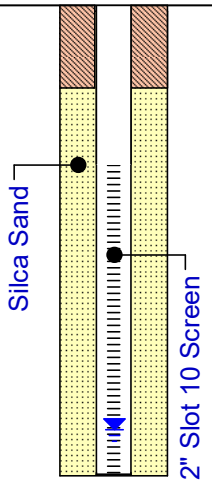
Azure Group

Log of Borehole: BH4

Project No.: 2209-004
Project: 2209-004
X Coordinate: -79.857902
Y Coordinate: 43.303062
Status: Water well

Elevation: 102.832
Total Depth: 13.93
Project Manager: AP

Depth		% Recovery	Soil Sample ID	Soil Analysis	SUBSURFACE PROFILE: Graphic	SUBSURFACE PROFILE: Type	SUBSURFACE PROFILE: Material Description	Hexane (ppm)		Well Diagram
34.0			17							
36.0	92.0	40	18			CS		<25	<5	
38.0		40	19			CS		<25	<5	
40.0	12.0	30	20			CS		<25	<5	
42.0		40	21			CS		<25	<5	
44.0	90.0	40	22	VOC, DUP2		CS	Light brown, wet	<25	<5	
46.0	14.0	70	23			CS		<25	<5	
48.0										
50.0	88.0									
52.0	16.0									
54.0										
56.0	86.0									
58.0										
60.0	18.0									
62.0	84.0									
64.0										



Drilled By: Terra Firma
Drill Method: Hollow Stem/Continous Sampling
Drill Date: 2022-11-16

Hole Size: 150 mm
Datum:
Sheet: 2 of 2

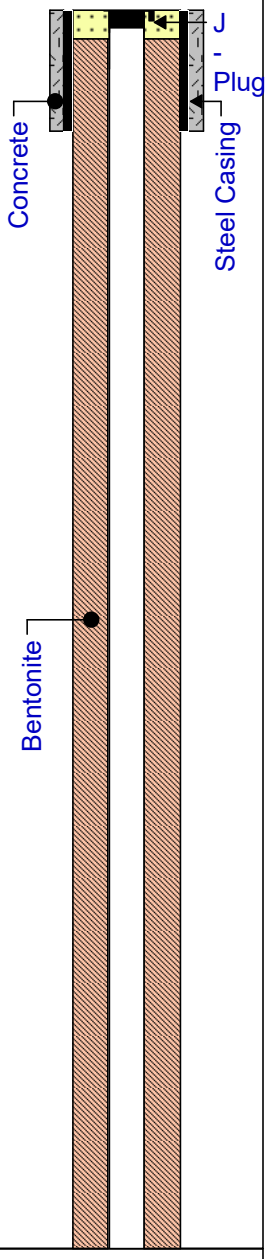
Log of Borehole: BH5

Azure Group

Project No.: 2209-004
Project: 2209-004
X Coordinate: -79.858294
Y Coordinate: 43.303188
Status: Water well

Elevation: 103.31
Total Depth: 14.63
Project Manager: AP

Depth (ft)	Depth (m)		% Recovery	Soil Sample ID	Soil Analysis	SUBSURFACE PROFILE: Graphic	SUBSURFACE PROFILE: Type	SUBSURFACE PROFILE: Material Description	Hexane (ppm)		Well Diagram
0.0	0.0	103.3						**Ground Surface**			
			40	1			CS	5" Topsoil Dark brown medium sand & silt, some cobbles, moist	<25	<5	
2.0			50	2	M&I		CS		<25	<5	
4.0		102.0	40	3			CS		<25	<5	
6.0	2.0		40	4			CS		<25	<5	
8.0			30	5			CS		<25	<5	
10.0		100.0	40	6			CS		<25	<5	
12.0	4.0		50	7			CS	Reddish silty clay and sand, trace gravel, moist to wet	<25	<5	
14.0			40	8			CS		<25	<5	
16.0			40	9			CS	Brown coarse sand and gravel	<25	<5	
18.0		98.0	50	10			CS		<25	<5	
20.0	6.0		30	11			CS		<25	<5	
22.0			20	12			CS		<25	<5	
24.0		96.0	40	13			CS		<25	<5	
26.0	8.0		40	14			CS		<25	<5	
28.0			50	15			CS		<25	<5	
30.0		94.0	50	16			CS		<25	<5	
32.0			30	17			CS		<25	<5	



