# Proposed Warehouse Development

FINAL

## Preliminary Hydrogeological Assessment

**Project Location:**
12892 Dixie Road, Caledon, Ontario

**Prepared for:**
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**MTE File No.:** 48043-300

*Engineers, Scientists, Surveyors.*

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# 1.0 Introduction

MTE Consultants Inc. (MTE) was retained by Tribal Partners (Canada) Inc. (Tribal) to carry out a preliminary hydrogeological assessment to support the proposed development of 12892 Dixie Road in Caledon, Ontario (hereinafter referred to as the "Site"). The approximate location of the Site is shown on **Figure 1**.

The Site is approximately 78.9 hectares (~195 acres) in area and is located on the west side of Dixie Road and the south side of Old School Road in an agricultural area of Caledon, Ontario. The Site is currently agricultural cropland with rural residences and associated outbuildings.

Based on the Concept Plan prepared by Baldassarra Architects Inc., the Site will be developed as an industrial warehousing complex consisting of four slab on-grade buildings with associated at-grade parking and stormwater management facilities. A copy of the Concept Plan is provided in **Appendix A**.

## 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

A Phase I environmental investigation was completed by MTE (report dated September 30, 2020). The Phase I recommended that a Phase II ESA be completed, which was undertaken concurrently with this investigation. The results of the Phase II ESA were provided under separate cover.

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

To support the design of the proposed development, a concurrent geotechnical investigation was also completed by MTE.

Although the results of the concurrent geotechnical and Phase II ESA investigations are provided under separate cover, relevant subsurface information has been reviewed and incorporated into the hydrogeological assessment, where appropriate.

In addition, the following additional studies have been undertaken concurrently by WSP to support the proposed development and may be relevant to the hydrogeological assessment:

- Comprehensive Environmental Impact Study and Management Plan (CEISMP);
- Stormwater Management Report; and
- Functional Servicing Report.

## 2.2 Terrain

### 2.2.1 Topography and Drainage

Based on a Plan of Survey prepared by R. Avis Surveying Inc., the Site topography slopes gently downwards to the east and north, with ground surface elevations ranging from a topographic high elevation of approximately 272.2 m above mean sea level (AMSL) in the west near Old School Road to a topographic low of approximately 259.8 m AMSL within the meander belt of Kilamanagh Creek in the southern portion of the Site.

Kilamanagh Creek is a tributary of the West Humber River. The tributary enters the Site from the south before turning east and flowing off-Site. The approximate length (ignoring sinuosity) of the on-Site reach of the tributary is 220 m.

In the northwest of the Site, another tributary of the West Humber River (Tributary 5) enters the Site through a culvert beneath Old School Road, flows southeast for approximately 410 m before turning east and leaving the Site through a culvert beneath Dixie Road.

There are three other tributaries of the West Humber, designated Tributaries 2, 3 and 4, that originate on the Site: two within the woodland and one south of the farm buildings.

### 2.2.2 Physiography

The landforms within the region are primarily the result of the movement and deposition of sediments as a result of glacial advancement and recession during the most recent periods of glaciation. The Site is located within the broad physiographic region known as the South Slope (Chapman & Putnam, 1984). This region is a sloping till plain that extends from the Oak Ridges Moraine located approximately 8 kilometers (km) northwest of the Site to the Peel Plain, located approximately 4 km to the east.

## 2.3 Regional Geology

### 2.3.1 Overburden

The Quaternary deposits in the region of the Site are mapped as a predominantly clay to silt textured till derived from glaciolacustrine deposits (Ontario Geological Survey, 2003). Along the northeastern boundary of the Site, modern alluvial deposits consisting of clay, silt, sand and gravel can also be found (Ontario Geological Survey, 2003). The Quaternary geology in the vicinity of the Site is shown on **Figure 2**.

### 2.3.2 Bedrock

Bedrock topography mapping suggests the elevation of the bedrock surface in the vicinity of the Site ranges from approximately 236 m AMSL in the north to 244 m AMSL in the south (Ontario Department of Mines, 1968). The bedrock consists of Upper Ordivician shales and siltstones of the Queenston Formation (Fm) (Armstrong & Dodge, 2007). The Queenston Formation is characterized by red shale; however, it also contains red siltstone, minor green shale and siltstone, with variable calcareous siltstone to sandstone and limestone interbeds (Johnson, Armstrong, Sanford, Telford, & Rutka, 1992). The Queenston Formation gradationally overlies the Georgian Bay Formation and the Carlsbad Formation in eastern Ontario (Armstrong & Dodge, 2007).

## 2.4 Regional Hydrogeology

### 2.4.1 Water Well Information System

The MECP Water Well Information System (WWIS) was queried for data pertaining to all wells located within an approximate 500 m radius of the Site and resulted in data for 39 wells. The well records corresponded to the following:

- Seventeen records were for wells reportedly used as a water supply;
    a. These wells were primarily completed within deep confined overburden or bedrock aquifers;
    b. These records included six large diameter bored or dug wells completed at intermediate depths within the glacial till that are anticipated to have low yields and rely on interbedded granular deposits as their source;
- Eleven records were reported to be used as monitoring, test hole or observation wells;
- Six records were for wells reported to have been abandoned; and
- Five records did not include information on well status or use.

The approximate locations of these wells, as indicated in the MECP well records, are shown on **Figure 3**. Pertinent information from these well records is summarized in **Table 1**.

### 2.4.2 Permit to Take Water Database

The MECP Permit to Take Water (PTTW) database contained only one inactive permit that was issued for a surface water taking approximately 200 m South of the Site. The record was active from 1973 to 1978 for a daily water taking of 412, 413 litres per day (L/day) from the West Humber River for agricultural purposes (Ministry of the Environment, Conservation and Parks, 2021).

### 2.4.3 Source Protection

The Source Protection Information Atlas (Ministry of Environment, Conservation and Parks, 2021) was used to confirm that the Site is not within:

- an Intake Protection Zone (IPZ);
- a Wellhead Protection Area (WHPA);

- a Highly Vulnerable Aquifer (HVA); or
- a Significant Groundwater Recharge Area (SGRA).

### 2.5 Natural Heritage Features

No Environmentally Significant Areas (ESAs) (Region of Peel, 2008) or Areas of Natural and Science Interest (ANSIs) were identified within 500 m of the Site (Land Information Ontario, 2020). A Provincially Significant Wetland (PSW), associated with the Heart Lake Wetland Complex swamp, is located approximately 495 m southeast of the Site (Land Information Ontario, 2020).

The CEISMP identified the following local natural heritage features in the vicinity of the Site:

- A woodland located in the central portion of the Site;
- Kilamanagh Creek (designated as coldwater) and associated riparian area in the southwest portion of the Site;
- Four other tributaries of the West Branch of the Humber River;
    a. Tributaries 2 and 3 are intermittent/ephemeral in nature and convey flows through the woodland to an online pond, prior to being conveyed off-property under Dixie Road;
    b. Tributary 4 and associated riparian wetland, originating south of the farm buildings, conveying flows through an adjacent residential property before being conveyed under Dixie Road to the east; and
    c. Tributary 5 and associated riparian wetland, originating north of Old School Road, flowing southeast through the Site before being conveyed under Dixie Road to the east.

The approximate locations of the above natural heritage features are shown on Figures 1 and 2 in **Appendix G**. For detailed information on these features, reference should be made to the CEISMP (WSP, 2021).

No groundwater dependent plant species were identified on-Site during the fieldwork completed for the CEISMP (WSP, 2021).

## 3.0 Field Investigation

### 3.1 Drilling Program

The drilling program for the concurrent geotechnical investigation was carried out between October 12 and October 30, 2020. Forty-one boreholes, designated BH101-20 to BH141-20, were drilled at the approximate locations shown on **Figure 4.** The boreholes were advanced with a CME 75 track-mounted drill rig equipped with continuous flight hollow stem augers. The drill rig was supplied and operated by Tri-Phase Group under the supervision of MTE. 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

Upon completion of drilling, monitoring wells were installed in seven boreholes and designated MW101-20 to MW107-20. The remaining boreholes were backfilled in general accordance with Ontario Regulation (O.Reg.) 903, as amended, under the Ontario Water Resources Act.

Monitoring wells MW102-20 to MW104-20, MW106-20 and MW107-20 were screened within the saturated granular deposits interbedded within the glacial till. MW101-20 and 105-20 were screened within the glacial till deposits. Each of the monitoring wells were constructed with 0.9 to 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 bentonite to near ground surface and hydrated in place. The monitoring wells were 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**. The approximate locations of the monitoring wells are shown on **Figure 4**.

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).

## 3.3 Staff Gauges

On November 19, 2020 two staff gauges, designated SG1 and SG2, were installed within the on-Site watercourses in order to monitor stage and assess groundwater and surface water interactions. The staff gauge locations are shown in **Figure 4.**

A third staff gauge was proposed to be installed within a watercourse reportedly flowing through the wooded area and discharging into a dugout pond. A dry swale was observed during the site visit. Three corrugated steel pipes were observed to outlet from the agricultural field at the "headwaters" of the swale, but were not discharging at that time. The outlet of these steel pipes leading from the farm field suggests some form of field drainage system is present and that the watercourse within the wooded area is ephemeral.

## 3.4 Elevation Survey

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

### 3.5 Hydraulic Conductivity Testing

Single well response tests were conducted in monitoring wells MW101-20, MW103-20, MW106-20 and MW107-20 to estimate the hydraulic conductivity of the saturated granular deposits confined beneath the glacial till deposits at the Site and to confirm the hydraulic conductivity of the glacial till. 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 water level dataset collected during the single well response tests was analyzed using the AquiferTest Pro software package. Hydraulic conductivity ($K$) values for each test were estimated using the Hvorslev analytical solution (Hvorslev, 1951). The results of the single well response tests are provided in **Appendix D** and summarized in **Table 2**.

The results of the hydraulic testing analyses indicate that the estimated $K$ values for the confined granular deposits range between approximately 2 x $10^{-5}$ and 7 x $10^{-7}$ m per second (m/s), with a geometric mean of approximately 3 x $10^{-6}$ m/s (n = 7). 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 silt, silty sand, and sand deposits.

In comparison, the results of the single well response testing on MW101-20 estimate a hydraulic conductivity of 8 x $10^{-8}$ m/s (n = 2) for the glacial till deposits.

### 3.6 Monitoring Program

Pressure transducers equipped with dataloggers were installed in six monitoring wells (MW101-20 to MW103-20 and MW105-20 to MW107-20). The dataloggers were configured to record water levels at one hour intervals and the data downloaded on a quarterly basis. 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 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 and surface water levels were manually measured in all seven monitoring wells and at the two staff gauge locations during each quarterly monitoring event. The results obtained over the period of record (November to December 2020) are summarized in **Table 3**.

Quarterly download of the dataloggers and manual measurement of groundwater and surface water levels will continue until September 2021, at which time the continuation of the groundwater monitoring will be reassessed.

## 4.0 Hydrostratigraphy

### 4.1 Stratigraphy

In general, the stratigraphic conditions encountered in the boreholes typically consisted of topsoil and/or surficial fill materials overlying glacial till deposits. The till ranged in composition from sandy silt to clayey silt. Cobbles and/or boulders should be anticipated in glacial till deposits. **Table 4.1** summarizes the variability in the particle size composition within the glacial tills.

**Table 4.1 – Particle Size Distribution Results for Glacial Tills**

| Borehole ID | Sample Depth (m) | Gravel (%) | Sand (%) | Silt (%) | Clay (%) |
|---|---|---|---|---|---|
| MW101-20 | 9.1 – 9.8 | 6 | 40 | 41 | 13 |
| MW103-20 | 6.1 – 6.7 | 1 | 26 | 66 | 7 |
| MW105-20 | 4.6 – 5.0 | 1 | 28 | 43 | 28 |
| BH116-20 | 3.0 – 3.7 | 7 | 25 | 40 | 28 |

Granular deposits were interbedded within the glacial till and ranged in composition from silt to silty sand to gravelly sand to sand and gravel. **Table 4.2** summarizes the variability in the particle size composition within the granular deposits.

**Table 4.2 – Particle Size Distribution Results for Granular Deposits**

| Borehole ID | Sample Depth (m) | Gravel (%) | Sand (%) | Silt (%) | Clay (%) |
|---|---|---|---|---|---|
| MW104-20 | 9.9 – 10.5 | 1 | 70 | 22 | 7 |
| MW106-20 | 10.7– 11.3 | 1 | 9 | 78 | 12 |
| MW107-20 | 9.9 – 10.5 | 8 | 44 | 35 | 15 |

The till deposits are considered an aquitard ($K$ ~ 8 x $10^{-8}$ m/s) and act as a confining layer for the saturated granular deposits ($K$ ~ 3 x $10^{-6}$ m/s). These granular deposits were encountered at elevations ranging from approximately 264.5 to 255.1 m AMSL, corresponding to depths ranging from 3.0 to 11.1 m BGS and, where fully penetrated, were approximately 0.3 to 2.0 m in thickness.

The simplified stratigraphy inferred from the boreholes is shown on the cross-sections provided on **Figure 5**, **Figure 6** and **Figure 7**.

## 4.2 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 groundwater elevations within the confined granular deposits have ranged from a maximum of 262.56 m AMSL to a minimum of 257.30 m AMSL over the monitoring period to date (November to December 2020). The hydrographs show a muted response following significant precipitation events, remaining relatively consistent over the period of record.

The groundwater elevations at MW106-20 and MW107-20 are noted to be above the top of the aquifer indicating artesian conditions.

It is noted that the monitoring period to date has coincided with a period when regional groundwater levels in southern Ontario are typically increasing as they rise towards their seasonally high levels in the late winter or early spring and then begin to decline towards their

seasonally low levels, which generally occur in late summer or early fall. For the purposes of design, groundwater elevations potentially one metre higher should be anticipated during the period of seasonally high groundwater levels following the spring freshet. Groundwater monitoring at the Site is currently scheduled to continue until September 2021. The amplitude of the seasonal variation will be further assessed following completion of the proposed monitoring period.

Because MW101-20 and MW105-20 were constructed with their well screens within the low permeability glacial till deposits, caution should be used when interpreting their groundwater level measurements. In general, groundwater level measurements within an aquitard should be limited to assessing vertical gradients within or between strata.

**Figure 8** shows the inferred potentiometric surface and flow direction across the Site for December 2020. The results indicate that the groundwater flow direction is generally towards the east, with observed gradients (i.e., slope) of 0.004 to 0.006 m/m over the Site.

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.

### 4.3 Groundwater and Surface Water Quality

Groundwater was sampled from two representative monitoring wells (MW106-20 and MW107-20) on November 23, 2020. 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.

A surface water sample was also collected from each of the two tributaries in the vicinity of their corresponding staff gauge (SG1 and SG2).

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 to the Bureau Veritas Laboratories (BV Labs) depot in London, Ontario for analysis at their Mississauga laboratory.

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

The samples were analyzed for a suite of general water quality parameters to establish a water quality baseline prior to development and assess groundwater-surface water interactions. The analytical results were compared to the Provincial Water Quality Objectives (PWQO) and there were no reported exceedances. The results are summarized in **Table 4** and a copy of the laboratory Certificate of Analysis is provided in **Appendix F**.

## 5.0 Water Balance

Water balances for the pre- and post-development conditions were completed for the Site to assess potential impacts of the proposed development on infiltration.

## 5.1 Methodology

Following the Thornthwaite and Mather (1957) approach, the annualized water balance for the Site may be expressed as:

$$P = RO + ET + I + \Delta S$$

Where:

| | |
|---|---|
| $P$ | = precipitation |
| $RO$ | = runoff |
| $ET$ | = evapotranspiration |
| $I$ | = infiltration |
| $\Delta S$ | = change in groundwater storage (assumed to be negligible over long term) |

The difference between precipitation and evapotranspiration is the water surplus ($WS$) available for infiltration ($I$) and runoff ($RO$).

$$WS = P - ET$$

The water surplus is used to estimate infiltration by applying an infiltration factor ($IF$).

$$I = WS \, x \, IF$$

This infiltration factor ($IF$) is estimated based on topography, soil type and ground cover, as described in the MECP Stormwater Management Planning and Design Manual (Ministry of the Environment, 2003).

And finally, runoff ($RO$) is estimated from:

$$RO = WS - I$$

The following sections provide a summary of the on-Site catchments and input parameters for the water balance equation.

### 5.1.1 Catchment Areas

Details of the catchments for the pre- and post-development conditions are described in the *Stormwater Management Report* (WSP, 2021b).

The pre- and post-development catchments are shown on **Figure 9** and **Figure 10**, respectively, which include details on the total area of each catchment and the percentage of impervious area within the catchment.

### 5.1.2 Precipitation

The average annual precipitation measured at the Toronto Lester B. Pearson International Airport Climate Station (Climate ID 6158733) for the period from 1981 to 2010 was 786 millimetres per year (mm/yr) (Environment Canada, 2021).

### 5.1.3 Evapotranspiration

The average annual evapotranspiration rates were determined using the MECP Stormwater Management Planning and Design Manual (Ministry of the Environment, 2003), which provides

a range of evapotranspiration values depending on ground and vegetative cover and the hydrologic soil group.

### 5.2 Results

The results of the water balance for the Site are summarized below in **Table 5.1** and a copy of the water balance worksheet is provided in **Appendix G**.

**Table 5.1 – Water Balance Summary**

| Parameter | Pre-Development [$m^3$/year] | Post-Development (Unmitigated) [$m^3$/year] | Difference [$m^3$/year] | % Change [%] |
|---|---|---|---|---|
| Precipitation (P) | 619,800 | 619,800 | 0 | 0 |
| Evapotranspiration (ET) | 352,300 | 136,500 | -215,800 | -61 |
| Infiltration (I) | 137,200 | 36,500 | -100,700 | -73 |
| Runoff (RO) | 130,400 | 446,800 | 316,400 | 243 |

NOTES:
1. Negative value indicates a decrease following development.

The proposed development is anticipated to increase the impervious surface area of the Site from effectively nil under the existing conditions to approximately 76% following development. This is anticipated to result in an estimated decrease in infiltration of approximately 73% and increase in runoff of approximately 243%. Mitigation strategies are discussed in Section 7.3.1.

### 5.3 Next Steps

As part of the detailed design and in consultation with the Toronto Region Conservation Authority (TRCA), feature-based water balances will be completed for sensitive ecological features identified as runoff dependent. Where feasible, the feature-based water balances should use site-specific data and include scenarios for pre-development, unmitigated post-development and mitigated post-development.

## 6.0 Dewatering Review

The following sections provide a qualitative discussion of the potential dewatering and 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 findings described herein.

## 6.1 Temporary Construction Dewatering

### 6.1.1 Services

The proposed development will be municipally serviced with piped water supply, storm and sanitary sewers. Inverts for the watermain and sewers are assumed to be at conventional depths of up to approximately 3 m BGS.

Although proactive construction dewatering is not anticipated to be required, saturated granular deposits were encountered as interbeds within the glacial till at variable depths and locations. Should excavations encounter these saturated granular deposits, temporary construction dewatering may be required to control groundwater inflow from these deposits.

Nuisance dewatering of groundwater seepage will be required where trench excavations for the services encounter sand/silt seams within the glacial till. Groundwater seepage from these sand/silt seams should be adequately handled by pumping from properly constructed sumps.

### 6.1.2 Foundations

It is understood that the floor slab for the four proposed warehouse buildings (Buildings A, B, C and D) will be constructed using conventional concrete slab-on-grade techniques with footing depths of approximately 1.4 m BGS. The approximate locations of the buildings are shown on **Figure 10**.

Given the shallow foundations used for slab-on-grade buildings, construction dewatering is not anticipated to be required for their excavation.

### 6.1.3 Stormwater Management Areas

The proposed development plan includes four Stormwater Management (SWM) facilities (SWM Areas A, B, C and D). The approximate locations of these areas are shown of **Figure 10**.

Although proactive construction dewatering is not anticipated to be required, saturated granular deposits were encountered as interbeds within the glacial till at variable depths and locations. Should excavations encounter these saturated granular deposits, temporary construction dewatering may be required to control groundwater inflow from these deposits.

Nuisance dewatering of groundwater seepage will be required where excavations for the stormwater management facilities encounter sand/silt seams within the glacial till. Groundwater seepage from these sand/silt seams should be adequately handled by pumping from properly constructed sumps.

## 6.2 Dewatering Permitting Requirements

Based on the encountered subsurface conditions, it is our opinion that with appropriate staging and scheduling considerations, the daily water taking volumes for nuisance dewatering within open excavations should be less than the threshold of 50,000 litres per day (L/day) above which a water taking permit is required. However, should excavations encounter the saturated granular deposits interbedded within the glacial till, the daily water taking volumes may exceed 50,000 L/day and an Environmental Activity Sector Registration (EASR) would be required.

An EASR is required for temporary construction dewatering with daily pumping volumes greater than 50,000 L/day, but less than 400,000 L/day. This is an online registration supported by Water Taking and Discharge Plans prepared by a Qualified Professional (QP). At least two weeks should be allowed in the project schedule to prepare the supporting documents and complete the online registration.

As a precaution, it is recommended that an EASR be obtained to avoid potential delays should these interbedded saturated granular deposits be encountered during excavation. Obtaining an EASR also has the benefit of maintaining staging and scheduling flexibility should large areas or multiple excavations require concurrent nuisance dewatering.

# 7.0 Preliminary Impact Assessment

## 7.1 Inventory of Groundwater Receptors

### 7.1.1 Water Supply Wells

Based on the MECP WWRs, water supply wells within 500 metres of the Site are primarily completed within deep confined overburden or bedrock aquifers. However, six large diameter bored or dug wells completed at intermediate depths within the glacial till were identified. These wells are anticipated to have low yields and rely on sand/silt seams and/or interbedded granular deposits as their source. The approximate locations of the water supply wells, as provided in the WWRs, are shown on **Figure 4**.

### 7.1.2 Watercourses

Five watercourses were identified on-Site:

- Two permanent tributaries of the West Humber River;
- One intermittent/ephemeral watercourse originating south of the farm buildings; and
- Two intermittent/ephemeral watercourses located within the central woodland and discharging to an on-line pond.

The approximate locations of these watercourses are shown on Figure 1 (WSP, 2021) in **Appendix G.**

Given the low permeability of the shallow sediments, as well as the observed separation between the channel beds and groundwater levels at the Site, groundwater is not anticipated to contribute to flow within these watercourses in the vicinity of the Site.

### 7.1.3 Wetlands

As discussed in Section 0, the CEISMP identified wetland communities (Reed Canary Grass Mineral Meadow Marsh) along the riparian zones of Tributaries 4 and 5 of the West Humber River and Kilamanagh Creek. The approximate locations of these wetland communities are shown on Figure 2 (WSP, 2021) in **Appendix G**.

Based on the low permeability of the encountered glacial till and apparent separation from groundwater, the hydraulic functions of the identified wetland communities are not considered to

be dependent on groundwater. It is anticipated that the hydrologic function of these wetlands is primarily supported by runoff.

## 7.2 Potential Groundwater Impacts during Construction

### 7.2.1 Temporary Construction Dewatering

It is anticipated that only nuisance dewatering of groundwater seepage from sand/silt seams within the glacial till will be required during construction. The nuisance dewatering would be completed using sumps and pumps is not anticipated to have a significant impact on nearby groundwater receptors.

In the event that construction dewatering is required to control groundwater inflow into excavations from saturated granular deposits, the low yield large diameter water supply wells located within approximately 250 metres of the Site may be susceptible to well interference during temporary construction dewatering. The potential impact on these water supply wells would be further assessed during preparation of the supporting documentation for an EASR.

Given that the identified watercourses and wetland community are not considered to be dependent on groundwater, no impacts to these natural heritage features are anticipated as a result of temporary construction dewatering.

No other groundwater related impacts are anticipated should construction dewatering be required.

### 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 groundwater.

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, if any; and
- implementing a spill contingency plan during construction.

With the above control measures in place, the residual risk of spills potentially impacting shallow groundwater is considered to be very low.

### 7.2.3 Water Supply Wells

Since proactive construction dewatering is not anticipated to be required, potential impacts to water supply wells in the vicinity of the Site are anticipated to be limited to spills and vibrations from heavy construction equipment. As discussed in Section 7.2.2, the risks from spills is minimized by implementing BMPs for refueling and maintenance activities. Vibrations from heavy construction equipment may disturb existing accumulated sediment in the bottom of the well casing and/or scale from the walls of the casing temporarily resulting in an increase in Total Suspended Solids (TSS). 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 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 would be recommended for wells 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; 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 approximately 90% of the pre-development infiltration following development. Due to the low permeability of the surficial glacial till, the proposed LID mitigation measures must be suitably designed for use in fine-textured soils with percolation rates of less than 15 millimeters per hour (mm/hr).

Design considerations for infiltration in low permeability soils include, but are not limited to:

- Use of underdrains with storage reservoirs below the underdrain;
- Longer drawdown periods and overflows;
- Vertical orientation of storage to increase hydraulic head;
- Matric potential and groundwater mounding;
- Compaction of soils within footprint of facility by heavy machinery during construction; and
- Decrease in infiltration performance over time and system maintenance requirements.

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.

### 7.3.2 Groundwater Recharge

Though the Site is not considered to be an area of significant groundwater recharge, by implementing appropriate LID mitigation measures to maintain approximately 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 groundwater recharge is anticipated following development.

Furthermore, the agricultural drainage tile system discussed in Section 3.3 would intercept some component of the infiltrating rainwater pulse, effectively decreasing the realized groundwater recharge. Removal of the drainage tile system will further improve groundwater recharge.

### 7.3.3 Water Supply Wells

As discussed in Section 7.3.1, mitigation measures will be implemented to maintain approximately 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 Watercourses and Wetlands

As discussed in Sections 7.1.2 and 7.1.3, the watercourses and wetlands identified on-Site are not considered to be dependent on groundwater. No groundwater related impacts to these features are anticipated as a result of the proposed development.

# 8.0 Conclusions

Based on the foregoing discussion, it is concluded that:

i. Stratigraphic conditions consist of low permeability glacial till deposits ranging in composition from sandy silt to clayey silt interbedded with saturated granular deposits consisting of silt to silty sand to gravelly sand to sand and gravel.

ii. Groundwater elevations within the confined granular deposits ranged from a maximum of 262.56 m AMSL to a minimum of 257.30 m AMSL over the period of record.

iii. Artesian conditions may be encountered in the saturated granular deposits.

iv. Proactive construction dewatering or depressurization is not anticipated to be required to facilitate excavations for site services, foundations and/or stormwater management facilities, though there is the risk of encountering saturated granular deposits interbedded within the glacial till that may require dewatering. Nuisance dewatering may be required to control groundwater seepage from sand/silt seams within the glacial till.

v. The identified watercourses and associated wetland communities are not considered to be groundwater dependent.

vi. 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.

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

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

ix. 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 groundwater level monitoring program described above should be continued to provide up to date groundwater levels for final design, approvals, permitting, tendering and construction;

ii. As a precaution, it is recommended that an EASR be obtained to avoid potential delays if interbedded saturated granular layers are encountered during excavation within the glacial tills and to maintain staging and scheduling flexibility should large areas or multiple excavations require concurrent nuisance dewatering.

iii. 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 survey should be undertaken for properties that are not connected to a piped municipal water supply and are located within 250 metres of the Site.

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

x. 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.

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

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

xiii. Post-development runoff contributions to sensitive natural heritage areas should be similar to pre-development conditions. Mitigation of thermal impacts of the post-development runoff contributed to Kilamanagh Creek should be included in the stormwater management design.

xiv. In consultation with the TRCA, a feature-based water balance be completed for each sensitive ecological feature identified as runoff dependent.

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

# 10.0 Limitations

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 the Tribal Partners (Canada) 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.**


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PROFESSIONAL GEOSCIENTIST
JOHN D. McNEIL
PRACTISING MEMBER
2014
ONTARIO

MBC/JDM:vlf

M:\48043\300\8 - Deliverables\3 - Reports\R01\48043-300 20210223 FINAL Prelim HydroG - North Site.docx

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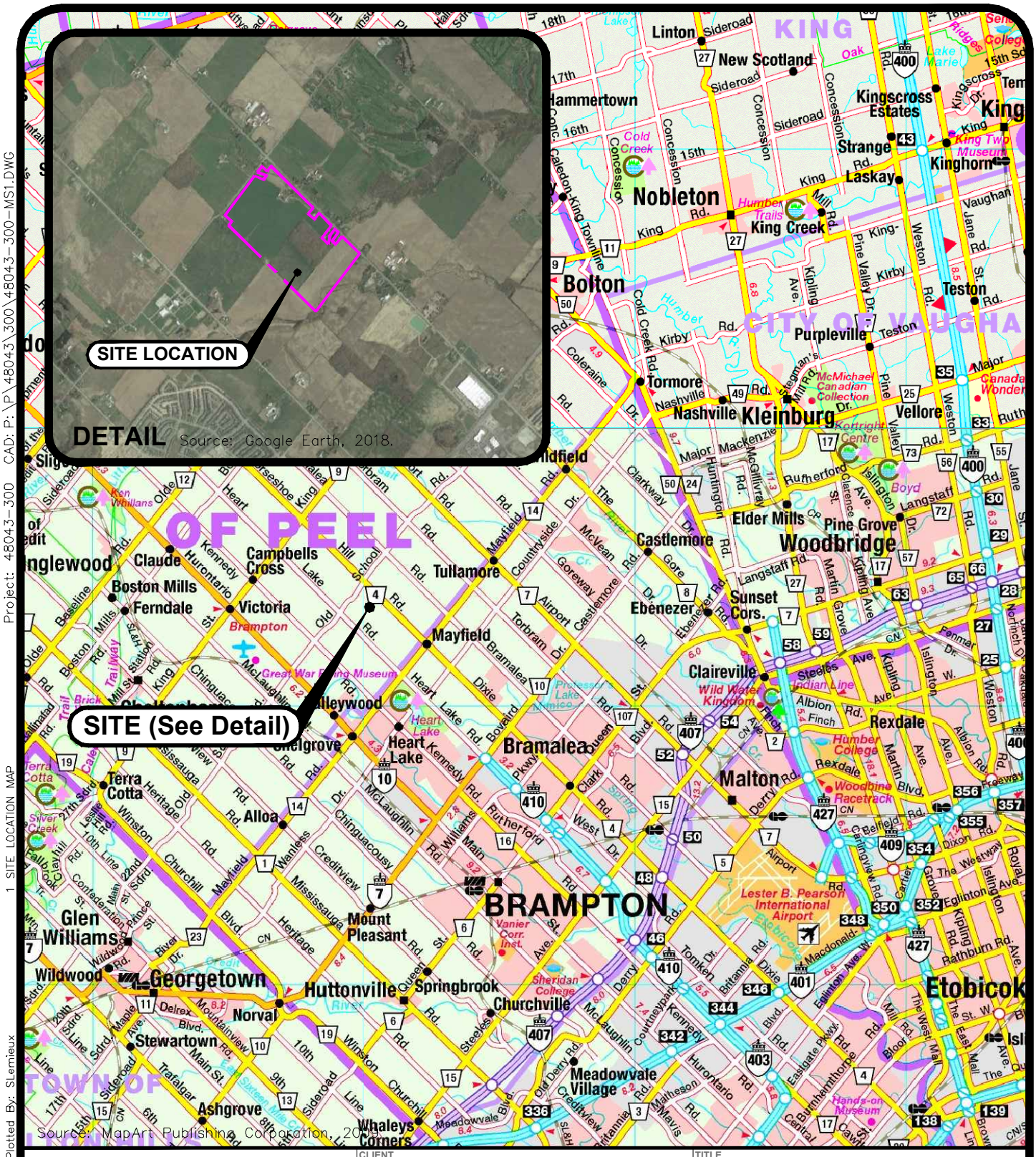
# Figures

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0 2 4 6 8 10km
Scale(8.5x11): 1:200 000

CLIENT
Tribal Partners Canada Inc.

PROJECT
Preliminary
Hydrogeological Assessment

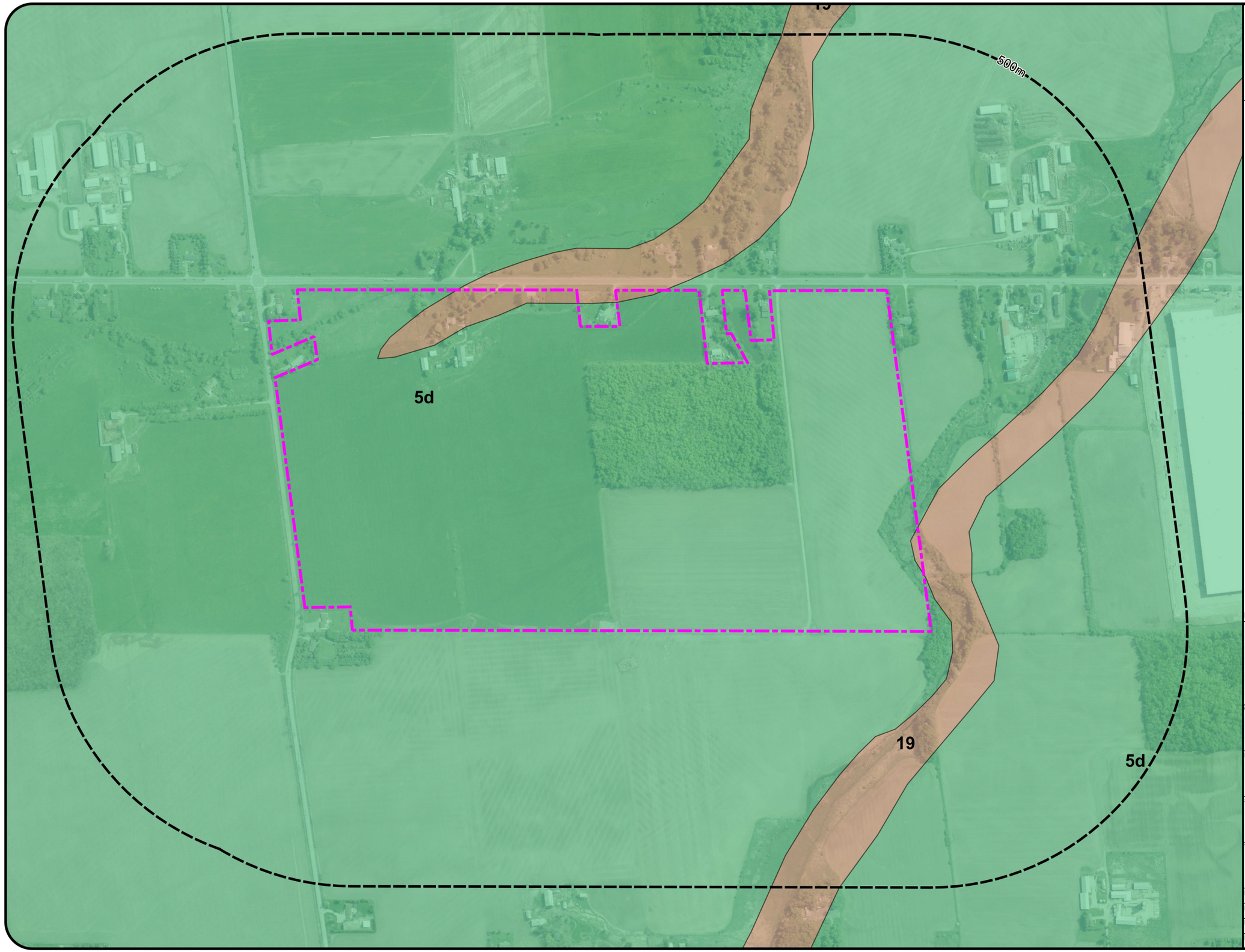
SITE
12892 Dixie Road
Caledon, ON

TITLE
**Site Location Map**

| | |
|---|---|
| Reviewed By | JDM |
| Prepared By | MBC |
| Drawn By | SGL |
| Date | February 2021 |
| Project No. | 48043-300 |
| Figure No. | 1 |

N
NORTH

1 SITE LOCATION MAP — Plotted By: SLemieux — February 23, 2021 — 2:05 PM
Project: 48043-300 CAD: P:\48043\300\48043-300-MS1.DWG




NORTH

PROJECT NORTH

## Legend

Site Boundary

500m Study Area

**Quaternary Geology**

Quaternary

19. Modern alluvial deposits: clay, silt, sand, gravel, may contain organic remains

5. Till:

5d. Clay to silt-textured till (derived from glaciolacustrine deposits or shale)

*Data Sources:*

*Ontario Geological Survey 2010. Surficial geology of southern Ontario; Ontario Geological Survey Miscellaneous Release-128 - Revised.*

*South Central Ontario Orthophotography Project (2018). Source: Data provided by Ontario Ministry of Natural Resources and Forestry.*


0 60 120 180 240 300 m

**Scale (11x17): 1:7000**

Project CRS: NAD83 / UTM zone 17N

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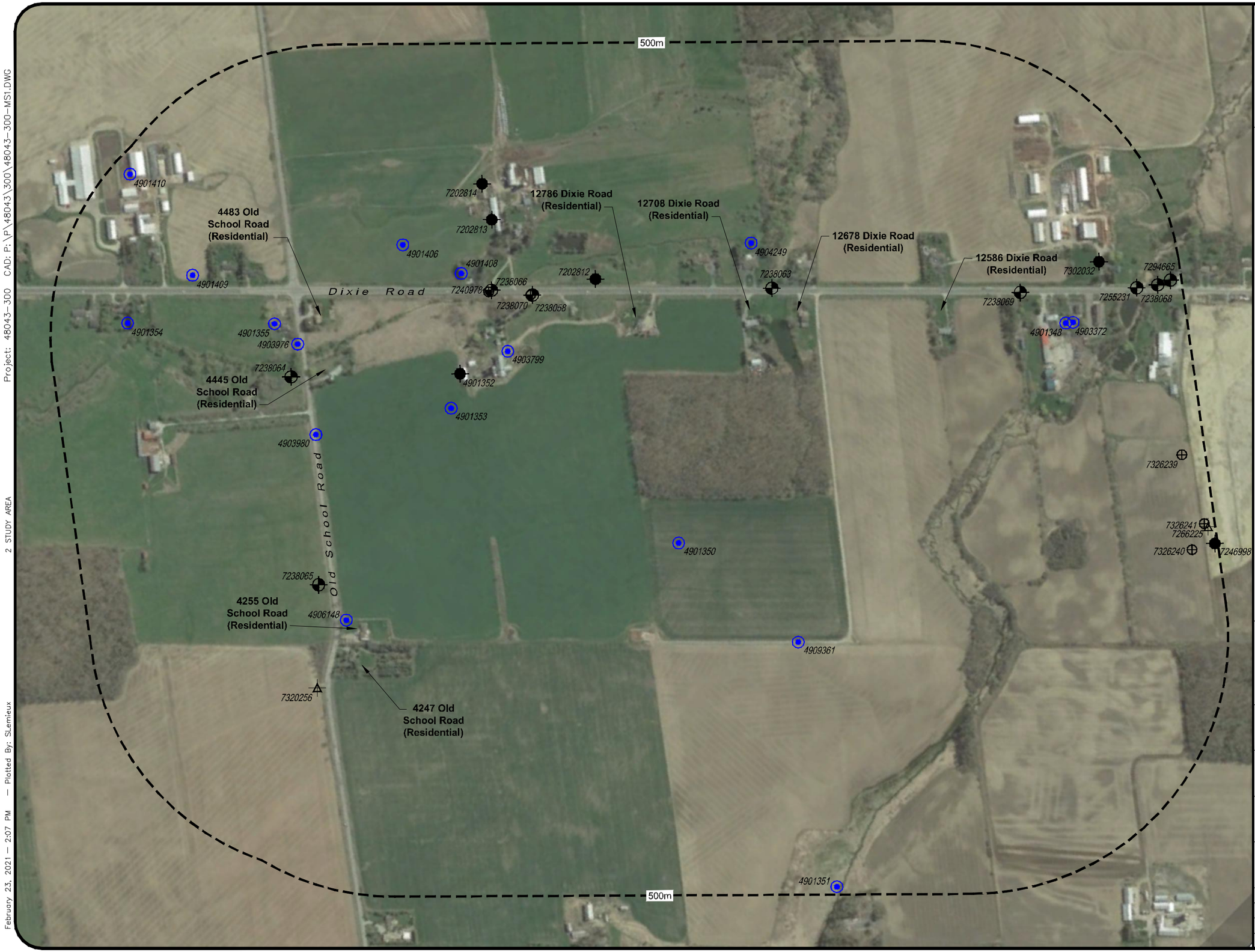
Client: Canaola Inc.

Project: Preliminary Hydrogeological Assessment

Site: 12892 Dixie Road, Caledon, ON

Title: **Quaternary Geology**

| | | | |
|---|---|---|---|
| Reviewed By | JDM | | |
| Prepared By | MBC | Project No | 48043-300 |
| Drawn By | SAR | Figure No | 2 |
| Date | February 2021 | | |




NORTH

PROJECT NORTH

LEGEND

- Property Line
- Study Area

Ontario Water Well Records:

- Observation Well
- Water Supply
- Test Hole
- Abandoned Well
- Unknown Well

Notes:
All Locations are Approximate

0 70 140 210 280 350m

Scale(11x17): 1:7000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SITE
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TITLE
**Water Wells**

| | | | |
|---|---|---|---|
| Reviewed By | JDM | | |
| Prepared By | MBC | Project No. | 48043-300 |
| Drawn By | SGL | Figure No. | 3 |
| Date | February 2021 | | |


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2 STUDY AREA
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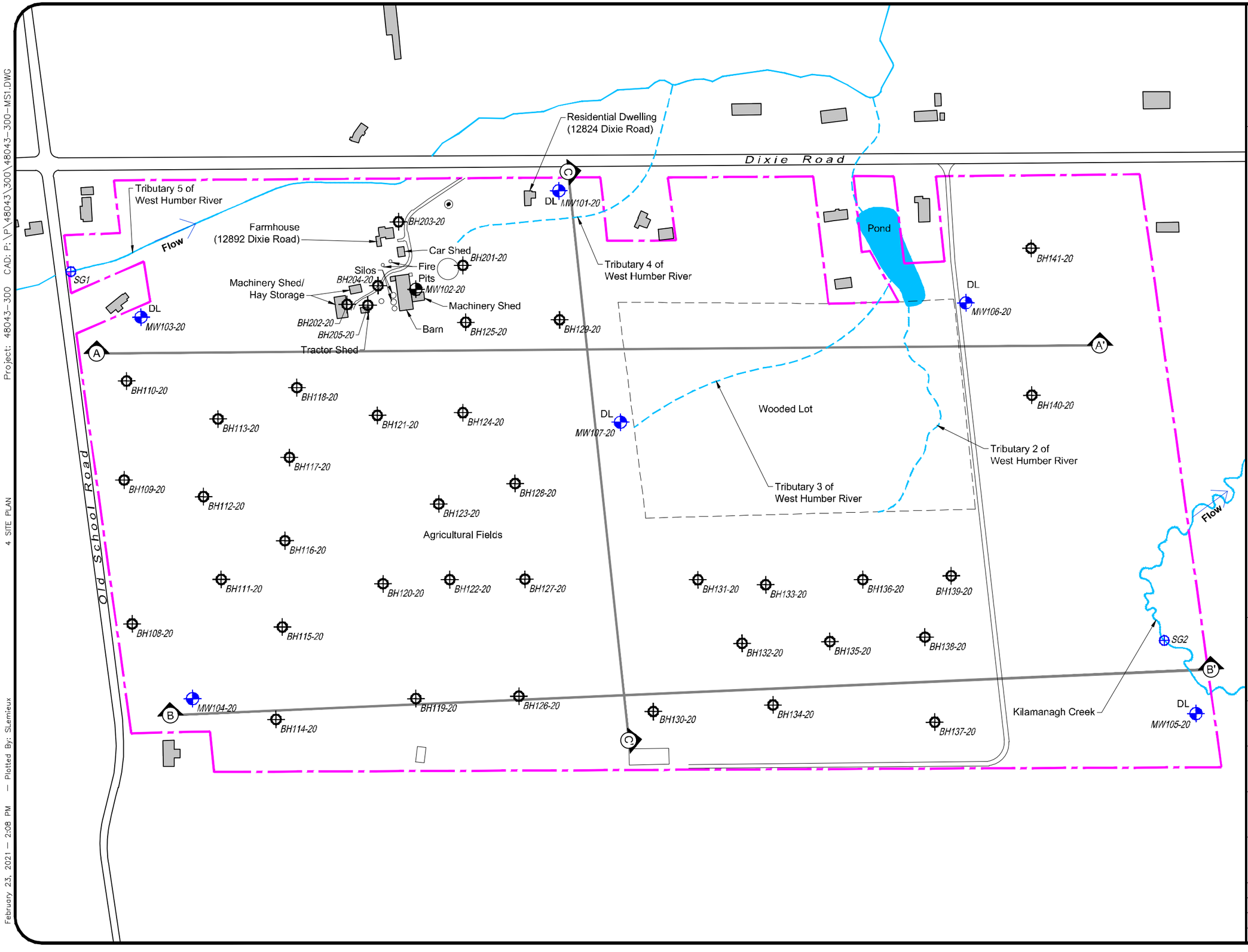


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4 SITE PLAN

February 23, 2021 — 2:08 PM — Plotted By: SLemieux

NORTH

PROJECT NORTH

LEGEND

- Property Line
- Existing Building
- Permanent Watercourse
- Intermittent/Ephemeral Watercourse
- Abandoned Drinking Water Well
- Borehole
- Monitoring Well (Phase II ESA)
- Monitoring Well (Hydrogeological Assessment)
- DL — Datalogger Installed
- Staff Gauge
- Cross-Section Line

Notes:
All Locations are Approximate

0 40 80 120 160 200m

Scale(11x17): 1:4000


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PROJECT
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Hydrogeological Assessment

SITE
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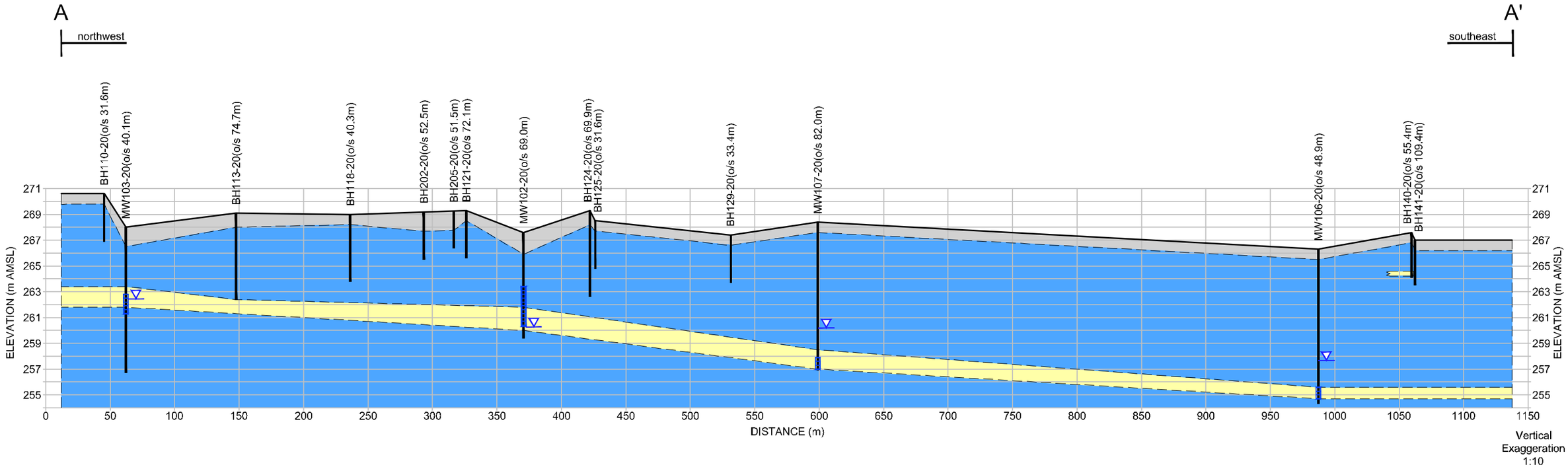
Caledon, ON

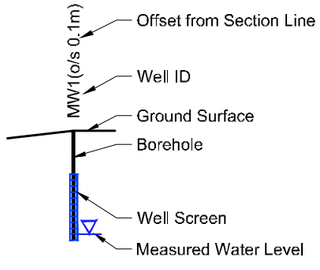
TITLE
**Location Plan**

| | | | |
|---|---|---|---|
| Reviewed By | JDM | | |
| Prepared By | MBC | Project No. | 48043–300 |
| Drawn By | SGL | Figure No. | 4 |
| Date | February 2021 | | |




LEGEND

- Property Line
- Fill
- Sand/ Silty Sand/ Sand and Gravel
- Clayey Silt Till/ Sandy Silt Till




NOTES:

1. Cross-Section locations are shown in Figure 4
2. Simplified stratigraphy shown above is based on the observed subsurface conditions at the borehole locations
3. Subsurface conditions may vary between and beyond each borehole locations
4. m AMSL - metres above mean sea level
5. Water levels measured on 2020/12/14

Scale(11x17): N.T.S.

