246 North Street, Dorchester

Preliminary Hydrogeological Assessment

Project Location:
246 North Street, Dorchester, ON

Prepared for:
246 North Inc.
627 Maitland Street,
London, ON N5Y 2V7

Prepared by:
MTE Consultants Inc.
123 St. George Street
London, ON N6A 3A1

March 15, 2023

MTE File No.: 47030-200

Engineers, Scientists, Surveyors.

Contents

Figures

Tables

Within the Text of the Report

Following the Text of the Report

Appendices

1.0 Introduction

MTE Consultants Inc. (MTE) was retained by 246 North Inc. to carry out a preliminary hydrogeological assessment in support of the Draft Plan and Zoning By-Law Application for the proposed residential development located at 246 North Street, in the Municipality of Thames Centre (hereinafter referred to as the "Site"). The approximate location of the Site is shown the Key Plan on **Figure 1**.

As presented on the Conceptual Plan (Zelinka Priamo, 2022) provided in **Appendix A**, the proposed subdivision development is 2.1351 hectares (ha) in area and includes: a Subdivision Area with nine single family residential lots; a Condominium Area with 20 units and Stormwater Management Facility (SWMF) block. The development will be municipally serviced by piped water supply, sanitary sewers and a stormwater management system.

The development property has the following legal description: Concession 4, Part of Lot 11; Registered Plan 33R10461 Parts 2,3 &4. The Site is currently vacant land (previously agricultural cropland) with residential properties to the north, east and south, and is bounded to west by North Street Right-of-Way (ROW).

1.1 Study Objectives

The objectives of the preliminary hydrogeological assessment were to:

- Summarize the local hydrogeological conditions;
- Provide hydrogeological input to the Site design;
- Provide a qualitative assessment of the dewatering and permitting requirements;
- Identify groundwater receptors and assess the potential for hydrogeological impacts on these receptors as a result of the proposed development; and,
- Provide recommendations for additional work, groundwater monitoring and/or mitigation, as required.

2.0 Background Review

The following sections present the results of the background information review and describe the Site setting in a regional context.

2.1 Previous Investigations

MTE completed a Geotechnical Investigation in 2019 (MTE, 2020a) to support Draft Plan of Subdivision and Condominium approvals. Pertinent information from that investigation has been reviewed and the findings incorporated into this assessment, where appropriate.

No other hydrogeological, geotechnical, environmental, or natural heritage reports are known to have been previously completed for the Site.

2.2 Terrain

2.2.1 Topography

Based on the ground surface elevation measured at each borehole location completed by MTE, the elevations range from 260.61 metres (m) above mean sea level (AMSL) at MW105-19, to 264.23 m AMSL at MW108-19. Site topography increases towards the northwest and appears to decrease east of North Street. Regionally, the topography decreases in elevation towards the Thames River, which is located approximately 250 meters (m) south of the Site.

2.2.2 Surface Water and Drainage Features

No watercourses were identified on the Site. Based on information provided by the Upper Thames River Conservation Authority (UTRCA), an unevaluated wetland is located west of North Street, approximately 30 m from the Site. The approximate location of the unevaluated wetland is shown on **Figure 2.**

The Clara St. Drain is located approximately 240 meters west of the southwestern corner of the Site along North Street (OMAFRA, 2022). This is a closed/tiled drain discharging to the Thames River (OMAFRA, 2022). There is also a drain (UT-MD-84) located approximately 85 m east of the southeastern corner of the Site. This drain is an open watercourse, classified as an intermittent water course (Type F) (by the Department of Fisheries). This drain branches approximately 160 m north of Minnie Street, and becomes a closed/tiled drain (UT-MD-188) to the north and continues east (UT-MD-187) as an open watercourse flowing towards the North Dorchester Swamp, which is a Provincially Significant Wetland (PSW). This PSW is located approximately 30 m to the east of the Site.

The approximate locations of these watercourses are shown on **Figure 2**.

2.3 Regional Geology

2.3.1 Overburden

The Quaternary deposits on the Site are mapped as Catfish Creek silty sand till deposits (Ontario Geological Survey, 2003).

The Quaternary geology in the vicinity of the Site is shown on **Figure 3**.

2.3.2 Bedrock

Bedrock topography mapping indicates the bedrock in the vicinity of the Site ranges from approximately 243 to 236 m AMSL. The bedrock consists of Middle Devonian aged limestones and dolostones of the Dundee formation from the Hamilton Group (Ontario Geological Survey, 1991). A review of the Ministry of Environment, Conservation and Parks (MECP) Water Well Information System (WWIS) within the vicinity of the Site indicates that limestone and/or shale was generally encountered at approximately 14 to 41 m below ground surface (BGS).

2.4 Regional Hydrogeology

2.4.1 Potential Aquifers

Based on a review of mapping provided by Goff and Brown (1981), there are two potential aquifers present in the vicinity of the Site. They are described by Goff and Brown (1981), as follows:

1) A shallow, generally unconfined, overburden aquifer consisting of surficial sands extending to depths of 1 to 11 m below ground surface (BGS) is present.
2) A bedrock aquifer consisting of Middle Devonian aged limestones of the Dundee Formation.

Due to the depth of the bedrock aquifers and the nature of the proposed the development, only the shallow overburden aquifer is considered in the impact assessment provided herein.

2.4.2 Water Well Information System

The MECP WWIS was queried for data pertaining to all wells located within an approximate 500 m radius of the Site and resulted in data for 22 wells. The well records corresponded to the following:

- Two records were reported to be used as monitoring or observation wells;
- Eighteen records were for wells used as a water supply;
- One record was for a well reported to have been abandoned; and
- One record did not include information on well status or use.

The approximate locations of these wells, as indicated in the MECP water well records (WWRs), are shown on **Figure 4**. Pertinent information from these well records is summarized in **Table 1**.

2.4.3 Permit to Take Water Database

The MECP Permit to Take Water (PTTW) database (Ministry of the Environment Conservation and Parks, 2021) was queried for data pertaining to permits issued for water takings located within 500 m of the Site. No active or inactive permits were identified for locations within 500 m of the Site. The query identified two expired permits (6317-8MAHH7 and 1871-8K8GS2), both for dewatering purposes, one from groundwater and the other from the Thames River.

2.4.4 Source Protection

The Site is located within the Upper Thames River Source Water Protection Area (Thames-Sydenham and Region Source Protection Plan, 2022). Based on a review of the Source Protection Information Atlas (Ministry of Environment, Conservation and Parks, 2021), the Site was confirmed to include areas designated as:

- a Highly Vulnerable Aquifer (HVA) with a vulnerability score of 6; and
- a Significant Groundwater Recharge Area (SGRA).

The potential implications of these source protection areas are discussed in Section 6.0.

2.5 Significant Natural Heritage Features

No Environmentally Significant Areas (ESAs) (County of Oxford Official Plan, 2021) or Areas of Natural and Science Interest (ANSIs) were identified within 500 m of the Site (Land Information Ontario, 2021).

3.0 Field Investigation

3.1 Drilling Program

The drilling program for the geotechnical investigation was completed December 16 and 17, 2019. MTE retained Direct Environmental Drilling (DED) of London, Ontario as the MECP licensed well contractors to complete the borehole drilling at the Site. The boreholes were advanced using a Geoprobe 7822 DT track-mounted drilling rig. All drilling was completed under the supervision of MTE.

Additional drilling was completed as part of this hydrogeological assessment on August 31, 2022. MTE retained London Soil Test (LST) of London, Ontario as the MECP licensed well contractors to complete the borehole drilling at the Site. The boreholes were advanced using a GeoProbe 7822 DT track-mounted drilling rig. All drilling was completed under the supervision of MTE.

The approximate locations of the boreholes are shown on **Figure 1.** The stratigraphy encountered in the boreholes is shown on the borehole logs provided in **Appendix B**. Particle size distribution curves for representative soil samples are provided in **Appendix C**.

3.2 Monitoring Wells and Mini-Piezometers

Upon completion of the geotechnical borehole drilling in 2019, monitoring wells were installed in four of the boreholes (MW103-19, MW105-19, MW106-19, and MW108-19). During the hydrogeological borehole drilling in 2022, two additional monitoring wells were installed (MW201-22 and MW202-22). On December 16, 2022, one nested pair of mini-piezometers, denoted MP-1S and MP-1D (shallow and deep – two mini-piezometers total) were installed within the wetland to determine vertical gradients and assess if groundwater is contributing to the hydrologic function of the unevaluated wetland.

Each of the monitoring wells were constructed with 1.5-metre long, nominal 50 mm inside diameter (ID), slot 10, Schedule 40 polyvinyl chloride (PVC) well screens threaded to PVC riser pipes. A sand pack consisting of commercially available silica sand was used to backfill the borehole annulus surrounding the well screen. The annulus above the sand pack was backfilled with a bentonite seal to near ground surface. The monitoring wells were secured with monument-style protective casings cemented in place. The monitoring wells were installed in general accordance with O.Reg. 903, as amended. The construction, maintenance and abandonment of the wells are regulated under the Ontario Water Resources Act (OWRA).

The mini-piezometers were constructed with 0.61-metre long, nominal 25 mm inside diameter (ID), slot 10, Schedule 40 polyvinyl chloride (PVC) well screens threaded to PVC riser pipes. Backfill details for the mini-piezometers were consistent with those described above for the monitoring wells. The mini-piezometers were also secured with monument-style protective casings, cemented in place.

Following their construction, the monitoring wells were mechanically developed using a hydrolift pump and dedicated low density polyethylene (LDPE) tubing equipped with an inertial foot valve and surge block. The monitoring wells were purged of a minimum of three standing well volumes or until dry three times.

Details of the monitoring well construction and encountered groundwater levels are provided on the borehole logs in **Appendix B**. Details of the mini-piezometer construction and encountered groundwater levels are summarized in **Table 2**. The approximate locations of the monitoring wells and mini-piezometers are shown on **Figure 1.**

3.3 Elevation Survey

The ground surface elevations at the borehole locations, and top of pipe elevations for the monitoring wells, were surveyed by MTE and referenced to geodetic datum.

3.4 Hydraulic Conductivity Testing

Single well response tests were conducted in monitoring wells MW103-19, MW106-19, and MW108-19 to estimate the hydraulic conductivity of the encountered saturated deposits. A minimum of two sets of rising head and falling head tests, were completed in each of the above monitoring wells. Prior to initiating the tests, each monitoring well was instrumented with a pressure transducer equipped with a datalogger to measure water levels at a suitable frequency during the tests. The resultant datasets for these tests are provided in **Appendix D** and discussed further in **Section 4.5**.

3.5 Groundwater Monitoring Program

In September 2022, pressure transducers equipped with dataloggers were installed in six of the monitoring wells (MW103-19, MW105-19, MW106-19, MW108-19, MW201-22, and MW202-22). The dataloggers were configured to record water levels at one-hour intervals and the data downloaded during each monitoring event. The transducer readings were compensated for changes in atmospheric pressure using data collected by a barometric pressure transducer installed at the Site for the duration of the monitoring period. During the compensation process, level offsets using corresponding manual water level measurements collected at the time of installation and/or download were applied to the data to convert the water levels to geodetic elevations. Hydrographs of the compensated groundwater elevations are provided in **Appendix E**.

Groundwater levels were manually measured in all six monitoring wells during each quarterly monitoring event. The results obtained over the monitoring period to date (September 2022 to March 2023) are summarized in **Table 3**. It is noted that groundwater monitoring at the Site is scheduled to continue until September 2023.

The groundwater level monitoring results obtained to date are discussed further in **Section 4.3**.

4.0 Hydrostratigraphy

4.1 Stratigraphy

In general, the stratigraphic conditions encountered in the boreholes typically consisted of topsoil underlain by native granular deposits consisting of sandy silt to sand to gravelly sand to sand and gravel. Glacial till deposits were encountered beneath the granular deposits at all boreholes and typically consisted of silt to clayey silt to sandy silt tills. The simplified stratigraphy inferred from the boreholes is shown on the cross-sections provided on **Figure 5**, **Figure 6** and **Figure 7**. The approximate locations of the cross-sections are shown on **Figure 1.** Descriptions of the encountered deposits are provided below.

4.2 Fill Material

Variable fill material was encountered at the ground surface in BH101-19 and BH110-19 and was 1.7 and 1.6 m thick, respectively. The fill typically ranges in composition from sand to sand and gravel with wood pieces.

4.3 Granular Deposits

Granular deposits were encountered beneath topsoil or fill materials in all of the boreholes. The thickness of the granular deposits range from approximately 1.3 to 4.3 m. The granular deposits typically range in composition from sand to silty sand to gravelly sand to sand and gravel. A 0.4 m layer of sandy silt was encountered above the sand deposit in BH110-19. The results of four particle size distribution analyses conducted on the granular deposits are provided in **Appendix C** and summarized in the table below.

Table 4.1 - Results of Granular Deposits Particle Size Distribution Analyses

Borehole Number	Sample Depth (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
MW103-19	2.3 – 2.7	21	69	9	1
MW105-19	1.5 – 2.0	0	73	25	2
MW106-19	2.3 – 2.7	0	90	8	2
MW108-19	3.0 – 3.7	0	73	25	2

4.4 Glacial Till Deposits

Glacial till was encountered beneath the granular soils in all of the boreholes and extends to the termination depth of each borehole. The till typically ranges in composition from silt to clayey silt to sandy silt. The results of one particle size distribution analysis conducted on the till are provided in **Appendix C** and summarized in the table below.

Table 4.2 - Results of Glacial Till Deposits Particle Size Distribution Analysis

Borehole Number	Sample Depth (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
BH101-19	3.8 – 4.3	0	2	82	16

4.5 Hydraulic Conductivity

4.5.1 Single Well Response Tests

The groundwater level datasets collected during the single well response tests were analyzed using the AquiferTest Pro software package. Hydraulic conductivity (K) values for each test were estimated using the Bouwer and Rice analytical solution (Bouwer and Rice, 1976). The results are provided in **Appendix D** and summarized in **Table 4.**

The results of the hydraulic testing analyses indicate that the estimated K values for the saturated native granular deposits range between approximately 7.9×10^{-6} to 6.5×10^{-5} meters per second (m/s), with a geometric mean of approximately 2.3×10^{-5} m/s (n = 14). The K values estimated from the single well response tests are consistent with the range of hydraulic conductivity values reported by Freeze and Cherry (1979) for similar materials and illustrate the relatively consistent hydraulic conductivity of the shallow unconfined aquifer across the Site.

4.6 Groundwater Elevations

The encountered groundwater levels are shown on the borehole logs in **Appendix B** and manually measured groundwater levels are summarized in **Table 3**. Hydrographs of the compensated groundwater elevations are provided in **Appendix E**.

The measured shallow groundwater elevations in the saturated granular deposits ranged from a maximum of 263.21 m AMSL at monitoring well MW103-19 to a minimum of 258.81 m AMSL at MW105-19 over the monitoring period (September 2022 to March 2023) for this investigation.

The observed water table response following significant precipitation events (refer to hydrographs) is characteristic of a shallow unconfined “aquifer”.

It is noted that the monitoring period has coincided with a period when regional groundwater levels in southern Ontario rise towards their seasonal high levels in late winter to early spring. Following this spring freshet, groundwater levels typically begin to decline towards their seasonal low levels, which generally occur in late summer to early fall.

In general, the local water table surface is anticipated to be a subdued replica of the ground surface topography, with flow convergence and discharge to significant surface water features.

Groundwater conditions may subsequently differ from those described herein due to seasonal and inter-annual variations in groundwater levels and in response to significant precipitation events. The groundwater conditions at the time of construction should be confirmed by the contractor and their work plan modified as appropriate.

The quarterly groundwater monitoring program at the Site is recommended to be continued until September 2023, at which point the results of the monitoring program will be evaluated. Please note we recommend continuing the monitoring program one year after construction.

The maximum anticipated groundwater level at the Site will be assessed as part of the detailed design and following collection of one year of groundwater levels. For preliminary design purposes, the following table provides preliminary estimations of the high groundwater level for each of the monitoring wells installed at the Site.

Table 4.3 – Preliminary Design High Groundwater Estimates

WELL ID	Ground Surface Elevation	Highest Measured Groundwater Elevation	Estimated High Groundwater Elevation
MW103-19	264.21	263.2	264.2
MW201-22	263.53	263.1	263.5
MW202-22	261.92	261.8	261.9

NOTES:

1. Elevations provided in metres (m) above mean sea level (AMSL).
2. Period of record to date is September 2022 to March 2023.
3. Highest measured groundwater elevations occurred on February 10, 2023.
4. Estimated high groundwater elevations were set to ground surface elevation due to the shallow nature of the water table.
5. Estimated high groundwater elevation will be updated during detailed design.

4.7 Water Quality

Groundwater was sampled from two representative monitoring wells (MW106-19, and MW201-22) during two sampling events, which occurred in November 2022 and March 2023. The samples were collected using dedicated inertial pumps and low-density polyethylene tubing. Prior to sampling, the wells were purged of a minimum of three equivalent well volumes of groundwater or purged dry three consecutive times. The samples were collected into the appropriate bottles supplied by the analytical laboratory with the applicable preservatives added by the laboratory. Upon collection, the water samples were placed on ice in coolers and submitted under chain of custody procedures to the Bureau Veritas depot in London, Ontario for analysis in their laboratory in Mississauga, Ontario.

No sheen, odours, free product, or other evidence of potential environmental contamination were observed in the samples collected from these monitoring wells.

The samples were analyzed for a suite of general water quality parameters to establish a water quality baseline prior to development. The analytical results were compared to the MECP Table 2 Site Condition Standards (SCS) for all property uses in a potable groundwater condition due to the presence of shallow groundwater supply wells within 500 meters of the site. The analytical results are summarized in **Table 5**. A copy of the laboratory Certificate of Analysis is provided in **Appendix F**. No exceedances of the MECP Table 2 SCS were reported for the parameters analyzed at both sampling locations during the fall event (November 2022) and spring event (March 2023).

5.0 Dewatering Review

The following sections provide a qualitative discussion of the potential dewatering and related permitting requirements for the project.

Design details for site servicing, foundations and stormwater management facilities were not available at the time of this review. Once available, MTE should be requested to review the design

and complete a quantitative dewatering assessment to confirm the preliminary findings described herein.

5.1 Temporary Construction Dewatering

The design is currently at the conceptual stage, so final elevations for excavations for the service trenches, and building foundations are not yet available.

Based on the encountered subsurface conditions, it is anticipated that temporary construction dewatering will be required should excavations extend into the encountered saturated granular deposits at the Site. Given the depth to groundwater and permeability of the saturated granular deposits (K range ~ 7.9×10^{-6} to 6.5×10^{-5} m/s), it is likely that proactive groundwater control in the form of a well point well point system or suitable equivalent may be required. The design of the dewatering system should be left to the contractor's discretion, with the general requirement to maintain dry and stable excavations throughout construction.

5.2 Construction Dewatering Permitting Requirements

Based on the encountered subsurface conditions, it is our opinion that the daily water taking volumes for construction dewatering within open excavations at the Site will exceed the threshold of 50,000 litres per day (L/day) above which a water taking permit is required.

Depending on the final design details and selected construction methods, one of the following water taking permits will be required:

- An Environmental Activity Sector Registration (EASR) is required for temporary construction dewatering greater than 50,000 litres per day (L/day) and less than 400,000 L/day. This is an online registration supporting by a Water Taking and Discharge Plan prepared by a professional hydrogeologist prior to the start of dewatering activities. We recommend a scheduling allowance of at least four weeks to prepare the WTDP and complete the online registration.
- A Permit to Take Water (PTTW) is required for temporary construction dewatering exceeding 400,000 L/day. This requires a Category 3 PTTW application, including a detailed supporting hydrogeological assessment prepared by a professional hydrogeologist. The application package should be submitted to the MECP at least four months prior to the start of any dewatering.

A permit for the discharge from the dewatering system may also be required. The application process and approval authority are dependent on the selected discharge location.

The specific requirements for water taking and discharge permits should be reviewed during detailed design.

6.0 Source Protection Implications

As discussed in Section 2.4.4 the Site is located within:

- HVA (score 6); and,
- SGRA (score 6).

Under O.Reg. 287/07, specific activities have been identified as chemical or pathogenic drinking water threats and these activities are regulated within HVAs and SGRAs. The following sub-sections summarize the results of our review of the applicable policies within Thames-Sydenham and Region Source Protection Plan (Thames-Sydenham and Region Source Protection Committee, 2015).

6.1 Moderate and Low Threat Policies

The Source Protection Plan was reviewed and the following moderate or low threat policies pertaining to development of the Site were identified.

Table 4.4: Summary of Moderate and Low Threat Policies

	Threats	Threat Applicability to Site	Applicable Policies
HVA (6)	Moderate:		
	Landfilling (Hazardous Waste or LIW)	N/A	N/A
	Landfilling (Municipal Waste)	N/A	N/A
	LIW Injection into a well	N/A	N/A
	Transfer/Processing Site – Hazardous Waste or LIW	N/A	N/A
	Transfer/Processing Site – Municipal Waste	N/A	N/A
	Low:		
	Aircrafts - De-icing Runoff	N/A	OC – 1.07
	Application of Agricultural Source Material (ASM) to Land	N/A	OC – 1.07
	ASM – Storage	N/A	OC – 1.07
	ASM Generation - Livestock Grazing	N/A	OC – 1.07
	ASM Generation - OCA or Farm Animal Yard	N/A	OC – 1.07
	Disposal of Hauled Sewage to Land	N/A	N/A
	Fertilizer – Application	Yes	OC – 1.07
	Fertilizer - Handling and Storage	Yes	OC – 1.07
	Fuel - Handling and Storage	N/A	N/A
	Hauled Sewage - Storage	N/A	N/A
	Industrial Effluent Discharges	N/A	N/A
	Landfarming of Petroleum Refining Waste	N/A	N/A
	Landfilling (Hazardous Waste or LIW)	N/A	N/A
	Landfilling (Municipal Waste)	N/A	N/A
	LIW Injection into a well	N/A	N/A
	Application of Non-agricultural source material (NASM) to land	N/A	OC – 1.07
	NASM - Handling & Storage	N/A	OC – 1.07
	Onsite Sewage Works	Yes	N/A
	Organic Solvent - Handling & Storage	N/A	N/A
	Outfall of a combined sewer overflow (CSO) or sanitary sewer overflow (SSO) from a manhole or wet well	N/A	N/A
	PCB Waste Storage	N/A	N/A
	Pesticide - Application	Yes	OC – 3.01; OC – 1.07
	Pesticide - Handling & Storage	Yes	OC – 1.07
	Pipeline	N/A	N/A
	Application of processed organic waste (POW) to land	N/A	N/A
	POW - Storage	N/A	N/A
	Road Salt - Application	Yes	OC – 1.07
	Road Salt - Handling & Storage – Exposed	N/A	OC – 1.07

	Threats	Threat Applicability to Site	Applicable Policies
	Road Salt - Handling & Storage - Not Exposed	N/A	OC – 1.07
	Road Salt - Handling & Storage - Potentially Exposed	N/A	OC – 1.07
	Snow - Storage	N/A	OC – 1.07
	Storm Water - Infiltration (Industrial/Commercial)	N/A	N/A
	Storm Water - Infiltration (Residential/Institutional)	Yes	N/A
	Storm Water - Infiltration (Rural)	N/A	N/A
	Storm Water - Outfall (Industrial/Commercial)	N/A	N/A
	Storm Water - Outfall (Residential/Institutional)	N/A	N/A
	Storm Water - Outfall (Rural)	N/A	N/A
	Tailings From Mines	N/A	N/A
	Transfer/Processing Site - Municipal Waste	N/A	N/A
	Waste Generation Facility - Registration Exempt or Excluded	N/A	N/A
	Waste Generation Facility - Requiring Registration	N/A	N/A
	Wastewater Collection Facilities and Associated Parts: Sanitary Sewers	Yes	N/A
	Wastewater Collection Facilities and Associated Parts: Sewage Pumping Station or Lift Station Wet Well, a Holding Tank or a Tunnel	N/A	N/A
	WWTF and Associated Parts	N/A	N/A

Based on a review of the Source Water Protection Policies and Threats, OC-1.07 and OC-3.01 apply to the proposed development and are summarized below:

- Policy OC – 1.07 Incentive Program Development. This policy relates to development of an incentive program by government organizations and no action is required by the proponent.
- Policy OC – 3.01 Low and Moderate Threat Pesticide Application – Management (Pesticides Act). This policy relates to government agencies reviewing and amending permits issued under the Pesticide Management Act and no action is required by the proponent.

If the proposed development includes land uses other than residential, MTE should be asked to review the proposed land use and applicable SPP policies.

7.0 Preliminary Impact Assessment

7.1 Inventory of Groundwater Receptors

7.1.1 Water Supply Wells

Eighteen records corresponding to water supply wells were reported in the WWIS for properties located within approximately 500 m of the Site. The water supply wells range in depth from 6 to 41 m BGS, with six of these wells completed within bedrock.

The identified records included four shallow (i.e., less than 15 m in depth) drilled water supply wells (WWRs 4115169, 4110727, 4110200 and 4102903) reportedly within 500 m of the Site. The

approximate locations of these shallow water supply wells, based on information in the WWIS, are shown on **Figure 3**. However, based on our review of available aerial imagery and a reconnaissance of the area, the locations of at least three of these shallow water supply wells are not considered to be reliable. It is therefore recommended that a door to door water well inventory be completed during detailed design. The inventory will identify the locations and well construction details of any shallow water supply wells that may be susceptible to impacts as a result of temporary construction dewatering. The well inventory should include properties within 500 m of the Site that are not connected to the piped municipal water supply.

7.1.2 Watercourses

As described in Section 2.2.2, no watercourses were identified on-Site. Off-site watercourses near the site are shown on **Figure 2**. The nearest off-site watercourse is UT-MD-188, which is located approximately 85 m to the east.

7.1.3 Wetlands

No wetlands were identified on the Site. An off-site unevaluated wetland was identified west of North Street, approximately 30m from the Site. The approximate limits of this wetland are shown on **Figure 2**.

As described in Section 3.2, a nested pair of mini-piezometers was installed within the unevaluated wetland to assess the hydrologic function of the wetland. Initial manual groundwater level measurements (December 2022, January 2023, and March 2023) indicate that the vertical gradient is slightly downward, suggesting that the wetland is not groundwater dependent during the winter months. The interaction between groundwater and the wetland will be further assessed as part of the detailed design phase when additional groundwater levels are available.

7.1.4 Environmentally Significant Areas

There are no Environmentally Significant Areas (ESAs) on, or immediately adjacent to, the Site.

7.2 Potential Groundwater Impacts during Construction

7.2.1 Temporary Construction Dewatering

Based on a review of the WWIS, shallow water supply wells were identified within 500 m of the Site. It is recommended that a door to door well inventory be completed to confirm the locations and well construction details for all properties within 500 m of the that are not connected to the piped municipal water supply. The potential impact on identified shallow water supply wells will be further assessed following completion of the door to door well inventory and quantitative dewatering assessment during detailed design.

In the event that construction dewatering is required and depending on the location of the dewatering system and required drawdown, construction dewatering has the potential to temporarily impact nearby shallow groundwater receptors. Further assessment of the potential impacts will be completed following receipt of final design details and completion of a quantitative dewatering assessment.

However, it is anticipated that with implementation of an appropriate monitoring and contingency plan, the risk of significant impacts to nearby shallow water supply wells and the wetland can be appropriately mitigated during temporary construction dewatering.

7.2.2 Spills

The proposed construction will require the use of heavy machinery and equipment and, as such, there is some potential for associated petroleum hydrocarbons, such as fuel or lubricants, to impact the shallow unconfined aquifer.

These risks are readily minimized by:

- implementing Best Management Practices (BMPs) for all refueling, fuel and lubricant storage and equipment maintenance activities;
- prohibiting refueling and maintenance activities within 30 m of any waterbody; and
- implementing a spill contingency plan during construction.

With the above control measures in place, the residual risk (accounting for likelihood and consequence) of spills potentially impacting shallow groundwater is considered to be very low.

7.2.3 Vibrations

Vibrations from heavy construction equipment may disturb existing accumulated sediment in the bottom of nearby water supply wells and/or dislodge scale from the walls of the well casing temporarily resulting in an increase in Total Suspended Solids (TSS) within the water column. Poorly maintained water supply wells are generally more susceptible.

A door to door well inventory should be completed to confirm the locations and installation depths of active water supply wells in the immediate vicinity of the Site. A request should also be submitted to the Municipality to confirm properties that are on a piped municipal water supply.

Following completion of the door to door well inventory, a monitoring and contingency plan should be developed for any active water supply wells that are considered to be susceptible to interference during construction.

7.2.4 Soil Compaction

Compaction of soils by heavy machinery traffic during construction may reduce the infiltration capacity of surficial soils. These impacts may be mitigated, at least partially, by implementing a best practices Soil Management Plan (SMP) during clearing, grading and construction with the goal to preserve or restore the pre-development infiltration capacity of the native soils and subsoils in areas that will remain pervious following development. The SMP may include:

- Allowing the proposed pervious areas to remain undisturbed, to the extent possible, and protecting them from compaction during construction; and/or
- Restoration of compacted subsoils following construction using a combination of de-compaction treatments (e.g. ripping, scarification, tilling) and application of organic soil amendments to increase the organic matter content.

7.3 Potential Post-Development Groundwater Impacts

7.3.1 Infiltration and Runoff

Following development, the increase in the impervious surface area at the Site is anticipated to decrease infiltration and increase runoff relative to the existing conditions.

Appropriate low impact development (LID) measures may mitigate the anticipated decrease in post-development infiltration. Subject to site limitations, specific mitigation measures may include:

- Reduction of the amount of impervious surface area, where feasible;
- Storage of precipitation for subsequent use to satisfy landscape irrigation requirements;
- Topsoil thickening to provide additional storage;
- Promote diffused infiltration of stormwater so that, where feasible, runoff from impervious surfaces sheet flows over adjacent pervious surfaces that are managed to optimize infiltration capacity;

- Construction of bioretention cells and/or bioswales within proposed greenspaces, boulevards or landscaped areas to allow for the diversion of overland flow and subsequent infiltration, where feasible;
- Construction of infiltration galleries beneath parking areas designed to collect roof top runoff for subsequent infiltration; and
- Use of permeable pavements, where feasible (i.e., driveways, parking lots, sidewalks, patios, etc.).

It is recommended that suitable LID mitigation measures be implemented to maintain a minimum of 90% of the pre-development infiltration following development.

In-situ infiltration testing in areas considered for infiltration is highly recommended to assess feasibility and provide a site-specific infiltration rate of the soils in those areas to inform the design. The testing program should include profiling of infiltration rates with depth at multiple locations within each proposed infiltration gallery.

7.3.2 Groundwater Recharge

As discussed in Section 2.4.4 the Site is considered to be in an area of significant groundwater recharge. However, by implementing appropriate LID mitigation measures to maintain a minimum of 90% of the pre-development infiltration and implementing a SMP to mitigate the reduction in infiltration due to soil and subsoil compaction, no significant change in the volume of groundwater recharge is anticipated following development.

7.3.3 Water Supply Wells

As discussed in Section 7.3.1, mitigation measures will be implemented to maintain a minimum of 90% of the pre-development infiltration at the Site. As a result, no significant change in the available drawdown of existing water supply wells is expected as a result of the proposed development.

7.3.4 Wetlands

As discussed in Section 7.1.3, preliminary manual groundwater level measurements indicate a downward vertical gradient in the vicinity of the unevaluated wetland, suggesting that the wetland is not groundwater dependent (at least during the winter months). The interaction between groundwater and the wetland will be further assessed as part of the detailed design phase when additional monitoring data are available.

As discussed in Section 7.3.1, mitigation measures will be implemented to maintain a minimum of 90% of the pre-development infiltration at the Site. As a result, no significant change in the shallow groundwater level in the vicinity of the off-site unevaluated wetland is anticipated as a result of the proposed development.