Drilled By: Terra Firma
Drill Method: Hollow Stem/Continous Sampling
Drill Date: 2022-11-16

Hole Size: 150 mm
Datum:
Sheet: 1 of 2

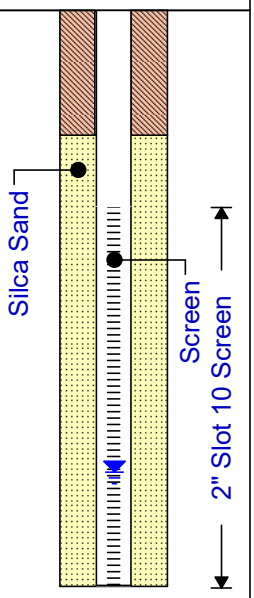
Azure Group

Log of Borehole: BH5

Project No.: 2209-004
Project: 2209-004
X Coordinate: -79.858294
Y Coordinate: 43.303188
Status: Water well

Elevation: 103.31
Total Depth: 14.63
Project Manager: AP

Depth		% Recovery	Soil Sample ID	Soil Analysis	SUBSURFACE PROFILE: Graphic	SUBSURFACE PROFILE: Type	SUBSURFACE PROFILE: Material Description	Hexane (ppm)		Well Diagram
34.0			17							
36.0		40	18			CS		<25	<5	
38.0	92.0	40	19			CS		<25	<5	
40.0	12.0	30	20			CS		<25	<5	
42.0		40	21			CS		<25	<5	
44.0	90.0	20	22	PHC/ VOC		CS	Light brown, wet	<25	<5	
46.0	14.0	20	23			CS		<25	<5	
48.0		20	24			CS		<25	<5	
50.0	88.0									
52.0	16.0									
54.0										
56.0	86.0									
58.0	18.0									
60.0										
62.0										
64.0	84.0									



Drilled By: Terra Firma
Drill Method: Hollow Stem/Continous Sampling
Drill Date: 2022-11-16

Hole Size: 150 mm
Datum:
Sheet: 2 of 2

Azure Group

Log of Borehole: BH6

Project No.: 2209-004
Project: 2209-004
X Coordinate: -79.857899
Y Coordinate: 43.303362
Status: Borehole