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PROJECT: Preliminary Hydrogeological Assessment

SITE: 12892 Dixie Road Caledon, ON

TITLE: **Cross-Section A-A'**

| | | | |
|---|---|---|---|
| Reviewed By | JDM | | |
| Prepared By | MBC | Project No. | 48043-300 |
| Drawn By | SGL | Figure No. | 5 |
| Date | February 2021 | | |

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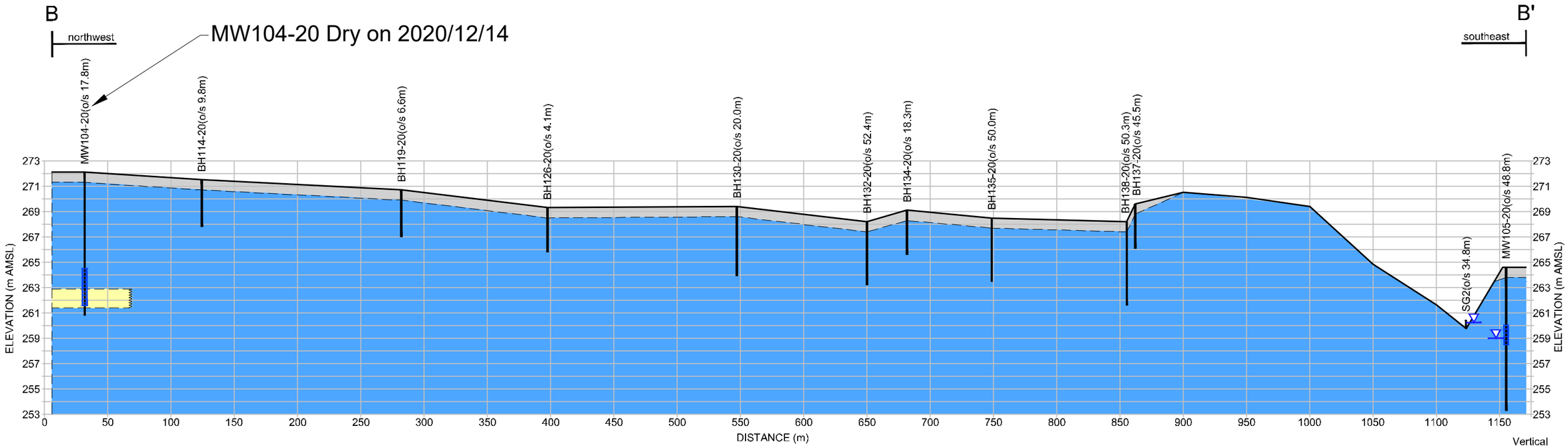
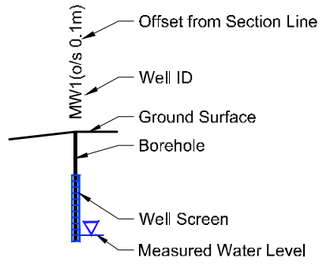



LEGEND

- Property Line
- Fill
- Sand/ Silty Sand/ Sand and Gravel
- Clayey Silt Till/ Sandy Silt Till




NOTES:

1. Cross-Section locations are shown in Figure 4
2. Simplified stratigraphy shown above is based on the observed subsurface conditions at the borehole locations
3. Subsurface conditions may vary between and beyond each borehole locations
4. m AMSL - metres above mean sea level
5. Water levels measured on 2020/12/14

Scale(11x17): N.T.S.

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SITE: 12892 Dixie Road Caledon, ON

TITLE: **Cross-Section B-B'**

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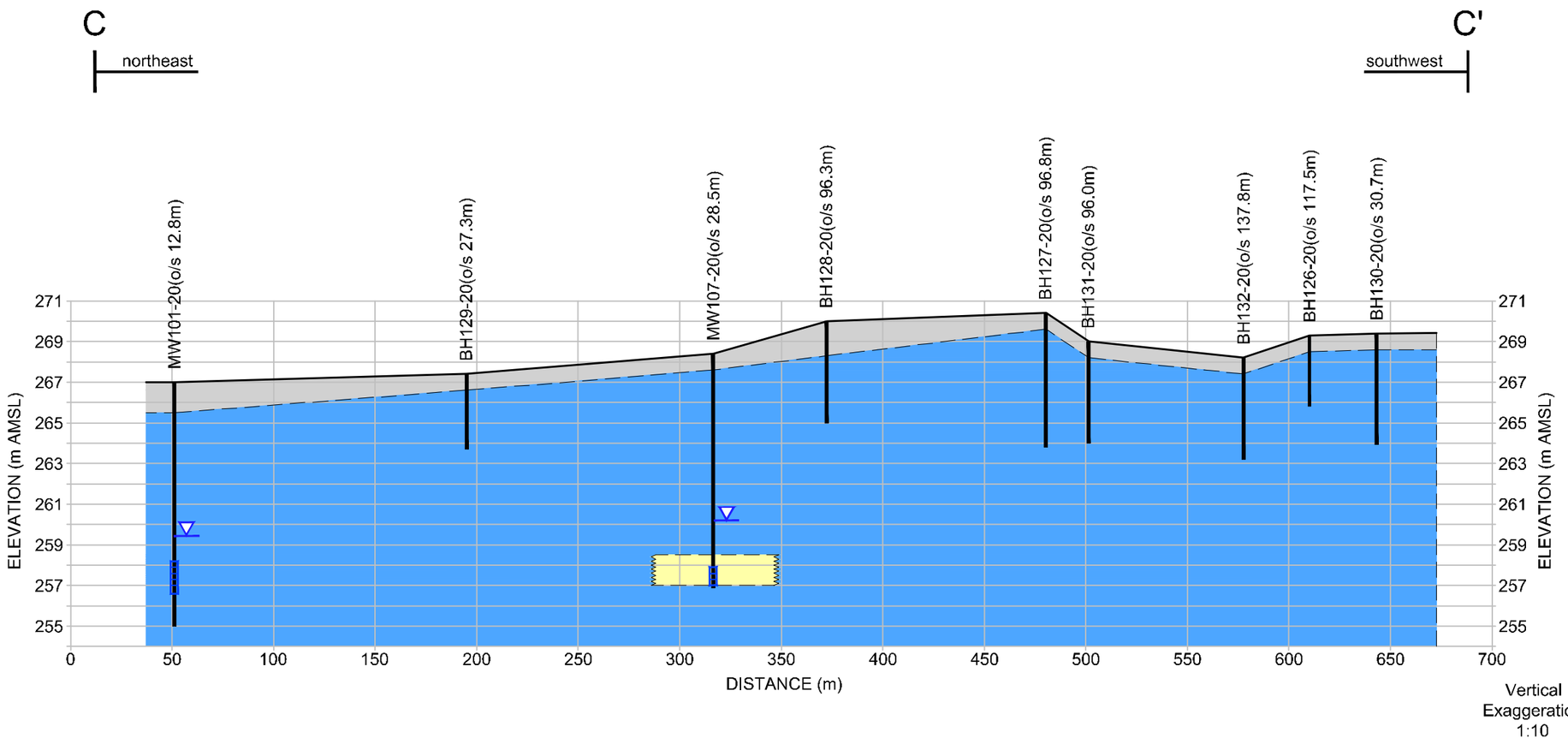
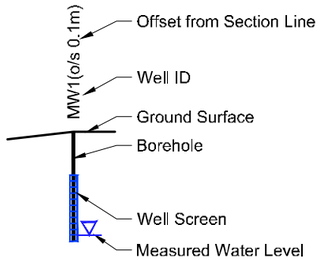
|---|---|---|---|
| Reviewed By | JDM | | |
| Prepared By | MBC | Project No. | 48043-300 |
| Drawn By | SGL | Figure No. | 6 |
| Date | February 2021 | | |




LEGEND

- Property Line
- Fill
- Sand/ Silty Sand/ Sand and Gravel
- Clayey Silt Till/ Sandy Silt Till




NOTES:

1. Cross-Section locations are shown in Figure 4
2. Simplified stratigraphy shown above is based on the observed subsurface conditions at the borehole locations
3. Subsurface conditions may vary between and beyond each borehole locations
4. m AMSL - metres above mean sea level
5. Water levels measured on 2020/12/14

Scale(11x17): N.T.S.

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SITE
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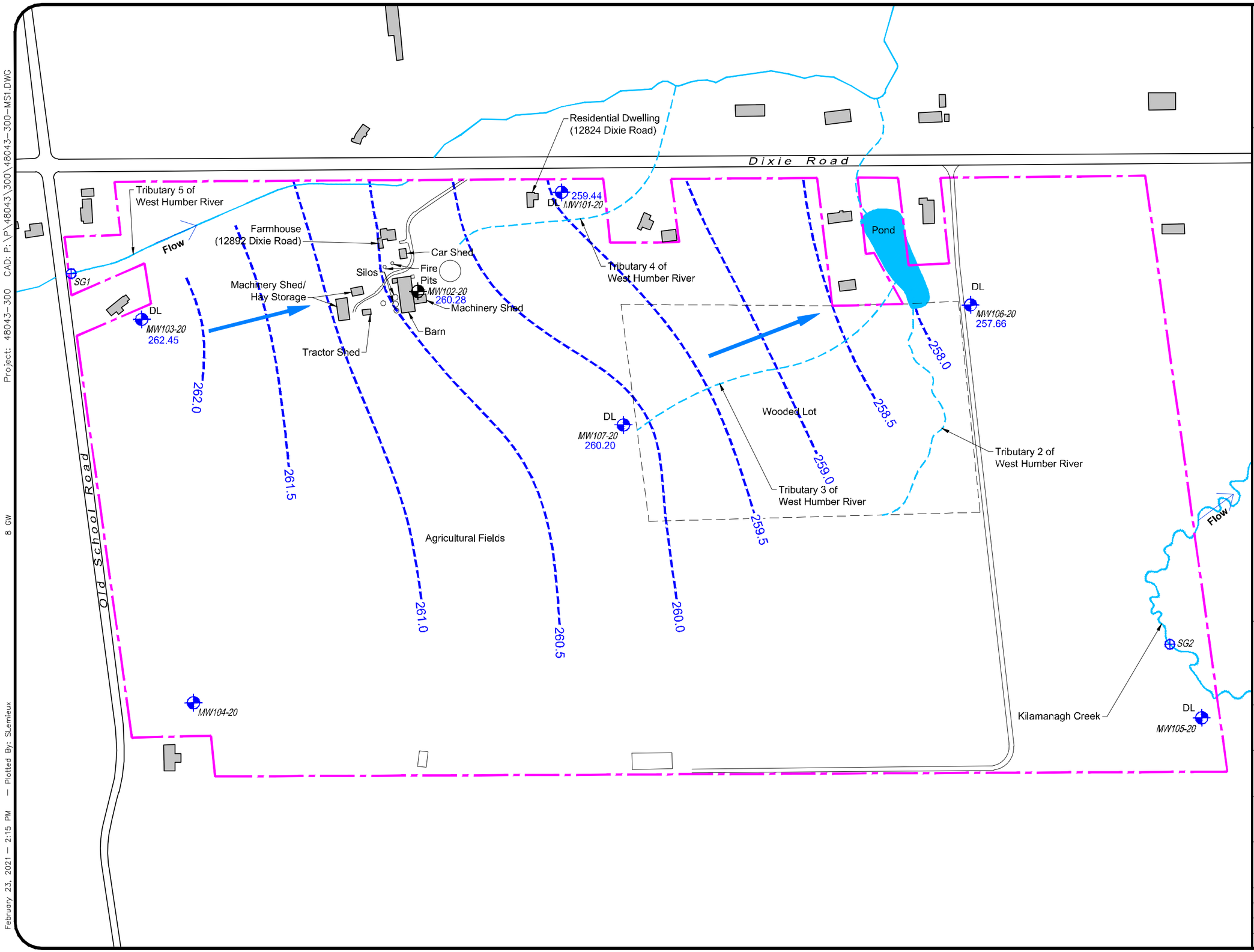
TITLE
**Cross-Section C-C'**

| | | | |
|---|---|---|---|
| Reviewed By | JDM | | |
| Prepared By | MBC | Project No. | 48043-300 |
| Drawn By | SGL | Figure No. | 7 |
| Date | February 2021 | | |




NORTH

PROJECT NORTH

LEGEND

- Property Line
- Existing Building
- Permanent Watercourse
- Intermittent/Ephemeral Watercourse
- Monitoring Well (Phase II ESA)
- Monitoring Well (Hydrogeological Assessment)
- Staff Gauge
- 257.66 Groundwater Elevation (m AMSL)
- 258.50 Groundwater Contour (m AMSL)
- Inferred Direction of Groundwater Flow

NOTES:

Water Levels Measured on 2020/12/14

m AMSL - Metres Above Mean Sea Level

All Locations are Approximate

0 40 80 120 160 200m

Scale(11x17): 1:4000

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TITLE
**Groundwater Flow in Confined Sands**

| | | | |
|---|---|---|---|
| Reviewed By | JDM | | |
| Prepared By | MBC | Project No. | 48043-300 |
| Drawn By | SGL | Figure No. | 8 |
| Date | February 2021 | | |


NORTH

PROJECT NORTH

LEGEND

Property Line

Catchment

103 — Catchment ID
7.25 — Area (ha.)
0 — % IMP

Notes:
- All Locations are Approximate
- Pre-Development Catchments Provided by WSP (2021)

0 40 80 120 160 200m

Scale(11x17): 1:4000

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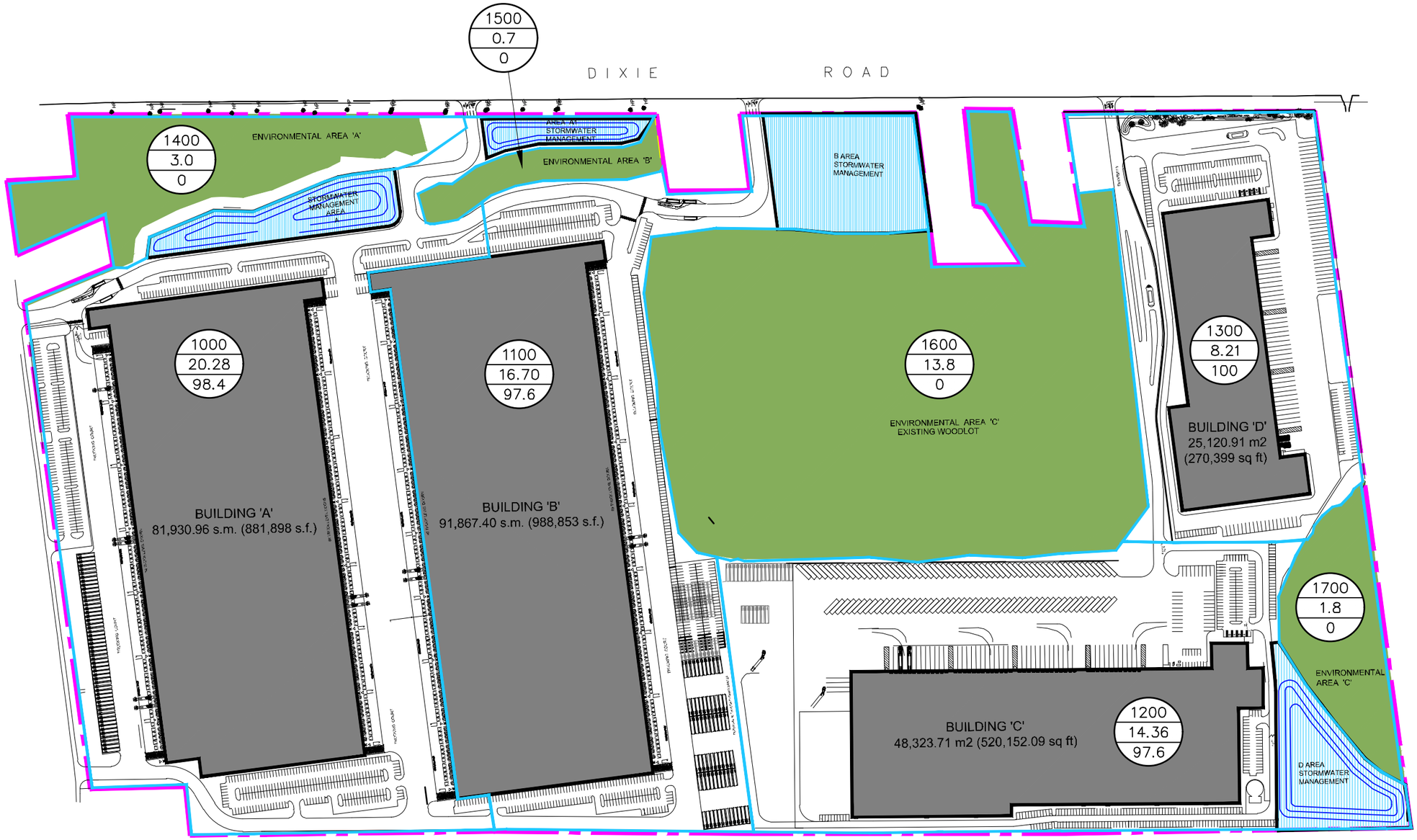
TITLE
**Pre-Development Catchments**

| | | | |
|---|---|---|---|
| Reviewed By | JDM | | |
| Prepared By | MBC | Project No. | 48043-300 |
| Drawn By | SGL | Figure No. | 9 |
| Date | February 2021 | | |

Project: 48043-300 CAD: P:\P\48043\300\48043-300-MS1.DWG
PRE-DEV CATCHMENTS
February 23, 2021 — 2:16 PM — Plotted By: SLemieux




NORTH

PROJECT NORTH

LEGEND

Property Line

Catchment

103 — Catchment ID
7.25 — Area (ha.)
0 — % IMP

Notes:
- All Locations are Approximate
- Post-Development Catchments Provided by WSP (2021)

0 40 80 120 160 200m

Scale(11x17): 1:4000

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Preliminary Hydrogeological Assessment

SITE
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TITLE
**Post-Development Catchments**

| | | | |
|---|---|---|---|
| Reviewed By | JDM | | |
| Prepared By | MBC | Project No. | 48043–300 |
| Drawn By | SGL | Figure No. | 10 |
| Date | February 2021 | | |

Project: 48043–300 CAD: P:\P\48043\300\48043–300–MS1.DWG POST–DEV CATCHMENTS
February 23, 2021 — 2:16 PM — Plotted By: SLemieux

# Tables

# Table 1: Summary of MECP Water Well Records

| MECP Well No. | UTM Coordinates (NAD83 Zone 17) Easting | Northing | Year Drilled | Nominal Casing Diameter (millimetres) | Drilling Method | Well Status | Well Use | Water Quality | Water Found (m BGS) | Total Depth (metres) | Interval Screened Top [m BGS} | Bottom (m BGS) | Static Level (m BGS) | Pumping Test Level (m BGS) | Rate (L/min) | Duration (hours) | Stratigraphy Depth to Unit Base (m BGS) | Description Colour | Material 1 | Material 2 | Material 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7238069 | 596033 | 4847347 | 2015 | 52 | Boring | Observation Well | Monitoring | - | - | 7.6 | 4.6 | 7.6 | - | - | - | - | 2.1 | brown | fill | loose | - |
| | | | | | | | | | | | | | | | | | 7.6 | grey | clay | packed | - |
| 7238068 | 596233 | 4847168 | 2015 | 52 | Boring | Observation Well | Monitoring | - | - | 7.6 | 4.6 | 7.6 | - | - | - | - | 2.1 | brown | fill | sand | loose |
| | | | | | | | | | | | | | | | | | 7.6 | grey | clay | silt | packed |
| 4904249 | 595715 | 4847564 | 1973 | 127 | Rotary | Water Supply | Domestic | | 34.7 | 39.0 | 34.7 | 39.0 | 15.2 | 19.8 | 15 | 6.0 | 8.2 | brown | clay | stones | - |
| | | | | | | | | | | | | | | | | | 10.4 | grey | clay | gravel | - |
| | | | | | | | | | | | | | | | | | 19.8 | grey | clay | - | - |
| | | | | | | | | | | | | | | | | | 29.9 | brown | clay | - | - |
| | | | | | | | | | | | | | | | | | 39.0 | | gravel | shale | - |
| 7255231 | 596200 | 4847193 | 2015 | 52 | Rotary | Observation Well | Monitoring | - | - | 6.1 | 4.5 | 6.1 | - | - | - | - | 1.8 | brown | sand | gravel | hard |
| | | | | | | | | | | | | | | | | | 3.7 | brown | sand | silt | hard |
| | | | | | | | | | | | | | | | | | 6.1 | grey | silt | sand | hard |
| 4901348 | 596039 | 4847019 | 1959 | 762 | - | Water Supply | Domestic | Fresh | 18.3 | 18.9 | - | - | - | 12.2 | 18.9 | - | 4.5 | brown | loam | clay | - |
| | | | | | | | | | | | | | | | | | 17.7 | grey | clay | stones | - |
| | | | | | | | | | | | | | | | | | 18.2 | grey | sand | - | - |
| 7238063 | 595696 | 4847696 | 2015 | 52 | - | Observation Well | Monitoring | - | - | - | 4.6 | 7.6 | - | - | - | - | 1.5 | brown | fill | | loose |
| | | | | | | | | | | | | | | | | | 3.1 | brown | sand | silt | loose |
| | | | | | | | | | | | | | | | | | 7.6 | grey | clay | silt | packed |
| 7266225 | 595968 | 4846774 | 2016 | 52 | Rotary | Monitoring Well / Test hole | Monitoring / Test Hole | - | - | 7.6 | 6.1 | 7.6 | - | - | - | - | 7.6 | brown to grey | sandy silt | some clay and gravel | hard - |
| 7294665 | 596257 | 4847157 | 2017 | 52 | Auger | Observation Well | Monitoring | - | 9.1 | 13.7 | 9.1 | 13.7 | - | - | - | - | 9.1 | grey | silt | clay | soft |
| 4903372 | - | - | 1969 | 178 | Cable Tool | Water Supply | Domestic | Fresh | 36.6 | 37.2 | - | - | 17.1 | 18.3 | 18.9 | 12.0 | 0.3 | | loam | - | - |
| | | | | | | | | | | | | | | | | | 3.4 | brown | sand | sandy clay | - |
| | | | | | | | | | | | | | | | | | 8.8 | | sand | hard pan | - |
| | | | | | | | | | | | | | | | | | 36.0 | | sand | quick sand | - |
| | | | | | | | | | | | | | | | | | 37.2 | | sand | - | - |
| 7246998 | 595955 | 4846732 | 2015 | 52 | Direct Push | Abandoned Monitoring and Test Hole | Monitoring and Test Hole | - | - | 6.1 | 3.0 | 6.1 | - | - | - | - | - | - | - | - | - |
| 7302032 | 596184 | 4847281 | 2017 | 900 | - | Abandoned Monitoring | - | - | 4.9 | 11.9 | - | - | - | - | - | - | - | - | - | - | - |
| 7326241 | 595968 | 4846774 | 2018 | - | - | - | - | - | - | 8.5 | - | - | - | - | - | - | - | - | - | - | - |
| 7326239 | 596032 | 4846900 | 2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 7326240 | 595915 | 4846755 | 2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4906148 | 594651 | 4847825 | 1983 | 762 | Boring | Water Supply | Domestic | Cloudy | 12.2 | 22.9 | - | - | 12.2 | 22.0 | 7.6 | 0.5 | 0.3 | brown | loam | hard | - |
| | | | | | | | | | | | | | | | | | 6.1 | brown | clay | hard | - |
| | | | | | | | | | | | | | | | | | 15.0 | grey | clay | hard | - |
| | | | | | | | | | | | | | | | | | 22.9 | grey | clay | sand | hard |
| 4901351 | 594945 | 4846557 | 1967 | 762 | Boring | Water Supply | Domestic / Livestock | Fresh | 8.5 | 12.2 | - | - | 8.5 | 11.3 | 5.7 | 0.5 | 0.3 | - | loam | - | - |
| | | | | | | | | | | | | | | | | | 3.0 | brown | clay | - | - |
| | | | | | | | | | | | | | | | | | 5.8 | - | hard pan | - | - |
| | | | | | | | | | | | | | | | | | 8.5 | blue | clay | - | - |
| | | | | | | | | | | | | | | | | | 8.8 | - | sand | - | - |
| | | | | | | | | | | | | | | | | | 12.2 | blue | clay | - | - |
| 4903799 | 595245 | 487973 | 1971 | 762 | Boring | Water Supply | Domestic / Livestock | Fresh | 17.7 | 20.7 | - | - | 1.5 | - | 11.4 | - | 0.3 | brown | loam | | - |
| | | | | | | | | | | | | | | | | | 2.4 | brown | clay | stones | - |
| | | | | | | | | | | | | | | | | | 3.0 | brown | sand | gravel | - |
| | | | | | | | | | | | | | | | | | 3.6 | brown | clay | - | - |
| | | | | | | | | | | | | | | | | | 6.7 | grey | clay | - | - |
| | | | | | | | | | | | | | | | | | 7.6 | grey | sand | clay | - |
| | | | | | | | | | | | | | | | | | 15.2 | grey | clay | silt | stones |
| | | | | | | | | | | | | | | | | | 20.7 | grey | clay | sand | stones |
| 7238064 | 594910 | 4848237 | 2015 | 52 | Boring | Observation Well | Monitoring | - | - | 7.6 | 4.6 | 7.6 | - | - | - | - | 1.5 | brown | fill | - | loose |
| | | | | | | | | | | | | | | | | | 3.1 | brown | sand | silt | loose |
| | | | | | | | | | | | | | | | | | 7.6 | grey | clay | silt | packed |
| 4903980 | 594865 | 4848123 | 1972 | 152 | Cable Tool | Water Supply | Domestic | Clear | 19.8 | 30.5 | - | - | 19.8 | 27.4 | 3.8 | 1.0 | 0.6 | brown | loam | - | - |
| | | | | | | | | | | | | | | | | | 17.7 | brown | clay | sand | - |
| | | | | | | | | | | | | | | | | | 19.8 | red | shale | - | - |
| 7238065 | 594661 | 4847912 | 2015 | 52 | Boring | Observation Well | Monitoring | - | - | 7.6 | 4.6 | 7.6 | - | - | - | - | 1.5 | brown | fill | - | loose |
| | | | | | | | | | | | | | | | | | 3.1 | brown | sand | silt | loose |
| | | | | | | | | | | | | | | | | | 7.6 | grey | clay | silt | packed |
| 7202814 | 595440 | 4848240 | 2013 | 150 | - | Abandoned | - | Fresh | 2.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| 7240978 | 595303 | 4848080 | 2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 7238070 | 595355 | 4848018 | 2015 | 52 | Boring | - | Monitoring | - | - | 7.6 | 4.3 | 7.6 | - | - | - | - | 2.1 | brown | fill | sand | loose |
| | | | | | | | | | | | | | | | | | 7.6 | grey | clay | silt | packed |
| 7238058 | 595356 | 4848017 | 2015 | 52 | Boring | Observation Well | Monitoring | - | - | 18.3 | 15.3 | 18.3 | - | - | - | - | 3.1 | brown | fill | gravel | loose |
| | | | | | | | | | | | | | | | | | 9.2 | brown | sand | silt | packed |
| | | | | | | | | | | | | | | | | | 18.3 | grey | sand | silt | packed |
| 4901350 | 595201 | 4847250 | 1952 | 102 | Cable Tool | Water Supply | Domestic / Livestock | Fresh | 41.1 | 41.1 | - | - | 12.2 | 12.2 | 37.9 | - | 9.1 | - | hard pan | gravel | - |
| | | | | | | | | | | | | | | | | | 25.9 | blue | clay | - | - |
| | | | | | | | | | | | | | | | | | 38.1 | - | sand | - | - |
| | | | | | | | | | | | | | | | | | 39.6 | - | sand | stones | - |
| | | | | | | | | | | | | | | | | | 41.1 | - | gravel | - | - |
| 7238066 | 595305 | 4848080 | 2015 | 52 | Boring | Observation Well | Monitoring | - | - | 18.3 | 15.3 | 18.3 | - | - | - | - | 3.1 | brown | fill | gravel | sand |
| | | | | | | | | | | | | | | | | | 9.2 | brown | sand | silt | packed |
| | | | | | | | | | | | | | | | | | 18.3 | grey | sand | silt | packed |

Table 1: Summary of MECP Water Well Records

| MECP Well No. | UTM Coordinates (NAD83 Zone 17) Easting | Northing | Year Drilled | Nominal Casing Diameter (millimetres) | Drilling Method | Well Status | Well Use | Water Quality | Water Found (m BGS) | Total Depth (metres) | Interval Screened Top (m BGS) | Bottom (m BGS) | Static Level (m BGS) | Pumping Test Level (m BGS) | Rate (L/min) | Duration (hours) | Stratigraphy Depth to Unit Base (m BGS) | Description Colour | Material 1 | Material 2 | Material 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4901410 | 594953 | 4848516 | 1964 | 168 | Cable Tool | Water Supply | Domestic / Livestock | Fresh | 29.9 | 34.1 | - | - | 15.2 | 32.0 | 9.5 | 3.0 | 5.5 | brown | clay | - | - |
| | | | | | | | | | | | | | | | | | 14.6 | blue | clay | - | - |
| | | | | | | | | | | | | | | | | | 18.0 | brown | sand | - | - |
| | | | | | | | | | | | | | | | | | 29.3 | - | gravel | clay | - |
| | | | | | | | | | | | | | | | | | 31.1 | - | shale | - | - |
| | | | | | | | | | | | | | | | | | 34.1 | grey | limestone | - | - |
| 4901354 | 594744 | 4848314 | 1966 | 762 | Boring | Water Supply | Domestic | Clear | 19.5 | 19.5 | - | - | - | 9.1 | 1.9 | - | 6.1 | brown | loam | clay | - |
| | | | | | | | | | | | | | | | | | 15.2 | grey | clay | - | - |
| | | | | | | | | | | | | | | | | | 18.9 | red | clay | sand | - |
| | | | | | | | | | | | | | | | | | 19.5 | - | sand | - | - |
| 4901406 | 595201 | 4847250 | 1952 | 102 | Cable Tool | Water Supply | Domestic | Fresh | 15.2 | 36.2 | - | - | 12.2 | 15.2 | 15.1 | 5.0 | 1.5 | brown | clay | - | - |
| | | | | | | | | | | | | | | | | | 15.2 | blue | clay | - | - |
| | | | | | | | | | | | | | | | | | 16.8 | - | sand | - | - |
| | | | | | | | | | | | | | | | | | 24.4 | blue | clay | boulders | - |
| | | | | | | | | | | | | | | | | | 27.1 | - | sand | gravel | - |
| | | | | | | | | | | | | | | | | | 36.3 | grey | shale | - | - |
| 4901355 | 594946 | 4848119 | 1967 | 168 | Cable Tool | Water Supply | Domestic | Clear | 18.2 | 25.0 | - | - | - | 24.3 | 11.3 | 2.0 | 0.6 | - | loam | - | - |
| | | | | | | | | | | | | | | | | | 14.3 | grey | clay | sand | - |
| | | | | | | | | | | | | | | | | | 20.4 | grey | sand | - | - |
| | | | | | | | | | | | | | | | | | 23.8 | - | sand | gravel | - |
| | | | | | | | | | | | | | | | | | 24.4 | - | sand | gravel | - |
| | | | | | | | | | | | | | | | | | 25.0 | - | gravel | - | - |
| 4901408 | 595273 | 4847922 | 1967 | 762 | Boring | Water Supply | Domestic | Fresh | 11.0 | 11.3 | - | - | - | 6.1 | 3.8 | - | 3.7 | brown | loam | clay | - |
| | | | | | | | | | | | | | | | | | 10.7 | grey | clay | - | - |
| | | | | | | | | | | | | | | | | | 11.0 | - | sand | - | - |
| 4901409 | 594900 | 4848290 | 1954 | 102 | Cable Tool | Water Supply | Domestic | Fresh | 33.5 | 33.5 | - | - | 9.1 | 24.4 | 15.1 | - | 1.2 | - | loam | - | - |
| | | | | | | | | | | | | | | | | | 27.4 | blue | clay | - | - |
| | | | | | | | | | | | | | | | | | 33.5 | blue | shale | - | - |
| 4901352 | 595133 | 4847785 | 1955 | 152 | Cable Tool | Abandoned - Supply | - | - | - | 46.3 | - | - | - | - | - | - | 1.0 | - | loam | - | - |
| | | | | | | | | | | | | | | | | | 2.7 | yellow | clay | - | - |
| | | | | | | | | | | | | | | | | | 15.5 | blue | clay | - | - |
| | | | | | | | | | | | | | | | | | 20.7 | - | hard pan | - | - |
| | | | | | | | | | | | | | | | | | 22.3 | red | shale | - | - |
| | | | | | | | | | | | | | | | | | 46.3 | - | limestone | - | - |
| 4903976 | 594965 | 4848273 | 1972 | 127 | Cable Tool | Water Supply | Domestic | Fresh | 17.6 | 28.3 | - | - | 15.2 | 25.0 | 7.6 | 1.0 | 0.3 | brown | loam | - | - |
| | | | | | | | | | | | | | | | | | 21.3 | blue | clay | - | - |
| | | | | | | | | | | | | | | | | | 28.3 | red | shale | - | - |
| 4901353 | 595703 | 4847750 | 1955 | 152 | Cable Tool | Water Supply | Livestock | Clear | 52.4 | 68.9 | - | - | 18.3 | 18.2 | - | - | 0.6 | - | loam | - | - |
| | | | | | | | | | | | | | | | | | 2.1 | yellow | clay | - | - |
| | | | | | | | | | | | | | | | | | 17.1 | blue | clay | - | - |
| | | | | | | | | | | | | | | | | | 18.9 | red | clay | - | - |
| | | | | | | | | | | | | | | | | | 20.7 | - | sand | clay | - |
| | | | | | | | | | | | | | | | | | 21.9 | red | shale | - | - |
| | | | | | | | | | | | | | | | | | 23.8 | blue | shale | - | - |
| | | | | | | | | | | | | | | | | | 52.4 | - | limestone | - | - |
| | | | | | | | | | | | | | | | | | 68.9 | blue | shale | - | - |
| 7202812 | 595465 | 4847952 | 2013 | 2286 | - | Abandoned - Other | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4909361 | 595244 | 4847171 | 2004 | 203 | Cable Tool | Water Supply | Domestic | Cloudy | 17.4 | | - | - | 9.1 | 14.0 | 37.9 | - | 9.1 | brown | fill | gravel | - |
| | | | | | | | | | | | | | | | | | 17.4 | white | limestone | - | - |
| 7320256 | 594517 | 4847772 | 2018 | 52 | Boring | Test Hole | Test Hole | - | 7.3 | 7.6 | 4.6 | 7.6 | - | - | - | - | 0.6 | brown | fill | gravel | loose |
| | | | | | | | | | | | | | | | | | 2.4 | brown | sand | - | loose |
| | | | | | | | | | | | | | | | | | 7.6 | grey | clay | silt | dense |
| 7202813 | 595404 | 4848177 | 2013 | 2286 | - | Abandoned - Other | - | - | - | 3.7 | - | - | - | - | - | - | - | - | - | - | - |

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 December 2020.
3. "-" indicates this information was not provided in the well record.
4. Refer to Figure 2 for well locations.
5. 'm BGS' defined as metres below ground surface.

Table 2: Summary of Single Well Response Tests

| Monitoring Well | Screened Interval (m BGS) | Hydrostratigraphy | Stratigraphic Description | Test | K (m/s) | Geometric Mean, K (m/s) |
|---|---|---|---|---|---|---|
| MW101-20 | 8.8 - 10.4 | Aquitard | compact to very dense grey SILT AND SAND, some clay, trace gravel | Rising Head 1 | 9.0E-08 | 8.E-08 |
| | | | | Rising Head 2 | 7.9E-08 | |
| MW103-20 | 5.2 - 6.7 | Confined Aquifer | very dense brown SILTY SAND, trace clay to dense grey/brown SAND, some silt, some gravel | Falling Head 1 | 3.3E-06 | 2.E-05 |
| | | | | Rising Head 1 | 5.4E-05 | |
| | | | | Rising Head 2 | 7.4E-05 | |
| MW106-20 | 10.7 - 11.6 | Confined Aquifer | compact grey SILT to SILTY SAND, trace clay | Falling Head 1 | 1.5E-06 | 1.E-06 |
| | | | | Rising Head 1 | 1.4E-06 | |
| MW107-20 | 10.5 - 11.4 | Confined Aquifer | compact grey SILTY SAND, some clay, trace gravel to very dense grey GRAVELLY SAND | Falling Head 1 | 4.3E-07 | 7.E-07 |
| | | | | Rising Head 1 | 9.9E-07 | |

Notes:
1. Table to be read in conjunction with accompanying report.
2. K values provided in metres per second (m/s).
3. Screened intervals provided in metres (m) below ground surface (bgs).
4. Refer to Figure 4 for well locations.
5. Refer to Borehole Logs for installation details.

Table 3: Summary of Manually Measured Groundwater Elevations

| Well ID | Ground Surface Elevation (m AMSL) | Top of Pipe Elevation (m AMSL) | 2020-11-04 | | 2020-11-09 | | 2020-11-19 | | 2020-11-23 | | 2020-11-30 | | 2020-12-14 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Water Level (m BTOP) | Elevation (m AMSL) | Water Level (m BTOP) | Elevation (m AMSL) | Water Level (m BTOP) | Elevation (m AMSL) | Water Level (m BTOP) | Elevation (m AMSL) | Water Level (m BTOP) | Elevation (m AMSL) | Water Level (m BTOP) | Elevation (m AMSL) |
| MW101-20 | 266.97 | 267.89 | 8.46 | 259.43 | 8.48 | 259.42 | 8.43 | 259.46 | 8.47 | 259.43 | - | - | 8.45 | 259.44 |
| MW102-20 | 267.55 | 268.49 | 8.18 | 260.31 | 8.18 | 260.31 | - | - | 8.20 | 260.29 | - | - | 8.21 | 260.28 |
| MW103-20 | 268.03 | 269.03 | 6.53 | 262.50 | 6.53 | 262.51 | - | - | 6.57 | 262.47 | 6.59 | 262.44 | 6.59 | 262.45 |
| MW104-20 | 272.09 | 273.13 | Dry | - | Dry | - | - | - | Dry | - | Dry | - | Dry | - |
| MW105-20 | 264.65 | 265.66 | Dry | - | 6.82 | 258.84 | - | - | 6.54 | 259.12 | 6.63 | 259.03 | 6.62 | 259.04 |
| MW106-20 | 266.25 | 267.20 | 9.65 | 257.55 | 9.70 | 257.49 | - | - | 9.74 | 257.46 | 9.49 | 257.71 | 9.54 | 257.66 |
| MW107-20 | 268.42 | 269.37 | 8.98 | 260.39 | 9.07 | 260.31 | - | - | 9.11 | 260.26 | 9.04 | 260.33 | 9.18 | 260.20 |
| SG1 | 263.03 | 264.52 | - | - | - | - | 1.20 | 263.32 | 1.18 | 263.35 | - | - | 1.13 | 263.40 |
| SG2 | 259.77 | 261.49 | - | - | - | - | 1.45 | 260.04 | 1.45 | 260.04 | - | - | 1.25 | 260.24 |

Notes:
1. Table to be read in conjunction with accompanying report.
2. See Borehole Log for installation details.
3. Dates are provided in Standard International (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. Reference elevations surveyed by MTE November 25, 2020 relative to geodetic datum.

Table 4: Analytical Results for RCAP Comprehensive in Groundwater and Surface Water

| Parameters | Unit | RDL | PWQO Criteria | Sample Location | MW106-20 | MW107-20 | SG1 | SG2 |
|---|---|---|---|---|---|---|---|---|
| | | | | Sample Name | MW106-20 | MW107-20 | SG1 | SG2 |
| | | | | Lab Job # | C0V1801 | C0V1801 | C0V1801 | C0V1801 |
| | | | | Laboratory ID | OFX270 | OFX271 | OFX272 | OFX273 |
| | | | | Sampling Date | 23-Nov-2020 | 23-Nov-2020 | 23-Nov-2020 | 23-Nov-2020 |
| | | | | Well Screen Interval (m bgs) | 10.7 - 11.6 | 10.5 - 11.4 | NA | NA |
| | | | | Maximum Concentration | | | | |
| **Calculated Parameters** | | | | | | | | |
| Anion Sum | me/L | NA | NV | | 14.1 | 8.11 | 7.09 | 14.1 | 8.49 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | 1.0 | NV | | 330 | 330 | 300 | 280 | 270 |
| Calculated TDS | mg/L | 1.0 | NV | | 790 | 420 | 350 | 790 | 460 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | 1.0 | NV | | 5.2 | 5.2 | 4.2 | 3.8 | 4 |
| Cation Sum | me/L | NA | NV | | 14.3 | 8.1 | 7.12 | 14.3 | 8.45 |
| Hardness (CaCO3) | mg/L | 1.0 | NV | | 390 | 340 | 320 | 390 | 350 |
| Ion Balance (% Difference) | % | NA | NV | | 0.81 | 0.09 | 0.22 | 0.81 | 0.22 |
| Langelier Index (@ 20C) | NA | NA | NV | | 1.19 | 1.07 | 0.765 | 1.17 | 1.19 |
| Langelier Index (@ 4C) | NA | NA | NV | | 0.943 | 0.824 | 0.516 | 0.924 | 0.943 |
| Saturation pH (@ 20C) | NA | NA | NV | | 7.41 | 7.16 | 7.41 | 6.99 | 7.01 |
| Saturation pH (@ 4C) | NA | NA | NV | | 7.65 | 7.41 | 7.65 | 7.24 | 7.25 |
| **Inorganics** | | | | | | | | | |
| Alkalinity (Total as CaCO3) | mg/L | 1.0 | NV | | 330 | 330 | 300 | 280 | 270 |
| Conductivity | umho/cm | 1.0 | NV | | 1500 | 720 | 630 | 1500 | 820 |
| Dissolved Chloride (Cl-) | µg/L | 1000 - 3000 | NV | | 260000 | 11000 | 15000 | 260000 | 75000 |
| Dissolved Organic Carbon | mg/L | 0.40 | NV | | 8.6 | 1.9 | 1.1 | 8.6 | 4.9 |
| Dissolved Sulphate (SO4) | mg/L | 1.0 | NV | | 55 | 55 | 27 | 49 | 41 |
| Nitrate (N) | mg/L | 0.10 | NV | | 0.41 | 0.41 | <0.10 | <0.10 | 0.37 |
| Nitrate + Nitrite (N) | mg/L | 0.10 | NV | | 0.53 | 0.53 | <0.10 | <0.10 | 0.37 |
| Nitrite (N) | mg/L | 0.010 | NV | | 0.115 | 0.115 | <0.010 | <0.010 | <0.010 |
| Orthophosphate (P) | mg/L | 0.010 | NV | | 0.11 | <0.010 | 0.011 | 0.11 | 0.035 |
| pH | pH | NA | 6.5:8.5 | | 8.23 | 8.23 | 8.17 | 8.16 | 8.2 |
| Total Ammonia-N | mg/L | 0.050 | NV | | 0.32 | 0.32 | 0.2 | <0.050 | <0.050 |
| **Metals** | | | | | | | | | |
| Dissolved Aluminum (Al) | µg/L | 4.9 | NV | | 80 | 80 | <4.9 | <4.9 | 7.1 |
| Dissolved Antimony (Sb) | µg/L | 0.50 | 20 | | 0.62 | 0.62 | <0.50 | <0.50 | <0.50 |
| Dissolved Arsenic (As) | µg/L | 1.0 | 100 | | 5 | 4.4 | 5 | <1.0 | <1.0 |
| Dissolved Barium (Ba) | µg/L | 2.0 | NV | | 220 | 220 | 120 | 53 | 53 |
| Dissolved Beryllium (Be) | µg/L | 0.40 | 11 | < | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Dissolved Boron (B) | µg/L | 10 | 200 | | 79 | 63 | 79 | 28 | 17 |
| Dissolved Cadmium (Cd) | µg/L | 0.090 | 0.2 | < | 0.090 | <0.090 | <0.090 | <0.090 | <0.090 |
| Dissolved Calcium (Ca) | µg/L | 200 | NV | | 120000 | 59000 | 35000 | 120000 | 100000 |
| Dissolved Chromium (Cr) | µg/L | 5.0 | NV | < | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Cobalt (Co) | µg/L | 0.50 | 0.9 | < | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Copper (Cu) | µg/L | 0.90 | 5 | | 2.4 | 1.7 | <0.90 | 2.4 | <0.90 |
| Dissolved Iron (Fe) | µg/L | 100 | 300 | | 200 | 200 | <100 | <100 | <100 |
| Dissolved Lead (Pb) | µg/L | 0.50 | 5 | < | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Magnesium (Mg) | µg/L | 50 | NV | | 56000 | 47000 | 56000 | 23000 | 21000 |
| Dissolved Manganese (Mn) | µg/L | 2.0 | NV | | 62 | 62 | 20 | 33 | 51 |
| Dissolved Molybdenum (Mo) | µg/L | 0.50 | 40 | | 9 | 9 | 3.9 | <0.50 | <0.50 |
| Dissolved Nickel (Ni) | µg/L | 1.0 | 25 | < | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Phosphorus (P) | µg/L | 100 | NV | | 180 | <100 | <100 | 180 | <100 |
| Dissolved Potassium (K) | µg/L | 200 | NV | | 9900 | 4400 | 4700 | 9900 | 3300 |
| Dissolved Selenium (Se) | µg/L | 2.0 | 100 | < | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Silicon (Si) | µg/L | 50 | NV | | 7600 | 7500 | 7600 | 4900 | 5300 |
| Dissolved Silver (Ag) | µg/L | 0.090 | 0.1 | < | 0.090 | <0.090 | <0.090 | <0.090 | <0.090 |
| Dissolved Sodium (Na) | µg/L | 100 | NV | | 140000 | 26000 | 15000 | 140000 | 33000 |
| Dissolved Strontium (Sr) | µg/L | 1.0 | NV | | 530 | 510 | 530 | 310 | 250 |
| Dissolved Thallium (Tl) | µg/L | 0.050 | 0.3 | < | 0.05 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Titanium (Ti) | µg/L | 5.0 | NV | < | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Uranium (U) | µg/L | 0.10 | 5 | | 1.6 | 1.5 | 0.55 | 1.6 | 0.6 |
| Dissolved Vanadium (V) | µg/L | 0.50 | 6 | | 1.7 | 1.7 | 0.64 | <0.50 | <0.50 |
| Dissolved Zinc (Zn) | µg/L | 5.0 | 30 | < | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |

Notes:

1. Criteria for Provincial Water Quality Objectives "PWQO" (Feb. 1999)
2. **Bold** - Exceeds Criteria
3. "-" - parameter not analyzed
4. m bgs - Metres below ground surface
5. RDL - Reported detection limit
6. NV- No Value
7. NA - Not Applicable
8. < - Less than the Reporting Detection Limit
9. µg/L- Micro-grams per Litre
10. mg/L - Milligrams per Litre
11. umho/cm - Micromhos per Centimeter
12. me/L - Milliequivalent per Litre

# Appendix A

# Concept Plan

OLD SCHOOL ROAD

P.I.N. 14297 – 0002 (LT)

OLD SCHOOL R O A D

OLD SCHOOL R O A D

PROPOSED ACCESS PROP. 26.56m CURB CUT

PROPOSED ACCESS PROP. 22.50m CURB CUT

PROPOSED ACCESS PROP. 27.00m CURB CUT

PYLON SITE SIGNAGE

TOP OF CULVERT HEIGHT: 0.45 M

TOP OF CULVERT(NORTH EAST CORNER) HEIGHT: 1.75 M APPROXIMATE WIDTH 4.00 METERS

TOP OF CULVERT HEIGHT: 1.90 M

DEDICATED BY BY-LAW 182-72, INST. VS239780

PART 3 PLAN 43R-6810

PART 4 PLAN 43R-6810 P.I.N. 14235-0719 (LT)

PART 5 PLAN 43R-6810 P.I.N. 14235 - 0675 (LT)

PART 1, PLAN 43R-10936 P.I.N. 14235 - 0692 (LT)

P.I.N. 14235 - 0694 (LT)

P.I.N. 14235 - 0695 (LT)

BRICK BUILDING INST. RO811129 P.I.N. 14235 - 0695 (LT)

BUILDING 'A'
81,930.96 s.m. (881,898 s.f.)

BUILDING 'B'
91,867.40 s.m. (988,853 s.f.)