8.0 Conclusions

Based on the foregoing discussion, it is concluded that:

i. Stratigraphic conditions typically consisted of native granular deposits consisting of sandy silt to sand to gravelly sand to sand and gravel. The granular deposits are underlain by glacial till deposits typically consisting of silt to clayey silt to sandy silt tills.

ii. Groundwater elevations within the unconfined granular deposits ranged from a maximum of 263.21 m AMSL to a minimum of 258.81 m AMSL over the period of record.

iii. Based on shallow nature of groundwater at the site, estimated high groundwater levels for preliminary design will be near existing ground surface.

iv. Baseline groundwater quality results did not exceed MECP Table 2 SCS for the parameters analyzed during both the fall and spring events.

v. Temporary construction dewatering is anticipated to be required for excavations extending into the encountered saturated granular deposits at the Site.

vi. Implementation of an appropriate monitoring and contingency plan will mitigate the risk of significant impacts to the shallow water supply wells (if any) and the wetland, should temporary construction dewatering be required.

vii. If unmitigated, the increase in the impervious surface area at the Site following development is anticipated to decrease infiltration and increase runoff relative to the existing conditions. Implementation of suitably designed LID measures will mitigate the anticipated decrease in post-development infiltration.

viii. The surficial soils may be susceptible to compaction by heavy machinery traffic during construction, which may further reduce their infiltration capacity.

ix. Nearby water supply wells may be susceptible to well interference due to heavy construction equipment vibrations, spills and/or temporary construction dewatering, if any.

x. No other significant impacts on groundwater receptors are anticipated as a result of the proposed development or related construction activities.

9.0 Recommendations

It is recommended that:

i. The quarterly groundwater level monitoring program described herein be continued to provide up to date groundwater levels for detailed design, approvals, permitting, tendering and construction.

ii. A quantitative assessment of the construction dewatering requirements be completed to support permitting and tendering once final design details for services and any below grade structures are available.

iii. In conjunction with the quantitative assessment of construction dewatering, additional groundwater samples should be collected to assess discharge options for dewatering purposes.

iv. To identify nearby water supply wells that may be susceptible to well interference from equipment vibrations, spills and/or temporary construction dewatering, a door to door well inventory should be undertaken for properties that are not connected to the piped municipal water supply and are located within 250 metres of the Site.

v. Based on the results of the door to door well inventory, a monitoring and contingency plan should be developed for any active water supply wells that are considered to be susceptible to interference during construction.

vi. A water taking permit be obtained from the MECP prior to the start of any construction dewatering. The specific requirements for water taking permit should be reviewed during detailed design.

vii. A discharge permit and/or agreement be obtained from the applicable approval authority prior to discharging any pumped water during construction dewatering. The

specific requirements for the discharge permit should be reviewed during detailed design.

viii. Special provisions for temporary construction dewatering should be included in the tender documents.

ix. A best practices SMP should be developed and implemented during clearing, grading and construction with the goal to preserve or restore the pre-development infiltration capacity of the native soils and subsoils in areas that will remain pervious following development.

x. Suitable LID strategies should be implemented, where feasible, to mitigate the potential decrease in infiltration following development and maintain a minimum of 90% of the pre-development infiltration.

xi. If the proposed land use changes from residential, MTE should be asked to review the proposed land use change and applicable SPP policies.

xii. A location-specific investigation of subsurface conditions and in-situ infiltration testing should be carried out to support LID design.

xiii. Following completion of groundwater monitoring, the monitoring wells should be properly abandoned in accordance with O.Reg. 903, as amended.

10.0 Limitations and Closure

Services performed by MTE Consultants Inc. (MTE) were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the Geoscience Consulting profession practicing under similar conditions in the same geographic area where the services are provided. No other warranty or representation expressed or implied as to the accuracy of the information, conclusions or recommendations is included or intended in this report.

This report was completed for the sole use of 246 North Inc. This report is not intended to be exhaustive in scope or to imply a risk-free site. As such, this report may not deal with all issues potentially applicable to the site and may omit aspects which are or may be of interest to the reader.

In addition, it should be recognized that a discrete soil sample represents one distinct portion of a site at the time it is collected, and that the findings of this report are based on conditions as they existed during the time period of the investigation. The material in the report reflects our opinions using the information available at the time the report was written. The soil and groundwater conditions between and beyond the test holes may differ from those encountered in the test holes. Should subsurface conditions arise that are different from those noted herein, MTE should be notified to determine whether or not changes should be made as a result of these conditions.

It should be recognized that the passage of time may affect the views, conclusions, and recommendations (if any) provided in this report because groundwater and soil conditions of a property can change, along with regulatory requirements. All design details were not known at the time of submission of this report, and it is recommended that MTE be retained to review the final design documents prior to construction to confirm they are consistent with our report recommendations. Should additional or new information become available, MTE recommends that it be brought to our attention in order that we may determine whether it affects the contents of this report.

Any use which another party makes of this report, or any reliance on, or decisions to be made based upon it, are the responsibility of such parties. MTE accepts no responsibility for liabilities

incurred by or damages, if any, suffered by another party as a result of decisions made or actions taken, based upon this report. Others with interest in the site should undertake their own investigations and studies to determine how or if the condition affects them or their plans. The contractors bidding on this project or undertaking the construction should make their own interpretation of the factual information and draw their own conclusions as to how subsurface conditions may affect their work.

The benchmark and elevations provided in this report are primarily established to identify differences between the test hole locations and should not be used for other purposes such as, planning, development, grading, and excavation.

All of which is respectfully submitted,

MTE Consultants Inc.

Alison Schincariol, M.Sc., P.Geo.
Hydrogeologist
+1 (519) 204-6510 ext. 2293
aschincariol@mte85.com

John McNeil, M.Sc., P.Geo.
Operational Director, London & Stratford
+1 (519) 204-6510 ext. 2228
jmcneil@mte85.com

AAS/JDM:sdm

\\mte85.local\mte\Proj_Mgmt\47030\200\HydroG\6 - Deliverables\3 - Reports\47030-200_246NorthStGeotechnicalInvestigation_2023-03-15.docx

11.0 References

Bouwer, H., and Rice, R.C.1976. A slug test for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells. Water Resour. Res., 12(3), 423.

Freeze, R., & Cherry, J. (1979). *Groundwater.* Prentice-Hall, Englewood Cliffs, NJ.

Goff, K. and D.R. Brown. (1981). *Thames River Basin Water Management Study Technical Report, Groundwater Resources – Summary*. Ministry of Environment Water Resources Report 14.

Land Information Ontario. (2021). *Areas of Natural and Scientific Interest (ANSI)*. Retrieved from Ontario GeoHub: https://geohub.lio.gov.on.ca/datasets/areas-of-natural-and-scientific-interest-ansi

Ministry of Environment, Conservation and Parks. (2021, January). Retrieved from Source Protection Information Atlas: https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?viewer=SourceWaterProtection.SWPViewer&locale=en-US

Ministry of the Environment Conservation and Parks. (2021). *Map: Permits to take Water*. Retrieved from Ontario.ca: https://www.ontario.ca/page/map-permits-take-water

Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). 2022. AgMaps. Retrieved from: https://www.lioapplications.lrc.gov.on.ca/AgMaps/Index.html?viewer=AgMaps.AgMaps&locale=en-CA

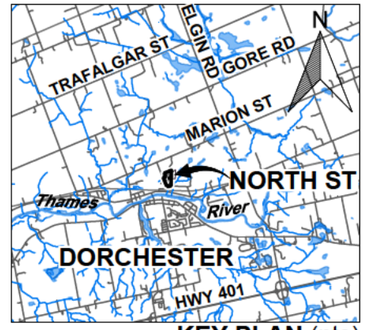
Ontario Geological Survey. (2003). *Surficial Geology of Ontario* (Vols. Miscellaneous Release Data 128 - Revised).

Ontario Geological Survey (1991). Bedrock geology of Ontario, southern sheet; Ontario Geological Survey, Map 2544, scale 1:1 000 000.

Thames-Sydenham and Region Source Protection Committee (2015). Thames-Sydenham and Region Source Protection Plan. Volume III – Policies affecting the areas the Thames-Sydenham and Region Source Protection Region except Oxford County.

Thames-Sydenham and Region Source Water Protection. (2022). Retrieved from: https://www.sourcewaterprotection.on.ca/approved-source-protection-plan/interactive-mapping/

Figures



KEY PLAN (nts)

LEGEND

- SITE BOUNDARY
- BOREHOLE
- BOREHOLE/MONITORING WELL
- MINI PIEZOMETER
- A A' GEOLOGICAL CROSS-SECTION

REFERENCES

AERIAL IMAGE, MINISTRY OF NATURAL RESOURCES AND FORESTRY, © QUEEN'S PRINTER FOR ONTARIO, 2022 ; CONCEPT PLAN PROVIDED BY ZELINKA PRIAMO LTD, AUTO CAD FILE "Concept Plan.dwg", FEBRUARY 9 - 2022; AND LAND INFORMATION ONTARIO ROAD AND WATER NETWORK © QUEEN'S PRINTER FOR ONTARIO, 2022 (key plan).

NOTES

THIS FIGURE IS SCHEMATIC ONLY AND TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

ALL LOCATIONS ARE APPROXIMATE.

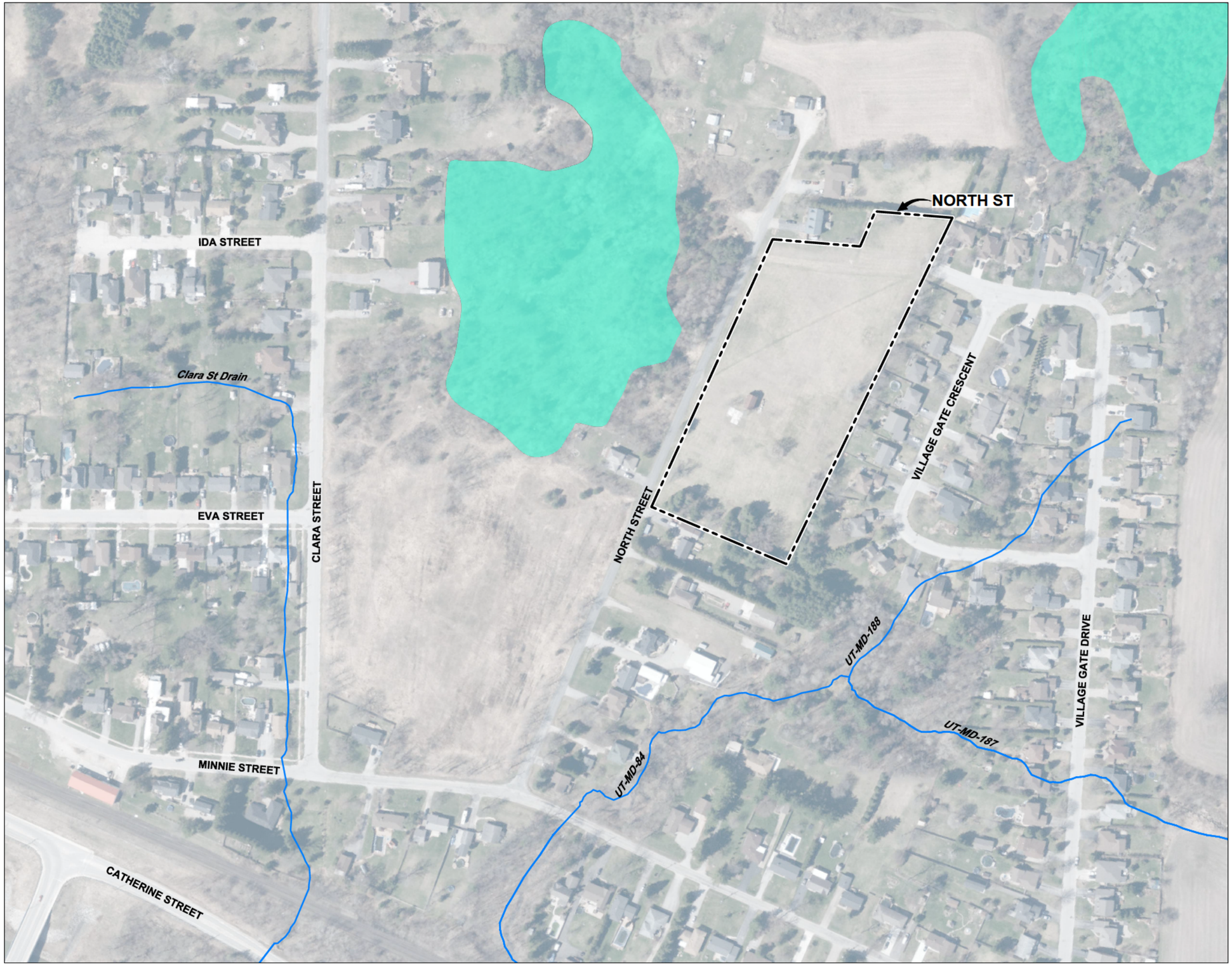
SCALE IN METRES
0 50 100m
1:2,500

MTE
Engineers, Scientists, Surveyors

PROJECT
PRELIMINARY HYDROGEOLOGICAL ASSESSMENT
NORTH STREET
DORCHESTER, ONTARIO

TITLE
SITE PLAN

Drawn DCH	Scale AS SHOWN	**FIGURE 1**	
Checked	Project No. 47030-200		
Date Mar 13/23	Rev No. 0		



N

LEGEND

- SITE BOUNDARY
- WATERCOURSE (LIO)
- WETLAND (LIO/UTRCA)

REFERENCES

AERIAL IMAGE, MINISTRY OF NATURAL RESOURCES AND FORESTRY, © QUEEN'S PRINTER FOR ONTARIO, 2022 ; CONCEPT PLAN PROVIDED BY ZELINKA PRIAMO LTD, AUTO CAD FILE "Concept Plan.dwg", FEBRUARY 9 - 2022; LAND INFORMATION ONTARIO WATER NETWORK © QUEEN'S PRINTER FOR ONTARIO, 2022; AND UPPER THAMES RIVER CONSERVATION AUTHORITY, WATER NETWORK AND WETLANDS, COPYRIGHT © UTRCA

NOTES

THIS FIGURE IS SCHEMATIC ONLY AND TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

ALL LOCATIONS ARE APPROXIMATE.

SCALE IN METRES
0 50 100m
1:2,500

MTE
Engineers, Scientists, Surveyors

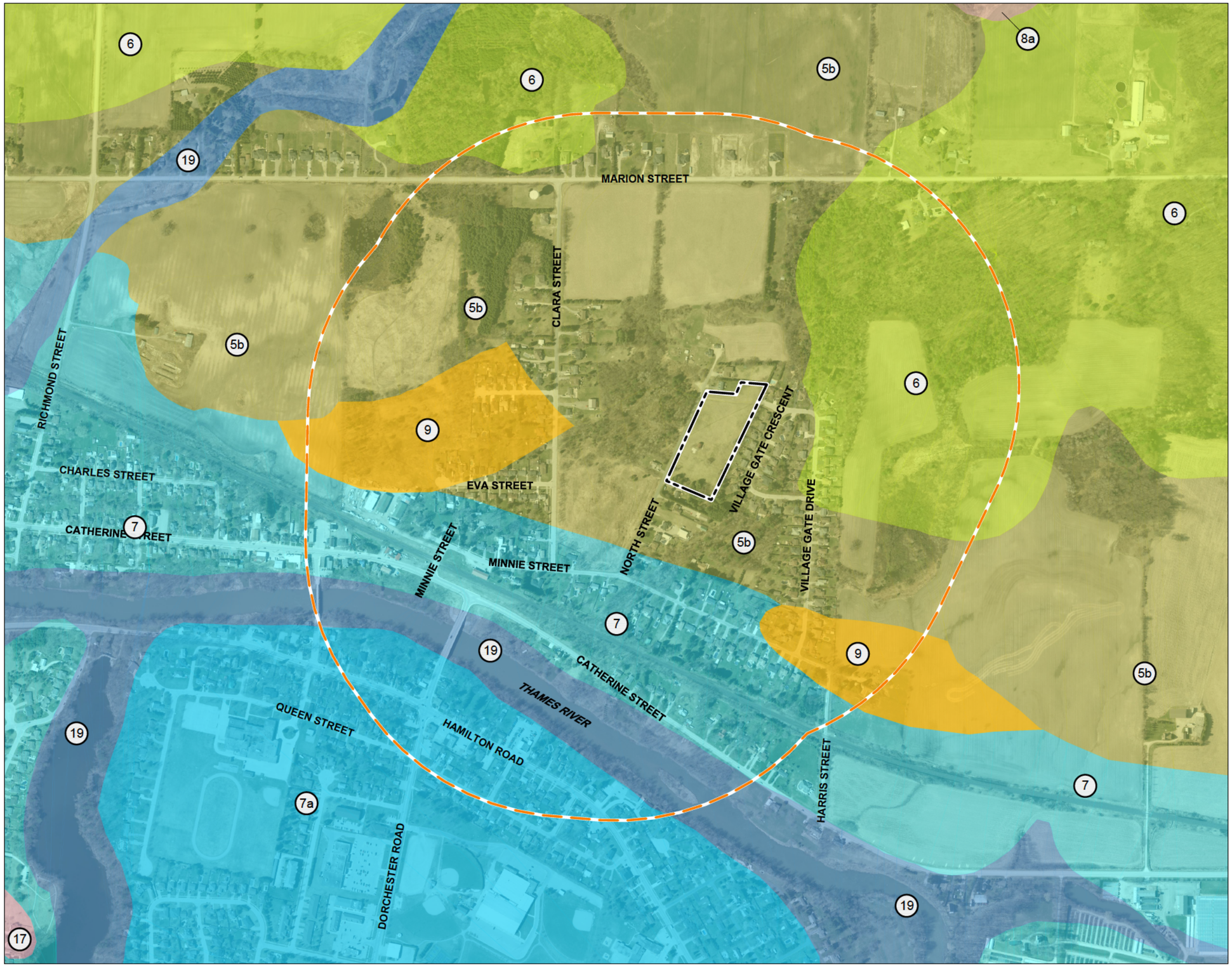
PROJECT
PRELIMINARY HYDROGEOLOGICAL ASSESSMENT
NORTH STREET
DORCHESTER, ONTARIO

TITLE
NATURAL HERITAGE FEATURES

Drawn	DCH	Scale	AS SHOWN
Checked		Project No.	47030-200
Date	Mar 1/23	Rev No.	0

FIGURE 2

Client: 246 North Inc.
TIME 10:19 22
PLOT DATE 1 March 2023
CAD: P:\P\47030\200\2_PROD\47030-200-R02 PRELIMINARY HYDROGEOLOGICAL ASSESSMENT\47030-200-R02004.DWG
25mm
0
Original Format in Tabloid (279mm x 432mm; 11" x 17")



N

LEGEND

- SITE BOUNDARY
- STUDY AREA (500m Buffer from Site Boundary)

- 5b — Catfish Creek Silty Sand Till Predominates
- 6 — Silty Sand And Very Fine To Fine Sand Predominates
- 7 — Gravel and gravelly sand; Valley Trains
- 7a — Gravel and gravelly sand; Valley Trains
- 8a — Sand, silt and clay
- 9 — Silty Sand And Very Fine To Fine Sand Predominates
- 17 — Silty Sand And Very Fine To Fine Sand Predominates
- 19 — Gravel, Sand, And Silt, Containing Organic Remains

REFERENCES

SOUTHWESTERN ONTARIO ORTHOPHOTOGRAPHY PROJECT (2020), SOURCE: DATA PROVIDED BY ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY, © COPYRIGHT: 2020 QUEEN'S PRINTER OF ONTARIO, ALL RIGHTS RESERVED;
CONCEPT PLAN PROVIDED BY ZELINKA PRIAMO LTD, AUTO CAD FILE "Concept Plan.dwg", FEBRUARY 9 - 2022; AND
ONTARIO GEOLOGICAL SURVEY 2010, SURFICIAL GEOLOGY OF SOUTHERN ONTARIO, ONTARIO GEOLOGICAL SURVEY MISCELLANEOUS RELEASE-128-REVISED.

NOTES

THIS FIGURE IS SCHEMATIC ONLY AND TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

ALL LOCATIONS ARE APPROXIMATE.

SCALE IN METRES

0 150 300m

1:7,500

MTE
Engineers, Scientists, Surveyors

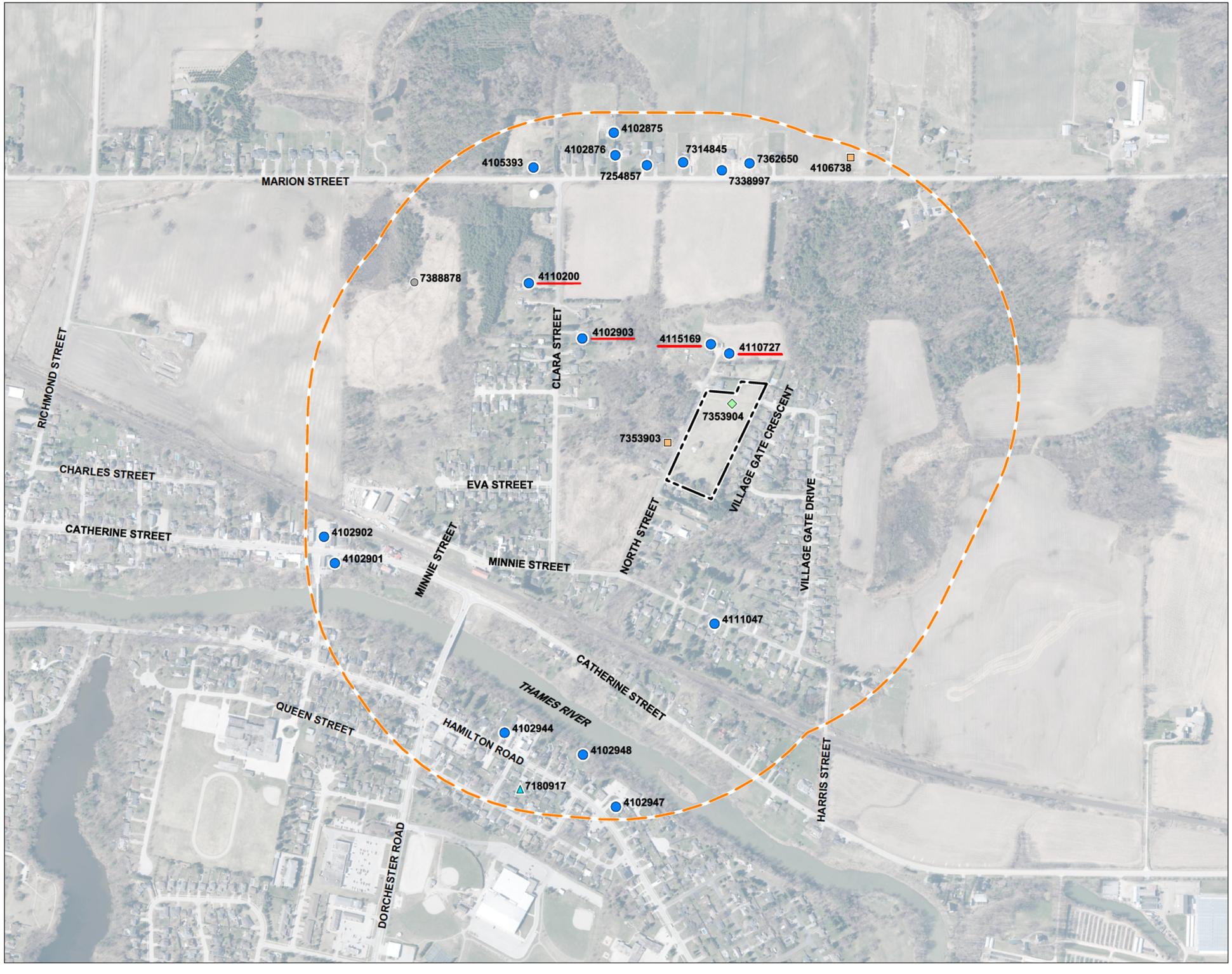
PROJECT
PRELIMINARY HYDROGEOLOGICAL ASSESSMENT
NORTH STREET
DORCHESTER, ONTARIO

TITLE
QUATERNARY GEOLOGY

Drawn: DCH	Scale: AS SHOWN
Checked:	Project No.: 47030-200
Date: Mar 1/23	Rev No.: 0

FIGURE 3

Client: 246 North Inc.
PLOT DATE 1 March 2023 TIME 10:16:49
CAD: P:\47030\200\2_PROD\47030-200-R02 PRELIMINARY HYDROGEOLOGICAL ASSESSMENT\47030-200-R02002.DWG
25mm Original Format in Tabloid (279mm x 432mm; 11" x 17")
0



N

LEGEND

- SITE BOUNDARY
- STUDY AREA (500m Buffer from Site Boundary)

MECP WELL RECORDS:
- ABANDONED
- TEST HOLE
- UNKNOWN
- MONITORING WELL / TEST HOLE
- WATER SUPPLY

- SHALLOW WATER SUPPLY WELL (<15m)

REFERENCES

SOUTHWESTERN ONTARIO ORTHOPHOTOGRAPHY PROJECT (2020), SOURCE: DATA PROVIDED BY ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY, © COPYRIGHT: 2020 QUEEN'S PRINTER OF ONTARIO, ALL RIGHTS RESERVED;
CONCEPT PLAN PROVIDED BY ZELINKA PRIAMO LTD, AUTO CAD FILE "Concept Plan.dwg", FEBRUARY 9 - 2022; AND
WATER WELL RECORDS PROVIDED BY THE ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY, © QUEEN'S PRINTER OF ONTARIO, ALL RIGHTS RESERVED.

NOTES

THIS FIGURE IS SCHEMATIC ONLY AND TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

ALL LOCATIONS ARE APPROXIMATE.

SCALE IN METRES
0 150 300m
1:7,500

MTE
Engineers, Scientists, Surveyors

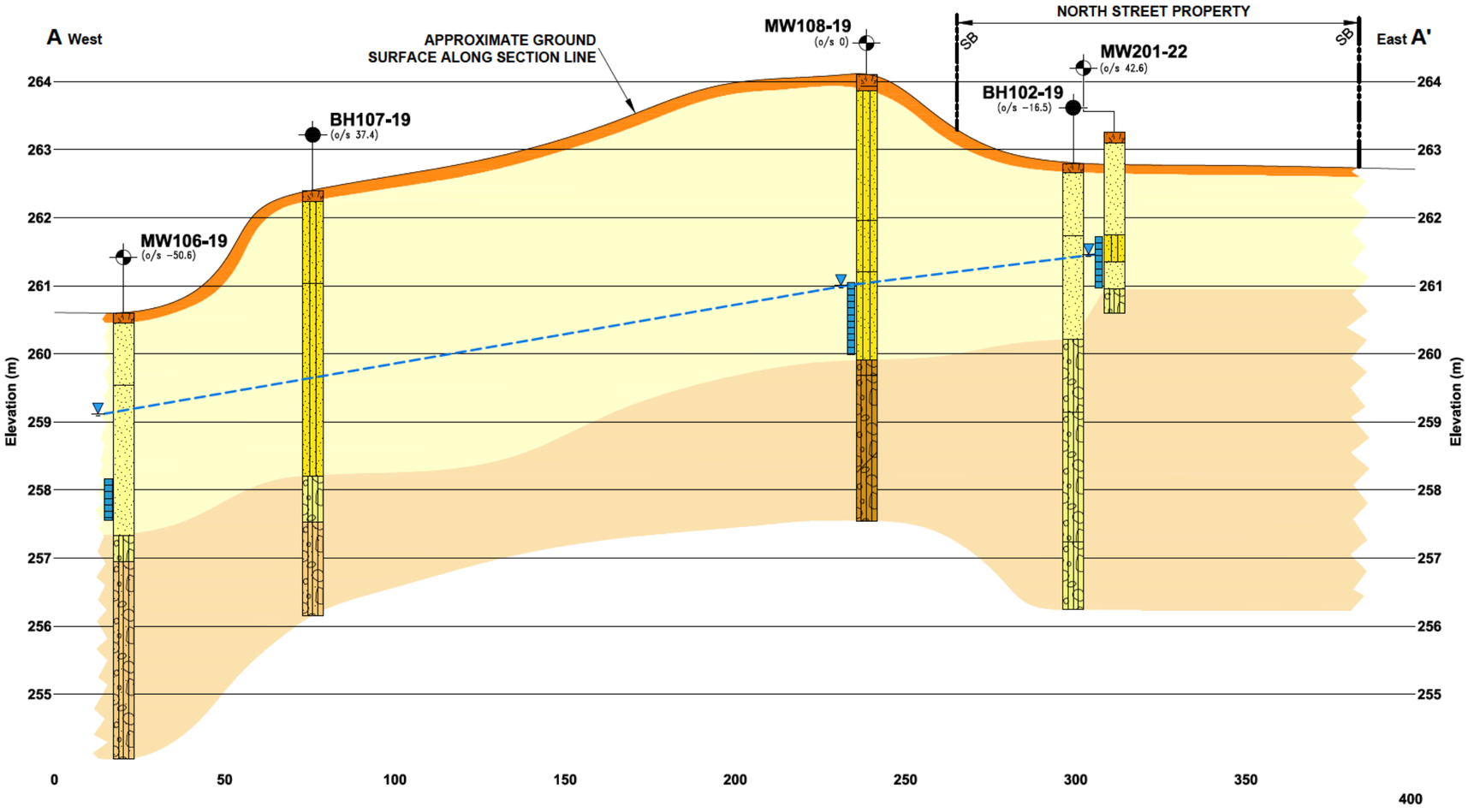
PROJECT
PRELIMINARY HYDROGEOLOGICAL ASSESSMENT
NORTH STREET
DORCHESTER, ONTARIO

TITLE
WATER WELL RECORDS

Drawn	DCH	Scale	AS SHOWN
Checked		Project No.	47030-200
Date	Mar 1/23	Rev No.	0

FIGURE 4

Client: 246 North Inc.
PLOT DATE 1 March 2023 TIME 10:18 29
CAD: P:\47030\200\2_PROD\47030-200-R02 PRELIMINARY HYDROGEOLOGICAL ASSESSMENT\47030-200-R02003.DWG
0 25mm Original Format in Tabloid (279mm x 432mm; 11" x 17")



LEGEND

- INFERRED GROUNDWATER TABLE
- SITE BOUNDARY (SB)
- BOREHOLE
- BOREHOLE/MONITORING WELL

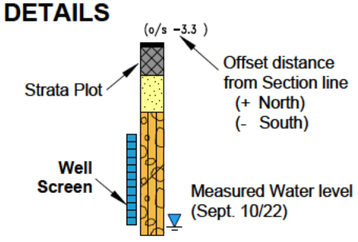
SIMPLIFIED STRATIGRAPHY

- TOPSOIL
- SAND
- SILTY SAND
- SILT TILL
- SANDY SILT TILL
- CLAYEY SILT TILL

HYDROSTRATIGRAPHY

- TOPSOIL
- SANDS
- SILT TILLS

TYPICAL INSTALLATION DETAILS



NOTES

THIS FIGURE IS SCHEMATIC ONLY AND TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

WIDTH OF BOREHOLES FOR ILLUSTRATION PURPOSES ONLY AND DO NOT CORRESPOND TO ACTUAL SPATIAL EXTENT.

THE GEOLOGIC SEQUENCE PRESENTED HEREIN IS BASED ON PROFESSIONAL INTERPRETATION FROM THE OVERBURDEN SEDIMENTS RECORDED DURING DRILLING, ACTUAL GEOLOGICAL CONDITIONS MAY VARY BETWEEN AND BEYOND LOCATIONS.

ALL LOCATIONS ARE APPROXIMATE.