Elevation: 103.132
Total Depth: 6.7
Project Manager: AP

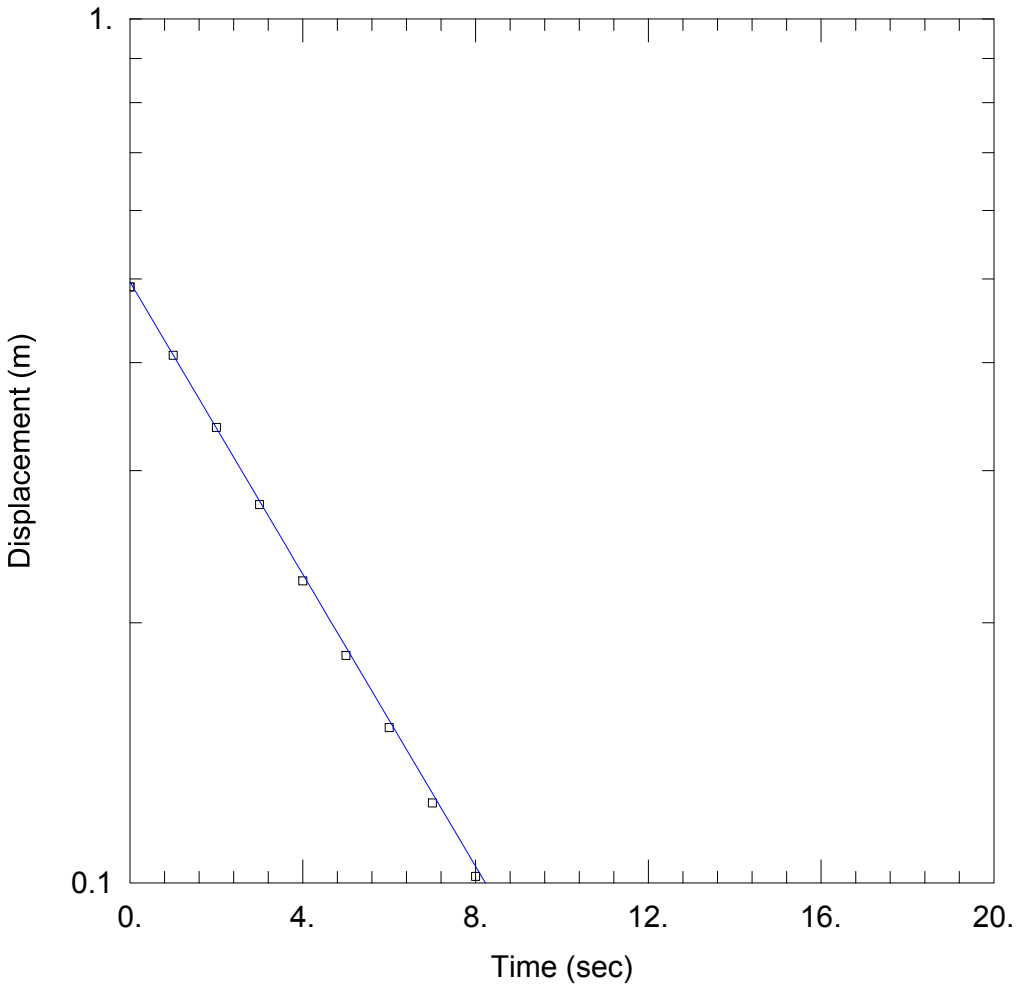
Depth (ft)	Depth (m)	Elevation	% Recovery	Soil Sample ID	Soil Analysis	SUBSURFACE PROFILE: Graphic	SUBSURFACE PROFILE: Type	SUBSURFACE PROFILE: Material Description	Hexane (ppm)		Well Diagram
		103.1						**Ground Surface**			
0.0	0.0		40	1			CS	4"Asphalt Dark brown sand & silt, some cobbles, moist	<25	<5	
2.0			50	2	M&I		CS		<25	<5	
4.0		102.0	40	3			CS		<25	<5	
6.0	2.0		40	4			CS		<25	<5	
8.0			30	5			CS		<25	<5	
10.0		100.0	40	6	PHC VOC		CS		<25	<5	
12.0	4.0		50	7			CS	Reddish silty clay and sand, trace gravel, moist	<25	<5	
14.0			40	8			CS		<25	<5	
16.0		98.0	40	9			CS		<25	<5	
18.0			50	10			CS		<25	<5	
20.0	6.0		30	11			CS		<25	<5	
22.0											
24.0		96.0									
26.0	8.0										
28.0											
30.0		94.0									
32.0											

Drilled By: Terra Firma
Drill Method: Hollow Stem/Continous Sampling
Drill Date: 2022-11-16

Hole Size: 150 mm
Datum:
Sheet: 1 of 1

APPENDIX E

Hydraulic Conductivity Testing Results



WELL TEST ANALYSIS

Data Set: M:\...\MW1 AQSolve - CR.aqt
Date: 12/02/22 Time: 11:47:28

PROJECT INFORMATION

Company: Azimuth Environmental
Project: 22-411
Location: 141-153 Plains Road West
Test Well: MW1
Test Date: 24-Nov-22

AQUIFER DATA

Saturated Thickness: 1.23 m Anisotropy Ratio (Kz/Kr): 1.

