Proposed Warehouse Development

Hydrogeological Assessment

Project Location:
12892 and 12668 Dixie Road, Caledon, Ontario

Prepared for:
Tribal Partners (Canada) Inc. and
QuadReal Property Group

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Engineers, Scientists, Surveyors.

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1.0 Introduction

MTE Consultants Inc. (MTE) was retained by Tribal Partners (Canada) Inc. and QuadReal Property Group to carry out a hydrogeological assessment to support the proposed development of two parcels identified as 12892 and 12668 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 proposed Site Plan prepared by Ware Malcomb, the Site will be developed as an industrial warehousing complex consisting of three slab on-grade buildings with associated at-grade parking and stormwater management facilities. A copy of the proposed Site Plan is provided in **Appendix A**.

1.1 Study Objectives

The objectives of the hydrogeological assessment were to:

- Summarize the local hydrogeological conditions;
- Provide hydrogeological input to the Site design;
- Provide a qualitative assessment of the construction dewatering and associated 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 and Concurrent 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 Statement and Management Plan (CEISMP);
- Stormwater Management Report, which includes a Site-Wide Water Balance; 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 pre-development 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 (designated as 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 may 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 (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 47 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;
- Eighteen records were reported to be used as monitoring, test hole or observation wells;
- Six records were for wells reported to have been abandoned; and
- Six 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. Intermittent 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 3 in **Appendix G**. For detailed information on these features, reference should be made to the CEISMP (WSP, 2024).

No groundwater dependent plant species were identified on-Site during the fieldwork completed for the CEISMP (WSP, 2024).

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, and on February 10, 2021. Fifty- five boreholes 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, and Orbit Garant Drilling 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 eight boreholes and designated MW101-20 to MW107-20, and MW157-21. 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, MW107-20, and MW157-21 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 and Mini-Piezometers

On November 19, 2020 two staff gauges (SG1 and SG2) were installed within Tributary 5 of the West Humber River and Kilamanagh Creek in order to monitor stage and assess groundwater and surface water interactions.

On April 29, 2021, four additional staff gauges, designated SG3, SG4, SG5 and SG6 were installed within Tributaries 2, 3 and 4 of the West Humber River to facilitate data collection to support the feature-based water balance currently being prepared by WSP.

Three mini-piezometers (MP-1, MP-2 and MP-3) were installed on May 4, 2021 within Tributaries 4, 3 and 2 near staff gauges SG3, SG4, and SG6, respectively, to assess groundwater and surface water interactions.

The mini-piezometers were constructed with 0.15 m, 0.30 m and 0.60 m long, nominal 25 mm inside diameter (ID), slot 10, Schedule 40 PVC well screens threaded to PVC riser pipes. A sand pack consisting of commercially available silica sand was used to backfill the annulus surrounding the well screens. The annulus above the sand pack was backfilled with granular bentonite to near ground surface and hydrated in place.

Details of the mini-piezometer construction are summarized in shown in and encountered groundwater levels are shown in the borehole logs in **Appendix B.** The approximate staff gauge and mini-piezometer locations are shown on **Figure 4.**

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

3.6.1 Groundwater

Pressure transducers equipped with dataloggers were installed in six monitoring wells (MW101-20 to MW103-20 and MW105-20 to MW107-20). Dataloggers were also installed in mini-piezometers MP-1, MP-2 and MP-3. 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 existing monitoring wells, mini-piezometers and staff gauge locations during each quarterly monitoring event. The results obtained over the period of record (November 2020 to December 2023) are summarized in **Table 3**.

3.6.2 Surface Water

Stage was manually measured at each of the staff gauges on a quarterly basis between May 2021 to December 2023. The results obtained over the period of record (November 2020 to December 2023) are summarized in **Table 3**.

On April 29, 2021, dataloggers were installed at SG3, SG4, SG5 and SG6 to support the feature-based water balance (WSP, 2024). These 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. Hydrographs of the compensated surface water levels are provided in **Appendix E**.

3.7 Water Supply Well Inventory

In December 2022, a water supply well inventory was undertaken to try to confirm the locations and installation depths of water supply wells in the immediate vicinity of the Site. General information on the project and a URL to access an online survey was mailed out to properties within one kilometer of the Site requesting information on any water wells present on their property. No responses have been received to date.

4.0 Hydrostratigraphy

4.1 Stratigraphy

The simplified stratigraphy inferred from the boreholes is shown on the cross-sections provided on **Figure 5**, **Figure 6** and **Figure 7**. The stratigraphy encountered in each borehole is shown on the borehole logs provided in **Appendix B**. Particle size distribution curves for representative soil samples are provided in **Appendix C**.

In general, the stratigraphic conditions encountered in the boreholes typically consisted of topsoil and/or surficial fill materials overlying glacial till deposits interbedded with sand and silt deposits. The till deposits are considered an aquitard (K ~ 8 x 10^{-8} m/s) and act as a confining layer when overlying the saturated granular deposits (K ~ 3 x 10^{-6} m/s). Further details on the composition of these strata are provided in the following subsections and in the Geotechnical Report (MTE, 2024).

4.1.1 Glacial Till Deposits

The till is brown to grey in colour with mottled to monochrome appearance and typically range in composition from sandy silt to clayey silt. Seams of sand and silt were encountered in the till deposits. Cobbles were present within the till deposits encountered in some boreholes. Boulders and cobbles should be expected in the glacial till strata. **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

4.1.2 Granular Deposits

Granular deposits were encountered as interbedded sand and silt deposits within or beneath the glacial till. These deposits are brown to grey in colour and typically range in composition from silt to sand and gravel. **Table 4.2** summarizes the variability in the particle size composition within the granular deposits.

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.

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

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**.

During drilling, groundwater was encountered within the sand or silt deposits in Boreholes BH123-20, BH140-20, BH145-20, BH151-20, MW157-21 at depths of 2.3 to 9.0 m below the ground surface. The remaining boreholes were dry during drilling.

The measured groundwater elevations within the confined granular deposits have ranged from a maximum of 264.01 m AMSL at MW103-20 to a minimum of 257.25 m AMSL at MW106-20 over the monitoring period to date (November 2020 to December 2023). The hydrographs show a somewhat muted response following significant precipitation events, remaining relatively consistent over the period of record, as expected for granular deposits confined by laterally extensive low permeability glacial till deposits.

The measured shallow groundwater elevations within the surficial deposits have ranged from a maximum of 266.32 m AMSL at MP-1 to a minimum of 262.86 m AMSL at MP-3 over the above-mentioned monitoring period.

The groundwater elevations at MW106-20 and MW107-20 are noted to be above the top of the aquifer indicating artesian conditions. Regional groundwater levels in southern Ontario are typically at 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. Though the observed muted response to precipitation events over the period of record suggests that recharge is somewhat independent of local precipitation, 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.

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.

Figures 8a, **8b**, and **8c** show the inferred potentiometric surfaces and inferred groundwater flow directions in the confined granular deposits (sand unit) for December 2020, September 2021 and March 2023 (respectively). The results indicate that the groundwater flow direction is generally towards the east, with observed gradients (i.e., slope) ranging from 0.002 to 0.008 m/m (March 2023) 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 Dewatering Review

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

If the design details for the foundations, site servicing, stormwater management facilities or other subsurface structures are revised, MTE should be requested to review the revised design to confirm the findings described herein remain valid.

5.1 Temporary Construction Dewatering

5.1.1 Foundations

It is understood that the floor slab for the three proposed industrial buildings will be constructed with spread or strip footings and slab-on-grade floors. Footing depths are anticipated to be approximately 1.4 m BGS. The approximate locations of the buildings are shown on **Figure 1**.

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

5.1.2 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.

Based on the assumed depth of the service trench and the general subsurface conditions at the Site, proactive construction dewatering is not anticipated to be required. 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 and/or interceptor trenches.

It is noted, however, that saturated granular deposits were encountered as interbeds within the glacial till at variable depths and locations at the Site. Should any excavations encounter these saturated granular deposits, temporary construction dewatering will be required to control groundwater inflow from these deposits.

5.1.3 Stormwater Management Ponds

The proposed development plan includes two Stormwater Management (SWM) ponds (Pond A and Pond B). The approximate locations of these ponds are shown on **Figure 1**, with additional details shown in **Appendix A.** The base of SWM Pond A will be at an elevation of 266.10 m AMSL and the base of SWM Pond B will be at an elevation of 264.30 m AMSL.

It should be noted that borehole and monitoring well coverage in the vicinity of SWM Ponds A and B is very limited. As a result, subsurface conditions have been inferred from nearby boreholes and monitoring wells and it must be recognized that the soil and groundwater conditions between and beyond the borehole and monitoring well locations may differ from those encountered in the test holes.

Based on the proposed elevation for the base of SWM Pond A and the inferred subsurface conditions from boreholes and monitoring wells near location of the pond, saturated granular deposits are not anticipated to be encountered during excavation of SWM Pond A.

The groundwater pressure in the confined sand deposits screened at MW107-20, located approximately 35 m east of SWM Pond A, has ranged from 257.43 to 262.46 m AMSL over the period of record. This suggest that the potentiometric surface for the confined sand deposit in this area ranges from approximately 3.6 to 8.7 m below the proposed base of SWM Pond A.

Based on the proposed elevation for the base of SWM Pond B and the inferred subsurface conditions from boreholes and monitoring wells near location of the pond, saturated granular deposits may be encountered during excavation of SWM Pond B. Groundwater was

encountered within a granular deposit interbedded in the at approximately 267.3 m AMSL during the drilling of BH145-21, located approximately 40 m west of SWM Pond B.

Nuisance dewatering of groundwater seepage may be required where excavations for the pond 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.

It is noted, however, that saturated granular deposits were encountered as interbeds within the glacial till at variable depths and locations at the Site. Should any excavations encounter these saturated granular deposits, temporary construction dewatering will be required to control groundwater inflow from these deposits.

5.2 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.

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.

About four weeks should be allowed in the project schedule to prepare the supporting documents and complete the online registration.

6.0 Impact Assessment

6.1 Inventory of Groundwater Receptors

6.1.1 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**.

A door to door well inventory was completed for properties within one kilometer of the Site to confirm the locations and installation depths of water supply wells in the vicinity of the Site. No responses were received for properties within approximately one kilometer of the Site.

6.1.2 Watercourses

Five watercourses were identified on-Site:

- Two permanent tributaries of the West Humber River (Tributary 5 in the northwestern corner of the Site and Kilamanagh Creek in the southeastern corner of the Site);
- One intermittent/ephemeral watercourse (Tributary 4) originating east of the farm buildings; and
- Two intermittent/ephemeral watercourses (Tributaries 2 and 3) located within the central woodland and discharging to an on-line pond.

The approximate locations of these watercourses are shown on **Figure 3**.

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.

6.1.3 Wetlands

As discussed in Section 2.5, 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 3 (WSP, 2024) 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.

6.2 Potential Groundwater Impacts during Construction

6.2.1 Temporary Construction Dewatering

It is anticipated that primarily 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.

6.2.2 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.

6.2.3 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 6.3.3, the risk 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.

6.2.4 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.

6.3 Potential Post-Development Groundwater Impacts

6.3.1 Infiltration and Runoff

Based on the results of the pre- and post-development water balance (WSP, 2024b), the post-development 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 is scheduled to be completed following the spring freshet and should include profiling of infiltration rates with depth.

6.3.2 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.

6.3.3 Water Supply Wells

As discussed in Section 6.3.1, 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.

6.3.4 Watercourses and Wetlands

As discussed in Sections 6.1.2 and 6.1.3, 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.

7.0 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 264.01 m AMSL to a minimum of 257.25 m AMSL over the period of record.

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

iv. The sampled groundwater met the PWQO for the parameters analyzed suggesting that groundwater pumped during construction dewatering may meet the PWQO for direct surface water discharge.

v. Proactive construction dewatering is not anticipated to be required to facilitate excavations for foundations.

vi. There is a risk of encountering saturated granular deposits interbedded within the glacial till at the Site. Should any excavations encounter these saturated granular deposits, temporary construction dewatering will be required to control groundwater inflow from these deposits.

vii. Nuisance dewatering may be required to control groundwater seepage from sand/silt seams within the glacial till during excavation.

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

ix. 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.

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

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

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

8.0 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. Quarterly download of the dataloggers and manual measurement of groundwater levels and surface water levels are continued for a period of at least 3 years following substantial completion of construction to confirm the findings of this assessment.

iii. An EASR be obtained as a precaution to avoid potential delays should the interbedded saturated granular deposits be encountered during excavation and to maintain staging and scheduling flexibility should large areas or multiple excavations require concurrent nuisance dewatering in excess of 50,000 L/day. A water taking and discharge plan will need to be prepared by a qualified professional as part of the EASR registration process.

iv. To reduce the likelihood of construction dewatering being required, it is recommended that excavations for the SWM pond and servicing trenches proceed during mid to late summer when groundwater levels are generally at their lowest.

xiii. A best practices soil management plan 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.

xiv. 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.

xv. A location-specific investigation of subsurface conditions and in-situ infiltration testing should be carried out to support LID design and is scheduled to be completed following the spring freshet in 2024.

xvi. 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.

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

9.0 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. and QuadReal Property Group. 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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MBC/AAS /JDM:sdm

M:\48043\300\8 - Deliverables\3 - Reports\2nd Submission\48043-300 20240306 2nd Submission HydroG Report.docx

10.0 References

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WSP Canada Inc. (2024b). *Stormwater Management Report*, 12668 & 12892 Dixie Road - Caledon. Project No. 201-11545-00.

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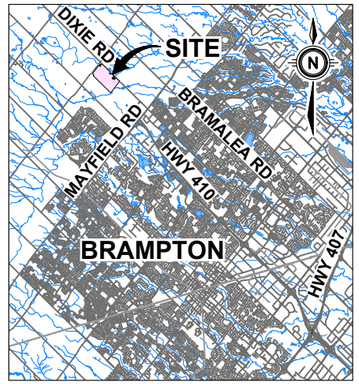
Figures



KEY PLAN (nts)

LEGEND

- SITE
- PERMANENT WATERCOURSE
- INTERMITTENT/EPHEMERAL WATERCOURSE
- BOREHOLE
- MONITORING WELL (Phase II ESA)
- MONITORING WELL (Hydrogeological Assessment)

REFERENCES

2020 AERIAL IMAGE, WATERCOURSE DATA, REGION OF PEEL;
WARE MALCOMB, SITE PLAN, JOB No. TOR23-0063-00, SHEET No. A100, DECEMBER 12 - 2023; AND
LAND INFORMATION ONTARIO, ROAD AND WATER NETWORK, © KING'S PRINTER FOR ONTARIO, 2024 (key plan)

NOTES

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

ALL LOCATIONS ARE APPROXIMATE.

0 40 80 120 160 200m

MTE
Engineers, Scientists, Surveyors

PROJECT
HYDROGEOLOGICAL ASSESSMENT
12668 & 12892 DIXIE ROAD, CALEDON, ONTARIO

TITLE
SITE LOCATION MAP

Drawn	Scale	Figure
DCH	1:4,000	1
Checked	Project No. 48043-300	
Date 2024-03-07	Rev No. 0	

CAD: P:\48043\300\48043-300-MS1_FIGURE 2.DWG

PROJECT NORTH

LEGEND

- SITE
- STUDY AREA (500m Buffer from Site)
- PERMANENT WATERCOURSE
- INTERMITTENT/EPHEMERAL WATERCOURSE

QUATERNARY GEOLOGY

- 5d — Brown loam to silt loam till
- 19 — Silt, sand, gravel

REFERENCES

2020 AERIAL IMAGE, WATERCOURSE DATA, REGION OF PEEL; AND
ONTARIO GEOLOGICAL SURVEY 2010, SURFICIAL GEOLOGY OF SOUTHERN ONTARIO, ONTARIO GEOLOGICAL SURVEY MISCELLANEOUS RELEASE-128-REVISED.

NOTES

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ALL LOCATIONS ARE APPROXIMATE.

0 75 150 225 300

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PROJECT
HYDROGEOLOGICAL ASSESSMENT
12668 & 12892 DIXIE ROAD, CALEDON, ONTARIO

TITLE
QUATERNARY GEOLOGY

Drawn	Scale	Figure
DCH	1:7,500	2
Checked	Project No. 48043-300	
Date 2024-03-07	Rev No. 0	

Plot Date: March 7, 2024 - 12:12 PM

PROJECT NORTH

LEGEND

- SITE
- STUDY AREA (500m Buffer from Site)
- PERMANENT WATERCOURSE
- INTERMITTENT/EPHEMERAL WATERCOURSE

MECP WELL RECORDS:

- ABANDONED
- OBSERVATION WELL
- TEST HOLE
- UNKNOWN
- MONITORING WELL / TEST HOLE
- WATER SUPPLY

REFERENCES

2020 AERIAL IMAGE, WATERCOURSE DATA, REGION OF PEEL; AND
WATER WELL RECORDS PROVIDED BY THE ONTARIO MINISTRY OF ENVIRONMENT CONSERVATION AND PARKS, © KING'S PRINTER OF ONTARIO, ALL RIGHTS RESERVED.

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ALL LOCATIONS ARE APPROXIMATE.

0 75 150 225 300

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PROJECT
HYDROGEOLOGICAL ASSESSMENT
12668 & 12892 DIXIE ROAD, CALEDON, ONTARIO

TITLE
WATER WELLS

Drawn	Scale	Figure
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Checked	Project No. 48043-300	
Date 2024-03-07	Rev No. 0	

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Plot Date: March 7, 2024 – 12:10 PM

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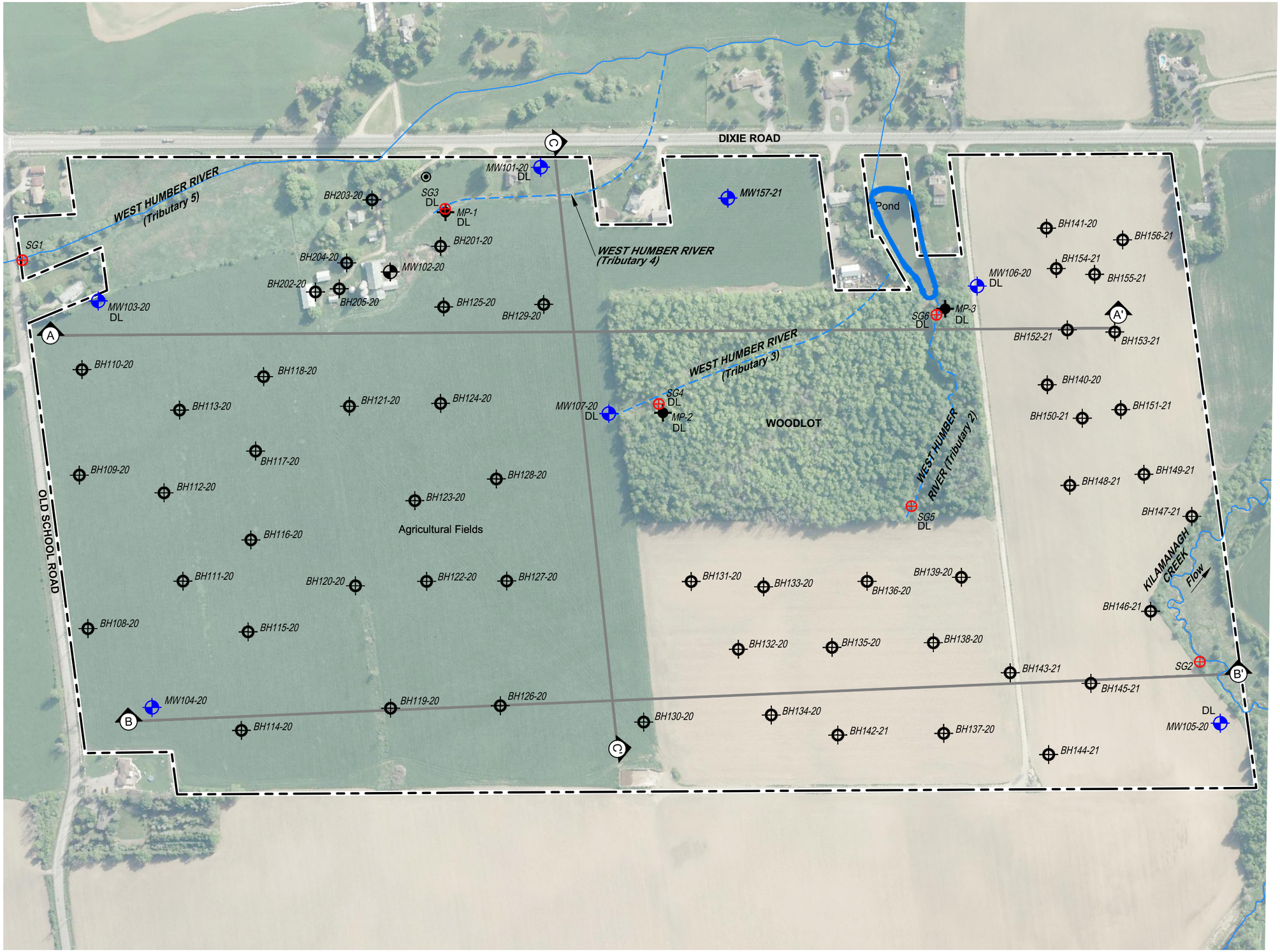

PROJECT NORTH

LEGEND

- SITE
- PERMANENT WATERCOURSE
- INTERMITTENT/EPHEMERAL WATERCOURSE
- ABANDONED DRINKING WATER WELL
- BOREHOLE
- MONITORING WELL (Phase II ESA)
- MONITORING WELL (Hydrogeological Assessment)
- MINI-PIEZOMETER
- STAFF GAUGE
- DL — DATALOGGER INSTALLED
- A — A' CROSS-SECTION LINE

REFERENCES

2020 AERIAL IMAGE, WATERCOURSE DATA, REGION OF PEEL; AND
LAND INFORMATION ONTARIO, ROAD AND WATER NETWORK, © KING'S PRINTER FOR ONTARIO, 2024 (key plan)

NOTES

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ALL LOCATIONS ARE APPROXIMATE.