VERTICAL SCALE IN METRES
0 1,5 3m
1:75

HORIZONTAL SCALE IN METRES
0 30 60m
1:1,500

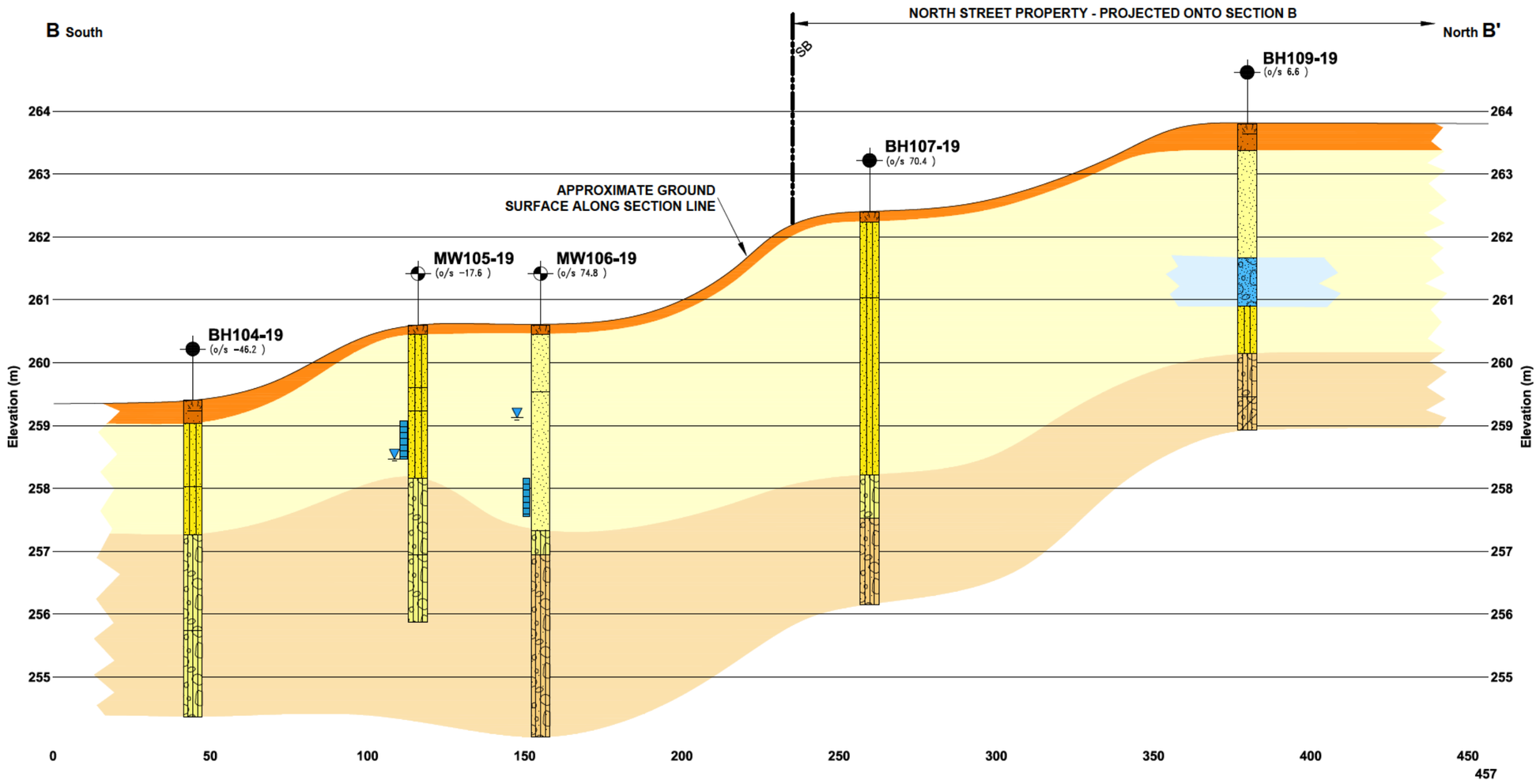
MTE
Engineers, Scientists, Surveyors

PROJECT
PRELIMINARY HYDROGEOLOGICAL ASSESSMENT
NORTH STREET
DORCHESTER, ONTARIO

TITLE
CROSS-SECTION A-A'

Drawn DCH	Scale AS SHOWN
Checked	Project No. 47030-200
Date Mar 1/23	Rev No. 0

FIGURE 5



LEGEND

- SITE BOUNDARY (SB)
- BOREHOLE
- BOREHOLE/MONITORING WELL

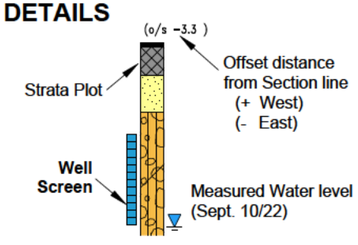
SIMPLIFIED STRATIGRAPHY

- TOPSOIL
- SAND
- SILTY SAND
- SILT TILL
- SANDY SILT TILL
- CLAYEY SILT TILL

HYDROSTRATIGRAPHY

- TOPSOIL
- FILL
- GRAVELS
- SANDS
- SILT TILLS

TYPICAL INSTALLATION DETAILS



NOTES

THIS FIGURE IS SCHEMATIC ONLY AND TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

WIDTH OF BOREHOLES FOR ILLUSTRATION PURPOSES ONLY AND DO NOT CORRESPOND TO ACTUAL SPATIAL EXTENT.

THE GEOLOGIC SEQUENCE PRESENTED HEREIN IS BASED ON PROFESSIONAL INTERPRETATION FROM THE OVERBURDEN SEDIMENTS RECORDED DURING DRILLING, ACTUAL GEOLOGICAL CONDITIONS MAY VARY BETWEEN AND BEYOND LOCATIONS.

ALL LOCATIONS ARE APPROXIMATE.

VERTICAL SCALE IN METRES
0 1.5 3m
1:75

HORIZONTAL SCALE IN METRES
0 30 60m
1:1,500

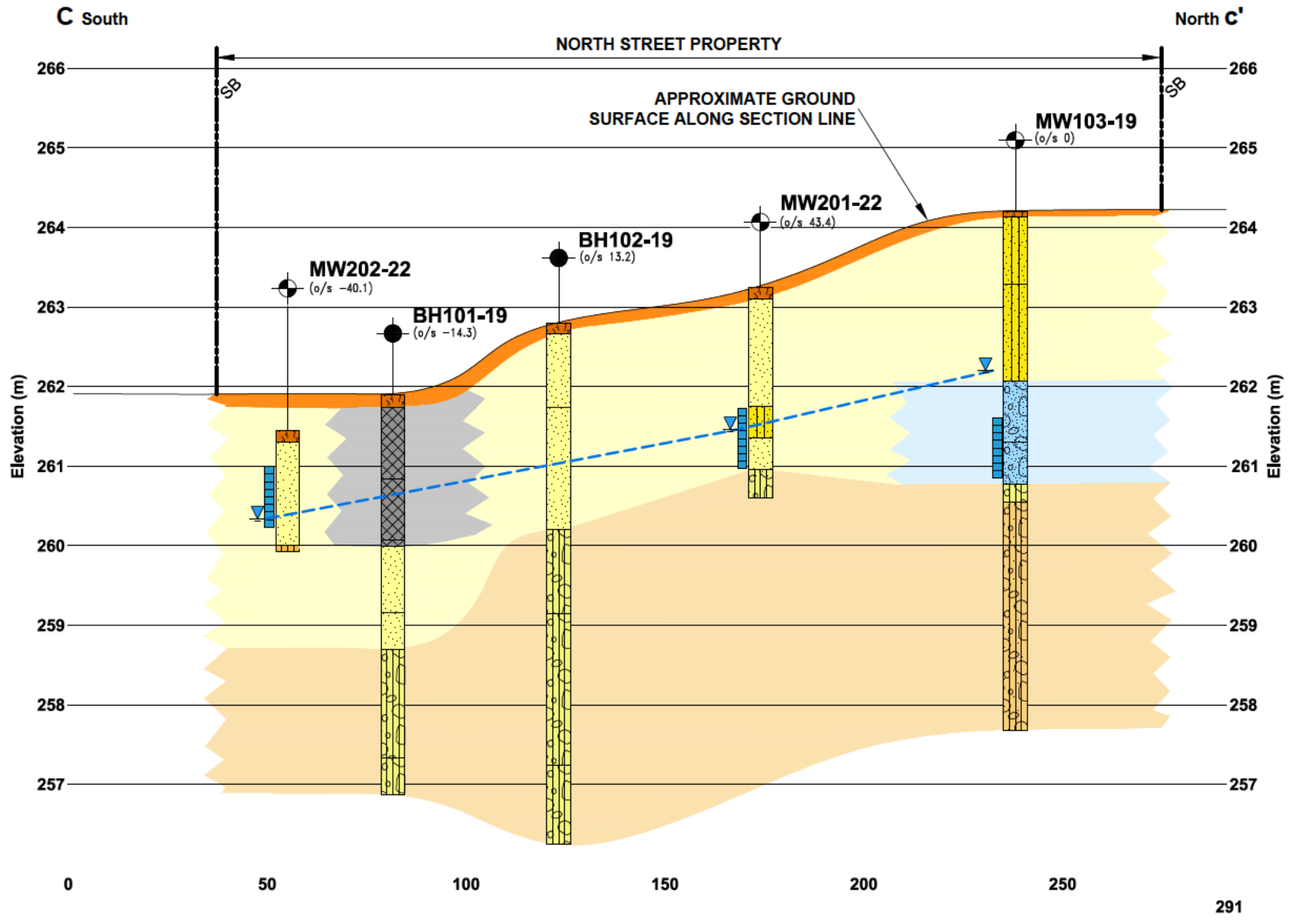
MTE
Engineers, Scientists, Surveyors

PROJECT
PRELIMINARY HYDROGEOLOGICAL ASSESSMENT
NORTH STREET
DORCHESTER, ONTARIO

TITLE
CROSS-SECTION B-B'

Drawn	DCH	Scale	AS SHOWN
Checked		Project No.	47030-200
Date	Mar 1/23	Rev No.	0

FIGURE 6



LEGEND

- INFERRED GROUNDWATER TABLE
- SITE BOUNDARY (SB)
- BOREHOLE
- BOREHOLE/MONITORING WELL

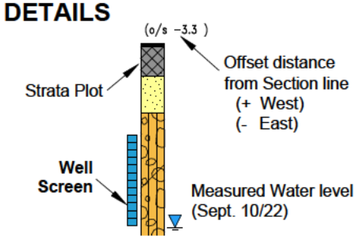
SIMPLIFIED STRATIGRAPHY

- TOPSOIL
- FILL
- SAND
- SILTY SAND
- GRAVELLY SAND
- SILT TILL
- SANDY SILT TILL
- CLAYEY SILT TILL

HYDROSTRATIGRAPHY

- TOPSOIL
- FILL
- GRAVELS
- SANDS
- SILT TILLS

TYPICAL INSTALLATION DETAILS



NOTES

THIS FIGURE IS SCHEMATIC ONLY AND TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

WIDTH OF BOREHOLES FOR ILLUSTRATION PURPOSES ONLY AND DO NOT CORRESPOND TO ACTUAL SPATIAL EXTENT.

THE GEOLOGIC SEQUENCE PRESENTED HEREIN IS BASED ON PROFESSIONAL INTERPRETATION FROM THE OVERBURDEN SEDIMENTS RECORDED DURING DRILLING, ACTUAL GEOLOGICAL CONDITIONS MAY VARY BETWEEN AND BEYOND LOCATIONS.

ALL LOCATIONS ARE APPROXIMATE.

VERTICAL SCALE IN METRES
0 1.5 3m
1:75

HORIZONTAL SCALE IN METRES
0 30 60m
1:1,500

MTE
Engineers, Scientists, Surveyors

PROJECT
PRELIMINARY HYDROGEOLOGICAL ASSESSMENT
NORTH STREET
DORCHESTER, ONTARIO

TITLE
CROSS-SECTION C-C'

Drawn DCH	Scale AS SHOWN
Checked	Project No. 47030-200
Date Mar 1/23	Rev No. 0

FIGURE 7

Tables

Table 1: Summary of MECP Water Well Records

MECP Well No.	MECP Well Tag No.	UTM Coordinates (NAD83 Zone 17) Easting	Northing	Year Drilled	Nominal Casing Diameter (mm)	Drilling Method	Well Status	Well Use	Water Quality	Water Found (mBGS)	Total Depth (mBGS)	Interval Screened Top (mBGS)	Bottom (mBGS)	Static Level (mBGS)	Pumping Test Final Level (mBGS)	Rate (LPM)	Duration (Hours)	Depth to Unit Base (m)	Stratigraphy Colour	Material 1	Material 2	Material 3
4102875	-	495133.7	4760743	1967	127	Cable Tool	Water Supply	Livestock	Fresh	19.5	20.73	18.3	19.2	10.1	18.9	31.8	8	2.4	Brown	Clay		
																		8.5	Brown	Clay	Medium Sand	
																		19.5	Brown	Fine Sand		
																		20.4	Brown	Coarse Sand		
																		20.7	Grey	Clay		
4102876	-	495153.7	4760703	1967	127	Cable Tool	Water Supply	Domestic	Fresh	41.1	41.15	-	-	12.2	40.2	27.3	6	6.1		Clay	Medium Sand	
																		18.9		Fine Sand		
																		28		Clay	Medium Sand	
																		32.6		Fine Sand		
																		33.5		Limestone		
																		40.2		Medium Sand	Gravel	
																		41.1	Grey	Limestone		
4102901	-	494953.7	4759743	1947	101.6	Cable Tool	Water Supply	Domestic	Sulphur	-	17.37	-	-	4.9	5.8	27.3	4	6.1	Brown	Clay	Stones	
																		15.8		Hardpan	Boulders	
																		17.4	Grey	Rock		
4102902	-	494913.7	4759783	1953	101.6	Cable Tool	Water Supply	Domestic	Fresh	18	17.98	-	-	4.6	6.1	18.2	5	0.9		Topsoil		
																		1.8	Yellow	Clay		
																		6.1		Gravel	Hardpan	
																		13.7		Stones	Hardpan	
																		18		Shale		
4102903	-	495233.7	4760343	1966	762	Boring	Water Supply	Domestic	Fresh	3.7	6.1	-	-	3.7	6.1	13.6	1	0.3		Topsoil		
																		3.4	Brown	Clay		
																		6.1	Brown	Medium Sand		
4102944	-	495393.7	4759563	1948	101.6	Cable Tool	Water Supply	Domestic	Sulphur	26.8	26.82	-	-	9.1	10.7	27.3	7	1.2		Topsoil		
																		6.1		Boulders	Clay	
																		15.2		Gravel	Stones	
																		26.8		Boulders	Clay	Rock
4102947	-	495653.7	4759513	1953	101.6	Cable Tool	Water Supply	Municipal	Minerial	24.4	24.38	-	-	4.6	6.1	36.4	5	0.6		Topsoil		
																		13.7		Hardpan		
																		15.2		Medium Sand	Gravel	
																		22.9		Medium Sand		
																		24.4		Shale		
4102948	-	495553.7	4759583	1955	203.2	Cable Tool	Water Supply	Municipal	Sulphur	27.4	27.43	-	-	3	3.7	181.8	24	1.8		Clay	Silt	
																		23.8		Gravel		
																		27.4		Limestone		
4105393	-	495013.7	4760618	1971	101.6	Cable Tool	Water Supply	Domestic	Fresh	19.5	21.34	19.8	21	10.4	18.6	40.9	8	0.3		Topsoil		
																		6.4	Brown	Clay	Medium Sand	
																		13.1	Brown	Clay	Medium Sand	
																		18.3	Grey	Fine Sand		
																		19.5	Grey	Medium Sand	Clay	
																		21	Grey	Fine Sand		
																		21.3	Grey	Clay	Gravel	
4106738	-	495584.7	4760880	1974	50.8	Rotary (Convent.)	Water Supply/Test Hole	Municipal	Fresh	16.5	28.96	18.3	21.3	3.7	5.2	45.5	5	0.3		Topsoil		
																		3	Brown	Clay		
																		16.5	Brown	Sand	Clay	
																		18	Brown	Gravel	Sand	Clay
																		21	Brown	Sand	Gravel	Clay
																		22.9	Brown	Sand		
																		24.7	Brown	Sand	Gravel	Clay
																		27.7	Grey	Clay	Sand	Gravel
																		29	Grey	Clay	Gravel	Limestone
4110200	-	495093.7	4760403	1984	914.4	Boring	Water Supply	Domestic	Fresh	7.6	14.63	-	-	7.6	14.3	22.7	2	6.1	Brown	Clay		
																		14.6	Brown	Sand		
4110727	-	495513.7	4760428	1986	152.4	Rotary (Air)	Water Supply	Domestic	Fresh	9.4	9.45	-	-	4.3	5.2	31.8	3	6.4	Brown	Sand		Packed
																		7.6	Grey	Sand	Gravel	
																		9.1	Grey	Gravel	Clay	
																		9.4	Grey	Medium Sand		Loose
4111047	-	495693.7	4759923	1987	152.4	Rotary (Air)	Water Supply	Cooling & A/C	Sulphur	24.4	24.38	-	-	5.2	5.8	68.2	3	0.3	Black	Topsoil		Porous
																		2.4	Brown	Sand	Gravel	Packed
																		3	Brown	Sand	Stones	Packed
																		3.4	Brown	Gravel	Clay	
																		11.6	Grey	Gravel	Clay	
																		12.8	Grey	Clay		Dense
																		14.6	Grey	Clay	Gravel	
																		18.9	Grey	Gravel	Clay	
																		23.8	Grey	Clay		Dense

Table 1: Summary of MECP Water Well Records

MECP Well No.	MECP Well Tag No.	UTM Coordinates (NAD83 Zone 17) Easting	Northing	Year Drilled	Nominal Casing Diameter (mm)	Drilling Method	Well Status	Well Use	Water Quality	Water Found (mBGS)	Total Depth (mBGS)	Interval Screened Top (mBGS)	Bottom (mBGS)	Static Level (mBGS)	Pumping Test Final Level (mBGS)	Rate (LPM)	Duration (Hours)	Stratigraphy Depth to Unit Base (m)	Colour	Material 1	Material 2	Material 3
																		24.4	Brown	Limestone		Hard
4115169	-	495473	4760431	2002	139.7	Rotary (Convent.)	Water Supply	Domestic	Not Stated	9.8	14.63	12.2	14.6	8.2	9.4	22.7	2	1.5	Brown	Clay		
																		9.1	Brown	Sand	Silt	Packed
																		9.8	Grey	Clay	Stones	Hard
																		11.6	Grey	Clay	Sand	Silt
																		12.2	Grey	Clay	Stones	Hard
																		14.3	Grey	Sand	Silt	Dirty
																		14.6	Grey	Clay	Stones	
7180917	A076107	495466	4759470	2012	-	Rotary (Convent.)	Abandoned-Other	Monitoring	-	-	-	-	-	-	-	-	-					
7254857	A170120	495219	4760709	2015	152.4	Rotary (Convent.)	Water Supply	Domestic	Untested	18.6	19.81	14.6	18.3	9.1	10.1	45.5	1.5	4.3	Brown	Clay	Stones	
																		18.3	Brown	Sand		
																		19.8	Grey	Hardpan		
7314845	A249256	495283	4760742	2018	152.4	Rotary (Convent.)	Water Supply	Domestic	Untested	12.8	21.03	15.8	19.5	10.7	12.3	45.5	1.5	0.6	Black	Topsoil		Topsoil
																		4.9	Brown	Clay	Stones	Sand
																		12.8	Brown	Sand		Fine Sand
																		19.5	Grey	Sand		Medium Sand
																		21	Grey	Clay		Soft
7338997	A258362	495360	4760757	2019	152.4	Rotary (Convent.)	Water Supply	Domestic	Untested	21.6	22.86	17.7	21.3	11.9	12.5	45.5	2	4	Brown	Clay		Sandy
																		21.6	Brown	Fine Sand		Loose
																		22.9	Grey	Clay		Soft
7353903	A284156	495469	4760218	2019	51	Boring	Test Hole	Test Hole	Untested	2.4	4.1	2.5	4.1	-	-	-	-	2.4	Brown	Sand	Silt	Loose
																		2.4	Brown	Sand	Silt	Loose
																		4.1	Brown	Sand	Silt	Gravel
																		4.1	Brown	Sand	Silt	Gravel
7353904	A278644	495557	4760339	2019	50.8	Boring	Test Hole	Monitoring	-	-	3.35	1.8	3.4	-	-	-	-	3.4	Brown	Sand		
																		3.4	Brown	Sand		
7362650	A236989	495405	4760791	2020	152.4	Rotary (Convent.)	Water Supply	Domestic	Untested	18	23.16	18	21.6	10.7	12.2	45.5	1	0.3	Brown	Topsoil		
																		4.3	Brown	Clay		Sandy
																		18	Brown	Sand		Loose
																		21.6	Brown	Sand		Loose
																		23.2	Grey	Clay	Sand	
7388878	A316986	494884	4760317	2021	-	-	-	-	-	-	-	-	-	-	-	-	-					

Notes:

1. Table to be read in conjunction with accompanying report.
2. Well records queried electronically from Ontario Ministry of the Environment, Conservation and Parks in April 2022.
3. "-" indicates this information was not provided in the well record.
4. Refer to Figure 3 for well locations.
5. 'm BGS' defined as metres below ground surface.

Table 2: Record of Mini-Piezometer Installations

Location	Depth (m BGS)	Description	Well Screen (m BGS)	Remarks
MP-1D	0.00 to 0.31	Black sandy peat with rootlets, very loose, moist	3.05 - 3.66	Approximate encountered water level
	0.31 to 0.61	Grey silt with organics, wet		1.46 m BGS
	0.76 to 1.52	Brown sand, trace silt and gravel, saturated, loose to compact		
	1.82 to 2.28	Grey sand, trace silt and gravel, saturated, compact		
	2.28 to 2.89	Grey sand, trace silt and gravel, saturated, loose		
	3.05 to 3.51	Grey sand, trace silt and gravel, saturated, compact		
	3.51 to 3.66	Grey silty sand and gravel, trace clay, saturated, compact		
MP-1S	0.00 to 0.31	Black sandy peat, very loose, moist	1.52 - 2.13	Approximate encountered water level
	0.31 to 0.61	Grey silt with organics		1.33 m BGS
	0.61 to 2.13	Brown sand, trace silt and gravel, saturated		

Notes:

1. Table to be read in conjunction with accompanying report.
2. MPs installed on December 16, 2022.
3. 'm BGS' refers to meters below ground surface

Table 3: Summary of Manually Measured Water Levels

Well ID	Ground Surface Elevation (m AMSL)	Top of Pipe Elevation (m AMSL)	2019-01-15	2019-01-28	2022-07-27	2022-09-10	2022-09-14	2022-10-21	2022-11-07	2022-12-05	2022-12-19	2023-01-05	2023-03-02
			Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)
MW103-19	264.21	265.20	263.48	263.47	262.42	262.40	262.35	262.37	262.36	262.35	-	262.81	262.93
MW105-19	260.61	261.38	260.40	260.35	258.77	258.93	258.85	-	258.95	259.14	-	260.17	260.18
MW106-19	260.71	261.45	259.94	259.79	259.12	259.24	259.22	259.34	259.36	259.45	-	259.84	259.58
MW108-19	264.23	264.95	262.50	262.44	260.96	261.01	260.95	261.05	261.06	261.16	-	261.72	262.01
MW201-22	263.53	264.35	-	-	-	261.92	261.89	-	261.90	262.01	-	262.78	262.69
MW202-22	261.92	262.73	-	-	-	260.67	260.61	260.72	260.72	260.87		261.58	261.54
MP-1D	262.78	261.94	-	-	-	-	-	-	-	-	260.52	260.99	261.00
MP-1S	262.74	261.92	-	-	-	-	-	-	-	-	260.54	261.01	261.03

Notes:

1. Table to be read in conjunction with accompanying report.
2. See Borehole Logs for installation details.
3. Dates are provided in Standard Interna ional (SI) format (i.e., yyyy-mm-dd).
4. Water levels provided in metres (m) below top of pipe (BTOP).
5. Elevations are provided in metres (m) above mean sea level (AMSL).
6. "-" Indicates no measurement

Table 4: Summary of Single Well Response Tests

Monitoring Well	Screened Interval [m BGS]	Stratigraphic Description	Test	K [m/s]	Geometric Mean, K [m/s]
MW103-19	1.83 - 3.35	Silty SAND, trace clay; Gravelley SAND, trace silt and clay	Falling Head 1	3.9E-05	4.E-05
			Rising Head 1	3.2E-05	
			Falling Head 2	4.5E-05	
			Rising Head 2	2.9E-05	
			Falling Head 3	6.5E-05	
			Rising Head 3	3.4E-05	
MW106-19	1.52 - 3.05	SAND, trace silt and clay	Falling Head 1	2.9E-05	2.E-05
			Rising Head 1	2.4E-05	
			Rising Head 2	2.2E-05	
			Rising Head 3	2.2E-05	
MW108-19	2.60 - 4.10	Silty SAND	Falling Head 1	1.3E-05	1.E-05
			Rising Head 1	7.9E-06	
			Falling Head 2	1.2E-05	
			Rising Head 2	8.3E-06	

Notes:

1. 'm BGS' refers to metres below ground surface.
2. 'm/s' refers to metres per second.
3. Refer to Figure 1 for well locations.
4. Refer to Borehole Logs for installation details.
5. Table to be read in conjunction with accompanying report.

Table 5: Analytical Results for Water Quality Analyses

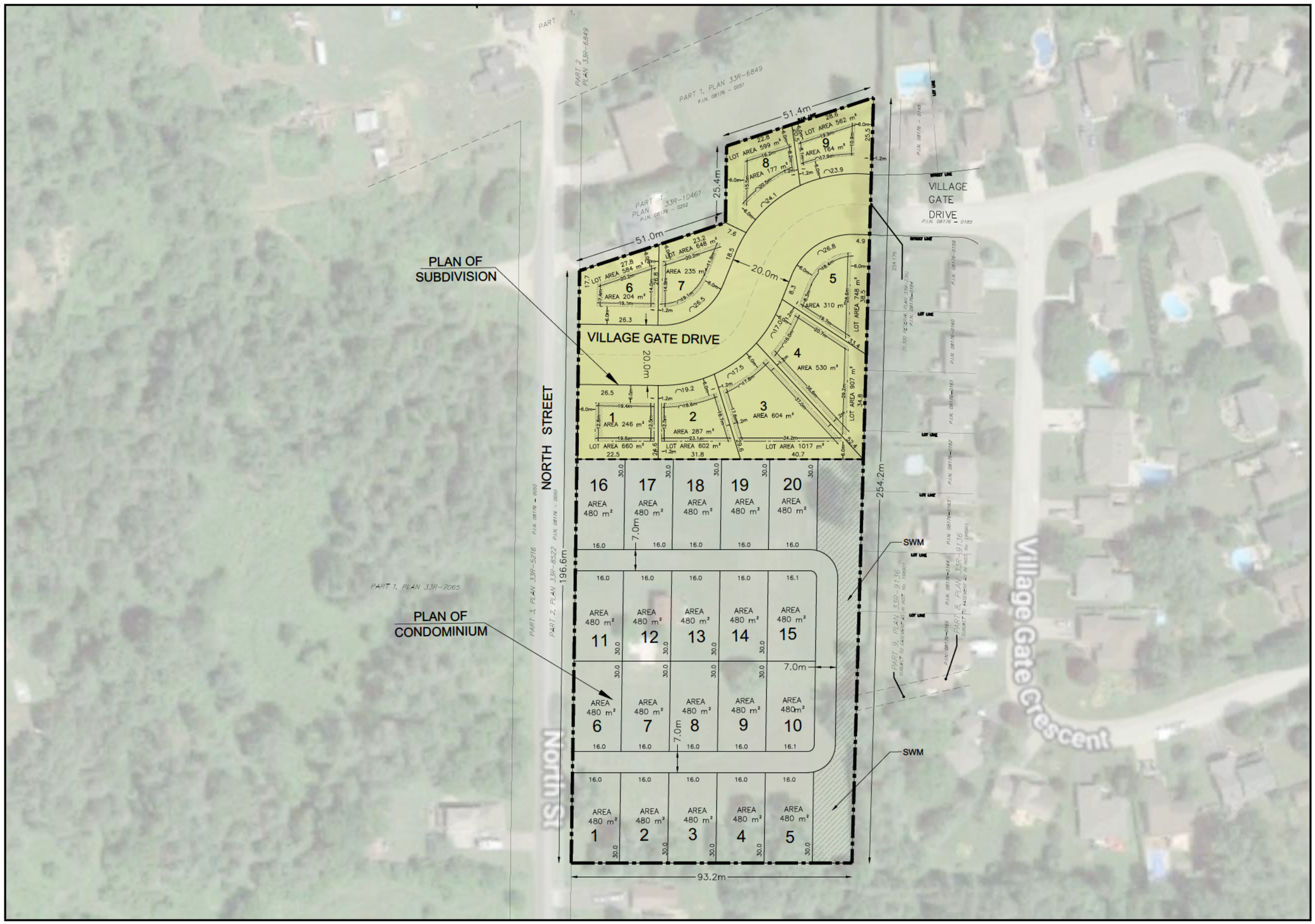
Parameters	Unit	RDL	MECP Table 2 SCS	Sample Location	MW106-19	MW201-22	MW106-19	MW201-22
				Sample Name	**MW106-19**	**MW201-22**	**MW106-19**	**MW201-22**
				Lab Job #	C2W6284	C2W6284	C361777	C361777
				Laboratory ID	UFT085	UFT086	VEW488	VEW489
				Sampling Date	11/7/2022	11/7/2022	3/2/2023	3/2/2023
				Well Screen Interval (m BGS)	**1.52 - 3.05**	**3.10 - 4.60**	**1.52 - 3.05**	**3.10 - 4.60**
				Maximum Concentration				
Metals								
Dissolved Aluminum	ug/L	4.9	-	24	<4.9	<4.9	7.0	24
Dissolved Antimony	ug/L	0.50	6	<	<0.50	<0.50	<0.50	<0.50
Dissolved Arsenic	ug/L	1.0	25	5.2	<1.0	<1.0	5.2	<1.0
Dissolved Barium	ug/L	2.0	1000	87	58	87	69	58
Dissolved Beryllium	ug/L	0.40	4	<	<0.40	<0.40	<0.40	<0.40
Dissolved Boron	ug/L	10	-	26	13	26	16	10
Dissolved Cadmium	ug/L	0.090	2.7	<	<0.090	<0.090	<0.090	<0.090
Dissolved Calcium	ug/L	200	-	100000	92000	100000	92000	99000
Dissolved Chromium	ug/L	5.0	-	<	<5.0	<5.0	<5.0	<5.0
Dissolved Cobalt	ug/L	0.50	3.8	0.63	<0.50	<0.50	0.63	<0.50
Dissolved Copper	ug/L	0.90	87	5.4	4.8	3.1	1.5	5.4
Dissolved Iron	ug/L	100	-	660	<100	<100	660	<100
Dissolved Lead	ug/L	0.50	10	<	<0.50	<0.50	<0.50	<0.50
Dissolved Magnesium	ug/L	50	-	20000	20000	19000	15000	19000
Dissolved Manganese	ug/L	2.0	-	150	54	74	150	33
Dissolved Molybdenum	ug/L	0.50	70	1.4	1.4	1.1	1.9	1.0
Dissolved Nickel	ug/L	1.0	100	2.0	<1.0	2.0	1.3	<1.0
Dissolved Phosphorus	ug/L	100	-	120	<100	120	<100	<100
Dissolved Potassium	ug/L	200	-	3500	1800	1100	3500	1500
Dissolved Selenium	ug/L	2.0	10	<	<2.0	<2.0	<2.0	<2.0
Dissolved Silicon	ug/L	50	-	5000	5000	4800	2900	4300
Dissolved Silver	ug/L	0.090	1.5	<	<0.090	<0.090	<0.090	<0.090
Dissolved Sodium	ug/L	100	490000	45000	2600	45000	2100	2200
Dissolved Strontium	ug/L	1.0	-	180	150	180	130	150
Dissolved Thallium	ug/L	0.050	2	<	<0.050	<0.050	<0.050	<0.050
Dissolved Titanium	ug/L	5.0	-	<	<5.0	<5.0	<5.0	<5.0
Dissolved Uranium	ug/L	0.10	20	4.9	4.3	1.6	2.1	4.9
Dissolved Vanadium	ug/L	0.50	6.2	1.1	<0.50	<0.50	1.1	<0.50
Dissolved Zinc	ug/L	5.0	1100	<	<5.0	<5.0	<5.0	<5.0
Inorganics								
Electrical Conductivity	umho/cm	1	-	830	570	830	530	620
pH	pH Units	NA	6.5-8.5	7 90	7.90	7.90	7.67	7.83
Dissolved Chloride	mg/L	1	790000	5 90	5.90	5.80	1.9	4.2
Nitrate as N	mg/L	0.1	-	4.64	<0.10	4.64	<0.10	0.68
Nitrite as N	mg/L	0.01	-	<	<0.010	0.852	<0.010	<0.010
Nitrate + Nitrite (N)	mg/L	0.1	-	5.5	<0.10	5.5	<0.10	0.68
Dissolved Sulphate	mg/L	1	-	33.0	33.0	29.0	38	33
Ortho Phosphate as P	mg/L	0.01	-	<	<0.010	0.025	<0.010	<0.010
Ammonia as N	mg/L	0.05	-	<	<0.05	<0.05	0.20	0.085
Dissolved Organic Carbon	mg/L	0.4	-	3.1	3.1	2.1	2.7	3.1
Calculated Parameters								
Total Dissolved Solids	mg/L	1	-	480	330	480	300	340
Bicarbonate (as CaCO3)	mg/L	1	-	310	270	310	240	290
Carbonate Alkalinity (as CaCO3)	mg/L	1	-	2.3	2.1	2.3	1.0	1.8
Hardness (as CaCO3)	mg/L	1	-	340	310	340	290	330

Notes:

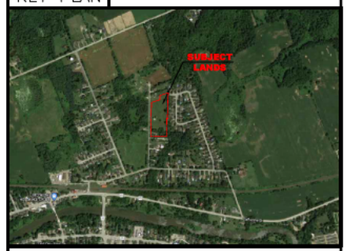
1. Criteria for MECP Table 2 for SCS for all property uses in a potable groundwater condition
2. **Bold** - Exceeds MECP Table 2 SCS
3. "-" - parameter not analyzed
4. m BGS - Metres below ground surface
5. RDL - Reported detection limit
6. ND - Non-detect
7 < - Less than the Reporting Detection Limit
8. ug/L - micrograms per litre
9 mg/L- milligrams per litre
10 umho/cm - micromhos per centimetre
11 Table to be read in conjunction with accompanying report.