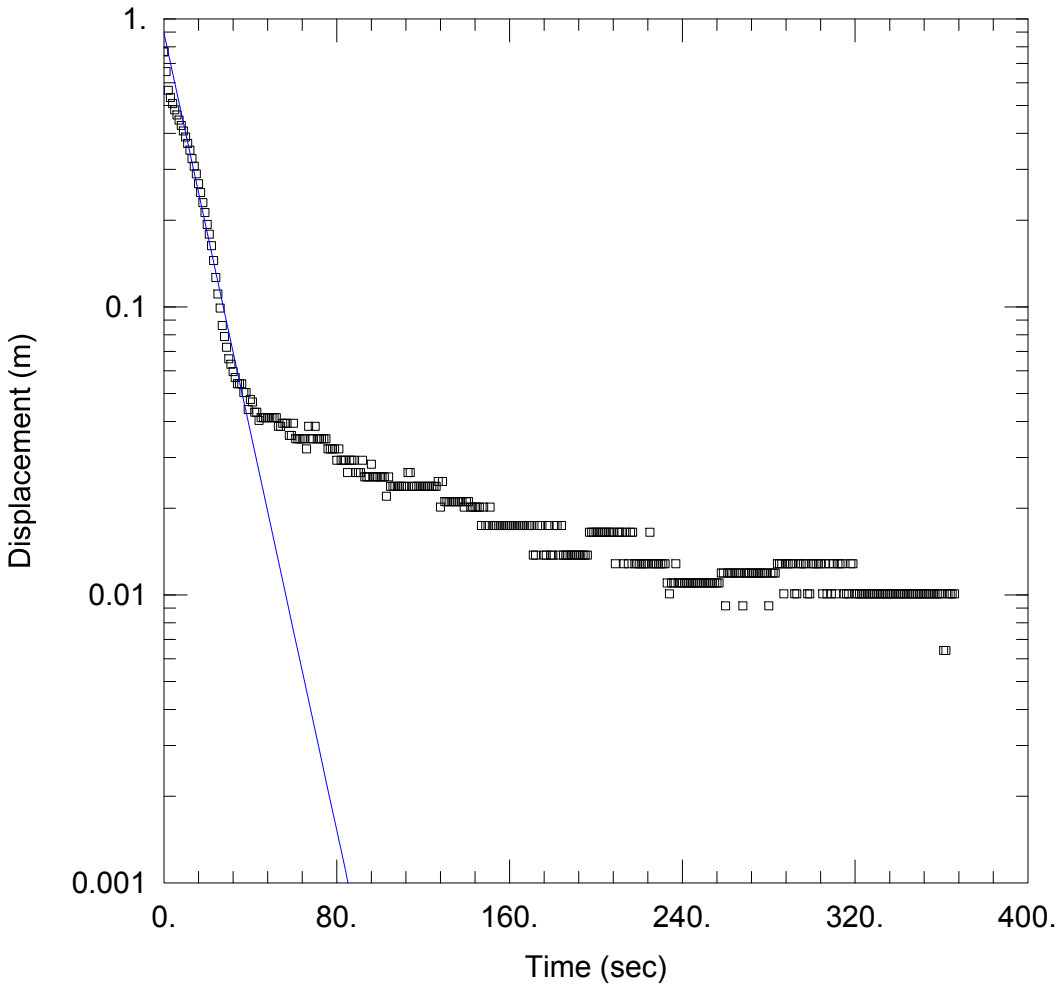
WELL DATA (MW1)

Initial Displacement: 0.4895 m
Total Well Penetration Depth: 1.23 m
Casing Radius: 0.019 m
Static Water Column Height: 1.23 m
Screen Length: 3. m
Wellbore Radius: 0.06 m
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 0.0001991 m/sec y0 = 0.496 m



WELL TEST ANALYSIS

Data Set: M:\...\MW2 AQSolve - CR.aqt
Date: 12/02/22 Time: 11:48:53

PROJECT INFORMATION

Company: Azimuth Environmental
Project: 22-411
Location: 141-153 Plains Road West
Test Well: MW2
Test Date: 24-Nov-22

AQUIFER DATA

Saturated Thickness: 1.36 m Anisotropy Ratio (Kz/Kr): 1.