BUILDING 'C'
48,323.71 m2
(520,152 sq ft)

BUILDING 'D'
25,120.91 m2 (270,399 sq ft)

FUTURE EXPANSION
10,706.18 m2
(115,240 sq ft)

ENVIRONMENTAL AREA 'A'

ENVIRONMENTAL AREA 'B'

ENVIRONMENTAL AREA 'C'
EXISTING WOODLOT

ENVIRONMENTAL AREA 'D'

STORMWATER MANAGEMENT AREA A
9,078.16 s.m. (2.24 acres)±

STORMWATER MANAGEMENT AREA A1
3,752.37 s.m. (.93 acres)±

STORMWATER MANAGEMENT AREA B
15,807.10 s.m. (3.91 acres)±

STORMWATER MANAGEMENT AREA C

11,887.24 s.m. (2.91 acres)±

TOP OF BANK

TOE OF SLOPE (ESTIMATED)

LIMIT OF ENVIRONMENTAL CONSTRAINTS 2021-02-03

WETLAND RSD SETBACK 2021-01-27

DIXIE ROAD

PART 1 PLAN 43R-7014 P.I.N. 14235-0696 (LT)

PART 37 PLAN 43R-20

PART 35 PLAN 43R-20345

PART 2 PLAN 43R-5085

PART 34 PLAN 43R-20345

PART 33 PLAN 43R-20345

PART 31 PLAN 43R-20345

PART 32 PLAN 43R-20345

PART 36, PLAN 43R-20345

PART 30, PLAN 43R-20345

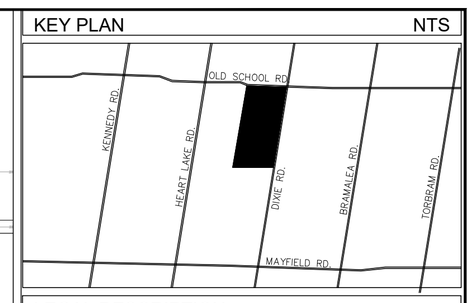
PART 29, PLAN 43R-20345

PART 1, PLAN 43R – 16721 P.I.N. 14235 – 0699 (LT)

EDGE OF CREEK

CONCESS

## KEY PLAN NTS




## LEGAL DESCRIPTION

PLAN OF SURVEY OF
PART OF LOTS 21 AND 22
CONCESSION 2,
EAST OF HURONTARIO STREET
CITY OF CALEDON
(FORMERLY THE TOWNSHIP OF CHINGUACOUSY, COUNTY OF PEEL)
REGIONAL MUNICIPALITY OF PEEL

SCALE 1 : 1000
0 20 40 60 metres

R. AVIS SURVEYING INC.


TRUE NORTH

PROJECT NORTH

## SITE AREA SUMMARY

| | | | |
|---|---|---|---|
| TOTAL SITE AREA | 790,553.67 m2 | or | 195.35 acres |
| SITE AREA "A-B" (including buffer) | 398,261.32 m2 | or | 98.41 acres |
| BUFFER "A-B-C1" | 24,392.41 m2 | or | 6.03 acres |
| SITE AREA "C-D" (including buffer) | 256,385.34 m2 | or | 63.35 acres |
| BUFFER "C2-D" | 31,665.35 m2 | or | 9.88 acres |
| ENVIRONMENTALLY PROTECTED AREAS (excluding buffers) | 135,907.01m2 | or | 33.59 acres |
| ENVIRONMENTAL AREA "A" | 26,709.02 m2 | or | 6.60 acres |
| ENVIRONMENTAL AREA "C" (Wood Lot) | 100,877.00 m2 | or | 24.93 acres |
| ENVIRONMENTAL AREA "D" | 8,320.99 m2 | or | 2.06 acres |

## OVERALL SITE STATISTICS

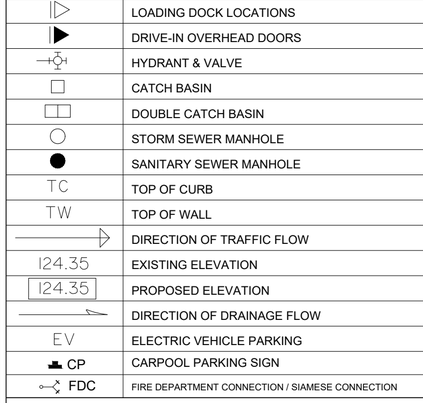
ZONING DESIGNATION: MS-XX

| | REQUIRED | PROVIDED |
|---|---|---|
| PLANTING STRIP WIDTH | | |
| FRONT YARD (OLD SCHOOL RD) | 9.0 m | 3.54 m |
| EXTERIOR LOT LINE (DIXIE RD.) | 7.0 m | 8.62 m |
| INTERIOR LOT LINE (WEST) | 1.5 m | 0.0 m |
| REAR LOT LINE (SOUTH) | 0.0 m | 0.0 m |
| SETBACKS | | |
| LOT FRONTAGE | 30.0 m | 456.33 m |
| FRONT YARD (OLD SCHOOL RD) | 20.0 m | 57.52 m |
| EXTERIOR SIDE YARD (DIXIE RD.) | 7.5 m | 20.12 m |
| INTERIOR SIDE YARD (WEST) | 6.0 m | 14.63 m |
| REAR YARD (SOUTH) | 15.0 m | 52.47 m |
| SITE COVERAGE (Based on Total Site Area, less ENV. "A", "D" & Wood Lot) | 247,242.98 m2 or | 37.76 % |
| LANDSCAPE AREA (Based on Total Site Area, less ENV. "A", "D" & Wood Lot) | 178,816.74 m2 or | 27.32 % |
| PAVED AREA (Based on Total Site Area, less ENV. "A", "D" & Wood Lot) | 228,586.94 m2 or | 34.92 % |
| TOTAL PARKING | 1,656 spaces | 1,857 spaces |
| TOTAL ACCESSIBLE PARKING | 39 spaces | 42 spaces |
| SNOW STORAGE AREA (MIN. 2%) | 11,972.89 m2 | 11,972.89 m2 |

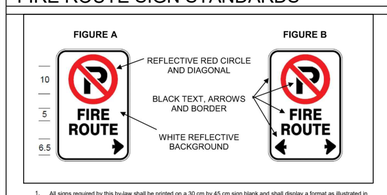
## SITE 'A-B' (NORTH) STATISTICS

| | | | |
|---|---|---|---|
| DEVELOPMENT SITE AREA | 373,711.65 m2 | or | 92.35 acres |

## CONTEXT MAP

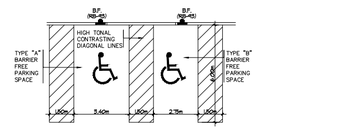



## FIRE ROUTE SIGN STANDARDS




1. All signs required by this by-law shall be printed on a 30 cm by 45 cm sign blank and shall display a format as illustrated in Figure A and Figure B.
2. Fire route signs shall be placed at each limit of the designated fire route and shall display single headed arrows (Figure A) pointing in the direction of such designated fire route. Signs displaying double headed arrows (Figure B) shall be placed at intermediate points along the designated fire route at intervals of approximately 30 metres or as identified by the Fire Chief.
3. Signs shall be installed, at an angle of 45-60 degrees in relation to the edge of the travelled portion of the designated route facing approaching traffic.
4. Signs shall be erected on a sign post anchored securely to the ground of a platform capable of holding the sign erect during all weather conditions. The maximum height of signs shall be no greater than 3 metres and the minimum height of signs shall be no less than 2 metres above the wearing surface of the fire route. The height measurement referred to in this section shall be taken to the top of the sign for both minimum and maximum heights.
5. Signs shall be erected on the boulevard of a designated fire route so that no part of the sign is closer than 60 cm nor grater than 3 metres to the edge of the fire route.

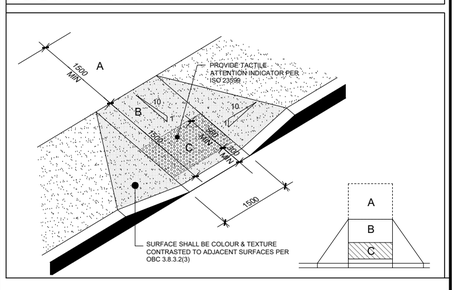
## ACCESSIBLE PARKING SPACE




## SYMBOL LEGEND

| | |
|---|---|
| ▷ | MAN DOOR LOCATIONS |
| \|▷ | LOADING DOCK LOCATIONS |
| ▶ | DRIVE-IN OVERHEAD DOORS |
| —☼— | HYDRANT & VALVE |
| □ | CATCH BASIN |
| ▭ | DOUBLE CATCH BASIN |
| ○ | STORM SEWER MANHOLE |
| ● | SANITARY SEWER MANHOLE |
| TC | TOP OF CURB |
| TW | TOP OF WALL |
| ——▷ | DIRECTION OF TRAFFIC FLOW |
| 124.35 | EXISTING ELEVATION |
| 124.35 | PROPOSED ELEVATION |
| ——≈ | DIRECTION OF DRAINAGE FLOW |
| EV | ELECTRIC VEHICLE PARKING |
| CP | CARPOOL PARKING SIGN |
| FDC | FIRE DEPARTMENT CONNECTION / SIAMESE CONNECTION |

## CURB RAMP DETAIL




| No. | ISSUED | DATE |
|---|---|---|

| No. | REVISION | DATE |
|---|---|---|

BALDASSARRA Architects Inc.
30 Great Gulf Drive, Unit 20 | Concord ON | L4K 0K7
T. 905.660.0722 | www.baldassarra.ca
OWNERS INFORMATION:

# Tribal

Old School Rd. & Dixie Rd.

Caledon, ON

**Overall Site Plan**

| DATE: | DRAWN BY: | CHECKED: | SCALE: |
|---|---|---|---|
| FEB. 2021 | HP | | 1:1750 |

PROJECT No. P-20177

DRAWING No. A-1.0

P:\P-20177 Tribal – Old School Road and Dixie Road Masterplan\Drawings\01 Current Drawings\P-20177 A-1.0.dwg, 2021-02-24 10:13:44 AM, LouisY, DWG To PDF.pc3

# Appendix B

# Borehole Logs

## ID Number: MW101-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

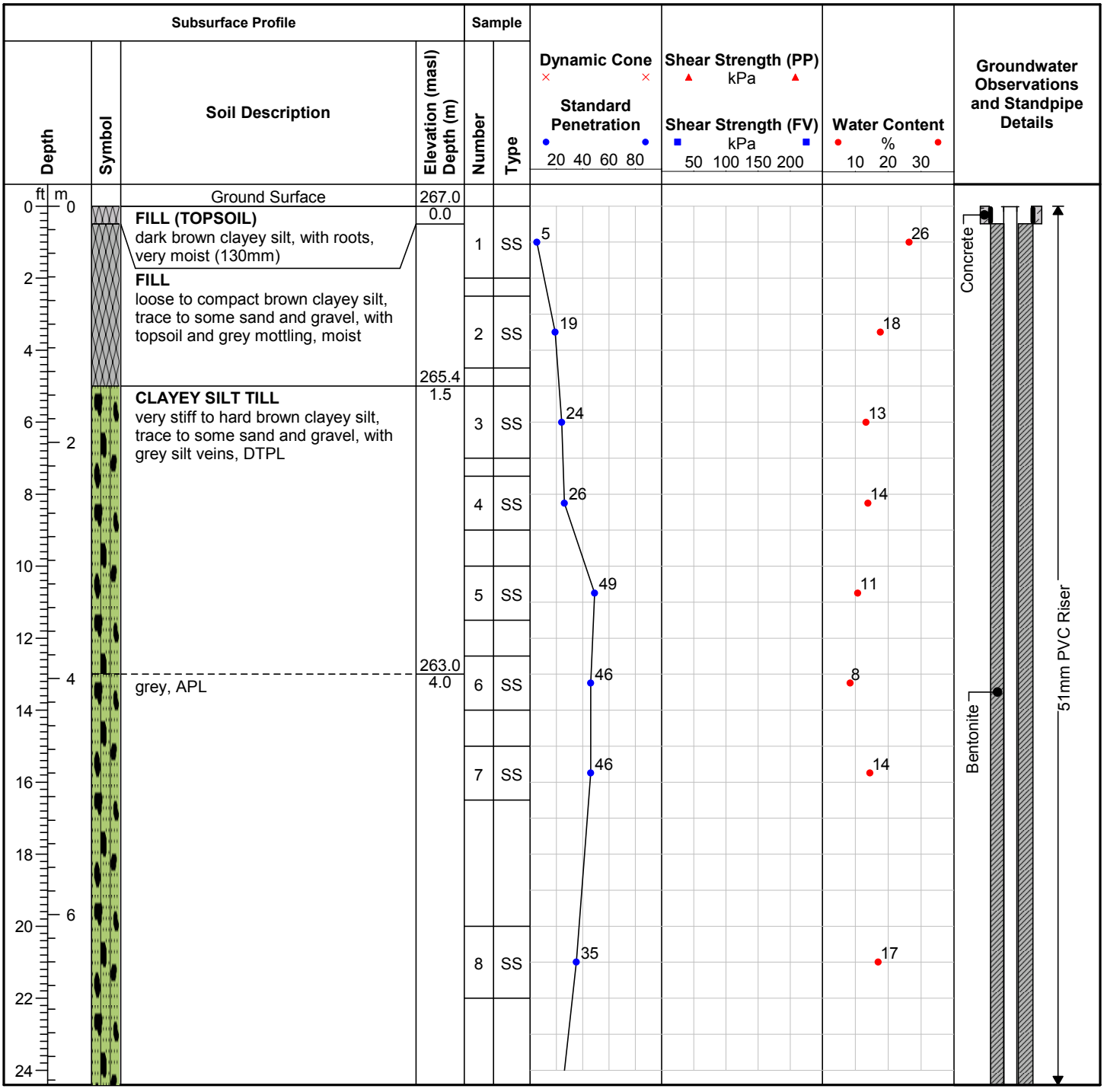
**Drill Date:** 10/29/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** Monument




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

Water level measured at 7.5 mbgs on Dec 14, 2020

## ID Number: MW101-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/29/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** Monument

| Depth | 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 |
|---|---|---|---|---|---|---|---|---|---|
| | | | 259.3 | | | | | | |
| | | sand seams | 7.6 | 9 | SS | 20 | | 10 | |
| 26 | 8 | | | | | | | | |
| 28 | | | | 10 | SS | 29 | | 10 | |
| 30 | | | 257.8 | | | | | | |
| | | **SILT AND SAND TILL**<br>compact to very dense grey silt and sand, some clay, trace gravel, very moist | 9.1 | 11 | SS | 19 | | 10 | |
| 32 | | | 257.1 | | | | | | |
| | 10 | wet | 9.9 | 12 | SS | 96/180mm | | 10 | |
| 34 | | | 256.3 | | | | | | |
| | | **SANDY SILT TILL**<br>very dense sandy silt, some clay and gravel, wet | 10.7 | 13 | SS | 50/125mm | | 9 | |
| 36 | | | | | | | | | |
| 38 | | | | 14 | SS | 50/75mm | | 13 | |
| | 12 | | 254.9 | | | | | | |
| 40 | | Drilling Terminated | 12.0 | | | | | | |
| 42 | | | | | | | | | |
| 44 | | | | | | | | | |
| 46 | 14 | | | | | | | | |
| 48 | | | | | | | | | |

Sand Pack

51mm Slotted Screen

**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

MTE

Water level measured at 7.5 mbgs on Dec 14, 2020

## ID Number: MW102-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/23/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** N/A

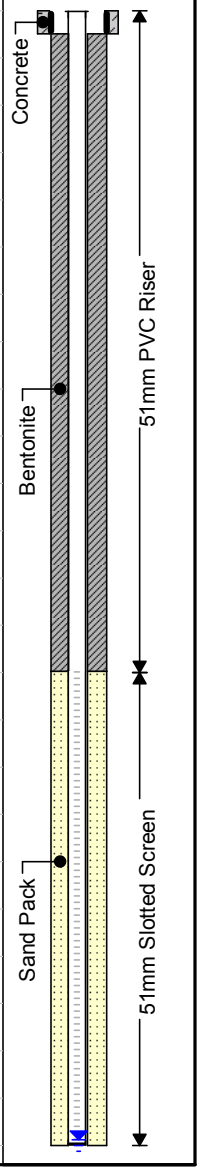
| Depth (ft / m) | Soil Description | Elevation (masl) / Depth (m) | Sample Number | Sample Type |
|---|---|---|---|---|
| 0 / 0 | Ground Surface | 267.6 | | |
| | **CONCRETE** Concrete: 150mm | 0.0 | 1 | SS |
| | **PAVEMENT STRUCTURE** ASPHALT: 150mm | | | |
| | **FILL** grey clayey silt, trace sand, DTPL | 266.6 / 0.9 | 2 | SS |
| 4 | brown, sandy silt, trace gravel, trace asphalt, moist | 265.9 | | |
| 6 / 2 | **CLAYEY SILT TILL** brown clayey silt, trace to some sand and gravel, DTPL | 1.7 | 3 | SS |
| 8 | sand seam | 265.0 / 2.6 | 4 | SS |
| 10 | **SANDY SILT TILL** brown sandy silt, trace to some clay, moist | 264.3 / 3.3 | 5 | SS |
| 12 / 4 | **CLAYEY SILT TILL** grey clayey silt, trace sand and gravel, DTPL to APL | 263.7 / 3.8 | 6 | SS |
| 14 | | 262.8 | 7 | SS |
| 16 | **SANDY SILT TILL** brown sandy silt, some clay, very moist | 4.8 | | |
| 18 | | 261.8 | 8 | SS |
| 20 / 6 | **SAND AND GRAVEL** brown sand and gravel, wet | 5.8 | | |
| | **SILTY SAND** brown silty sand, trace clay and gravel, wet | | 9 | SS |
| 22 | | | | |
| 24 | | | 10 | SS |

**Dynamic Cone / Standard Penetration** (20 40 60 80): 10, 25, 27, 26, 71, 20, 24, 142, 117

**Shear Strength (PP) / Shear Strength (FV)** kPa (50 100 150 200)

**Water Content** % (10 20 30)

**Groundwater Observations and Standpipe Details**




**Field Technician:** SKC

**Drafted by:** SKC

**Reviewed by:** B. Thorner

Water level measured at 7.3mbgs on Dec 14, 2020

## ID Number: MW102-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/23/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** N/A

| Subsurface Profile | | | | Sample | | 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 |
|---|---|---|---|---|---|---|---|---|---|
| Depth | Symbol | Soil Description | Elevation (masl) Depth (m) | Number | Type | | | | |
| | | | 259.9 | | | | | | |
| 26 | | **SILT**<br>grey silt, some clay, wet | 7.6 | 11 | SS | 59 | | | |
| 8 | | | 259.3 | | | | | | |
| 28 | | Drilling Terminated | 8.2 | | | | | | |
| 30 | | | | | | | | | |
| 32 | | | | | | | | | |
| 10 | | | | | | | | | |
| 34 | | | | | | | | | |
| 36 | | | | | | | | | |
| 38 | | | | | | | | | |
| 12 | | | | | | | | | |
| 40 | | | | | | | | | |
| 42 | | | | | | | | | |
| 44 | | | | | | | | | |
| 46 | | | | | | | | | |
| 14 | | | | | | | | | |
| 48 | | | | | | | | | |

**Field Technician:** SKC

**Drafted by:** SKC

**Reviewed by:** B. Thorner

MTE

**Sheet:** 2 of 2

Water level measured at 7.3mbgs on Dec 14, 2020

## ID Number: MW103-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

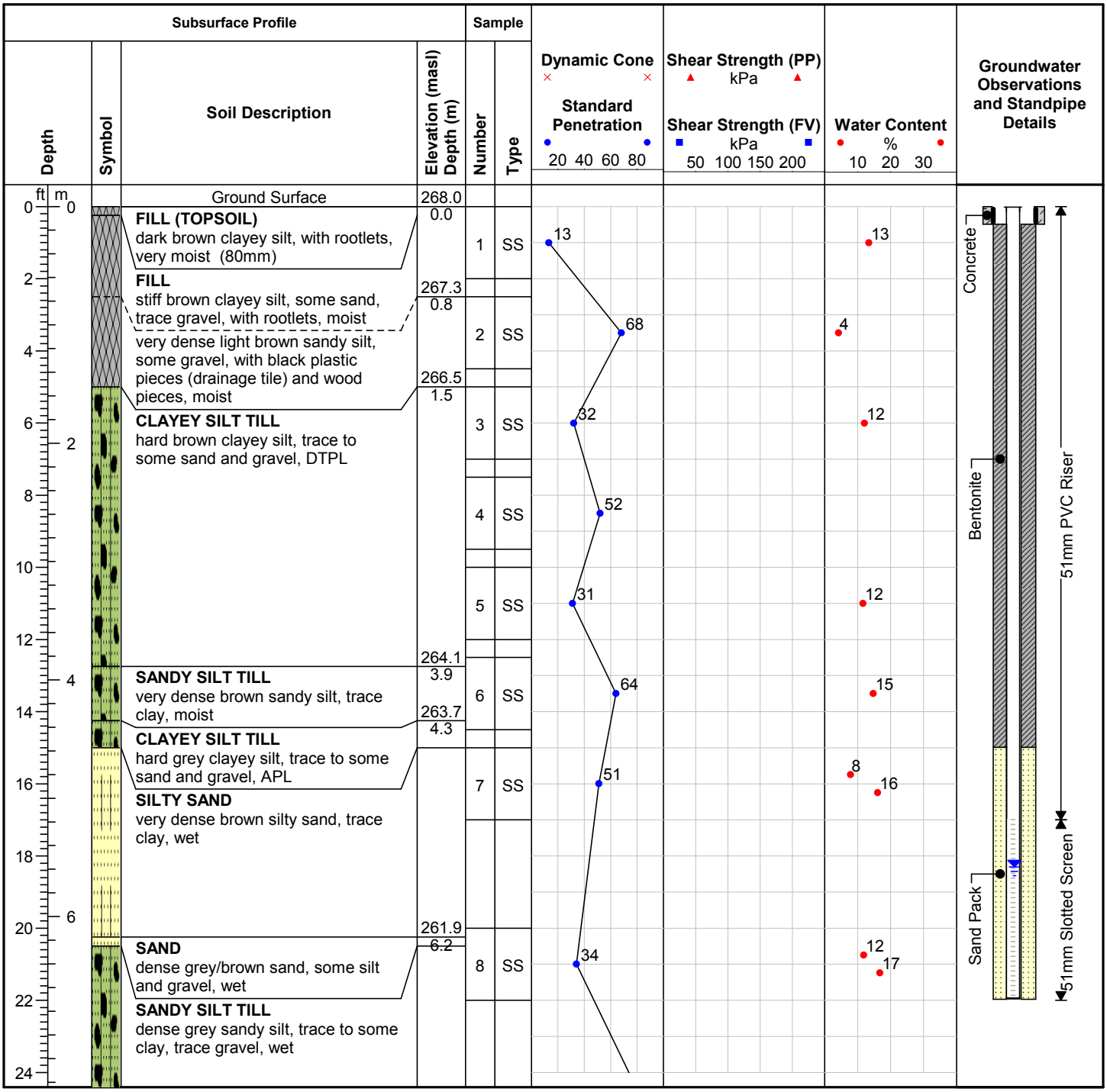
**Drill Date:** 10/19/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** Monument




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

Water level measured at 5.6mbgs on Dec 14, 2020

## ID Number: MW103-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

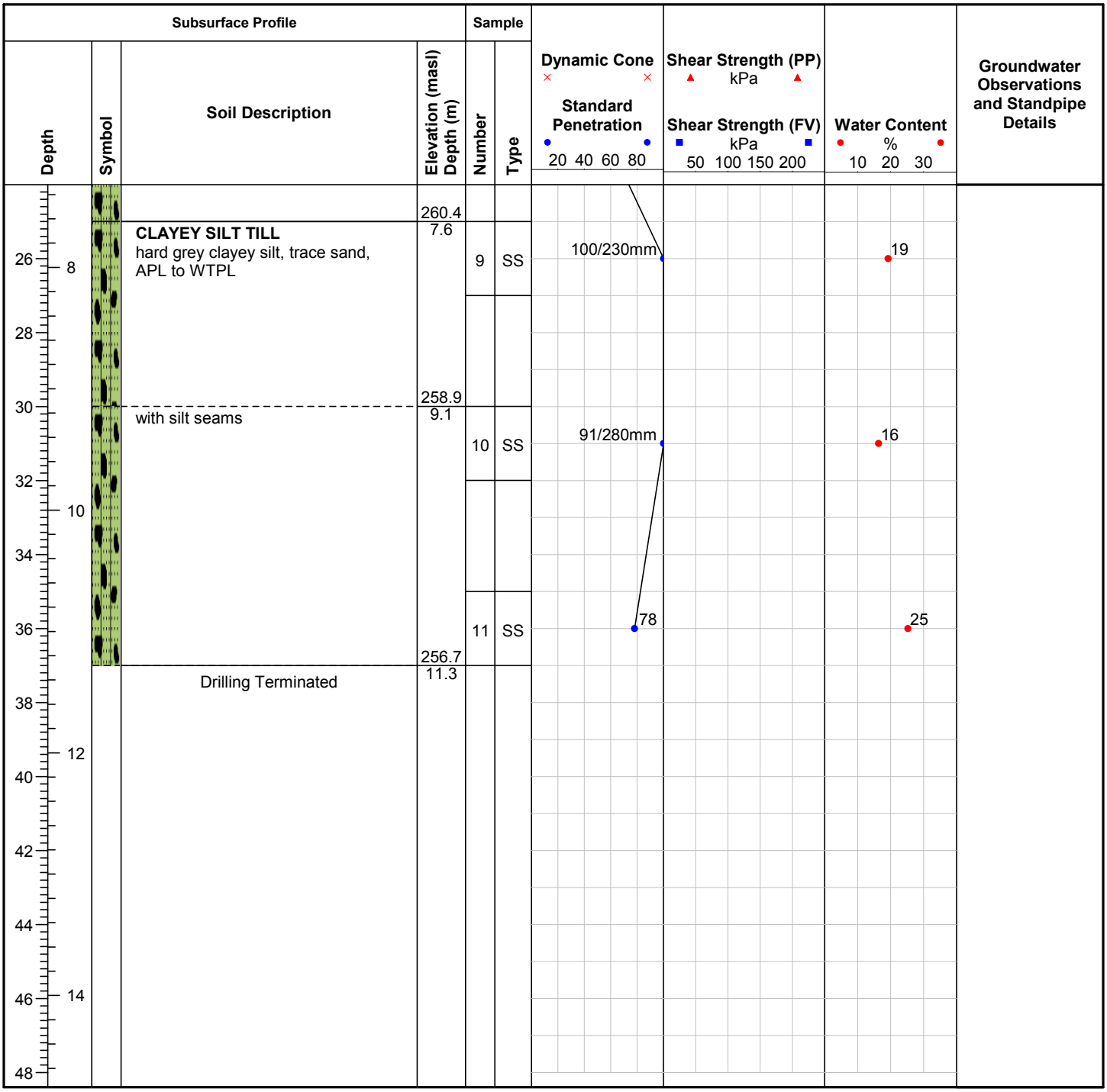
**Drill Date:** 10/19/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** Monument




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

MTE

**Sheet:** 2 of 2

Water level measured at 5.6mbgs on Dec 14, 2020

## ID Number: MW104-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

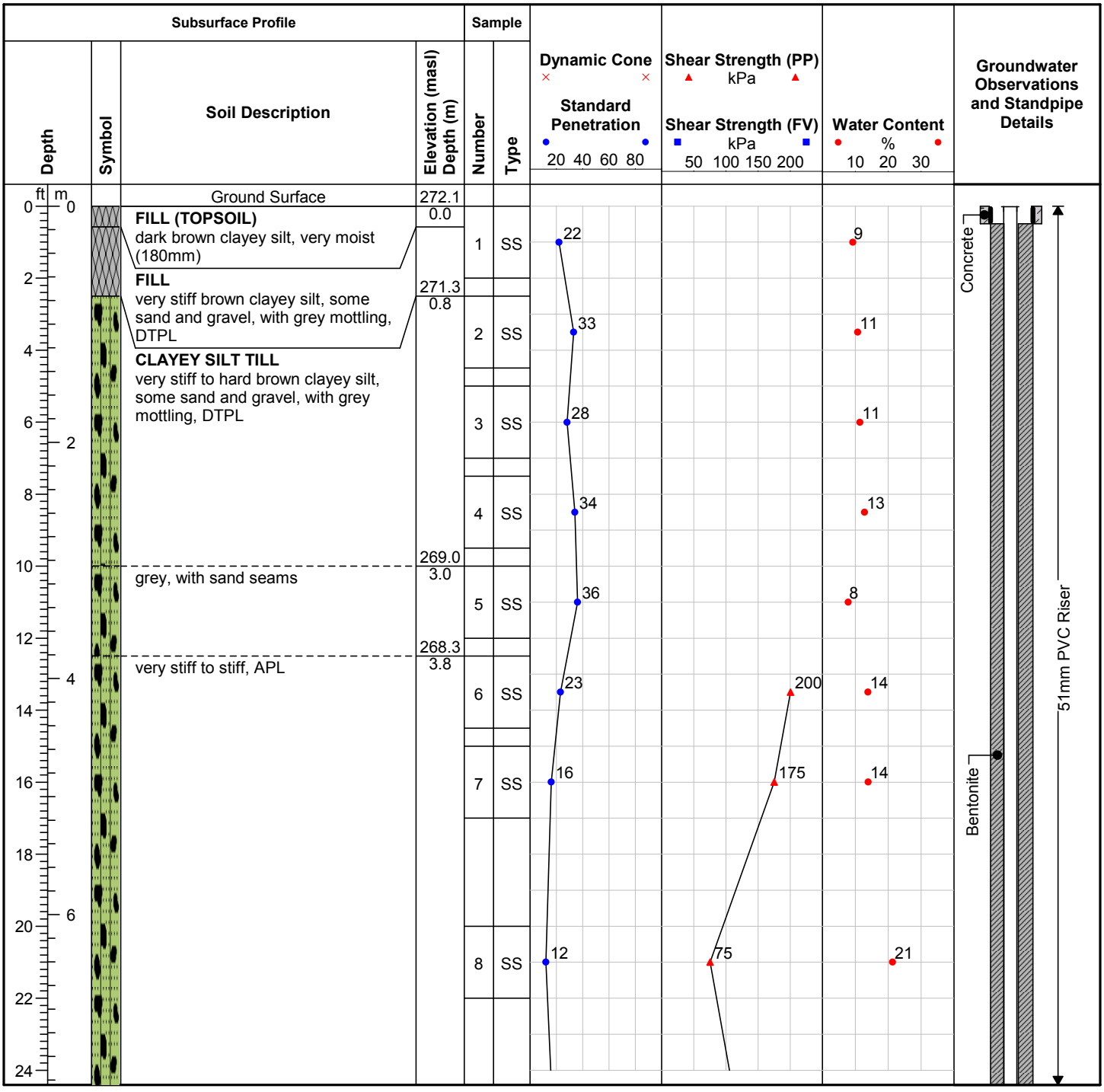
**Drill Date:** 10/21/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** Monument




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

No water level measured as borehole was dry on Dec 14, 2020

## ID Number: MW104-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

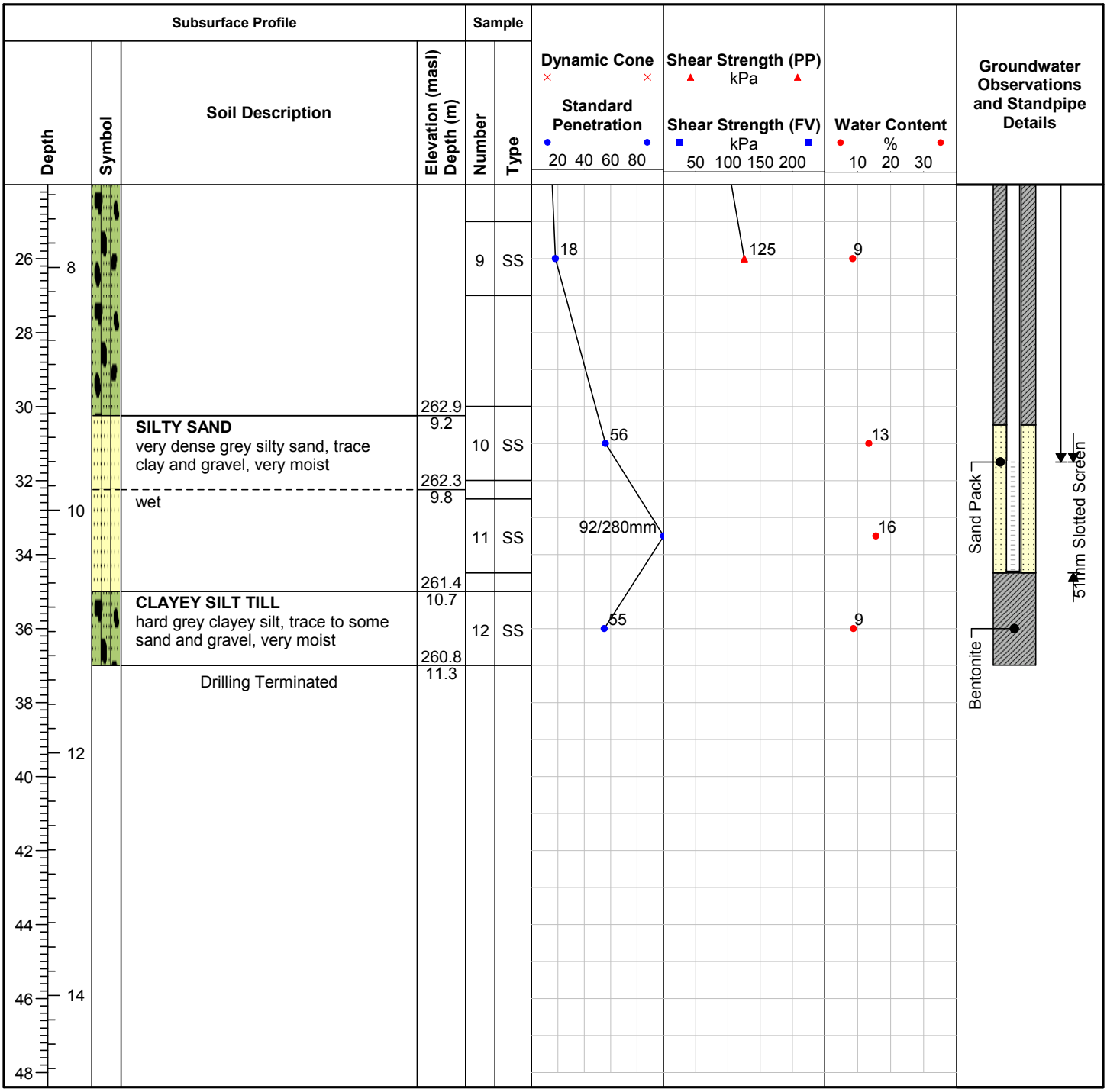
**Drill Date:** 10/21/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** Monument




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

No water level measured as borehole was dry on Dec 14, 2020

## ID Number: MW105-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

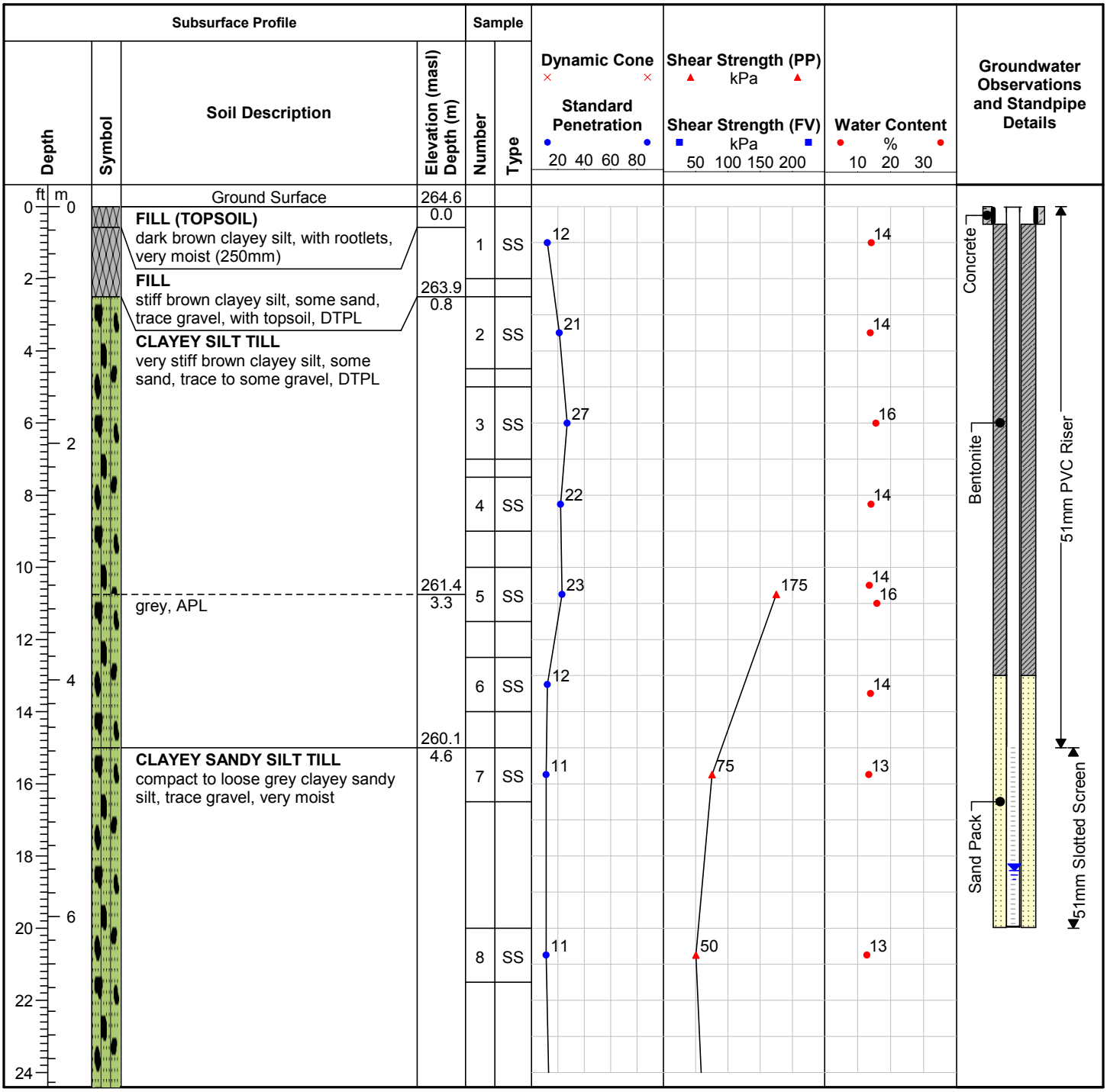
**Drill Date:** 10/28/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** Monument




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

Water level measured at 5.6 mbgs on Dec 14, 2020

## ID Number: MW105-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

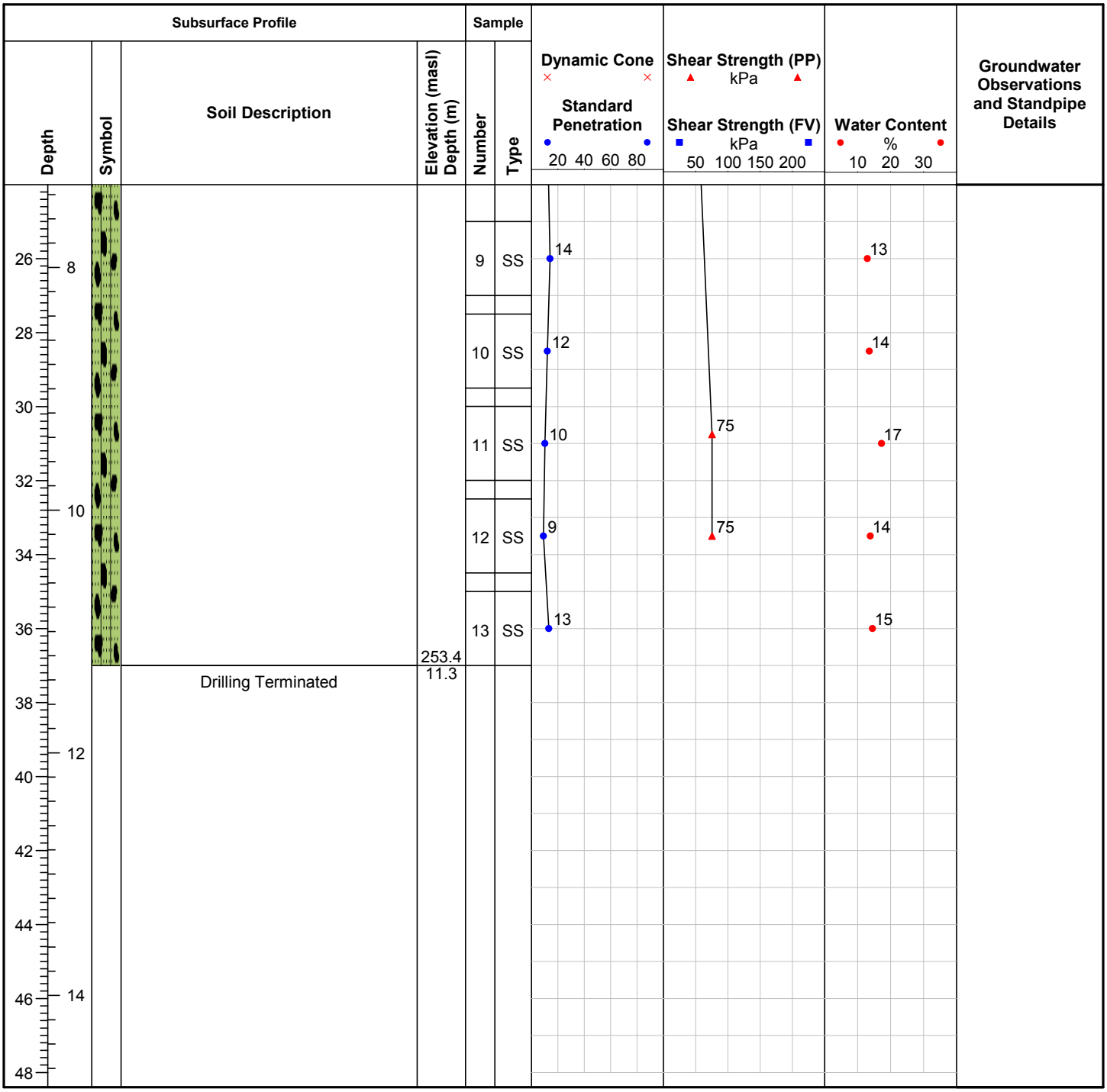
**Drill Date:** 10/28/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** Monument




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

Water level measured at 5.6 mbgs on Dec 14, 2020

## ID Number: MW106-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

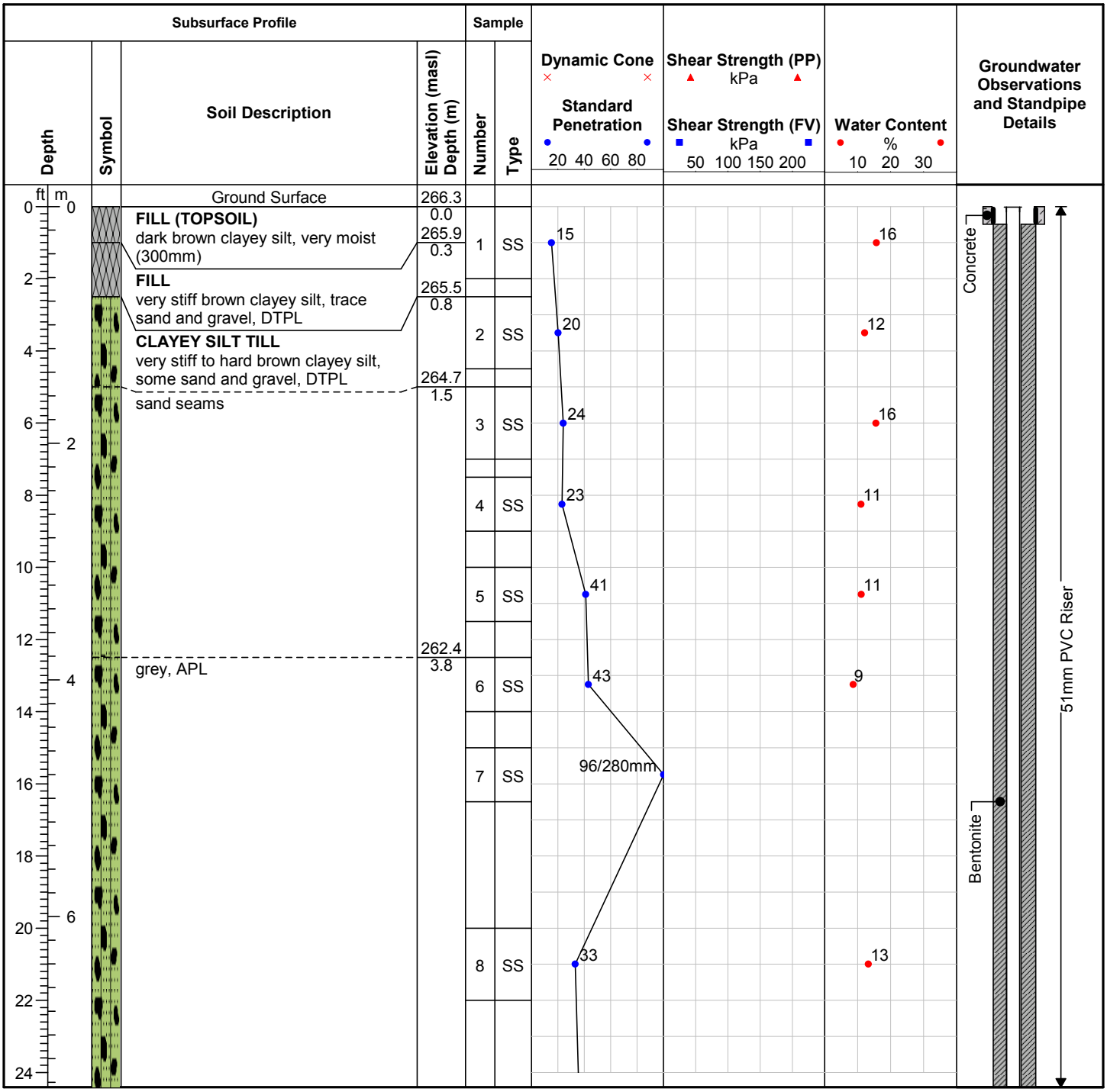
**Drill Date:** 10/28/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** Monument




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

Water level measured at 8.6 mbgs on Dec 14, 2020

## ID Number: MW106-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

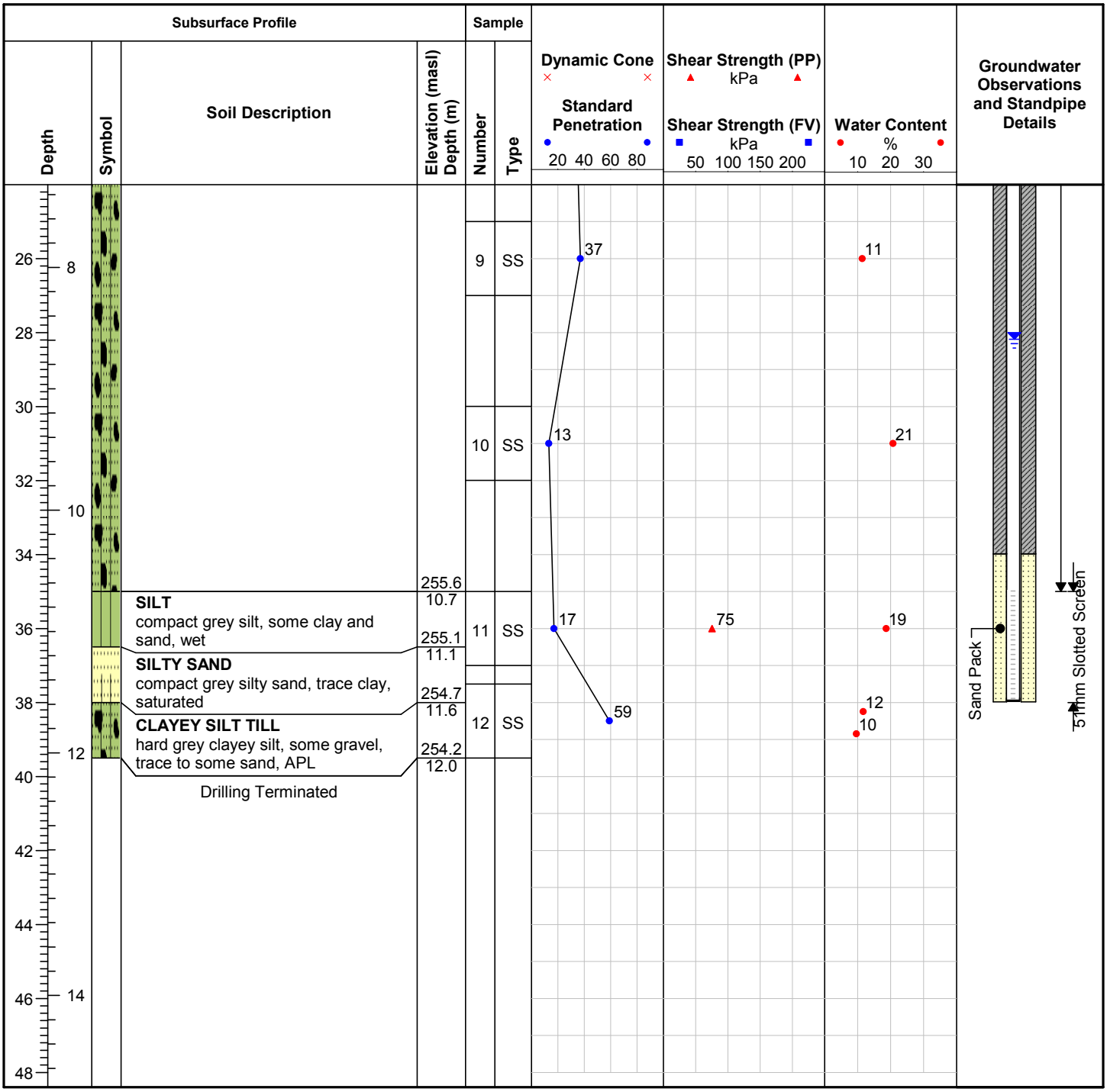
**Drill Date:** 10/28/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** Monument




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

Water level measured at 8.6 mbgs on Dec 14, 2020

## ID Number: MW107-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

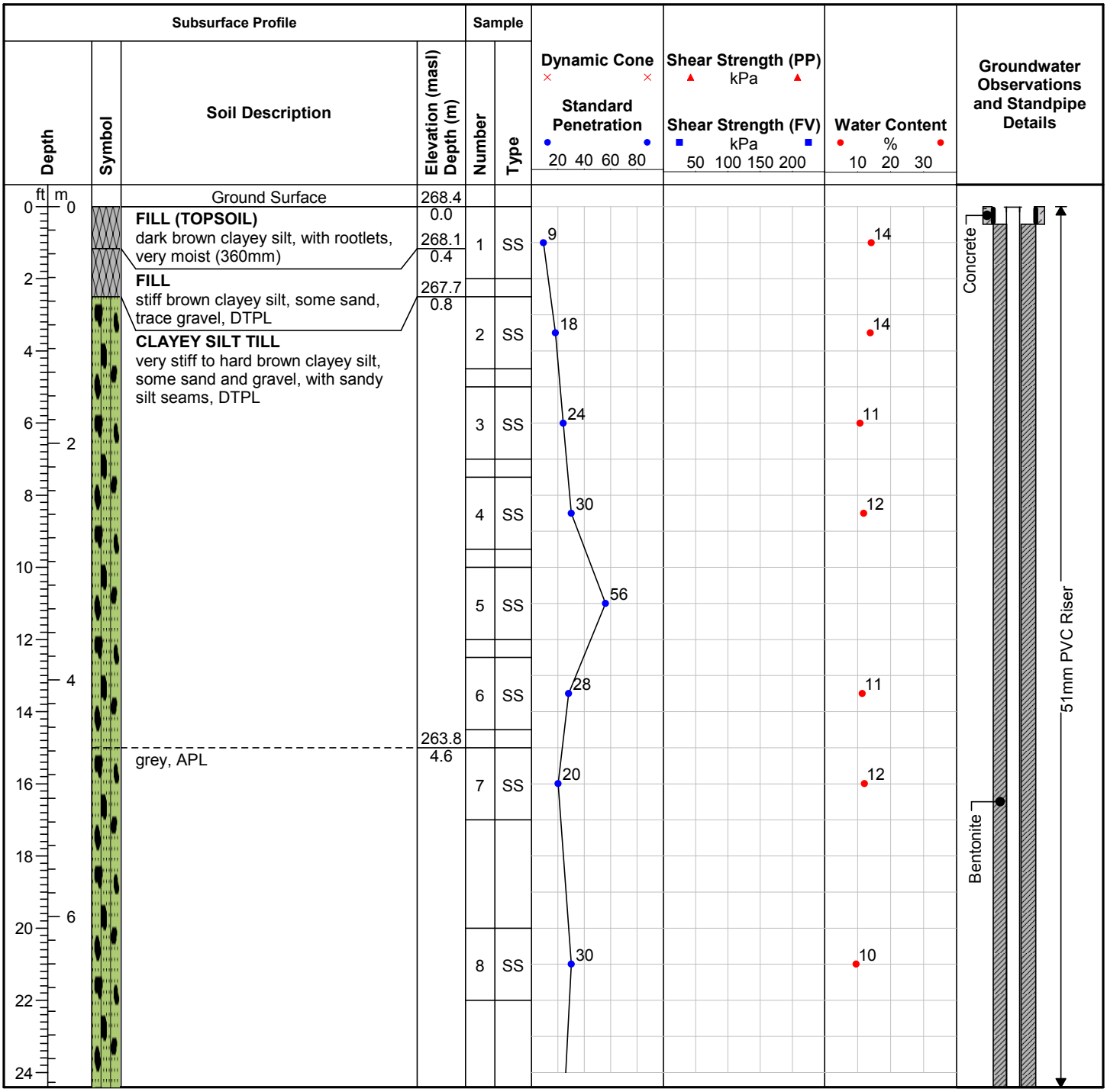
**Drill Date:** 10/26/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** Monument