Appendix A

Concept Plan



KEY PLAN



CONCEPTUAL PLAN

CON 4 NRT PT LOT 11 RP 33R10461 PARTS 2 3 & 4

MUNICIPALITY OF THAMES CENTRE
COUNTY OF MIDDLESEX

EXISTING ZONE: R1

TOTAL LOT AREA	2.1351 ha
LOT FRONTAGE	196.6 m

SUBDIVISION LANDS

	REQUIRED	PROPOSED
TOTAL SUBDIVISION LAND AREA		0.8739 ha
LOT AREA	700 m²	*552.0 m²
LOT FRONTAGE	15.0 m	>15.0 m
NUMBER OF LOT	N/A	9

CONDOMINIUM LANDS

	REQUIRED	PROPOSED
TOTAL CONDOMINIUM AREA		1.2611 ha
LOT AREA	700 m²	*480 m²
LOT FRONTAGE	15.0 m	>15.0 m
NUMBER OF UNIT	N/A	20
SWM AREA		1400.7 m²

*DENOTES ZONING BY LAW AMENDMENT REQUIRED

NO.	REVISION	DATE	INITIAL

246 NORTH INC.

246 NORTH ST.

ZELINKA PRIAMO LTD
A Professional Planning Practice
318 Wellington Road, London, Ontario N6C 4P4
Tel (519) 474-7137 Fax (519) 474-2284 e-mail zp@zpplan.com

DRAWN BY	PROJECT NO.
SN	RCS/LON/21-01
DATE	SCALE
MAY 2022	1:1250

D:\Zelinka\1-Zelinka\Thames Centre\North Street\Concept Plan_March.dwg

Appendix B

Borehole Logs

The following are abbreviations and symbols commonly used on borehole logs, figures and reports.

Sample Types

AS	Auger Sample
CS	Chunk Sample
BS	Bulk Sample
GS	Grab Sample
WS	Wash Sample
SS	Split Spoon
RC	Rock Core
SC	Soil Core
TW	Thinwall, Open
TP	Thinwall, Piston

Soil Tests

PP	Pocket Penetrometer
FV	Field Vane
SPT	Standard Penetration Test
CPT	Cone Penetration Test
WC	Water Content
WL	Water Level

Penetration Resistance

Standard Penetration Test, N (ASTM D1586)	The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) open spilt spoon sampler for a distance of 300 mm (12 in.).
Dynamic Cone Penetration Resistance	The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive an uncased 50 mm (2 in.) diameter, 60o cone attached to “A” size drill rods for a distance of 300 mm (12 in.).

Soil Description

Cohesive Soils	Undrained Shear Strength (Cu)	
Consistency	kPa	psf
Very Soft	0 to 12	0 to 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1,000
Stiff	50 to 100	1,000 to 2,000
Very Stiff	100 to 200	2,000 to 4,000
Hard	Above 200	Above 4,000

Cohesionless Soils	
Relative Density	SPT N Value
Very Loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	Above 50

WH	Sampler advanced by static weight of hammer
WR	Sampler advanced by static weight of drilling rods
PH	Sampler advanced by hydraulic force
PM	Sampler advanced by manual force

DTPL	Drier than Plastic Limit
APL	About Plastic Limit
WTPL	Wetter than Plastic Limit
mbgs	Metres below Ground Surface

ID Number: BH101-19

Project: Clara St. and North St. Development Geotechnical Investigation

Project No: 47030-200

Client: S.E.M. Construction

Site Location: 246 North Street, Dorchester, ON

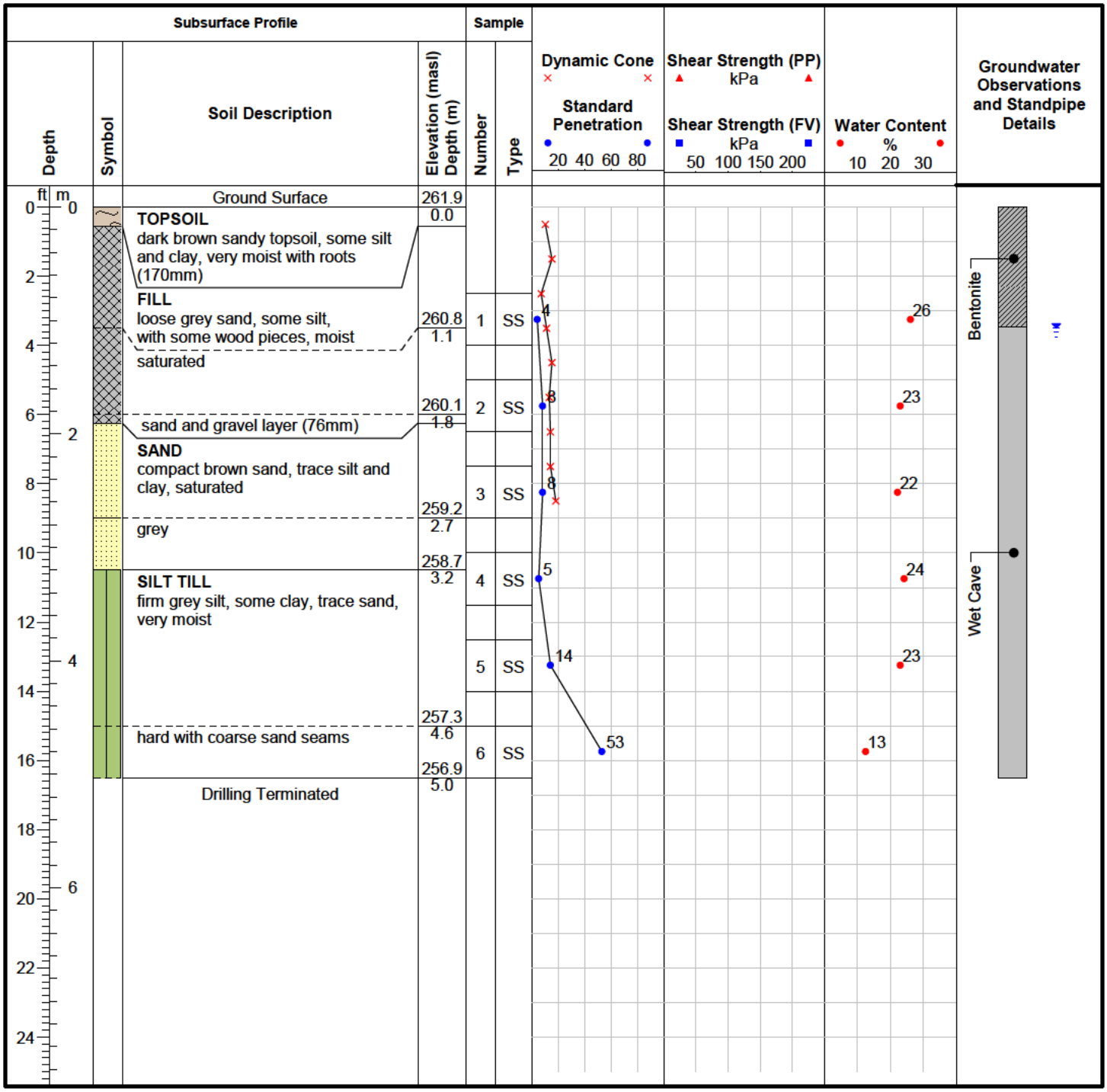
Drill Date: 12/16/2019

Drilling Contractor: Direct Environmental Drilling

Drill Rig: Geoprobe 7822DT

Drill Method: Conventional/Hollow Stem Augers

Protective Cover: N/A



Field Technician: M. Costello

Drafted by: M. Costello

Reviewed by: B. Thorner

MTE

Sheet: 1 of 1

Water level encountered at 1.1mbgs during drilling

ID Number: BH102-19

Project: Clara St. and North St. Development Geotechnical Investigation

Project No: 47030-200

Client: S.E.M. Construction

Site Location: 246 North Street, Dorchester, ON

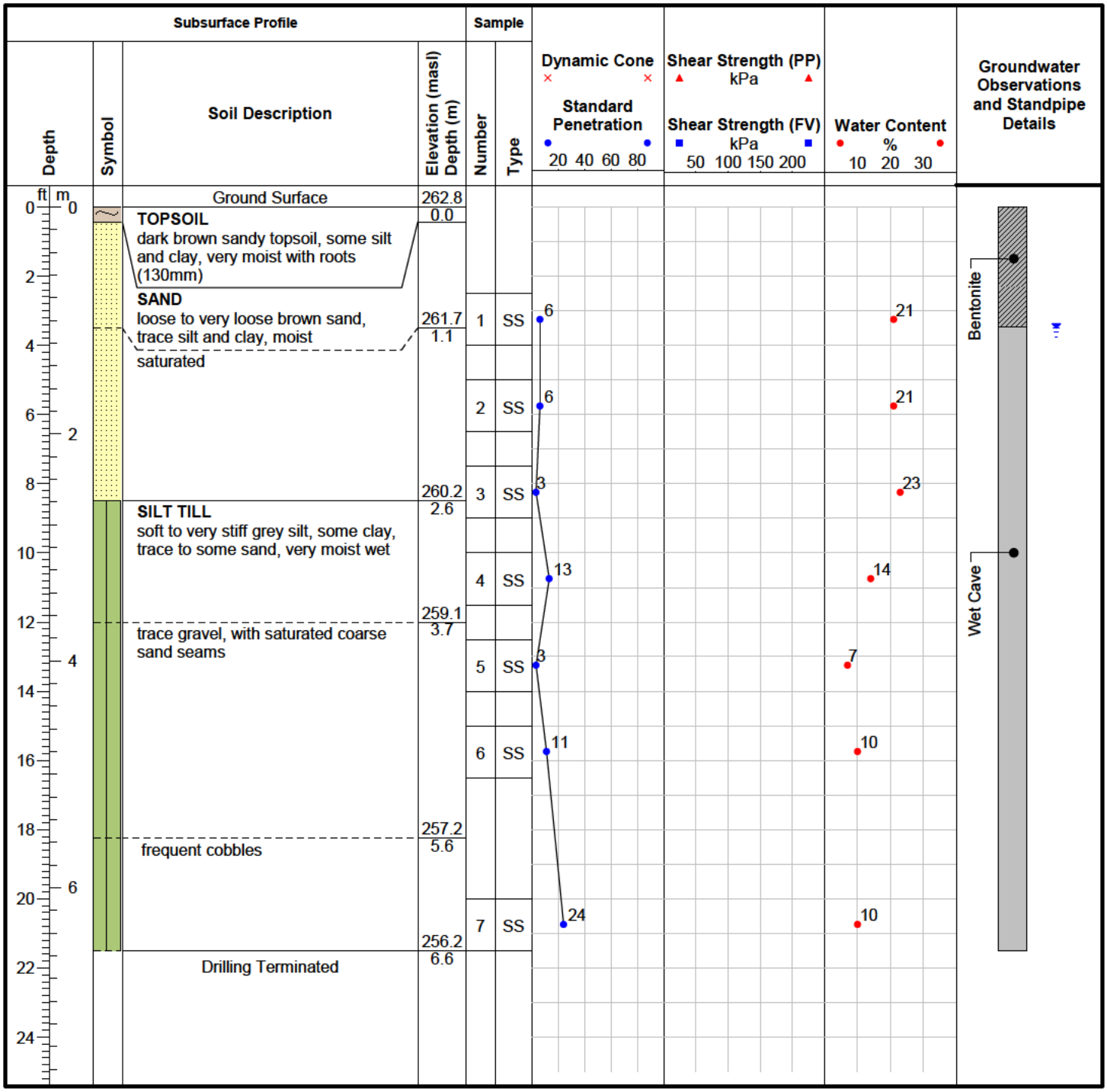
Drill Date: 12/16/2019

Drilling Contractor: Direct Environmental Drilling

Drill Rig: Geoprobe 7822DT

Drill Method: Conventional/Hollow Stem Augers

Protective Cover: N/A



Field Technician: M. Costello

Drafted by: M. Costello

Reviewed by: B. Thorner

MTE

Sheet: 1 of 1

Water level encountered at 1.1mbgs during drilling

ID Number: MW103-19

Project: Clara St. and North St. Development Geotechnical Investigation

Project No: 47030-200

Client: S.E.M. Construction

Site Location: 246 North Street, Dorchester, ON

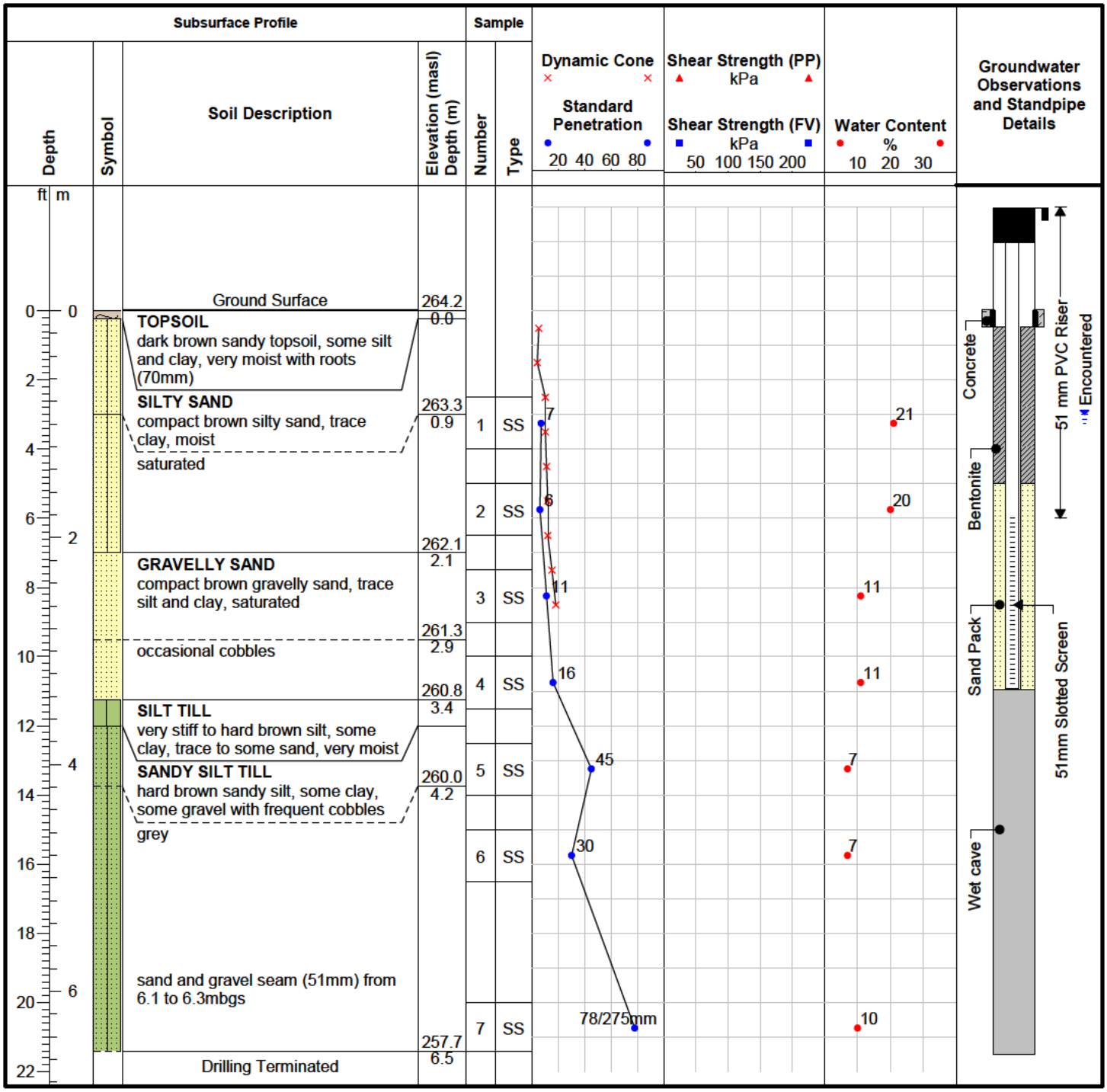
Drill Date: 12/16/2019

Drilling Contractor: Direct Environmental Drilling

Drill Rig: Geoprobe 7822DT

Drill Method: Conventional/Hollow Stem Augers

Protective Cover: Monument casing



Field Technician: M. Costello

Drafted by: M. Costello

Reviewed by: B. Thorner

MTE

Sheet: 1 of 1

Water level encountered at 1.0mbgs during drilling
Water level measured at 263 55m asl on January 15, 2020
Water level measured at 263.54m asl on Januart 28, 2020

ID Number: BH104-19

Project: Clara St. and North St. Development Geotechnical Investigation

Project No: 47031-200

Client: S.E.M. Construction

Site Location: 230 Clara Street, Dorchester, ON

Drill Date: 12/16/2019

Drilling Contractor: Direct Environmental Drilling

Drill Rig: Geoprobe 7822DT

Drill Method: Conventional/Hollow Stem Augers

Protective Cover: N/A

Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Standard Penetration (Dynamic Cone)	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %
0 / 0	Ground Surface	259.4					
0 / 0	**TOPSOIL** dark brown clayey silt topsoil, some sand, trace gravel, very moist with roots (370mm)	259.0 / 0.0					
2 / 0.4	**SILTY SAND** compact brown silty sand, some gravel, trace clay, moist to wet	258.0 / 1.4	1	SS	31		9
4 / 1.4	grey, saturated		2	SS	23		20
6 / 2	**SILT TILL** compact to very dense grey silt, some clay, some sand, trace to some gravel, wet with coarse sand seams	259.4 / 2.1	3	SS	23		9
10 / 3			4	SS	48		7
12 / 3.7	very moist	255.7 / 3.7	5	SS	61		10
14 / 4			6	SS	91		6
16 / 5	Drilling Terminated	254.4 / 5.0					

Groundwater Observations and Standpipe Details: Bentonite; Wet cave

Field Technician: M. Costello

Drafted by: M. Costello

Reviewed by: B. Thorner

Water level encountered at 1.1mbgs during drilling

Sheet: 1 of 1

ID Number: MW105-19

Project: Clara St. and North St. Development Geotechnical Investigation

Project No: 47031-200

Client: S.E.M. Construction

Site Location: 230 Clara Street, Dorchester, ON

Drill Date: 12/17/2019

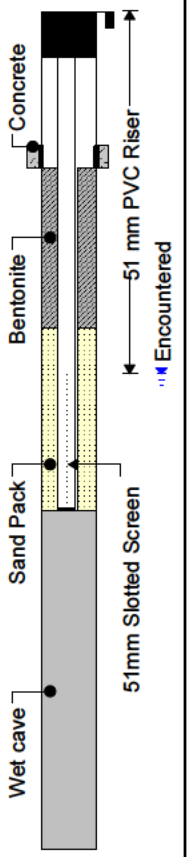
Drilling Contractor: Direct Environmental Drilling

Drill Rig: D50T Track

Drill Method: Conventional/Hollow Stem Augers

Protective Cover: Monument casing

Depth (ft)	Depth (m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Standard Penetration (Dynamic Cone)	Shear Strength (PP) kPa	Shear Strength (FV) kPa	Water Content %
0	0	Ground Surface	260.6 / 0.0						
		TOPSOIL dark brown clayey silt topsoil, some sand, very moist with roots (150mm)							
2		**SILTY SAND** compact brown silty sand, some gravel, moist	259.6 / 1.0	1	SS	21			12
		oxidation staining							
4		brown and grey, trace clay, wet	259.2 / 1.4						
6	2	silt seam (51mm) at 1.83mbgs		2	SS	20			21
8		**SILT TILL** compact to very dense silt, some clay, trace sand and gravel, very moist to wet	258.2 / 2.4	3	SS	26			9
10				4	SS	29			8
12	4	some gravel with frequent cobbles	256.9 / 3.7	5	SS	50/100mm			10
14				6	SS	50/100mm			9
16		Drilling Terminated	255.9 / 4.7						
18	6								
20									
22									



Field Technician: M. Costello

Drafted by: M. Costello

Reviewed by: B. Thorner

Sheet: 1 of 1

Water level encountered at 1.50mbgs during drilling
Water level measured at 260.47m asl on January 15, 2020
Water level measured at 260.41m asl on January 28, 2020

ID Number: MW106-19

Project: Clara St. and North St. Development Geotechnical Investigation

Project No: 47031-200

Client: S.E.M. Construction

Site Location: 230 Clara Street, Dorchester, ON

Drill Date: 12/17/2019

Drilling Contractor: Direct Environmental Drilling

Drill Rig: D50T Track

Drill Method: Conventional/Hollow Stem Augers

Protective Cover: Monument casing

Depth (ft)	Depth (m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Standard Penetration (Dynamic Cone)	Shear Strength (PP) kPa	Shear Strength (FV) kPa	Water Content %
0	0	Ground Surface	260.6 / 0.0						
		TOPSOIL dark brown clayey silt topsoil, some sand and gravel, very moist with roots (150mm)							
		SAND compact to very loose brown sand, trace silt and clay, moist saturated	259.5 / 1.1	1	SS	20			21
4	2			2	SS	19			22
6				3	SS	10			23
8				4	SS	3			23
10			257.3 / 3.3						9
		SILT TILL very loose grey silt, some clay, trace sand and gravel, very moist	259.9 / 3.7	5	SS	21			10
12	4	**SANDY SILT TILL** loose to dense grey sandy silt, some clay, trace to some gravel, very moist		6	SS	7			17
14									
16									
18									
20	6			7	SS	43			11
22			254.0 / 6.6						
		Drilling Terminated							
24									
26	8								

Groundwater Observations and Standpipe Details: Concrete; Bentonite; 51 mm PVC Riser; Encountered; Sand Pack; 51mm Slotted Screen; Wet cave

Field Technician: M. Costello

Drafted by: M. Costello

Reviewed by: B. Thorner

MTE

Sheet: 1 of 1

Water level encountered at 1.10mbgs during drilling
Water level measured at 258.80m asl on January 15, 2020
Water level measured at 258.65m asl on January 28, 2020

ID Number: BH107-19

Project: Clara St. and North St. Development Geotechnical Investigation

Project No: 47031-200

Client: S.E.M. Construction

Site Location: 230 Clara Street, Dorchester, ON

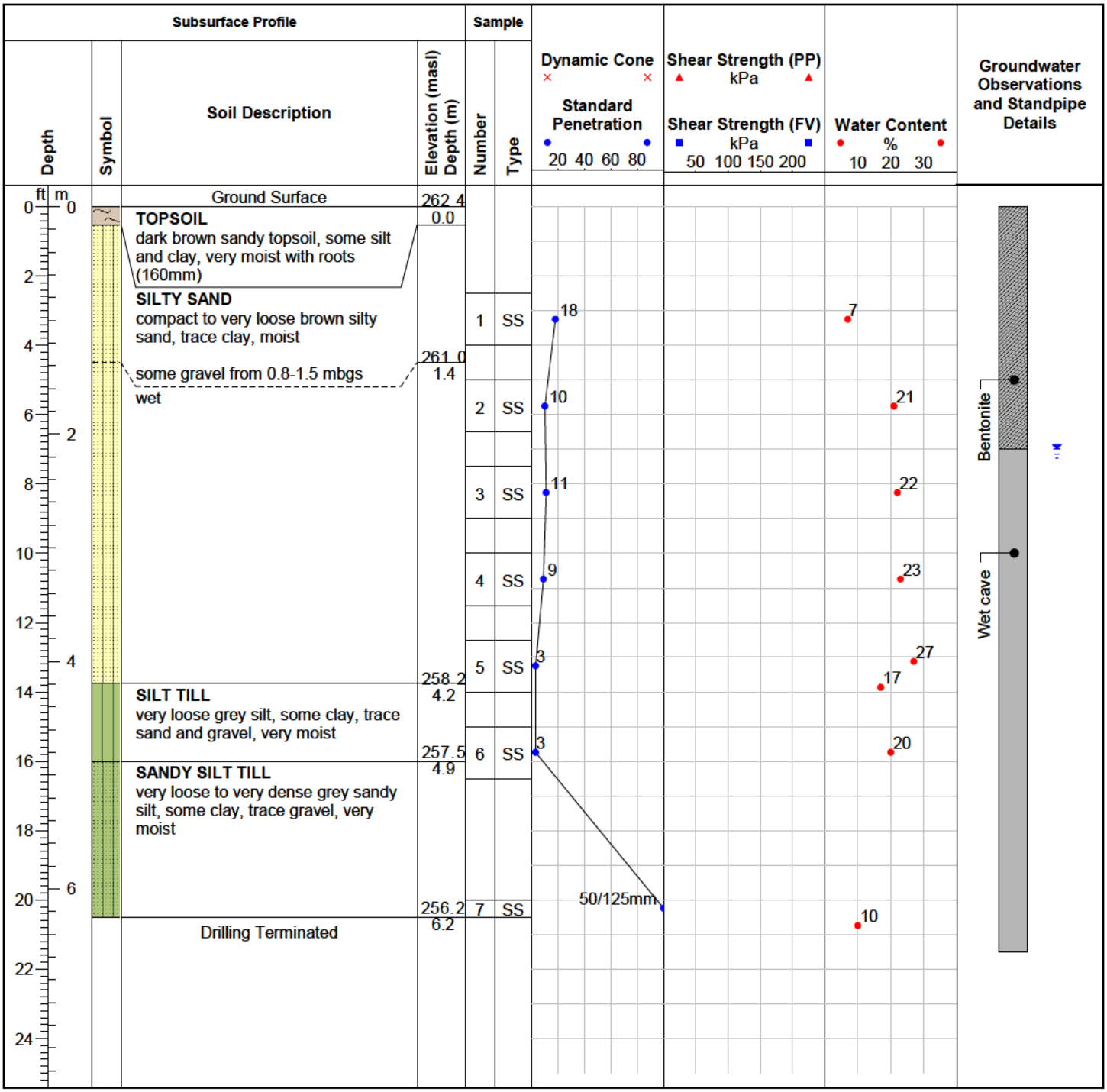
Drill Date: 12/16/2019

Drilling Contractor: Direct Environmental Drilling

Drill Rig: D50T Track

Drill Method: Conventional/Hollow Stem Augers

Protective Cover: N/A



Field Technician: M. Costello

Drafted by: M. Costello

Reviewed by: B. Thorner

MTE

Sheet: 1 of 1

Water level encountered at 2.1mbgs during drilling

ID Number: MW108-19

Project: Clara St. and North St. Development Geotechnical Investigation

Project No: 47031-200

Client: S.E.M. Construction

Site Location: 230 Clara Street, Dorchester, ON

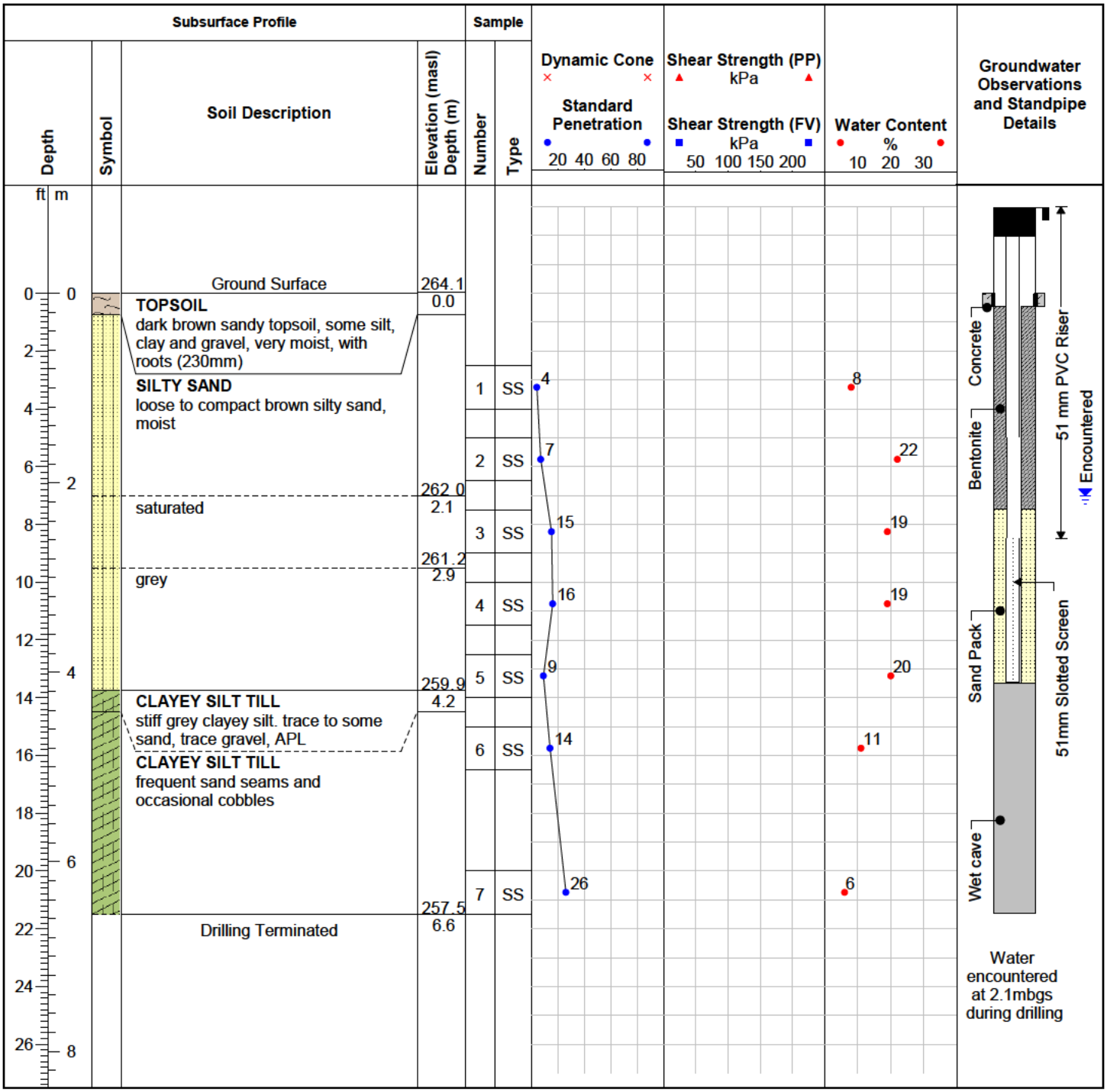
Drill Date: 12/17/2019

Drilling Contractor: Direct Environmental Drilling

Drill Rig: D50T Track

Drill Method: Conventional/Hollow Stem Augers

Protective Cover: Monument casing



Field Technician: M. Costello

Drafted by: M. Costello

Reviewed by: B. Thorner

Water level measured at 262.76m asl on January 15, 2020
Water level measured at 262.69m asl on January 28, 2020