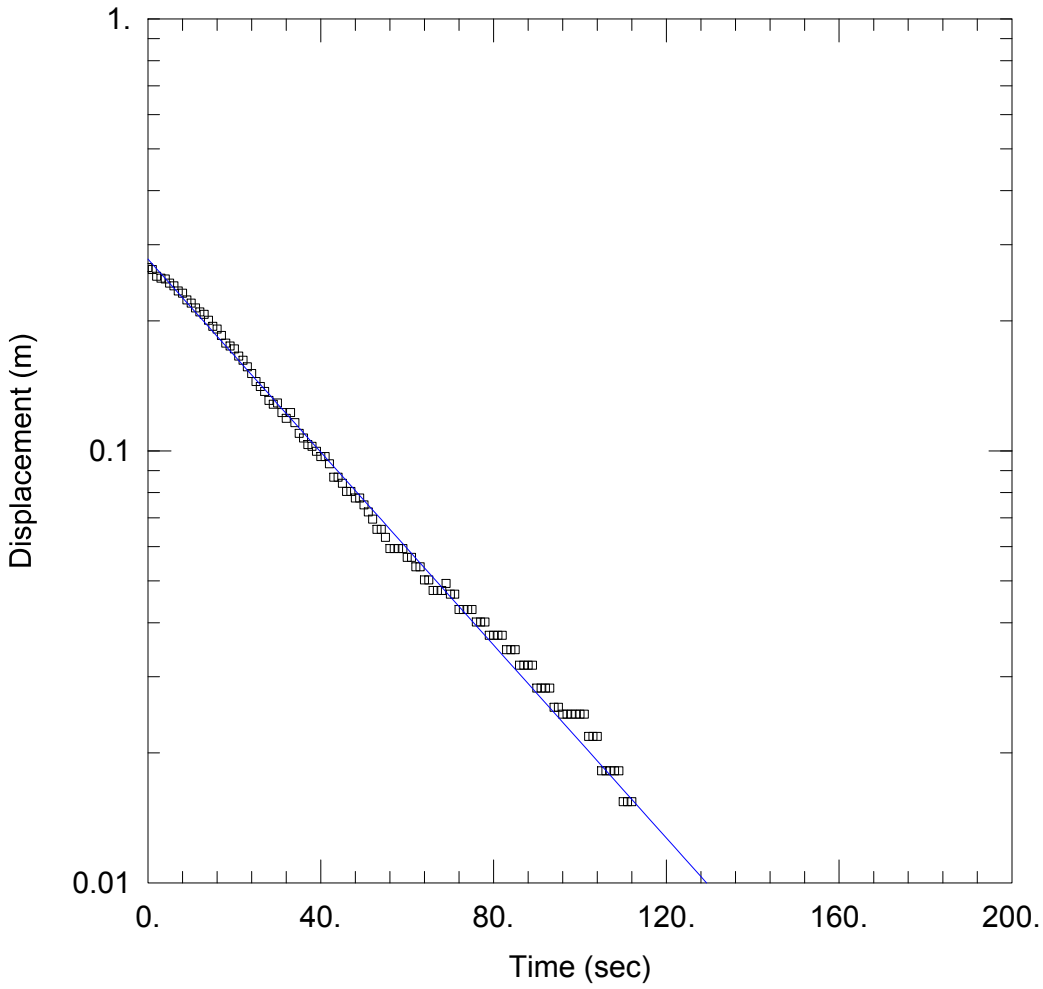
WELL DATA (MW2)

Initial Displacement: 0.7691 m
Total Well Penetration Depth: 1.36 m
Casing Radius: 0.019 m
Static Water Column Height: 1.36 m
Screen Length: 3. m
Wellbore Radius: 0.06 m
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 8.147E-5 m/sec y0 = 0.8915 m