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

Water level measured at 8.2 mbgs on Dec 14, 2020

## ID Number: MW107-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

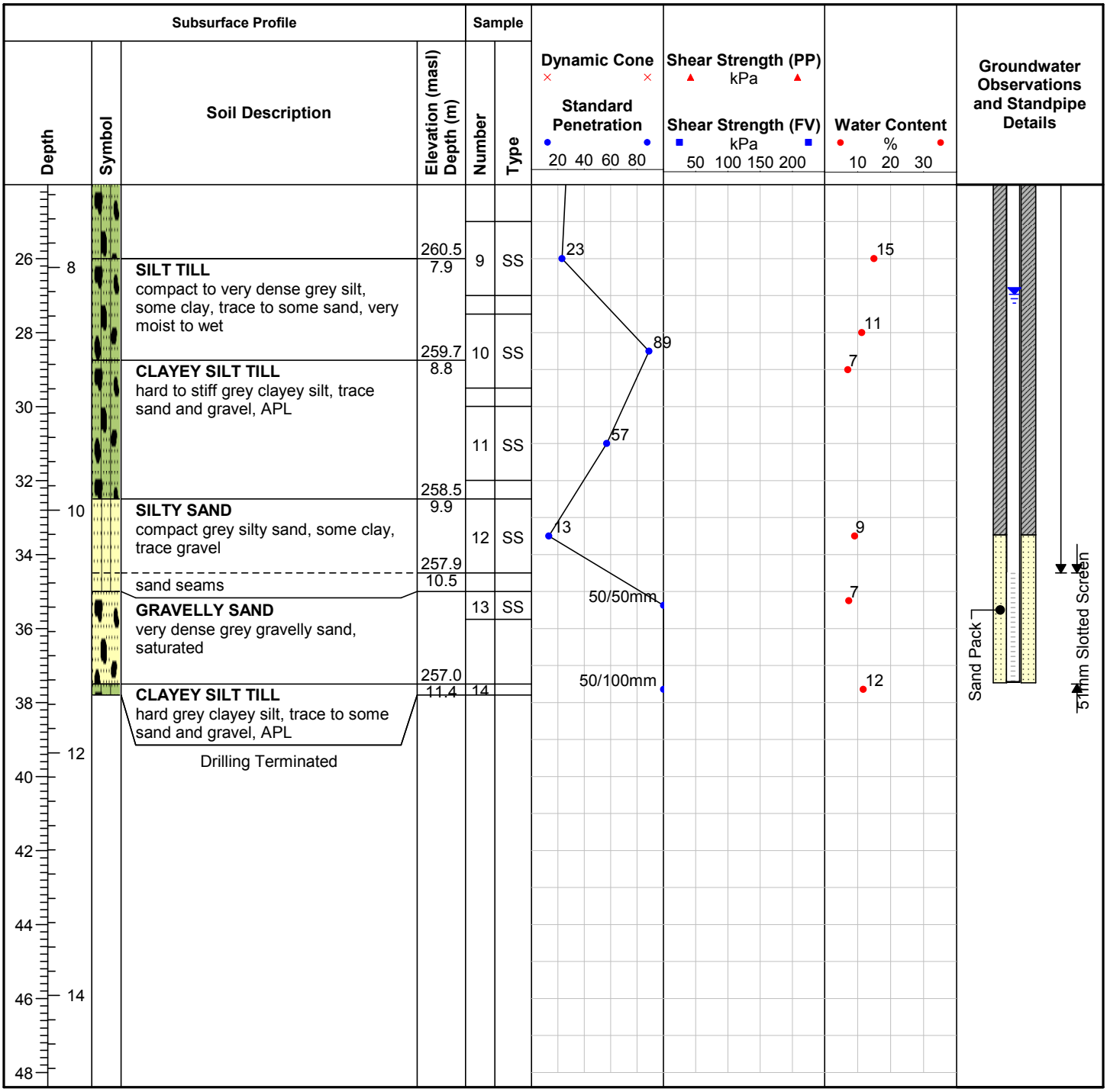
**Drill Date:** 10/26/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:** Monument




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

Water level measured at 8.2 mbgs on Dec 14, 2020

## ID Number: BH108-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

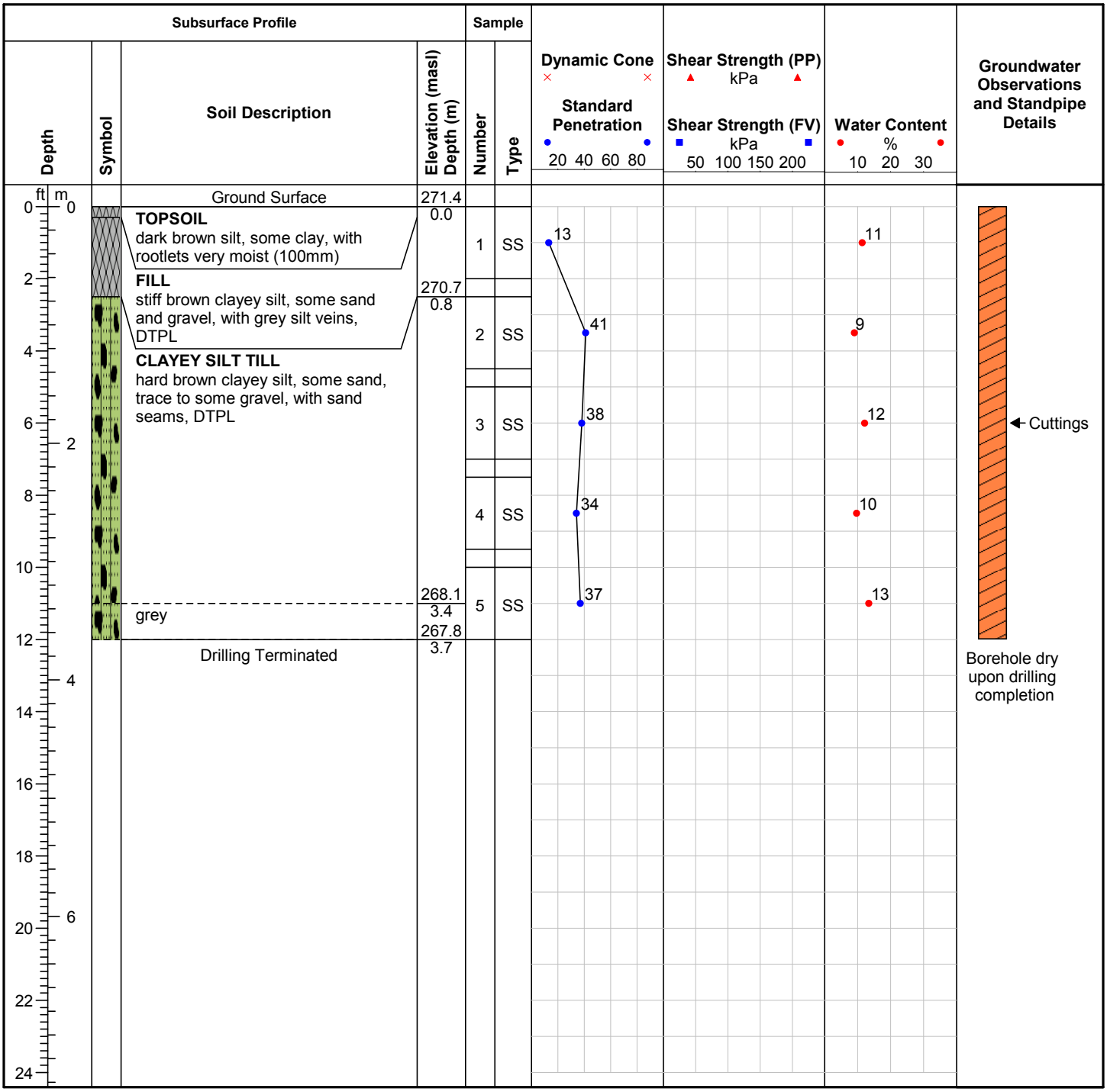
**Drill Date:** 10/20/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH109-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

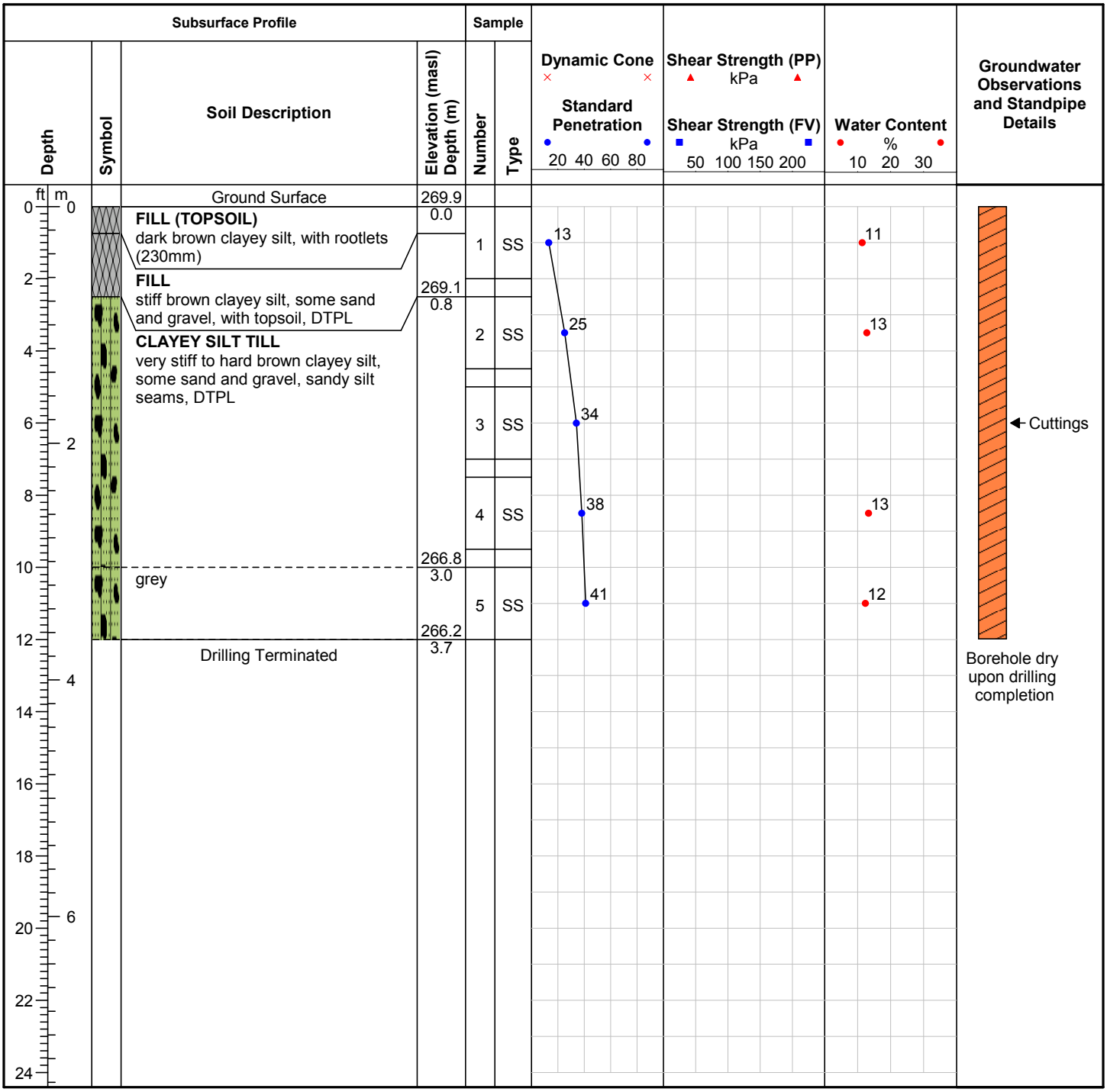
**Drill Date:** 10/19/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH110-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

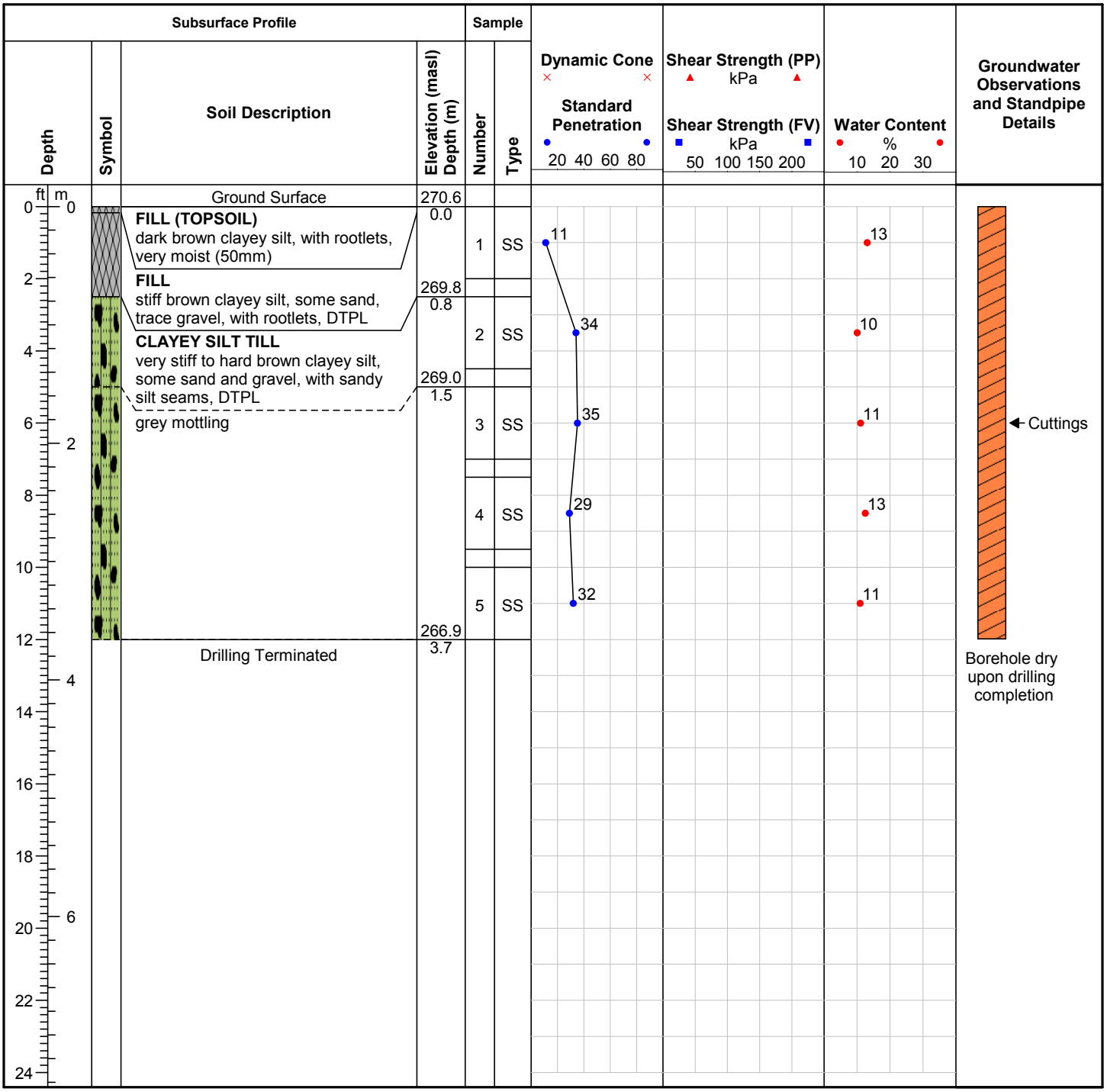
**Drill Date:** 10/19/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH111-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

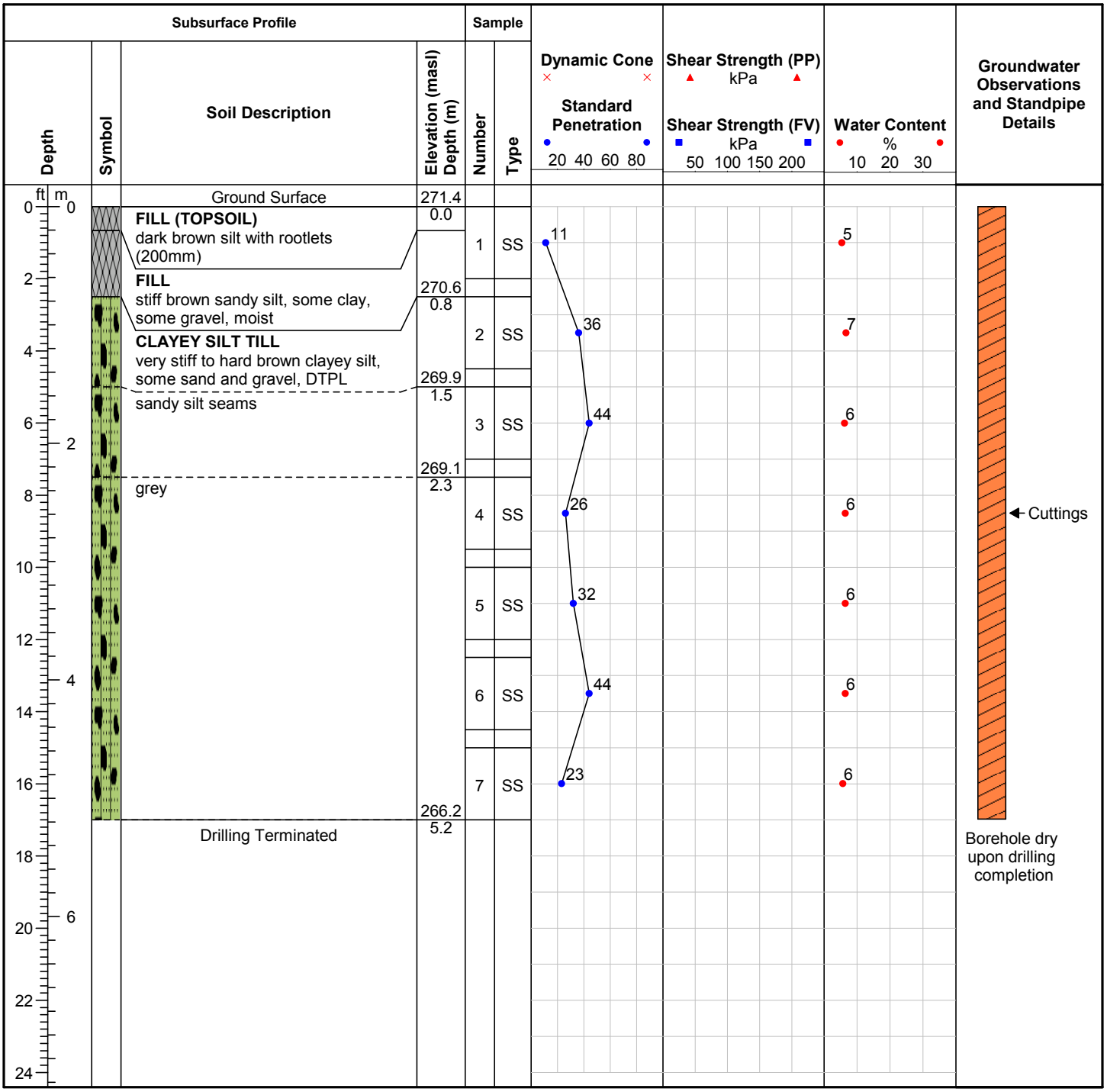
**Drill Date:** 10/20/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

MTE

**Sheet:** 1 of 1

## ID Number: BH112-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

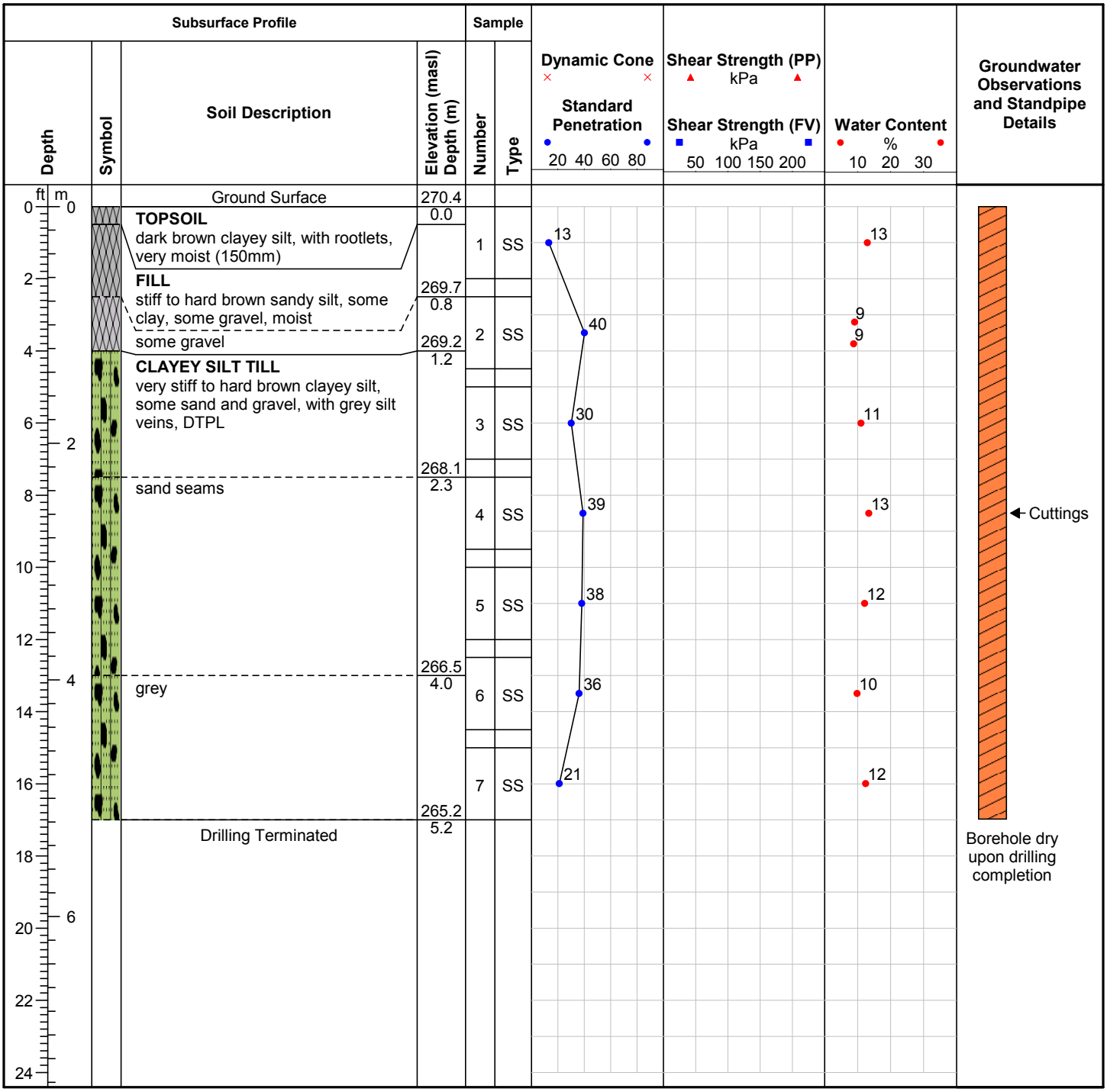
**Drill Date:** 10/20/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH113-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

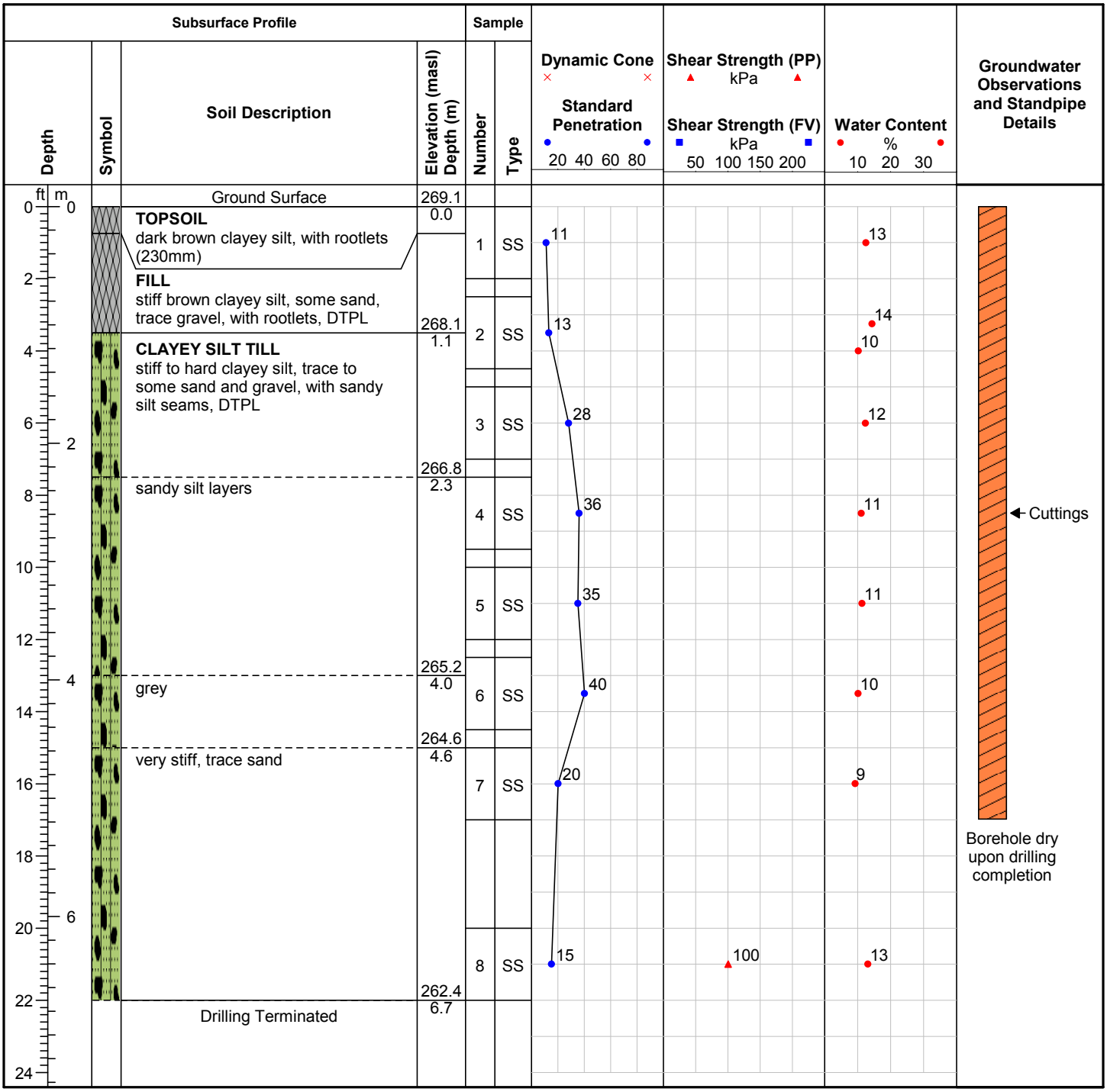
**Drill Date:** 10/20/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH114-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/21/2020

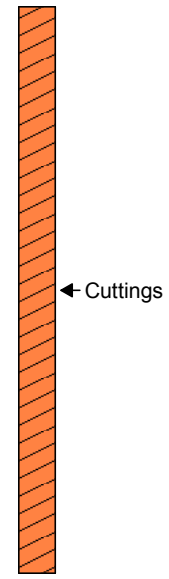
**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**

| 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 | 271.5 | | | | | | |
| 0 | | **FILL (TOPSOIL)** dark brown silt, with rootlets, very moist (200mm) | 0.0 | 1 | SS | 14 | | 10 | |
| 2 | | **FILL** stiff brown clayey silt, some sand, trace gravel, DTPL | 270.7 / 0.8 | 2 | SS | 40 | | 8 | |
| 4 | | **SANDY SILT TILL** dense brown sandy silt, some clay and gravel, moist | 269.9 / 1.5 | 3 | SS | 34 | | 9 | |
| 6 / 2 | | **CLAYEY SILT TILL** hard brown clayey silt, trace to some sand and gravel, DTPL | | 4 | SS | 33 | | 11 | |
| 8 | | | | 5 | SS | 44 | | 11 | |
| 10 | | | | | | | | | |
| 12 / 4 | | Drilling Terminated | 267.8 / 3.7 | | | | | | |
| 14 | | | | | | | | | |
| 16 | | | | | | | | | |
| 18 | | | | | | | | | |
| 20 / 6 | | | | | | | | | |
| 22 | | | | | | | | | |
| 24 | | | | | | | | | |




Borehole dry upon drilling completion

**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH115-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

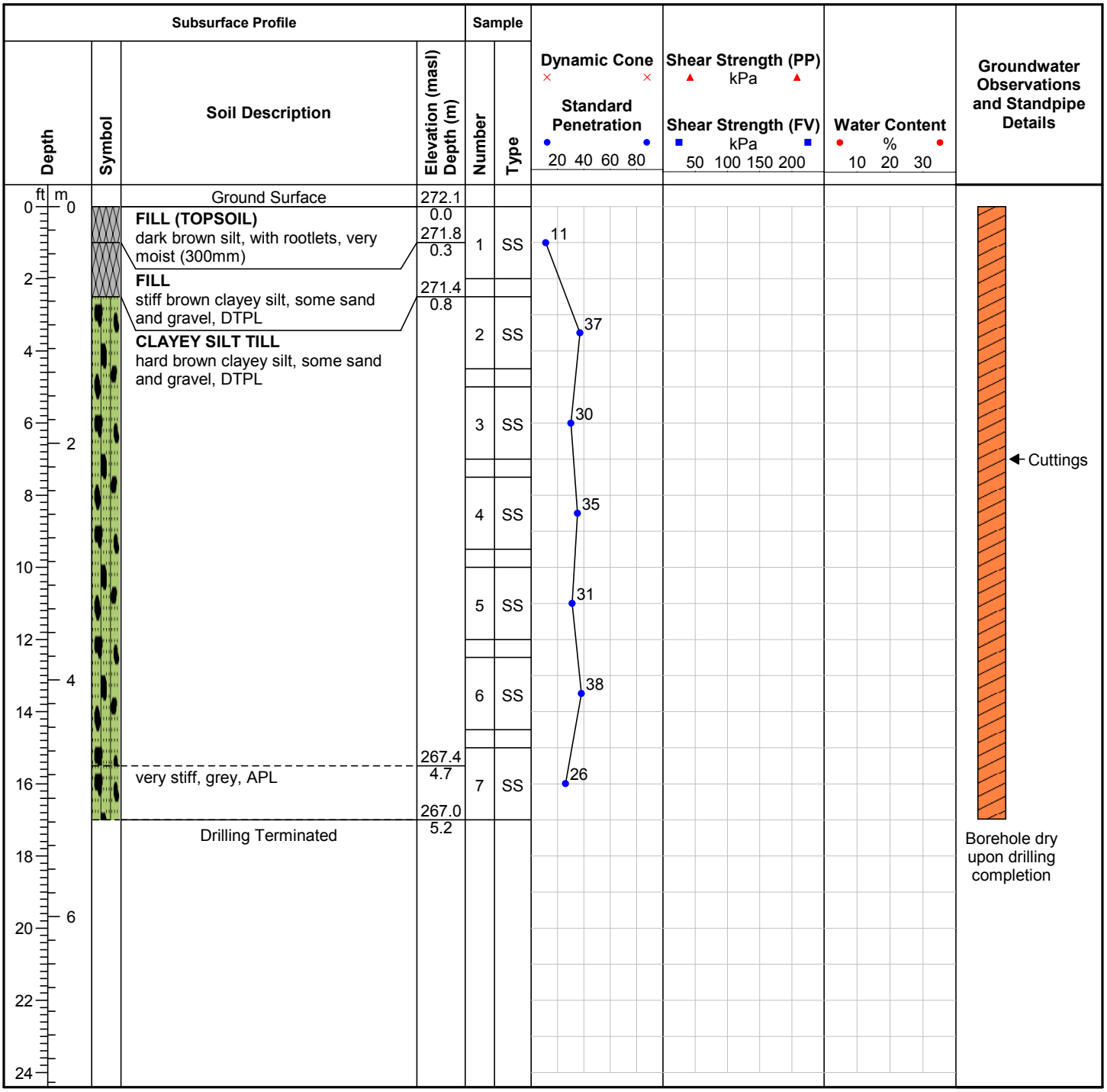
**Drill Date:** 10/21/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH116-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

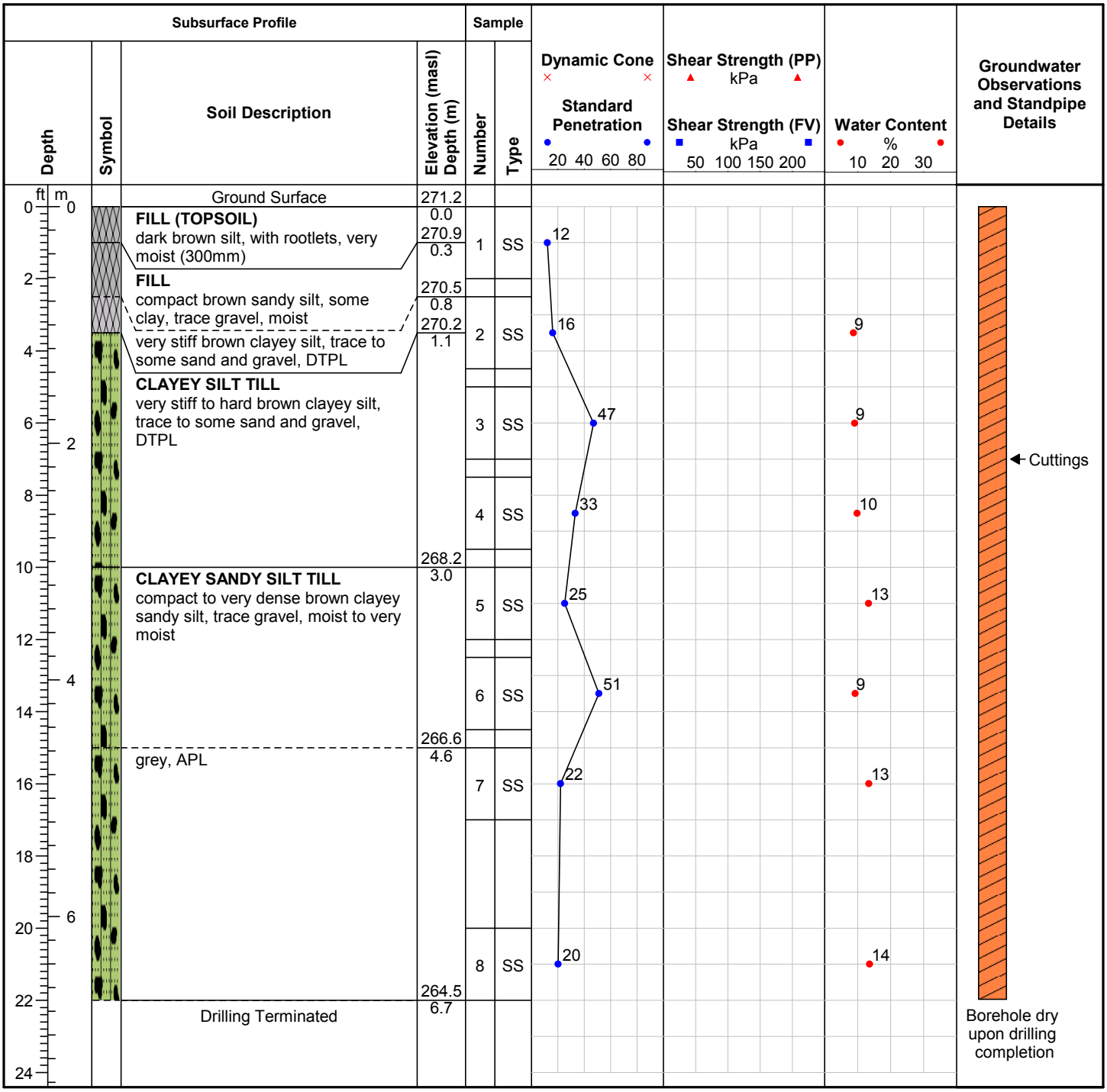
**Drill Date:** 10/21/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH117-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

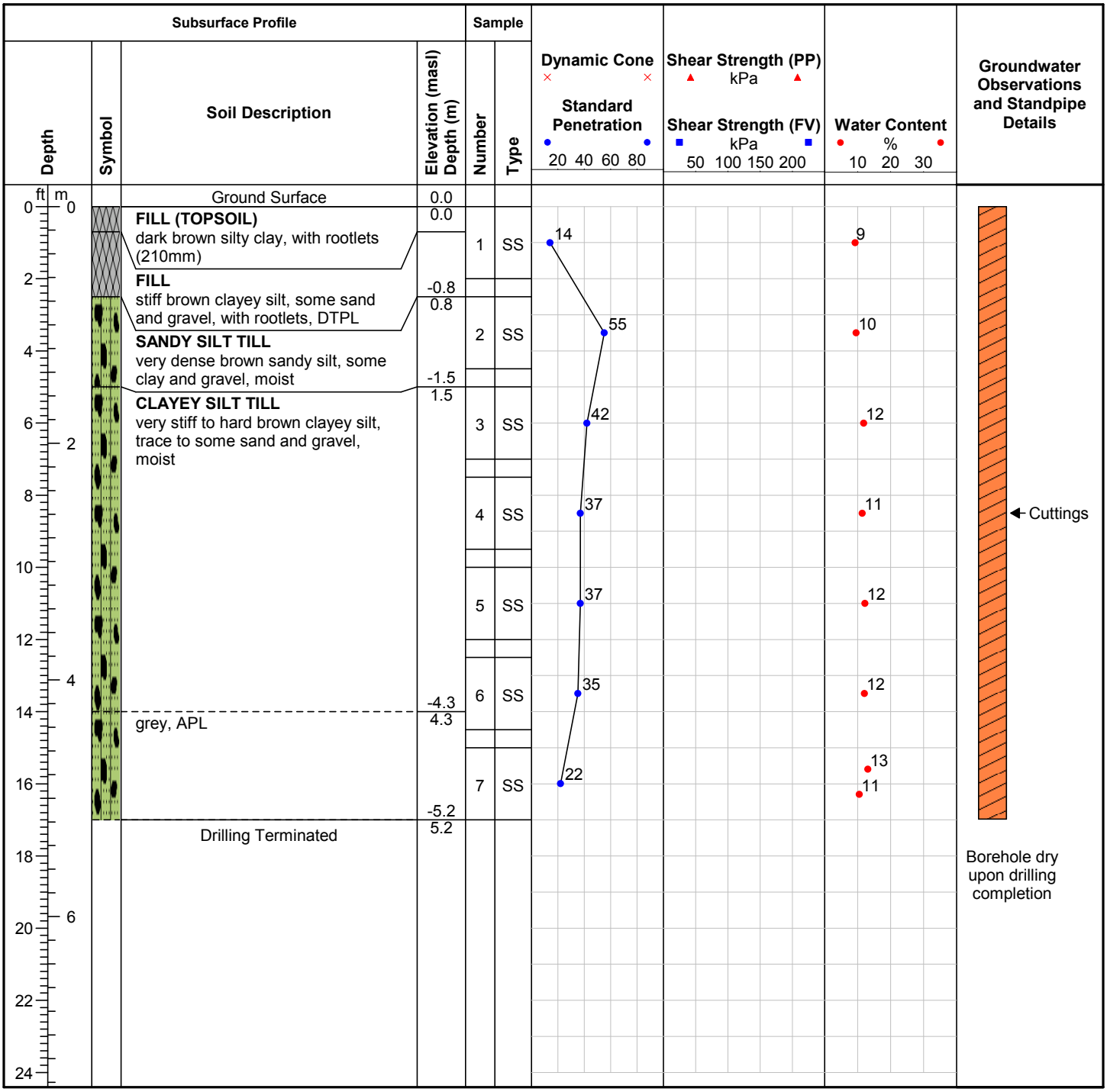
**Drill Date:** 10/22/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH118-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

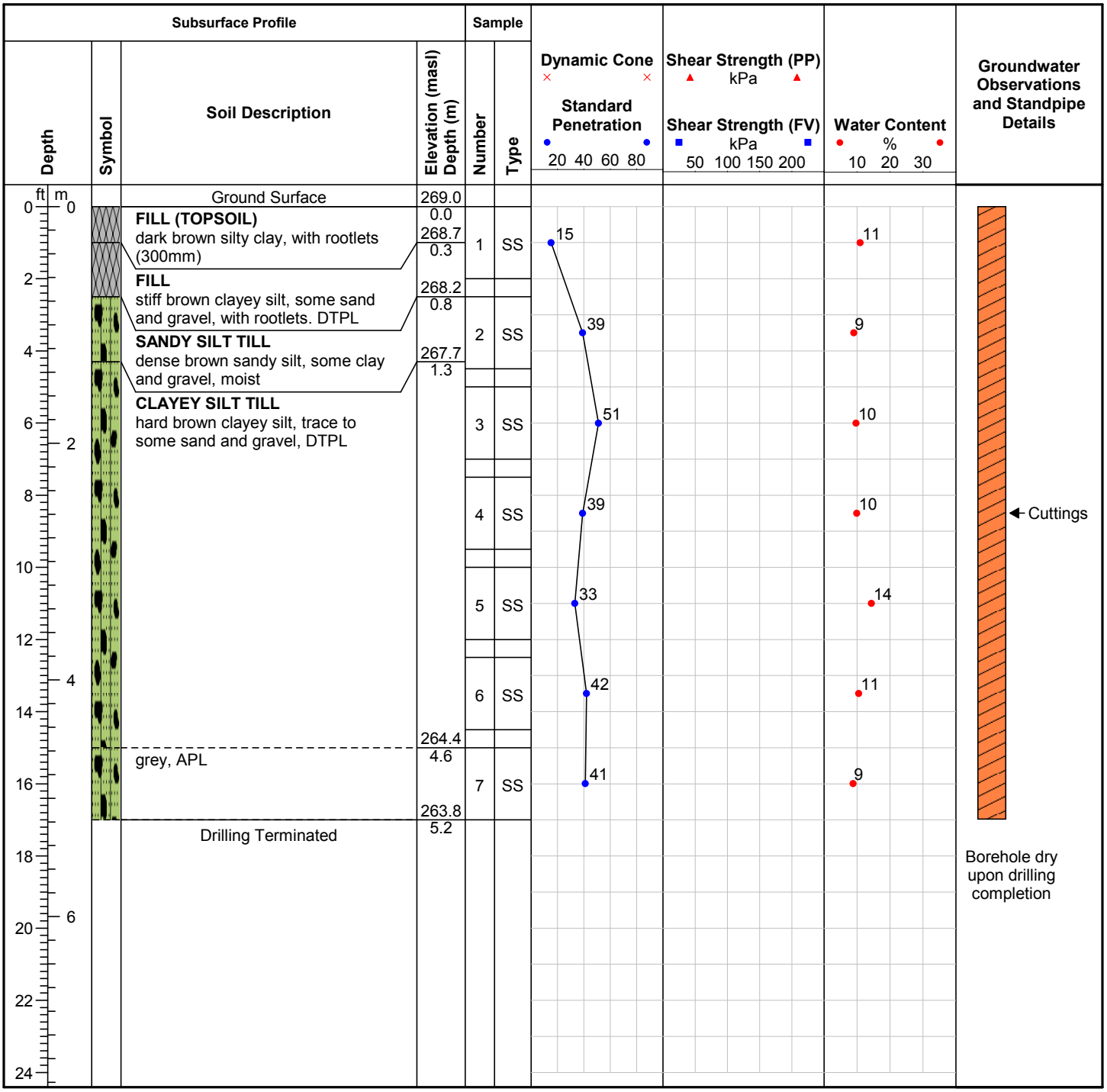
**Drill Date:** 10/22/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH119-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/22/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**

| Depth (ft / m) | Symbol | Soil Description | Elevation (masl) / Depth (m) | Sample Number | Sample Type |
|---|---|---|---|---|---|
| 0 / 0 | | Ground Surface | 270.7 | | |
| | | **FILL (TOPSOIL)** very stiff brown clayey silt, some sand and gravel, moist (80mm) | 0.0 | 1 | SS |
| | | **FILL** very stiff brown clayey silt, some sand and gravel, DTPL | 269.9 / 0.8 | 2 | SS |
| | | **CLAYEY SILT TILL** hard clayey silt, trace to some sand and gravel, DTPL | 269.0 | | |
| 2 / 6 | | grey silt veins | 1.7 | 3 | SS |
| | | sand seams | 268.4 / 2.3 | 4 | SS |
| | | silt seams | 267.7 / 3.0 | 5 | SS |
| | | Drilling Terminated | 267.1 / 3.7 | | |

Dynamic Cone (Standard Penetration): 18, 36, 31, 32, 40

Shear Strength (PP) / Shear Strength (FV) kPa: 20 40 60 80 | 50 100 150 200

Water Content %: 10 20 30 — 10, 9, 10, 14, 13

Groundwater Observations and Standpipe Details: Cuttings

Borehole dry upon drilling completion

**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

MTE

**Sheet:** 1 of 1

## ID Number: BH120-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

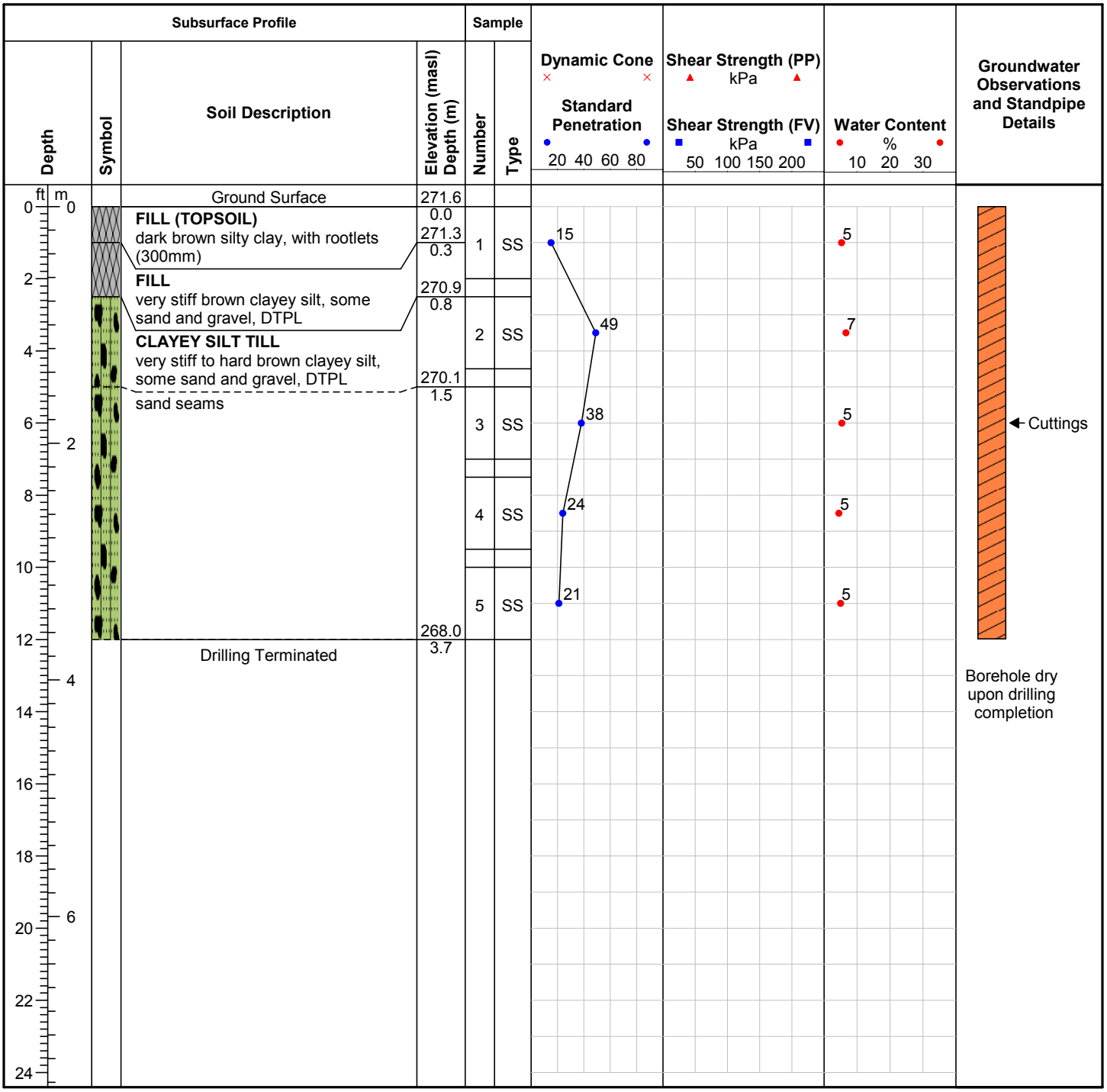
**Drill Date:** 10/22/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH121-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/22/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Hollow Stem Auger