0 40 80 120 160 200m

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Engineers, Scientists, Surveyors

PROJECT
HYDROGEOLOGICAL ASSESSMENT
12668 & 12892 DIXIE ROAD, CALEDON, ONTARIO

TITLE
BOREHOLE LOCATION PLAN

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Checked	Project No. 48043-300	
Date 2024-03-07	Rev No. 0	

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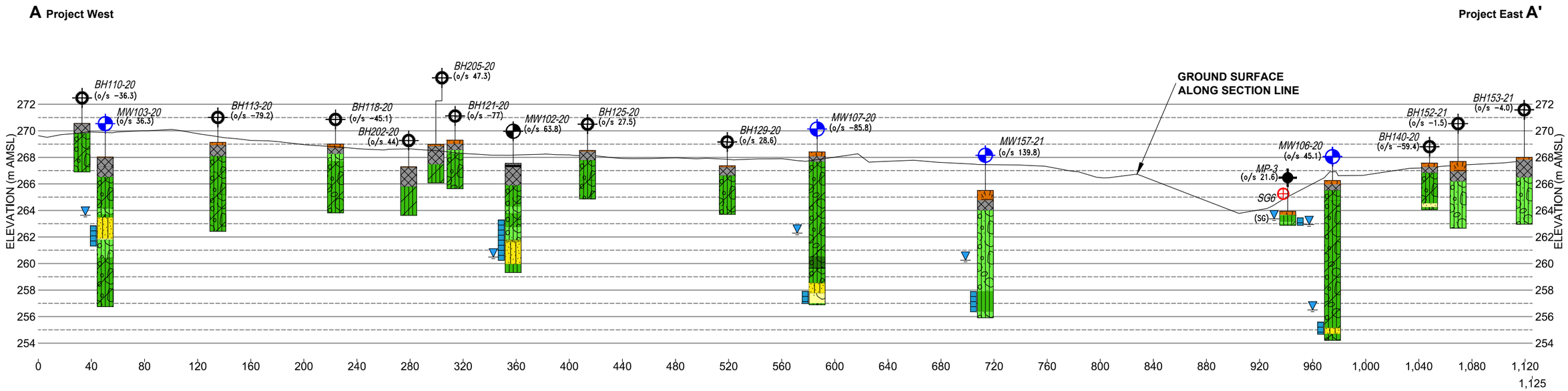


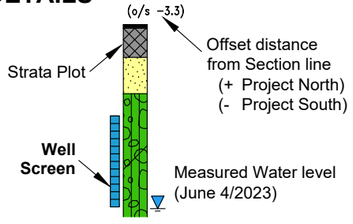
LEGEND

- BOREHOLE
- MONITORING WELL (Phase II ESA)
- MONITORING WELL (Hydrogeological Assessment)
- MINI-PIEZOMETER
- STAFF GAUGE

SIMPLIFIED STRATIGRAPHY

- ASPHALT
- CONCRETE
- TOPSOIL
- FILL
- SILT
- SAND
- SILTY SAND
- CLAYEY SILT
- CLAYEY SILT TILL
- SILT TILL
- SANDY SILT TILL
- SAND & GRAVEL
- GRAVELLY SAND

TYPICAL INSTALLATION DETAILS



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VERTICAL SCALE (1:300)

0 30 60 90 120 150m
HORIZONTAL SCALE (1:3,000)

REFERENCES

MTE, EXISTING GRADE, PROJECT No. 48043-200, FILE No. 48043-200-XR2.

NOTES

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

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

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PROJECT
HYDROGEOLOGICAL ASSESSMENT
12668 & 12892 DIXIE ROAD, CALEDON, ONTARIO

TITLE
CROSS-SECTION A-A'

Drawn	Scale	Figure
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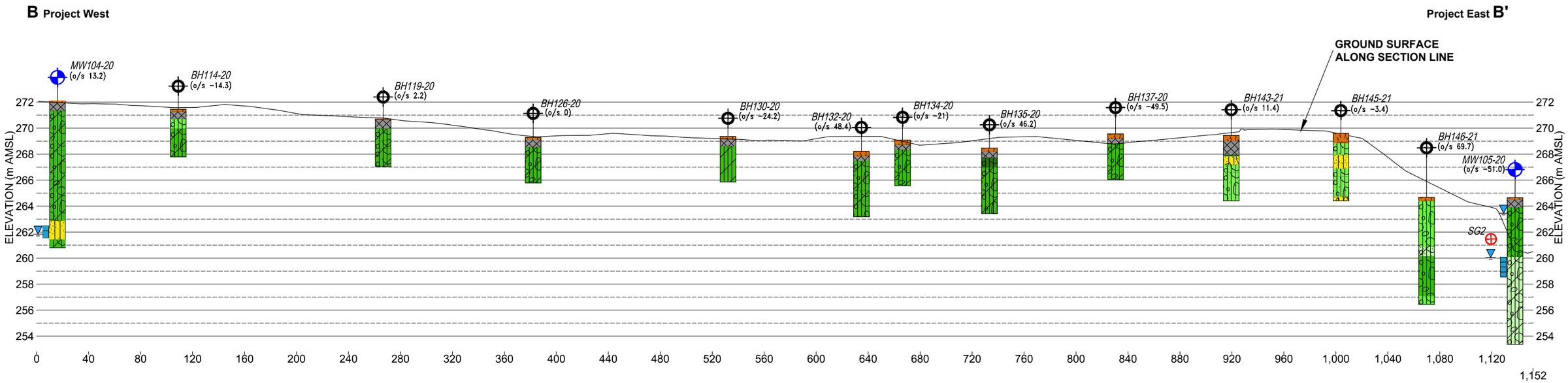
Checked	Project No. 48043-300	
Date 2024-03-07	Rev No. 0	



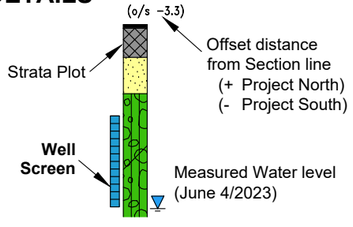
LEGEND

- BOREHOLE
- MONITORING WELL (Phase II ESA)
- MONITORING WELL (Hydrogeological Assessment)
- STAFF GAUGE

SIMPLIFIED STRATIGRAPHY

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

TYPICAL INSTALLATION DETAILS



REFERENCES

MTE, EXISTING GRADE, PROJECT No. 48043-200, FILE No. 48043-200-XR2.

NOTES

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ALL LOCATIONS ARE APPROXIMATE.

0 3 6 9 12 15m
VERTICAL SCALE (1:300)

0 30 60 90 120 150m
HORIZONTAL SCALE (1:3,000)

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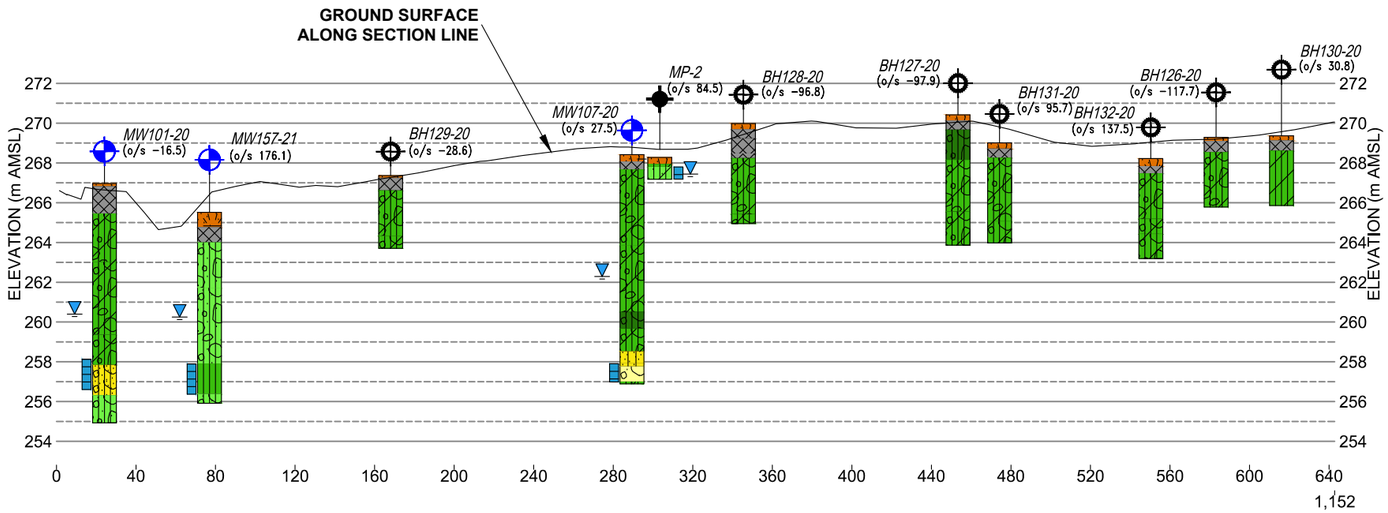
PROJECT
HYDROGEOLOGICAL ASSESSMENT
12668 & 12892 DIXIE ROAD, CALEDON, ONTARIO

TITLE
CROSS-SECTION B-B'

Drawn	Scale	Figure
DCH	AS SHOWN	6
Checked	Project No. 48043-300	
Date 2024-03-07	Rev No. 0	

C Project North

Project South C'



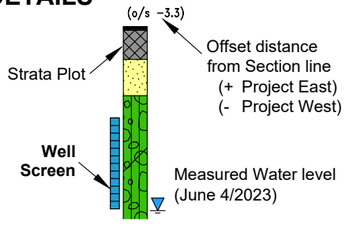
LEGEND

- BOREHOLE
- MONITORING WELL (Phase II ESA)
- MONITORING WELL (Hydrogeological Assessment)
- MINI-PIEZOMETER
- STAFF GAUGE

SIMPLIFIED STRATIGRAPHY

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

TYPICAL INSTALLATION DETAILS



REFERENCES

MTE, EXISTING GRADE, PROJECT No. 48043-200,
FILE No. 48043-200-XR2.

NOTES

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ALL LOCATIONS ARE APPROXIMATE.

0 3 6 9 12 15m
VERTICAL SCALE (1:300)

0 30 60 90 120 150m
HORIZONTAL SCALE (1:3,000)

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PROJECT
HYDROGEOLOGICAL ASSESSMENT
12668 & 12892 DIXIE ROAD, CALEDON, ONTARIO

TITLE
CROSS-SECTION C-C'

Drawn	Scale	Figure
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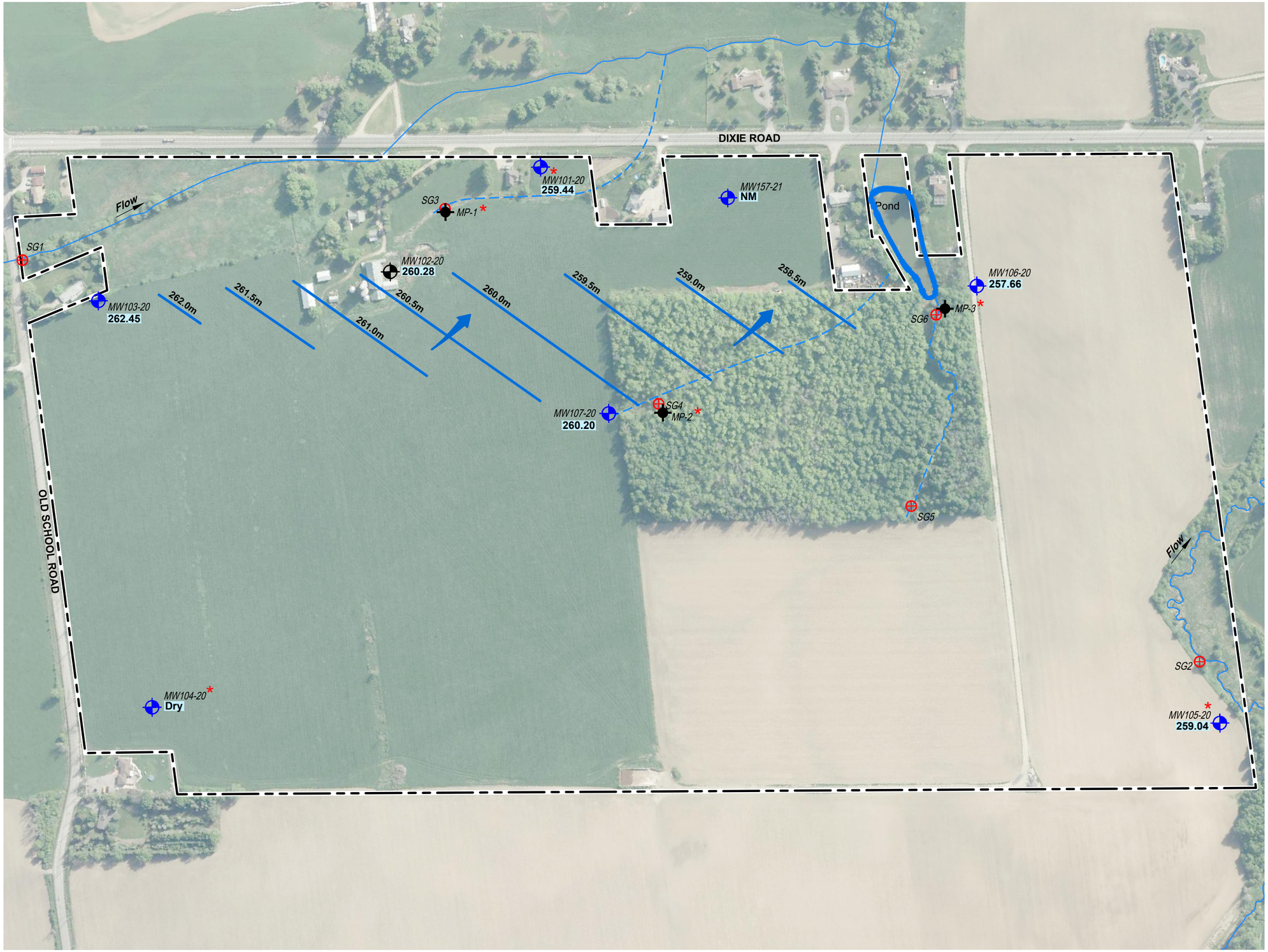
Checked	Project No. 48043-300	
Date 2024-03-07	Rev No. 0	



PROJECT NORTH

LEGEND

- SITE
- STUDY AREA (500m Buffer from Site)
- PERMANENT WATERCOURSE
- INTERMITTENT/EPHEMERAL WATERCOURSE
- MONITORING WELL (Phase II ESA)
- MONITORING WELL (Hydrogeological Assessment)
- STAFF GAUGE
- 259.95 MEASURED WATER LEVEL DECEMBER 14, 2020 (m AMSL)
- 259.0m INTERPRETED WATER TABLE ELEVATION (m AMSL)
- INFERRED GROUNDWATER FLOW DIRECTION
- * NOT USED FOR WATER TABLE INTERPRETATION
- NM NOT MEASURED IN 2023

REFERENCES

2020 AERIAL IMAGE, WATERCOURSE DATA, REGION OF PEEL.

NOTES

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

ALL LOCATIONS ARE APPROXIMATE.

0 40 80 120 160 200m

MTE
Engineers, Scientists, Surveyors

PROJECT
HYDROGEOLOGICAL ASSESSMENT
12668 & 12892 DIXIE ROAD, CALEDON, ONTARIO

TITLE
GROUNDWATER FLOW IN CONFINED SANDS (December 2020)

Drawn	Scale	Figure
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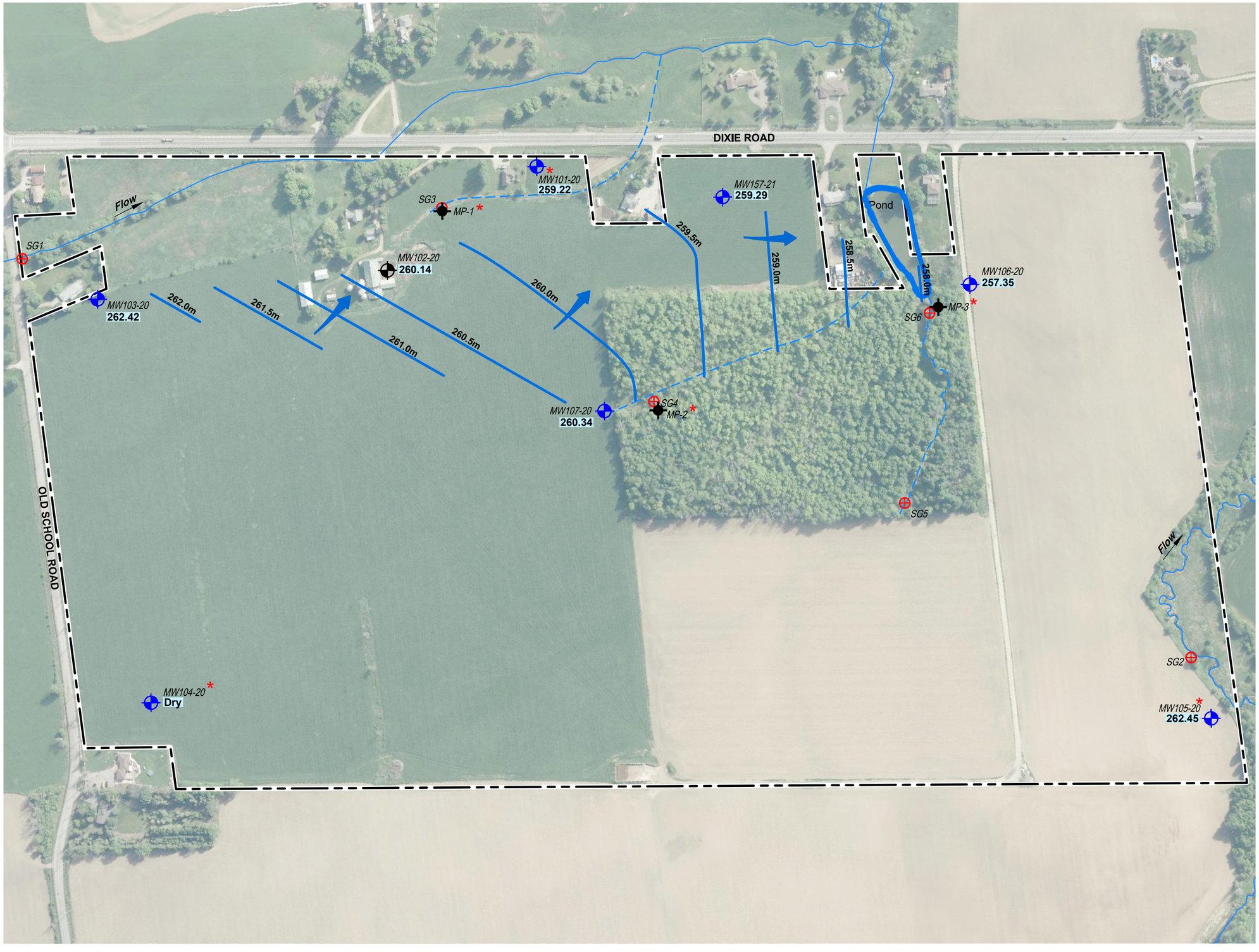
Checked	Project No. 48043-300	
Date 2024-03-07	Rev No. 0	



PROJECT NORTH

LEGEND

- SITE
- STUDY AREA (500m Buffer from Site)
- PERMANENT WATERCOURSE
- INTERMITTENT/EPHEMERAL WATERCOURSE
- MONITORING WELL (Phase II ESA)
- MONITORING WELL (Hydrogeological Assessment)
- STAFF GAUGE
- 259.95 MEASURED WATER LEVEL SEPTEMBER 9, 2021 (m AMSL)
- 259.0m INTERPRETED WATER TABLE ELEVATION (m AMSL)
- INFERRED GROUNDWATER FLOW DIRECTION
- * NOT USED FOR WATER TABLE INTERPRETATION

REFERENCES

2020 AERIAL IMAGE, WATERCOURSE DATA, REGION OF PEEL.

NOTES

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

ALL LOCATIONS ARE APPROXIMATE.

0 40 80 120 160 200m

MTE
Engineers, Scientists, Surveyors

PROJECT
HYDROGEOLOGICAL ASSESSMENT
12668 & 12892 DIXIE ROAD, CALEDON, ONTARIO

TITLE
GROUNDWATER FLOW IN CONFINED SANDS (September 2021)

Drawn	Scale	Figure
DCH	1:4,000	**8B**
Checked	Project No. 48043-300	
Date 2024-03-07	Rev No. 0	

CAD: P:\P\48043\300\48043-300-MS1_FIGURE 8.DWG

Plot Date: March 7, 2024 - 12:20 PM

DIXIE ROAD

OLD SCHOOL ROAD

Pond

Flow

Flow

SG1

SG3

MP-1 *

MW101-20
260.14 *

MW157-21
259.95

MW102-20
260.67

MW103-20
263.81

MW104-20 *
Dry

MW106-20
258.44

MP-3 *

SG6

MW107-20
261.87

SG4

MP-2 *

SG5

SG2

MW105-20 *
263.51

260.50

261.0m

261.5m

262.0m

262.5m

263.0m

263.5m

260.0m

259.5m

259.0m

PROJECT NORTH

LEGEND

- SITE
- STUDY AREA (500m Buffer from Site)
- PERMANENT WATERCOURSE
- INTERMITTENT/EPHEMERAL WATERCOURSE
- MONITORING WELL (Phase II ESA)
- MONITORING WELL (Hydrogeological Assessment)
- STAFF GAUGE
- 259.95 MEASURED WATER LEVEL MARCH 27, 2023 (m AMSL)
- 259.0m INTERPRETED WATER TABLE ELEVATION (m AMSL)
- INFERRED GROUNDWATER FLOW DIRECTION
- * NOT USED FOR WATER TABLE INTERPRETATION

REFERENCES

2020 AERIAL IMAGE, WATERCOURSE DATA, REGION OF PEEL.

NOTES

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HYDROGEOLOGICAL ASSESSMENT
12668 & 12892 DIXIE ROAD, CALEDON, ONTARIO

TITLE
GROUNDWATER FLOW IN CONFINED SANDS (March 2023)

Drawn: DCH	Scale: 1:4,000	Figure: **8C**
Checked:	Project No.: 48043-300	
Date: 2024-03-07	Rev No.: 0	

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)	Depth to Unit Base (m BGS)	Stratigraphy 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

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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)	Depth to Unit Base (m BGS)	Stratigraphy Description Colour	Material 1	Material 2	Material 3
																	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
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

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)	Depth to Unit Base (m BGS)	Stratigraphy Description Colour	Material 1	Material 2	Material 3
																	7.6	grey	clay	silt	dense
7202813	595404	4848177	2013	2286	-	Abandoned - Other	-	-	-	3.7	-	-	-	-	-	-	-	-	-	-	-
7417504	596129	4847945	2022	52	Rotary	Observation Well	Monitoring	-	12.2	13.7	12.2	13.7	-	-	-	-	0.2	brown	topsoil	-	-
																	3.8	brown	clay	-	-
																	10.7	grey	clay	till	-
																	13.7	grey	silt	-	-
7417502	595874	4847761	2022	52	Rotary	Observation Well	Monitoring	-	7.6	12.2	10.7	12.2	-	-	-	-	0.2	brown	topsoil	-	-
																	10.4	brown	till	-	-
																	12.2	grey	till	-	-
7417503	596237	4847627	2022	52	Rotary	Observation Well	Monitoring	-	11.6	12.2	10.7	12.2	-	-	-	-	0.3	brown	topsoil	-	-
																	11.6	brown	till	-	-
																	12.2	grey	till	silt	-
7376565	594976	4848177	2020	-	-	Unknown	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7417427	595376	4846985	2022	52	Auger	Observation Well	Monitoring	-	-	6.1	3.1	6.1	-	-	-	-	1.5	brown	topsoil	sand	moist
																	3.1	grey	silt	clay	moist
																	6.1	grey	till	clay	dry
7417426	595452	4846832	2022	52	Auger	Observation Well	Monitoring	-	-	6.1	3.1	6.1	-	-	-	-	1.5	brown	topsoil	sand	moist
																	3.1	grey	sand	silty	dry
																	6.1	grey	till	clay	dry
7417425	595525	4846670	2022	52	Auger	Observation Well	Monitoring	-	-	6.1	3.1	6.1	-	-	-	-	1.5	brown	topsoil	sand	moist
																	3.1	grey	silt	clay	dry
																	6.1	grey	till	clay	dry
7405119	596081	4847357	2021	52	Auger	Observation Well	Monitoring	-	-	6.1	3.1	6.1	-	-	-	-	6.1	-	clay	gravel	-

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 February 2024.
3. "-" indicates this information was not provided in the well record.
4. Refer to Figure 3 for well locations.
5. 'm BGS' defined as metres below ground surface.