WELL TEST ANALYSIS

Data Set: M:\...\MW5 AQSolve - CR.aqt
Date: 12/02/22 Time: 11:49:59

PROJECT INFORMATION

Company: Azimuth Environmental
Project: 22-411
Location: 141-153 Plains Road West
Test Well: MW5
Test Date: 24-Nov-22

AQUIFER DATA

Saturated Thickness: 0.75 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW2)

Initial Displacement: 0.2657 m
Total Well Penetration Depth: 0.75 m
Casing Radius: 0.019 m
Static Water Column Height: 0.75 m
Screen Length: 3. m
Wellbore Radius: 0.06 m
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 2.63E-5 m/sec y0 = 0.2778 m

APPENDIX F

Source Water Protection Mapping

141-453 Plains Road West, Burlington



Legend

- Source Protection Areas
- Intake Protection Zone Q
- Wellhead Protection Area Q1
- Wellhead Protection Area Q2
- Issue Contributing Areas
- Highly Vulnerable Aquifers
- Significant Groundwater Recharge Area
  - 0
  - 2
  - 4
  - 6
- WHPA Groundwater Under Direct Influence (WHPA-E)
- Wellhead Protection Area
  - A
  - B
  - C
  - C1
  - D
  - F
- Intake Protection Zone 1
- Event Based Areas
- Intake Protection Zone 2
- Intake Protection Zone 3

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Environment, Conservation and Parks (MECP) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.

Ontario

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Map Created: 12/2/2022
Map Center: 43.31492 N, -79.86489 W

APPENDIX G

Water Balance Summary

Table A: Pre-Development

Catchment Designation	Landscaped	Rooftop	Asphalt / Walkway	Total
Area (m^2)	700	505	1,195	2,400
Pervious Area (m^2)	700	0	0	700
Impervious Area (m^2)	0	505	1,195	1,700
Infiltration Factors				
Topography Infiltration Factor	0.25	0	0	
Soil Infiltration Factor	0.4	0	0	
Land Cover Infiltration Factor	0.1	0	0	
Infiltration Factor	0.75	0	0	
Run-Off Coefficient	0.25	1	1	
Run-Off From Impervious Surfaces	0.8	0.8	0.8	
Inputs (Per Unit Area)				
Precipitation (mm/yr)	875	875	875	875
Rainfall (mm/yr)	693	693	693	693
Run-On (mm/yr)	0	0	0	0
Other Inputs (mm/yr)	0	0	0	0
Total Inputs (mm/yr)	**875**	**875**	**875**	875
Outputs (Per Unit Area)				
Precipitation Surplus (mm/yr)	386	700	700	608
Net Surplus (mm/yr)	386	700	700	608
Evapotranspiration (mm/yr)	509	175	175	272
Infiltration (mm/yr)	290	0	0	84
Surplus Infiltration (mm/yr)	0	0	0	0
Total Infiltration (mm/yr)	290	0	0	84
Run-Off Pervious Areas (mm/yr)	97	0	0	28
Run-Off Impervious Areas (mm/yr)	0	700	700	496
Total Run-Off (mm/yr)	97	700	700	524
Total Outputs (mm/yr)	**895**	**875**	**875**	**881**
Difference (Inputs - Outputs)	**20**	**0**	**0**	**0**
Inputs (Volumes)				
Precipitation (m^3/yr)	613	442	1,046	2,100
Run-On (m^3/yr)	0	0	0	0
Other Inputs (m^3/yr)	0	0	0	0
Total Inputs (m^3/yr)	**613**	**442**	**1,046**	**2,100**
Outputs (Volumes)				
Precipitation Surplus (m^3/yr)	270	354	837	1,460
Net Surplus (m^3/yr)	270	354	837	1,460
Evapotranspiration (m^3/yr)	356	88	209	654
Infiltration (m^3/yr)	203	0	0	203
Surplus Infiltration (m^3/yr)	0	0	0	0
Total Infiltration (m^3/yr)	**203**	**0**	**0**	**203**
Run-Off Pervious Areas (m^3/yr)	68	0	0	68
Run-Off Impervious Areas (m^3/yr)	0	354	837	1,190
Total Run-Off (m^3/yr)	68	354	837	1,258
Total Outputs (m^3/yr)	627	442	1,046	2,114
Difference (Inputs - Outputs)	**14**	**0**	**0**	**14**