**Protective Cover:**

| 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 | 269.3 | | | | | | |
| 0 | | **FILL (TOPSOIL)** dark brown clayey silt, with rootlets (300mm) | 0.0 / 269.0 / 0.3 | 1 | SS | 16 | | 10 | |
| 2 | | **FILL** very stiff brown clayey silt, some sand and gravel, DTPL | 268.5 / 0.8 / 268.2 / 1.1 | 2 | SS | 36 | | 9 | |
| 4 | | **SANDY SILT TILL** dense brown sandy silt, some clay and gravel, with grey silt veins, moist | | 3 | SS | 32 | | 13 | |
| 6 | | **CLAYEY SILT TILL** hard to very stiff clayey silt, some sand and gravel, with grey silt veins, DTPL | | 4 | SS | 27 | | 12 | |
| 10 | | | | 5 | SS | 44 | | 13 | |
| 12 | | Drilling Terminated | 265.6 / 3.7 | | | | | | Cuttings; Borehole dry upon drilling completion |
| 14 | | | | | | | | | |
| 16 | | | | | | | | | |
| 18 | | | | | | | | | |
| 20 | | | | | | | | | |
| 22 | | | | | | | | | |
| 24 | | | | | | | | | |

**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

MTE

**Sheet:** 1 of 1

## ID Number: BH122-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

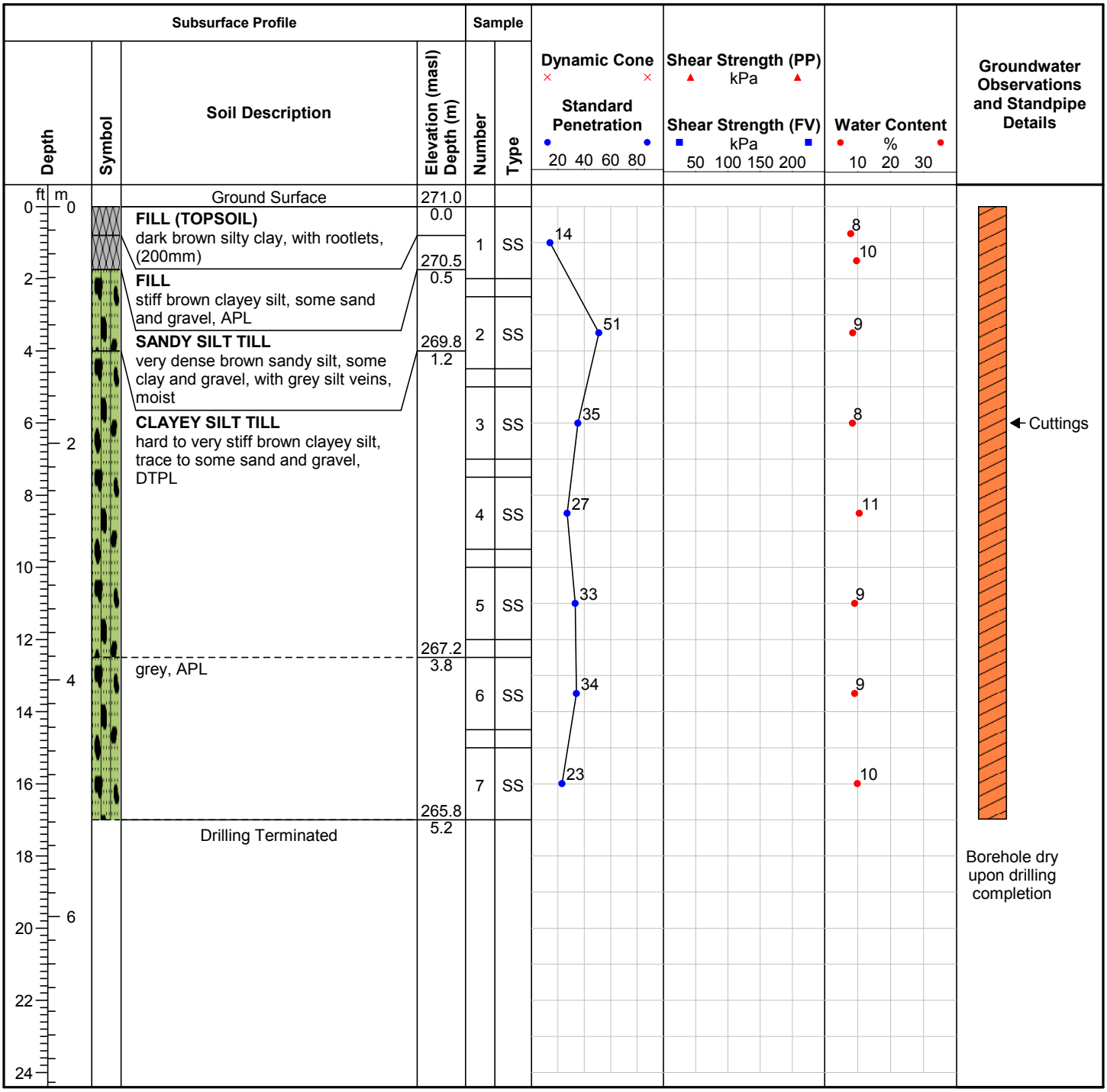
**Drill Date:** 10/22/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH123-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

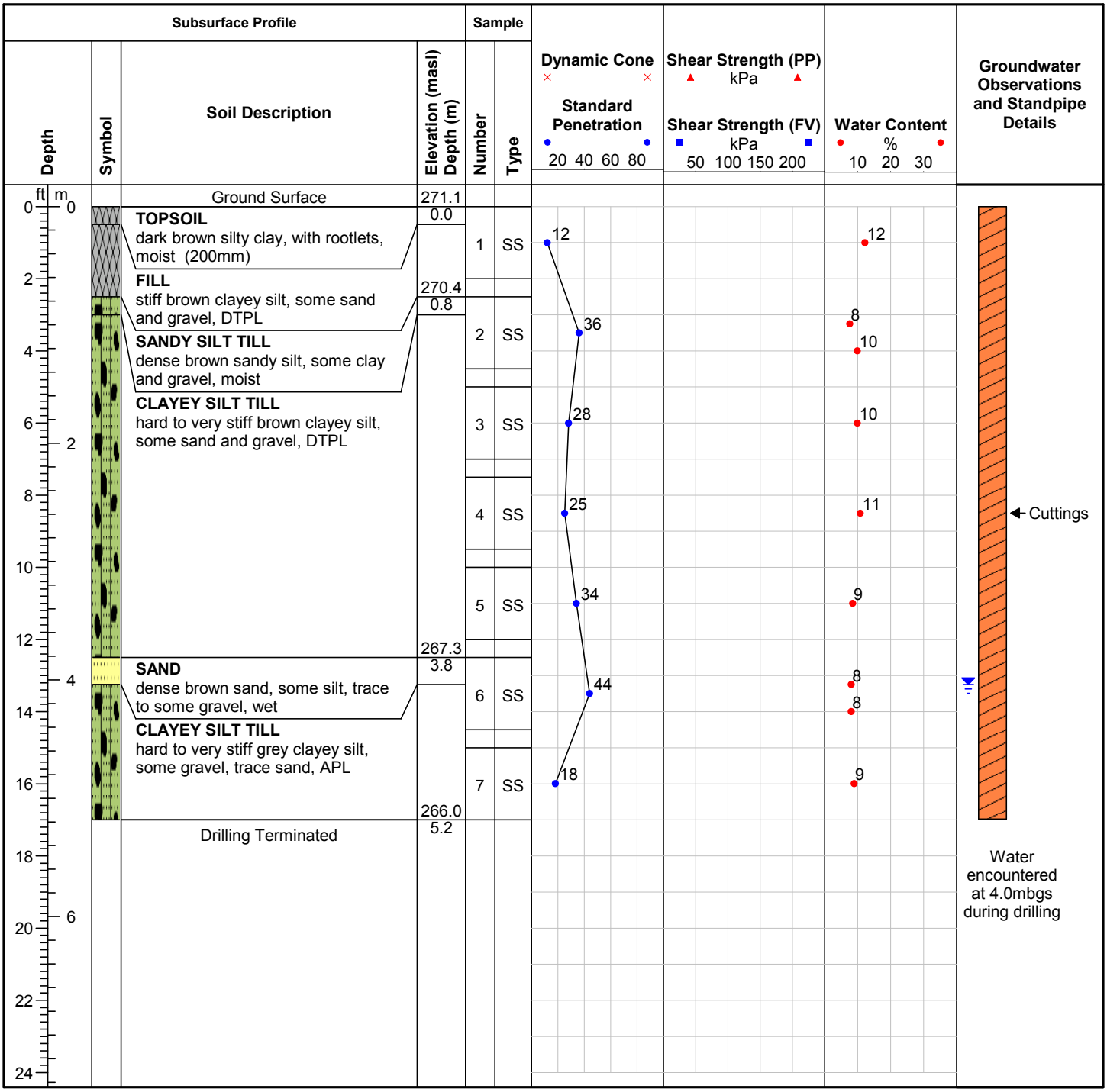
**Drill Date:** 10/22/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH124-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

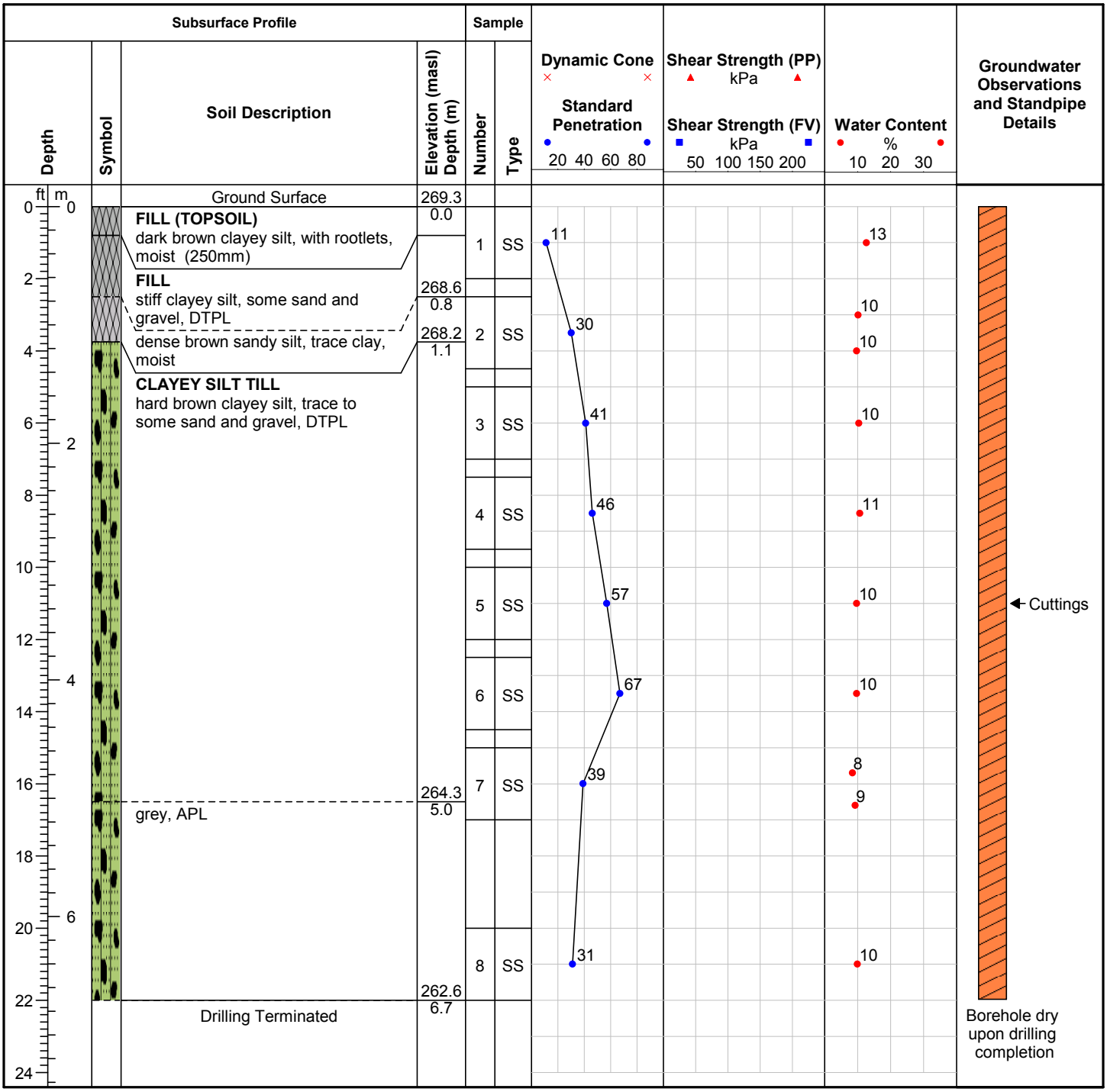
**Drill Date:** 10/20/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH125-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

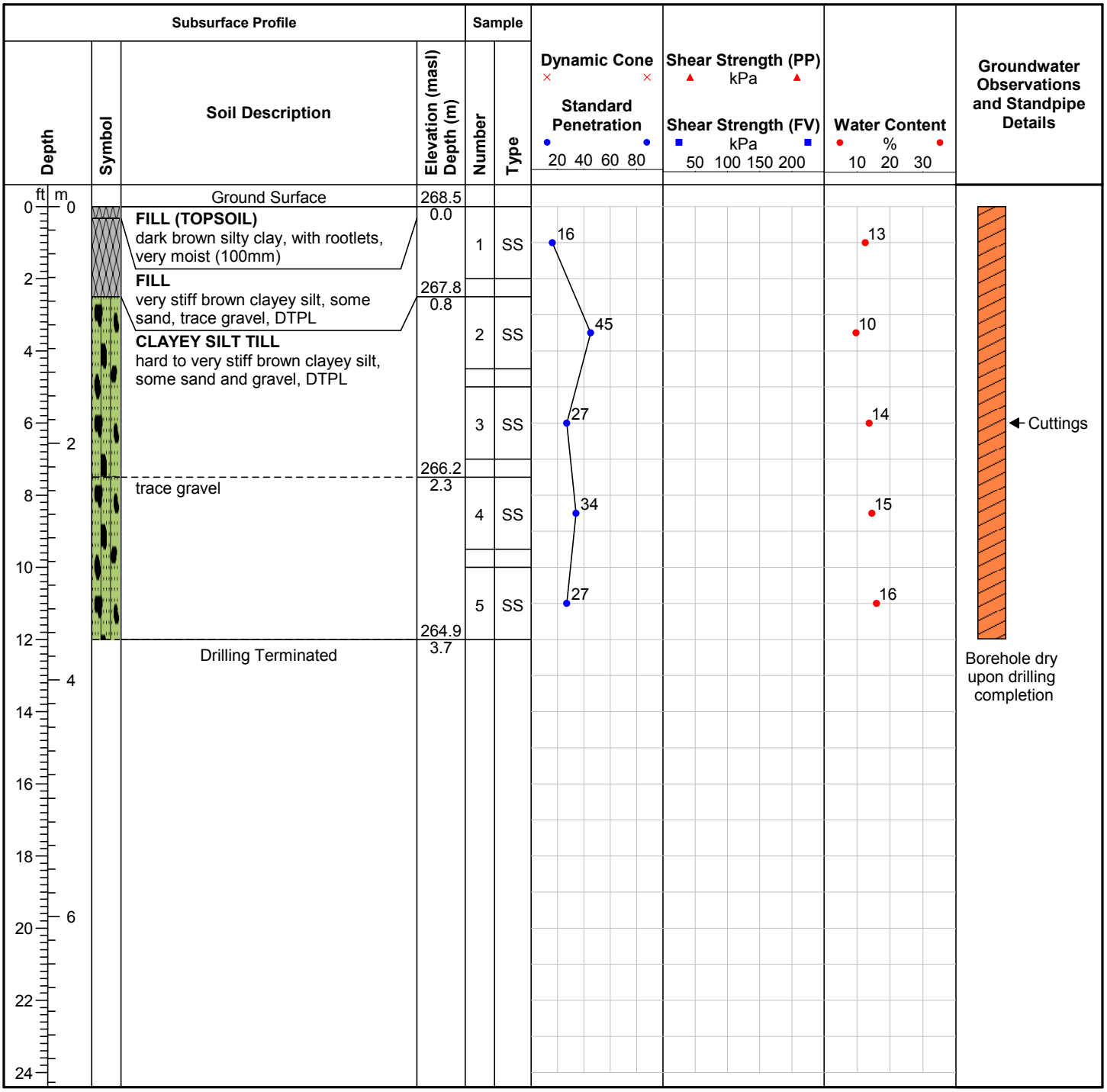
**Drill Date:** 10/26/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH126-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

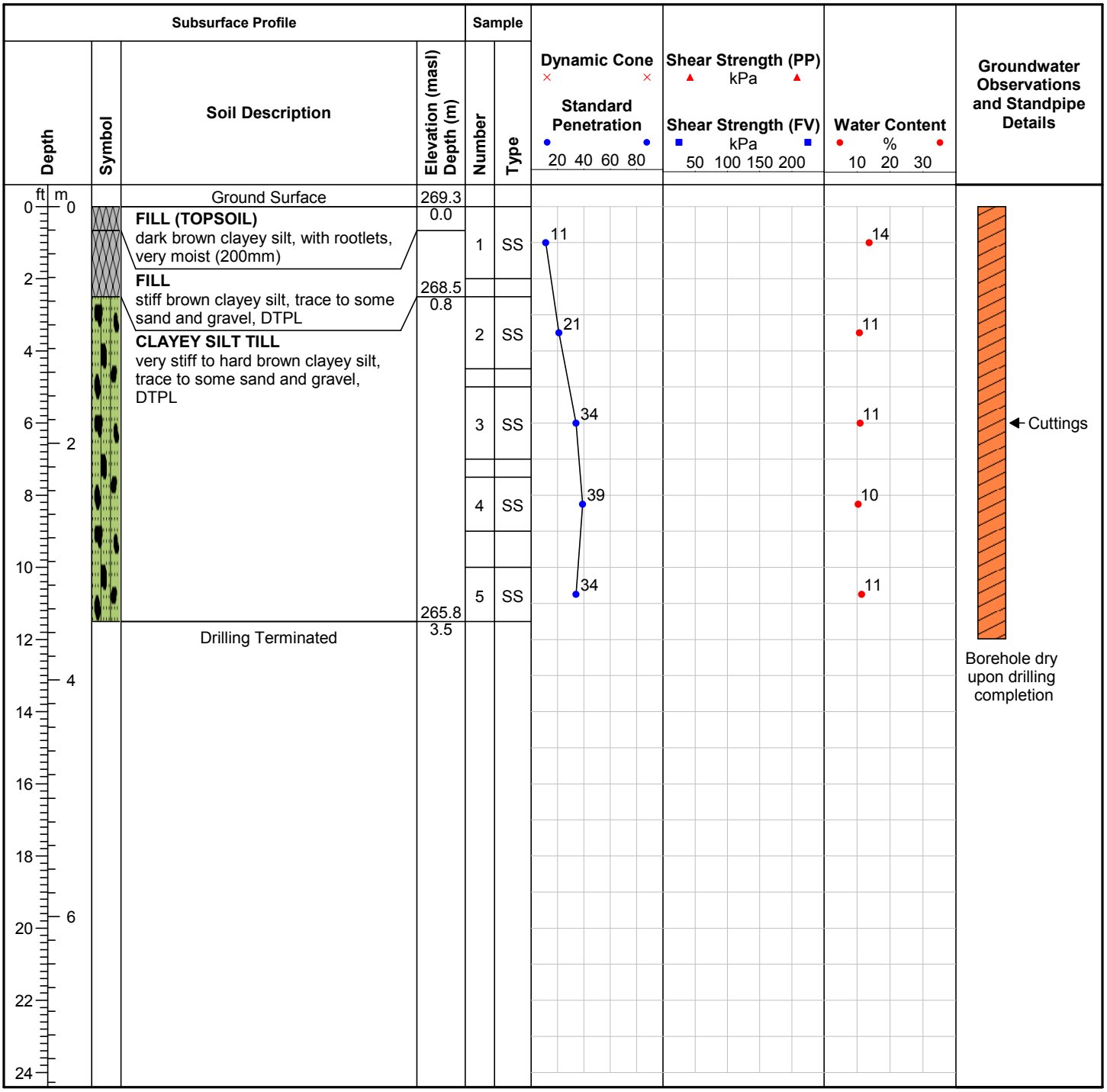
**Drill Date:** 10/26/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH127-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

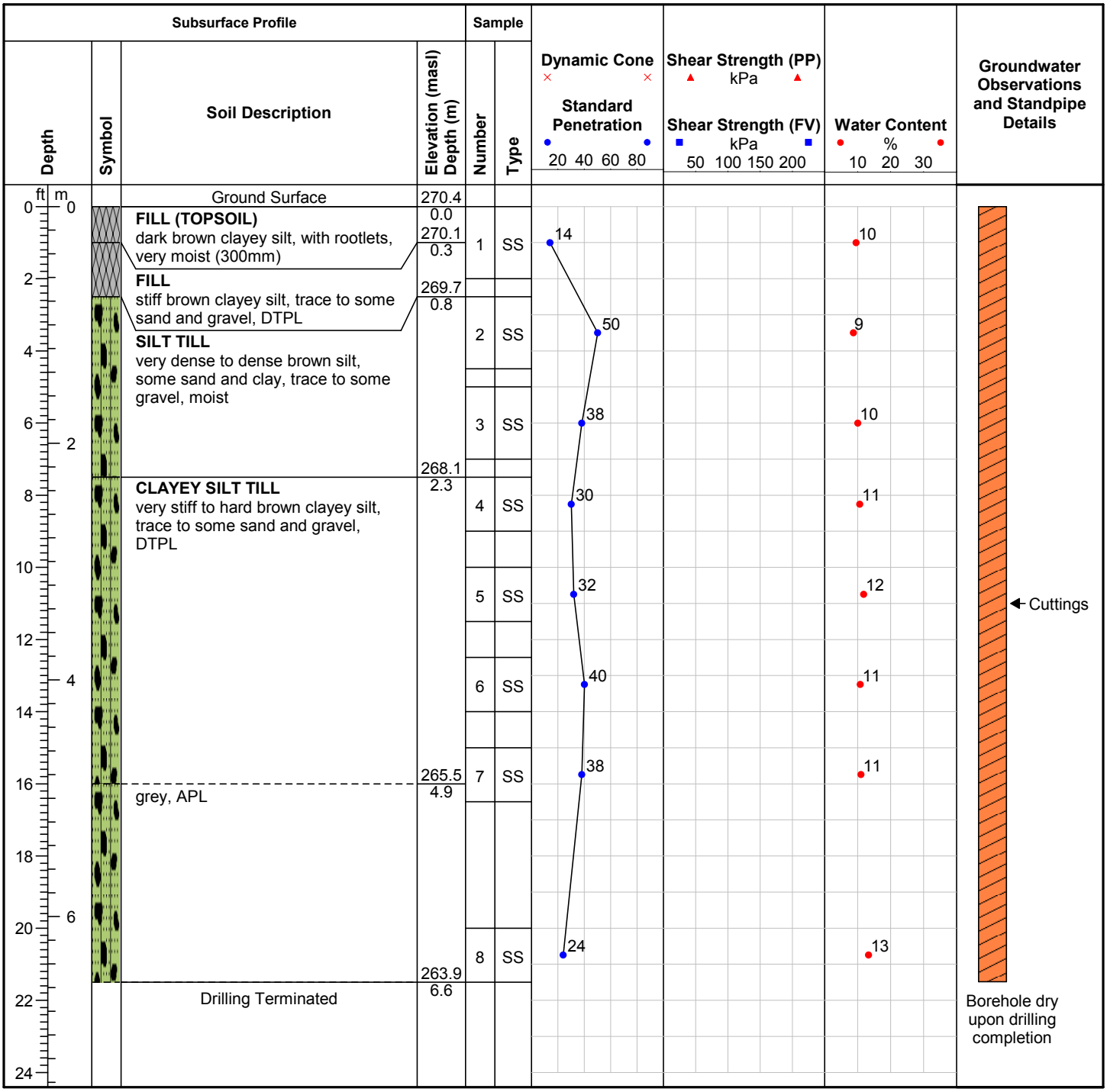
**Drill Date:** 10/20/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH128-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

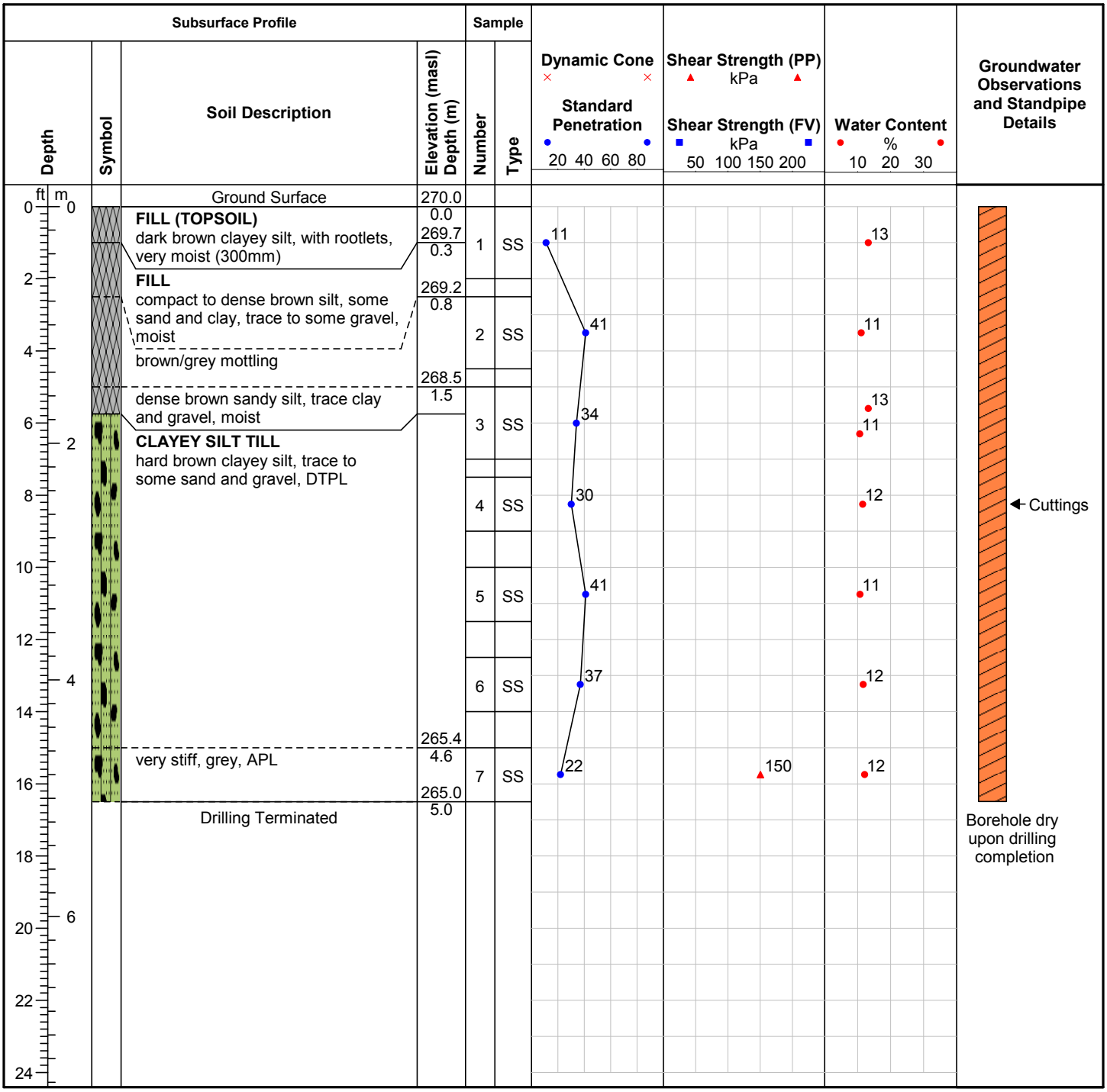
**Drill Date:** 10/26/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

MTE

## ID Number: BH129-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

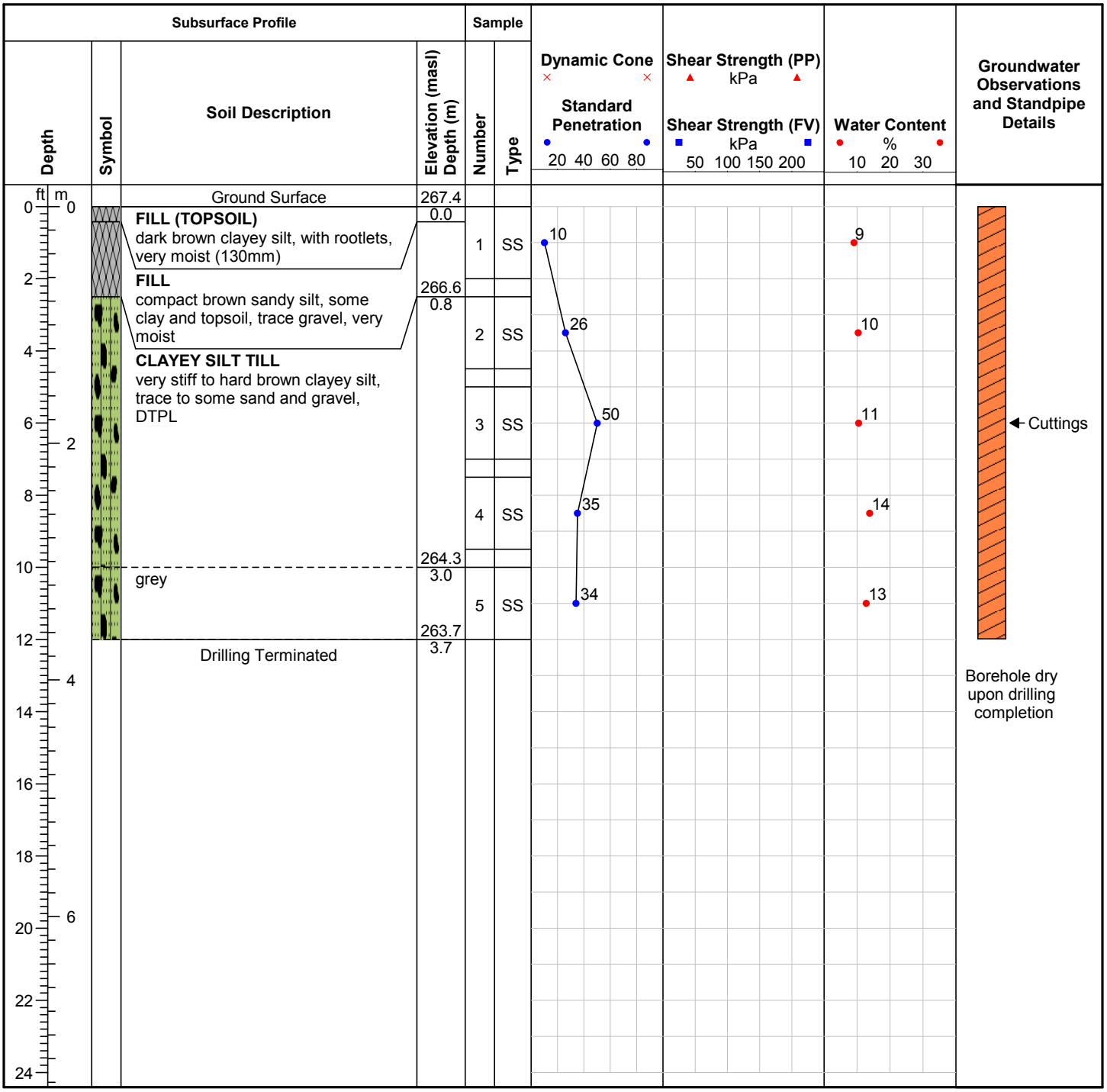
**Drill Date:** 10/26/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH130-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/27/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**

| 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 | 269.4 | | | | | | |
| | | **FILL (TOPSOIL)** compact brown silt, some sand and clay, trace gravel, moist (250mm) | 0.0 | 1 | SS | 15 | | 9 | |
| 2 ft | | **FILL** compact brown silt, some sand and clay, trace gravel, moist | 268.6 0.8 | 2 | SS | 24 | | 12 | |
| 4 ft | | **CLAYEY SILT** very stiff to hard brown clayey silt, trace sand and gravel, with grey silt veins, DTPL | | 3 | SS | 29 | | 12 | |
| 6 ft / 2 m | | | | 4 | SS | 34 | | 13 | |
| 8 ft | | | | 5 | SS | 54 | | 10 | |
| 10 ft | | | 265.9 | | | | | | |
| 12 ft / 4 m | | Drilling Terminated | 3.5 | | | | | | Cuttings; Borehole dry upon drilling completion |
| 14 ft | | | | | | | | | |
| 16 ft | | | | | | | | | |
| 18 ft | | | | | | | | | |
| 20 ft / 6 m | | | | | | | | | |
| 22 ft | | | | | | | | | |
| 24 ft | | | | | | | | | |

**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

MTE

**Sheet:** 1 of 1

## ID Number: BH131-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

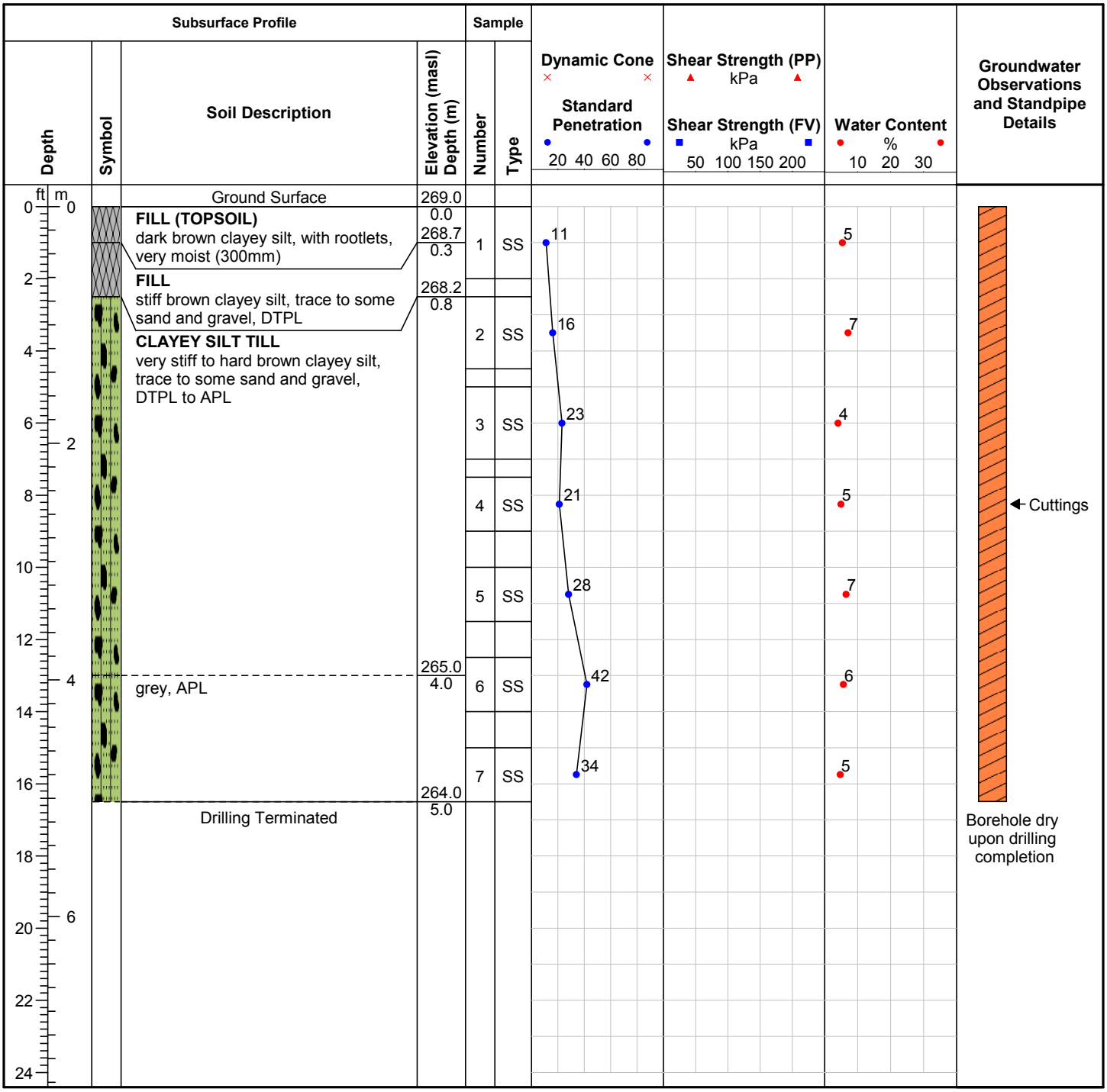
**Drill Date:** 10/27/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH132-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

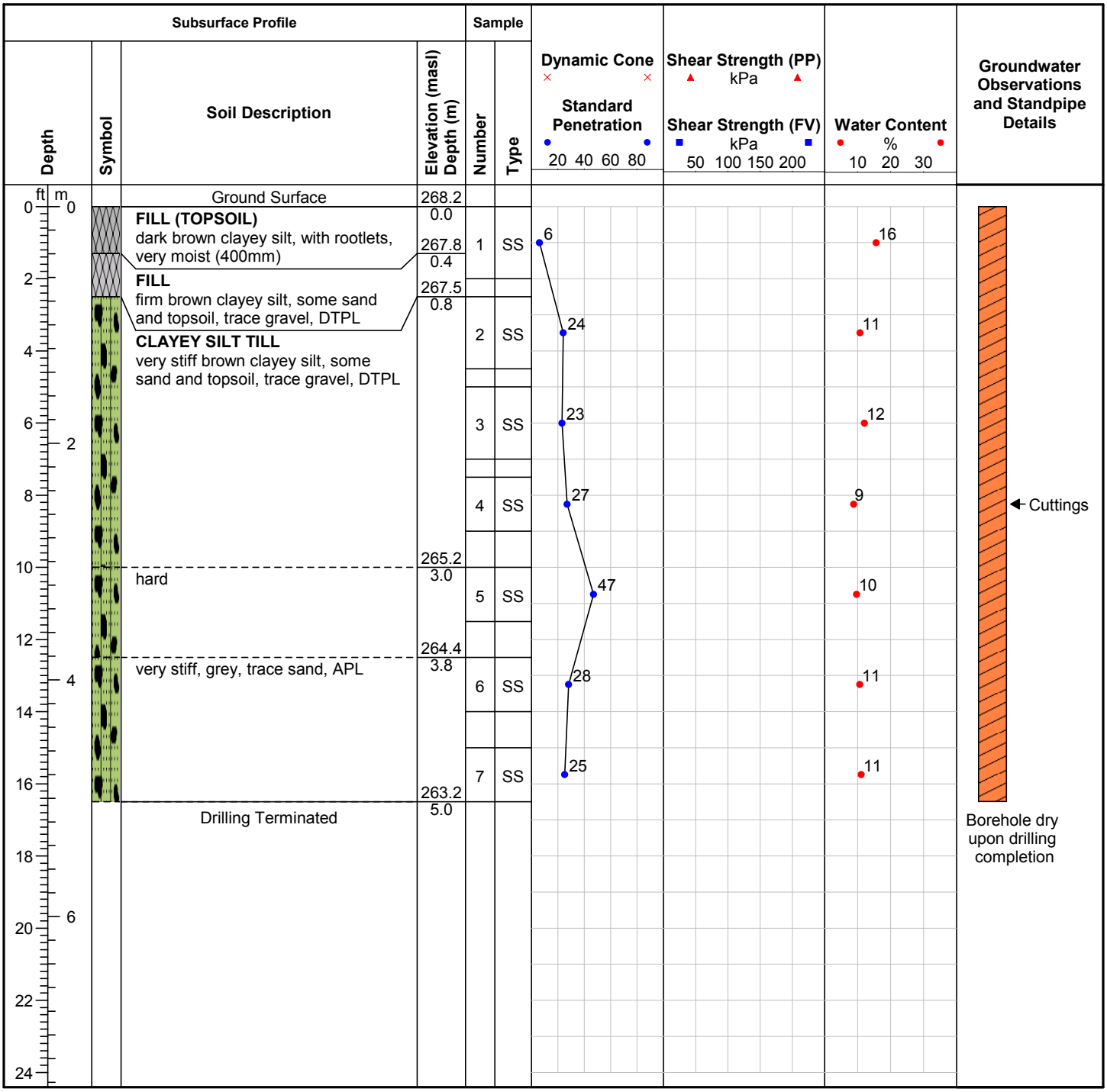
**Drill Date:** 10/27/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH133-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

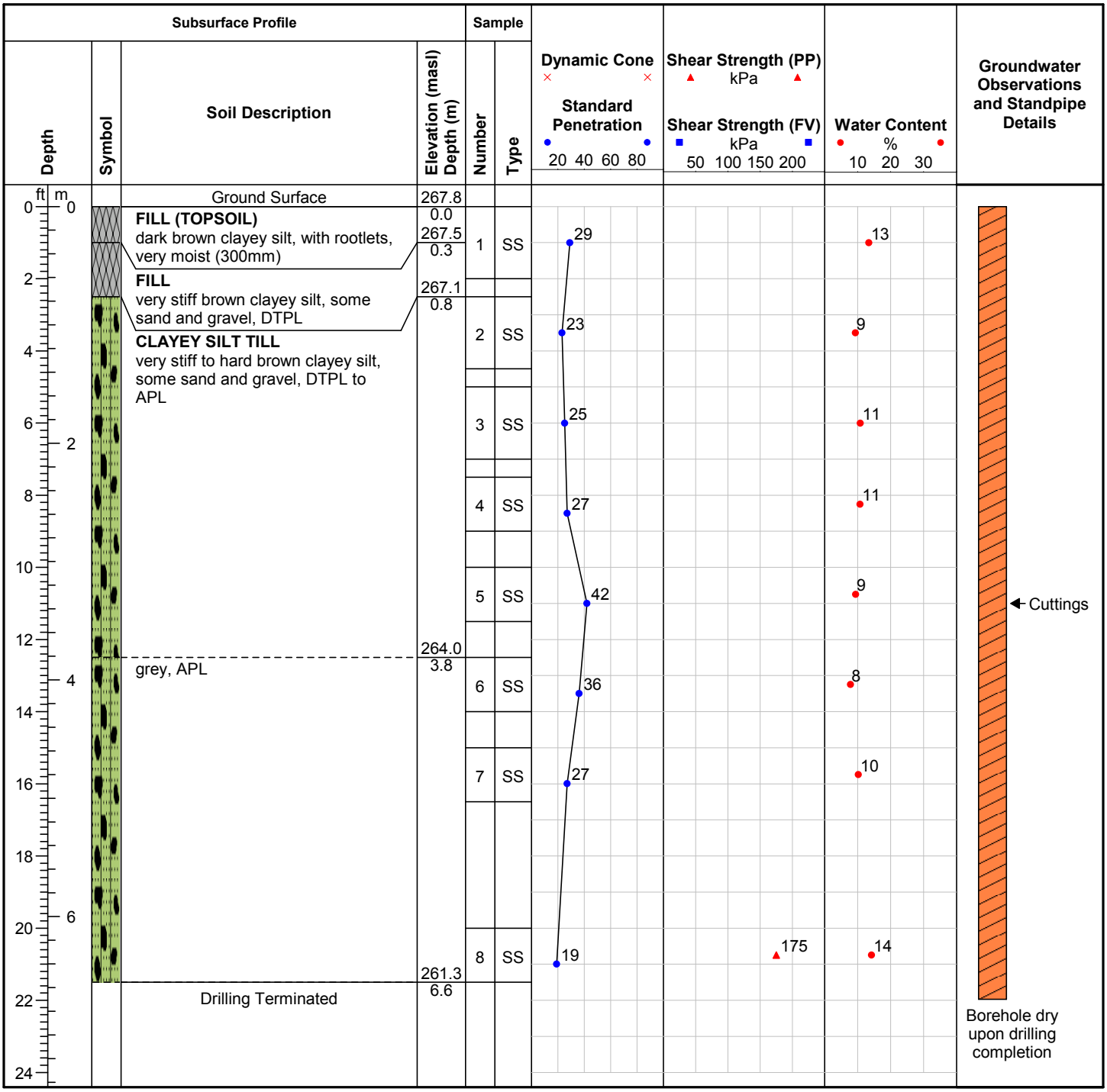
**Drill Date:** 10/27/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH134-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/27/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**

| 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 | 269.1 | | | | | | |
| | | **TOPSOIL** dark brown clayey silt, with rootlets, very moist (380mm) | 0.0 / 268.7 / 0.4 | 1 | SS | 8 | | 6 | |
| 2 ft / 1 m | | **FILL** stiff brown clayey silt, some sand and gravel, DTPL | 268.3 / 0.8 | 2 | SS | 38 | | 8 | |
| 4 ft / 2 m | | **CLAYEY SILT TILL** hard to very stiff brown clayey silt, some sand and gravel, DTPL | | 3 | SS | 23 | | 8 | |
| 8 ft / 3 m | | | | 4 | SS | 29 | | 7 | |
| 10 ft / 3 m | | | | 5 | SS | 45 | | 5 | |
| 12 ft / 4 m | | Drilling Terminated | 265.6 / 3.5 | | | | | | Cuttings; Borehole dry upon drilling completion |
| 24 ft / 6 m | | | | | | | | | |

**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

MTE

## ID Number: BH135-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

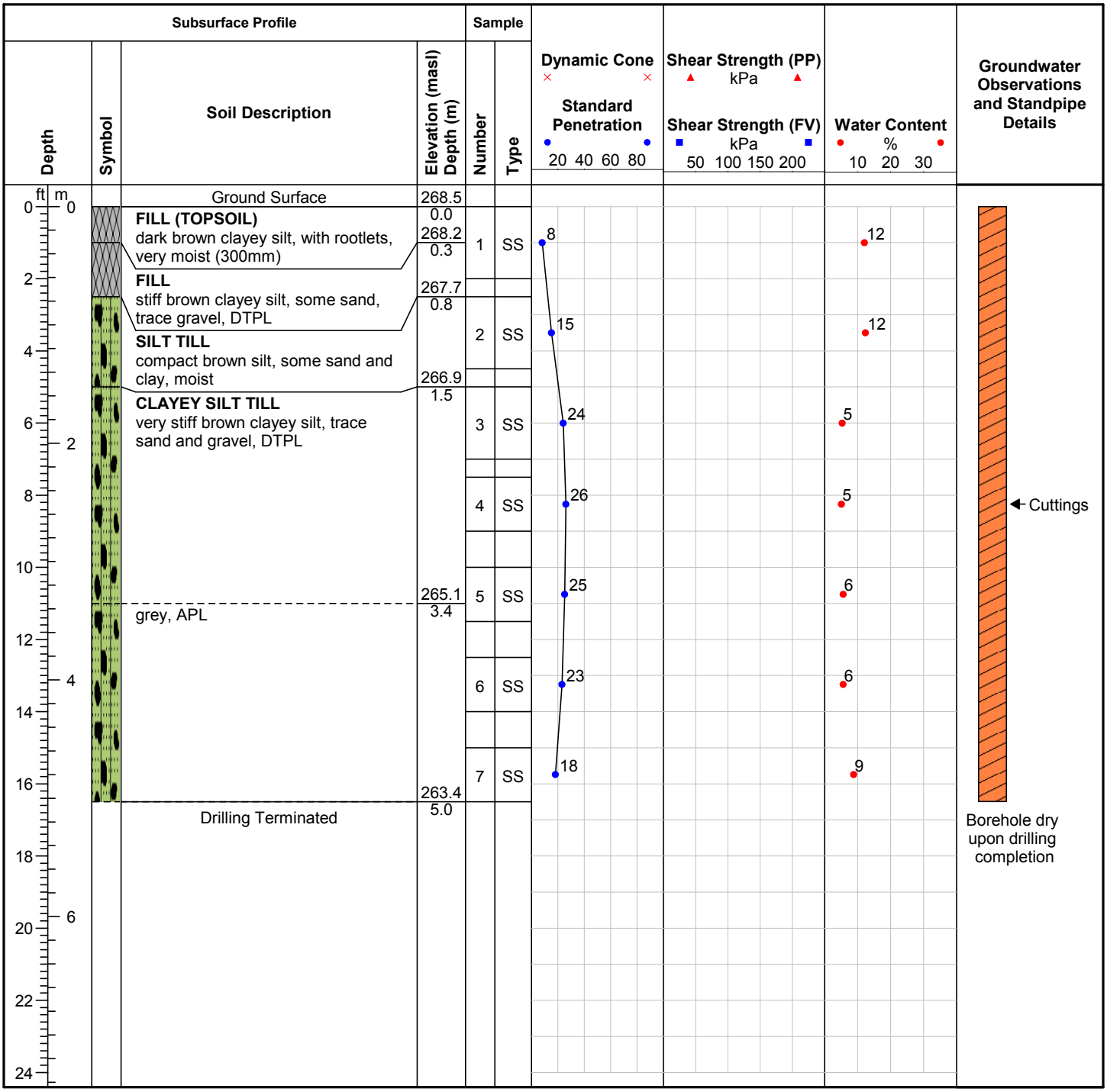
**Drill Date:** 10/27/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