Table 2: 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 Water Levels

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	2021-03-12	2021-05-04	2021-06-16	2021-09-09	2021-12-13	2022-03-24	2022-06-15	2022-09-14	2022-12-20	2023-03-27	2023-06-05	2023-09-13	2023-12-11
			Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)	Elevation (m AMSL)
MW101-20	266.97	267.89	259.43	259.42	259.46	259.43	-	259.44	259.39	-	259.35	259.22	259.44	259.79	259.88	259.61	259.18	260.14	260.40	260.30	259.65
MW102-20	267.55	268.49	260.31	260.31	-	260.29	-	260.28	260.11	-	260.14	260.14	260.11	260.51	260.30	260.27	260.16	260.67	260.49	260.67	260.61
MW103-20	268.03	269.03	262.50	262.51	-	262.47	262.44	262.45	262.68	-	262.73	262.42	262.97	263.49	263.44	262.60	262.54	263.81	263.66	263.27	262.97
MW104-20	272.09	273.13	Dry	Dry	-	Dry	Dry	Dry	Dry	-	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	261.84	Dry	261.92
MW105-20	264.65	265.66	Dry	258.84	-	259.12	259.03	259.04	263.07	-	263.31	262.45	263.48	263.12	263.06	262.65	262.98	263.51	263.45	-	262.20
MW106-20	266.25	267.20	257.55	257.49	-	257.46	257.71	257.66	257.98	-	257.84	257.35	258.13	258.37	258.17	257.86	257.73	258.44	258.50	258.20	257.89
MW107-20	268.42	269.37	260.39	260.31	-	260.26	260.33	260.20	260.13	-	260.60	260.34	260.63	261.57	261.83	261.23	260.51	261.87	262.29	262.09	261.17
MW157-21	265.51	266.49	-	-	-	-	-	-	259.41	-	259.37	259.29	259.62	259.91	259.95	259.71	259.70	259.95	260.25	259.07	259.87
SG1	263.03	264.52	-	-	263.32	263.35	-	263.40	263.54	-	263.13	263.23	263.50	263.60	263.35	263.25	263.31	263.38	263.32	263.28	263.37
SG2	259.77	261.49	-	-	260.04	260.04	-	260.24	260.78	-	259.96	260.36	260.55	260.85	260.02	260.24	260.47	260.76	260.04	260.37	260.12
SG3	265.78	267.17	-	-	-	-	-	-	-	265.81	Dry	Dry	265.81	265.86	Dry	Dry	265.83	265.83	Dry	Dry	Dry
SG4	267.87	269.38	-	-	-	-	-	-	-	267.97	Dry	Dry	267.91	267.92	Dry	Dry	267.83	267.95	Dry	Dry	267.80
SG5	265.20	266.61	-	-	-	-	-	-	-	265.23	265.21	Dry	265.30	265.36	265.25	Dry	265.32	265.36	265.25	Dry	265.28
SG6	263.24	264.89	-	-	-	-	-	-	-	263.41	Dry	Dry	263.48	263.82	263.38	263.34	263.45	263.49	263.38	Dry	263.36
MP-1	266.33	267.09	-	-	-	-	-	-	-	Dry	Dry	265.31	266.13	266.29	265.40	Dry	Dry	266.19	265.36	Dry	Dry
MP-2	268.28	269.15	-	-	-	-	-	-	-	268.27	267.50	Dry	268.00	268.07	267.72	Dry	Dry	268.05	267.44	Dry	Dry
MP-3	263.94	264.87	-	-	-	-	-	-	-	263.52	Dry	Dry	263.90	264.04	263.06	Dry	Dry	263.98	262.93	Dry	Dry

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, February 12, 2021 and May 4, 2021 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

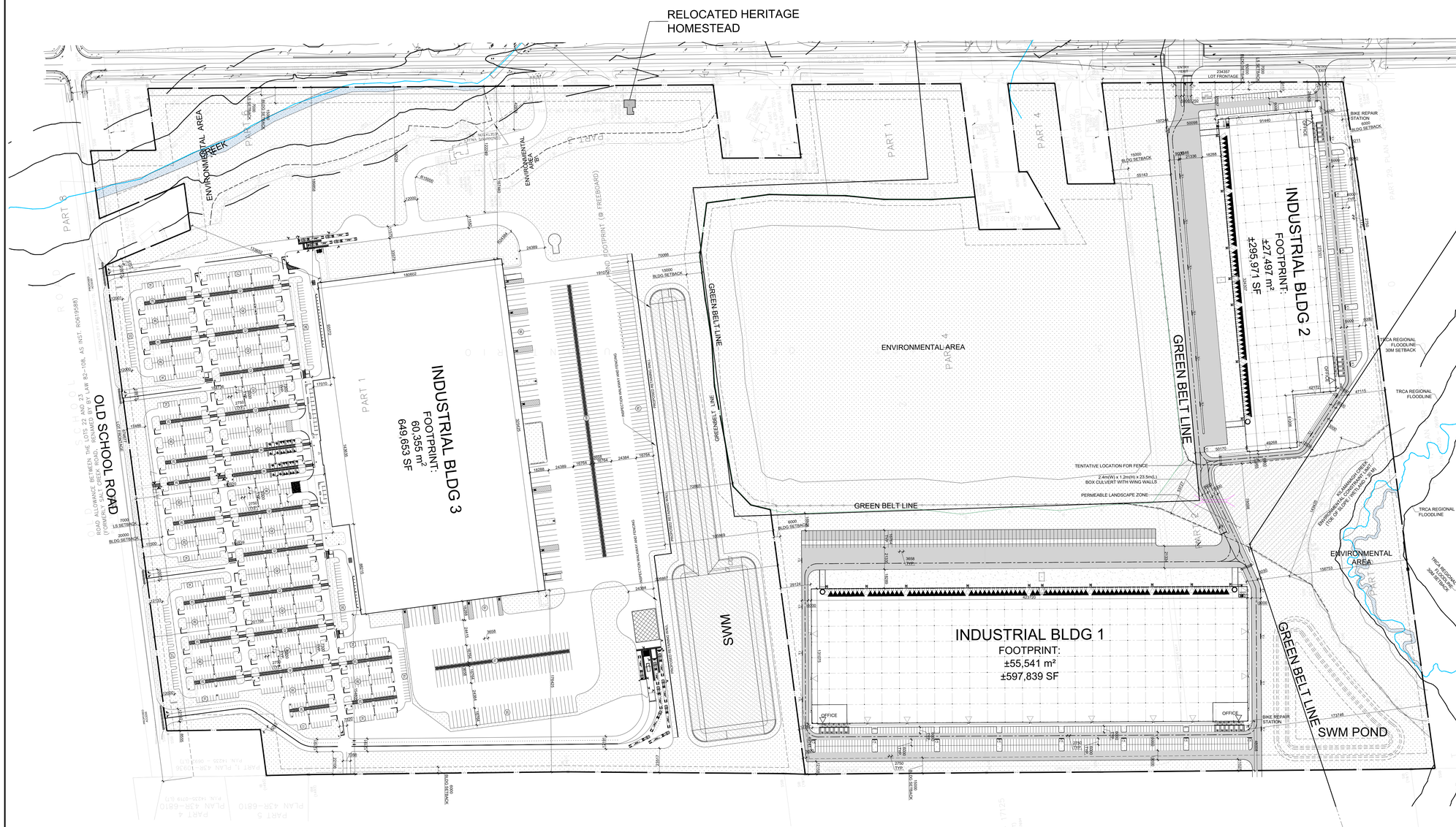
Notes:

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

Proposed Site Plan

CAUTION: IF THIS SHEET IS NOT 36"x48" IT IS A REDUCED PRINT



SITE PLAN

SCALE: 1:1500

SITE STATISTICS - 12668 DIXIE RD		
Existing Zoning Category	*A1*	
Proposed Zoning Category	*MS*	
Building Classification	*Group F2 (O.B.C. A- 3.1.2.1.(1))*	
GROSS SITE AREA	4,104,005 SF	381,274.90m²
Zone Permitted Use *(Town of Caledon Zoning By-law 2006-50)*		
Proposed Use	*Industrial*	
Section 8.3 - Zoning Standards - MS-XX Zone		
BUILDING AREA:		
BUILDING 1	**602,071 SF**	**55,934.27 m²**
Warehouse Area	*588,623 SF*	*54,684.89 m²*
Office Area	*13,448 SF*	*1,249.38 m²*
BUILDING 2	**295,970 SF**	**27,496.57 m²**
Warehouse Area	*284,770 SF*	*26,456.05 m²*
Office Area	*11,200 SF*	*1,040.51 m²*
TOTAL BUILDING AREA	**898,041 SF**	**83,430.84 m²**
NET FLOOR AREA:		
BUILDING 1	**601,091 SF**	**55,843.22 m²**
Floor Area	*602,071 SF*	*55,934.27 m²*
Building Area under services, M&E rooms etc.	*980 SF*	*91.04 m²*
BUILDING 2	**294,902 SF**	**27,397.30 m²**
Floor Area	*295,970 SF*	*27,496.57 m²*
Building Area under services, M&E rooms etc.	*1,068 SF*	*99.27 m²*
TOTAL NET AREA	**895,993 SF**	**83,240.53 m²**

Requirements	**Proposed**	**Required**
Min. Lot Area	381,274.90m²	925.00m²
Net Floor Area	83,240.53m²	-
Gross Floor Area	83,430.84m²	-
Lot Coverage	21.88%	50.00%
Min. Lot Frontage (m)	234.36	30.00
Min. Front Yard Building Setback (m) *(Towards Dixie)*	28.41	15.00
Min. Int.Side (N) Yard Building Set back (m)	107.24	6.00
Min. Int.Side (S) Yard Building Set back (m)	34.49	6.00
Min. Int. Side Yard Building Set back (m) - Abutting Residential	107.24	6.00
Min. Rear Yard Building Setback (m)	48.01	15.00
Maximum Building Height (m) - Building 1	14.50	20.00
Maximum Building Height (m) - Building 2	14.50	20.00
Min. Landscape Area (% of Lot Area)	59.94%	10.00%
Min. Landscape Area (SM)	*228,557.68m²*	*8,343.08m²*
Min. Front Landscape Buffer (m)	9.12	7.00
Min. Int. Side (N) Landscape Buffer (m)	3.02	0.00
Min. Int. Side (S) Landscape Buffer (m)	3.21	0.00
Min. Rear Landscape Buffer (m)	11.03	0.00
Min. Landscape Buffer (m) - Abutting EPA > 6m width	-	-

Parking Calculations	**Proposed**	**Required**
BUILDING 1		
@139 + 1/170m² of Net Floor Area over 10,000 m²	411	409
BUILDING 2		
@139 + 1/170m² of Net Floor Area over 10,000 m²	262	241
Total no. of Parking Spaces	**673**	**650**
(Including Accessible Parking Spaces)		
Accessible Parking Spaces		
@201 to 1000 parking spaces is 2 plus 2% of total spaces		
@More than 1000 parking spaces is 11 plus 1% of total spaces		
BUILDING 1		
@201 to 1000 parking spaces is 2 plus 2% of total spaces	12	11
BUILDING 2		
@201 to 1000 parking spaces is 2 plus 2% of total spaces	8	7
Total no. of Accessible Parking Spaces	**20**	**18**
	10 Type - A	*9 Type - A*
	10 Type - B	*9 Type - B*
EV Parking Spaces	*12*	-
Parking Stall Dimensions	*Aisle*	
	ACCESSIBLE: TYPE A - 3.4m X 5.4m	
	TYPE B - 2.75m X 5.4m	
	w/ 1.5m access aisle on either side	

Proposed Trailer Parking	**Proposed**	**Required**
BUILDING 1	94	-
BUILDING 2		-
Total no. of Trailer Parking Spaces	**94**	-

Loading Space Calculations	**Proposed**	**Required**
BUILDING 1	8	8
BUILDING 2	61	5
@3 + 1 per 9300 m² in excess of 7441 m² of Net Floor Area		
Total no. of Loading Spaces	**146**	**13**
Min. Loading Space Dimensions	*3.5m(W) X 14.0m(L) X 3.35m(H)*	

SITE STATISTICS - 12862 DIXIE RD		
Existing Zoning Category	*A1*	
Proposed Zoning Category	*MS*	
Building Classification	*Group F2 (O.B.C. A- 3.1.2.1.(1))*	
GROSS SITE AREA	4,401,789 SF	408,939.99m²
NET DEVELOPABLE SITE AREA	4,023,570 SF	373,802.23m²
Proposed Use	*Industrial*	
Section 8.3 - Zoning Standards - MS-XX Zone		
BUILDING AREA:		
BUILDING 3	**649,652 SF**	**60,354.74 m²**
TOTAL BUILDING AREA	**649,652 SF**	**60,354.74 m²**
NET FLOOR AREA:		
BUILDING 3		
1ST FLOOR AREA	*649,652 SF*	*60,354.74 m²*
2nd FLOOR AREA	*606,573 SF*	*56,352.57 m²*
3rd FLOOR AREA	*606,573 SF*	*56,352.57 m²*
4th FLOOR AREA	*606,573 SF*	*56,352.57 m²*
5th FLOOR AREA	*606,573 SF*	*56,352.57 m²*
Primary Gate House	*278 SF*	*25.83 m²*
Secondary Gate House	*148 SF*	*13.75 m²*
TOTAL NET AREA	**3,076,372 SF**	**285,804.80 m²**

Requirements	**Proposed**	**Required**
Min. Lot Area	408,939.99m²	925.00m²
Net Floor Area	285,804.60m²	-
Gross Floor Area	285,804.60m²	-
Lot Coverage	14.76%	50.00%
Min. Lot Frontage (m)	674.68	30.00
Min. Front Yard Building Setback (m) *(Towards Dixie)*	183.92	20.00
Min. Ext.Side (N) Yard Building Set back (m)	167.44	6.00
Min. Int.Side (S) Yard Building Set back (m)	154.81	6.00
Min. Rear Yard Building Setback (m)	191.07	15.00
Maximum Building Height (m) - BUILDING 3	31.55	35.00
Min. Landscape Area (% of Lot Area)	42.06%	10.00%
Min. Landscape Area (SM)	*171,961.27m²*	*28,580.46m²*
Min. Front Landscape Buffer (m)	12.00	7.00
Min. Ext. Side (N) Landscape Buffer (m)	42.28	7.00
Min. Int. Side (S) Landscape Buffer (m)	6.29	0.00
Min. Rear Landscape Buffer (m)	70.07	0.00
Min. Landscape Buffer (m) - Abutting EPA > 6m width	70.07	-

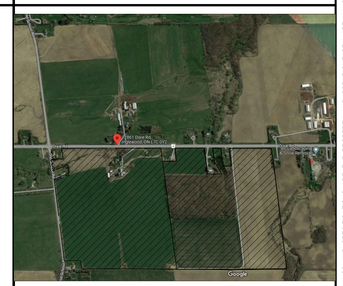
Parking Calculations	**Proposed**	**Required**
BUILDING 3		
@168 + 1/170m² of Net Floor Area over 20,000 m²	1698	1732
Total no. of Parking Spaces	**1698**	**1732**
(Including Accessible Parking Spaces)		
Accessible Parking Spaces		
@More than 1000 parking spaces is 11 plus 1% of total spaces		
BUILDING 3		
@More than 1000 parking spaces is 11 plus 1% of total spaces	28	28
Total no. of Accessible Parking Spaces	**28**	**28**
	8 Type - A	*14 Type - A*
	20 Type - B	*14 Type - B*
Parking Stall Dimensions	*STANDARD: 2.75m X 5.5m w/1.3m Aisle*	
	ACCESSIBLE: TYPE A - 3.35m X 5.5m	
	TYPE B - 2.44m X 5.5m w/ 1.5m access aisle on either side	

Proposed Trailer Parking	**Proposed**	**Required**
BUILDING 3	394	-
Total no. of Trailer Parking Spaces	**394**	-

Loading Space Calculations	**Proposed**	**Required**
BUILDING 3	58	33
@3 + 1 per 9300 m² in excess of 7441 m² of Net Floor Area		
Total no. of Loading Spaces	**58**	**33**
Min. Loading Space Dimensions	*3.5m(W) X 14.0m(L) X 3.35m(H)*	

SITE LEGEND

- NEW HEAVY DUTY PAVEMENT (HATCHED)
- LANDSCAPE AREA
- DETECTIBLE TACTILE WARNING SURFACE, CONFORMING TO 2012 O.B.C.
- FIRE ACCESS ROUTE WITH 12.5M TURNING RADIUS
- TRUCK LOADING DOCK DOOR
- KNOCK OUT PANEL
- MAN DOOR ENTRY
- EXIT DOOR LOCATION
- FIRE DEPT CONNECTION (VERIFY LOCATION WITH CIVIL DRAWINGS)
- PROPOSED FIRE HYDRANT (VERIFY LOCATION WITH CIVIL DRAWINGS)
- EXISTING FIRE HYDRANT (VERIFY LOCATION WITH CIVIL DRAWINGS)
- D.C. 1500mm WIDE DEPRESSED CURB FOR ACCESSIBLE PARKING AND PEDESTRIAN ACCESS – REFER TO DETAIL 4/A1.2
- PROPOSED CATCHBASIN
- MH DENOTES MANHOLE
- WHP/HP EXISTING HYDRO POLE
- CP PAINTED CARPOOL PARKING SPACE SYMBOL
- BFPS BARRIER FREE PARKING SIGN
- BFPSV BARRIER FREE PARKING SIGN WITH VAN TAB
- DRIVE–IN DOOR
- STOP NEW STOP SIGN
- F.R. NEW FIRE ROUTE SIGN
- GM GAS METER & PRESSURE REGULATING STATION BY GAS COMPANY
- LIGHT FIXTURES, REFER ELECTRICAL DWG FOR DETAILS
- LIGHT POLES, REFER ELECTRICAL DWG FOR DETAILS



VICINITY MAP
SCALE: NOT TO SCALE

WARE MALCOMB
6020 Highway 7, Suite 300
Vaughan, ON L4H 0R1, Canada
P 905.760.1221
ARCHITECTURE CIVIL ENGINEERING
PLANNING BRANDING
INTERIORS BUILDING MEASUREMENT

ONTARIO ASSOCIATION OF ARCHITECTS
AMANDA ALVARO SANABRIA
LICENCE 7712

QUADREAL PROPERTY GROUP &
TRIBAL PARTNERS CANADA INC.
12668 & 12862 DIXIE ROAD
CALEDON, ONTARIO CANADA

SITE PLAN

NO.	DATE	REMARKS
1	2023-12-12	ISSUED FOR COORDINATION

PA / PM: AS
DRAWN BY: JS
JOB NO.: TOR23-0063-00

SHEET
A100

Appendix B

Borehole Logs

Abbreviations and Symbols

Boreholes MW101-20 to MW157-21

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

Sample Types

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

Soil Tests

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

Penetration Resistance

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

Soil Description

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

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

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

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

ID Number: 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

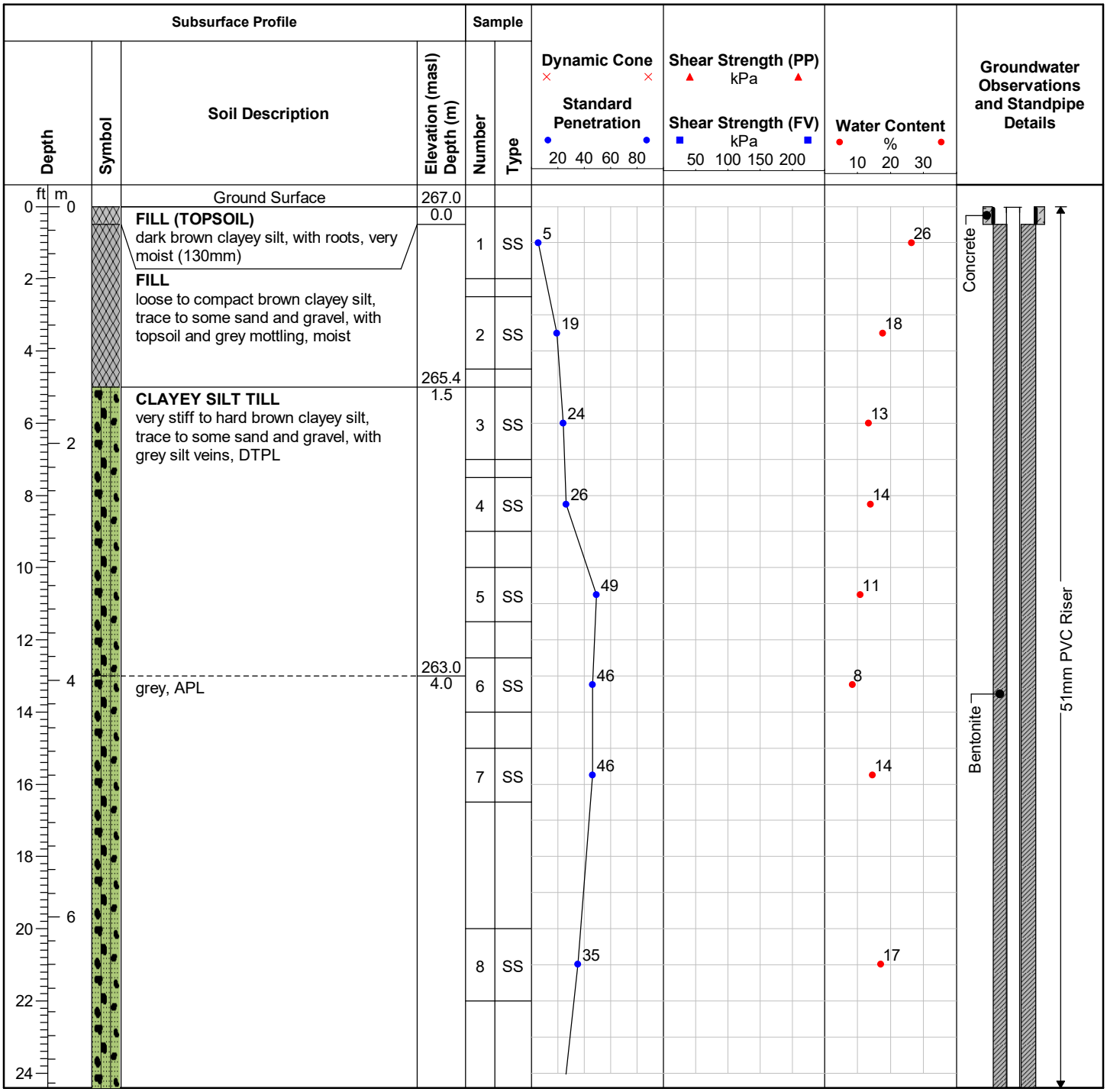
Drill Date: 10/29/2020

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

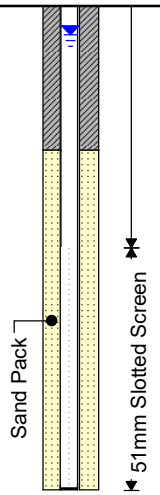
Drilling Contractor: Tri-Phase Group

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	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %	Groundwater Observations and Standpipe Details
			259.3 / 7.6						
26	8	sand seams		9	SS	20		10	
28				10	SS	29		10	
30			257.8 / 9.1						
		SILT AND SAND TILL compact to very dense grey silt and sand, some clay, trace gravel, very moist		11	SS	19		10	
32			257.1 / 9.9						
34	10	wet		12	SS	96/180mm		10	
36			256.3 / 10.7						
		SANDY SILT TILL very dense sandy silt, some clay and gravel, wet		13	SS	50/125mm		9	
38				14	SS	50/75mm		13	
40	12		254.9 / 12.0						
		Drilling Terminated							
42									
44									
46	14								
48									