ID Number: BH109-19

Project: Clara St. and North St. Development Geotechnical Investigation

Project No: 47031-200

Client: S.E.M. Construction

Site Location: 230 Clara Street, Dorchester, ON

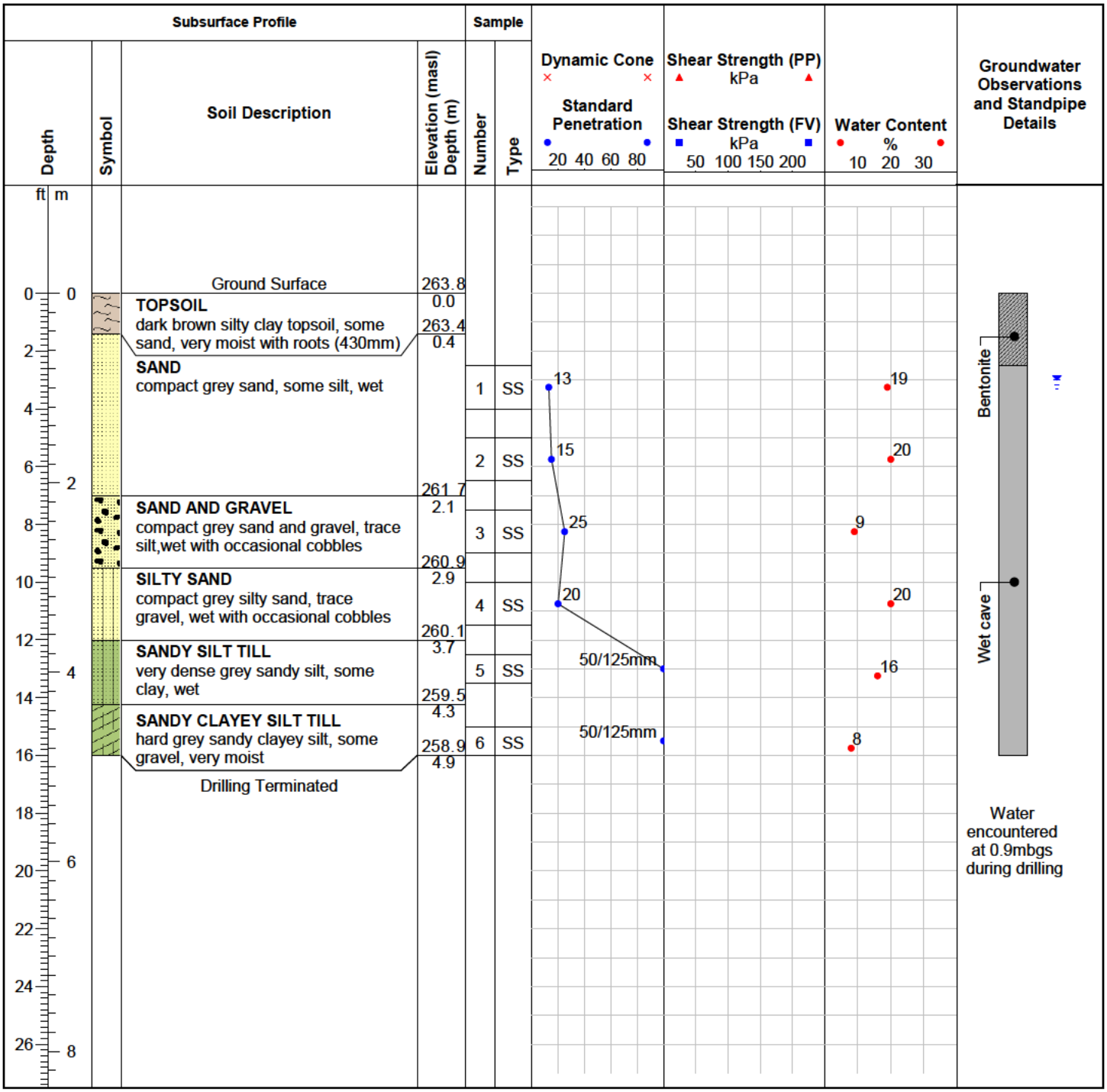
Drill Date: 12/17/2019

Drilling Contractor: Direct Environmental Drilling

Drill Rig: D50T Track

Drill Method: Conventional/Hollow Stem Augers

Protective Cover: N/A



Field Technician: M. Costello

Drafted by: M. Costello

Reviewed by: B. Thorner

MTE

ID Number: BH110-19

Project: Clara St. and North St. Development Geotechnical Investigation

Project No: 47031-200

Client: S.E.M. Construction

Site Location: 230 Clara Street, Dorchester, ON

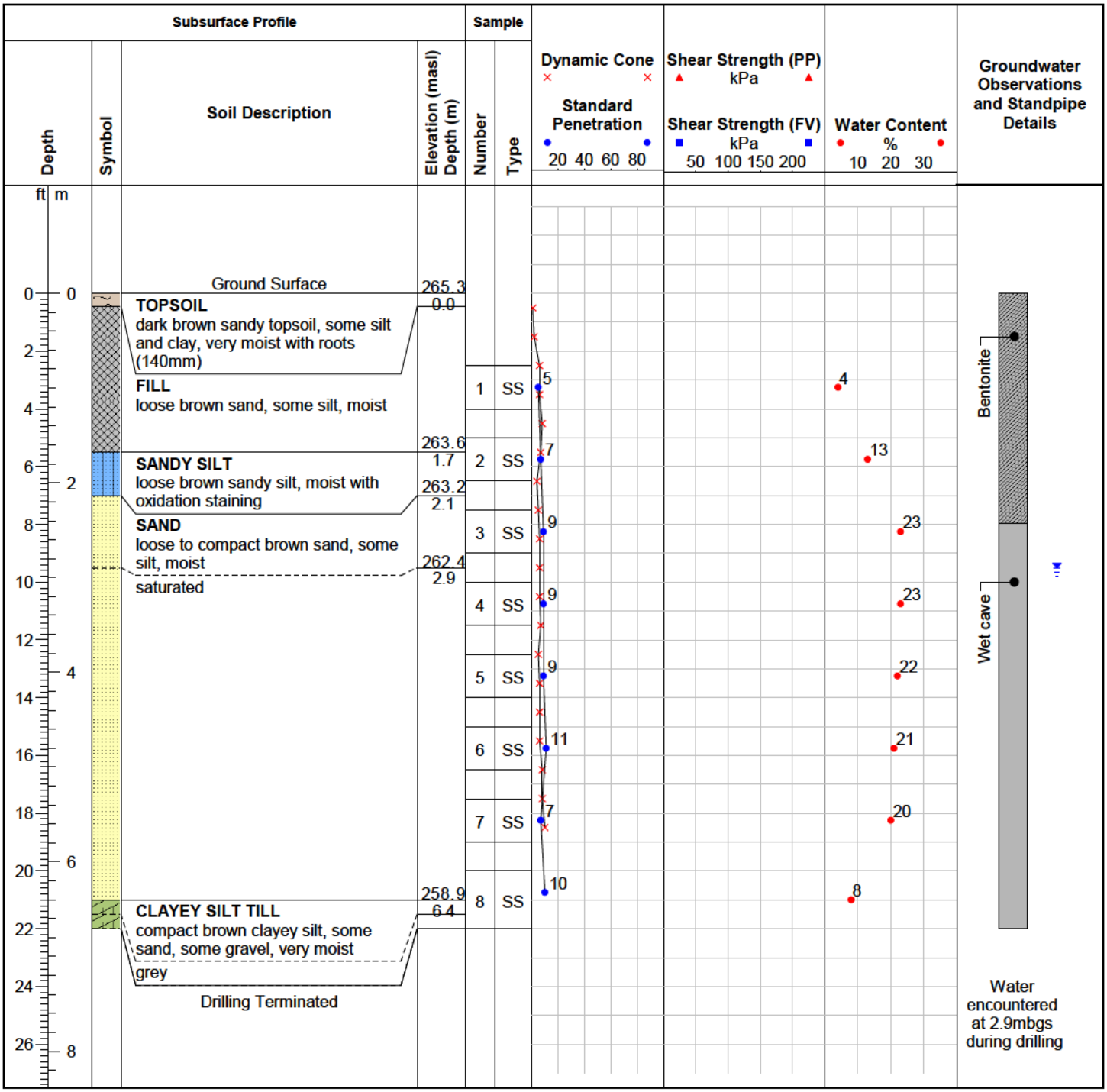
Drill Date: 12/17/2019

Drilling Contractor: Direct Environmental Drilling

Drill Rig: D50T Track

Drill Method: Conventional/Hollow Stem Augers

Protective Cover: N/A



Field Technician: M. Costello

Drafted by: M. Costello

Reviewed by: B. Thorner

MTE

Sheet: 1 of 1

ID No.: MW201-22

Project Name: 246 North St Development: Geotechnical Investigation

MTE File No.: 47030-200

Client: 246 North Inc.

Site Location: 246 North Street, Dorchester, ON

Date Completed: 8/31/2022

Drilling Contractor: London Soil Test Ltd.

Drill Rig: GeoProbe 78822DT

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone / Standard Penetration (20 40 60 80)	Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)	Water Content % (10 20 30)	Groundwater Observations and Standpipe Details
0 ft / 0 m		Ground Surface	263.5						
0		**TOPSOIL** loose brown sandy topsoil, trace gravel, with rootlets, damp (300mm)	0.0 / 263.2	1	SS	3			Concrete
0.3		**SAND** very loose dark brown sand, trace gravel, damp							
2			262.5	2	SS	2			
1.1		trace silt and clay, with black organics, moist							
4			262.0						
1.5		compact, grey, trace silt, saturated		3	SS	13			Bentonite
6									51mm PVC Riser
2				4	SS	17			
8									
10			260.5						
3.0		**SILTY SAND** compact grey silty sand, trace gravel and clay, saturated		5	SS	19			
12			259.7						
3.8		**SAND** compact grey sand, saturated		6	SS	25			
4									
14			259.0						Sand Pack
4.6		**SILT TILL** compact grey silt, trace gravel, saturated		7	SS	11			51mm Slotted Screen
16									
18			258.2						
5.3		Drilling Terminated							
20									
6									

Water encountered at 1.5 mbgs during drilling

Field Technician: A.M

Drafted by: B. Graul

Reviewed by: B. Thorner

Water level measured at 1.6 mbgs (Elevation: 261.9 m) on September 10, 2022

ID No.: MW202-22

Project Name: 246 North St Development: Geotechnical Investigation

MTE File No.: 47030-200

Client: 246 North Inc.

Site Location: 246 North Street, Dorchester, ON

Date Completed: 8/31/2022

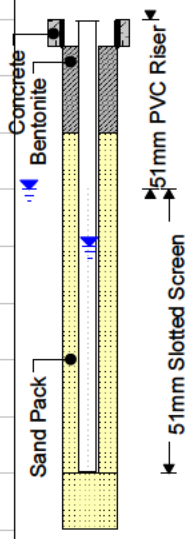
Drilling Contractor: London Soil Test Ltd.

Drill Rig: GeoProbe 78822DT

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone / Standard Penetration (20 40 60 80)	Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)	Water Content % (10 20 30)	Groundwater Observations and Standpipe Details
0 ft / 0 m		Ground Surface	261.9						
0		**TOPSOIL** loose brown sandy topsoil, trace silt, trace gravel, damp (300mm)	0.0 / 261.6 / 0.3	1	SS	7			
2		**SAND** loose to compact brown sand, trace gravel, very moist	261.0 / 0.9	2	SS	12			
4		grey, trace clay, gravel and silt, saturated		3	SS	12			
6 / 2									
8				4	SS	13			
			259.0 / 2.9						
10		**SILT** compact grey silt, some clay, saturated							
12 / 4		Drilling Terminated							
14									
16									
18									
20 / 6									



Water encountered at 0.9 mbgs during drilling

Field Technician: A.M

Drafted by: B. Graul

Reviewed by: B. Thorner

Water level measured at 1.2 mbgs (Elevation: 260.7 m) on September 10, 2022

Appendix C

Particle Size Distributions

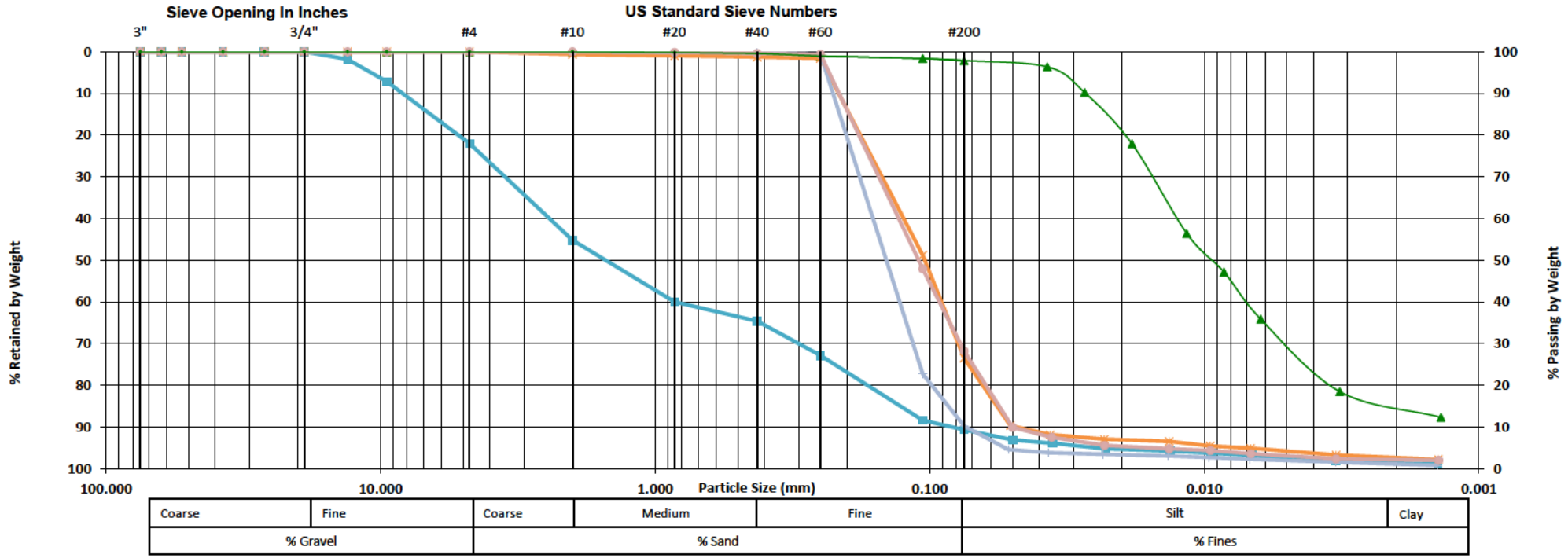
Particle Size Distribution Analysis Test Results

Project Name: Clara St and North St Development
Client: SEM Construction
Project Location: 230 Clara St and 246 North St, Dorchester, ON

Date Sampled: Dec. 16-18, 2019
Date Tested: Jan. 6-9, 2020

MTE File No.: 47030-200
Table No: 101

Unified Soil Classification



Symbol	Borehole ID	Sample #	*Sample Depth*	Description
▲	BH101-19	SS-5	3.8-4.3 mbgs	SILT, some Clay, trace Sand
■	MW103-19	SS-3	2.3-2.7 mbgs	Gravelly SAND, trace Silt and Clay
✱	MW105-19	SS-2	1.5-2.0 mbgs	Silty SAND, trace Clay
+	MW106-19	SS-3	2.3-2.7 mbgs	SAND, trace Silt and Clay
●	MW108-19	SS-4	3.0-3.5 mbgs	Silty SAND, trace Clay

CERTIFIED BY CCIL
Canadian Council of Independent Laboratories
For specific tests as listed on www.ccil.com

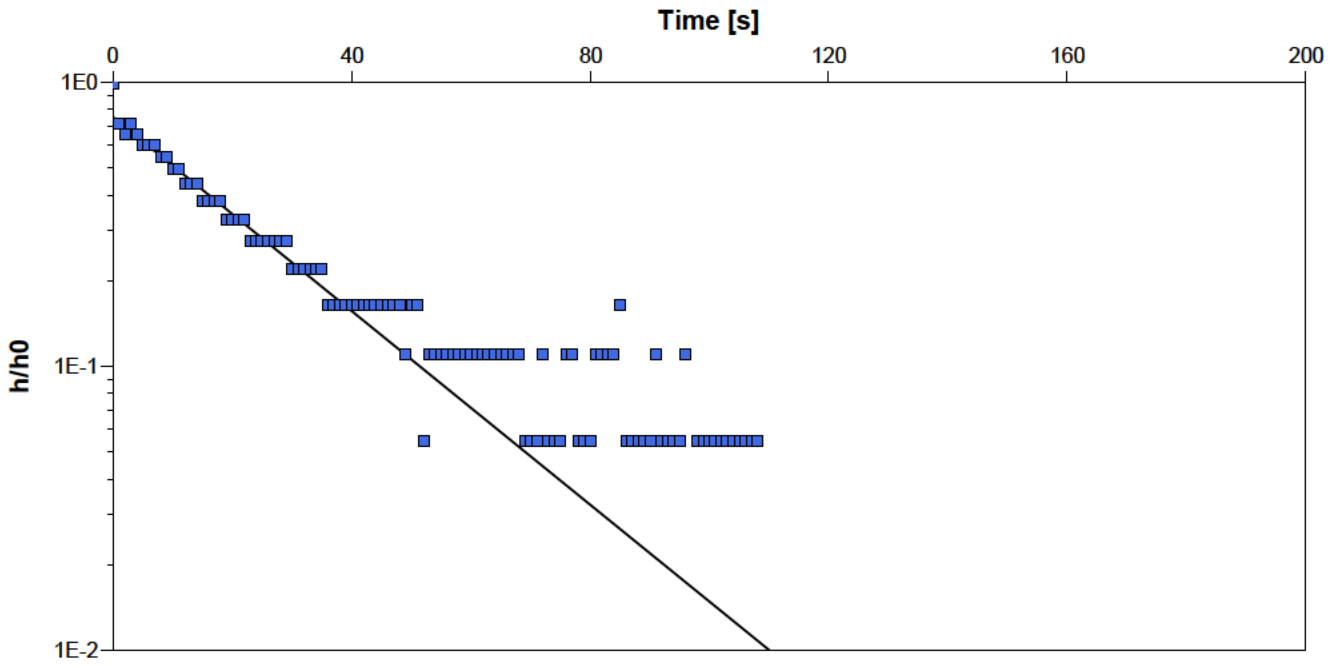
NOTES:

Appendix D

Single Well Response Tests

Slug Test Analysis Report	
Project: 246 North Street	
Number: 47030-200	
Client:	

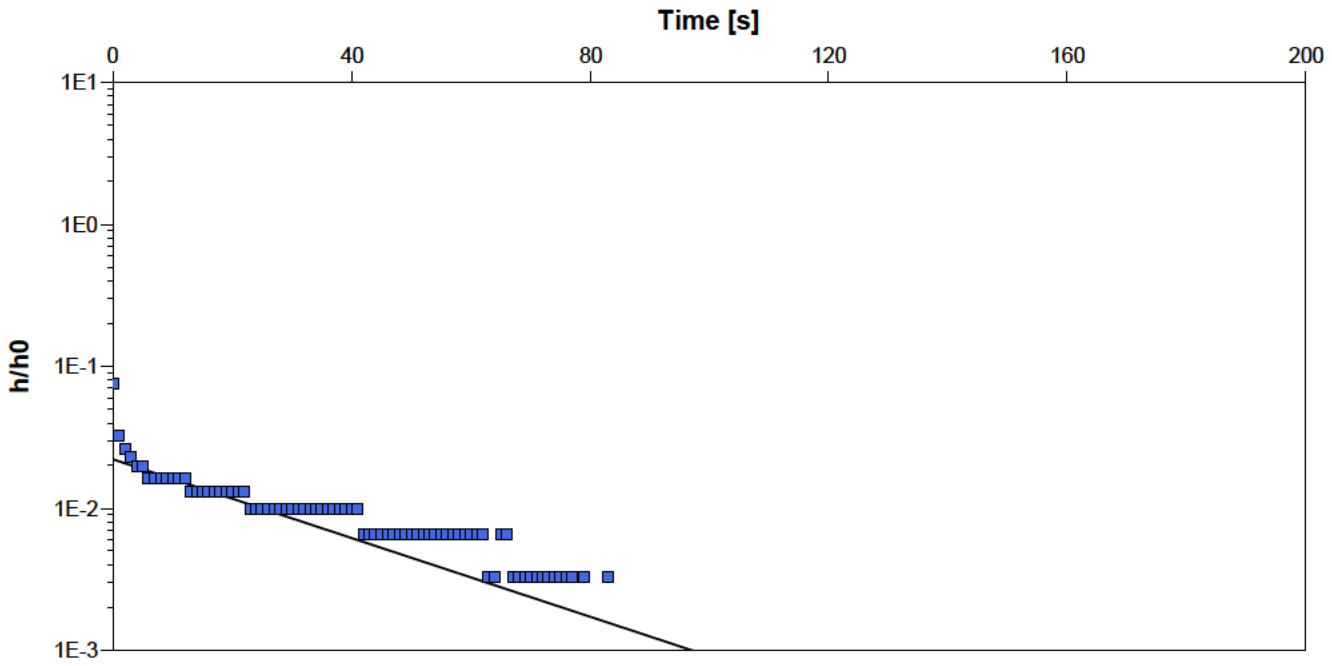
Location: Dorchester	Slug Test: MW103-19 FH1	Test Well: MW103-19
Test Conducted by: BVV		Test Date: 10/21/2022
Analysis Performed by: AS	MW103-19 FH1	Analysis Date: 12/14/2022
Aquifer Thickness: 3.30 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW103-19	$3\ 89 \times 10^{-5}$	

	Slug Test Analysis Report	
	Project: 246 North Street	
	Number: 47030-200	
	Client:	
Location: Dorchester	Slug Test: MW103-19 RH1	Test Well: MW103-19
Test Conducted by: BVV		Test Date: 10/21/2022
Analysis Performed by: AS	MW103-19 RH1	Analysis Date: 12/14/2022
Aquifer Thickness: 3.30 m		

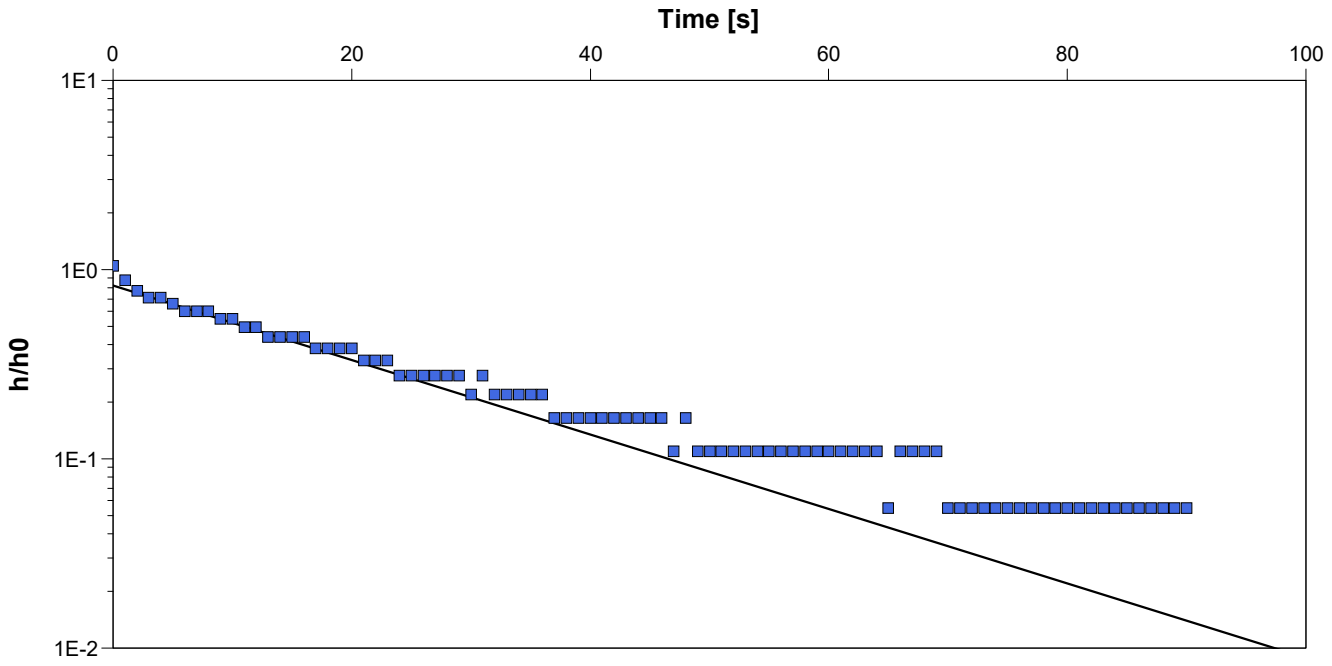


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW103-19	3.17×10^{-5}	

	Slug Test Analysis Report
	Project: 246 North Street
	Number: 47030-200
	Client:

Location: Dorchester	Slug Test: MW103-19 FH2	Test Well: MW103-19
Test Conducted by: BVV		Test Date: 10/21/2022
Analysis Performed by: AS	MW103-19 FH2	Analysis Date: 12/14/2022
Aquifer Thickness: 3.30 m		

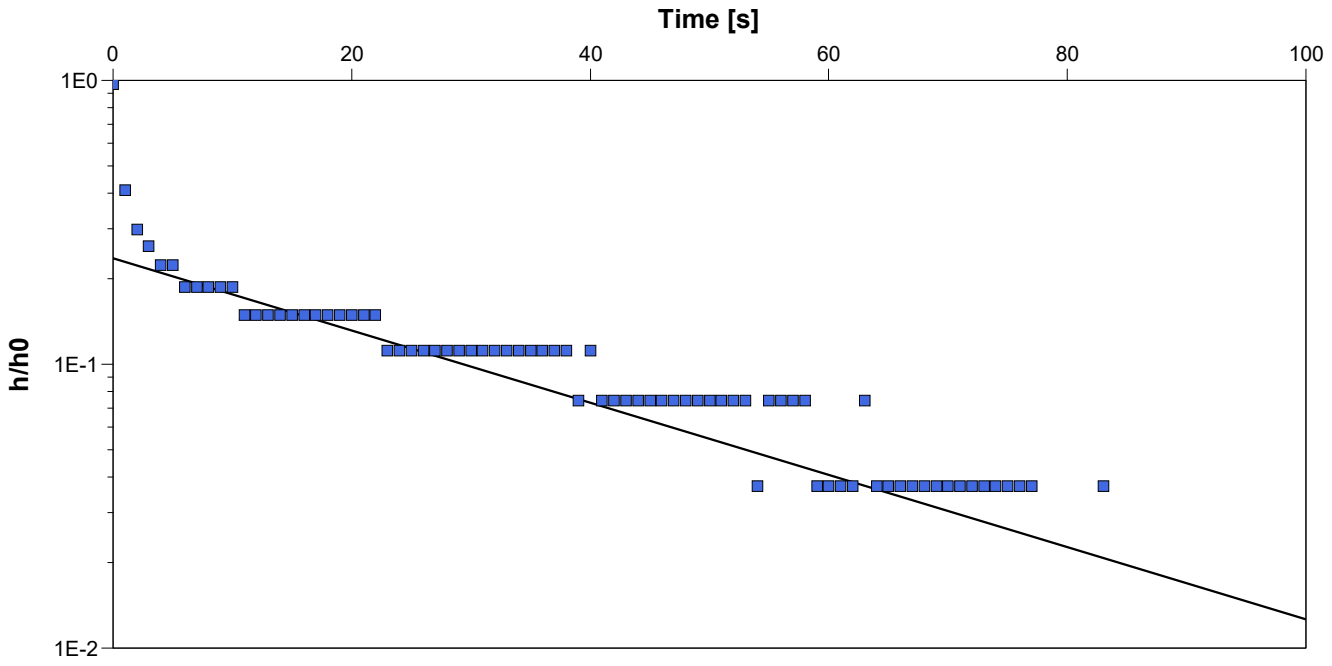


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW103-19	4.49×10^{-5}	

	Slug Test Analysis Report
	Project: 246 North Street
	Number: 47030-200
	Client:

Location: Dorchester	Slug Test: MW103-19 RH2	Test Well: MW103-19
Test Conducted by: BVV		Test Date: 10/21/2022
Analysis Performed by: AS	MW103-19 RH2	Analysis Date: 12/14/2022
Aquifer Thickness: 3.30 m		

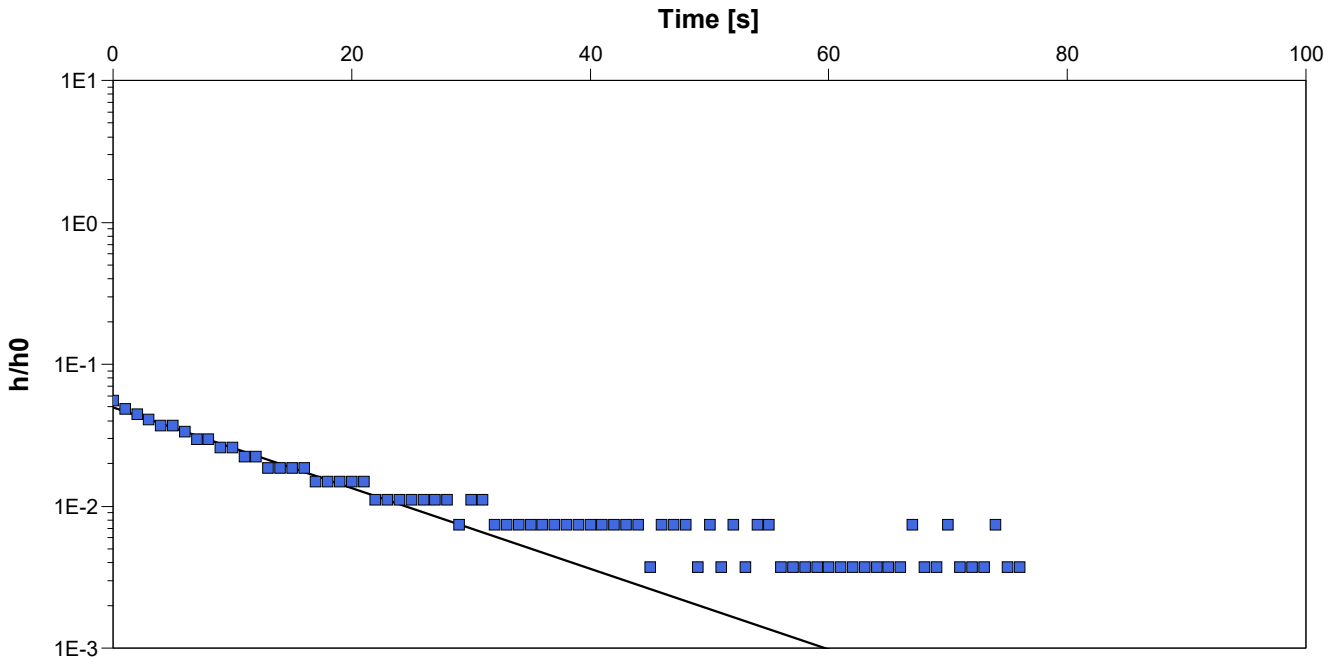


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW103-19	$2\ 90 \times 10^{-5}$	

	Slug Test Analysis Report
	Project: 246 North Street
	Number: 47030-200
	Client:

Location: Dorchester	Slug Test: MW103-19 FH3	Test Well: MW103-19
Test Conducted by: BVV		Test Date: 10/21/2022
Analysis Performed by: AS	MW103-19 FH3	Analysis Date: 12/14/2022
Aquifer Thickness: 3.30 m		

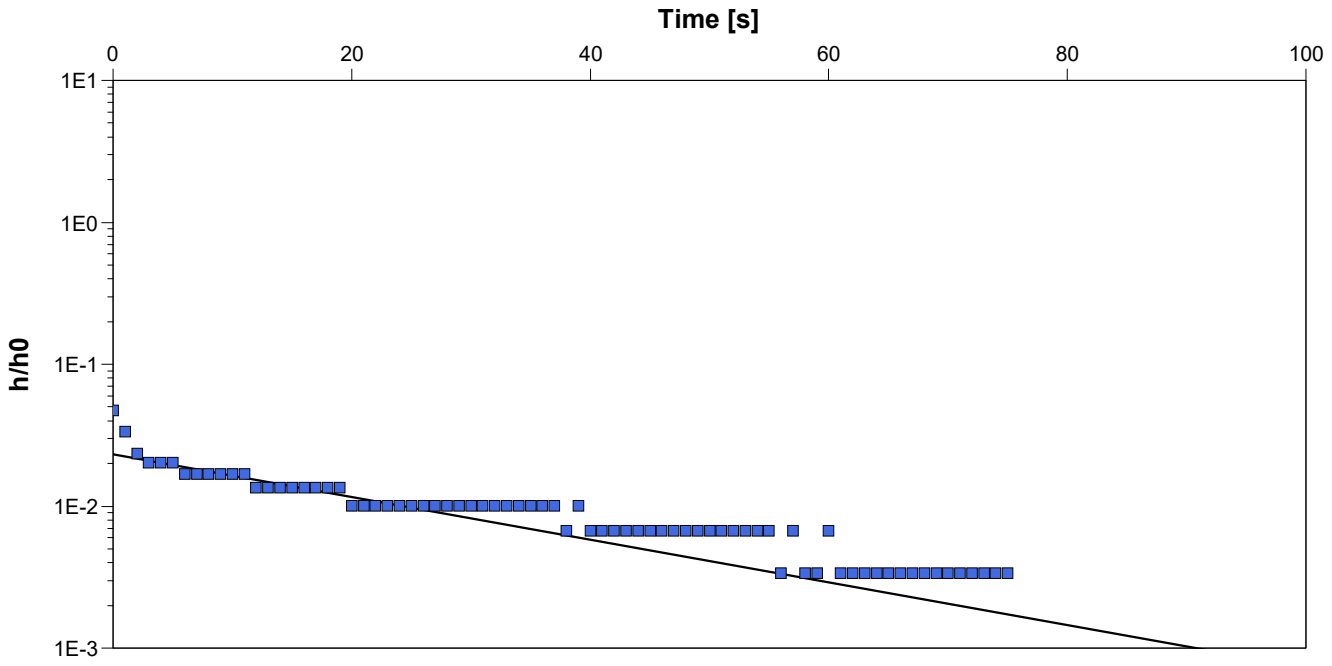


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW103-19	6.49×10^{-5}	

	Slug Test Analysis Report
	Project: 246 North Street
	Number: 47030-200
	Client:

Location: Dorchester	Slug Test: MW103-19 RH3	Test Well: MW103-19
Test Conducted by: BVV		Test Date: 10/21/2022
Analysis Performed by: AS	MW103-19 RH3	Analysis Date: 12/14/2022
Aquifer Thickness: 3.30 m		

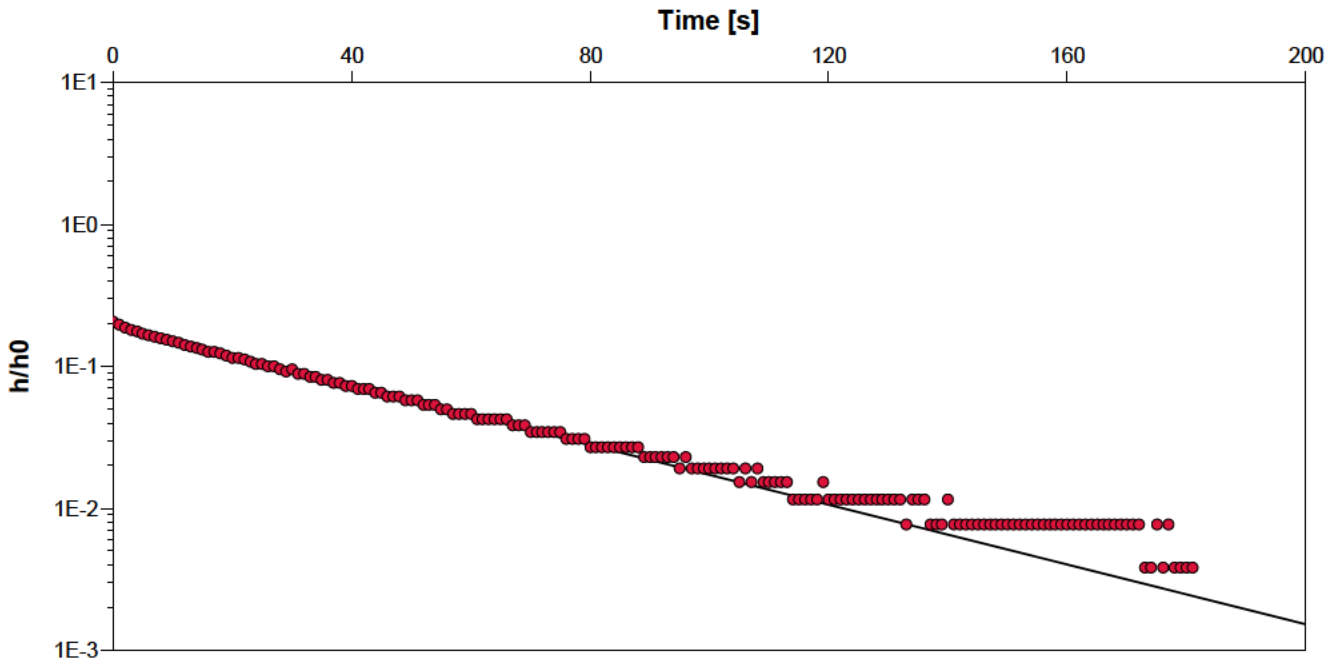


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW103-19	3.43×10^{-5}	

	Slug Test Analysis Report
	Project: 246 North Street
	Number: 47030-200
	Client:

Location: Dorchester	Slug Test: MW106-19 RH1	Test Well: MW106-19
Test Conducted by: BVV		Test Date: 10/21/2022
Analysis Performed by: AS	MW106-19 RH1	Analysis Date: 12/14/2022
Aquifer Thickness: 3.20 m		

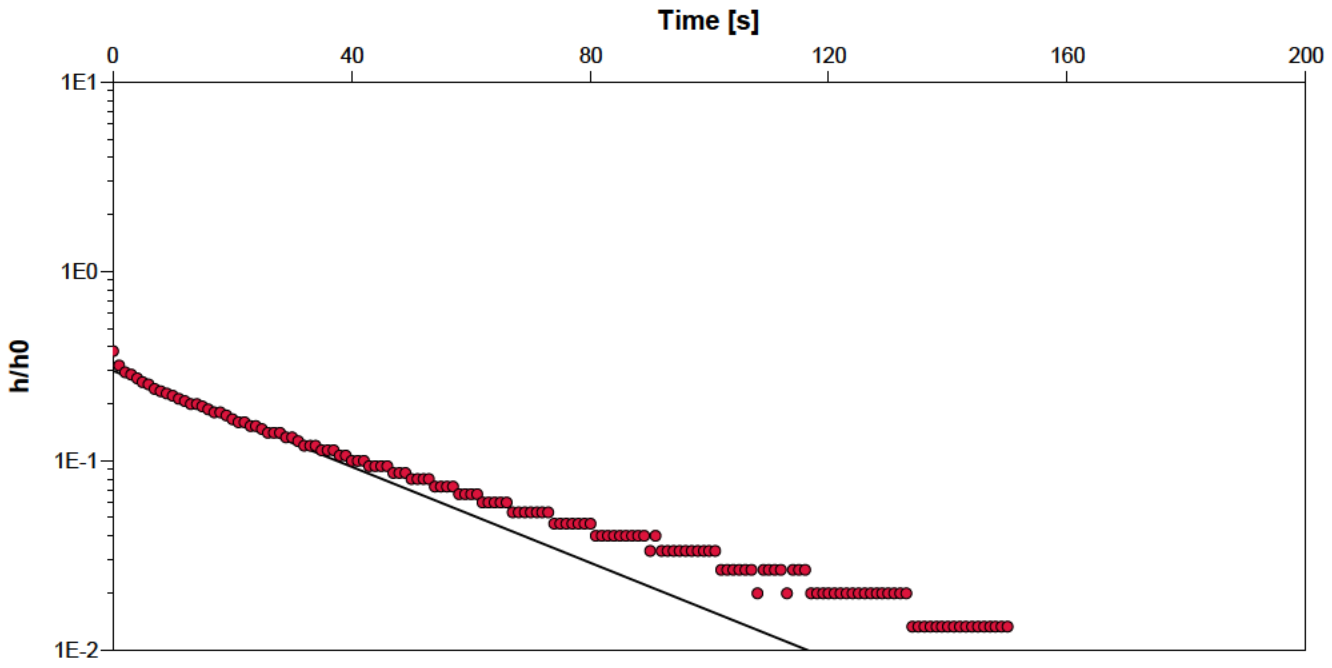


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW106-19	2.39×10^{-5}	

	Slug Test Analysis Report
	Project: 246 North Street
	Number: 47030-200
	Client:

Location: Dorchester	Slug Test: MW106-19 FH1	Test Well: MW106-19
Test Conducted by: BV		Test Date: 10/21/2022
Analysis Performed by: AS	MW106-19 FH1	Analysis Date: 12/14/2022
Aquifer Thickness: 3.20 m		

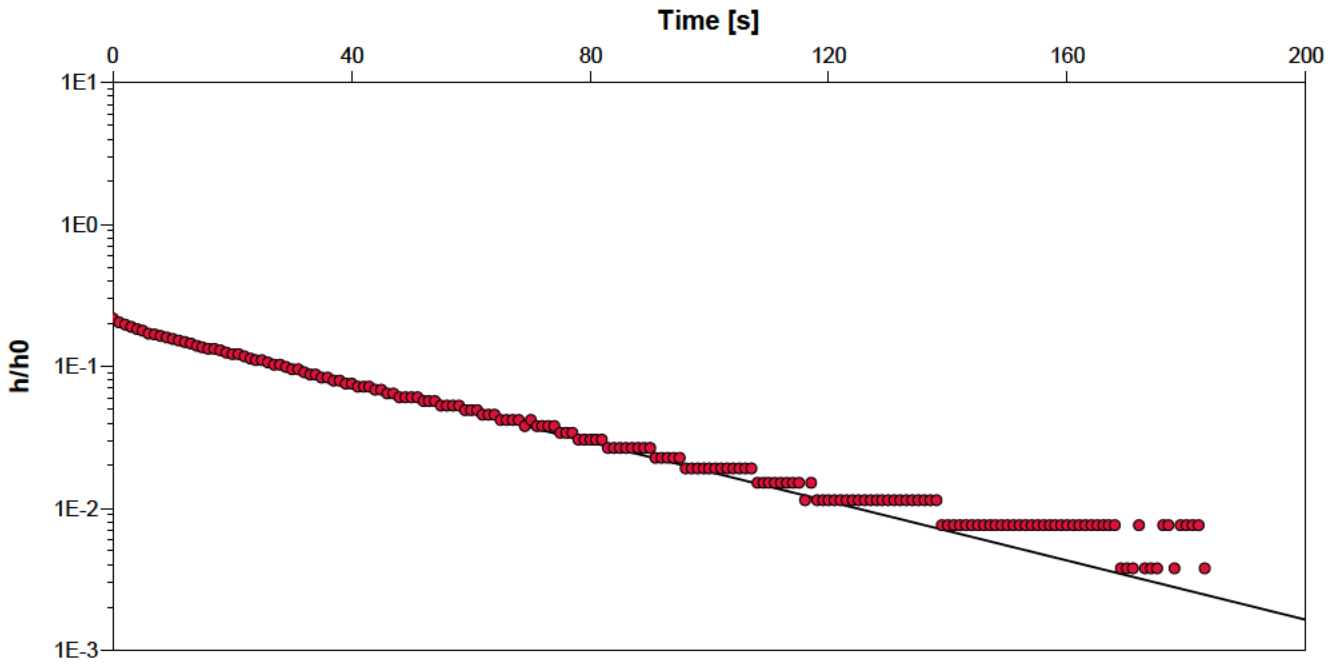


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW106-19	2.87×10^{-5}	

	Slug Test Analysis Report
	Project: 246 North Street
	Number: 47030-200
	Client:

Location: Dorchester	Slug Test: MW106-19 RH2	Test Well: MW106-19
Test Conducted by: BVV		Test Date: 10/21/2022
Analysis Performed by: AS	MW106-19 RH2	Analysis Date: 12/14/2022
Aquifer Thickness: 3.20 m		

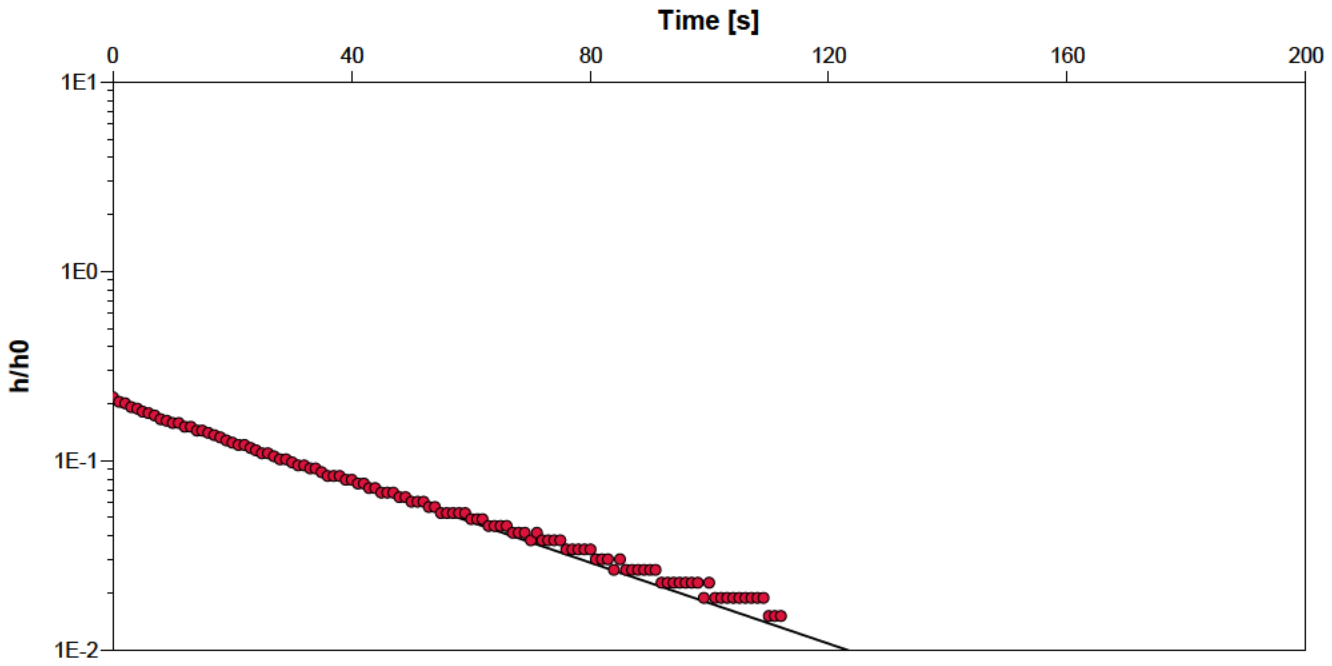


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW106-19	2.17×10^{-5}	

	Slug Test Analysis Report
	Project: 246 North Street
	Number: 47030-200
	Client:

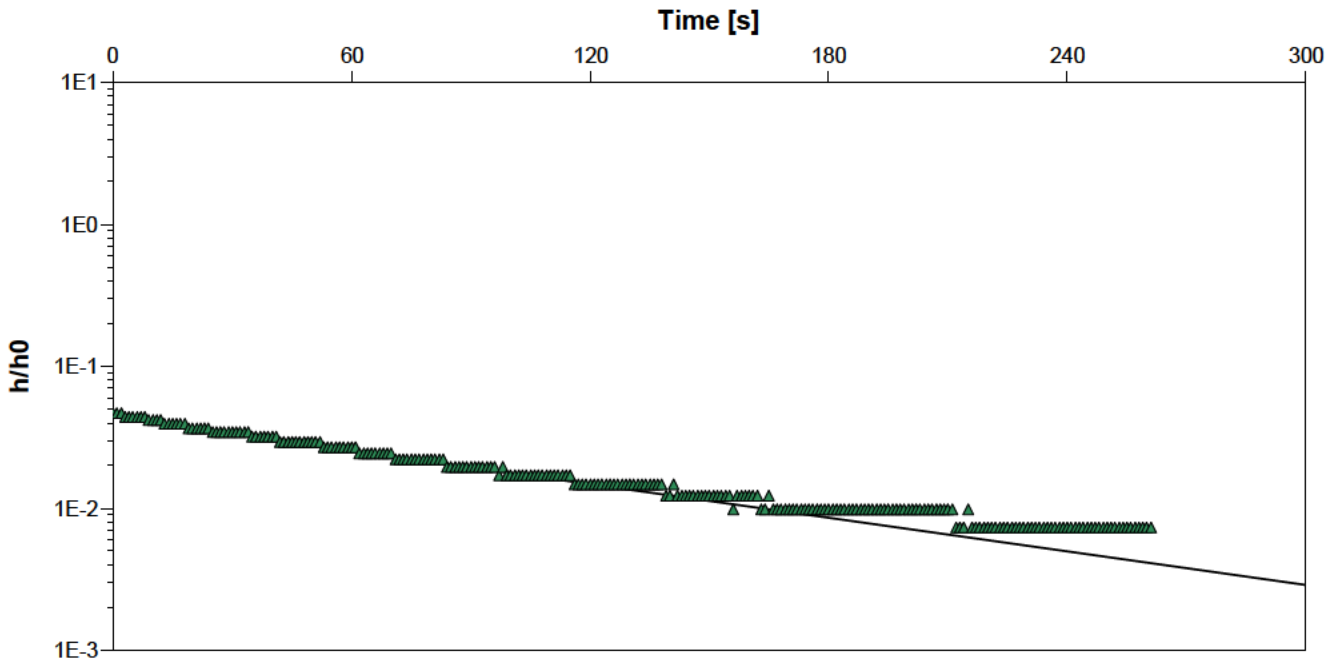
Location: Dorchester	Slug Test: MW106-19 RH3	Test Well: MW106-19
Test Conducted by: BVV		Test Date: 10/21/2022
Analysis Performed by: AS	MW106-19 RH3	Analysis Date: 12/14/2022
Aquifer Thickness: 3.20 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW106-19	2.23×10^{-5}	

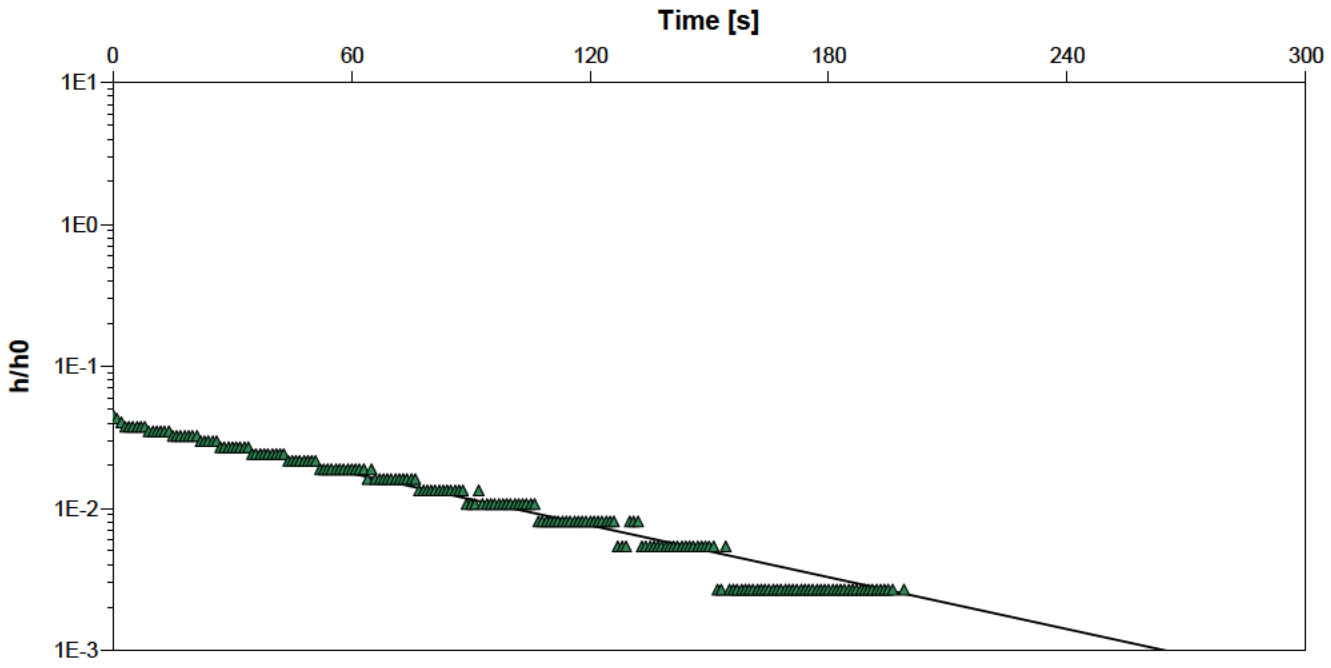
	Slug Test Analysis Report	
	Project: 246 North Street	
	Number: 47030-200	
	Client:	
Location: Dorchester	Slug Test: MW108-19 RH1	Test Well: MW108-19
Test Conducted by: BVV		Test Date: 10/21/2022
Analysis Performed by:	New analysis 1	Analysis Date: 12/14/2022
Aquifer Thickness: 4.00 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW108-19	$7\ 89 \times 10^{-6}$	

	Slug Test Analysis Report	
	Project: 246 North Street	
	Number: 47030-200	
	Client:	
Location: Dorchester	Slug Test: MW108-19 FH1	Test Well: MW108-19
Test Conducted by: BVV		Test Date: 10/21/2022
Analysis Performed by: AS	MW108-19 FH1	Analysis Date: 12/14/2022
Aquifer Thickness: 4.00 m		

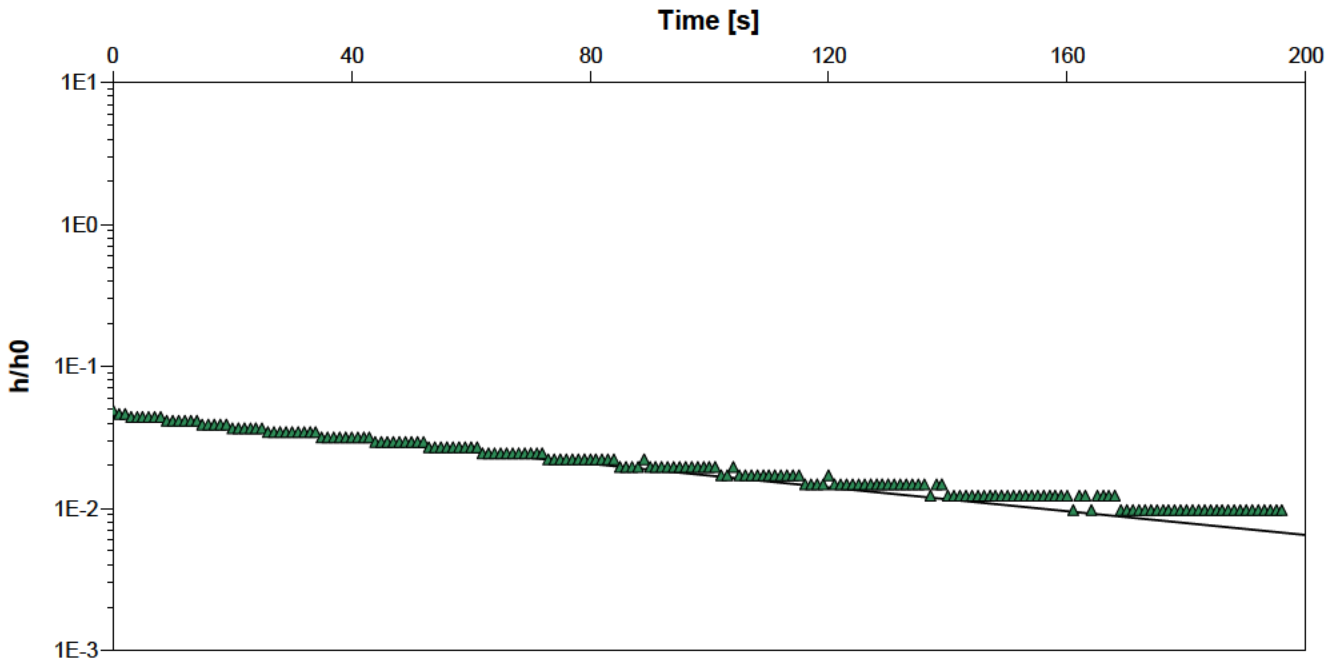


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW108-19	1.32×10^{-5}	

Slug Test Analysis Report	
Project: 246 North Street	
Number: 47030-200	
Client:	

Location: Dorchester	Slug Test: MW108-19 RH2	Test Well: MW108-19
Test Conducted by: BVV		Test Date: 10/21/2022
Analysis Performed by: AS	MW108-19 RH2	Analysis Date: 12/14/2022
Aquifer Thickness: 4.00 m		

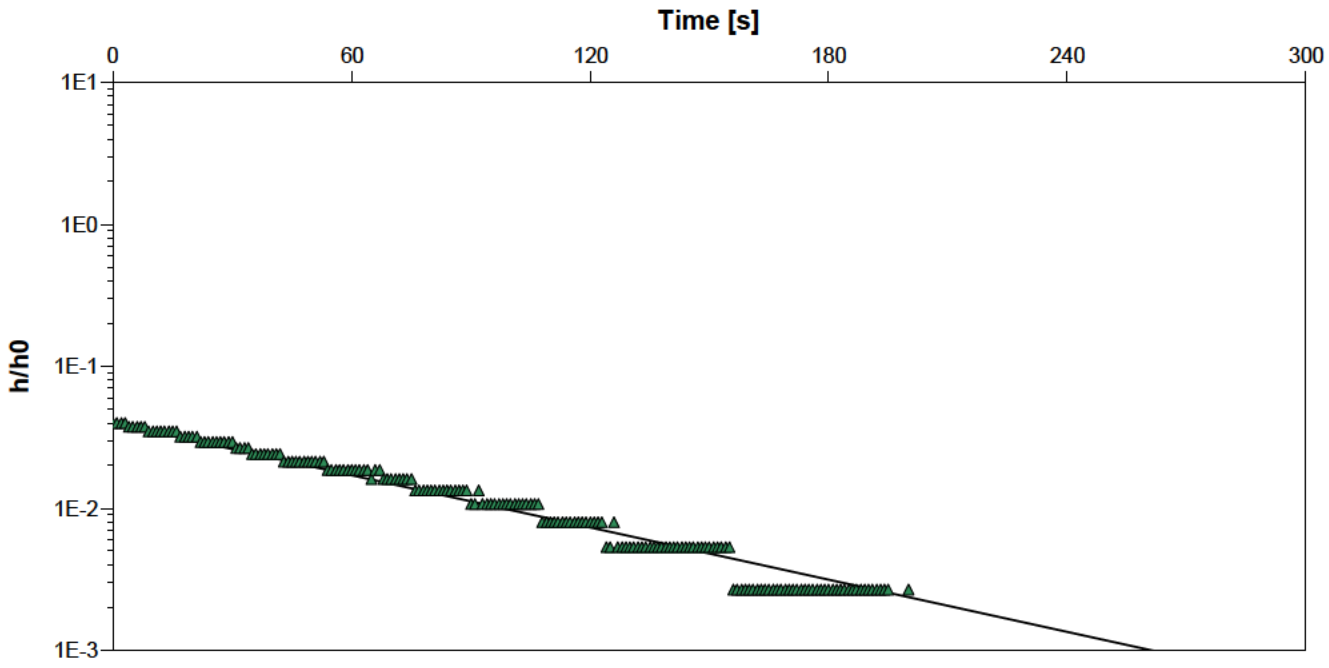


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW108-19	8.33×10^{-6}	

Slug Test Analysis Report	
Project: 246 North Street	
Number: 47030-200	
Client:	

Location: Dorchester	Slug Test: MW108-19 FH2	Test Well: MW108-19
Test Conducted by: BV		Test Date: 10/21/2022
Analysis Performed by: AS	MW108-19 FH2	Analysis Date: 12/14/2022
Aquifer Thickness: 4.00 m		



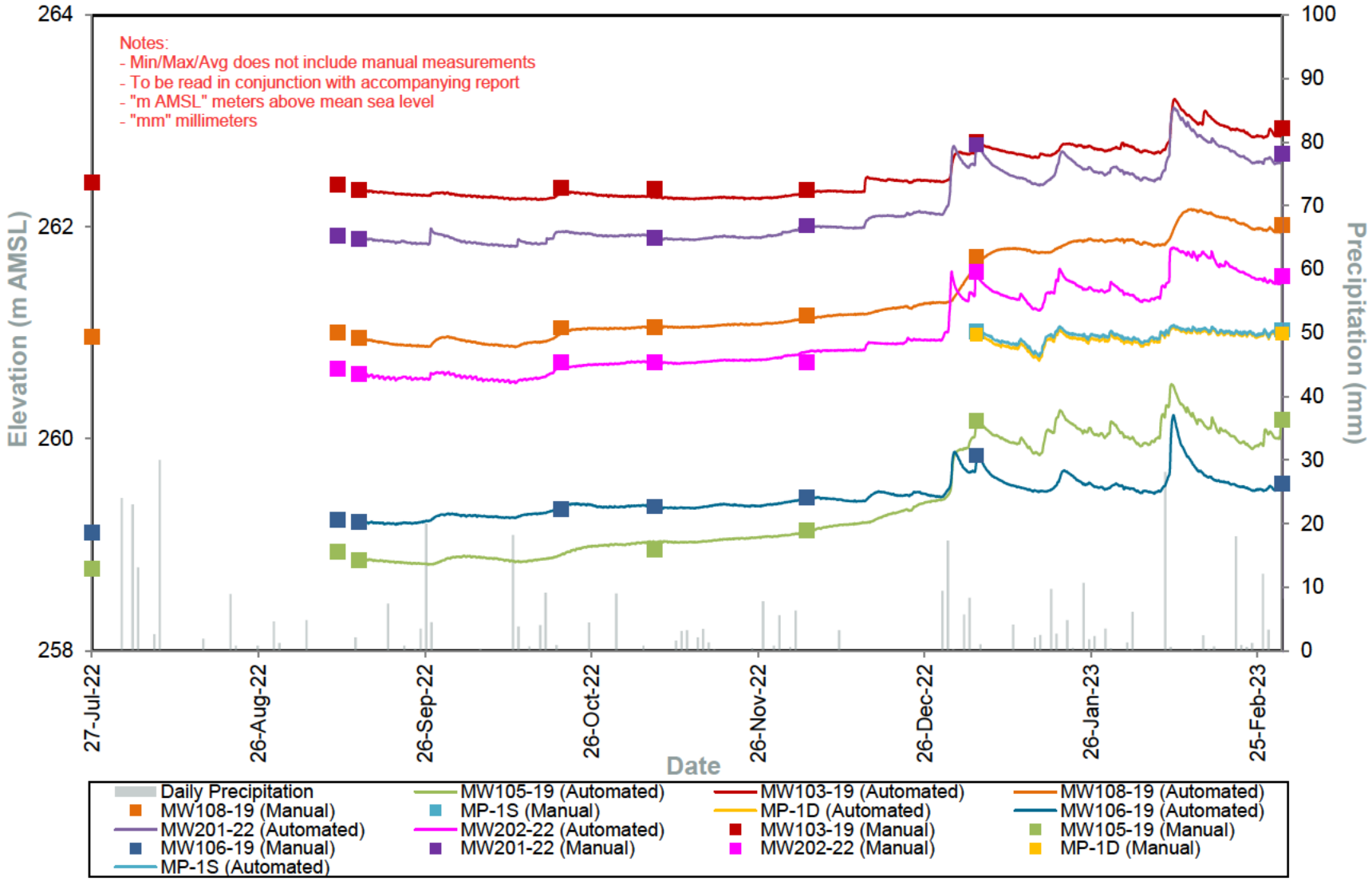
Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW108-19	1.22×10^{-5}	