Table B: Post-Development (no mit)

Catchment Designation	Landscaped	Rooftop	Asphalt / Walkway	Total
Area (m^2)	0	1,468	932	2,400
Pervious Area (m^2)	0	0	0	0
Impervious Area (m^2)	0	1,468	932	2,400
Infiltration Factors				
Topography Infiltration Factor	0.25	0	0	
Soil Infiltration Factor	0.4	0	0	
Land Cover Infiltration Factor	0.1	0	0	
Infiltration Factor	0.75	0	0	
Run-Off Coefficient	0.25	1	1	
Run-Off From Impervious Surfaces	0.8	0.8	0.8	
Inputs (Per Unit Area)				
Precipitation (mm/yr)	875	875	875	875
Rainfall (mm/yr)	693	693	693	693
Run-On (mm/yr)	0	0	0	0
Other Inputs (mm/yr)	0	0	0	0
Total Inputs (mm/yr)	**875**	**875**	**875**	882
Outputs (Per Unit Area)				
Precipitation Surplus (mm/yr)	386	700	700	700
Net Surplus (mm/yr)	386	700	700	700
Evapotranspiration (mm/yr)	509	175	175	175
Infiltration (mm/yr)	290	0	0	0
Surplus Infiltration (mm/yr)	0	0	0	0
Total Infiltration (mm/yr)	290	0	0	0
Run-Off Pervious Areas (mm/yr)	97	0	0	0
Run-Off Impervious Areas (mm/yr)	0	700	700	700
Total Run-Off (mm/yr)	97	700	700	700
Total Outputs (mm/yr)	**895**	**875**	**875**	**875**
Difference (Inputs - Outputs)	**20**	**0**	**0**	**0**
Inputs (Volumes)				
Precipitation (m^3/yr)	0	1,285	816	2,100
Run-On (m^3/yr)	0	0	0	0
Other Inputs (m^3/yr)	0	0	0	0
Total Inputs (m^3/yr)	**0**	**1,285**	**816**	**2,100**
Outputs (Volumes)				
Precipitation Surplus (m^3/yr)	0	1,028	652	1,680
Net Surplus (m^3/yr)	0	1,028	652	1,680
Evapotranspiration (m^3/yr)	0	257	163	420
Infiltration (m^3/yr)	0	0	0	0
Surplus Infiltration (m^3/yr)	0	0	0	0
Total Infiltration (m^3/yr)	**0**	**0**	**0**	**0**
Run-Off Pervious Areas (m^3/yr)	0	0	0	0
Run-Off Impervious Areas (m^3/yr)	0	1,028	652	1,680
Total Run-Off (m^3/yr)	0	1,028	652	1,680
Total Outputs (m^3/yr)	0	1,285	816	2,100
Difference (Inputs - Outputs)	**0**	**0**	**0**	**0**

Table C: Water Balance Summary Table

Characteristic	Site			
	Pre-Development	Post-Development	Change (Pre to Post)	
Inputs (Volume)				
Precipitation (m^3/yr)	2,100	2,100	0	0%
Run-On (m^3/yr)	0	0	0	NA
Other Inputs (m^3/yr)	0	0	0	NA
Total Inputs (m^3/yr)	2,100	2,100	0	0%
Outputs (Volume)				
Precipitation Surplus (m^3/yr)	1,460	1,680	220	15%
Net Surplus (m^3/yr)	1,460	1,680	220	15%
Evapotranspiration (m^3/yr)	654	420	-234	-36%
Infiltration (m^3/yr)	203	0	-203	-100%
Rooftop Infiltration (m^3/yr)	0	0	0	NA
Total Infiltration (m^3/yr)	**203**	**0**	**-203**	**-100%**
Run-Off Pervious Areas (m^3/yr)	68	0	-68	-100%
Run-Off Impervious Areas (m^3/yr)	1,190	1,680	490	41%
Total Run-Off (m^3/yr)	1,258	1,680	422	34%
Total Outputs (m^3/yr)	**2,114**	**2,100**	**-14**	**-1%**