Field Technician: MBC

Drafted by: B. Graul

Reviewed by: B. Thorner

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

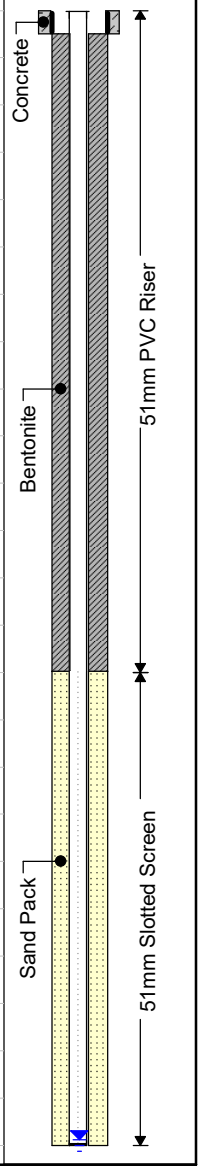
Protective Cover: N/A

Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Standard Penetration (Dynamic Cone)	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %
0 / 0	Ground Surface	267.6					
	CONCRETE Concrete: 150mm	0.0					
	PAVEMENT STRUCTURE ASPHALT: 150mm		1	SS	10		
	FILL grey clayey silt, trace sand, DTPL	266.6 / 0.9					
2 / 0	brown, sandy silt, trace gravel, trace asphalt, moist		2	SS	25		
4		265.9					
6 / 2	**CLAYEY SILT TILL** brown clayey silt, trace to some sand and gravel, DTPL	1.7	3	SS	27		
8	sand seam	265.0 / 2.6	4	SS	26		
10		264.3					
12 / 4	**SANDY SILT TILL** brown sandy silt, trace to some clay, moist	3.3 / 263.7	5	SS	71		
14	**CLAYEY SILT TILL** grey clayey silt, trace sand and gravel, DTPL to APL	3.8	6	SS	20		
16		262.8					
	SANDY SILT TILL brown sandy silt, some clay, very moist	4.8	7	SS	24		
18			8	SS	142		
		261.8					
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	117		

Standard Penetration: 20 40 60 80

Shear Strength kPa: 50 100 150 200

Water Content %: 10 20 30



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	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %	Groundwater Observations and Standpipe Details
Depth	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	20 40 60 80	50 100 150 200	10 20 30	
			259.9						
26 — 8		**SILT** grey silt, some clay, wet	7.6	11	SS	59			
		Drilling Terminated	259.3 8.2						
28									
30									
32 — 10									
34									
36									
38									
40 — 12									
42									
44									
46 — 14									
48									

Field Technician: SKC

Drafted by: SKC

Reviewed by: B. Thorner

MTE

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

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)
		Ground Surface	268.0					
0 / 0		**FILL (TOPSOIL)** dark brown clayey silt, with rootlets, very moist (80mm)	0.0	1	SS	13		13
		FILL stiff brown clayey silt, some sand, trace gravel, with rootlets, moist	267.3 / 0.8					
4		very dense light brown sandy silt, some gravel, with black plastic pieces (drainage tile) and wood pieces, moist		2	SS	68		4
			266.5 / 1.5					
6 / 2		**CLAYEY SILT TILL** hard brown clayey silt, trace to some sand and gravel, DTPL		3	SS	32		12
8				4	SS	52		
10				5	SS	31		12
12 / 4			264.1					
		SANDY SILT TILL very dense brown sandy silt, trace clay, moist	3.9	6	SS	64		15
14			263.7 / 4.3					
		CLAYEY SILT TILL hard grey clayey silt, trace to some sand and gravel, APL		7	SS	51		8 16
16		**SILTY SAND** very dense brown silty sand, trace clay, wet						
18								
20 / 6			261.9					
		SAND dense grey/brown sand, some silt and gravel, wet	6.2	8	SS	34		12 17
22		**SANDY SILT TILL** dense grey sandy silt, trace to some clay, trace gravel, wet						
24								