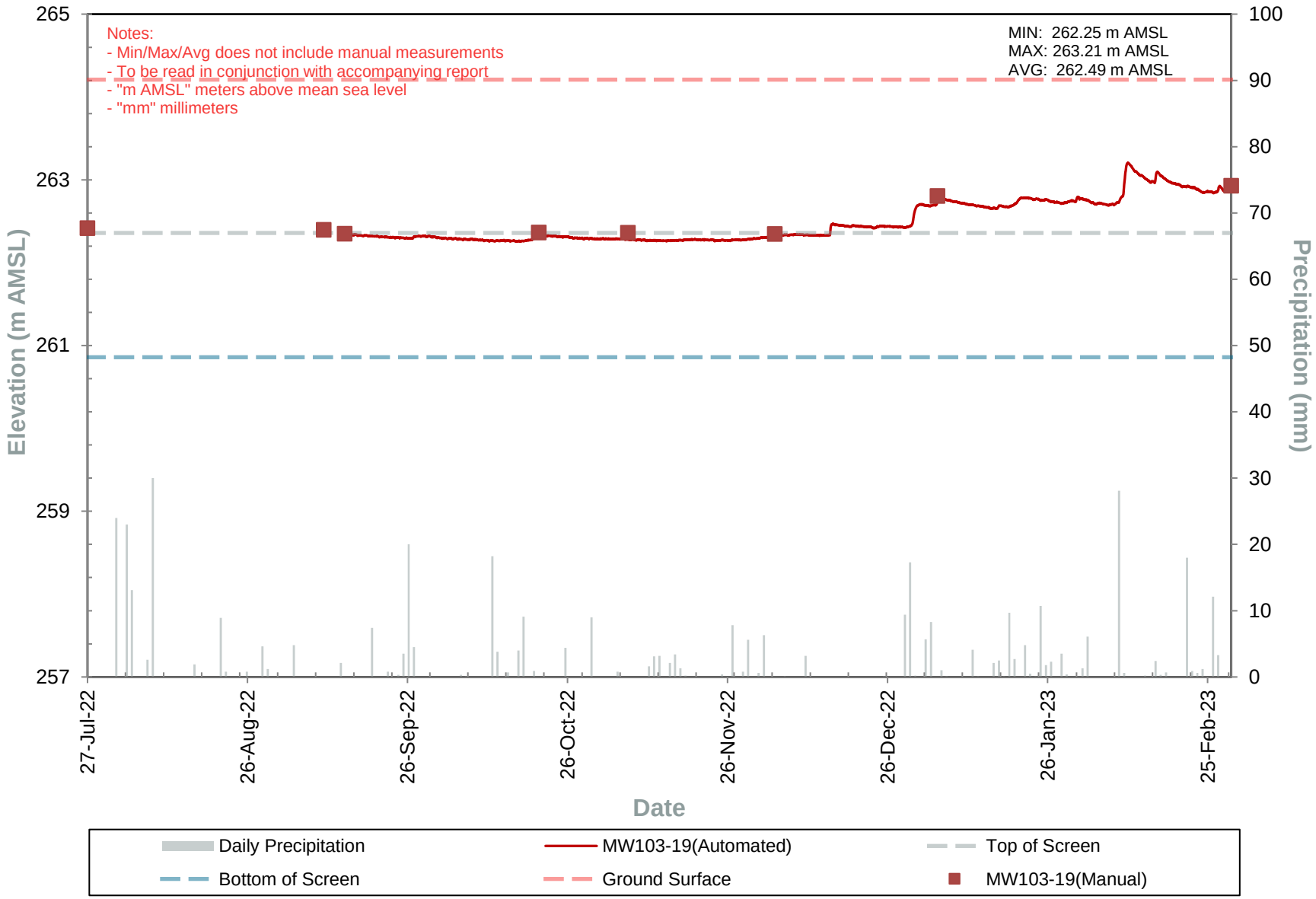
Appendix E

Hydrographs

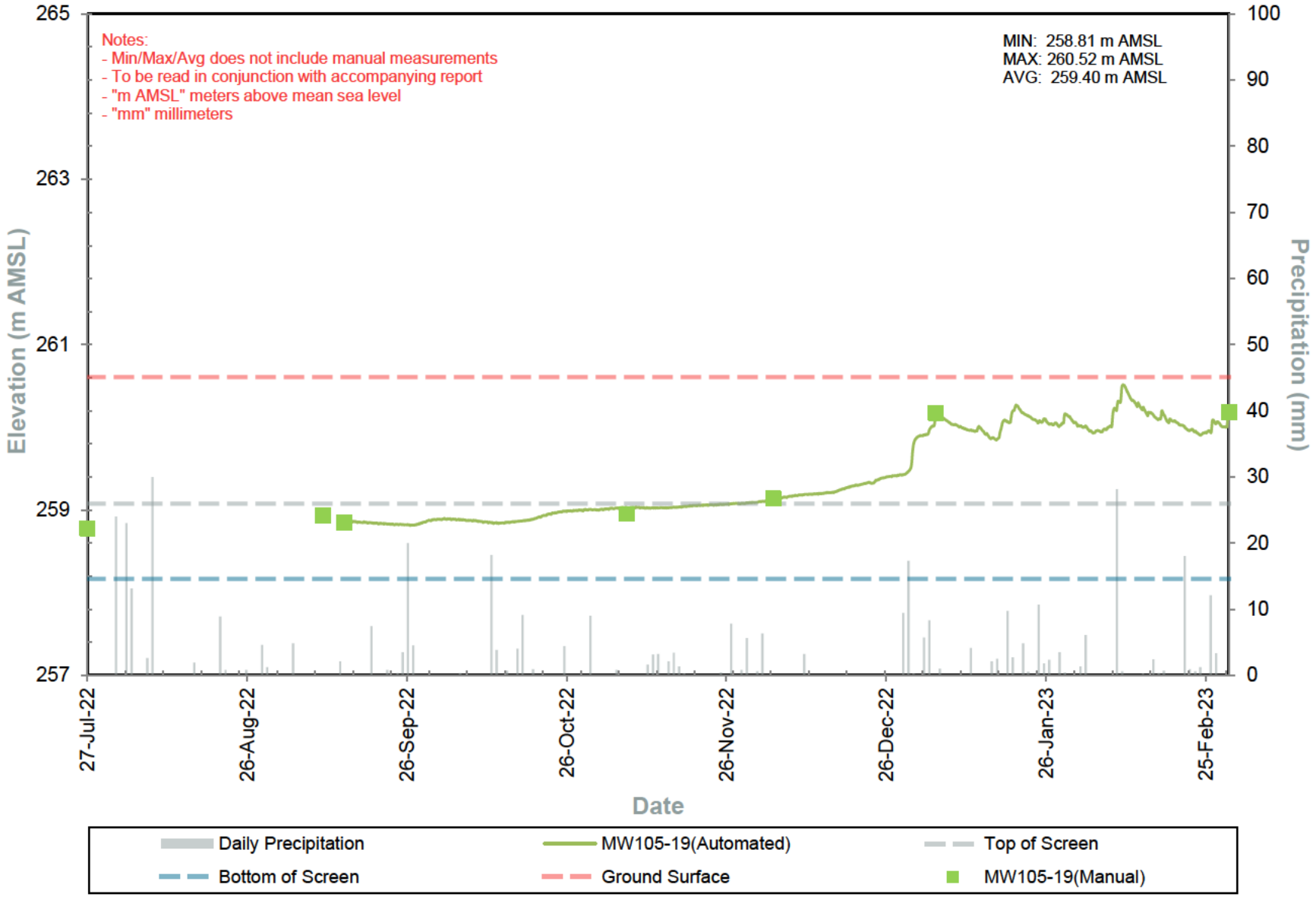
Hydrograph 1: Groundwater Elevations



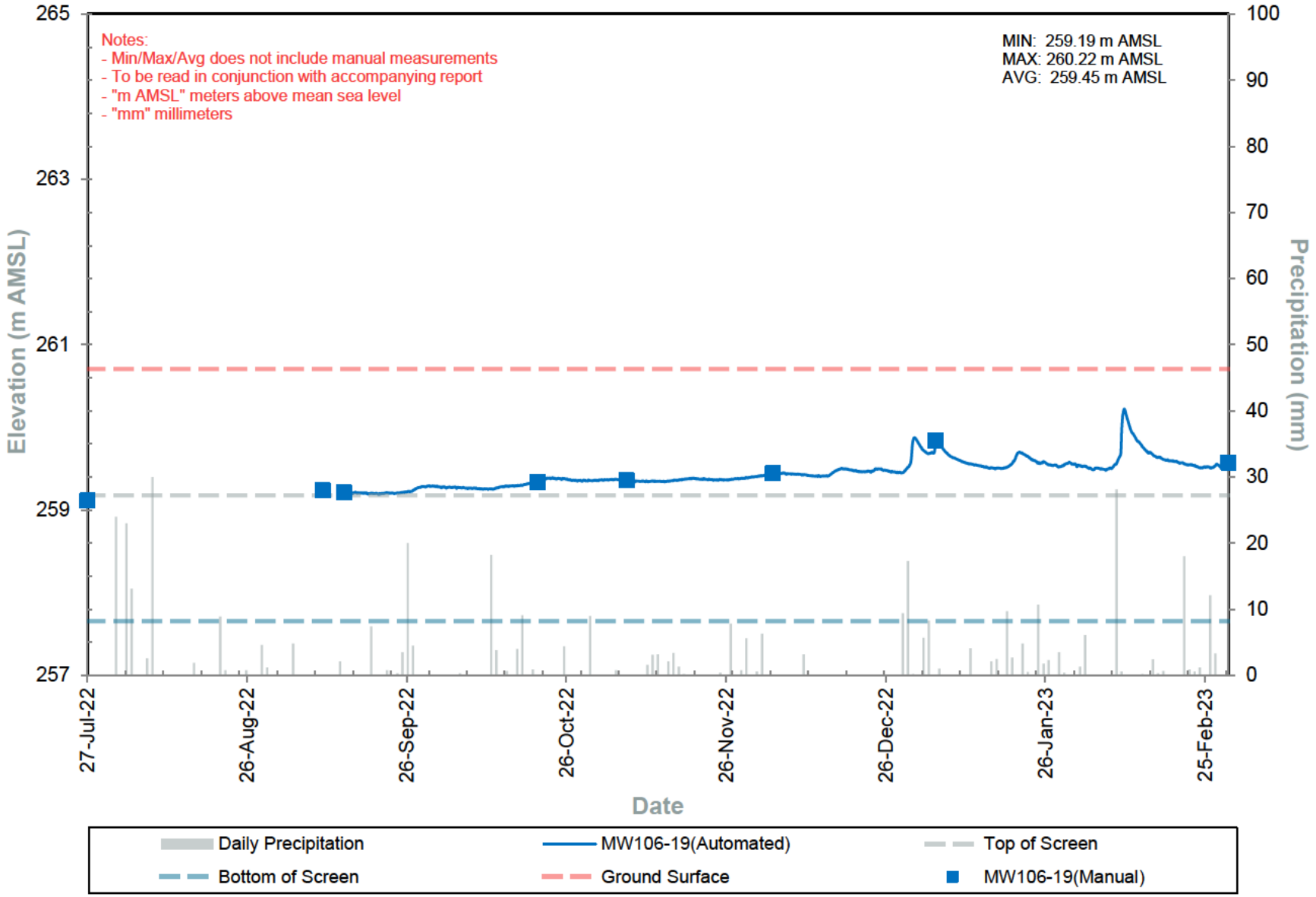
Hydrograph 2: Groundwater Elevations - MW103-19



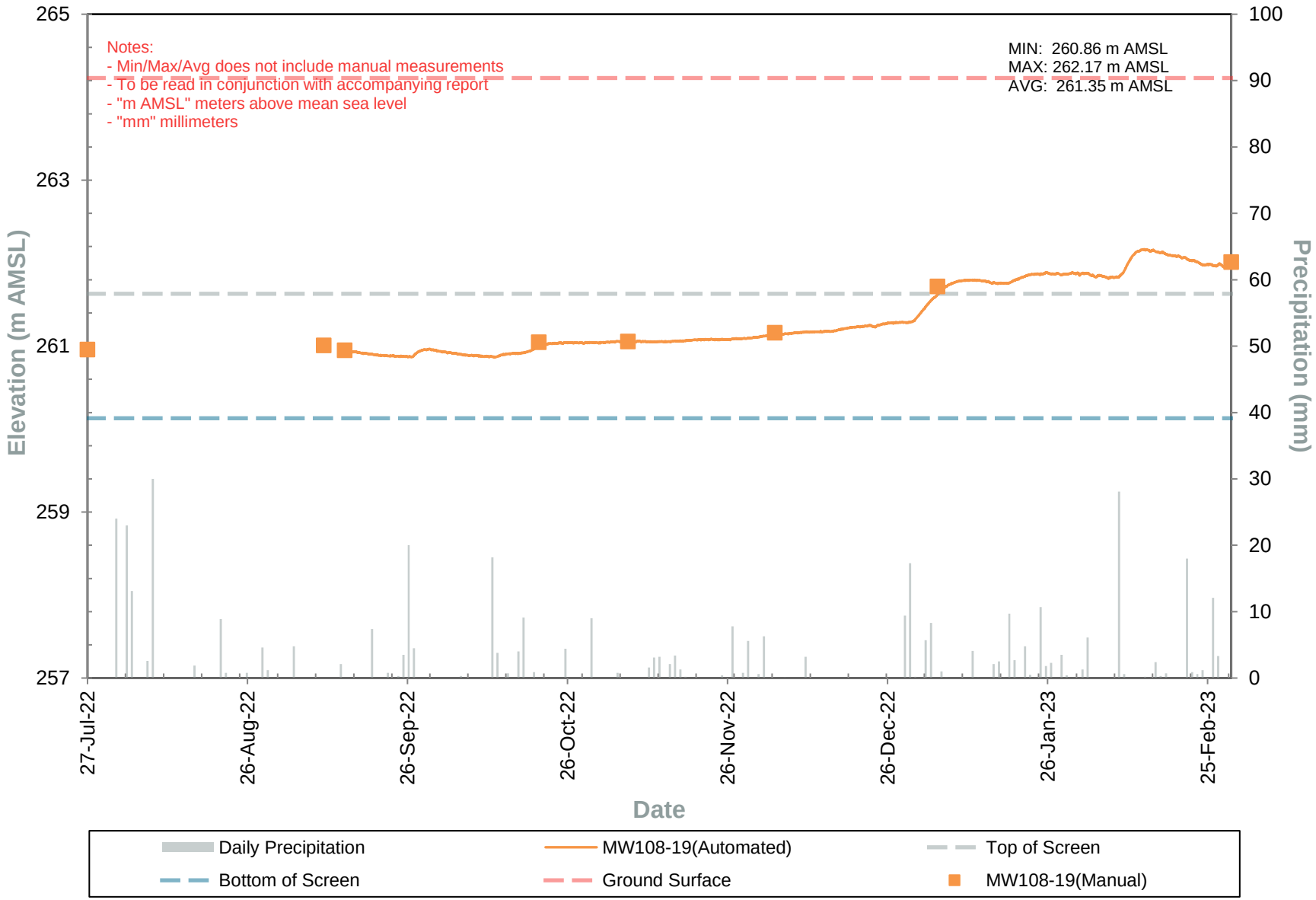
Hydrograph 3: Groundwater Elevations - MW105-19



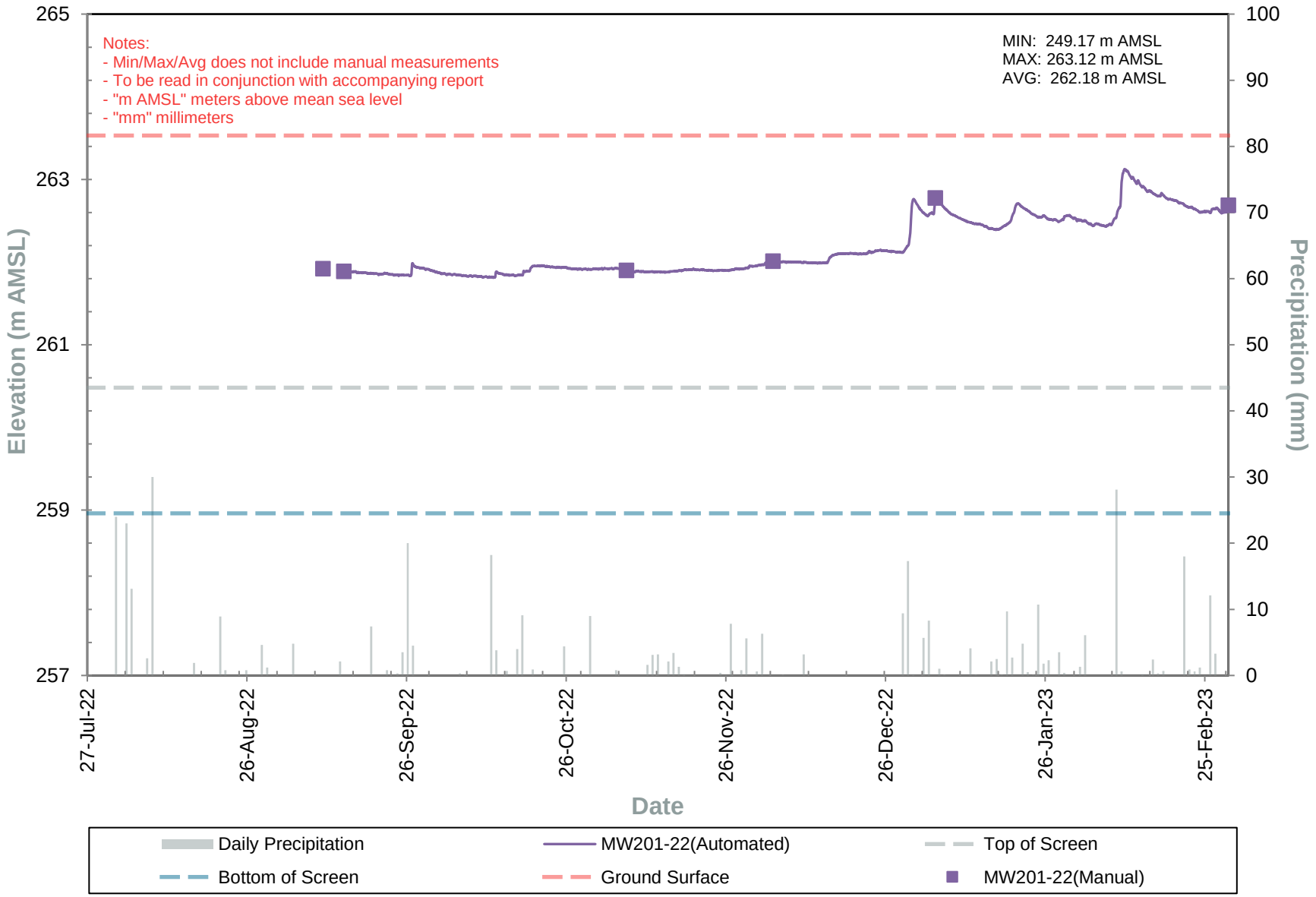
Hydrograph 4: Groundwater Elevations - MW106-19



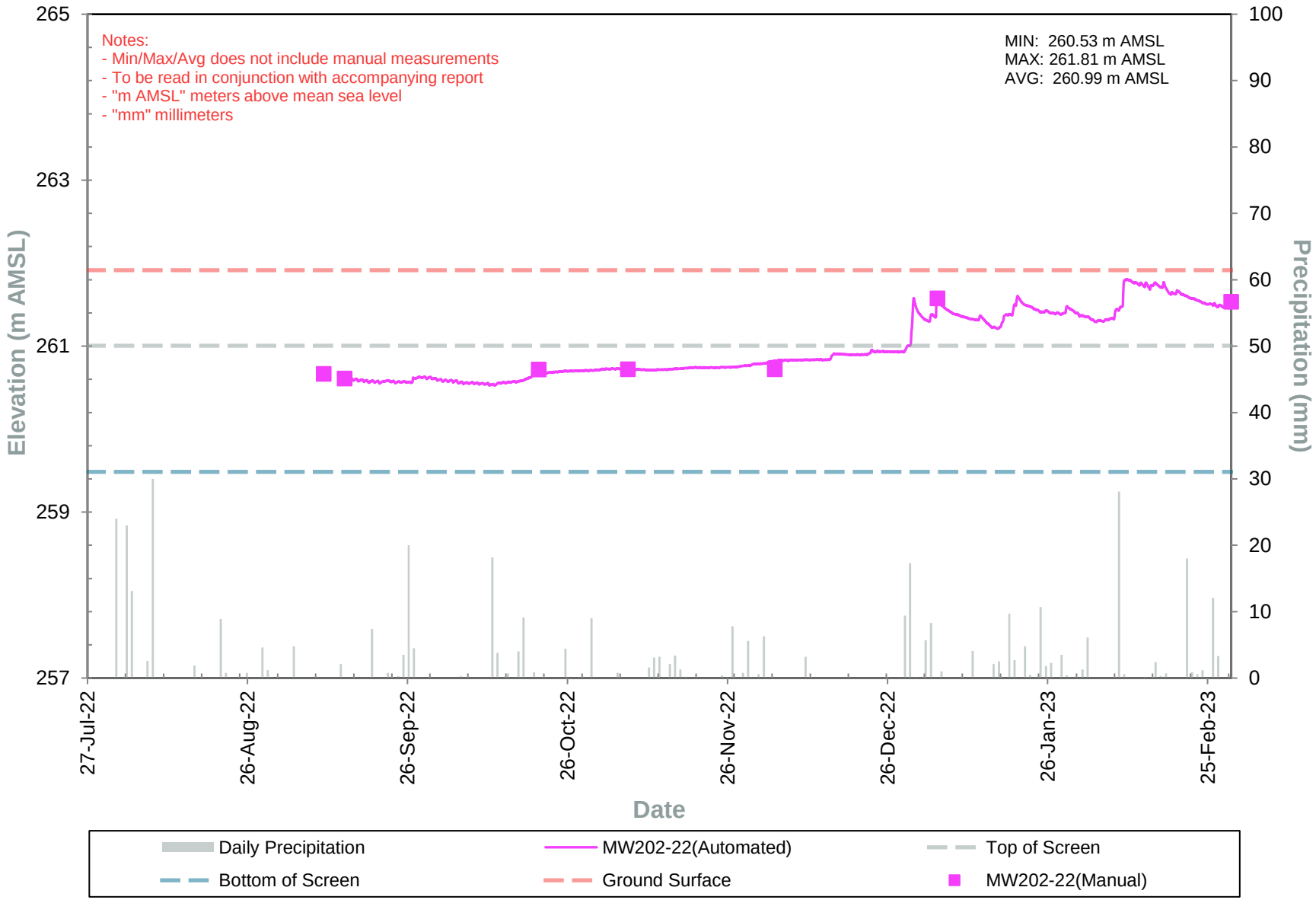
Hydrograph 5: Groundwater Elevations - MW108-19



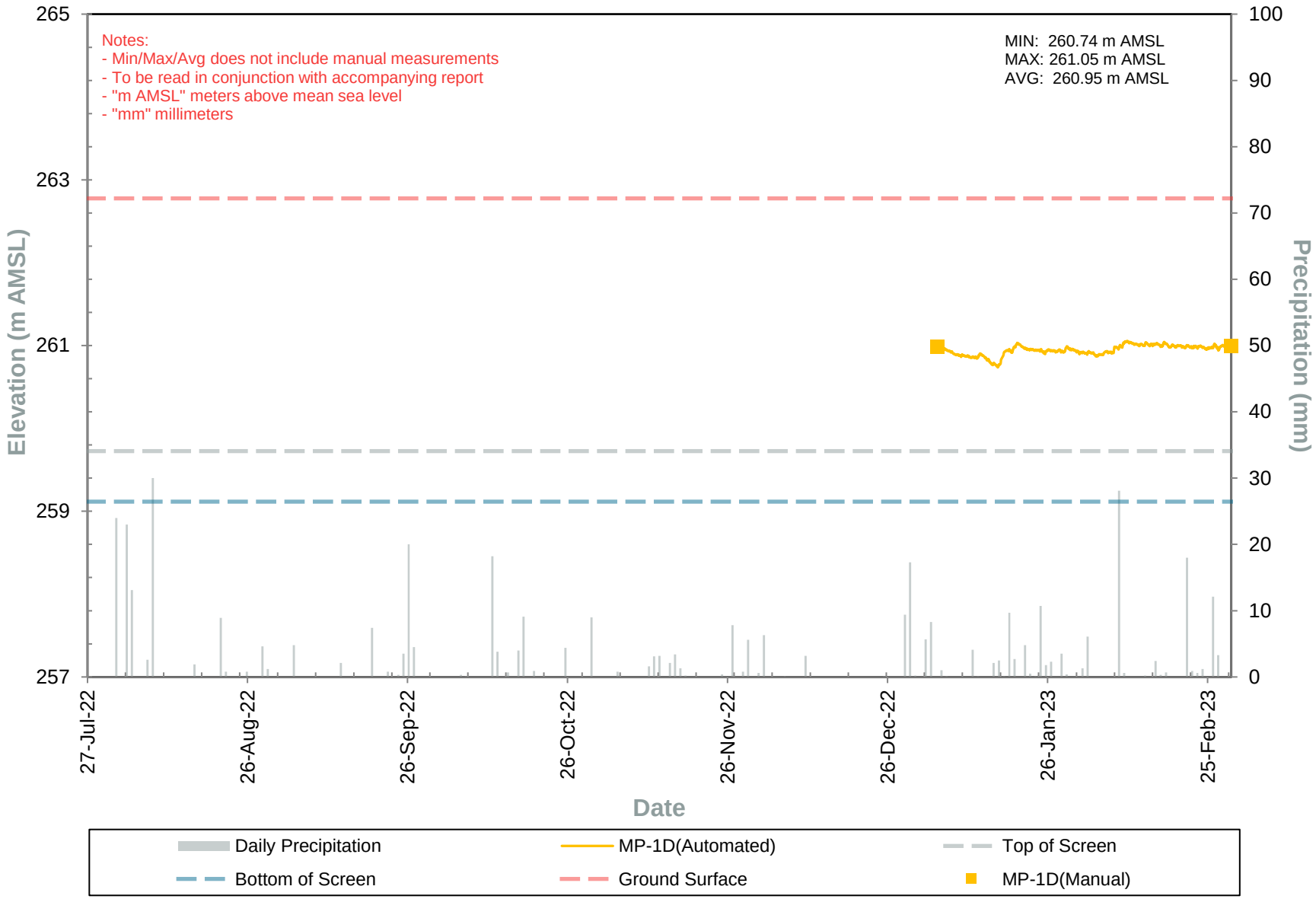
Hydrograph 6: Groundwater Elevations - MW201-22



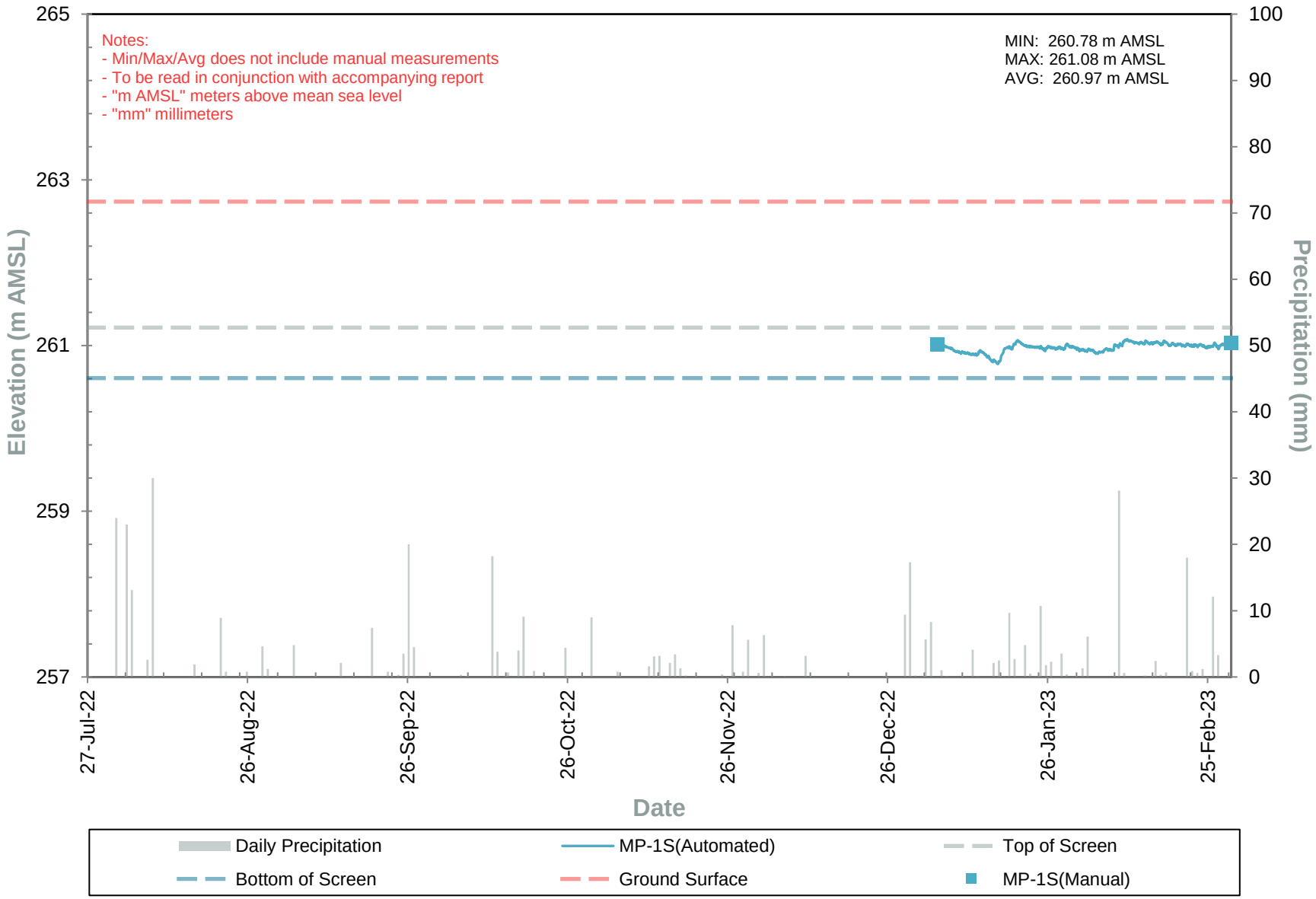
Hydrograph 7: Groundwater Elevations - MW202-22



Hydrograph 8: Groundwater Elevations - MP-1D



Hydrograph 9: Groundwater Elevations - MP-1S



Appendix F

Certificate of Analysis

Your Project #: 47030-200
Your C.O.C. #: 905909-01-01

Attention: Alison Schincariol

MTE Consultants Inc
520 Bingemans Centre Dr
Kitchener, ON
CANADA N2B 3X9

Report Date: 2022/11/14
Report #: R7387053
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C2W6284
Received: 2022/11/07, 13:00

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	2	N/A	2022/11/09	CAM SOP-00448	SM 23 2320 B m
Carbonate, Bicarbonate and Hydroxide	2	N/A	2022/11/10	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	2	N/A	2022/11/10	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	2	N/A	2022/11/09	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	2	N/A	2022/11/09	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	2	N/A	2022/11/10	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	2	N/A	2022/11/10	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	2	N/A	2022/11/10		
Anion and Cation Sum	2	N/A	2022/11/10		
Total Ammonia-N	2	N/A	2022/11/10	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	2	N/A	2022/11/11	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	2	2022/11/08	2022/11/09	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	2	N/A	2022/11/09	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	2	N/A	2022/11/10		Auto Calc
Sat. pH and Langelier Index (@ 4C)	2	N/A	2022/11/10		Auto Calc
Sulphate by Automated Colourimetry	2	N/A	2022/11/09	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	2	N/A	2022/11/10		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless

Your Project #: 47030-200
Your C.O.C. #: 905909-01-01

Attention: Alison Schincariol

MTE Consultants Inc
520 Bingemans Centre Dr
Kitchener, ON
CANADA N2B 3X9

Report Date: 2022/11/14
Report #: R7387053
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C2W6284
Received: 2022/11/07, 13:00

otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Ronklin Gracian, Project Manager
Email: Ronklin.Gracian@bureauveritas.com
Phone# (905)817-5752

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

RCAP - COMPREHENSIVE (WATER)