MTE

**Sheet:** 1 of 1

## ID Number: BH136-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

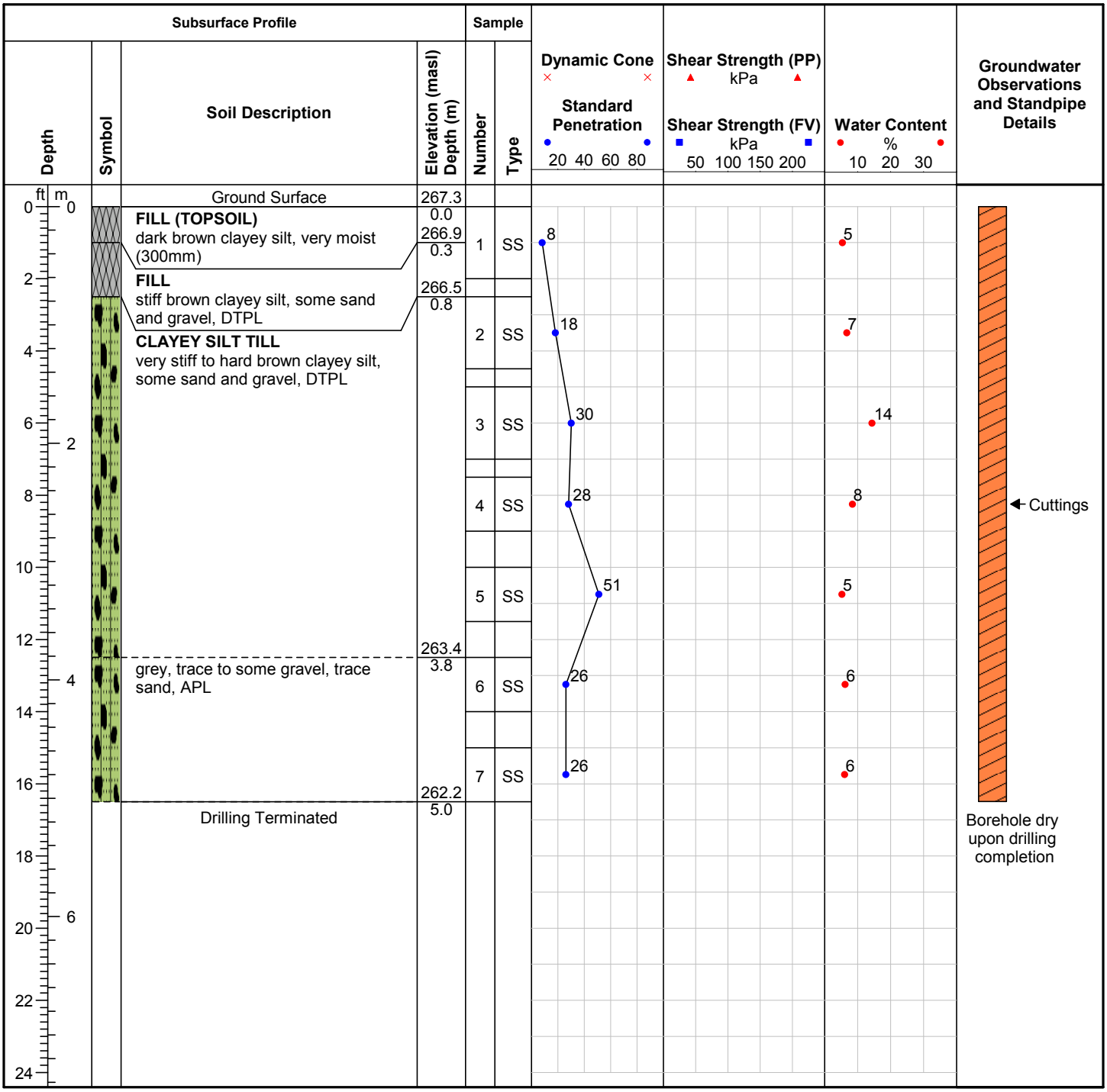
**Drill Date:** 10/27/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH137-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/28/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**

| 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 | 269.6 | | | | | | |
| 0 | | **FILL (TOPSOIL)** dark brown clayey silt, with rootlets, very moist (380mm) | 0.0 / 269.2 / 0.4 | 1 | SS | 14 | | 13 | |
| 2 | | **FILL** stiff brown clayey silt, some sand and gravel, DTPL | 268.8 / 0.8 | 2 | SS | 20 | | 14 | |
| 4 | | **CLAYEY SILT TILL** very stiff brown clayey silt, trace to some sand and gravel, DTPL | | 3 | SS | 23 | | 12 | |
| 6 / 2 | | | | 4 | SS | 27 | | 11 | |
| 8 | | | | | | | | | |
| 10 | | | | 5 | SS | 28 | | 11 | |
| 12 / 4 | | Drilling Terminated | 266.1 / 3.5 | | | | | | Cuttings; Borehole dry upon drilling completion |
| 14 | | | | | | | | | |
| 16 | | | | | | | | | |
| 18 | | | | | | | | | |
| 20 / 6 | | | | | | | | | |
| 22 | | | | | | | | | |
| 24 | | | | | | | | | |

**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

MTE

**Sheet:** 1 of 1

## ID Number: BH138-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

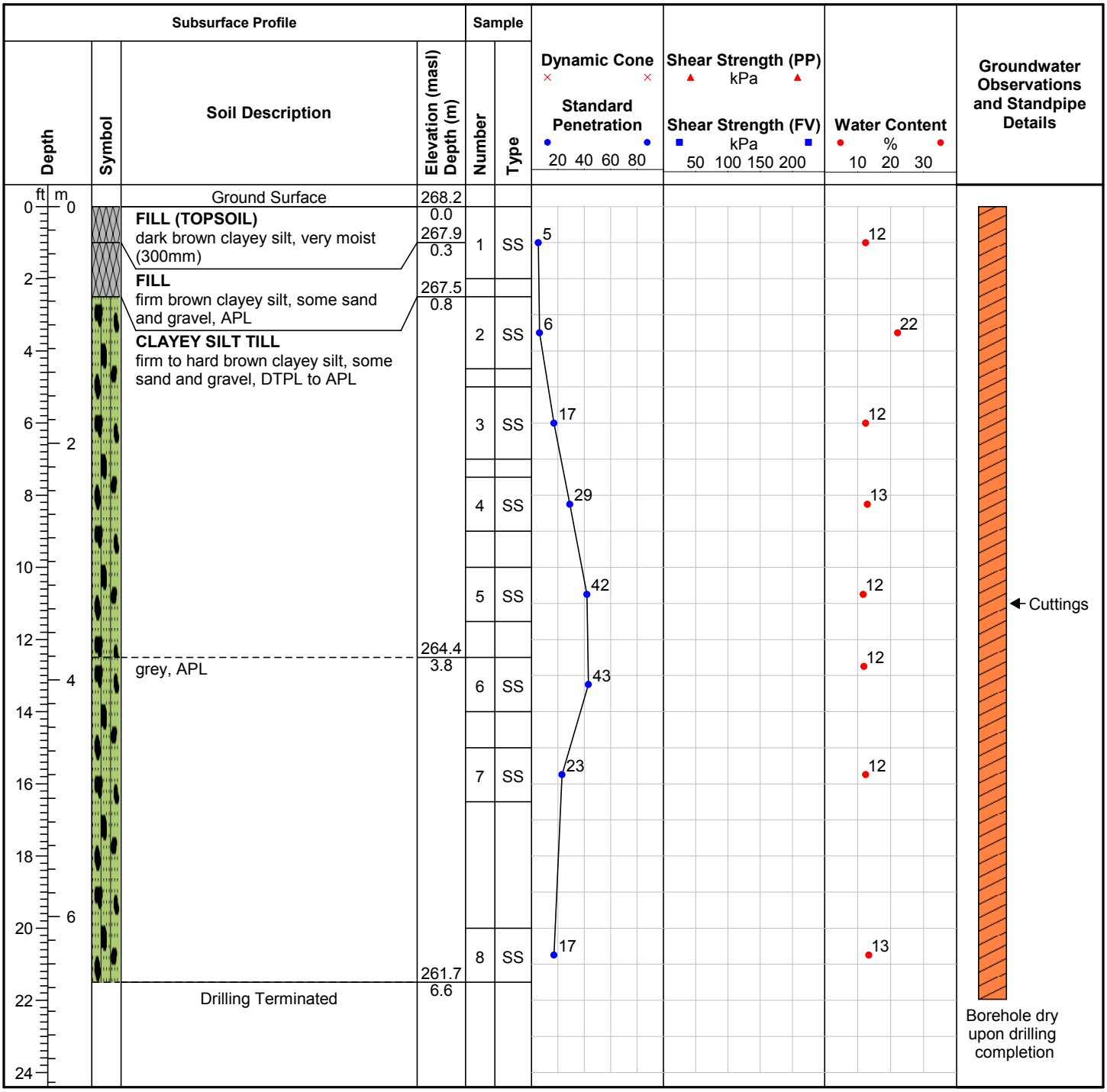
**Drill Date:** 10/27/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH139-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

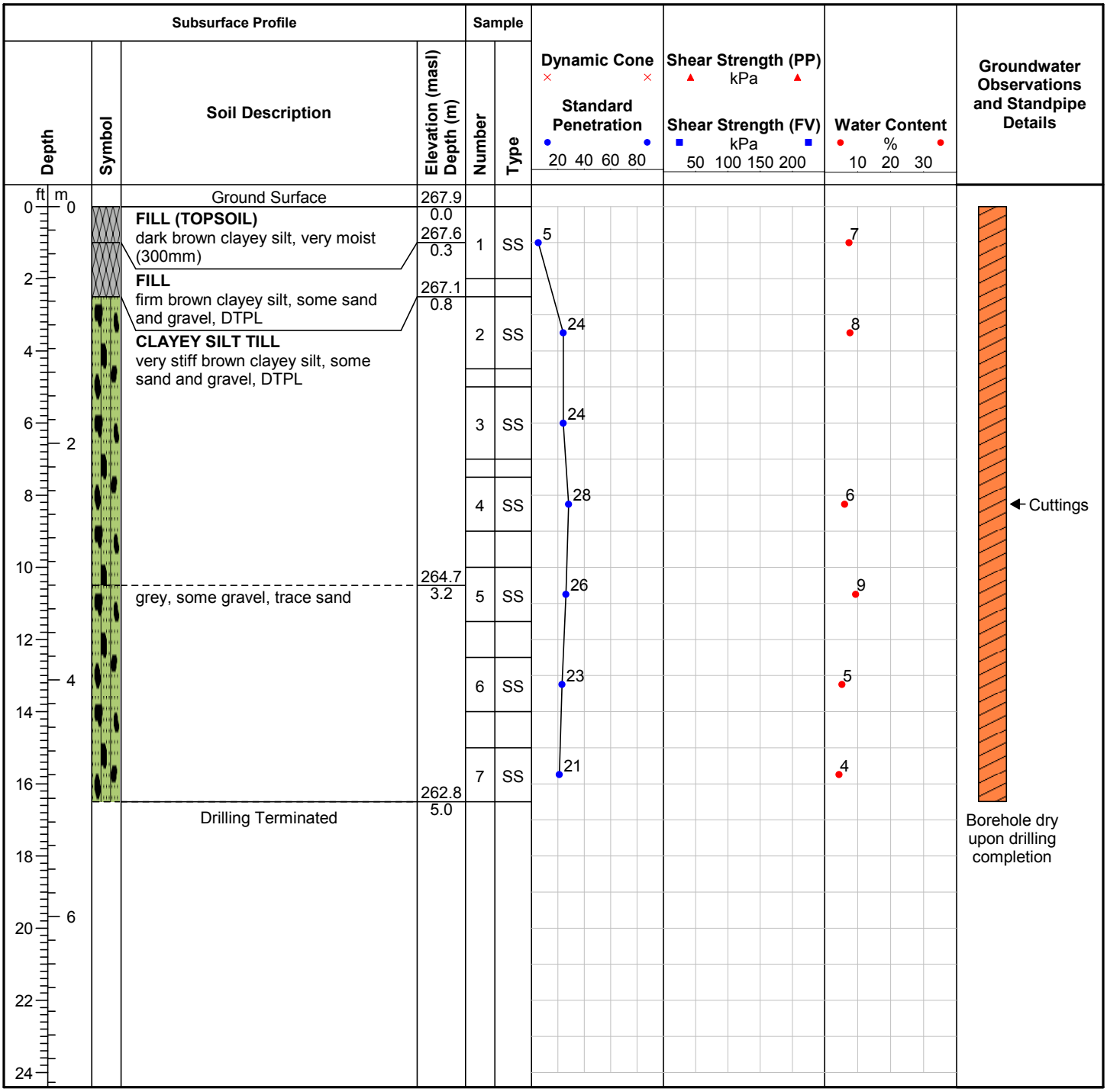
**Drill Date:** 10/27/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH140-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

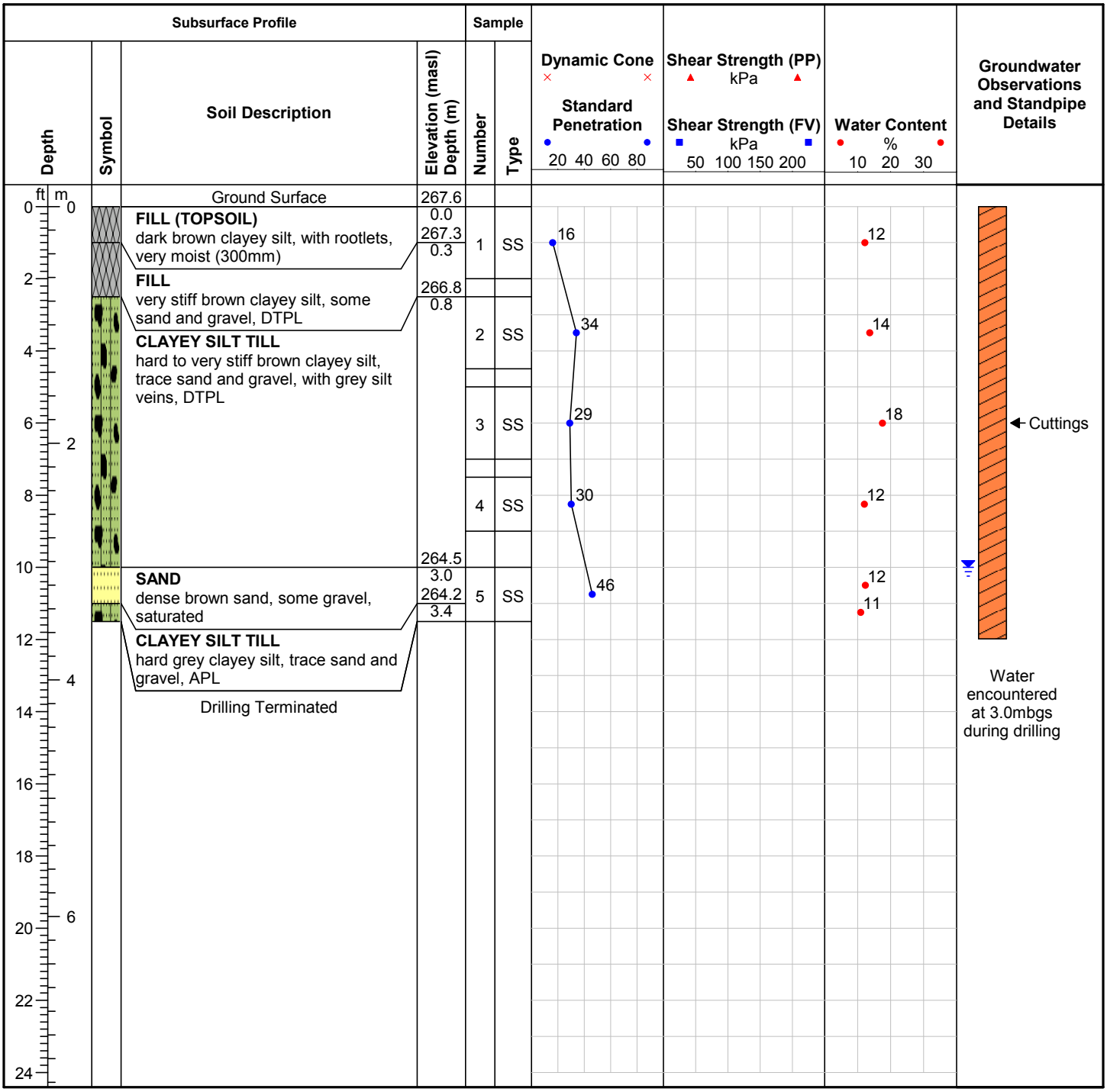
**Drill Date:** 10/28/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH141-20

**Project:** 12892 Dixie Road: Engineering Consulting Services

**Project No:** 48043-100

**Client:** Tribal Partners (Canada) Inc.

**Site Location:** 12892 Dixie Road, Caledon, ON

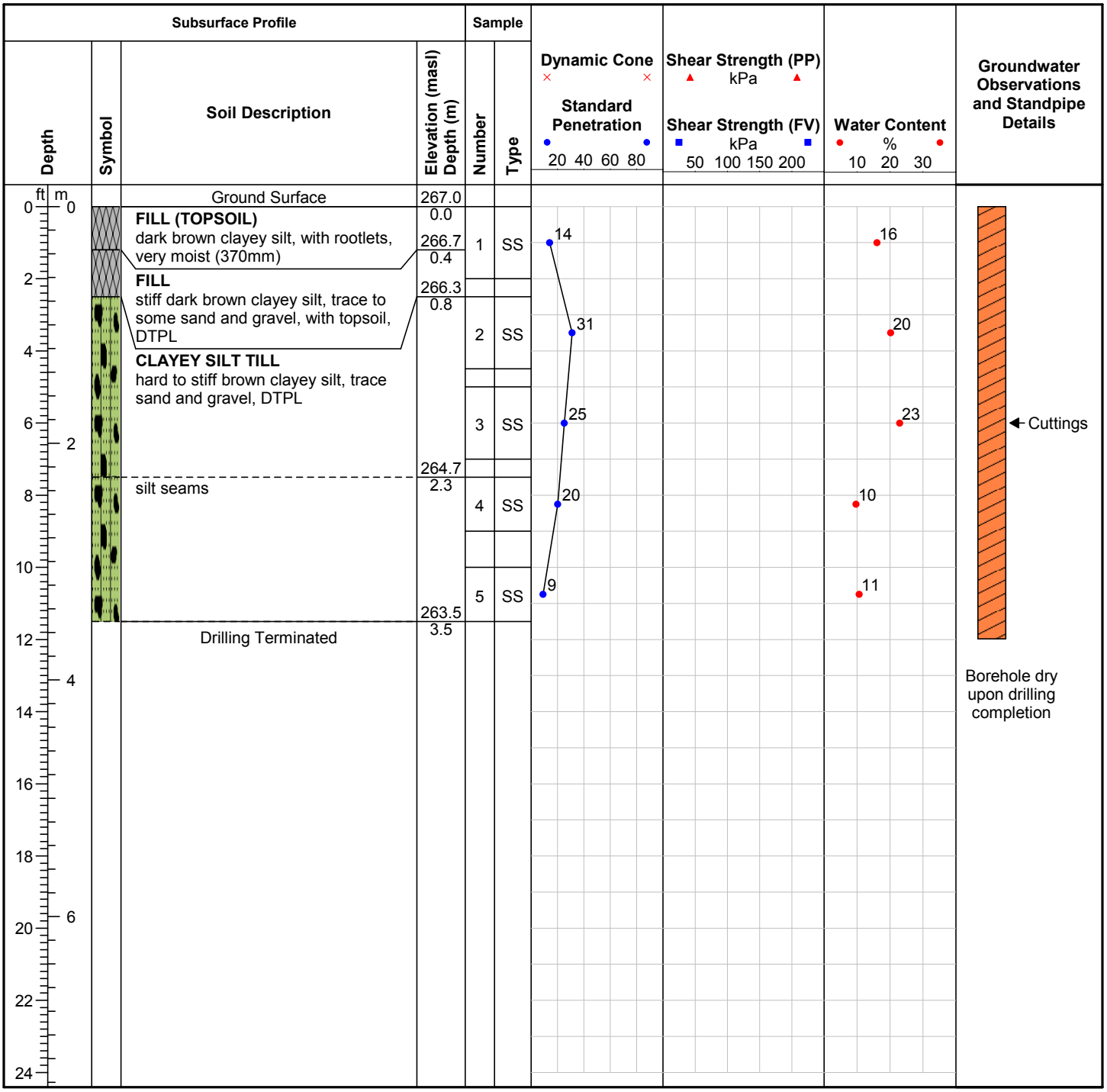
**Drill Date:** 10/28/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:**




**Field Technician:** MBC

**Drafted by:** B. Graul

**Reviewed by:** B. Thorner

**Sheet:** 1 of 1

## ID Number: BH201-20

**Project Name:** 12892 Dixie Road: Engineering Consulting Services

**MTE File No.:** 48043-100

**Client:** Tribal Partners

**Site Location:** 12824 & 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/23/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:** N/A

| Subsurface Profile | | | Sample | | | | | | | Well Completion Details |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (ft / m) | Symbol | Soil Description | Elevation (masl) Depth (m) | Number | Type | Recovery (%) | Soil Sample Lab Analysis | PID (ppm) | Hydrocarbon (ppm) | |
| 0 / 0 | | Ground Surface | | | | | | | | |
| | | **TOPSOIL** Dark brown, clayey silt with rootlets, damp | 0.0 | | | | | | | |
| | | **FILL** Brown, clayey silt with sand, some gravel, moist | 0.2 | 1 | SS | 60 | Metals, OCs, CPs, PHCs | 0 | 0 | |
| 2 | | | | 2 | SS | 60 | | 0 | 0 | |
| 4 | | | | | | | | | | |
| 6 / 2 | | **CLAYEY SILT** Brown, trace sand and gravel, moist | 1.7 | 3 | SS | 100 | | 0 | 0 | |
| 8 | | | | 4 | SS | 80 | | 0 | 0 | |
| 10 | | Drilling Terminated | 2.9 | | | | | | | |
| 12 | | | | | | | | | | |

**Field Technician:** SKC

**Drafted by:** SKC

**Reviewed by:** TJJ

MTE

## ID Number: BH202-20

**Project Name:** 12892 Dixie Road: Engineering Consulting Services

**MTE File No.:** 48043-100

**Client:** Tribal Partners

**Site Location:** 12824 & 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/23/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:** N/A

| Subsurface Profile | | | Sample | | | | | | | Well Completion Details |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (ft / m) | Symbol | Soil Description | Elevation (masl) Depth (m) | Number | Type | Recovery (%) | Soil Sample Lab Analysis | PID (ppm) | Hydrocarbon (ppm) | |
| 0 / 0 | | Ground Surface | | | | | | | | |
| | | **TOPSOIL** Dark brown, clayey silt with rootlets, damp to moist | 0.0 | | | | | | | |
| | | **FILL** Brown, clayey silt, some sand and gravel, moist | | 1 | SS | 70 | Metals, OCs, CPs, PHCs | 0 | 0 | |
| 2 | | Orange sand seam at 0.91m | | | | | | | | |
| | | | | 2 | SS | 85 | | 0 | 0 | |
| 4 | | | | | | | | | | |
| | | **CLAYEY SILT** Brown to grey, some sand and gravel, moist | 1.5 | | | | | | | |
| 6 / 2 | | | | 3 | SS | 100 | | 0 | 0 | |
| 8 | | | | 4 | SS | 100 | | 0 | 0 | |
| 10 | | | | 5 | SS | 100 | | 0 | 0 | |
| 12 | | Drilling Terminated | 3.7 | | | | | | | |

**Field Technician:** SKC

**Drafted by:** SKC

**Reviewed by:** TJJ

MTE

## ID Number: BH203-20

**Project Name:** 12892 Dixie Road: Engineering Consulting Services

**MTE File No.:** 48043-100

**Client:** Tribal Partners

**Site Location:** 12824 & 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/23/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:** N/A

| Subsurface Profile | | | Sample | | | | | | | Well Completion Details |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (ft / m) | Symbol | Soil Description | Elevation (masl) Depth (m) | Number | Type | Recovery (%) | Soil Sample Lab Analysis | PID (ppm) | Hydrocarbon (ppm) | |
| 0 / 0 | | Ground Surface | | | | | | | | |
| | | **TOPSOIL** Dark brown, clayey silt with rootlets, damp | 0.0 | 1 | SS | 0 | Metals | 0 | 0 | |
| | | **FILL** Brown, clayey silt with sand, trace to some gravel, moist | | | | | | | | |
| 2 | | | | 2 | SS | 90 | | 0 | 0 | |
| 4 | | | | | | | | | | |
| | | **CLAYEY SILT** Light brown to grey, trace sand and gravel, moist | 1.5 | 3 | SS | 90 | | 0 | 0 | |
| 6 / 2 | | | | | | | | | | |
| 8 | | | | 4 | SS | 95 | | 0 | 0 | |
| 10 | | Drilling Terminated | 2.9 | | | | | | | |
| 12 | | | | | | | | | | |

**Field Technician:** SKC

**Drafted by:** SKC

**Reviewed by:** TJJ

MTE

## ID Number: BH204-20

**Project Name:** 12892 Dixie Road: Engineering Consulting Services

**MTE File No.:** 48043-100

**Client:** Tribal Partners

**Site Location:** 12824 & 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/23/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:** N/A

| Subsurface Profile | | | Sample | | | | | | | Well Completion Details |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (ft / m) | Symbol | Soil Description | Elevation (masl) Depth (m) | Number | Type | Recovery (%) | Soil Sample Lab Analysis | PID (ppm) | Hydrocarbon (ppm) | |
| 0 / 0 | | Ground Surface | | | | | | | | |
| | | **TOPSOIL** Dark brown, clayey silt with rootlets, damp | 0.0 | | | | | | | |
| | | **FILL** Brown, clayey silt, trace sand and gravel, trace rootlets | | 1 | SS | 70 | PHCs | 0 | 0 | |
| 2 | | Higher gravel content from 0.15m to 0.30m | | | | | | | | |
| | | | | 2 | SS | 80 | | 0 | 0 | |
| 4 | | Grey mottling at 1.22m | | | | | | | | |
| | | **CLAYEY SILT** Light brown to grey, trace sand and gravel, moist | 1.7 | 3 | SS | 75 | | 0 | 0 | |
| 6 / 2 | | | | | | | | | | |
| 8 | | | | 4 | SS | 85 | | 0 | 0 | |
| | | Drilling Terminated | 2.9 | | | | | | | |
| 10 | | | | | | | | | | |
| 12 | | | | | | | | | | |

**Field Technician:** SKC

**Drafted by:** SKC

**Reviewed by:** TJJ

MTE

## ID Number: BH205-20

**Project Name:** 12892 Dixie Road: Engineering Consulting Services

**MTE File No.:** 48043-100

**Client:** Tribal Partners

**Site Location:** 12824 & 12892 Dixie Road, Caledon, ON

**Drill Date:** 10/23/2020

**Drilling Contractor:** Tri-Phase Group

**Drill Rig:** CME 75

**Drill Method:** Solid Stem Auger

**Protective Cover:** N/A

| Subsurface Profile | | | Sample | | | | | | | Well Completion Details |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (ft / m) | Symbol | Soil Description | Elevation (masl) Depth (m) | Number | Type | Recovery (%) | Soil Sample Lab Analysis | PID (ppm) | Hydrocarbon (ppm) | |
| 0 / 0 | | Ground Surface | | | | | | | | |
| | | **TOPSOIL** Dark brown, clayey silt with rootlets, damp to moist | 0.0 | | | | | | | |
| | | **FILL** Brown, clayey silt, some sand and gravel, moist | 0.2 | 1 | SS | 90 | Metals, OCs, CPs, PHCs | 0 | 0 | |
| 2 | | | | | | | | | | |
| | | Grey mottling at 1.22m | | 2 | SS | 100 | | 0 | 0 | |
| 4 | | | | | | | | | | |
| | | **CLAYEY SILT** Brown to grey, some sand, trace gravel, mosit | 1.5 | 3 | SS | 80 | | 0 | 0 | |
| 6 / 2 | | | | | | | | | | |
| 8 | | | | 4 | SS | 85 | | 0 | 0 | |
| 10 | | Drilling Terminated | 2.9 | | | | | | | |
| 12 | | | | | | | | | | |

**Field Technician:** SKC

**Drafted by:** SKC

**Reviewed by:** TJJ

**Sheet:** 1 of 1

# Appendix C

# Particle Size Distributions

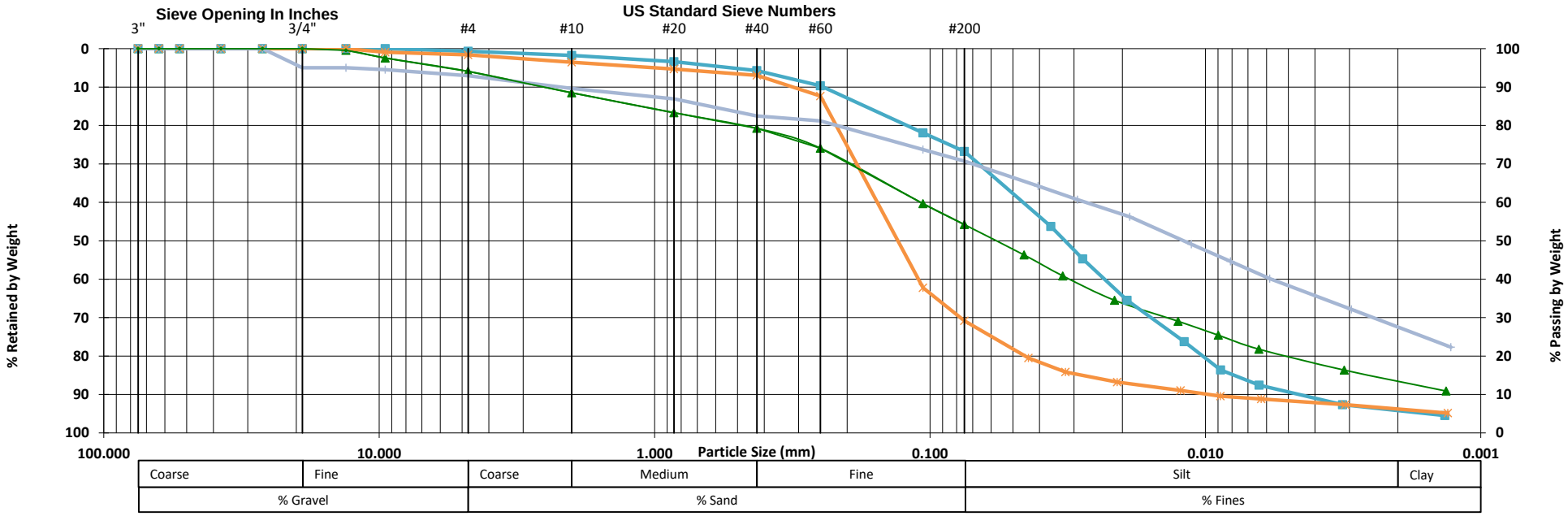
# Particle Size Distribution Analysis Test Results

**Project Name:** 12982 Dixie Road Geotechnical Investigation
**Client:** Tribal Partners Inc.
**Project Location:** 12982 Dixie Road, Caledon, ON

**Date Sampled:** Oct. 19-29, 2020
**Date Tested:** Nov. 17-24, 2020

**MTE File No.:** 48043-200
**Table No.:** 101

## Unified Soil Classification




| Symbol | Borehole ID | Sample # | *Sample Depth* | Description |
|---|---|---|---|---|
| ▲ | MW101-20 | SS-11 | 9.1-9.8 mbgs | SILT and SAND, some Clay, trace Gravel |
| ■ | MW103-20 | SS-8 | 6.1-6.7 mbgs | Sandy SILT, trace Clay and Gravel |
| ✳ | MW104-20 | SS-11 | 9.9-10.5 mbgs | Silty SAND, trace Clay and Gravel |
| + | MW105-20 | SS-7 | 4.6-5.0 mbgs | Clayey Sandy SILT, trace Gravel |

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

**NOTES:**

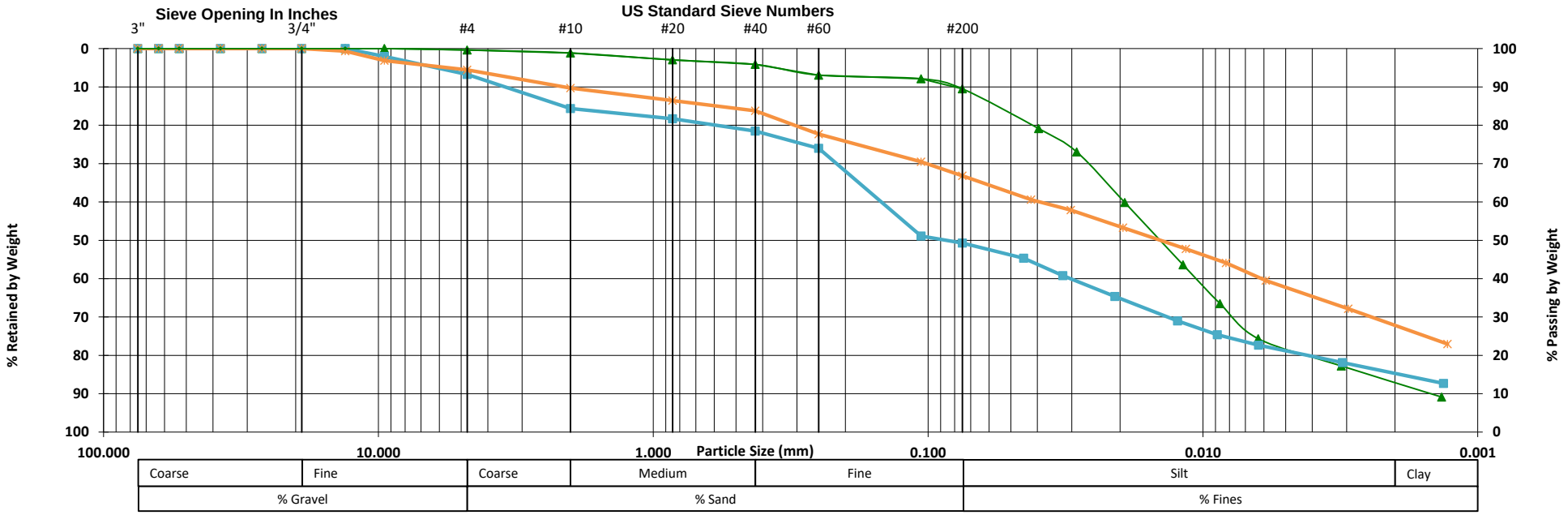
# Particle Size Distribution Analysis Test Results

**Project Name:** 12982 Dixie Road Geotechnical Investigation
**Client:** Tribal Partners Inc.
**Project Location:** 12982 Dixie Road, Caledon, ON

**Date Sampled:** Oct. 19-29, 2020
**Date Tested:** Nov. 17-24, 2020

**MTE File No.:** 48043-200
**Table No.:** 102

## Unified Soil Classification




| Symbol | Borehole ID | Sample # | *Sample Depth* | Description |
|---|---|---|---|---|
| ▲ | MW106-20 | SS-11 | 10.7-11.3 mbgs | SILT, some Clay and Sand |
| ■ | MW107-20 | SS-12 | 9.9-10.5 mbgs | Silty SAND, some Clay, trace Gravel |
| ✳ | BH116-20 | SS-5 | 3.0-3.7 mbgs | Clayey Sandy SILT, trace Gravel |

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

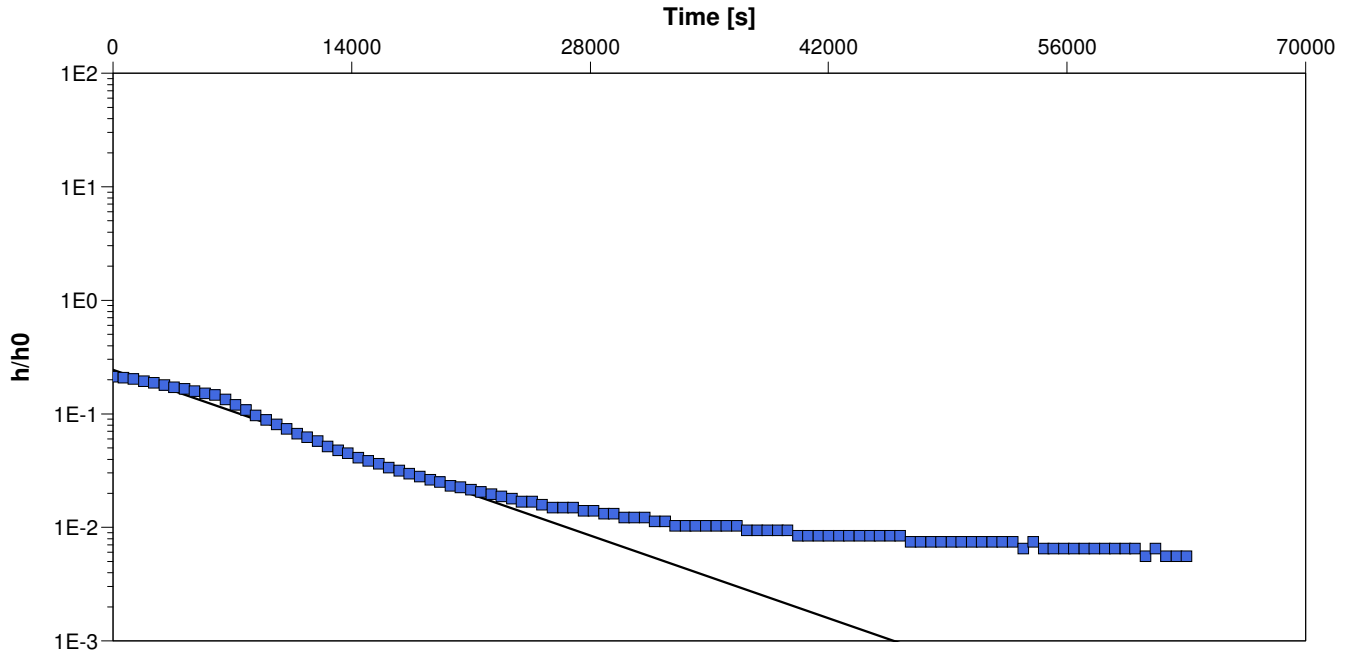
**NOTES:**

# Appendix D

# Single Well Response Tests

| | |
|---|---|
| | **Slug Test Analysis Report** |
| | Project: Hydrogeological Assessment |
| | Number: 48043-300 |
| | Client: Tribal Partners |

| | | |
|---|---|---|
| Location: 12892 Dixie Road, Caledon | Slug Test: MW101-20 - Rising Test 1 | Test Well: MW101-20 |
| Test Conducted by: | | Test Date: 11/23/2020 |
| Analysis Performed by: MBC | MW101 - Rising Test 1 | Analysis Date: 12/14/2020 |
| Aquifer Thickness: 1.60 m | | |

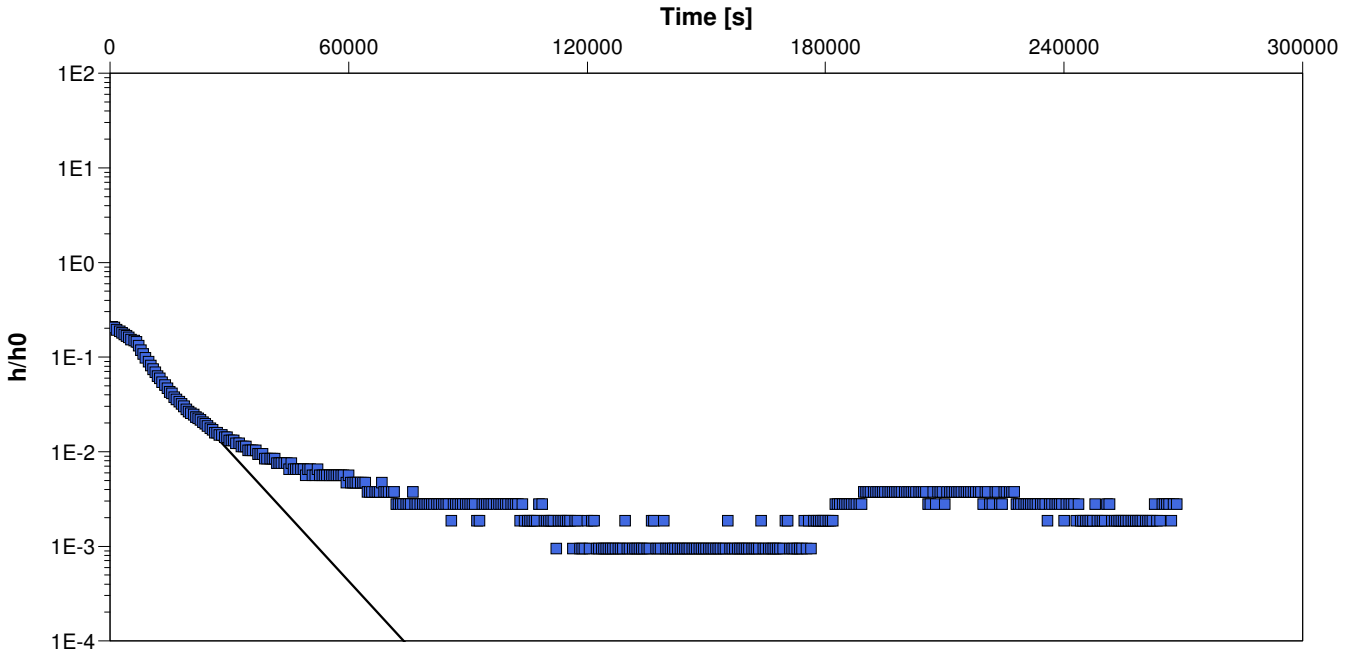



Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity [m/s] | |
|---|---|---|
| MW101-20 | $8.95 \times 10^{-8}$ | |

| | |
|---|---|
| | **Slug Test Analysis Report** |
| | Project: Hydrogeological Assessment |
| | Number: 48043-300 |
| | Client: Tribal Partners |

| | | |
|---|---|---|
| Location: 12892 Dixie Road, Caledon | Slug Test: MW101-20 - Rising Test 2 | Test Well: MW101-20 |
| Test Conducted by: MBC | | Test Date: 11/23/2020 |
| Analysis Performed by: MBC | MW101-20 - Rising Test 2 | Analysis Date: 12/14/2020 |
| Aquifer Thickness: 1.60 m | | |

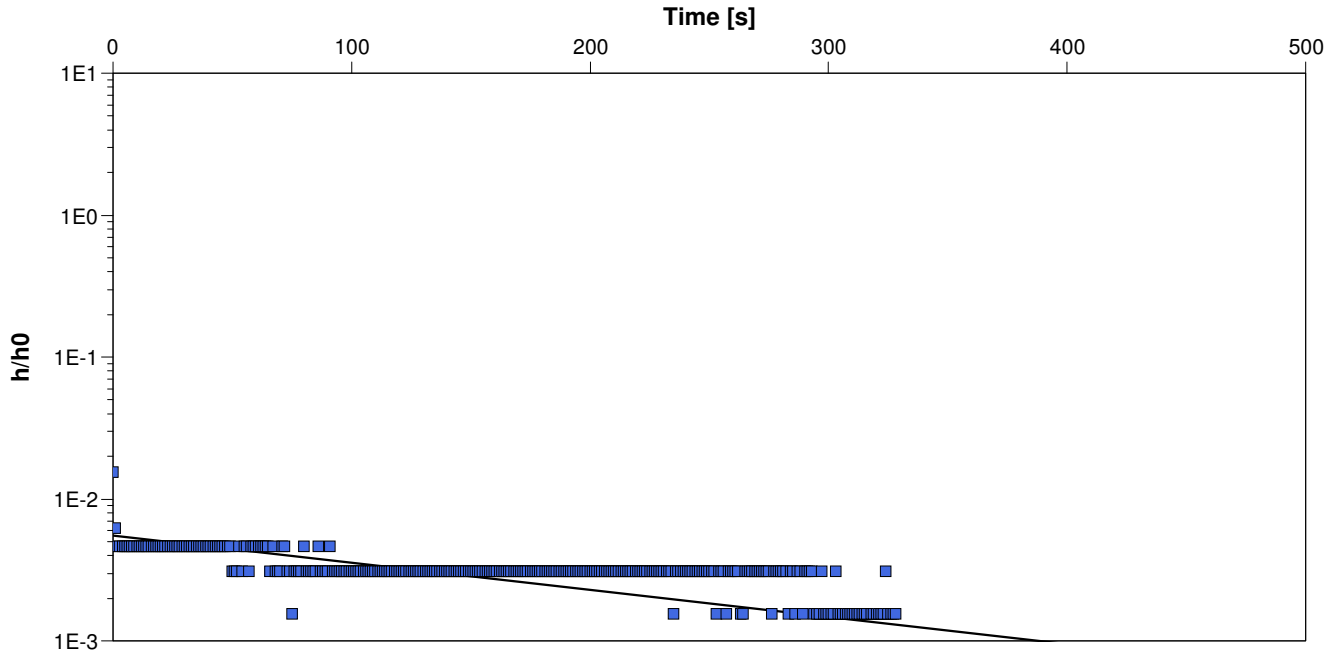



Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity [m/s] | |
|---|---|---|
| MW101-20 | $7.85 \times 10^{-8}$ | |

| | |
|---|---|
| | **Slug Test Analysis Report** |
| | Project: Hydrogeological Assessment |
| | Number: 48043-300 |
| | Client: Tribal Partners |

| | | |
|---|---|---|
| Location: 12892 Dixie Road, Caledon | Slug Test: MW103-20 - Falling Test 1 | Test Well: MW101-20 |
| Test Conducted by: JAK | | Test Date: 11/30/2020 |
| Analysis Performed by: MBC | MW103-20 - Falling Test 1 | Analysis Date: 12/1/2020 |
| Aquifer Thickness: 1.60 m | | |

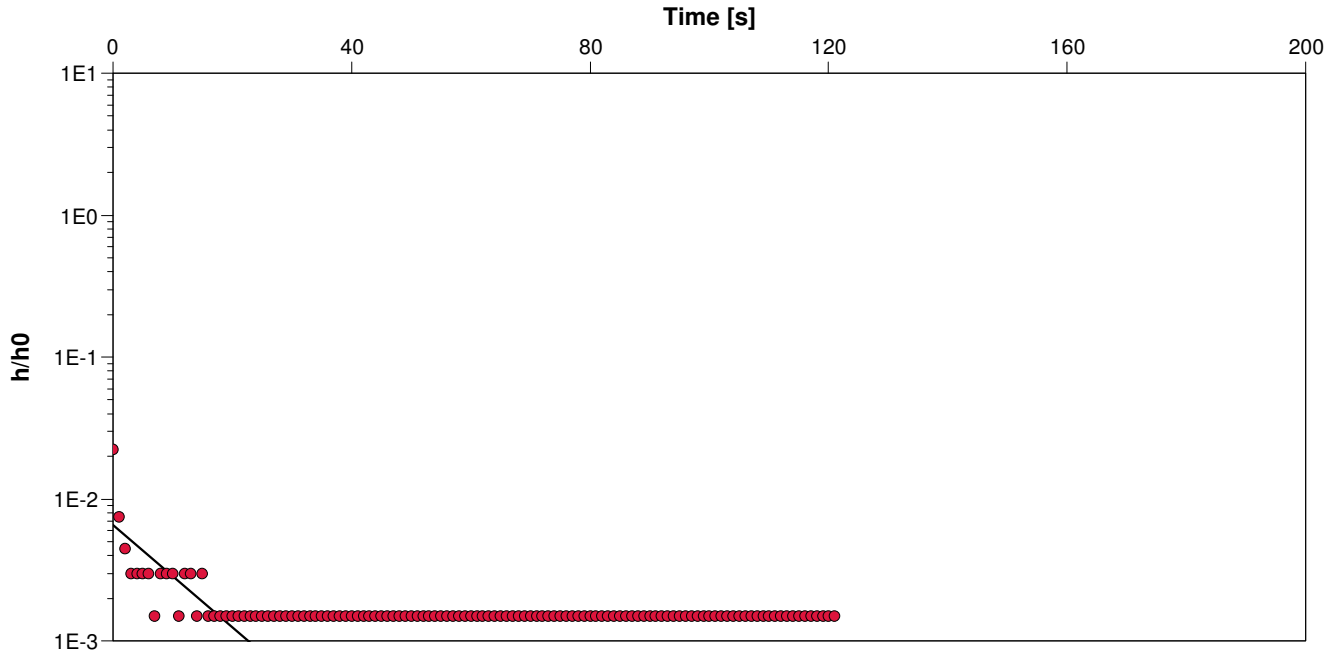



Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity [m/s] | |
|---|---|---|
| MW101-20 | $3.27 \times 10^{-6}$ | |

| | |
|---|---|
| | **Slug Test Analysis Report** |
| | Project: Hydrogeological Assessment |
| | Number: 48043-300 |
| | Client: Tribal Partners |

| | | |
|---|---|---|
| Location: 12892 Dixie Road, Caledon | Slug Test: MW103-20 - Rising Test 1 | Test Well: MW103-20 |
| Test Conducted by: JAK | | Test Date: 11/30/2020 |
| Analysis Performed by: MBC | MW103-20 - Rising Test 1 | Analysis Date: 12/1/2020 |
| Aquifer Thickness: 1.60 m | | |

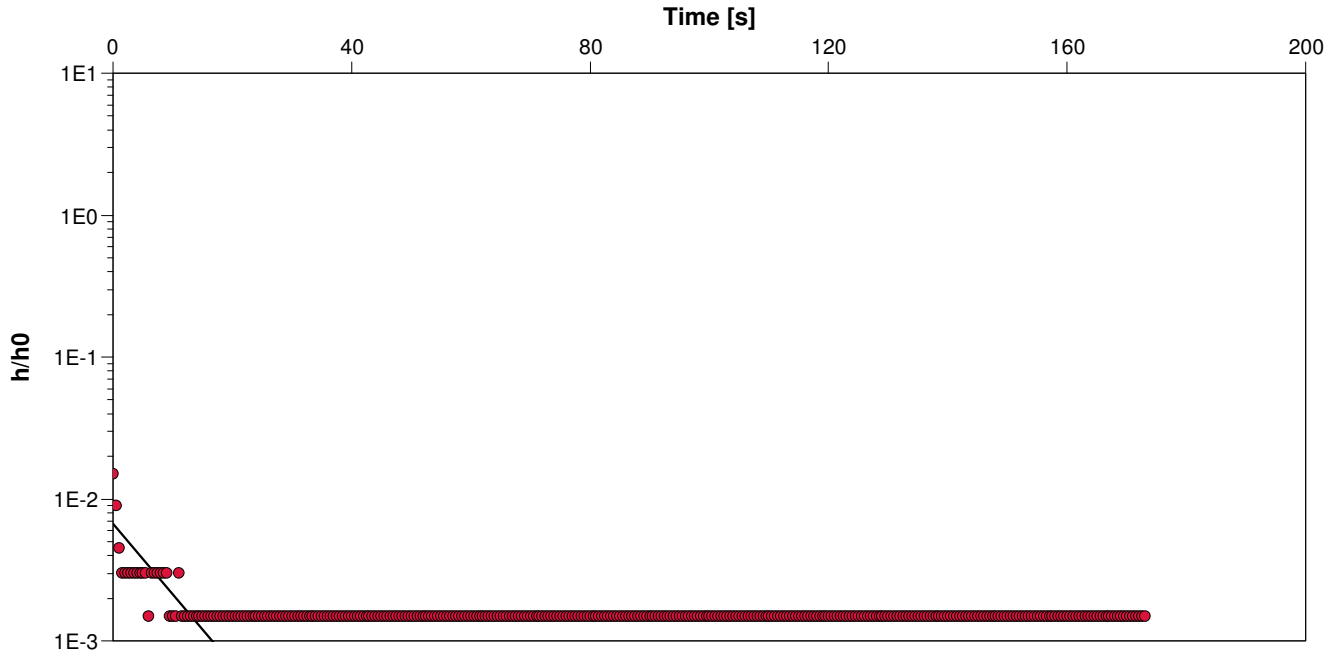



Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity [m/s] | |
|---|---|---|
| MW103-20 | $5.37 \times 10^{-5}$ | |

| | |
|---|---|
| | **Slug Test Analysis Report** |
| | Project: Hydrogeological Assessment |
| | Number: 48043-300 |
| | Client: Tribal Partners |

| | | |
|---|---|---|
| Location: 12892 Dixie Road, Caledon | Slug Test: MW103-20 - Rising Test 2 | Test Well: MW103-20 |
| Test Conducted by: JAK | | Test Date: 11/30/2020 |
| Analysis Performed by: MBC | MW103-20 - Rising Test 2 | Analysis Date: 12/1/2020 |
| Aquifer Thickness: 1.60 m | | |