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

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

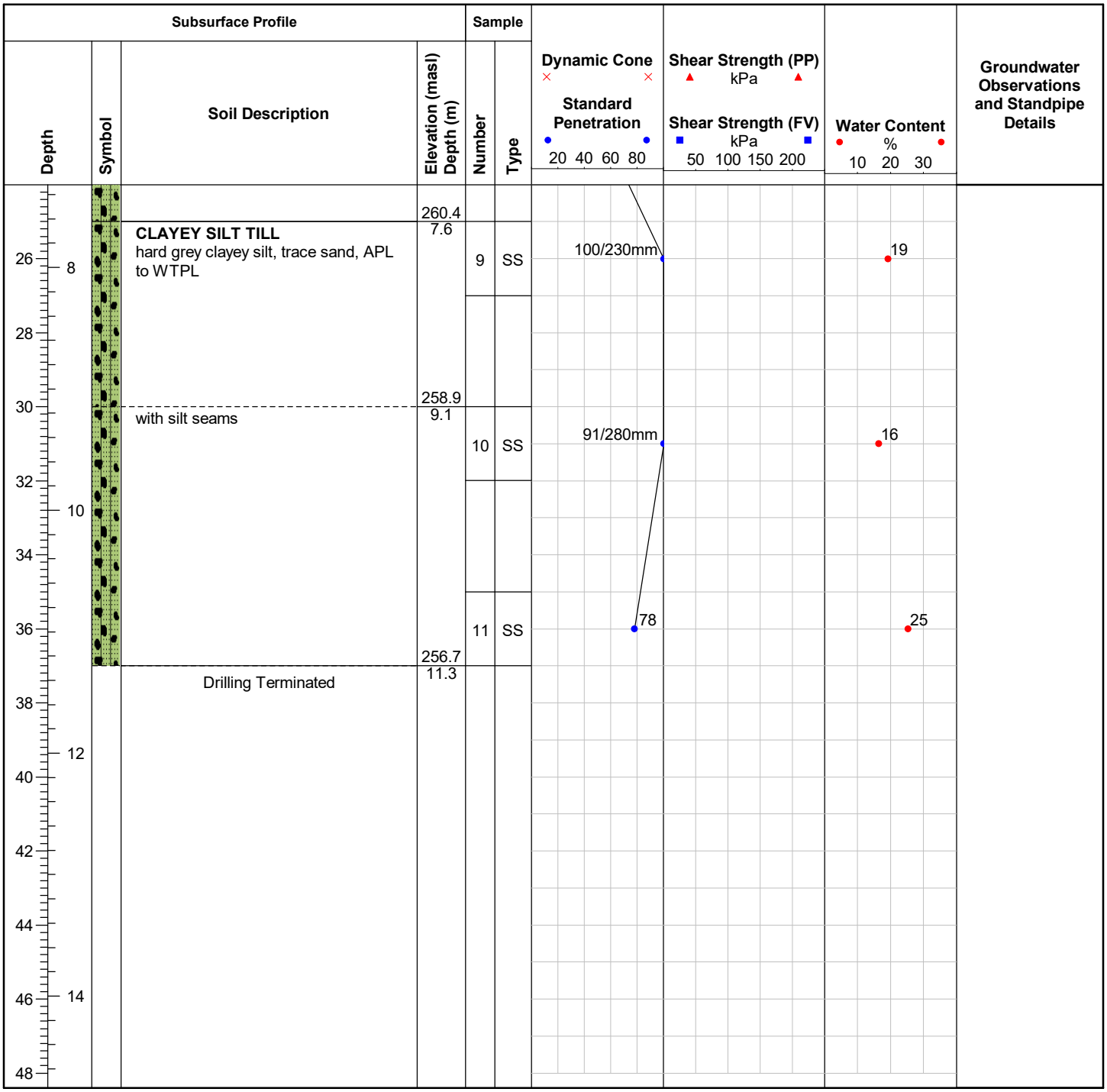
Drill Date: 10/19/2020

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

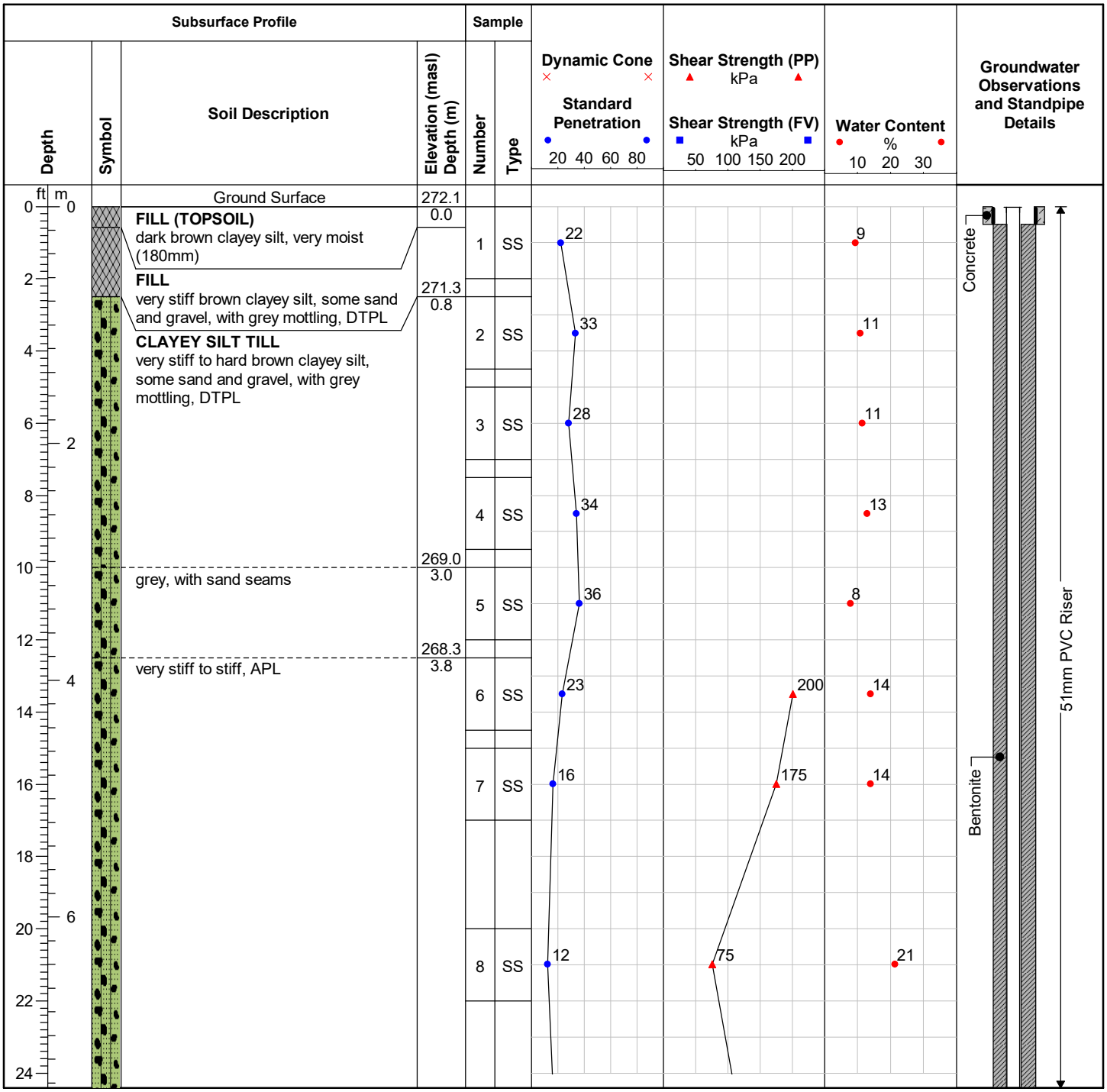
Drill Date: 10/21/2020

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

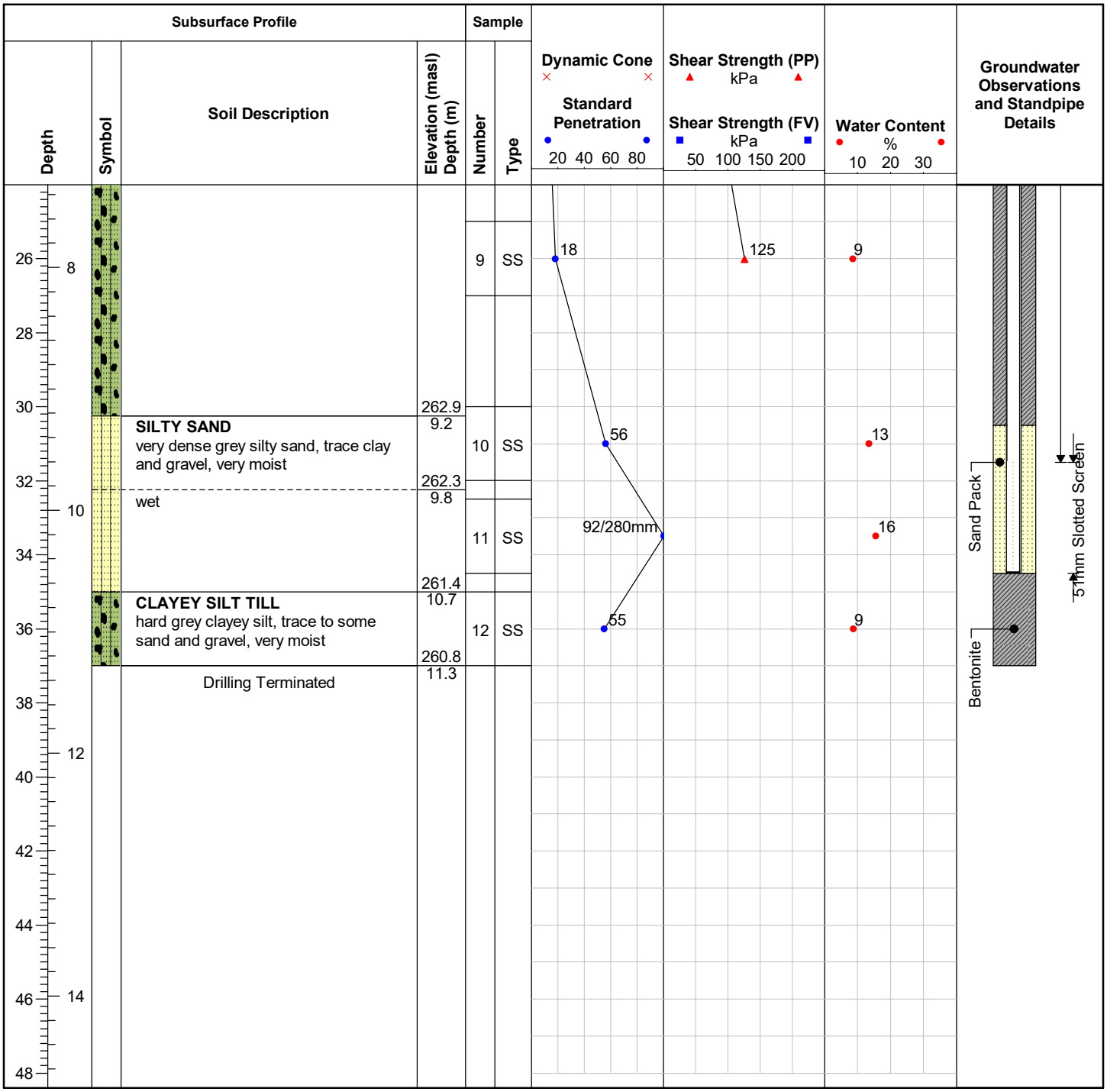
Drill Date: 10/21/2020

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

MTE

Sheet: 2 of 2

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

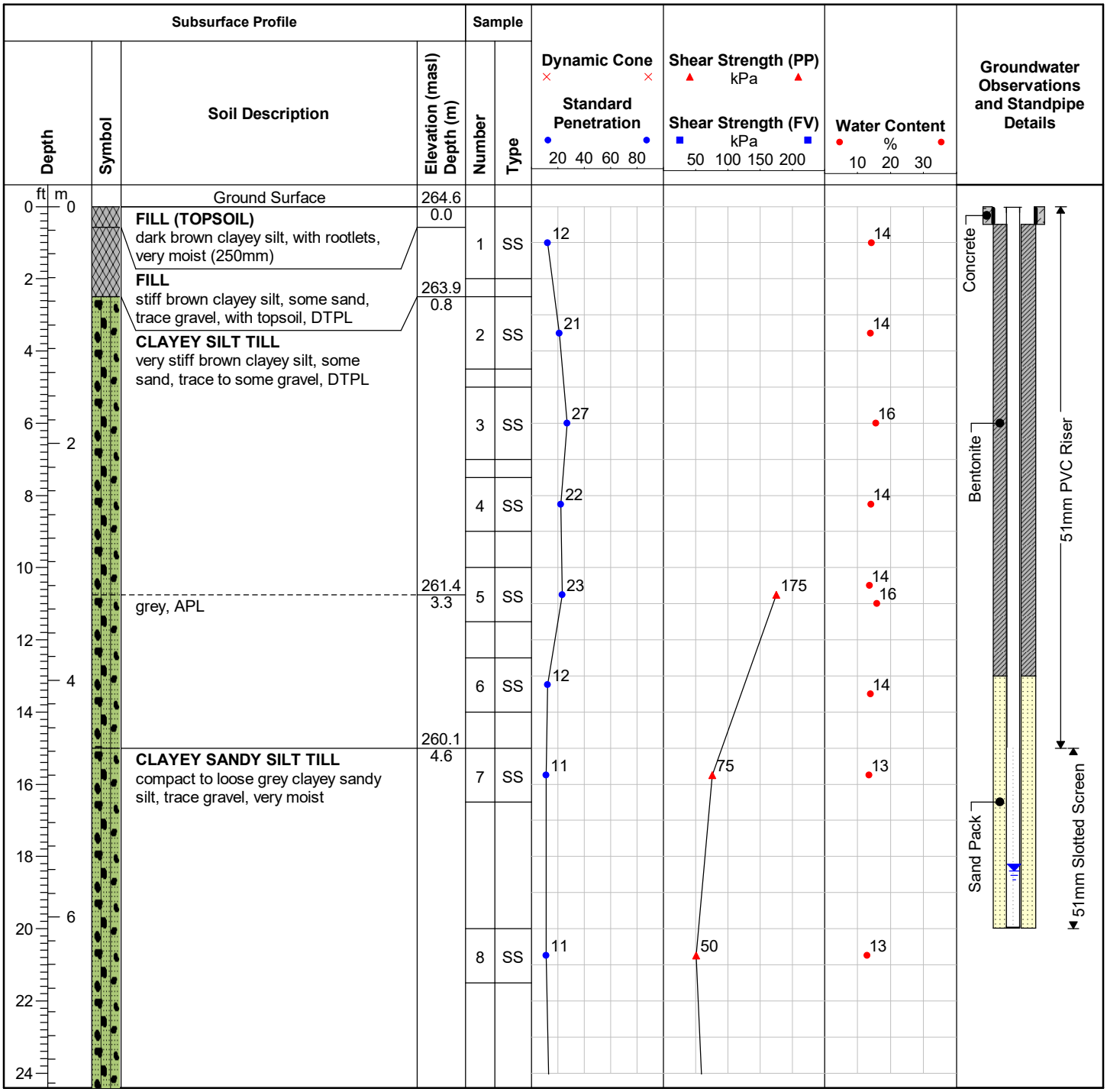
Drill Date: 10/28/2020

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

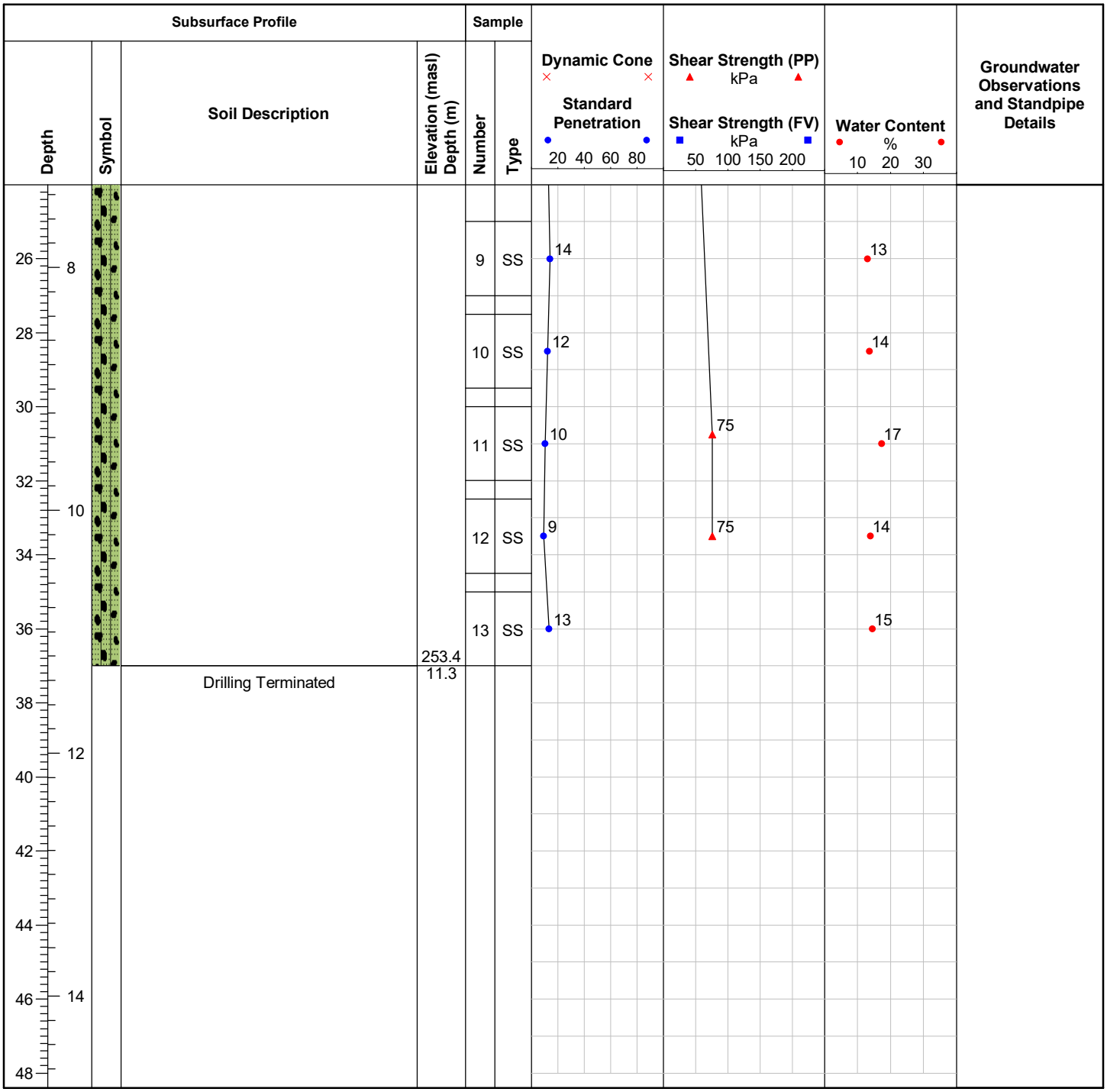
Drill Date: 10/28/2020

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

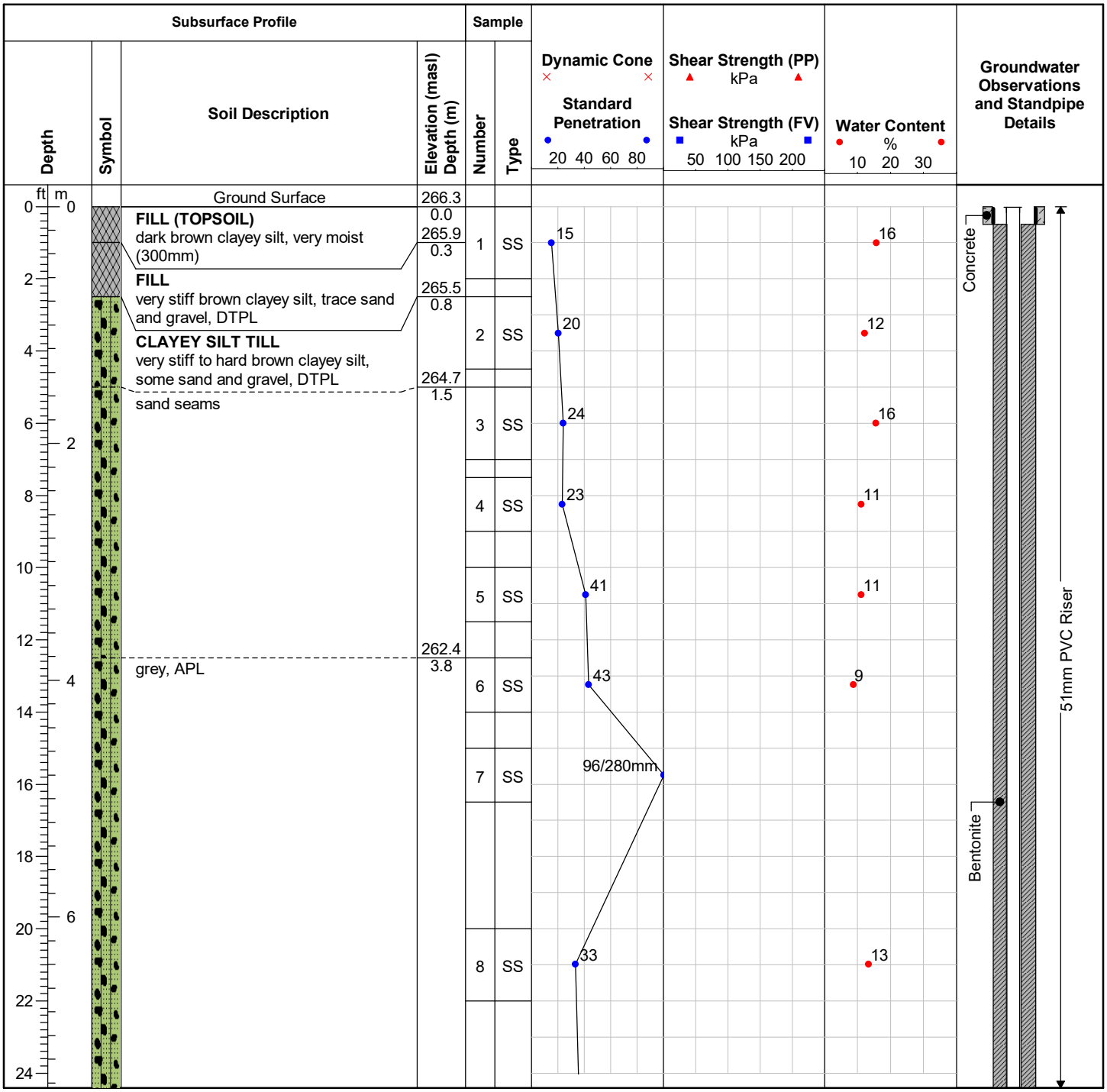
Drill Date: 10/28/2020

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

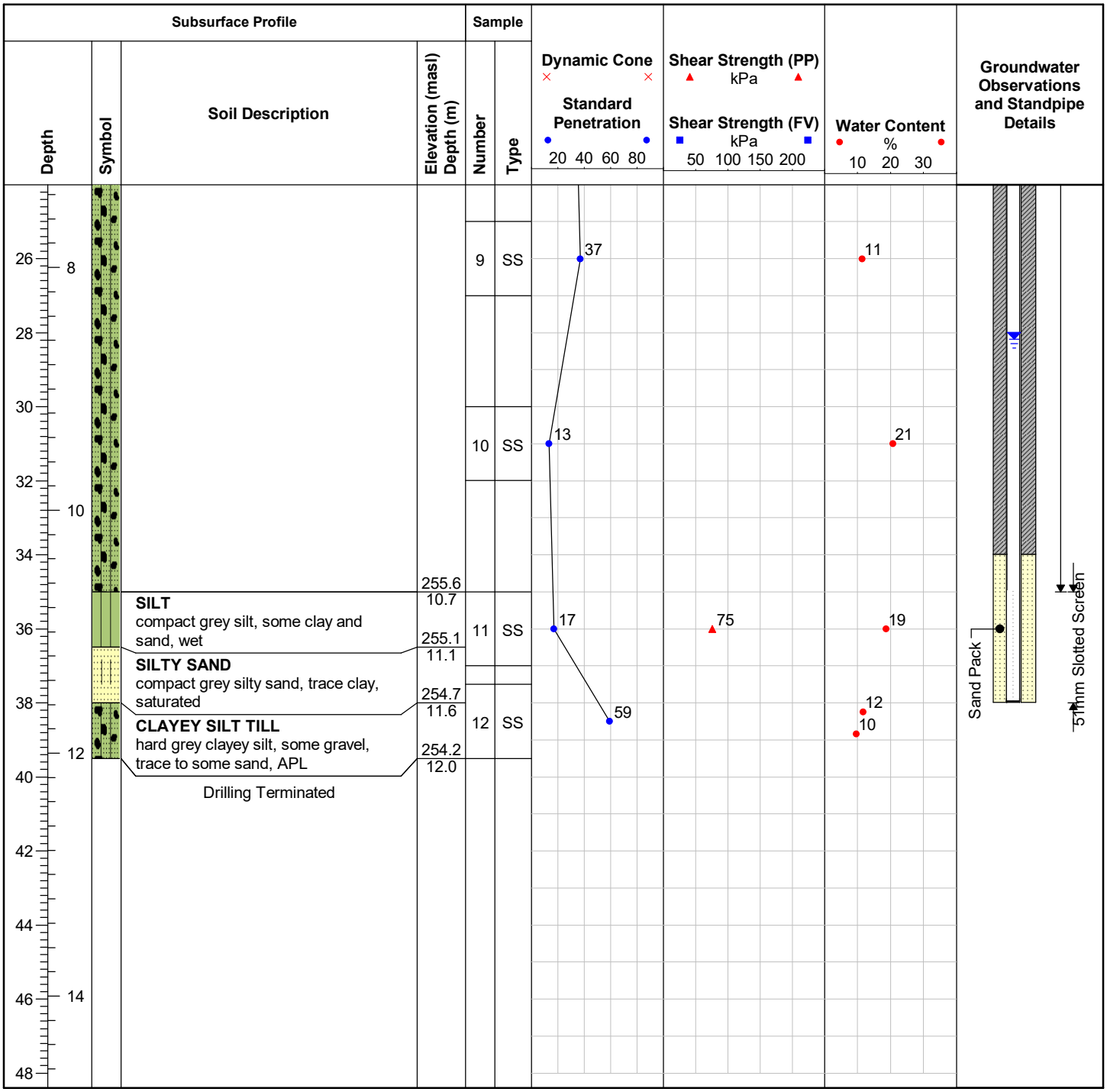
Drill Date: 10/28/2020

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

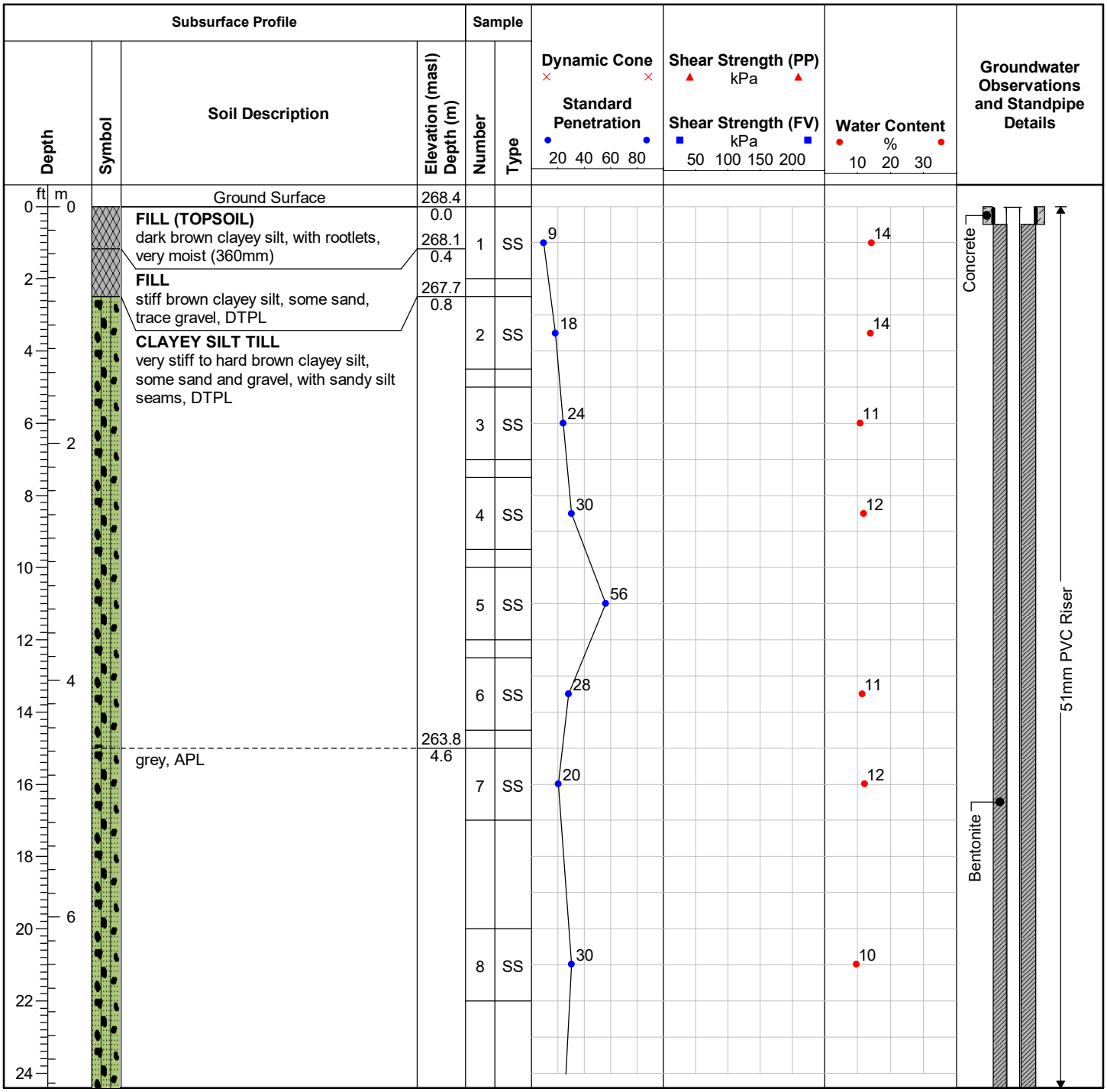
Drill Date: 10/26/2020

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

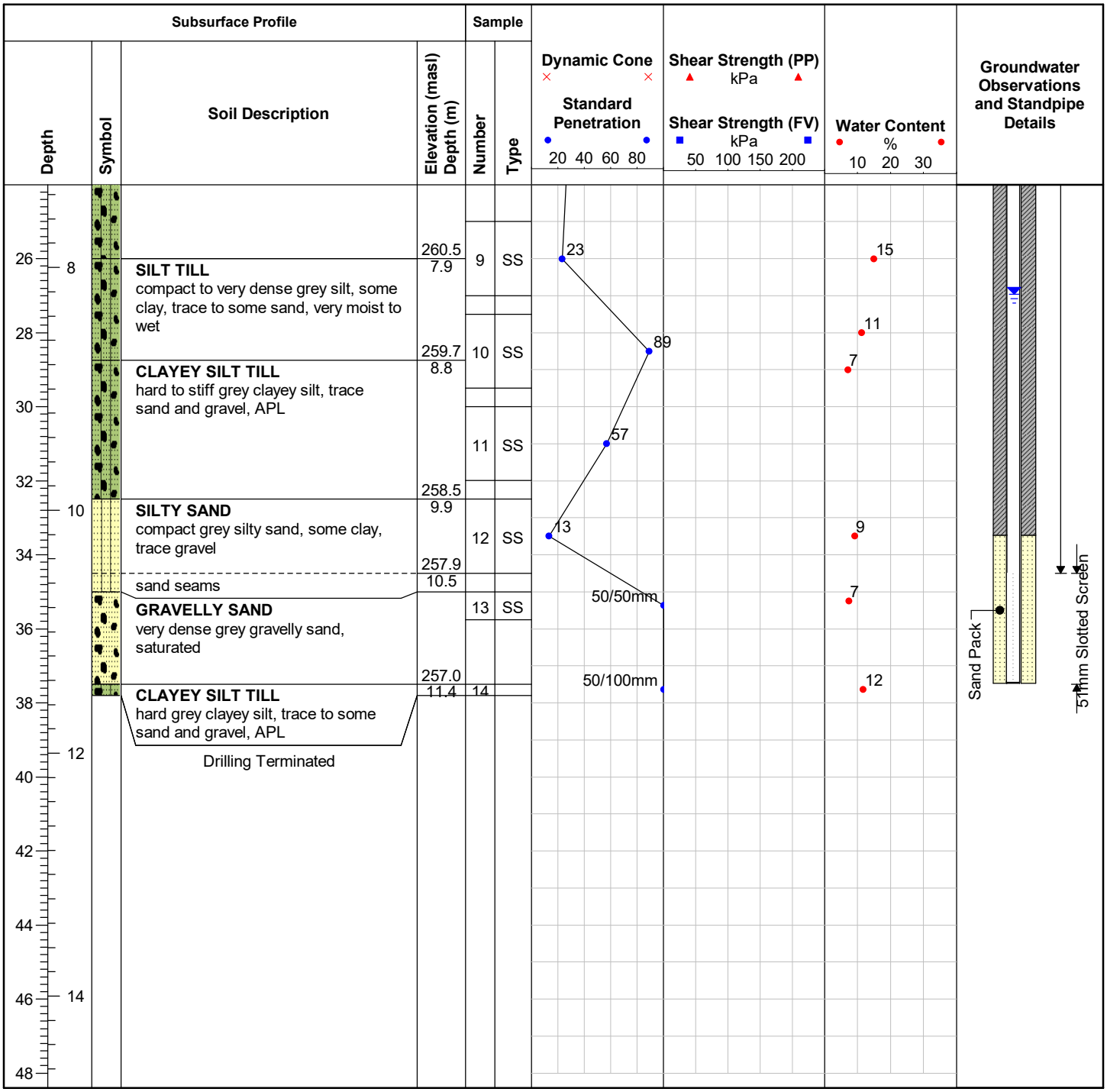
Drill Date: 10/26/2020