APPENDIX H

Water Quality Data

Results of Ground Water Chemical Analyses

Parameter	Symbol	Units	Burlington Storm Sewer Use By-Law	Provincial Water Quality Objectives (1994)	MW1 Sampled on: 2022-11-24 Sampled by: Azimuth Analyzed by: Caduceon
Saturation pH		N/A		-	6.99
pH		N/A	6.5-8.5	6.5-8.5	7.9
Langlier Index		N/A		-	0.913
Alkalinity (as CaCO3)		mg/L		-	217
Bicarbonate (as CaCO3)	HCO_3^-	mg/L		-	217
Carbonate (as CaCO3)	CO_3^{-2}	mg/L		-	< 5
Hydroxide		mg/L		-	< 5
Electrical Conductivity		uS/cm		-	1780
Fluoride	F^-	mg/L		-	< 1
Chloride	Cl^-	mg/L		-	368
Nitrate as N	NO_3-N	mg/L		-	1.62
Nitrite as N	NO_2-N	mg/L		-	< 0.5
Bromide	Br^-	mg/L		-	< 4
Sulphate	SO_4^{-2}	mg/L		-	84
Calcium	Ca	mg/L		-	151
Magnesium	Mg	mg/L		-	36.9
Sodium	Na	mg/L		-	165
Potassium	K	mg/L		-	3.9
Ammonia as N	NH_3-N	mg/L		-	< 0.01
Un-ionized Ammonia		mg/L		0.02	<0.0001
Phosphate as P	PO_4^{-3}	mg/L		-	0.007
Total Phosphorus	P	mg/L	0.4	0.03	**<u>4.71</u>**
Reactive Silica	Si	mg/L		-	10.9
Total Organic Carbon	TOC	mg/L		-	< 0.2
Colour		Colour Units		-	< 2
Turbidity		NTU		-	7280
Aluminum	Al	mg/L		0.075	0.06
Arsenic	As	mg/L	0.02	0.005	0.0001
Barium	Ba	mg/L		-	0.093
Boron	B	mg/L		0.2	0.074
Cadmium	Cd	mg/L	0.008	0.0002	< 0.000012
Chromium	Cr	mg/L	0.08	0.0089	< 0.001
Copper	Cu	mg/L	0.04	0.005	0.001
Iron	Fe	mg/L		0.3	0.029
Lead	Pb	mg/L	0.12	0.001	0.00007
Manganese	Mn	mg/L	0.05	-	0.014
Mercury	Hg	mg/L	0.0004	0.0002	< 0.00002
Molybdenum	Mo	mg/L		0.04	0.0009
Nickel	Ni	mg/L	0.08	0.025	< 0.01
Selenium	Se	mg/L	0.02	0.1	0.001
Silver	Ag	mg/L	0.12	0.0001	< 0.0001
Strontium	Sr	mg/L		-	0.365
Thallium	Tl	mg/L		0.0003	< 0.00005
Tin	Sn	mg/L		-	< 0.05
Titanium	Ti	mg/L		-	< 0.005
Uranium	U	mg/L		0.005	0.00091
Vanadium	V	mg/L		0.006	0.0002
Zinc	Zn	mg/L	0.04	0.03	< 0.005
Total Dissolved Solids	TDS	mg/L		-	939
Total Hardness (as CaCO3)		mg/L		-	529
% Difference/Ion Balance		%		-	3.71
Biochemical Oxygen Demand	BOD	mg/L	15	-	< 3
Total Kjeldahl Nitrogen	TKN	mg/L		-	3.3
Chemical Oxygen Demand	COD	mg/L		-	81
Phenols		mg/L	0.008	0.001	< 0.001

Bold and highlighted indicates PWQO exceedance
Underline indicates Sewer Use By-Law exceedance