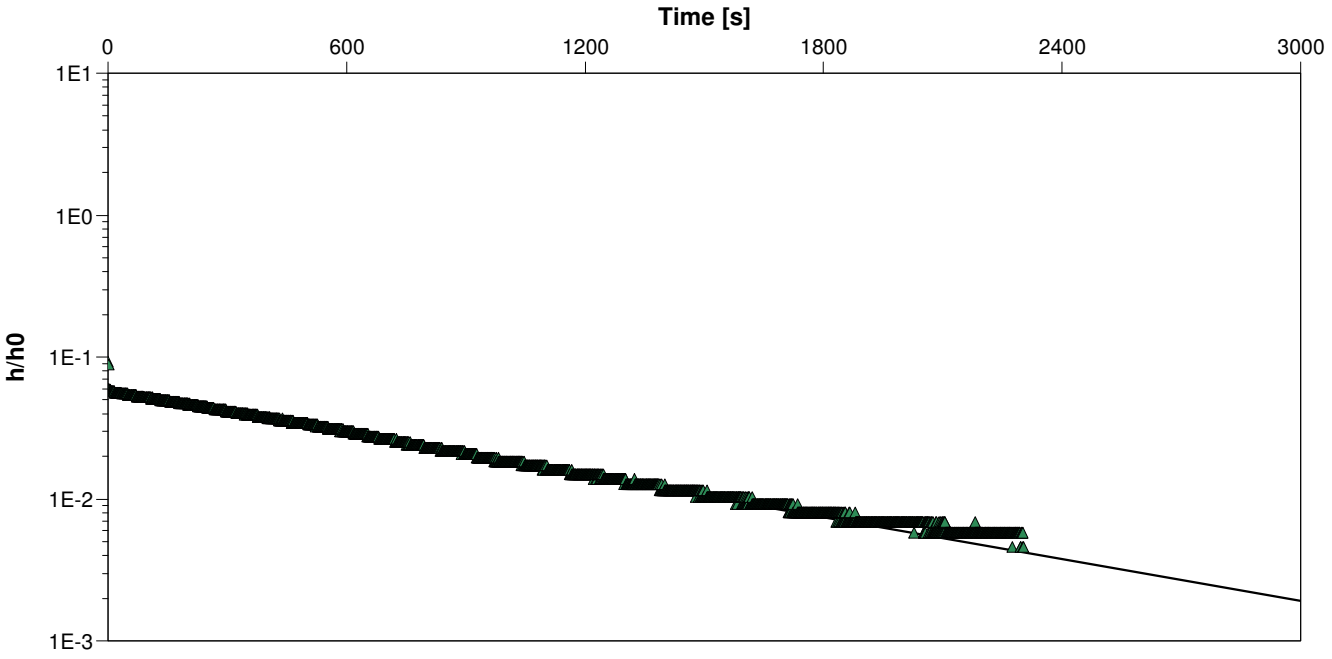



Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity [m/s] | |
|---|---|---|
| MW103-20 | $7.41 \times 10^{-5}$ | |

| | |
|---|---|
| | **Slug Test Analysis Report** |
| | Project: Hydrogeological Assessment |
| | Number: 48043-300 |
| | Client: Tribal Partners |

| | | |
|---|---|---|
| Location: 12892 Dixie Road, Caledon | Slug Test: MW106-20 - Falling Test 1 | Test Well: MW106-20 |
| Test Conducted by: JAK | | Test Date: 11/30/2020 |
| Analysis Performed by: MBC | MW106-20 - Falling Head Test 1 | Analysis Date: 12/1/2020 |
| Aquifer Thickness: 0.50 m | | |

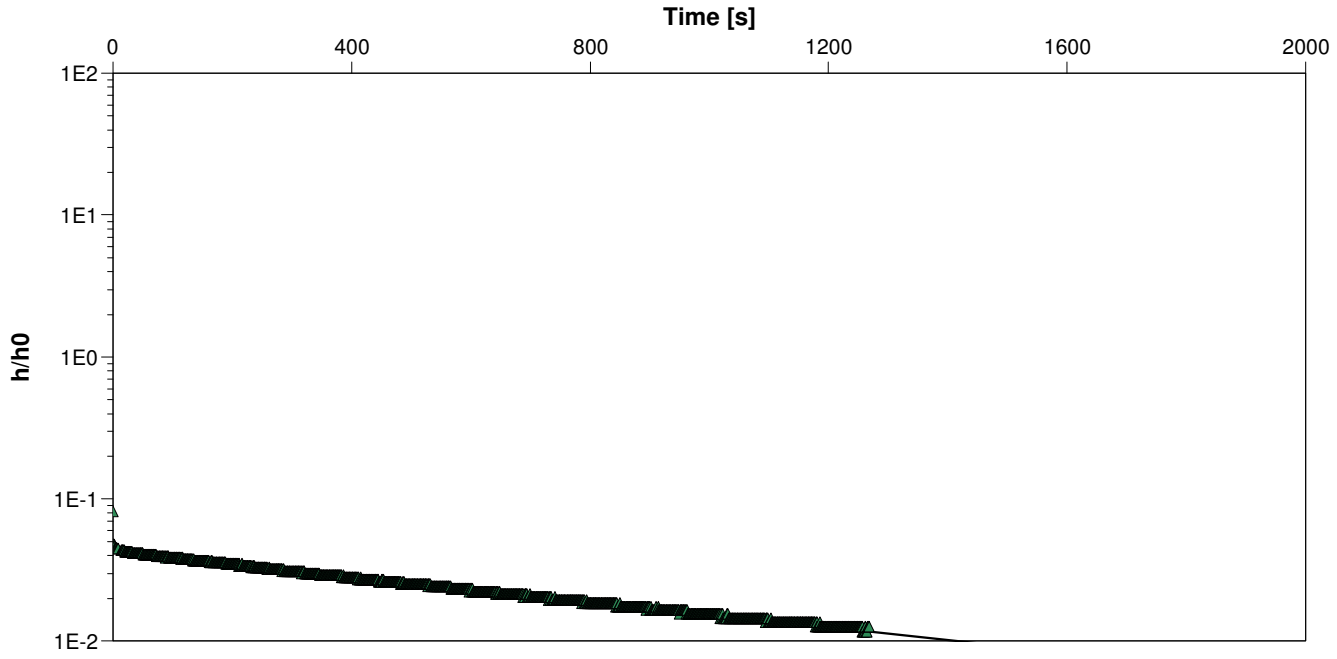



Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity [m/s] | |
|---|---|---|
| MW106-20 | $1.49 \times 10^{-6}$ | |

| | |
|---|---|
| | **Slug Test Analysis Report** |
| | Project: Hydrogeological Assessment |
| | Number: 48043-300 |
| | Client: Tribal Partners |

| | | |
|---|---|---|
| Location: 12892 Dixie Road, Caledon | Slug Test: MW106-20 - Rising Test 1 | Test Well: MW106-20 |
| Test Conducted by: JAK | | Test Date: 11/30/2020 |
| Analysis Performed by: MBC | MW106-20 - Rising Test 1 | Analysis Date: 12/1/2020 |
| Aquifer Thickness: 0.50 m | | |

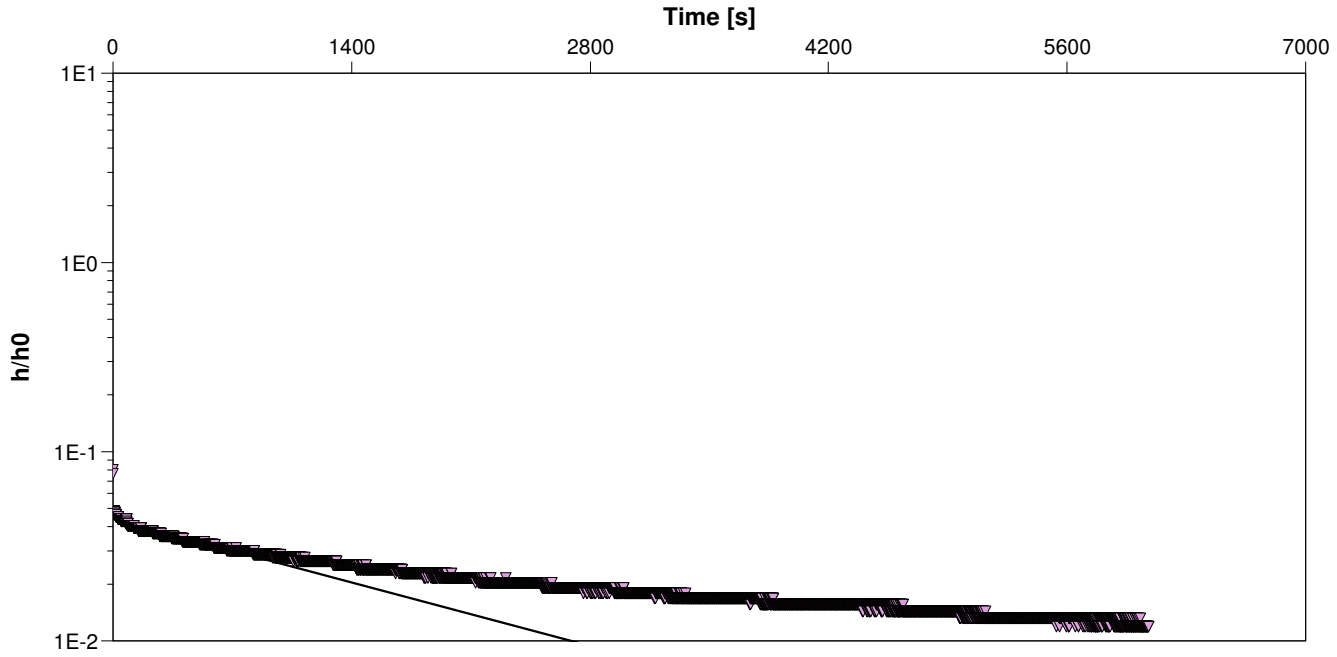



Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity [m/s] | |
|---|---|---|
| MW106-20 | $1.37 \times 10^{-6}$ | |

| | |
|---|---|
| | **Slug Test Analysis Report** |
| | Project: Hydrogeological Assessment |
| | Number: 48043-300 |
| | Client: Tribal Partners |

| | | |
|---|---|---|
| Location: 12892 Dixie Road, Caledon | Slug Test: MW107-20 - Falling Test 1 | Test Well: MW107-20 |
| Test Conducted by: JAK | | Test Date: 11/30/2020 |
| Analysis Performed by: MBC | MW107-20 - Falling Test 1 | Analysis Date: 12/1/2020 |
| Aquifer Thickness: 1.50 m | | |

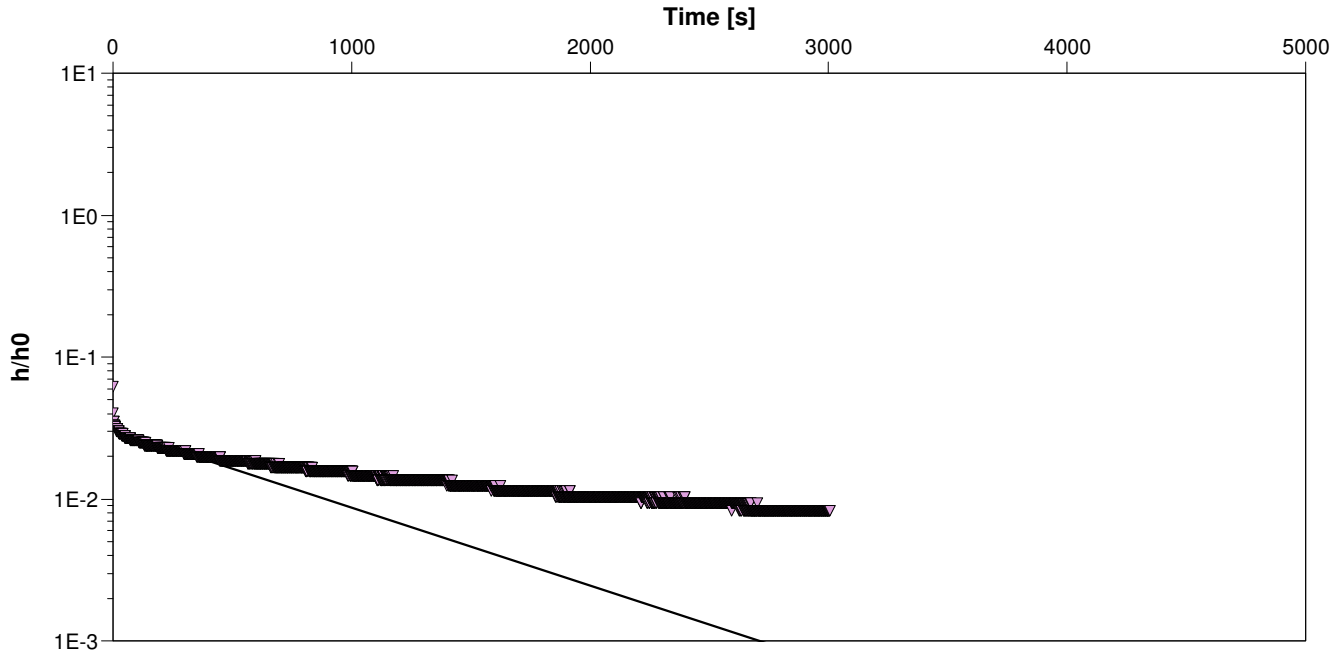



Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity [m/s] | |
|---|---|---|
| MW107-20 | $4.34 \times 10^{-7}$ | |

| | |
|---|---|
| | **Slug Test Analysis Report** |
| | Project: Hydrogeological Assessment |
| | Number: 48043-300 |
| | Client: Tribal Partners |

| | | |
|---|---|---|
| Location: 12892 Dixie Road, Caledon | Slug Test: MW107-20 - Rising Test 1 | Test Well: MW107-20 |
| Test Conducted by: MBC | | Test Date: 11/30/2020 |
| Analysis Performed by: MBC | MW107-20 - Rising Test 1 | Analysis Date: 12/1/2020 |
| Aquifer Thickness: 1.50 m | | |



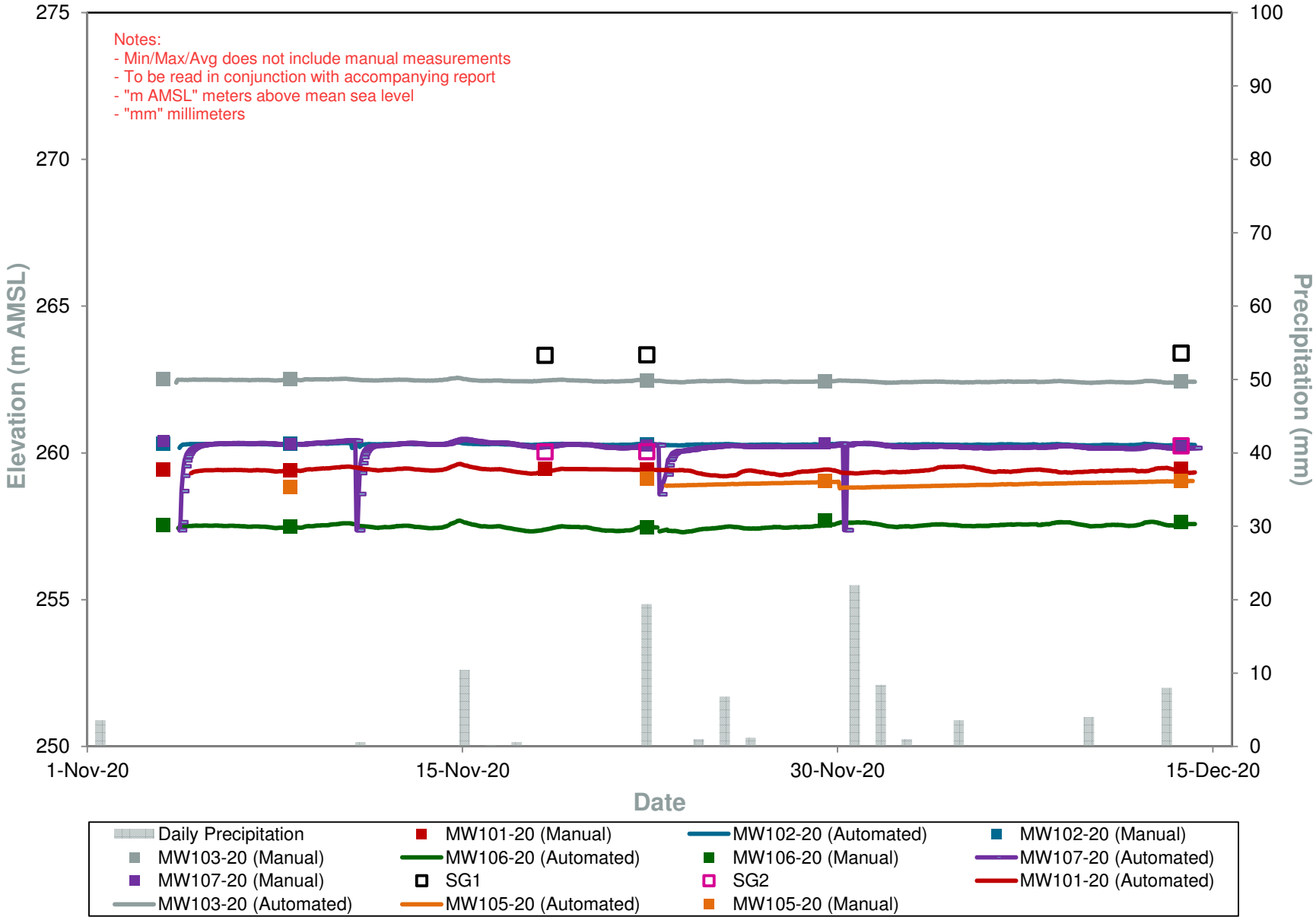

Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity [m/s] | |
|---|---|---|
| MW107-20 | $9.94 \times 10^{-7}$ | |

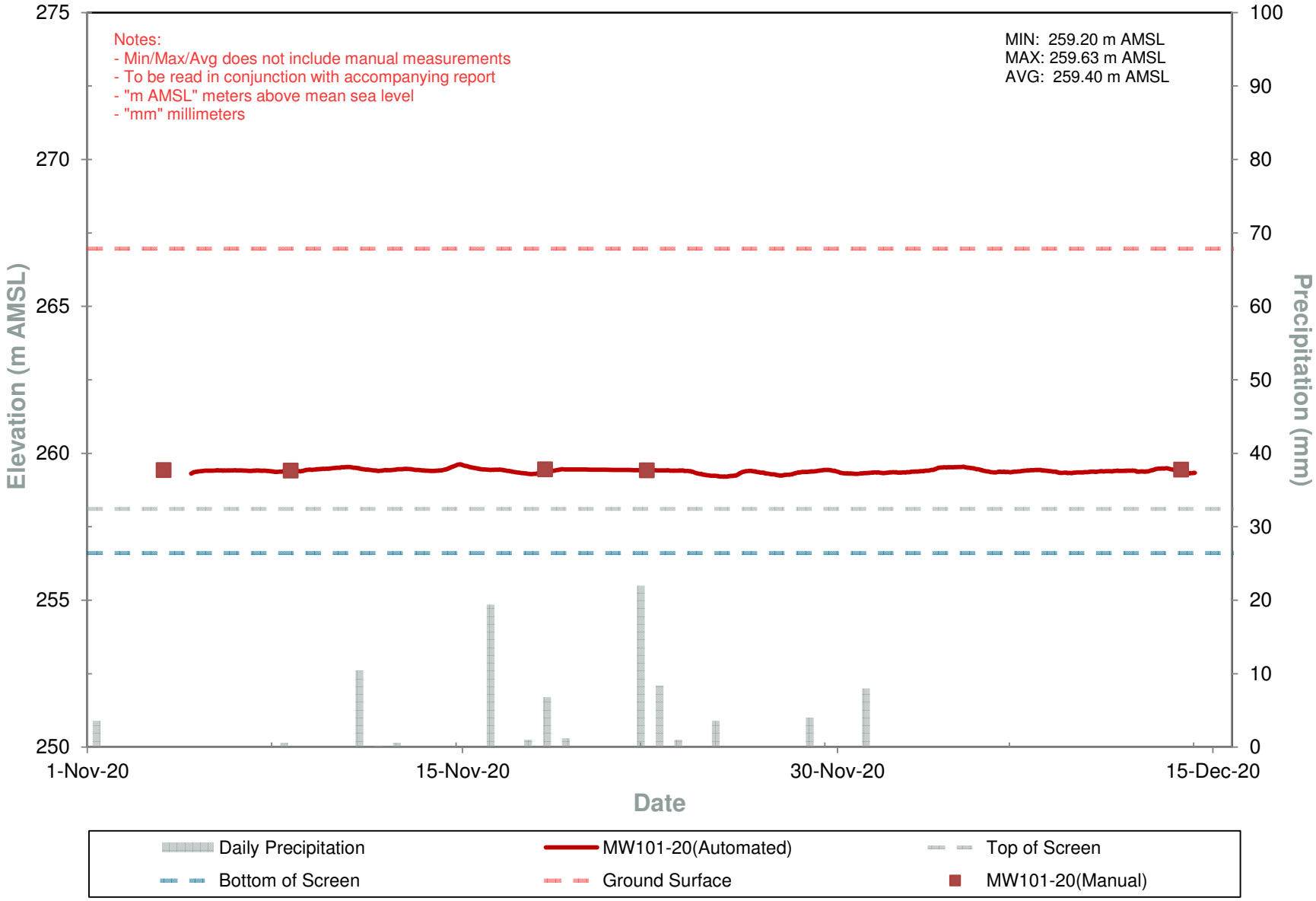
# Appendix E

# Hydrographs

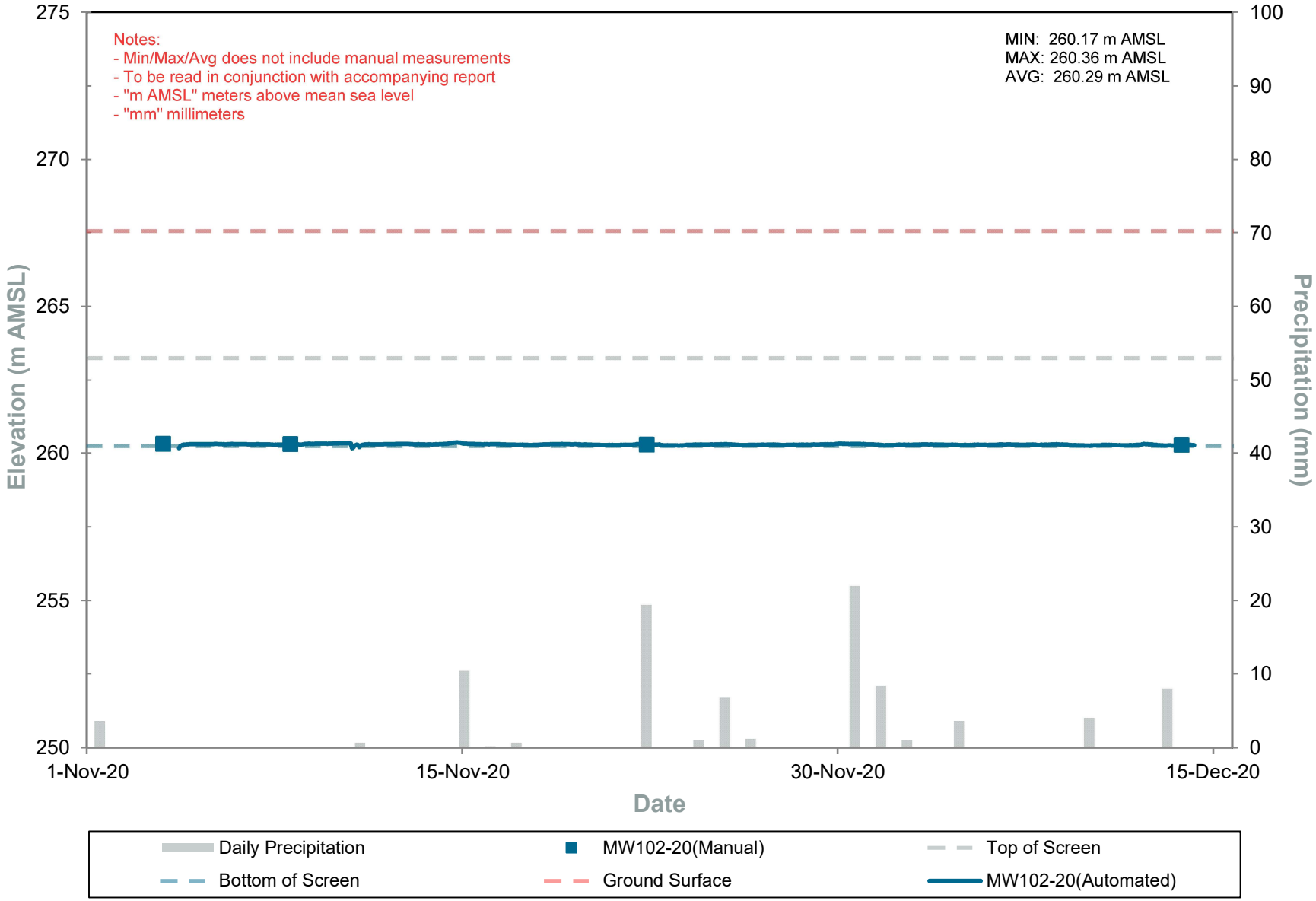
## Hydrograph 1: Groundwater Elevations



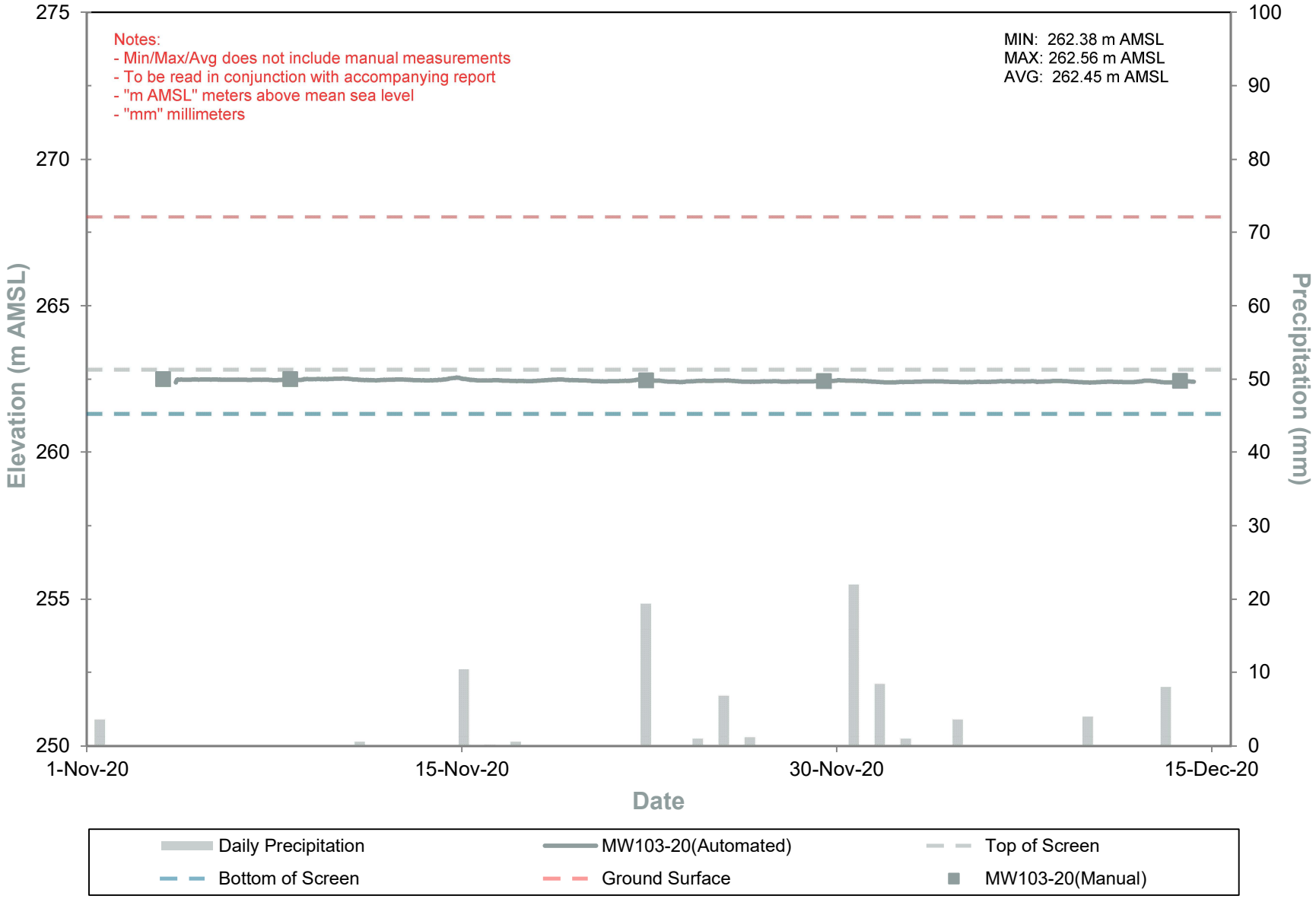
## Hydrograph 2: Groundwater Elevations - MW101-20



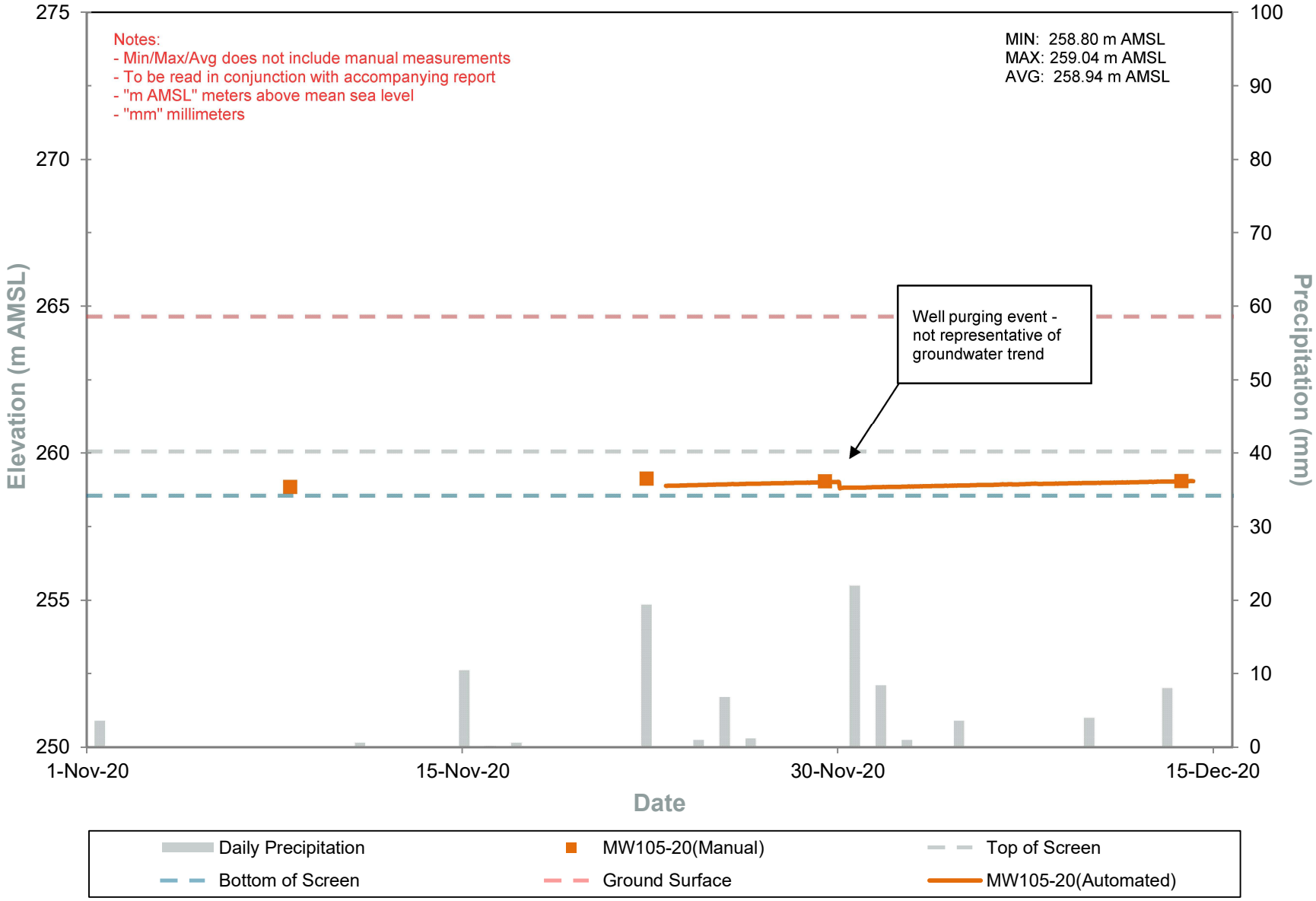
## Hydrograph 3: Groundwater Elevations - MW102-20



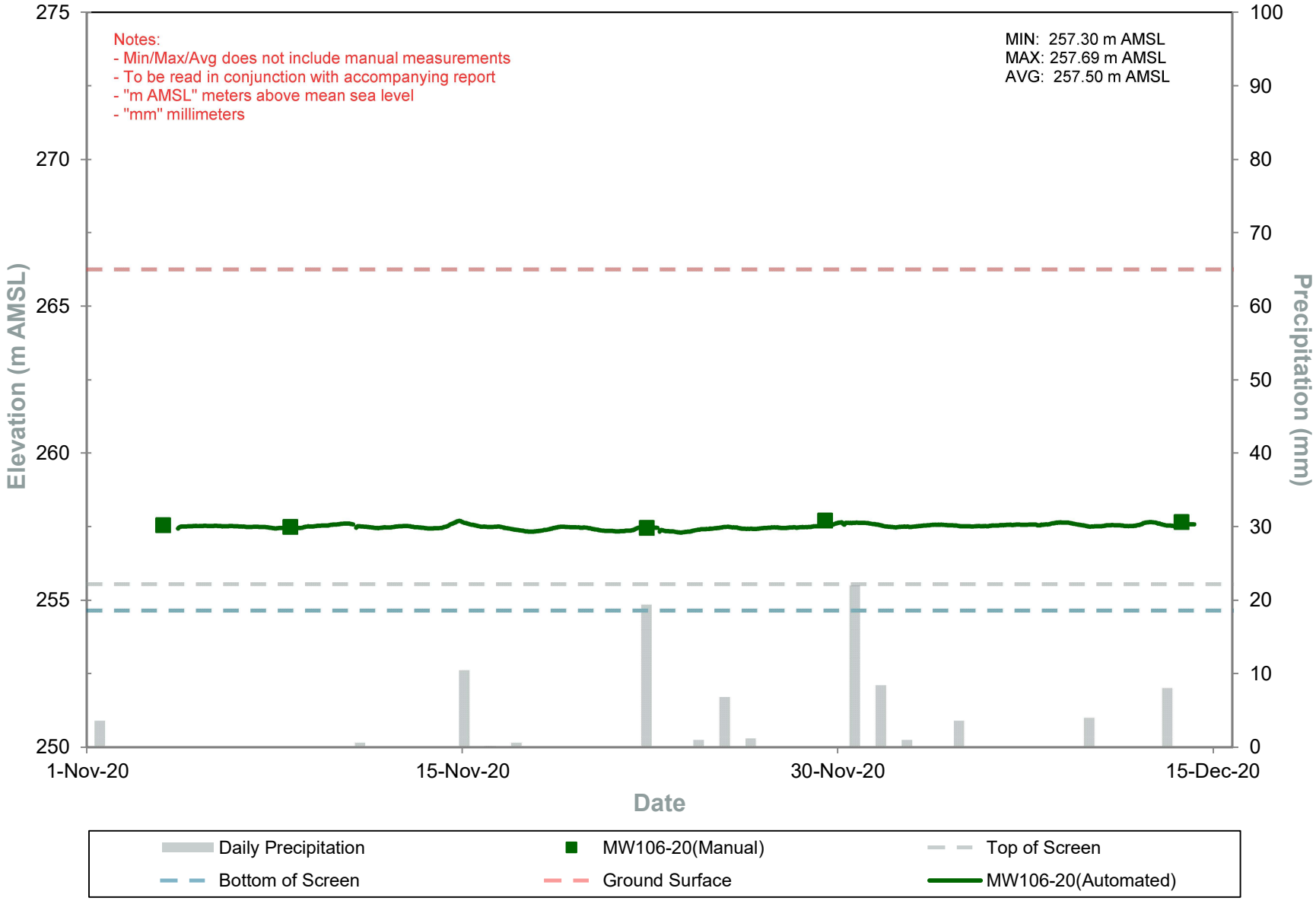
## Hydrograph 4: Groundwater Elevations - MW103-20



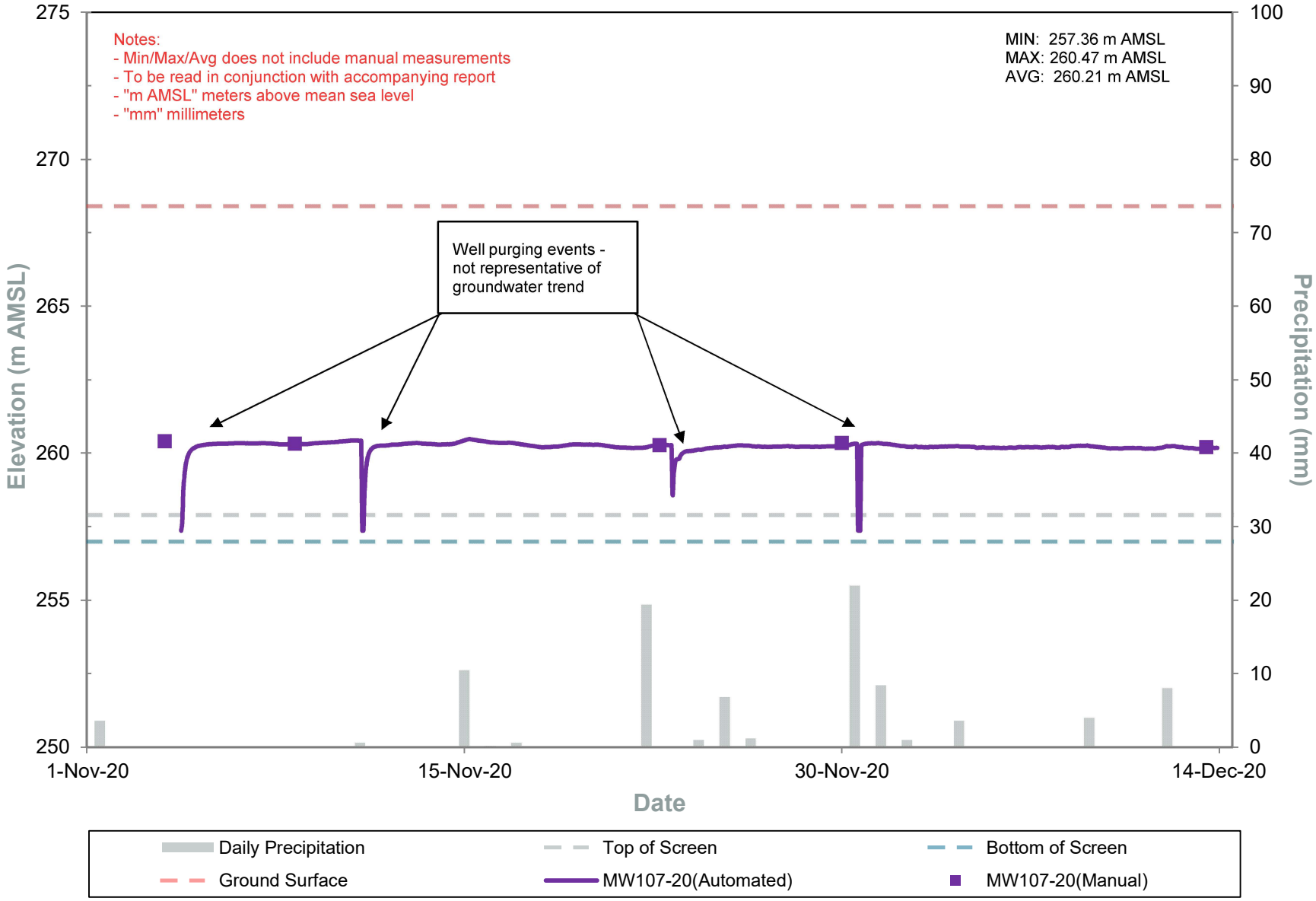
## Hydrograph 5: Groundwater Elevations - MW105-20



## Hydrograph 6: Groundwater Elevations - MW106-20



## Hydrograph 7: Groundwater Elevations - MW107-20



# Appendix F

## Certificate of Analysis

Your Project #: 48043-300
Your C.O.C. #: 794340-29-01

**Attention: John McNeil**

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

**Report Date: 2020/12/01**
Report #: R6431488
Version: 1 - Final

# CERTIFICATE OF ANALYSIS

**BV LABS JOB #: C0V1801**
**Received: 2020/11/23, 17:58**

Sample Matrix: Water
# Samples Received: 4

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Analytical Method |
|---|---|---|---|---|---|
| Alkalinity | 4 | N/A | 2020/11/26 | CAM SOP-00448 | SM 23 2320 B m |
| Carbonate, Bicarbonate and Hydroxide | 4 | N/A | 2020/11/27 | CAM SOP-00102 | APHA 4500-CO2 D |
| Chloride by Automated Colourimetry | 4 | N/A | 2020/11/27 | CAM SOP-00463 | SM 23 4500-Cl E m |
| Conductivity | 4 | N/A | 2020/11/26 | CAM SOP-00414 | SM 23 2510 m |
| Dissolved Organic Carbon (DOC) (1) | 2 | N/A | 2020/11/25 | CAM SOP-00446 | SM 23 5310 B m |
| Dissolved Organic Carbon (DOC) (1) | 2 | N/A | 2020/11/26 | CAM SOP-00446 | SM 23 5310 B m |
| Hardness (calculated as CaCO3) | 3 | N/A | 2020/11/27 | CAM SOP 00102/00408/00447 | SM 2340 B |
| Hardness (calculated as CaCO3) | 1 | N/A | 2020/11/30 | CAM SOP 00102/00408/00447 | SM 2340 B |
| Lab Filtered Metals by ICPMS | 2 | 2020/11/25 | 2020/11/26 | CAM SOP-00447 | EPA 6020B m |
| Dissolved Metals by ICPMS | 1 | N/A | 2020/11/25 | CAM SOP-00447 | EPA 6020B m |
| Dissolved Metals by ICPMS | 1 | N/A | 2020/11/30 | CAM SOP-00447 | EPA 6020B m |
| Ion Balance (% Difference) | 3 | N/A | 2020/11/27 | | |
| Ion Balance (% Difference) | 1 | N/A | 2020/11/30 | | |
| Anion and Cation Sum | 3 | N/A | 2020/11/27 | | |
| Anion and Cation Sum | 1 | N/A | 2020/11/30 | | |
| Total Ammonia-N | 4 | N/A | 2020/11/26 | CAM SOP-00441 | USGS I-2522-90 m |
| Nitrate (NO3) and Nitrite (NO2) in Water (2) | 3 | N/A | 2020/11/25 | CAM SOP-00440 | SM 23 4500-NO3I/NO2B |
| Nitrate (NO3) and Nitrite (NO2) in Water (2) | 1 | N/A | 2020/11/26 | CAM SOP-00440 | SM 23 4500-NO3I/NO2B |
| pH | 3 | 2020/11/25 | 2020/11/26 | CAM SOP-00413 | SM 4500H+ B m |
| pH | 1 | 2020/11/26 | 2020/11/26 | CAM SOP-00413 | SM 4500H+ B m |
| Orthophosphate | 4 | N/A | 2020/11/26 | CAM SOP-00461 | EPA 365.1 m |
| Sat. pH and Langelier Index (@ 20C) | 3 | N/A | 2020/11/27 | | Auto Calc |
| Sat. pH and Langelier Index (@ 20C) | 1 | N/A | 2020/11/30 | | Auto Calc |
| Sat. pH and Langelier Index (@ 4C) | 3 | N/A | 2020/11/27 | | Auto Calc |
| Sat. pH and Langelier Index (@ 4C) | 1 | N/A | 2020/11/30 | | Auto Calc |
| Sulphate by Automated Colourimetry | 4 | N/A | 2020/11/27 | CAM SOP-00464 | EPA 375.4 m |
| Total Dissolved Solids (TDS calc) | 3 | N/A | 2020/11/27 | | Auto Calc |
| Total Dissolved Solids (TDS calc) | 1 | N/A | 2020/11/30 | | Auto Calc |

Your Project #: 48043-300
Your C.O.C. #: 794340-29-01

**Attention: John McNeil**

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

**Report Date: 2020/12/01**
Report #: R6431488
Version: 1 - Final

# CERTIFICATE OF ANALYSIS

**BV LABS JOB #: C0V1801**
**Received: 2020/11/23, 17:58**

**Remarks:**

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs 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 BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs 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.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs 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 BV Labs, unless otherwise agreed in writing. BV Labs 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 BV Labs, 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 your Project Manager.
Ronklin Gracian, Project Manager
Email: Ronklin.Gracian@bvlabs.com
Phone# (905)817-5752

==========

BV Labs 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 Signature Page.