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

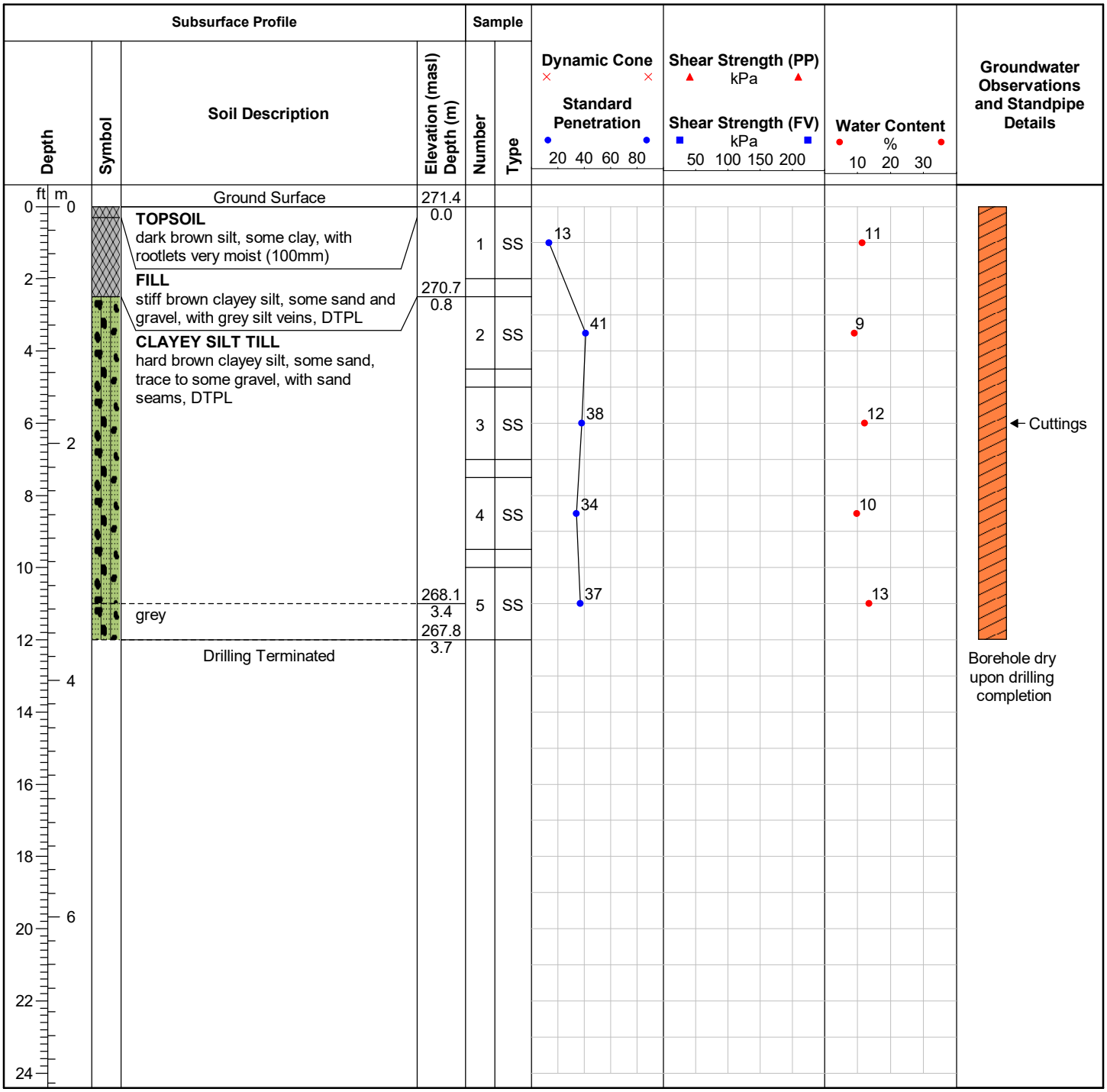
Drill Date: 10/20/2020

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

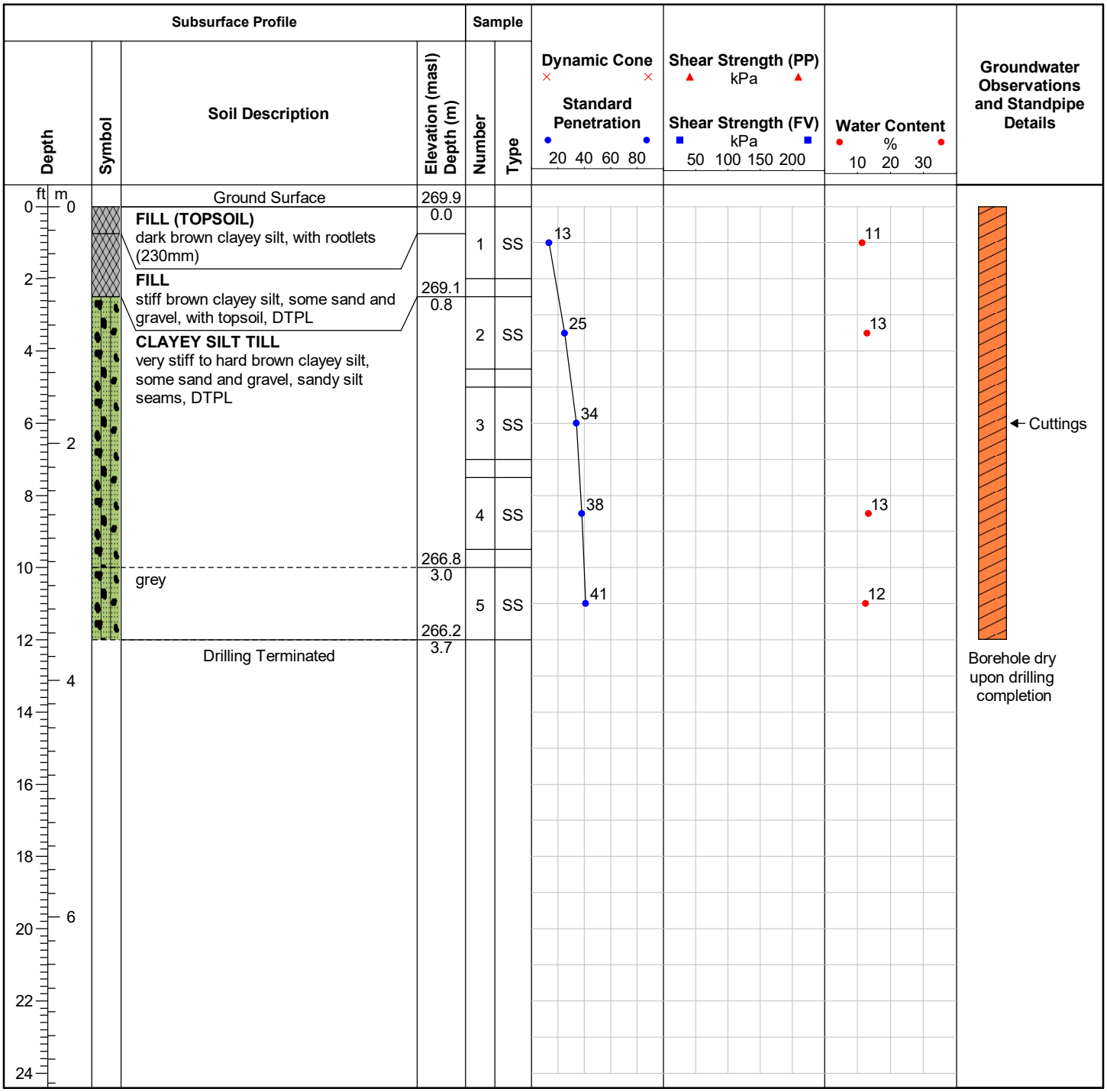
Drill Date: 10/19/2020

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

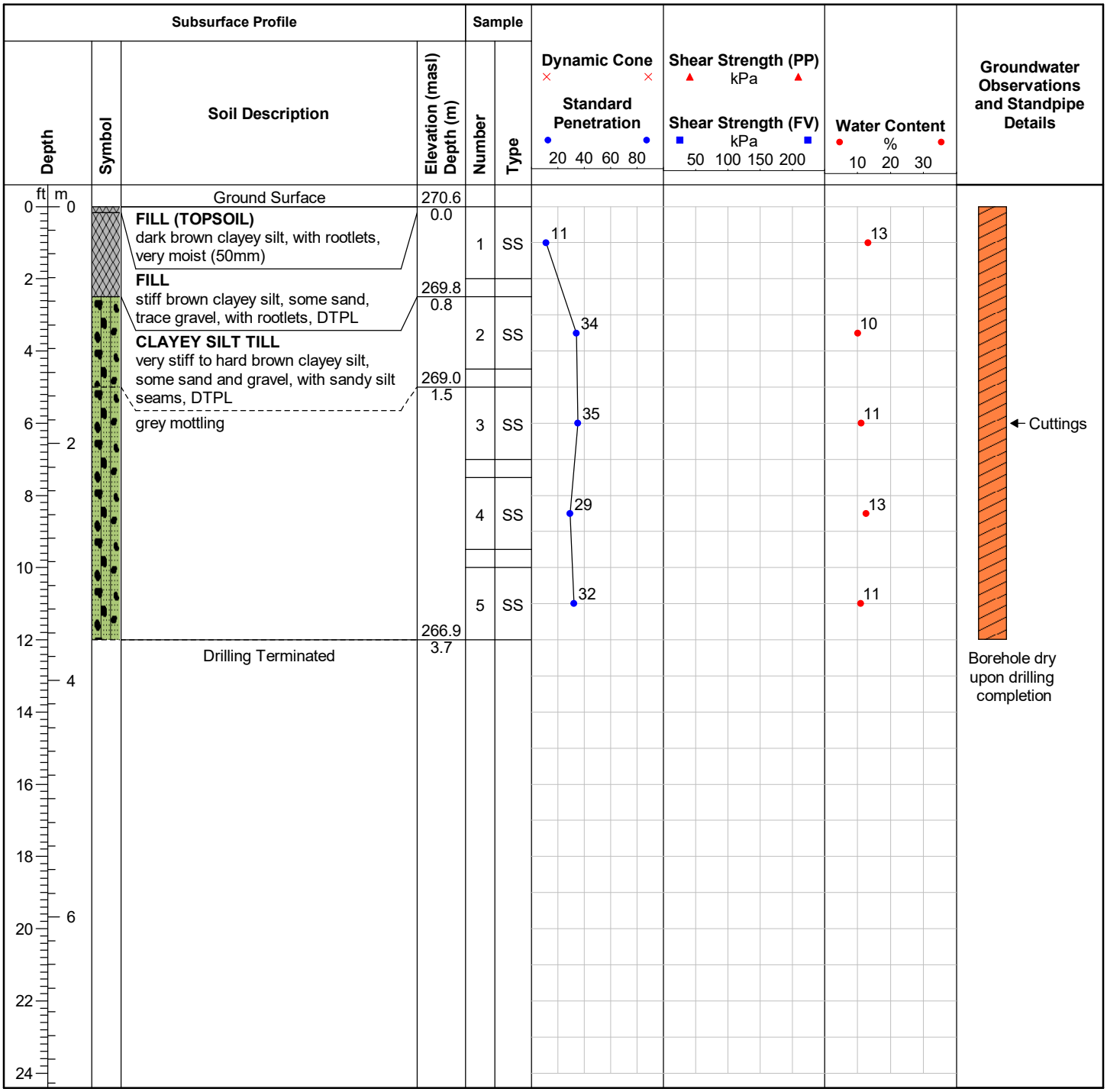
Drill Date: 10/19/2020

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

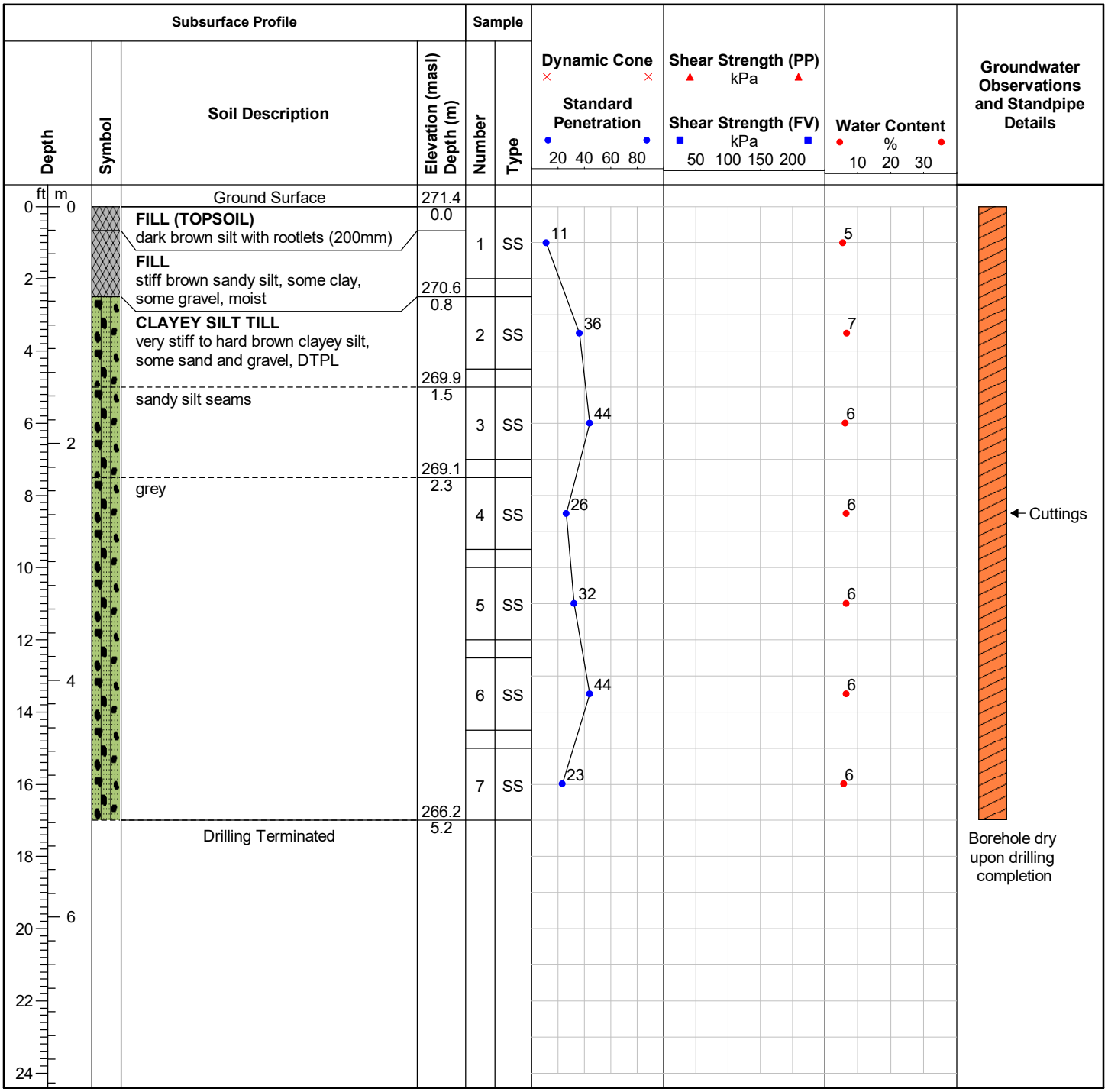
Drill Date: 10/20/2020

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

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

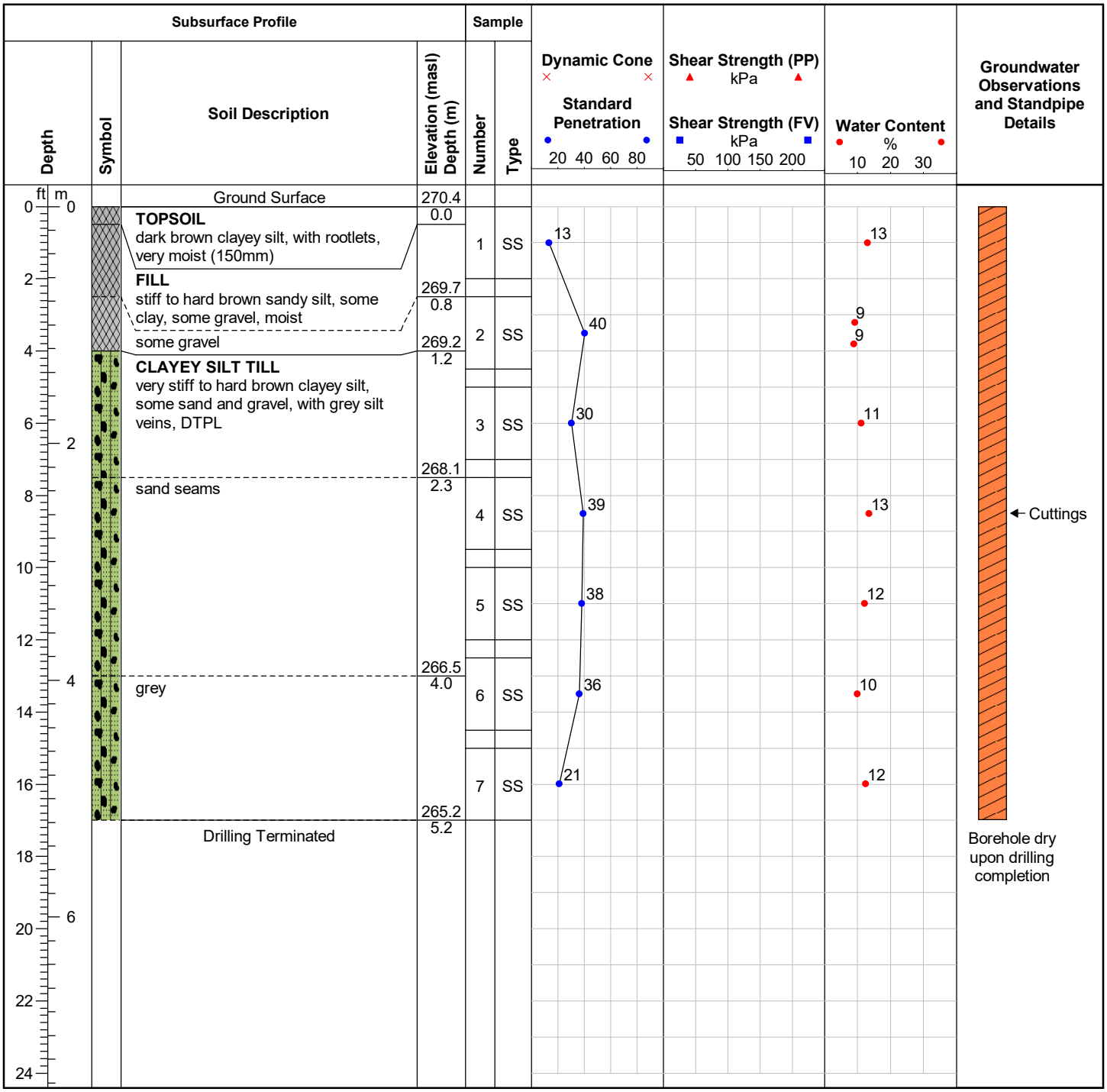
Drill Date: 10/20/2020

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

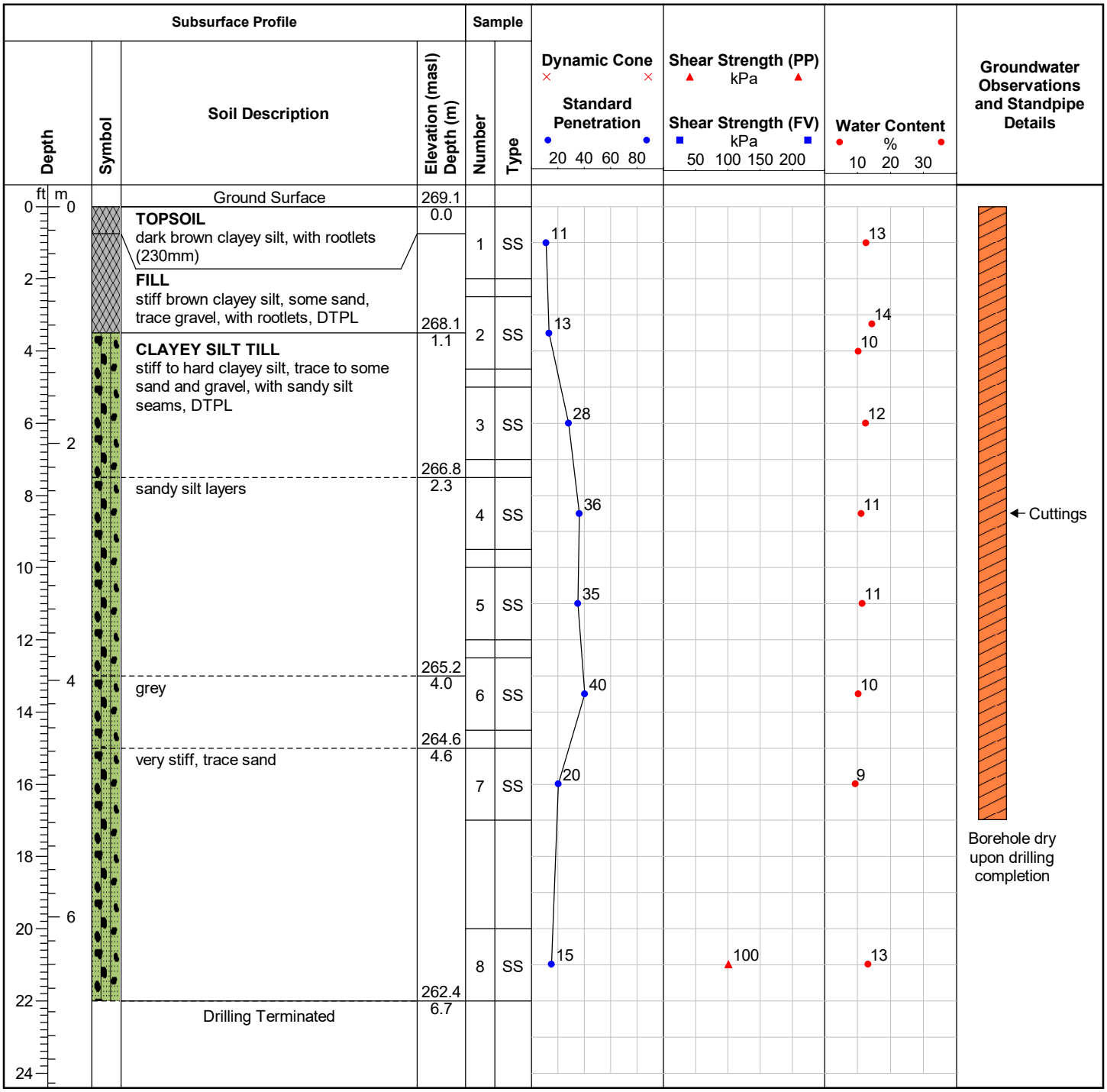
Drill Date: 10/20/2020

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	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %	Groundwater Observations and Standpipe Details
		Ground Surface	271.5						
0 / 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	← Cuttings
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						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: 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