Bureau Veritas ID			UFT085		UFT086		
Sampling Date			2022/11/07 10:45		2022/11/07 12:10		
COC Number			905909-01-01		905909-01-01		
	UNITS	**Criteria**	**MW106-19**	**QC Batch**	**MW201-22**	**RDL**	**QC Batch**
Calculated Parameters							
Anion Sum	me/L	-	6.36	8331879	8.91	N/A	8331879
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	270	8331299	310	1.0	8331299
Calculated TDS	mg/L	-	330	8331881	480	1.0	8331881
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	2.1	8331299	2.3	1.0	8331299
Cation Sum	me/L	-	6.35	8331879	8.72	N/A	8331879
Hardness (CaCO3)	mg/L	-	310	8329960	340	1.0	8329960
Ion Balance (% Difference)	%	-	0.0900	8330457	1.09	N/A	8330457
Langelier Index (@ 20C)	N/A	-	0.878	8331878	0.945		8331878
Langelier Index (@ 4C)	N/A	-	0.629	8331880	0.697		8331880
Saturation pH (@ 20C)	N/A	-	7.03	8331878	6.95		8331878
Saturation pH (@ 4C)	N/A	-	7.27	8331880	7.20		8331880
Inorganics							
Total Ammonia-N	mg/L	-	<0.050	8337990	<0.050	0.050	8337990
Conductivity	umho/cm	-	570	8332990	830	1.0	8332990
Dissolved Organic Carbon	mg/L	-	3.1	8332958	2.1	0.40	8332958
Orthophosphate (P)	mg/L	-	<0.010	8333212	0.025	0.010	8333212
pH	pH	6.5:8.5	7.90	8333001	7.90		8333001
Dissolved Sulphate (SO4)	mg/L	-	33	8333204	29	1.0	8333204
Alkalinity (Total as CaCO3)	mg/L	-	280	8332992	310	1.0	8332992
Dissolved Chloride (Cl-)	ug/L	-	5900	8333210	58000	1000	8333210
Nitrite (N)	mg/L	-	<0.010	8332752	0.852	0.010	8332769
Nitrate (N)	mg/L	-	<0.10	8332752	4.64	0.10	8332769
Nitrate + Nitrite (N)	mg/L	-	<0.10	8332752	5.50	0.10	8332769
Metals							
Dissolved Aluminum (Al)	ug/L	-	<4.9	8336020	<4.9	4.9	8336020
Dissolved Antimony (Sb)	ug/L	20	<0.50	8336020	<0.50	0.50	8336020
Dissolved Arsenic (As)	ug/L	100	<1.0	8336020	<1.0	1.0	8336020
Dissolved Barium (Ba)	ug/L	-	58	8336020	87	2.0	8336020
Dissolved Beryllium (Be)	ug/L	11	<0.40	8336020	<0.40	0.40	8336020

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

RCAP - COMPREHENSIVE (WATER)

Bureau Veritas ID			UFT085		UFT086		
Sampling Date			2022/11/07 10:45		2022/11/07 12:10		
COC Number			905909-01-01		905909-01-01		
	UNITS	**Criteria**	**MW106-19**	**QC Batch**	**MW201-22**	**RDL**	**QC Batch**
Dissolved Boron (B)	ug/L	200	13	8336020	26	10	8336020
Dissolved Cadmium (Cd)	ug/L	0.2	<0.090	8336020	<0.090	0.090	8336020
Dissolved Calcium (Ca)	ug/L	-	92000	8336020	100000	200	8336020
Dissolved Chromium (Cr)	ug/L	-	<5.0	8336020	<5.0	5.0	8336020
Dissolved Cobalt (Co)	ug/L	0.9	<0.50	8336020	<0.50	0.50	8336020
Dissolved Copper (Cu)	ug/L	5	4.8	8336020	3.1	0.90	8336020
Dissolved Iron (Fe)	ug/L	300	<100	8336020	<100	100	8336020
Dissolved Lead (Pb)	ug/L	5	<0.50	8336020	<0.50	0.50	8336020
Dissolved Magnesium (Mg)	ug/L	-	20000	8336020	19000	50	8336020
Dissolved Manganese (Mn)	ug/L	-	54	8336020	74	2.0	8336020
Dissolved Molybdenum (Mo)	ug/L	40	1.4	8336020	1.1	0.50	8336020
Dissolved Nickel (Ni)	ug/L	25	<1.0	8336020	2.0	1.0	8336020
Dissolved Phosphorus (P)	ug/L	-	<100	8336020	120	100	8336020
Dissolved Potassium (K)	ug/L	-	1800	8336020	1100	200	8336020
Dissolved Selenium (Se)	ug/L	100	<2.0	8336020	<2.0	2.0	8336020
Dissolved Silicon (Si)	ug/L	-	5000	8336020	4800	50	8336020
Dissolved Silver (Ag)	ug/L	0.1	<0.090	8336020	<0.090	0.090	8336020
Dissolved Sodium (Na)	ug/L	-	2600	8336020	45000	100	8336020
Dissolved Strontium (Sr)	ug/L	-	150	8336020	180	1.0	8336020
Dissolved Thallium (Tl)	ug/L	0.3	<0.050	8336020	<0.050	0.050	8336020
Dissolved Titanium (Ti)	ug/L	-	<5.0	8336020	<5.0	5.0	8336020
Dissolved Uranium (U)	ug/L	5	4.3	8336020	1.6	0.10	8336020
Dissolved Vanadium (V)	ug/L	6	<0.50	8336020	<0.50	0.50	8336020
Dissolved Zinc (Zn)	ug/L	30	<5.0	8336020	<5.0	5.0	8336020

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C2W6284
Report Date: 2022/11/14

MTE Consultants Inc
Client Project #: 47030-200
Sampler Initials: BVV

TEST SUMMARY

Bureau Veritas ID: UFT085
Sample ID: MW106-19
Matrix: Water

Collected: 2022/11/07
Shipped:
Received: 2022/11/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8332992	N/A	2022/11/09	Kien Tran
Carbonate, Bicarbonate and Hydroxide	CALC	8331299	N/A	2022/11/10	Automated Statchk
Chloride by Automated Colourimetry	KONE	8333210	N/A	2022/11/10	Samuel Law
Conductivity	AT	8332990	N/A	2022/11/09	Kien Tran
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8332958	N/A	2022/11/09	Gyulshen Idriz
Hardness (calculated as CaCO3)		8329960	N/A	2022/11/10	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	8336020	N/A	2022/11/10	Arefa Dabhad
Ion Balance (% Difference)	CALC	8330457	N/A	2022/11/10	Automated Statchk
Anion and Cation Sum	CALC	8331879	N/A	2022/11/10	Automated Statchk
Total Ammonia-N	LACH/NH4	8337990	N/A	2022/11/10	Anna-Kay Gooden
Nitrate & Nitrite as Nitrogen in Water	LACH	8332752	N/A	2022/11/11	Chandra Nandlal
pH	AT	8333001	2022/11/08	2022/11/09	Kien Tran
Orthophosphate	KONE	8333212	N/A	2022/11/09	Samuel Law
Sat. pH and Langelier Index (@ 20C)	CALC	8331878	N/A	2022/11/10	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	8331880	N/A	2022/11/10	Automated Statchk
Sulphate by Automated Colourimetry	KONE	8333204	N/A	2022/11/09	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	8331881	N/A	2022/11/10	Automated Statchk

Bureau Veritas ID: UFT086
Sample ID: MW201-22
Matrix: Water

Collected: 2022/11/07
Shipped:
Received: 2022/11/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8332992	N/A	2022/11/09	Kien Tran
Carbonate, Bicarbonate and Hydroxide	CALC	8331299	N/A	2022/11/10	Automated Statchk
Chloride by Automated Colourimetry	KONE	8333210	N/A	2022/11/10	Samuel Law
Conductivity	AT	8332990	N/A	2022/11/09	Kien Tran
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8332958	N/A	2022/11/09	Gyulshen Idriz
Hardness (calculated as CaCO3)		8329960	N/A	2022/11/10	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	8336020	N/A	2022/11/10	Arefa Dabhad
Ion Balance (% Difference)	CALC	8330457	N/A	2022/11/10	Automated Statchk
Anion and Cation Sum	CALC	8331879	N/A	2022/11/10	Automated Statchk
Total Ammonia-N	LACH/NH4	8337990	N/A	2022/11/10	Anna-Kay Gooden
Nitrate & Nitrite as Nitrogen in Water	LACH	8332769	N/A	2022/11/11	Chandra Nandlal
pH	AT	8333001	2022/11/08	2022/11/09	Kien Tran
Orthophosphate	KONE	8333212	N/A	2022/11/09	Samuel Law
Sat. pH and Langelier Index (@ 20C)	CALC	8331878	N/A	2022/11/10	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	8331880	N/A	2022/11/10	Automated Statchk
Sulphate by Automated Colourimetry	KONE	8333204	N/A	2022/11/09	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	8331881	N/A	2022/11/10	Automated Statchk

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.7°C

Project number updated as per client request.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C2W6284
Report Date: 2022/11/14

QUALITY ASSURANCE REPORT

MTE Consultants Inc
Client Project #: 47030-200
Sampler Initials: BVV

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8332752	Nitrate (N)	2022/11/11	NC	80 - 120	99	80 - 120	<0.10	mg/L	0.057	20
8332752	Nitrite (N)	2022/11/11	105	80 - 120	107	80 - 120	<0.010	mg/L	0.56	20
8332769	Nitrate (N)	2022/11/11	99	80 - 120	98	80 - 120	<0.10	mg/L	NC	20
8332769	Nitrite (N)	2022/11/11	107	80 - 120	106	80 - 120	<0.010	mg/L	NC	20
8332958	Dissolved Organic Carbon	2022/11/09	97	80 - 120	99	80 - 120	<0.40	mg/L	0.29	20
8332990	Conductivity	2022/11/09			99	85 - 115	<1.0	umho/cm	0.066	25
8332992	Alkalinity (Total as CaCO3)	2022/11/09			95	85 - 115	<1.0	mg/L	0.12	20
8333001	pH	2022/11/09			102	98 - 103			0.36	N/A
8333204	Dissolved Sulphate (SO4)	2022/11/09	115	75 - 125	102	80 - 120	<1.0	mg/L	1.2	20
8333210	Dissolved Chloride (Cl-)	2022/11/10	111	80 - 120	103	80 - 120	<1000	ug/L	1.2	20
8333212	Orthophosphate (P)	2022/11/09	90	75 - 125	101	80 - 120	<0.010	mg/L	0.68	25
8336020	Dissolved Aluminum (Al)	2022/11/10	96	80 - 120	96	80 - 120	<4.9	ug/L		
8336020	Dissolved Antimony (Sb)	2022/11/10	102	80 - 120	101	80 - 120	<0.50	ug/L	NC	20
8336020	Dissolved Arsenic (As)	2022/11/10	97	80 - 120	96	80 - 120	<1.0	ug/L	NC	20
8336020	Dissolved Barium (Ba)	2022/11/10	98	80 - 120	97	80 - 120	<2.0	ug/L	2.5	20
8336020	Dissolved Beryllium (Be)	2022/11/10	94	80 - 120	95	80 - 120	<0.40	ug/L	NC	20
8336020	Dissolved Boron (B)	2022/11/10	95	80 - 120	97	80 - 120	<10	ug/L	1.5	20
8336020	Dissolved Cadmium (Cd)	2022/11/10	99	80 - 120	98	80 - 120	<0.090	ug/L	18	20
8336020	Dissolved Calcium (Ca)	2022/11/10	NC	80 - 120	97	80 - 120	<200	ug/L		
8336020	Dissolved Chromium (Cr)	2022/11/10	92	80 - 120	92	80 - 120	<5.0	ug/L	NC	20
8336020	Dissolved Cobalt (Co)	2022/11/10	96	80 - 120	95	80 - 120	<0.50	ug/L	1.3	20
8336020	Dissolved Copper (Cu)	2022/11/10	97	80 - 120	97	80 - 120	<0.90	ug/L	2.1	20
8336020	Dissolved Iron (Fe)	2022/11/10	95	80 - 120	95	80 - 120	<100	ug/L		
8336020	Dissolved Lead (Pb)	2022/11/10	96	80 - 120	97	80 - 120	<0.50	ug/L	NC	20
8336020	Dissolved Magnesium (Mg)	2022/11/10	99	80 - 120	96	80 - 120	<50	ug/L		
8336020	Dissolved Manganese (Mn)	2022/11/10	97	80 - 120	95	80 - 120	<2.0	ug/L		
8336020	Dissolved Molybdenum (Mo)	2022/11/10	100	80 - 120	97	80 - 120	<0.50	ug/L	NC	20
8336020	Dissolved Nickel (Ni)	2022/11/10	95	80 - 120	95	80 - 120	<1.0	ug/L	3.0	20
8336020	Dissolved Phosphorus (P)	2022/11/10	98	80 - 120	112	80 - 120	<100	ug/L		
8336020	Dissolved Potassium (K)	2022/11/10	102	80 - 120	99	80 - 120	<200	ug/L		
8336020	Dissolved Selenium (Se)	2022/11/10	98	80 - 120	99	80 - 120	<2.0	ug/L	NC	20

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8336020	Dissolved Silicon (Si)	2022/11/10	97	80 - 120	98	80 - 120	<50	ug/L		
8336020	Dissolved Silver (Ag)	2022/11/10	93	80 - 120	95	80 - 120	<0.090	ug/L	NC	20
8336020	Dissolved Sodium (Na)	2022/11/10	NC	80 - 120	91	80 - 120	<100	ug/L	0.35	20
8336020	Dissolved Strontium (Sr)	2022/11/10	98	80 - 120	98	80 - 120	<1.0	ug/L		
8336020	Dissolved Thallium (Tl)	2022/11/10	96	80 - 120	96	80 - 120	<0.050	ug/L	NC	20
8336020	Dissolved Titanium (Ti)	2022/11/10	96	80 - 120	97	80 - 120	<5.0	ug/L		
8336020	Dissolved Uranium (U)	2022/11/10	98	80 - 120	99	80 - 120	<0.10	ug/L	6.9	20
8336020	Dissolved Vanadium (V)	2022/11/10	95	80 - 120	93	80 - 120	<0.50	ug/L	NC	20
8336020	Dissolved Zinc (Zn)	2022/11/10	98	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
8337990	Total Ammonia-N	2022/11/10	100	75 - 125	102	80 - 120	<0.050	mg/L	NC	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C2W6284
Report Date: 2022/11/14

MTE Consultants Inc
Client Project #: 47030-200
Sampler Initials: BVV

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

[redacted]

Cristina Carriere, Senior Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by {0}, {1} responsible for {2} {3} laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas
109 & 110, 4023 Meadowbrook Drive, London, Ontario Canada N6L 1E7 Tel: (519) 652-9444 Toll-free:800-563-6266 Fax:(519) 652-8189 www.bvna.com

REC'D IN LONDON

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#6868 MTE Consultants Inc	Company Name:	MTE	Quotation #:	B90004	Bureau Veritas Job #:	Bottle Order #: 905909
Attention:	Accounts Payable	Attention:	Alison Schincariol, Bansari Vatiya	P.O. #:			
Address:	520 Bingemans Centre Dr Kitchener ON N2B 3X9	Address:	123 st George St London ON, N6A 3A1	Project:	46844-200	COC #: C#905909-01-01	Project Manager: Ronklin Gracian
Tel:	(519) 743-6500 Fax: (519) 743-6513	Tel:	519 204 6510 Fax:	Project Name:			
Email:	accounting@mte85.com	Email:	ASchincariol@mte85.com bvatiya@mtes.com	Site #:			
				Sampled By:	BV		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☒ PWQO ☐ Reg 406 Table ___
- ☐ Other ___

Special Instructions
Compare results to PWQO & lower detection limits where applicable

Include Criteria on Certificate of Analysis (Y/N)? Y

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects
Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.
Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): RCAp - Comprehensive	# of Bottles	Comments
1	MW106-19	MW106-19	NOV 7/22	10:45	GW	Y	X	4	
2	MW201-22	MW201-22	NOV 07/22	12:10	GW	Y	X	4	
3									
4									
5									
6									
7									
8									
9									
10									On Ice

07-Nov-22 13:00
Ronklin Gracian
C2W6284
RPK ENV-1361

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes	No
[redacted]	22/11/07		[redacted]	2022/11/07	13:00			10, 8, 8	Intact		✓
				2022/11/07	18:14						

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY [redacted]
** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

1/1/0
418837

Bureau Veritas Canada (2019) Inc.

Exceedance Summary Table – Prov. Water Quality Obj.

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
No Exceedances						

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Your Project #: 47030-200
Your C.O.C. #: 922632-01-01

Attention: Alison Schincariol

MTE Consultants Inc
520 Bingemans Centre Dr
Kitchener, ON
CANADA N2B 3X9

Report Date: 2023/03/08
Report #: R7538670
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C361777
Received: 2023/03/02, 16:25

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	2	N/A	2023/03/07	CAM SOP-00448	SM 23 2320 B m
Carbonate, Bicarbonate and Hydroxide	2	N/A	2023/03/08	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	2	N/A	2023/03/08	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	2	N/A	2023/03/07	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	2	N/A	2023/03/07	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	2	N/A	2023/03/07	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	2	N/A	2023/03/07	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	2	N/A	2023/03/08		
Anion and Cation Sum	2	N/A	2023/03/08		
Total Ammonia-N	2	N/A	2023/03/07	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	2	N/A	2023/03/08	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	2	2023/03/07	2023/03/07	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	2	N/A	2023/03/08	CAM SOP-00461	SM 23 4500-P E m
Sat. pH and Langelier Index (@ 20C)	2	N/A	2023/03/08		Auto Calc
Sat. pH and Langelier Index (@ 4C)	2	N/A	2023/03/08		Auto Calc
Sulphate by Automated Turbidimetry	2	N/A	2023/03/08	CAM SOP-00464	SM 23 4500-SO42- E m
Total Dissolved Solids (TDS calc)	2	N/A	2023/03/08		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless

Your Project #: 47030-200
Your C.O.C. #: 922632-01-01

Attention: Alison Schincariol

MTE Consultants Inc
520 Bingemans Centre Dr
Kitchener, ON
CANADA N2B 3X9

Report Date: 2023/03/08
Report #: R7538670
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C361777
Received: 2023/03/02, 16:25

otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Ankita Bhalla, Project Manager
Email: Ankita.Bhalla@bureauveritas.com
Phone# (905) 817-5700
==========
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

RCAP - COMPREHENSIVE (WATER)

Bureau Veritas ID			VEW488	VEW489		
Sampling Date			2023/03/02 12:35	2023/03/02 13:39		
COC Number			922632-01-01	922632-01-01		
	UNITS	**Criteria**	**MW106-19**	**MW201-22**	**RDL**	**QC Batch**
Calculated Parameters						
Anion Sum	me/L	-	5.58	6.58	N/A	8535918
Bicarb. Alkalinity (calc. as CaCO3	mg/L	-	240	290	1.0	8535921
Calculated TDS	mg/L	-	300	340	1.0	8535920
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	1.0	1.8	1.0	8535921
Cation Sum	me/L	-	6.07	6.69	N/A	8535918
Hardness (CaCO3)	mg/L	-	290	330	1.0	8535915
Ion Balance (% Difference)	%	-	4.18	0.840	N/A	8535916
Langelier Index (@ 20C)	N/A	-	0.585	0.851		8535917
Langelier Index (@ 4C)	N/A	-	0.336	0.602		8535919
Saturation pH (@ 20C)	N/A	-	7.08	6.98		8535917
Saturation pH (@ 4C)	N/A	-	7.33	7.23		8535919
Inorganics						
Total Ammonia-N	mg/L	-	0.20	0.085	0.050	8537793
Conductivity	umho/cm	-	530	620	1.0	8538222
Dissolved Organic Carbon	mg/L	-	2.7	3.1	0.40	8539272
Orthophosphate (P)	mg/L	-	<0.010	<0.010	0.010	8538245
pH	pH	6.5:8.5	7.67	7.83		8538197
Dissolved Sulphate (SO4)	mg/L	-	38	33	1.0	8538226
Alkalinity (Total as CaCO3)	mg/L	-	240	290	1.0	8538212
Dissolved Chloride (Cl-)	ug/L	-	1900	4200	1000	8538225
Nitrite (N)	mg/L	-	<0.010	<0.010	0.010	8538041
Nitrate (N)	mg/L	-	<0.10	0.68	0.10	8538041
Nitrate + Nitrite (N)	mg/L	-	<0.10	0.68	0.10	8538041
Metals						
Dissolved Aluminum (Al)	ug/L	-	7.0	24	4.9	8537644
Dissolved Antimony (Sb)	ug/L	20	<0.50	<0.50	0.50	8537644
Dissolved Arsenic (As)	ug/L	100	5.2	<1.0	1.0	8537644
Dissolved Barium (Ba)	ug/L	-	69	58	2.0	8537644
Dissolved Beryllium (Be)	ug/L	11	<0.40	<0.40	0.40	8537644

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

RCAP - COMPREHENSIVE (WATER)

Bureau Veritas ID			VEW488	VEW489		
Sampling Date			2023/03/02 12:35	2023/03/02 13:39		
COC Number			922632-01-01	922632-01-01		
	UNITS	**Criteria**	**MW106-19**	**MW201-22**	**RDL**	**QC Batch**
Dissolved Boron (B)	ug/L	200	16	10	10	8537644
Dissolved Cadmium (Cd)	ug/L	0.2	<0.090	<0.090	0.090	8537644
Dissolved Calcium (Ca)	ug/L	-	92000	99000	200	8537644
Dissolved Chromium (Cr)	ug/L	-	<5.0	<5.0	5.0	8537644
Dissolved Cobalt (Co)	ug/L	0.9	0.63	<0.50	0.50	8537644
Dissolved Copper (Cu)	ug/L	5	1.5	**5.4**	0.90	8537644
Dissolved Iron (Fe)	ug/L	300	**660**	<100	100	8537644
Dissolved Lead (Pb)	ug/L	5	<0.50	<0.50	0.50	8537644
Dissolved Magnesium (Mg)	ug/L	-	15000	19000	50	8537644
Dissolved Manganese (Mn)	ug/L	-	150	33	2.0	8537644
Dissolved Molybdenum (Mo)	ug/L	40	1.9	1.0	0.50	8537644
Dissolved Nickel (Ni)	ug/L	25	1.3	<1.0	1.0	8537644
Dissolved Phosphorus (P)	ug/L	-	<100	<100	100	8537644
Dissolved Potassium (K)	ug/L	-	3500	1500	200	8537644
Dissolved Selenium (Se)	ug/L	100	<2.0	<2.0	2.0	8537644
Dissolved Silicon (Si)	ug/L	-	2900	4300	50	8537644
Dissolved Silver (Ag)	ug/L	0.1	<0.090	<0.090	0.090	8537644
Dissolved Sodium (Na)	ug/L	-	2100	2200	100	8537644
Dissolved Strontium (Sr)	ug/L	-	130	150	1.0	8537644
Dissolved Thallium (Tl)	ug/L	0.3	<0.050	<0.050	0.050	8537644
Dissolved Titanium (Ti)	ug/L	-	<5.0	<5.0	5.0	8537644
Dissolved Uranium (U)	ug/L	5	2.1	4.9	0.10	8537644
Dissolved Vanadium (V)	ug/L	6	1.1	<0.50	0.50	8537644
Dissolved Zinc (Zn)	ug/L	30	<5.0	<5.0	5.0	8537644

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C361777
Report Date: 2023/03/08

MTE Consultants Inc
Client Project #: 47030-200
Sampler Initials: BV

TEST SUMMARY

Bureau Veritas ID: VEW488
Sample ID: MW106-19
Matrix: Water

Collected: 2023/03/02
Shipped:
Received: 2023/03/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8538212	N/A	2023/03/07	Kien Tran
Carbonate, Bicarbonate and Hydroxide	CALC	8535921	N/A	2023/03/08	Automated Statchk
Chloride by Automated Colourimetry	KONE	8538225	N/A	2023/03/08	Massarat Jan
Conductivity	AT	8538222	N/A	2023/03/07	Kien Tran
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8539272	N/A	2023/03/07	Gyulshen Idriz
Hardness (calculated as CaCO3)		8535915	N/A	2023/03/07	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	8537644	N/A	2023/03/07	Nan Raykha
Ion Balance (% Difference)	CALC	8535916	N/A	2023/03/08	Automated Statchk
Anion and Cation Sum	CALC	8535918	N/A	2023/03/08	Automated Statchk
Total Ammonia-N	LACH/NH4	8537793	N/A	2023/03/07	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	8538041	N/A	2023/03/08	Chandra Nandlal
pH	AT	8538197	2023/03/07	2023/03/07	Kien Tran
Orthophosphate	KONE	8538245	N/A	2023/03/08	Massarat Jan
Sat. pH and Langelier Index (@ 20C)	CALC	8535917	N/A	2023/03/08	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	8535919	N/A	2023/03/08	Automated Statchk
Sulphate by Automated Turbidimetry	KONE	8538226	N/A	2023/03/08	Massarat Jan
Total Dissolved Solids (TDS calc)	CALC	8535920	N/A	2023/03/08	Automated Statchk

Bureau Veritas ID: VEW489
Sample ID: MW201-22
Matrix: Water

Collected: 2023/03/02
Shipped:
Received: 2023/03/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8538212	N/A	2023/03/07	Kien Tran
Carbonate, Bicarbonate and Hydroxide	CALC	8535921	N/A	2023/03/08	Automated Statchk
Chloride by Automated Colourimetry	KONE	8538225	N/A	2023/03/08	Massarat Jan
Conductivity	AT	8538222	N/A	2023/03/07	Kien Tran
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8539272	N/A	2023/03/07	Gyulshen Idriz
Hardness (calculated as CaCO3)		8535915	N/A	2023/03/07	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	8537644	N/A	2023/03/07	Nan Raykha
Ion Balance (% Difference)	CALC	8535916	N/A	2023/03/08	Automated Statchk
Anion and Cation Sum	CALC	8535918	N/A	2023/03/08	Automated Statchk
Total Ammonia-N	LACH/NH4	8537793	N/A	2023/03/07	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	8538041	N/A	2023/03/08	Chandra Nandlal
pH	AT	8538197	2023/03/07	2023/03/07	Kien Tran
Orthophosphate	KONE	8538245	N/A	2023/03/08	Massarat Jan
Sat. pH and Langelier Index (@ 20C)	CALC	8535917	N/A	2023/03/08	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	8535919	N/A	2023/03/08	Automated Statchk
Sulphate by Automated Turbidimetry	KONE	8538226	N/A	2023/03/08	Massarat Jan
Total Dissolved Solids (TDS calc)	CALC	8535920	N/A	2023/03/08	Automated Statchk

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.3°C

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C361777
Report Date: 2023/03/08

QUALITY ASSURANCE REPORT

MTE Consultants Inc
Client Project #: 47030-200
Sampler Initials: BV

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8537644	Dissolved Aluminum (Al)	2023/03/07	109	80 - 120	96	80 - 120	<4.9	ug/L		
8537644	Dissolved Antimony (Sb)	2023/03/07	115	80 - 120	104	80 - 120	<0.50	ug/L	NC	20
8537644	Dissolved Arsenic (As)	2023/03/07	109	80 - 120	101	80 - 120	<1.0	ug/L	NC	20
8537644	Dissolved Barium (Ba)	2023/03/07	108	80 - 120	100	80 - 120	<2.0	ug/L	1.1	20
8537644	Dissolved Beryllium (Be)	2023/03/07	111	80 - 120	102	80 - 120	<0.40	ug/L	NC	20
8537644	Dissolved Boron (B)	2023/03/07	108	80 - 120	102	80 - 120	<10	ug/L	1.8	20
8537644	Dissolved Cadmium (Cd)	2023/03/07	107	80 - 120	99	80 - 120	<0.090	ug/L	3.3	20
8537644	Dissolved Calcium (Ca)	2023/03/07	NC	80 - 120	97	80 - 120	<200	ug/L		
8537644	Dissolved Chromium (Cr)	2023/03/07	107	80 - 120	98	80 - 120	<5.0	ug/L	NC	20
8537644	Dissolved Cobalt (Co)	2023/03/07	106	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
8537644	Dissolved Copper (Cu)	2023/03/07	111	80 - 120	99	80 - 120	<0.90	ug/L	0.93	20
8537644	Dissolved Iron (Fe)	2023/03/07	108	80 - 120	101	80 - 120	<100	ug/L		
8537644	Dissolved Lead (Pb)	2023/03/07	105	80 - 120	98	80 - 120	<0.50	ug/L	2.7	20
8537644	Dissolved Magnesium (Mg)	2023/03/07	NC	80 - 120	99	80 - 120	<50	ug/L		
8537644	Dissolved Manganese (Mn)	2023/03/07	106	80 - 120	99	80 - 120	<2.0	ug/L		
8537644	Dissolved Molybdenum (Mo)	2023/03/07	119	80 - 120	102	80 - 120	<0.50	ug/L	5.0	20
8537644	Dissolved Nickel (Ni)	2023/03/07	101	80 - 120	96	80 - 120	<1.0	ug/L	0.27	20
8537644	Dissolved Phosphorus (P)	2023/03/07	116	80 - 120	104	80 - 120	<100	ug/L		
8537644	Dissolved Potassium (K)	2023/03/07	115	80 - 120	102	80 - 120	<200	ug/L		
8537644	Dissolved Selenium (Se)	2023/03/07	106	80 - 120	97	80 - 120	<2.0	ug/L	NC	20
8537644	Dissolved Silicon (Si)	2023/03/07	109	80 - 120	98	80 - 120	<50	ug/L		
8537644	Dissolved Silver (Ag)	2023/03/07	109	80 - 120	104	80 - 120	<0.090	ug/L	NC	20
8537644	Dissolved Sodium (Na)	2023/03/07	NC	80 - 120	98	80 - 120	<100	ug/L	0.88	20
8537644	Dissolved Strontium (Sr)	2023/03/07	NC	80 - 120	101	80 - 120	<1.0	ug/L		
8537644	Dissolved Thallium (Tl)	2023/03/07	107	80 - 120	100	80 - 120	<0.050	ug/L	3.0	20
8537644	Dissolved Titanium (Ti)	2023/03/07	110	80 - 120	97	80 - 120	<5.0	ug/L		
8537644	Dissolved Uranium (U)	2023/03/07	109	80 - 120	97	80 - 120	<0.10	ug/L	0.12	20
8537644	Dissolved Vanadium (V)	2023/03/07	108	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
8537644	Dissolved Zinc (Zn)	2023/03/07	103	80 - 120	99	80 - 120	<5.0	ug/L	3.5	20
8537793	Total Ammonia-N	2023/03/07	90	75 - 125	97	80 - 120	<0.050	mg/L	NC	20
8538041	Nitrate (N)	2023/03/08	94	80 - 120	101	80 - 120	<0.10	mg/L	NC	20

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8538041	Nitrite (N)	2023/03/08	104	80 - 120	109	80 - 120	<0.010	mg/L	NC	20
8538197	pH	2023/03/07			102	98 - 103			0.28	N/A
8538212	Alkalinity (Total as CaCO3)	2023/03/07			97	85 - 115	<1.0	mg/L	0.0078	20
8538222	Conductivity	2023/03/07			101	85 - 115	<1.0	umho/cm	0.088	25
8538225	Dissolved Chloride (Cl-)	2023/03/08	86	80 - 120	94	80 - 120	<1000	ug/L	1.9	20
8538226	Dissolved Sulphate (SO4)	2023/03/08	NC	75 - 125	96	80 - 120	<1.0	mg/L	1.7	20
8538245	Orthophosphate (P)	2023/03/08	88	75 - 125	104	80 - 120	<0.010	mg/L	5.0	20
8539272	Dissolved Organic Carbon	2023/03/07	96	80 - 120	99	80 - 120	<0.40	mg/L	3.6	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C361777
Report Date: 2023/03/08

MTE Consultants Inc
Client Project #: 47030-200
Sampler Initials: BV

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

[redacted]

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by {0}, {1} responsible for {2} {3} laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel (905) 817-5700 Toll-free 800-563-6266 Fax (905) 817-5777 www.bvna.com

REC'D IN LONDON

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#6868 MTE Consultants Inc	Company Name:	MTE Consultants INC	Quotation #:	C25343	Bureau Veritas Job #:	Bottle Order #: 922632
Attention:	Accounts Payable	Attention:	Alison Schincariol	P.O. #:			
Address:	520 Bingemans Centre Dr Kitchener ON N2B 3X9	Address:	123 St George	Project:	47030-200	COC #: C#922632-01-01	Project Manager: Ankita Bhalla
Tel:	(519) 743-6500 Fax: (519) 743-6513	Tel:	Fax:	Project Name:			
Email:	accounting@mte85.com	Email:	ASchincariol@mte85.com	Site #:			
				Sampled By:			

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☒ PWQO ☐ Reg 406 Table ___
- ☐ Other ___

Special Instructions
compare to PWQO & lower detection limits where applicable

Include Criteria on Certificate of Analysis (Y/N)? ___

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / CrVI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): RCAp - Comprehensive	# of Bottles	Comments
1	MW106-19	MW106-19	2 March 2023	12.35	GW	Y	X	4	
2	MW201-22	MW201-22	↓	1:39	↓	Y	X	4	
3									
4									
5									
6									
7									
8									
9									
10									On Ice

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☐
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

02-Mar-23 16:25
Ankita Bhalla
C361777
AJH ENV-1465

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
[redacted]	23/03/02		[redacted]	2023/03/02	16:25			6, 7, 6	Present		✓
				2023/03/03	16:30				Intact		✓

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

Exceedance Summary Table – Prov. Water Quality Obj.

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
MW106-19	VEW488-03	Dissolved Iron (Fe)	300	660	100	ug/L
MW201-22	VEW489-03	Dissolved Copper (Cu)	5	5.4	0.90	ug/L

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com