BV Labs Job #: C0V1801
Report Date: 2020/12/01

MTE Consultants Inc
Client Project #: 48043-300
Sampler Initials: MC

## RCAP - COMPREHENSIVE (WATER)

| BV Labs ID | | | OFX270 | | | OFX270 | | | OFX271 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | | | 2020/11/23 14:42 | | | 2020/11/23 14:42 | | | 2020/11/23 15:20 | | |
| COC Number | | | 794340-29-01 | | | 794340-29-01 | | | 794340-29-01 | | |
| | **UNITS** | **Criteria** | **MW106-20** | **RDL** | **QC Batch** | **MW106-20 Lab-Dup** | **RDL** | **QC Batch** | **MW107-20** | **RDL** | **QC Batch** |
| **Calculated Parameters** | | | | | | | | | | | |
| Anion Sum | me/L | - | 8.11 | N/A | 7074369 | | | | 7.09 | N/A | 7074369 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | - | 330 | 1.0 | 7073132 | | | | 300 | 1.0 | 7073132 |
| Calculated TDS | mg/L | - | 420 | 1.0 | 7074372 | | | | 350 | 1.0 | 7074372 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | - | 5.2 | 1.0 | 7073132 | | | | 4.2 | 1.0 | 7073132 |
| Cation Sum | me/L | - | 8.10 | N/A | 7074369 | | | | 7.12 | N/A | 7074369 |
| Hardness (CaCO3) | mg/L | - | 340 | 1.0 | 7073133 | | | | 320 | 1.0 | 7073133 |
| Ion Balance (% Difference) | % | - | 0.0900 | N/A | 7073134 | | | | 0.220 | N/A | 7073134 |
| Langelier Index (@ 20C) | N/A | - | 1.07 | | 7074370 | | | | 0.765 | | 7074370 |
| Langelier Index (@ 4C) | N/A | - | 0.824 | | 7074371 | | | | 0.516 | | 7074371 |
| Saturation pH (@ 20C) | N/A | - | 7.16 | | 7074370 | | | | 7.41 | | 7074370 |
| Saturation pH (@ 4C) | N/A | - | 7.41 | | 7074371 | | | | 7.65 | | 7074371 |
| **Inorganics** | | | | | | | | | | | |
| Total Ammonia-N | mg/L | - | 0.32 | 0.050 | 7077399 | | | | 0.20 | 0.050 | 7077399 |
| Conductivity | umho/cm | - | 720 | 1.0 | 7076464 | | | | 630 | 1.0 | 7076464 |
| Dissolved Organic Carbon | mg/L | - | 1.9 | 0.40 | 7075788 | 1.9 | 0.40 | 7075788 | 1.1 | 0.40 | 7075788 |
| Orthophosphate (P) | mg/L | - | <0.010 | 0.010 | 7075392 | | | | 0.011 | 0.010 | 7075392 |
| pH | pH | 6.5:8.5 | 8.23 | | 7076476 | | | | 8.17 | | 7076476 |
| Dissolved Sulphate (SO4) | mg/L | - | 55 | 1.0 | 7075391 | | | | 27 | 1.0 | 7075391 |
| Alkalinity (Total as CaCO3) | mg/L | - | 330 | 1.0 | 7076462 | | | | 300 | 1.0 | 7076462 |
| Dissolved Chloride (Cl-) | ug/L | - | 11000 | 1000 | 7075384 | | | | 15000 | 1000 | 7075384 |
| Nitrite (N) | mg/L | - | 0.115 | 0.010 | 7075569 | | | | <0.010 | 0.010 | 7075202 |
| Nitrate (N) | mg/L | - | 0.41 | 0.10 | 7075569 | | | | <0.10 | 0.10 | 7075202 |
| Nitrate + Nitrite (N) | mg/L | - | 0.53 | 0.10 | 7075569 | | | | <0.10 | 0.10 | 7075202 |
| **Metals** | | | | | | | | | | | |
| Dissolved Aluminum (Al) | ug/L | - | 80 | 4.9 | 7075570 | | | | <4.9 | 4.9 | 7075570 |
| Dissolved Antimony (Sb) | ug/L | 20 | 0.62 | 0.50 | 7075570 | | | | <0.50 | 0.50 | 7075570 |
| Dissolved Arsenic (As) | ug/L | 100 | 4.4 | 1.0 | 7075570 | | | | 5.0 | 1.0 | 7075570 |
| Dissolved Barium (Ba) | ug/L | - | 220 | 2.0 | 7075570 | | | | 120 | 2.0 | 7075570 |

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

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



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

BV Labs Job #: C0V1801
Report Date: 2020/12/01

MTE Consultants Inc
Client Project #: 48043-300
Sampler Initials: MC

## RCAP - COMPREHENSIVE (WATER)

| BV Labs ID | | | OFX270 | | | OFX270 | | | OFX271 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | | | 2020/11/23 14:42 | | | 2020/11/23 14:42 | | | 2020/11/23 15:20 | | |
| COC Number | | | 794340-29-01 | | | 794340-29-01 | | | 794340-29-01 | | |
| | **UNITS** | **Criteria** | **MW106-20** | **RDL** | **QC Batch** | **MW106-20 Lab-Dup** | **RDL** | **QC Batch** | **MW107-20** | **RDL** | **QC Batch** |
| Dissolved Beryllium (Be) | ug/L | 11 | <0.40 | 0.40 | 7075570 | | | | <0.40 | 0.40 | 7075570 |
| Dissolved Boron (B) | ug/L | 200 | 63 | 10 | 7075570 | | | | 79 | 10 | 7075570 |
| Dissolved Cadmium (Cd) | ug/L | 0.2 | <0.090 | 0.090 | 7075570 | | | | <0.090 | 0.090 | 7075570 |
| Dissolved Calcium (Ca) | ug/L | - | 59000 | 200 | 7075570 | | | | 35000 | 200 | 7075570 |
| Dissolved Chromium (Cr) | ug/L | - | <5.0 | 5.0 | 7075570 | | | | <5.0 | 5.0 | 7075570 |
| Dissolved Cobalt (Co) | ug/L | 0.9 | <0.50 | 0.50 | 7075570 | | | | <0.50 | 0.50 | 7075570 |
| Dissolved Copper (Cu) | ug/L | 5 | 1.7 | 0.90 | 7075570 | | | | <0.90 | 0.90 | 7075570 |
| Dissolved Iron (Fe) | ug/L | 300 | 200 | 100 | 7075570 | | | | <100 | 100 | 7075570 |
| Dissolved Lead (Pb) | ug/L | 5 | <0.50 | 0.50 | 7075570 | | | | <0.50 | 0.50 | 7075570 |
| Dissolved Magnesium (Mg) | ug/L | - | 47000 | 50 | 7075570 | | | | 56000 | 50 | 7075570 |
| Dissolved Manganese (Mn) | ug/L | - | 62 | 2.0 | 7075570 | | | | 20 | 2.0 | 7075570 |
| Dissolved Molybdenum (Mo) | ug/L | 40 | 9.0 | 0.50 | 7075570 | | | | 3.9 | 0.50 | 7075570 |
| Dissolved Nickel (Ni) | ug/L | 25 | <1.0 | 1.0 | 7075570 | | | | <1.0 | 1.0 | 7075570 |
| Dissolved Phosphorus (P) | ug/L | - | <100 | 100 | 7075570 | | | | <100 | 100 | 7075570 |
| Dissolved Potassium (K) | ug/L | - | 4400 | 200 | 7075570 | | | | 4700 | 200 | 7075570 |
| Dissolved Selenium (Se) | ug/L | 100 | <2.0 | 2.0 | 7075570 | | | | <2.0 | 2.0 | 7075570 |
| Dissolved Silicon (Si) | ug/L | - | 7500 | 50 | 7075570 | | | | 7600 | 50 | 7075570 |
| Dissolved Silver (Ag) | ug/L | 0.1 | <0.090 | 0.090 | 7075570 | | | | <0.090 | 0.090 | 7075570 |
| Dissolved Sodium (Na) | ug/L | - | 26000 | 100 | 7075570 | | | | 15000 | 100 | 7075570 |
| Dissolved Strontium (Sr) | ug/L | - | 510 | 1.0 | 7075570 | | | | 530 | 1.0 | 7075570 |
| Dissolved Thallium (Tl) | ug/L | 0.3 | <0.050 | 0.050 | 7075570 | | | | <0.050 | 0.050 | 7075570 |
| Dissolved Titanium (Ti) | ug/L | - | <5.0 | 5.0 | 7075570 | | | | <5.0 | 5.0 | 7075570 |
| Dissolved Uranium (U) | ug/L | 5 | 1.5 | 0.10 | 7075570 | | | | 0.55 | 0.10 | 7075570 |
| Dissolved Vanadium (V) | ug/L | 6 | 1.7 | 0.50 | 7075570 | | | | 0.64 | 0.50 | 7075570 |
| Dissolved Zinc (Zn) | ug/L | 30 | <5.0 | 5.0 | 7075570 | | | | <5.0 | 5.0 | 7075570 |

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

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



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BV Labs Job #: C0V1801
Report Date: 2020/12/01

MTE Consultants Inc
Client Project #: 48043-300
Sampler Initials: MC

## RCAP - COMPREHENSIVE (LAB FILTERED)

| BV Labs ID | | | OFX272 | | | OFX273 | | |
|---|---|---|---|---|---|---|---|---|
| Sampling Date | | | 2020/11/23 12:40 | | | 2020/11/23 13:52 | | |
| COC Number | | | 794340-29-01 | | | 794340-29-01 | | |
| | **UNITS** | **Criteria** | **SG1** | **RDL** | **QC Batch** | **SG2** | **RDL** | **QC Batch** |
| **Calculated Parameters** | | | | | | | | |
| Anion Sum | me/L | - | 14.1 | N/A | 7074369 | 8.49 | N/A | 7074369 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | - | 280 | 1.0 | 7073132 | 270 | 1.0 | 7073132 |
| Calculated TDS | mg/L | - | 790 | 1.0 | 7074372 | 460 | 1.0 | 7074372 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | - | 3.8 | 1.0 | 7073132 | 4.0 | 1.0 | 7073132 |
| Cation Sum | me/L | - | 14.3 | N/A | 7074369 | 8.45 | N/A | 7074369 |
| Hardness (CaCO3) | mg/L | - | 390 | 1.0 | 7073133 | 350 | 1.0 | 7073133 |
| Ion Balance (% Difference) | % | - | 0.810 | N/A | 7073134 | 0.220 | N/A | 7073134 |
| Langelier Index (@ 20C) | N/A | - | 1.17 | | 7074370 | 1.19 | | 7074370 |
| Langelier Index (@ 4C) | N/A | - | 0.924 | | 7074371 | 0.943 | | 7074371 |
| Saturation pH (@ 20C) | N/A | - | 6.99 | | 7074370 | 7.01 | | 7074370 |
| Saturation pH (@ 4C) | N/A | - | 7.24 | | 7074371 | 7.25 | | 7074371 |
| **Inorganics** | | | | | | | | |
| Total Ammonia-N | mg/L | - | <0.050 | 0.050 | 7077399 | <0.050 | 0.050 | 7077399 |
| Conductivity | umho/cm | - | 1500 | 1.0 | 7076464 | 820 | 1.0 | 7077732 |
| Dissolved Organic Carbon | mg/L | - | 8.6 | 0.40 | 7075788 | 4.9 | 0.40 | 7075735 |
| Orthophosphate (P) | mg/L | - | 0.11 | 0.010 | 7075392 | 0.035 | 0.010 | 7075392 |
| pH | pH | 6.5:8.5 | 8.16 | | 7076476 | 8.20 | | 7077731 |
| Dissolved Sulphate (SO4) | mg/L | - | 49 | 1.0 | 7075391 | 41 | 1.0 | 7075391 |
| Alkalinity (Total as CaCO3) | mg/L | - | 280 | 1.0 | 7076462 | 270 | 1.0 | 7077724 |
| Dissolved Chloride (Cl-) | ug/L | - | 260000 | 3000 | 7075384 | 75000 | 1000 | 7075384 |
| Nitrite (N) | mg/L | - | <0.010 | 0.010 | 7075202 | <0.010 | 0.010 | 7075202 |
| Nitrate (N) | mg/L | - | <0.10 | 0.10 | 7075202 | 0.37 | 0.10 | 7075202 |
| Nitrate + Nitrite (N) | mg/L | - | <0.10 | 0.10 | 7075202 | 0.37 | 0.10 | 7075202 |
| **Metals** | | | | | | | | |
| Dissolved Aluminum (Al) | ug/L | - | <4.9 | 4.9 | 7076206 | 7.1 | 4.9 | 7076206 |
| Dissolved Antimony (Sb) | ug/L | 20 | <0.50 | 0.50 | 7076206 | <0.50 | 0.50 | 7076206 |
| Dissolved Arsenic (As) | ug/L | 100 | <1.0 | 1.0 | 7076206 | <1.0 | 1.0 | 7076206 |
| Dissolved Barium (Ba) | ug/L | - | 53 | 2.0 | 7076206 | 53 | 2.0 | 7076206 |
| Dissolved Beryllium (Be) | ug/L | 11 | <0.40 | 0.40 | 7076206 | <0.40 | 0.40 | 7076206 |

| | |
|---|---|
| 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



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BV Labs Job #: C0V1801
Report Date: 2020/12/01

MTE Consultants Inc
Client Project #: 48043-300
Sampler Initials: MC

## RCAP - COMPREHENSIVE (LAB FILTERED)

| BV Labs ID | | | OFX272 | | | OFX273 | | |
|---|---|---|---|---|---|---|---|---|
| Sampling Date | | | 2020/11/23 12:40 | | | 2020/11/23 13:52 | | |
| COC Number | | | 794340-29-01 | | | 794340-29-01 | | |
| | **UNITS** | **Criteria** | **SG1** | **RDL** | **QC Batch** | **SG2** | **RDL** | **QC Batch** |
| Dissolved Boron (B) | ug/L | 200 | 28 | 10 | 7076206 | 17 | 10 | 7076206 |
| Dissolved Cadmium (Cd) | ug/L | 0.2 | <0.090 | 0.090 | 7076206 | <0.090 | 0.090 | 7076206 |
| Dissolved Calcium (Ca) | ug/L | - | 120000 | 200 | 7076206 | 100000 | 200 | 7076206 |
| Dissolved Chromium (Cr) | ug/L | - | <5.0 | 5.0 | 7076206 | <5.0 | 5.0 | 7076206 |
| Dissolved Cobalt (Co) | ug/L | 0.9 | <0.50 | 0.50 | 7076206 | <0.50 | 0.50 | 7076206 |
| Dissolved Copper (Cu) | ug/L | 5 | 2.4 | 0.90 | 7076206 | <0.90 | 0.90 | 7076206 |
| Dissolved Iron (Fe) | ug/L | 300 | <100 | 100 | 7076206 | <100 | 100 | 7076206 |
| Dissolved Lead (Pb) | ug/L | 5 | <0.50 | 0.50 | 7076206 | <0.50 | 0.50 | 7076206 |
| Dissolved Magnesium (Mg) | ug/L | - | 23000 | 50 | 7076206 | 21000 | 50 | 7076206 |
| Dissolved Manganese (Mn) | ug/L | - | 33 | 2.0 | 7076206 | 51 | 2.0 | 7076206 |
| Dissolved Molybdenum (Mo) | ug/L | 40 | <0.50 | 0.50 | 7076206 | <0.50 | 0.50 | 7076206 |
| Dissolved Nickel (Ni) | ug/L | 25 | <1.0 | 1.0 | 7076206 | <1.0 | 1.0 | 7076206 |
| Dissolved Phosphorus (P) | ug/L | - | 180 | 100 | 7076206 | <100 | 100 | 7076206 |
| Dissolved Potassium (K) | ug/L | - | 9900 | 200 | 7076206 | 3300 | 200 | 7076206 |
| Dissolved Selenium (Se) | ug/L | 100 | <2.0 | 2.0 | 7076206 | <2.0 | 2.0 | 7076206 |
| Dissolved Silicon (Si) | ug/L | - | 4900 | 50 | 7076206 | 5300 | 50 | 7076206 |
| Dissolved Silver (Ag) | ug/L | 0.1 | <0.090 | 0.090 | 7076206 | <0.090 | 0.090 | 7076206 |
| Dissolved Sodium (Na) | ug/L | - | 140000 | 100 | 7076206 | 33000 | 100 | 7076206 |
| Dissolved Strontium (Sr) | ug/L | - | 310 | 1.0 | 7076206 | 250 | 1.0 | 7076206 |
| Dissolved Thallium (Tl) | ug/L | 0.3 | <0.050 | 0.050 | 7076206 | <0.050 | 0.050 | 7076206 |
| Dissolved Titanium (Ti) | ug/L | - | <5.0 | 5.0 | 7076206 | <5.0 | 5.0 | 7076206 |
| Dissolved Uranium (U) | ug/L | 5 | 1.6 | 0.10 | 7076206 | 0.60 | 0.10 | 7076206 |
| Dissolved Vanadium (V) | ug/L | 6 | <0.50 | 0.50 | 7076206 | <0.50 | 0.50 | 7076206 |
| Dissolved Zinc (Zn) | ug/L | 30 | <5.0 | 5.0 | 7076206 | <5.0 | 5.0 | 7076206 |

| | |
|---|---|
| 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



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## TEST SUMMARY

**BV Labs ID:** OFX270
**Sample ID:** MW106-20
**Matrix:** Water

**Collected:** 2020/11/23
**Shipped:**
**Received:** 2020/11/23

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Alkalinity | AT | 7076462 | N/A | 2020/11/26 | Surinder Rai |
| Carbonate, Bicarbonate and Hydroxide | CALC | 7073132 | N/A | 2020/11/27 | Automated Statchk |
| Chloride by Automated Colourimetry | KONE | 7075384 | N/A | 2020/11/27 | Deonarine Ramnarine |
| Conductivity | AT | 7076464 | N/A | 2020/11/26 | Surinder Rai |
| Dissolved Organic Carbon (DOC) | TOCV/NDIR | 7075788 | N/A | 2020/11/25 | Nimarta Singh |
| Hardness (calculated as CaCO3) | | 7073133 | N/A | 2020/11/30 | Automated Statchk |
| Dissolved Metals by ICPMS | ICP/MS | 7075570 | N/A | 2020/11/30 | Azita Fazaeli |
| Ion Balance (% Difference) | CALC | 7073134 | N/A | 2020/11/30 | Automated Statchk |
| Anion and Cation Sum | CALC | 7074369 | N/A | 2020/11/30 | Automated Statchk |
| Total Ammonia-N | LACH/NH4 | 7077399 | N/A | 2020/11/26 | Amanpreet Sappal |
| Nitrate (NO3) and Nitrite (NO2) in Water | LACH | 7075569 | N/A | 2020/11/26 | Chandra Nandlal |
| pH | AT | 7076476 | 2020/11/25 | 2020/11/26 | Surinder Rai |
| Orthophosphate | KONE | 7075392 | N/A | 2020/11/26 | Alina Dobreanu |
| Sat. pH and Langelier Index (@ 20C) | CALC | 7074370 | N/A | 2020/11/30 | Automated Statchk |
| Sat. pH and Langelier Index (@ 4C) | CALC | 7074371 | N/A | 2020/11/30 | Automated Statchk |
| Sulphate by Automated Colourimetry | KONE | 7075391 | N/A | 2020/11/27 | Deonarine Ramnarine |
| Total Dissolved Solids (TDS calc) | CALC | 7074372 | N/A | 2020/11/30 | Automated Statchk |

**BV Labs ID:** OFX270 Dup
**Sample ID:** MW106-20
**Matrix:** Water

**Collected:** 2020/11/23
**Shipped:**
**Received:** 2020/11/23

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Dissolved Organic Carbon (DOC) | TOCV/NDIR | 7075788 | N/A | 2020/11/25 | Nimarta Singh |

**BV Labs ID:** OFX271
**Sample ID:** MW107-20
**Matrix:** Water

**Collected:** 2020/11/23
**Shipped:**
**Received:** 2020/11/23

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Alkalinity | AT | 7076462 | N/A | 2020/11/26 | Surinder Rai |
| Carbonate, Bicarbonate and Hydroxide | CALC | 7073132 | N/A | 2020/11/27 | Automated Statchk |
| Chloride by Automated Colourimetry | KONE | 7075384 | N/A | 2020/11/27 | Deonarine Ramnarine |
| Conductivity | AT | 7076464 | N/A | 2020/11/26 | Surinder Rai |
| Dissolved Organic Carbon (DOC) | TOCV/NDIR | 7075788 | N/A | 2020/11/26 | Nimarta Singh |
| Hardness (calculated as CaCO3) | | 7073133 | N/A | 2020/11/27 | Automated Statchk |
| Dissolved Metals by ICPMS | ICP/MS | 7075570 | N/A | 2020/11/25 | Azita Fazaeli |
| Ion Balance (% Difference) | CALC | 7073134 | N/A | 2020/11/27 | Automated Statchk |
| Anion and Cation Sum | CALC | 7074369 | N/A | 2020/11/27 | Automated Statchk |
| Total Ammonia-N | LACH/NH4 | 7077399 | N/A | 2020/11/26 | Amanpreet Sappal |
| Nitrate (NO3) and Nitrite (NO2) in Water | LACH | 7075202 | N/A | 2020/11/25 | Chandra Nandlal |
| pH | AT | 7076476 | 2020/11/25 | 2020/11/26 | Surinder Rai |
| Orthophosphate | KONE | 7075392 | N/A | 2020/11/26 | Alina Dobreanu |
| Sat. pH and Langelier Index (@ 20C) | CALC | 7074370 | N/A | 2020/11/27 | Automated Statchk |
| Sat. pH and Langelier Index (@ 4C) | CALC | 7074371 | N/A | 2020/11/27 | Automated Statchk |

## TEST SUMMARY

**BV Labs ID:** OFX271
**Sample ID:** MW107-20
**Matrix:** Water

**Collected:** 2020/11/23
**Shipped:**
**Received:** 2020/11/23

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Sulphate by Automated Colourimetry | KONE | 7075391 | N/A | 2020/11/27 | Deonarine Ramnarine |
| Total Dissolved Solids (TDS calc) | CALC | 7074372 | N/A | 2020/11/27 | Automated Statchk |

**BV Labs ID:** OFX272
**Sample ID:** SG1
**Matrix:** Water

**Collected:** 2020/11/23
**Shipped:**
**Received:** 2020/11/23

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Alkalinity | AT | 7076462 | N/A | 2020/11/26 | Surinder Rai |
| Carbonate, Bicarbonate and Hydroxide | CALC | 7073132 | N/A | 2020/11/27 | Automated Statchk |
| Chloride by Automated Colourimetry | KONE | 7075384 | N/A | 2020/11/27 | Deonarine Ramnarine |
| Conductivity | AT | 7076464 | N/A | 2020/11/26 | Surinder Rai |
| Dissolved Organic Carbon (DOC) | TOCV/NDIR | 7075788 | N/A | 2020/11/26 | Nimarta Singh |
| Hardness (calculated as CaCO3) | | 7073133 | N/A | 2020/11/27 | Automated Statchk |
| Lab Filtered Metals by ICPMS | ICP/MS | 7076206 | 2020/11/25 | 2020/11/26 | Arefa Dabhad |
| Ion Balance (% Difference) | CALC | 7073134 | N/A | 2020/11/27 | Automated Statchk |
| Anion and Cation Sum | CALC | 7074369 | N/A | 2020/11/27 | Automated Statchk |
| Total Ammonia-N | LACH/NH4 | 7077399 | N/A | 2020/11/26 | Amanpreet Sappal |
| Nitrate (NO3) and Nitrite (NO2) in Water | LACH | 7075202 | N/A | 2020/11/25 | Chandra Nandlal |
| pH | AT | 7076476 | 2020/11/25 | 2020/11/26 | Surinder Rai |
| Orthophosphate | KONE | 7075392 | N/A | 2020/11/26 | Alina Dobreanu |
| Sat. pH and Langelier Index (@ 20C) | CALC | 7074370 | N/A | 2020/11/27 | Automated Statchk |
| Sat. pH and Langelier Index (@ 4C) | CALC | 7074371 | N/A | 2020/11/27 | Automated Statchk |
| Sulphate by Automated Colourimetry | KONE | 7075391 | N/A | 2020/11/27 | Deonarine Ramnarine |
| Total Dissolved Solids (TDS calc) | CALC | 7074372 | N/A | 2020/11/27 | Automated Statchk |

**BV Labs ID:** OFX273
**Sample ID:** SG2
**Matrix:** Water

**Collected:** 2020/11/23
**Shipped:**
**Received:** 2020/11/23

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Alkalinity | AT | 7077724 | N/A | 2020/11/26 | Surinder Rai |
| Carbonate, Bicarbonate and Hydroxide | CALC | 7073132 | N/A | 2020/11/27 | Automated Statchk |
| Chloride by Automated Colourimetry | KONE | 7075384 | N/A | 2020/11/27 | Deonarine Ramnarine |
| Conductivity | AT | 7077732 | N/A | 2020/11/26 | Surinder Rai |
| Dissolved Organic Carbon (DOC) | TOCV/NDIR | 7075735 | N/A | 2020/11/25 | Nimarta Singh |
| Hardness (calculated as CaCO3) | | 7073133 | N/A | 2020/11/27 | Automated Statchk |
| Lab Filtered Metals by ICPMS | ICP/MS | 7076206 | 2020/11/25 | 2020/11/26 | Arefa Dabhad |
| Ion Balance (% Difference) | CALC | 7073134 | N/A | 2020/11/27 | Automated Statchk |
| Anion and Cation Sum | CALC | 7074369 | N/A | 2020/11/27 | Automated Statchk |
| Total Ammonia-N | LACH/NH4 | 7077399 | N/A | 2020/11/26 | Amanpreet Sappal |
| Nitrate (NO3) and Nitrite (NO2) in Water | LACH | 7075202 | N/A | 2020/11/25 | Chandra Nandlal |
| pH | AT | 7077731 | 2020/11/26 | 2020/11/26 | Surinder Rai |
| Orthophosphate | KONE | 7075392 | N/A | 2020/11/26 | Alina Dobreanu |
| Sat. pH and Langelier Index (@ 20C) | CALC | 7074370 | N/A | 2020/11/27 | Automated Statchk |



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BV Labs Job #: C0V1801
Report Date: 2020/12/01

MTE Consultants Inc
Client Project #: 48043-300
Sampler Initials: MC

## TEST SUMMARY

**BV Labs ID:** OFX273
**Sample ID:** SG2
**Matrix:** Water

**Collected:** 2020/11/23
**Shipped:**
**Received:** 2020/11/23

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Sat. pH and Langelier Index (@ 4C) | CALC | 7074371 | N/A | 2020/11/27 | Automated Statchk |
| Sulphate by Automated Colourimetry | KONE | 7075391 | N/A | 2020/11/27 | Deonarine Ramnarine |
| Total Dissolved Solids (TDS calc) | CALC | 7074372 | N/A | 2020/11/27 | Automated Statchk |



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## GENERAL COMMENTS

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

| | |
|---|---|
| Package 1 | 2.7°C |

Sample OFX271 [MW107-20] : ortho-Phosphate > Total Phosphorus: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample OFX273 [SG2] : ortho-Phosphate > Total Phosphorus: Both values fall within the method uncertainty for duplicates and are likely equivalent.

**Results relate only to the items tested.**



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BV Labs Job #: C0V1801
Report Date: 2020/12/01

# QUALITY ASSURANCE REPORT

MTE Consultants Inc
Client Project #: 48043-300
Sampler Initials: MC

| | | | Matrix Spike | | SPIKED BLANK | | Method Blank | | RPD | |
|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits |
| 7075202 | Nitrate (N) | 2020/11/25 | 90 | 80 - 120 | 92 | 80 - 120 | <0.10 | mg/L | 2.9 | 20 |
| 7075202 | Nitrite (N) | 2020/11/25 | 102 | 80 - 120 | 105 | 80 - 120 | <0.010 | mg/L | NC | 20 |
| 7075384 | Dissolved Chloride (Cl-) | 2020/11/27 | NC | 80 - 120 | 101 | 80 - 120 | <1000 | ug/L | 1.3 | 20 |
| 7075391 | Dissolved Sulphate (SO4) | 2020/11/27 | NC | 75 - 125 | 104 | 80 - 120 | <1.0 | mg/L | 1.2 | 20 |
| 7075392 | Orthophosphate (P) | 2020/11/26 | 102 | 75 - 125 | 100 | 80 - 120 | <0.010 | mg/L | NC | 25 |
| 7075569 | Nitrate (N) | 2020/11/26 | 94 | 80 - 120 | 96 | 80 - 120 | <0.10 | mg/L | 2.2 | 20 |
| 7075569 | Nitrite (N) | 2020/11/26 | 101 | 80 - 120 | 104 | 80 - 120 | <0.010 | mg/L | | |
| 7075570 | Dissolved Aluminum (Al) | 2020/11/25 | 102 | 80 - 120 | 103 | 80 - 120 | <4.9 | ug/L | | |
| 7075570 | Dissolved Antimony (Sb) | 2020/11/25 | 104 | 80 - 120 | 101 | 80 - 120 | <0.50 | ug/L | NC | 20 |
| 7075570 | Dissolved Arsenic (As) | 2020/11/25 | 98 | 80 - 120 | 98 | 80 - 120 | <1.0 | ug/L | 0.93 | 20 |
| 7075570 | Dissolved Barium (Ba) | 2020/11/25 | 99 | 80 - 120 | 96 | 80 - 120 | <2.0 | ug/L | 4.3 | 20 |
| 7075570 | Dissolved Beryllium (Be) | 2020/11/25 | 96 | 80 - 120 | 99 | 80 - 120 | <0.40 | ug/L | NC | 20 |
| 7075570 | Dissolved Boron (B) | 2020/11/25 | 102 | 80 - 120 | 99 | 80 - 120 | <10 | ug/L | 2.7 | 20 |
| 7075570 | Dissolved Cadmium (Cd) | 2020/11/25 | 98 | 80 - 120 | 100 | 80 - 120 | <0.090 | ug/L | NC | 20 |
| 7075570 | Dissolved Calcium (Ca) | 2020/11/25 | NC | 80 - 120 | 100 | 80 - 120 | <200 | ug/L | | |
| 7075570 | Dissolved Chromium (Cr) | 2020/11/25 | 95 | 80 - 120 | 99 | 80 - 120 | <5.0 | ug/L | NC | 20 |
| 7075570 | Dissolved Cobalt (Co) | 2020/11/25 | 93 | 80 - 120 | 99 | 80 - 120 | <0.50 | ug/L | NC | 20 |
| 7075570 | Dissolved Copper (Cu) | 2020/11/25 | 96 | 80 - 120 | 99 | 80 - 120 | <0.90 | ug/L | 5.5 | 20 |
| 7075570 | Dissolved Iron (Fe) | 2020/11/25 | 96 | 80 - 120 | 98 | 80 - 120 | <100 | ug/L | | |
| 7075570 | Dissolved Lead (Pb) | 2020/11/25 | 91 | 80 - 120 | 96 | 80 - 120 | <0.50 | ug/L | NC | 20 |
| 7075570 | Dissolved Magnesium (Mg) | 2020/11/25 | NC | 80 - 120 | 99 | 80 - 120 | <50 | ug/L | | |
| 7075570 | Dissolved Manganese (Mn) | 2020/11/25 | 96 | 80 - 120 | 99 | 80 - 120 | <2.0 | ug/L | | |
| 7075570 | Dissolved Molybdenum (Mo) | 2020/11/25 | 102 | 80 - 120 | 100 | 80 - 120 | <0.50 | ug/L | 0.26 | 20 |
| 7075570 | Dissolved Nickel (Ni) | 2020/11/25 | 91 | 80 - 120 | 98 | 80 - 120 | <1.0 | ug/L | NC | 20 |
| 7075570 | Dissolved Phosphorus (P) | 2020/11/25 | 106 | 80 - 120 | 110 | 80 - 120 | <100 | ug/L | | |
| 7075570 | Dissolved Potassium (K) | 2020/11/25 | 99 | 80 - 120 | 100 | 80 - 120 | <200 | ug/L | | |
| 7075570 | Dissolved Selenium (Se) | 2020/11/25 | 97 | 80 - 120 | 101 | 80 - 120 | <2.0 | ug/L | NC | 20 |
| 7075570 | Dissolved Silicon (Si) | 2020/11/25 | 104 | 80 - 120 | 98 | 80 - 120 | <50 | ug/L | | |
| 7075570 | Dissolved Silver (Ag) | 2020/11/25 | 66 (1) | 80 - 120 | 98 | 80 - 120 | <0.090 | ug/L | NC | 20 |
| 7075570 | Dissolved Sodium (Na) | 2020/11/25 | NC | 80 - 120 | 100 | 80 - 120 | <100 | ug/L | 0.51 | 20 |
| 7075570 | Dissolved Strontium (Sr) | 2020/11/25 | 97 | 80 - 120 | 98 | 80 - 120 | <1.0 | ug/L | | |



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## 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 |
| 7075570 | Dissolved Thallium (Tl) | 2020/11/25 | 92 | 80 - 120 | 97 | 80 - 120 | <0.050 | ug/L | NC | 20 |
| 7075570 | Dissolved Titanium (Ti) | 2020/11/25 | 104 | 80 - 120 | 95 | 80 - 120 | <5.0 | ug/L | | |
| 7075570 | Dissolved Uranium (U) | 2020/11/25 | 100 | 80 - 120 | 100 | 80 - 120 | <0.10 | ug/L | NC | 20 |
| 7075570 | Dissolved Vanadium (V) | 2020/11/25 | 98 | 80 - 120 | 99 | 80 - 120 | <0.50 | ug/L | NC | 20 |
| 7075570 | Dissolved Zinc (Zn) | 2020/11/25 | 92 | 80 - 120 | 100 | 80 - 120 | <5.0 | ug/L | NC | 20 |
| 7075735 | Dissolved Organic Carbon | 2020/11/25 | 99 | 80 - 120 | 98 | 80 - 120 | <0.40 | mg/L | 1.2 | 20 |
| 7075788 | Dissolved Organic Carbon | 2020/11/25 | 99 | 80 - 120 | 98 | 80 - 120 | <0.40 | mg/L | 0.89 | 20 |
| 7076206 | Dissolved Aluminum (Al) | 2020/11/26 | 96 | 80 - 120 | 99 | 80 - 120 | <4.9 | ug/L | NC | 20 |
| 7076206 | Dissolved Antimony (Sb) | 2020/11/26 | 101 | 80 - 120 | 102 | 80 - 120 | <0.50 | ug/L | NC | 20 |
| 7076206 | Dissolved Arsenic (As) | 2020/11/26 | 95 | 80 - 120 | 98 | 80 - 120 | <1.0 | ug/L | 2.2 | 20 |
| 7076206 | Dissolved Barium (Ba) | 2020/11/26 | 96 | 80 - 120 | 100 | 80 - 120 | <2.0 | ug/L | 2.5 | 20 |
| 7076206 | Dissolved Beryllium (Be) | 2020/11/26 | 93 | 80 - 120 | 95 | 80 - 120 | <0.40 | ug/L | NC | 20 |
| 7076206 | Dissolved Boron (B) | 2020/11/26 | 89 | 80 - 120 | 92 | 80 - 120 | <10 | ug/L | 1.6 | 20 |
| 7076206 | Dissolved Cadmium (Cd) | 2020/11/26 | 97 | 80 - 120 | 99 | 80 - 120 | <0.090 | ug/L | NC | 20 |
| 7076206 | Dissolved Calcium (Ca) | 2020/11/26 | NC | 80 - 120 | 98 | 80 - 120 | <200 | ug/L | 1.3 | 20 |
| 7076206 | Dissolved Chromium (Cr) | 2020/11/26 | 90 | 80 - 120 | 93 | 80 - 120 | <5.0 | ug/L | NC | 20 |
| 7076206 | Dissolved Cobalt (Co) | 2020/11/26 | 91 | 80 - 120 | 96 | 80 - 120 | <0.50 | ug/L | NC | 20 |
| 7076206 | Dissolved Copper (Cu) | 2020/11/26 | 91 | 80 - 120 | 94 | 80 - 120 | <0.90 | ug/L | NC | 20 |
| 7076206 | Dissolved Iron (Fe) | 2020/11/26 | 94 | 80 - 120 | 96 | 80 - 120 | <100 | ug/L | NC | 20 |
| 7076206 | Dissolved Lead (Pb) | 2020/11/26 | 94 | 80 - 120 | 97 | 80 - 120 | <0.50 | ug/L | NC | 20 |
| 7076206 | Dissolved Magnesium (Mg) | 2020/11/26 | 92 | 80 - 120 | 100 | 80 - 120 | <50 | ug/L | 1.6 | 20 |
| 7076206 | Dissolved Manganese (Mn) | 2020/11/26 | 93 | 80 - 120 | 95 | 80 - 120 | <2.0 | ug/L | NC | 20 |
| 7076206 | Dissolved Molybdenum (Mo) | 2020/11/26 | 94 | 80 - 120 | 95 | 80 - 120 | <0.50 | ug/L | 0.60 | 20 |
| 7076206 | Dissolved Nickel (Ni) | 2020/11/26 | 89 | 80 - 120 | 93 | 80 - 120 | <1.0 | ug/L | NC | 20 |
| 7076206 | Dissolved Phosphorus (P) | 2020/11/26 | 97 | 80 - 120 | 107 | 80 - 120 | <100 | ug/L | NC | 20 |
| 7076206 | Dissolved Potassium (K) | 2020/11/26 | 100 | 80 - 120 | 102 | 80 - 120 | <200 | ug/L | 1.4 | 20 |
| 7076206 | Dissolved Selenium (Se) | 2020/11/26 | 94 | 80 - 120 | 96 | 80 - 120 | <2.0 | ug/L | NC | 20 |
| 7076206 | Dissolved Silicon (Si) | 2020/11/26 | 98 | 80 - 120 | 98 | 80 - 120 | <50 | ug/L | 0.49 | 20 |
| 7076206 | Dissolved Silver (Ag) | 2020/11/26 | 93 | 80 - 120 | 96 | 80 - 120 | <0.090 | ug/L | NC | 20 |
| 7076206 | Dissolved Sodium (Na) | 2020/11/26 | 92 | 80 - 120 | 98 | 80 - 120 | <100 | ug/L | 1.4 | 20 |
| 7076206 | Dissolved Strontium (Sr) | 2020/11/26 | 94 | 80 - 120 | 98 | 80 - 120 | <1.0 | ug/L | 2.6 | 20 |



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## 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 |
| 7076206 | Dissolved Thallium (Tl) | 2020/11/26 | 92 | 80 - 120 | 98 | 80 - 120 | <0.050 | ug/L | NC | 20 |
| 7076206 | Dissolved Titanium (Ti) | 2020/11/26 | 94 | 80 - 120 | 96 | 80 - 120 | <5.0 | ug/L | NC | 20 |
| 7076206 | Dissolved Uranium (U) | 2020/11/26 | 93 | 80 - 120 | 97 | 80 - 120 | <0.10 | ug/L | 2.0 | 20 |
| 7076206 | Dissolved Vanadium (V) | 2020/11/26 | 91 | 80 - 120 | 94 | 80 - 120 | <0.50 | ug/L | NC | 20 |
| 7076206 | Dissolved Zinc (Zn) | 2020/11/26 | 93 | 80 - 120 | 95 | 80 - 120 | <5.0 | ug/L | NC | 20 |
| 7076462 | Alkalinity (Total as CaCO3) | 2020/11/26 | | | 96 | 85 - 115 | <1.0 | mg/L | 0.38 | 20 |
| 7076464 | Conductivity | 2020/11/26 | | | 101 | 85 - 115 | <1.0 | umho/cm | 0.36 | 25 |
| 7076476 | pH | 2020/11/26 | | | 101 | 98 - 103 | | | 0.80 | N/A |
| 7077399 | Total Ammonia-N | 2020/11/26 | 99 | 75 - 125 | 98 | 80 - 120 | <0.050 | mg/L | 3.7 | 20 |
| 7077724 | Alkalinity (Total as CaCO3) | 2020/11/26 | | | 96 | 85 - 115 | <1.0 | mg/L | 1.6 | 20 |
| 7077731 | pH | 2020/11/26 | | | 101 | 98 - 103 | | | 0.36 | N/A |
| 7077732 | Conductivity | 2020/11/26 | | | 102 | 85 - 115 | <1.0 | umho/cm | 0.58 | 25 |

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).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.



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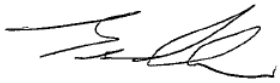
## VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Brad Newman, B.Sc., C.Chem., Scientific Service Specialist

BV Labs 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 Signature Page.



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Page 1 of 1

# CHAIN OF CUSTODY RECORD

| INVOICE TO: | | REPORT TO: | | PROJECT INFORMATION: | | Laboratory Use Only: | |
|---|---|---|---|---|---|---|---|
| Company Name: | #6868 MTE Consultants Inc | Company Name: | MTE ConsyHants | Quotation #: | B90004 | BV Labs Job #: | Bottle Order #: 794340 |
| Attention: | Accounts Payable | Attention: | ~~Oshin Gharabegian~~ John McNeil | P.O. #: | | | |
| Address: | 520 Bingemans Centre Dr, Kitchener ON N2B 3X9 | Address: | 123 St. George St, London, ON | Project: | 48043-300 | COC #: C#794340-29-01 | Project Manager: Ronklin Gracian |
| Tel: | (519) 743-6500 Fax: (519) 743-6513 | Tel: | ~~(905) 639-2552 Ext: 2430~~ | Project Name: | | | |
| Email: | accounting@mte85.com | Email: | ~~OGharabegian@mte85.com~~ jmcneil@mte85.com mcostello@mte85.com | Sampled By: | Mackenzie Costello | | |

**MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY**

| Regulation 153 (2011) | Other Regulations | Special Instructions |
|---|---|---|
| ☐ Table 1 ☐ Res/Park ☐ Medium/Fine | ☐ CCME ☐ Sanitary Sewer Bylaw | |
| ☐ Table 2 ☐ Ind/Comm ☐ Coarse | ☐ Reg 558 ☐ Storm Sewer Bylaw | |
| ☐ Table 3 ☐ Agri/Other ☐ For RSC | ☐ MISA Municipality | |
| ☐ Table ___ | ☒ PWQO ☐ Reg 406 Table | |
| | ☐ Other * Lower DL | |

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

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

| | Sample Barcode Label | Sample (Location) Identification | Date Sampled | Time Sampled | Matrix | Field Filtered (please circle): Metals / Hg / Cr VI | O.Reg 406 Excess Soil Bulk BTEX/F1-F4 | O.Reg 406 Excess Soil Bulk VOCs | O.Reg 406 Excess Soil Bulk ICPMS METALS | Conductivity | SAR - ICP Metals | pH CaCl2 EXTRACT | O.Reg 406 Excess Soil Bulk OCs | RCAp – Comprehensive | # of Bottles | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | MW106-20 | 20/11/23 | 14:42 | GW | Yes | | | | | | | | X | 4 | |
| 2 | | MW107-20 | " | 15:20 | " | Yes | | | | | | | | X | 4 | |
| 3 | | SG1 | " | 12:40 | " | No | | | | | | | | X | 4 | Please filter at lab |
| 4 | | SG2 | " | 13:52 | " | NO | | | | | | | | X | 4 | Please filter at lab, |
| 5 | | | | | | | | | | | | | | | | Please lower detection |
| 6 | | | | | | | | | | | | | | | | limit for PWQO where |
| 7 | | | | | | | | | | | | | | | | necessary. |
| 8 | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | |

23-Nov-20 17:58
Ronklin Gracian
C0V1801
GK1 ENV-748

**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 #)*

| * RELINQUISHED BY: (Signature/Print) | Date: (YY/MM/DD) | Time | RECEIVED BY: (Signature/Print) | Date: (YY/MM/DD) | Time | # jars used and not submitted |
|---|---|---|---|---|---|---|
| Mackenzie Costello | 20/11/23 | 16:15 | | 20/11/23 | 17:58 | |

**Laboratory Use Only**

| Time Sensitive | Temperature (°C) on Recei | Custody Seal Present | Yes | No |
|---|---|---|---|---|
| | 22.4 | Intact | ✓ | |

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' 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.BVLABS.COM/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.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

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

White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

## Exceedance Summary Table – Prov. Water Quality Obj.

### Result Exceedances

| Sample ID | BV Labs 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.


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# Appendix G

# Water Balance

| Parameter | Units | Pre-Development | | | | | | | | | Post-Development (Unmitigated) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Catchment | - | 100 | | 101 | | | 102 | | | 103 | 1000 | | 1100 | | 1200 | | 1300 | 1400 | 1500 | 1600 | | | 1700 |
| Area | ha | 16.25 | | 18.62 | | | 36.65 | | | 7.33 | 20.28 | | 16.7 | | 14.36 | | 8.21 | 3.0 | 0.7 | 13.8 | | | 1.8 |
| Average Annual Precipitation | mm | 786 | | 786 | | | 786 | | | 786 | 786 | | 786 | | 786 | | 786 | 786 | 786 | 786 | | | 786 |
| % Impervious | % | 0% | | 0% | | | 0% | | | 0% | 98.4% | | 97.6% | | 97.6% | | 100% | 0.0% | 0.0% | 0.0% | | | 0.0% |
| Surface/Ground Cover | - | Urban Lawn/Crop | Pasture and Shrubs | Urban Lawn/Crop | Wooded | Wetland | Crop | Wooded | Pond | Crop | Impervious | Lined SWM Ponds (2) | Impervious | Lined SWM Pond | Impervious | Lined SWM Pond | Impervious | Pasture and Shrubs | Wetland | Woodlot | Urban Lawn (Buffer) | Pond | Pasture and Shrubs |
| Simplified Soil Description (Native) | - | Glacial Till | Glacial Till | Glacial Till | Glacial Till | Glacial Till | Glacial Till | Glacial Till | Glacial Till | Glacial Till | - | - | - | - | - | - | - | Glacial Till | Glacial Till | Glacial Till | Glacial Till | Glacial Till | Glacial Till |
| Hydrologic Soil Group | - | CD | CD | CD | CD | CD | CD | CD | CD | CD | - | - | - | - | - | - | - | CD | CD | CD | CD | CD | CD |
| Area | ha | 13.25 | 3.00 | 15.21 | 2.71 | 0.70 | 30.08 | 6.18 | 0.39 | 7.33 | 19.00 | 1.28 | 15.13 | 1.57 | 13.16 | 1.20 | 8.21 | 3.00 | 0.70 | 8.89 | 4.52 | 0.39 | 1.80 |
| | $m^2$ | 132,500 | 30,000 | 152,100 | 27,100 | 7,000 | 300,800 | 61,800 | 3,900 | 73,300 | 190,000 | 12,800 | 151,300 | 15,700 | 131,600 | 12,000 | 82,100 | 30,000 | 7,000 | 88,900 | 45,200 | 3,900 | 18,000 |
| Precipitation, P | m/year | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 | 0.786 |
| Evapotranspiration, ET | m/year | 0.444 | 0.457 | 0.444 | 0.460 | 0.460 | 0.444 | 0.460 | 0.510 | 0.444 | 0.050 | 0.510 | 0.050 | 0.510 | 0.050 | 0.510 | 0.050 | 0.457 | 0.460 | 0.460 | 0.444 | 0.510 | 0.457 |
| Water Surplus, WS | m/year | 0.342 | 0.329 | 0.342 | 0.326 | 0.326 | 0.342 | 0.326 | 0.276 | 0.342 | 0.736 | 0.276 | 0.736 | 0.276 | 0.736 | 0.276 | 0.736 | 0.329 | 0.326 | 0.326 | 0.342 | 0.276 | 0.329 |
| Ground Cover Factor | - | 0.10 | 0.15 | 0.10 | 0.20 | 0.15 | 0.10 | 0.20 | 0.00 | 0.10 | - | - | - | - | - | - | - | 0.15 | 0.15 | 0.20 | 0.10 | 0.00 | 0.15 |
| Soils Factor | - | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | - | - | - | - | - | - | - | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| Topography Factor | - | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | - | - | - | - | - | - | - | 0.20 | 0.20 | 0.20 | 0.30 | 0.20 | 0.10 |
| Infiltration Factor (sum) | - | 0.50 | 0.55 | 0.50 | 0.60 | 0.55 | 0.50 | 0.60 | 0.40 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.55 | 0.55 | 0.60 | 0.60 | 0.40 | 0.45 |
| Infiltration, I | m/year | 0.171 | 0.181 | 0.171 | 0.196 | 0.179 | 0.171 | 0.196 | 0.111 | 0.171 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.181 | 0.179 | 0.196 | 0.205 | 0.111 | 0.148 |
| Runoff, RO | m/year | 0.171 | 0.148 | 0.171 | 0.130 | 0.147 | 0.171 | 0.130 | 0.166 | 0.171 | 0.736 | 0.276 | 0.736 | 0.276 | 0.736 | 0.276 | 0.736 | 0.148 | 0.147 | 0.130 | 0.137 | 0.166 | 0.181 |
| **Annual Volumes** | | | | | | | | | | | | | | | | | | | | | | | |
| Precipitation, P | $m^3$/year | 104,145 | 23,580 | 119,551 | 21,301 | 5,502 | 236,429 | 48,575 | 3,065 | 57,614 | 149,340 | 10,061 | 118,922 | 12,340 | 103,438 | 9,432 | 64,531 | 23,580 | 5,502 | 69,875 | 35,527 | 3,065 | 14,148 |
| Evapotranspiration, ET | $m^3$/year | 58,831 | 13,696 | 67,533 | 12,463 | 3,219 | 133,557 | 28,421 | 1,987 | 32,546 | 9,500 | 6,522 | 7,565 | 7,999 | 6,580 | 6,114 | 4,105 | 13,696 | 3,219 | 40,885 | 20,069 | 1,987 | 8,218 |
| Infiltration, I | $m^3$/year | 22,657 | 5,436 | 26,009 | 5,302 | 1,256 | 51,436 | 12,092 | 431 | 12,534 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,436 | 1,256 | 17,395 | 9,275 | 431 | 2,669 |
| Runoff, RO | $m^3$/year | 22,657 | 4,448 | 26,009 | 3,535 | 1,027 | 51,436 | 8,061 | 647 | 12,534 | 139,840 | 3,539 | 111,357 | 4,341 | 96,858 | 3,318 | 60,426 | 4,448 | 1,027 | 11,596 | 6,183 | 647 | 3,262 |
| **Catchment Totals** | | | | | | | | | | | | | | | | | | | | | | | |
| Precipitation, P | $m^3$/year | 127,725 | | 146,353 | | | 288,069 | | | 57,614 | 159,401 | | 131,262 | | 112,870 | | 64,531 | 23,580 | 5,502 | 108,468 | | | 14,148 |
| Evapotranspiration, ET | $m^3$/year | 72,527 | | 83,216 | | | 163,966 | | | 32,546 | 16,022 | | 15,564 | | 12,694 | | 4,105 | 13,696 | 3,219 | 62,941 | | | 8,218 |
| Infiltration, I | $m^3$/year | 28,093 | | 32,567 | | | 63,959 | | | 12,534 | 0 | | 0 | | 0 | | 0 | 5,436 | 1,256 | 27,101 | | | 2,669 |
| Runoff, RO | $m^3$/year | 27,105 | | 30,571 | | | 60,144 | | | 12,534 | 143,379 | | 115,698 | | 100,176 | | 60,426 | 4,448 | 1,027 | 18,427 | | | 3,262 |

**Site Totals**

| | | | |
|---|---|---|---|
| Precipitation, P | $m^3$/year | 619,761 | 619,761 |
| Evapotranspiration, ET | $m^3$/year | 352,254 | 136,459 |
| Infiltration, I | $m^3$/year | 137,153 | 36,461 |
| Runoff, RO | $m^3$/year | 130,354 | 446,841 |

# Appendix H

# Natural Environment Plans

**Excerpt from WSP (2021)**

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**Legend**

- Subject Property
- Ephemeral Watercourse
- Permanent Watercourse
- On-line Pond

**Designated Natural Areas**

- Core Areas of the Greenlands System, Region of Peel Official Plan (Approximate)
- Core Areas of the Greenlands System and Environmental Policy Area (Approximate)
- Environmental Policy Area, Town of Caledon Official Plan (Approximate)
- Regulated Area July 2019 (large scale)
- Protected Countryside of the Greenbelt Plan

OLD SCHOOL ROAD

DIXIE ROAD

Tributary 5 of the West Humber River

Tributary 4 of the West Humber River

Tributary 3 of the West Humber River

Tributary 2 of the West Humber River

Kilamanagh Creek

WSP

12892 Dixie Road - Caledon, Ontario
**Designated Natural Areas**

0 50 100
Metres
1:5,000

N

Date: February 2021
Project No: 201-12310-00
Figure No: 1

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OLD SCHOOL ROAD
HDF5a
CUM1-1
MAM2-2
CUM1-1
CUM1-1
Active Agriculture
HDF5b
HDF4
MAM2-2
Tributary 4 of the West Humber River
Tributary 5 of the West Humber River
Tributary 3 of the West Humber River
HDF3
Active Agriculture
FOD5-1
DIXIE ROAD
Tributary 2 of the West Humber River
HDF1b
HDF2b
HDF1a
HDF2a
Active Agriculture
MAM2-2
CUT1
Kilamanagh Creek

**Legend**

- Subject Property
- Intermittent Watercourse
- Permanent Watercourse
- On-line Pond
- Flow Direction

**Notable Species Observations**

- Barn Swallow Habitat
- Black Ash
- Monarch (Adult)

**HDF Assessment**

- Headwater Drianage Feature (approximate)
- HDF Reach Break

**Ecological Land Classification**

- Vegetation Community
- CUM1-1: Dry - Moist Old Field Cultural Meadow
- CUT1: Mineral Cultural Thicket
- FOD5-1: Dry - Fresh Sugar Maple Deciduous Forest
- MAM2-2: Reed Canary Grass Mineral Meadow Marsh

wsp

12892 Dixie Road - Caledon, Ontario
**Existng Natural Environment Conditions**

0 50 100
Metres
1:5,000

N

Date: February 2021
Project No: 201-12310-00
Figure No: 2