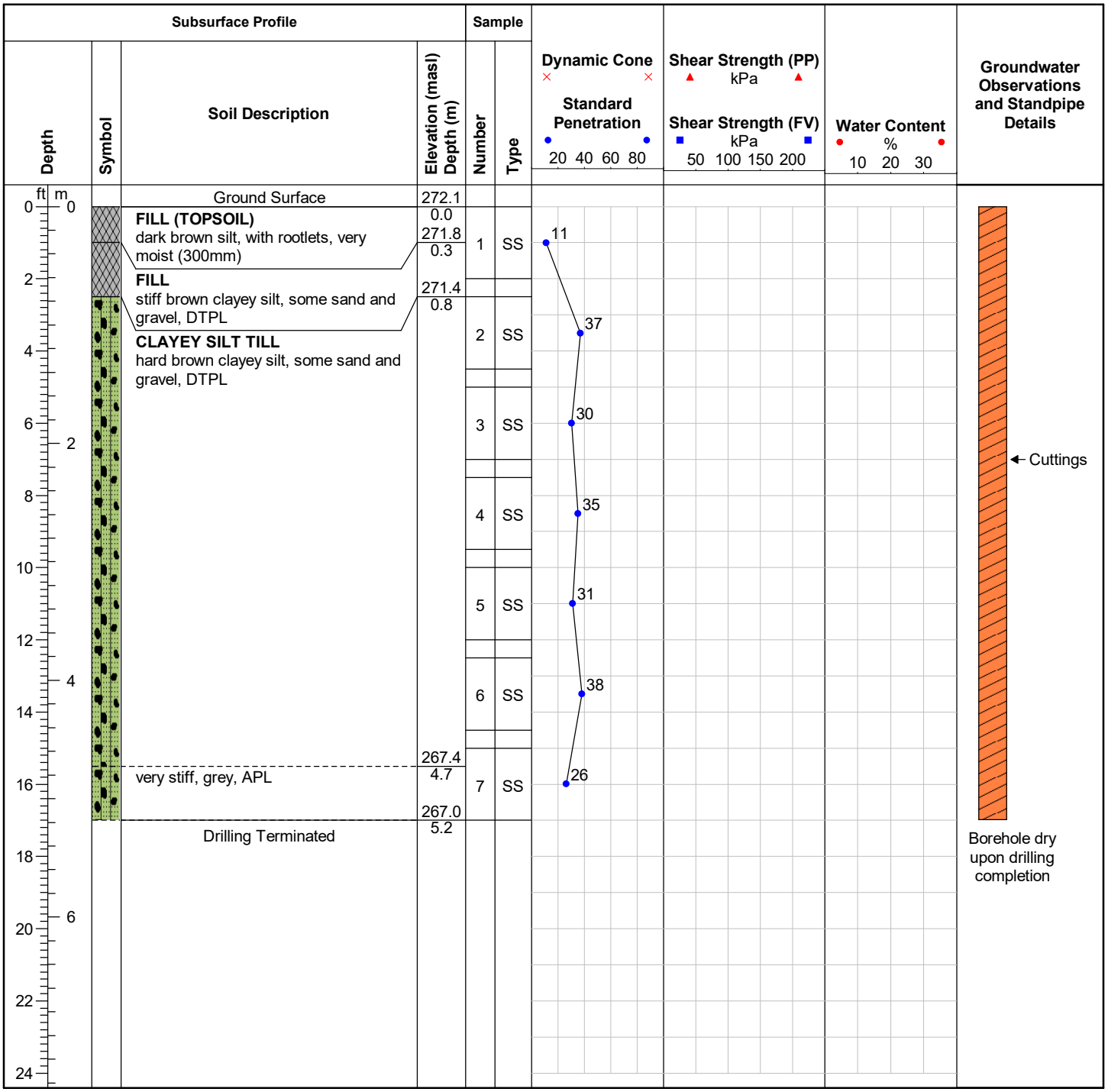
Drill Date: 10/21/2020

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

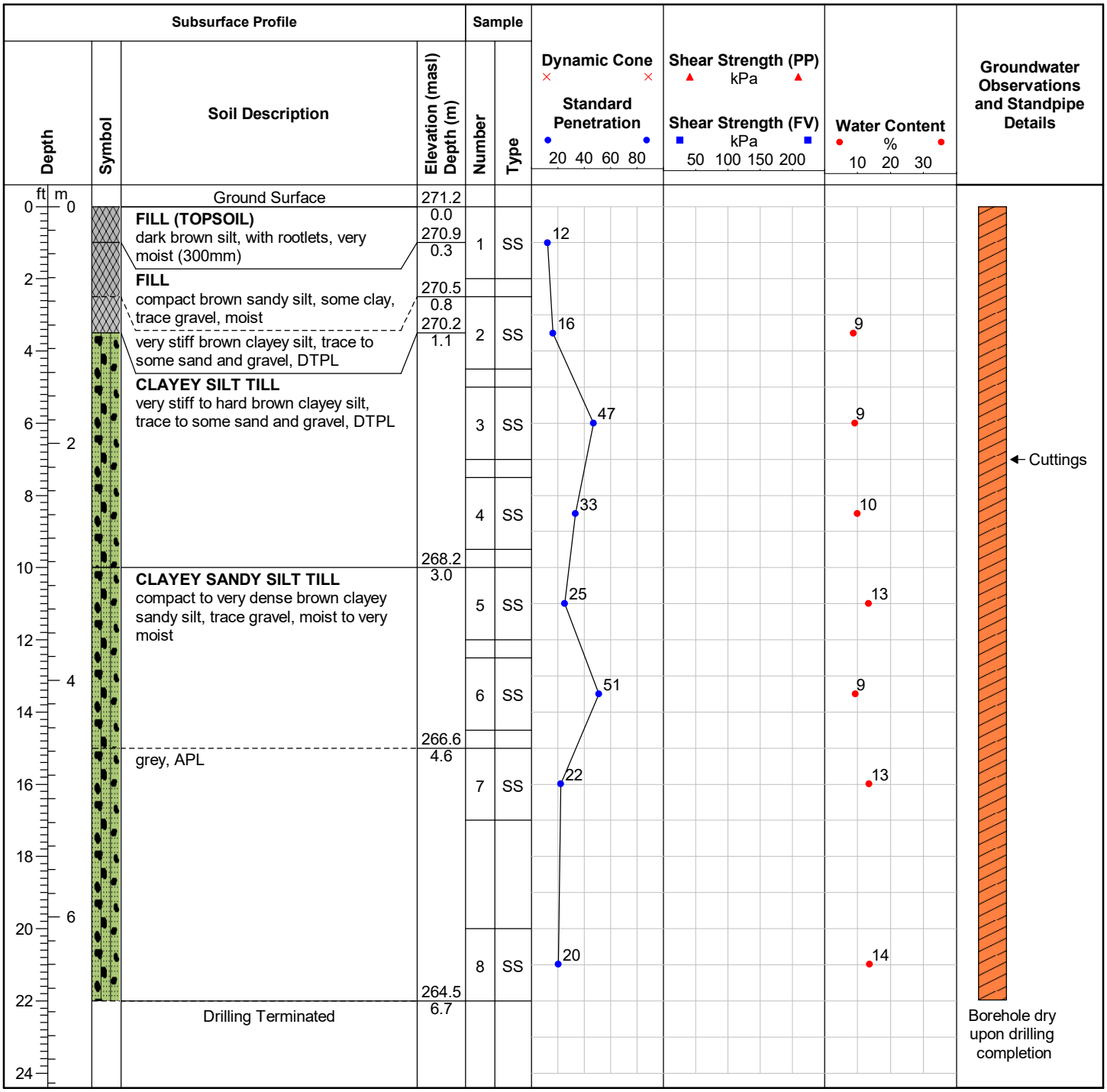
Drill Date: 10/21/2020

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

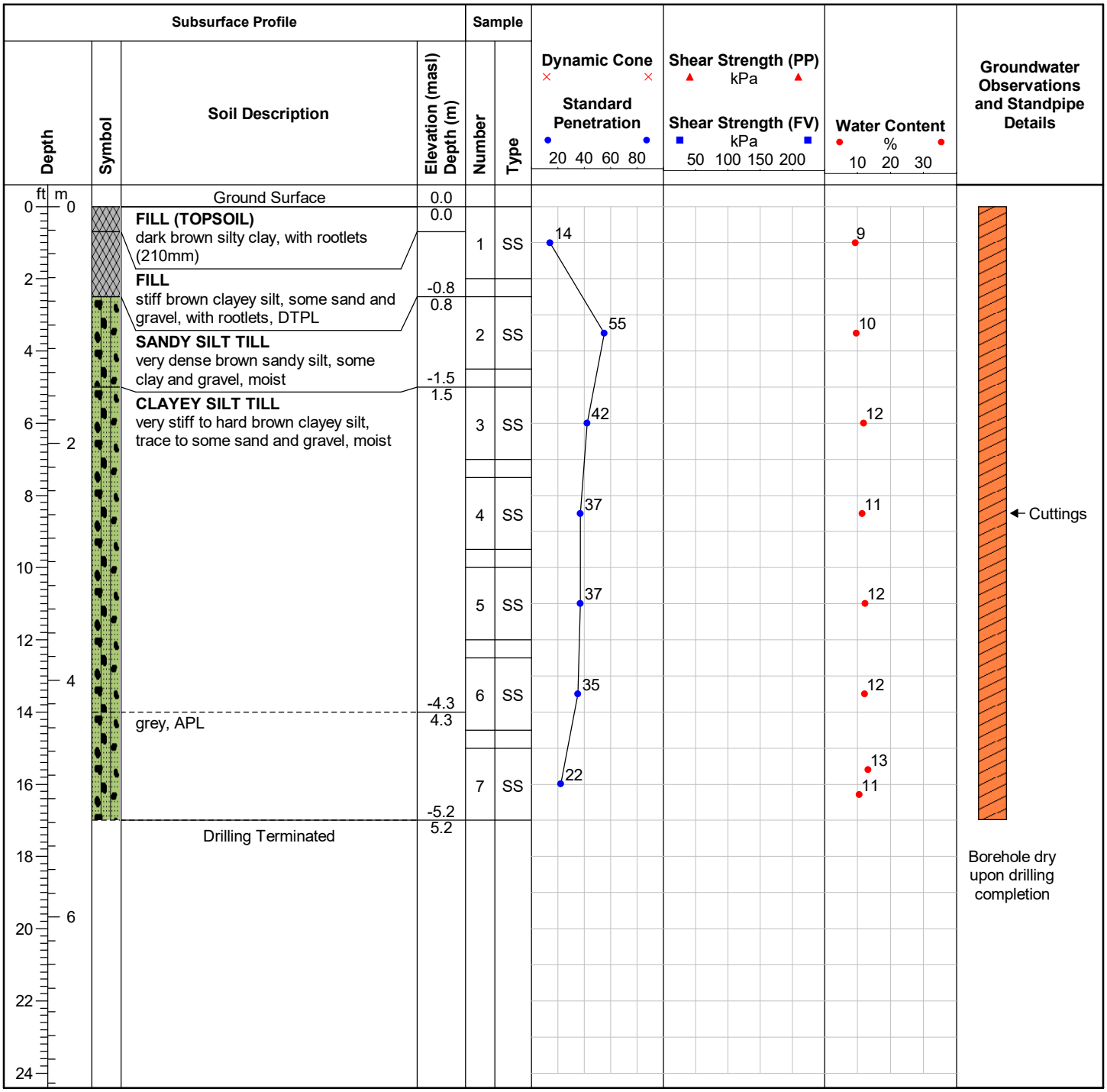
Drill Date: 10/22/2020

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

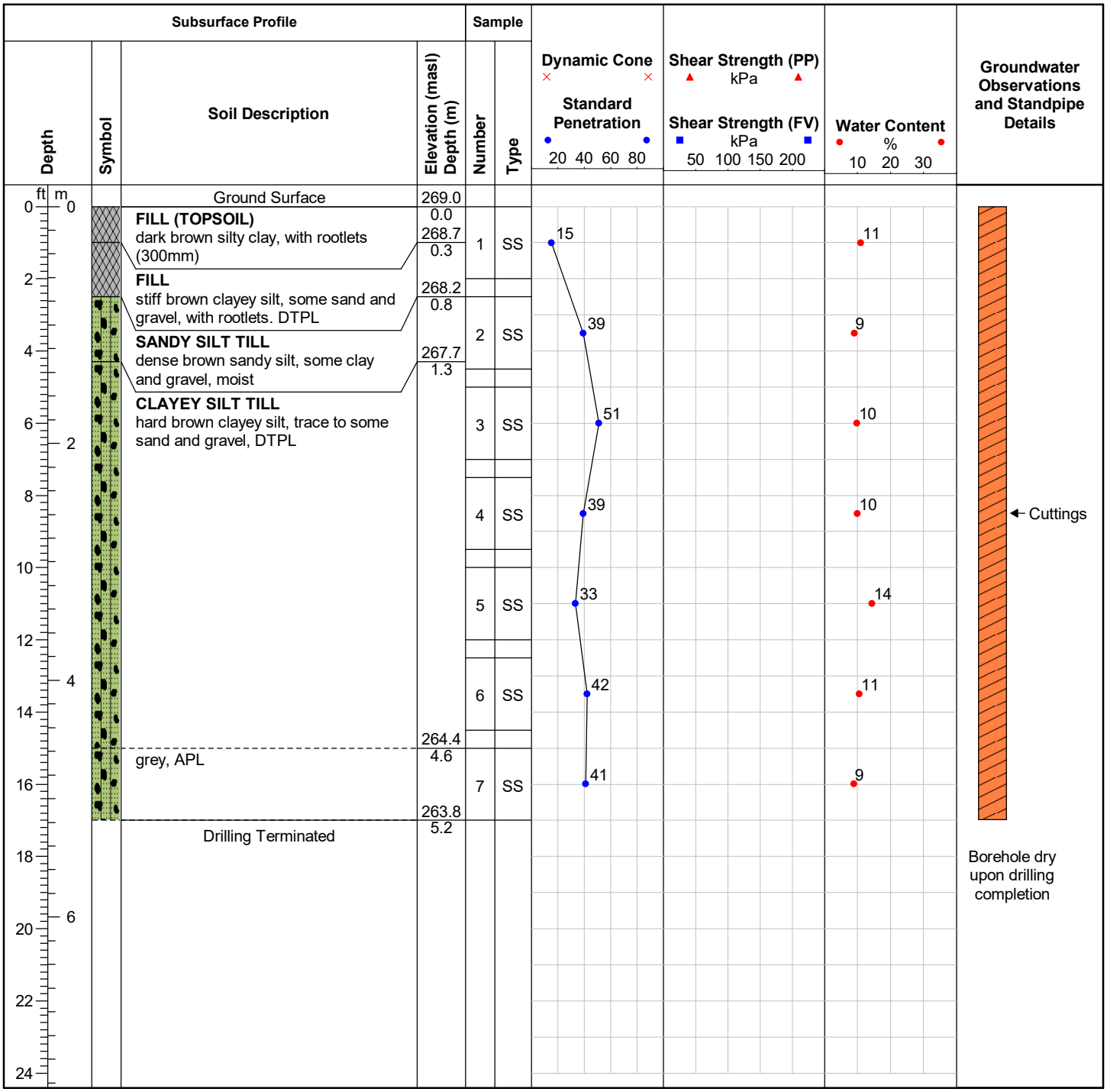
Drill Date: 10/22/2020

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

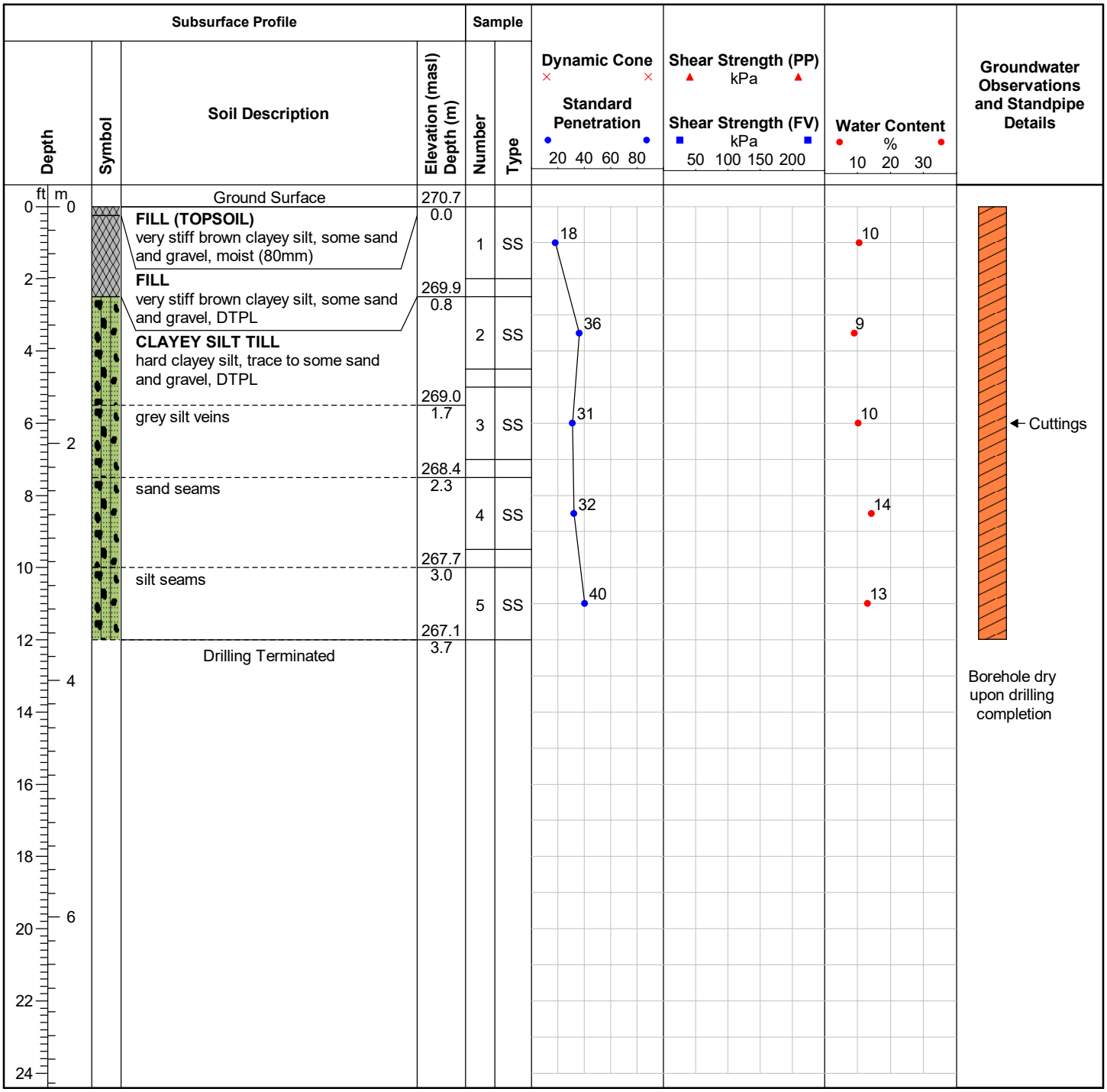
Drill Date: 10/22/2020

Drilling Contractor: Tri-Phase Group

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:



Field Technician: MBC

Drafted by: B. Graul

Reviewed by: B. Thorner

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

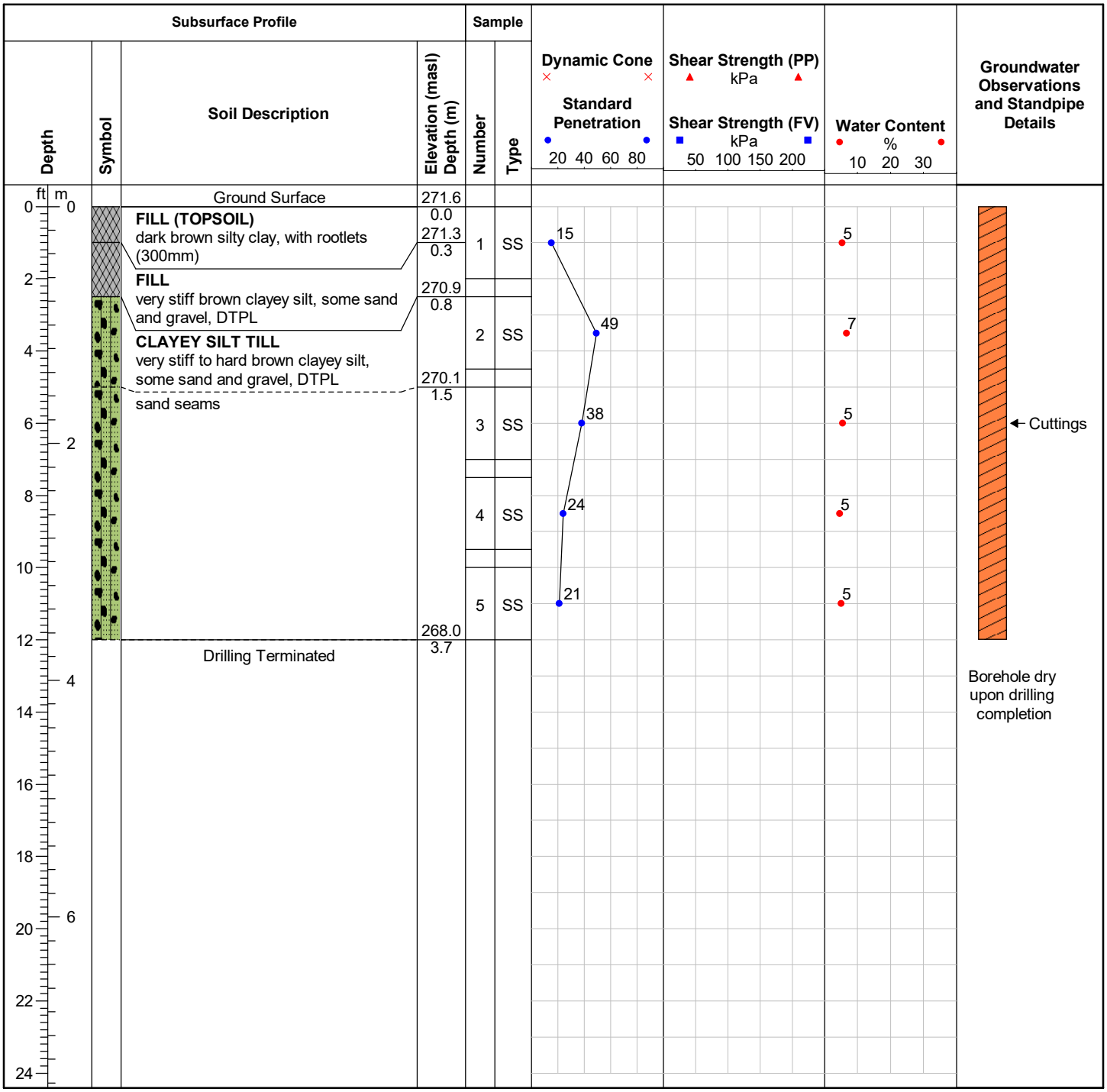
Drill Date: 10/22/2020

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						
		FILL (TOPSOIL) dark brown clayey silt, with rootlets (300mm)	0.0 / 269.0 / 0.3	1	SS	16		10	
2 ft / 0.6 m		**FILL** very stiff brown clayey silt, some sand and gravel, DTPL	268.5 / 0.8 / 268.2	2	SS	36		9	
4 ft / 1.2 m		**SANDY SILT TILL** dense brown sandy silt, some clay and gravel, with grey silt veins, moist	1.1						
6 ft / 1.8 m		**CLAYEY SILT TILL** hard to very stiff clayey silt, some sand and gravel, with grey silt veins, DTPL		3	SS	32		13	← Cuttings
8 ft / 2.4 m				4	SS	27		12	
10 ft / 3.0 m				5	SS	44		13	
12 ft / 3.7 m		Drilling Terminated	265.6 / 3.7						Borehole dry upon drilling completion
14 ft / 4.3 m									
16 ft / 4.9 m									
18 ft / 5.5 m									
20 ft / 6.1 m									
22 ft / 6.7 m									
24 ft / 7.3 m									

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

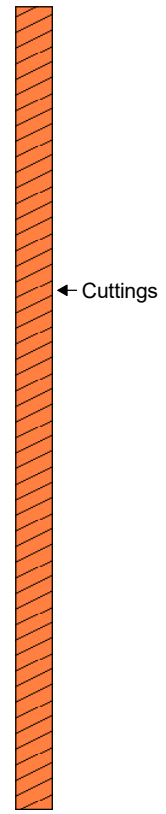
Drilling Contractor: Tri-Phase Group

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:

Depth (ft / m)	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)
	Ground Surface	271.0					
0	**FILL (TOPSOIL)** dark brown silty clay, with rootlets, (200mm)	0.0 / 270.5	1	SS	14		8, 10
2	**FILL** stiff brown clayey silt, some sand and gravel, APL	0.5 / 269.8	2	SS	51		9
4	**SANDY SILT TILL** very dense brown sandy silt, some clay and gravel, with grey silt veins, moist	1.2	3	SS	35		8
6	**CLAYEY SILT TILL** hard to very stiff brown clayey silt, trace to some sand and gravel, DTPL		4	SS	27		11
8			5	SS	33		9
10			6	SS	34		9
12	grey, APL	267.2 / 3.8	7	SS	23		10
14		265.8 / 5.2					
16	Drilling Terminated						
18							
20							
22							
24							



Groundwater Observations and Standpipe Details: Borehole dry upon drilling completion

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

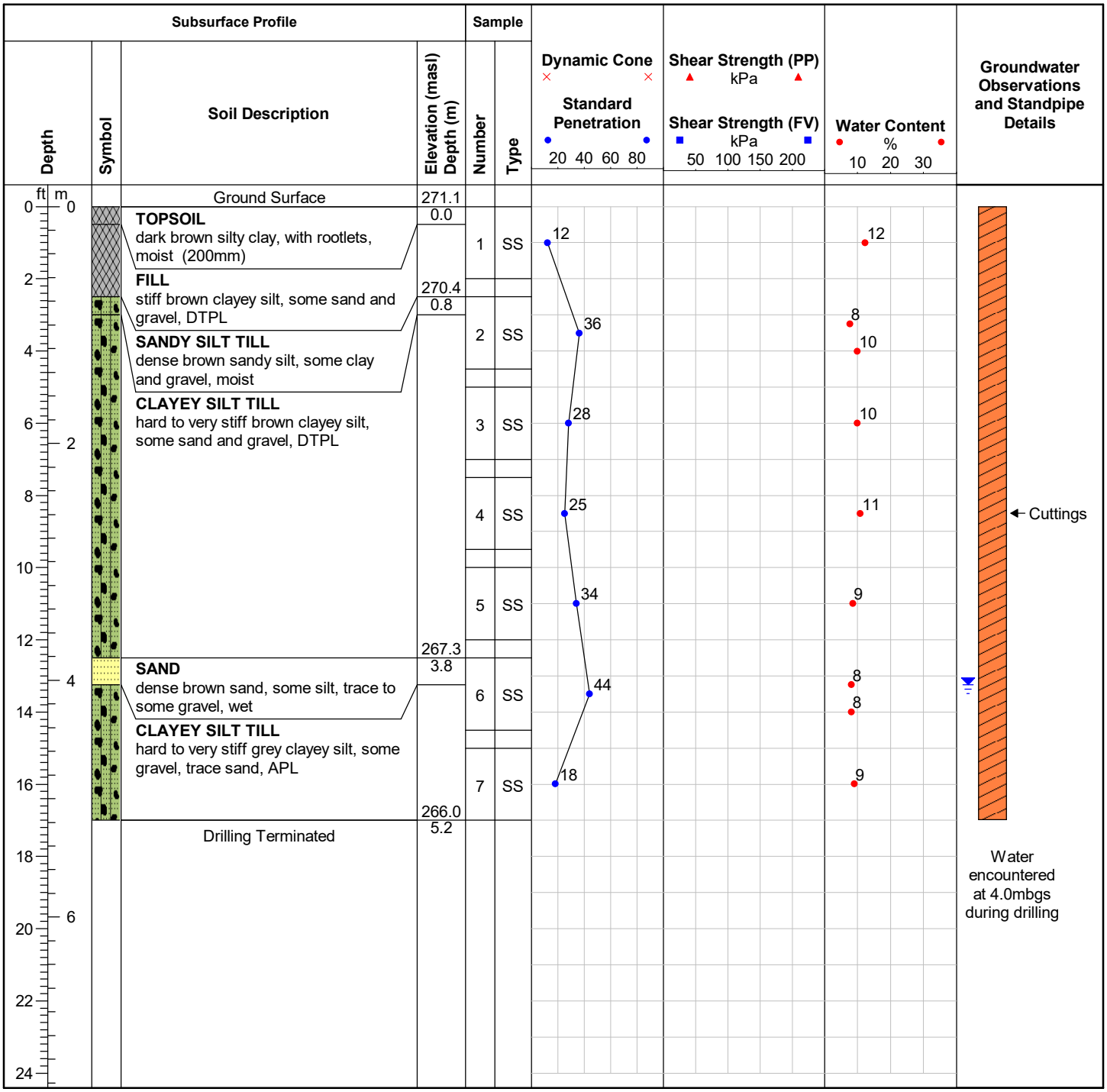
Drill Date: 10/22/2020

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

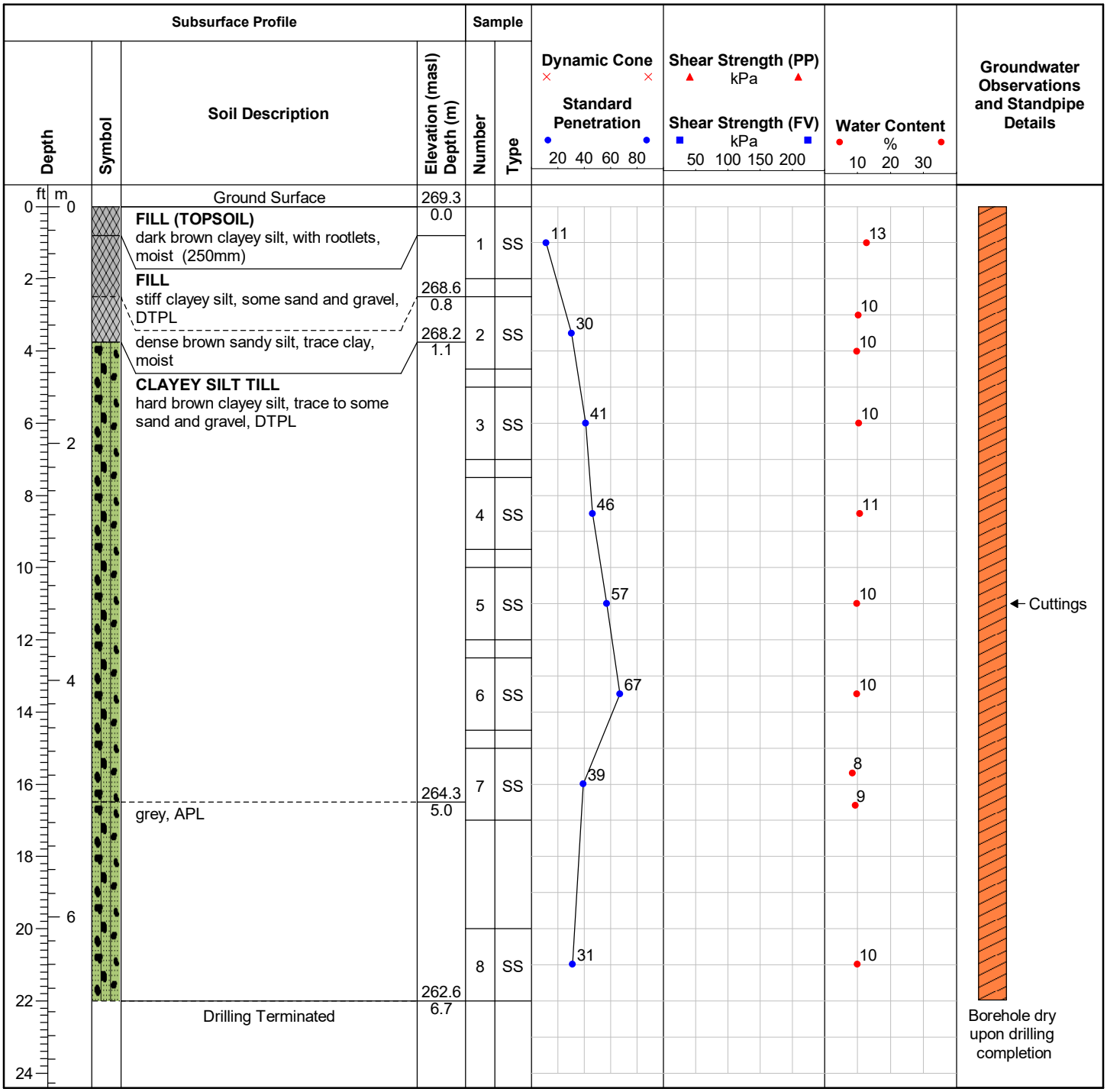
Drill Date: 10/20/2020

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

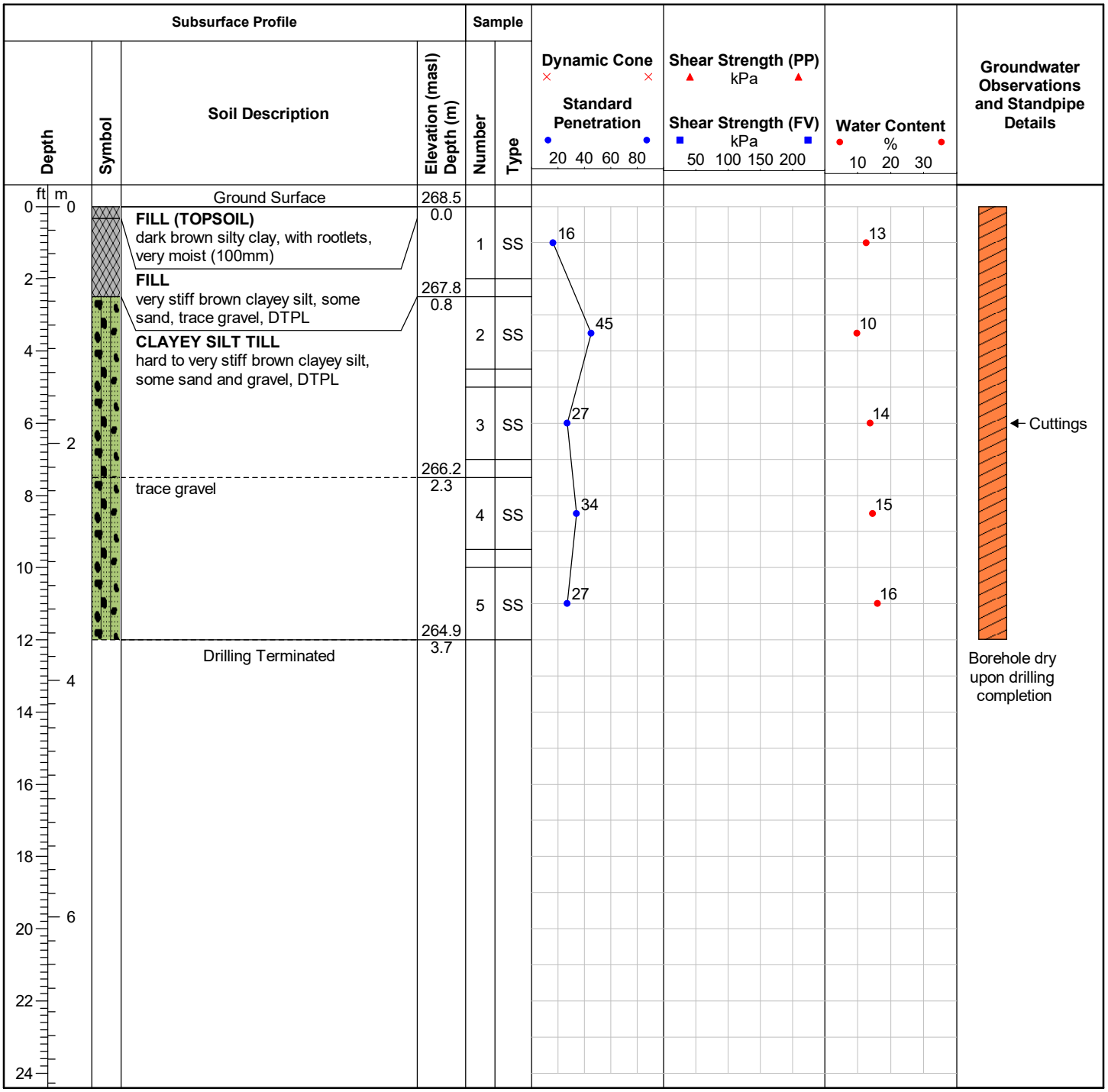
Drill Date: 10/26/2020

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:

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
		Ground Surface	269.3						
0		**FILL (TOPSOIL)** dark brown clayey silt, with rootlets, very moist (200mm)	0.0	1	SS	11		14	
2		**FILL** stiff brown clayey silt, trace to some sand and gravel, DTPL	268.5 / 0.8	2	SS	21		11	
4		**CLAYEY SILT TILL** very stiff to hard brown clayey silt, trace to some sand and gravel, DTPL		3	SS	34		11	← Cuttings
6				4	SS	39		10	
8				5	SS	34		11	
10			265.8						Borehole dry upon drilling completion
12		Drilling Terminated	3.5						
14									
16									
18									
20									
22									
24									

Field Technician: MBC

Drafted by: B. Graul

Reviewed by: B. Thorner

MTE

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

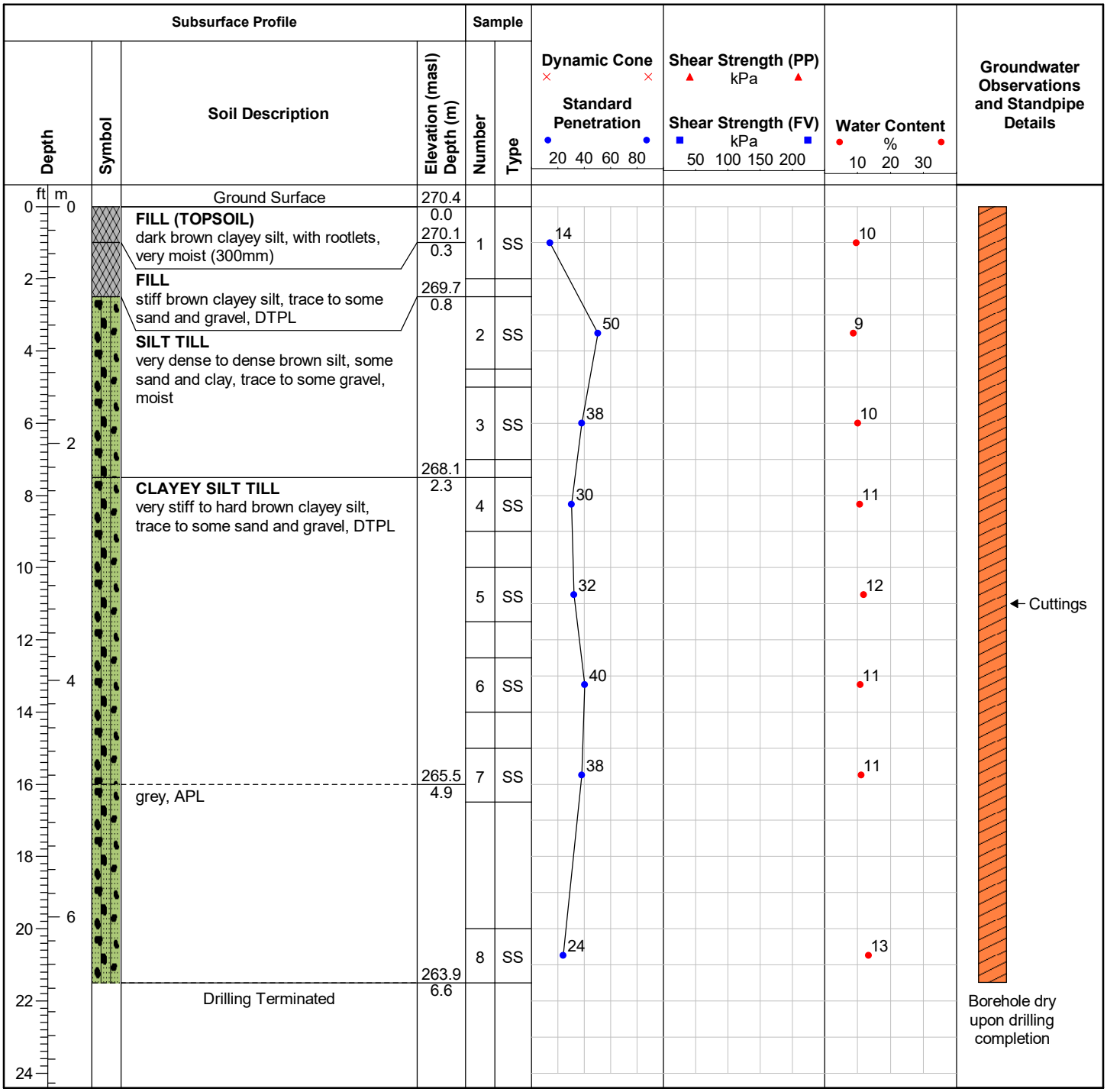
Drill Date: 10/20/2020

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

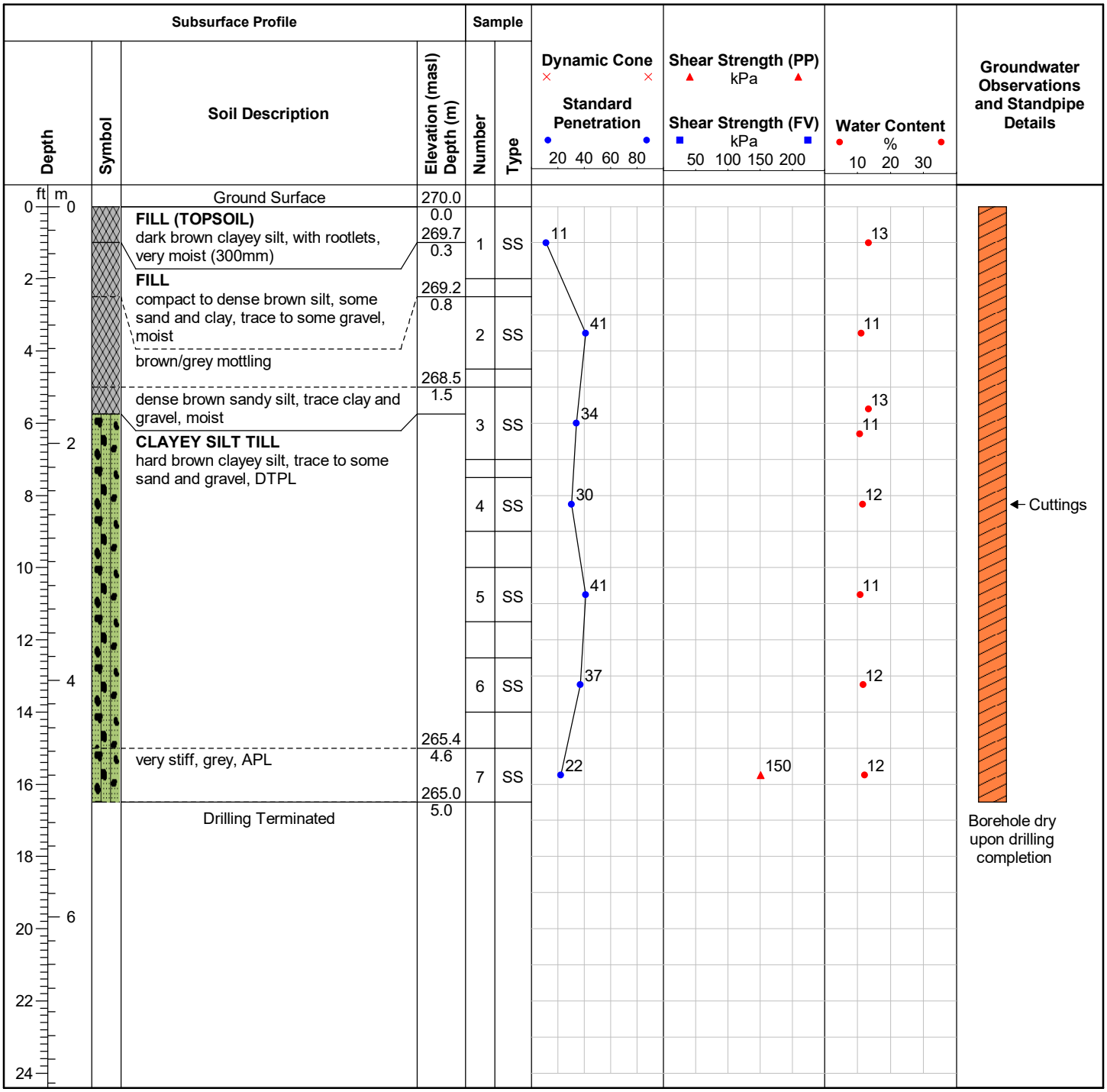
Drill Date: 10/26/2020

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

Sheet: 1 of 1

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

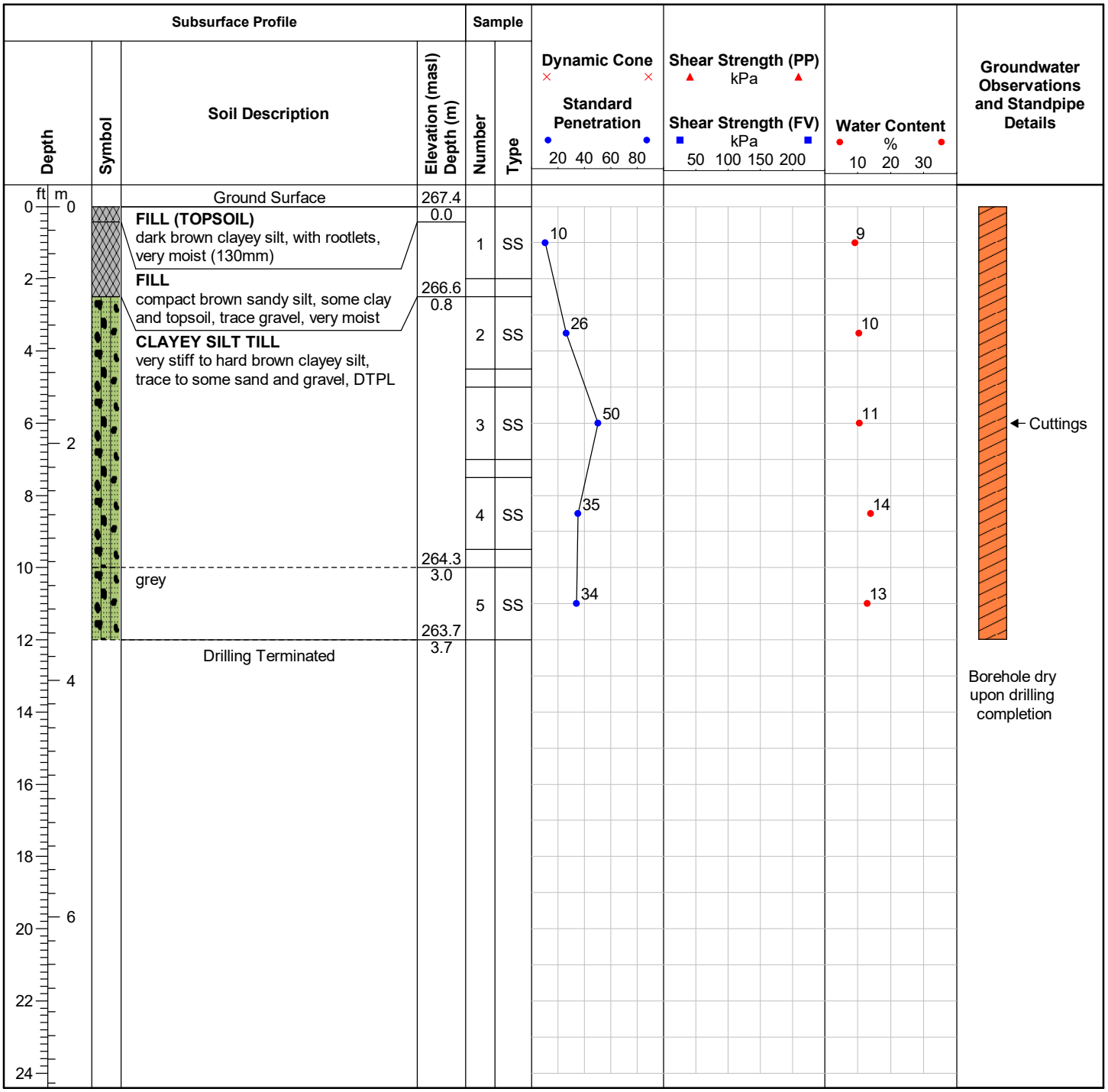
Drill Date: 10/26/2020

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 / 0.5 m		**FILL** compact brown silt, some sand and clay, trace gravel, moist	268.6 / 0.8	2	SS	24		12	
4 ft / 1 m		**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	
10 ft / 3 m				5	SS	54		10	
12 ft / 4 m		Drilling Terminated	265.9 / 3.5						Cuttings; Borehole dry upon drilling completion
20 ft / 6 m									
24 ft									

Field Technician: MBC

Drafted by: B. Graul

Reviewed by: B. Thorner

MTE

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

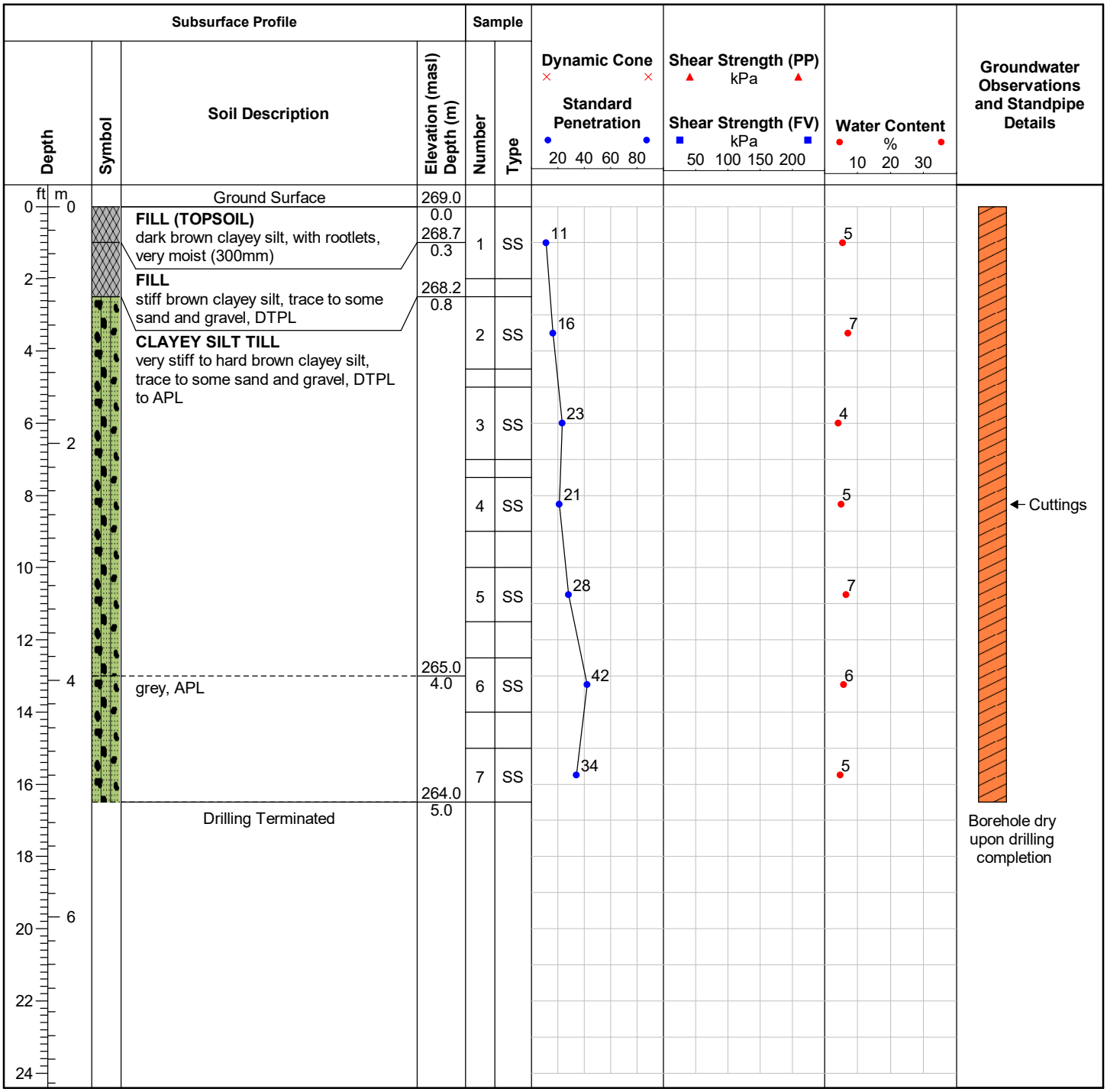
Drill Date: 10/27/2020

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

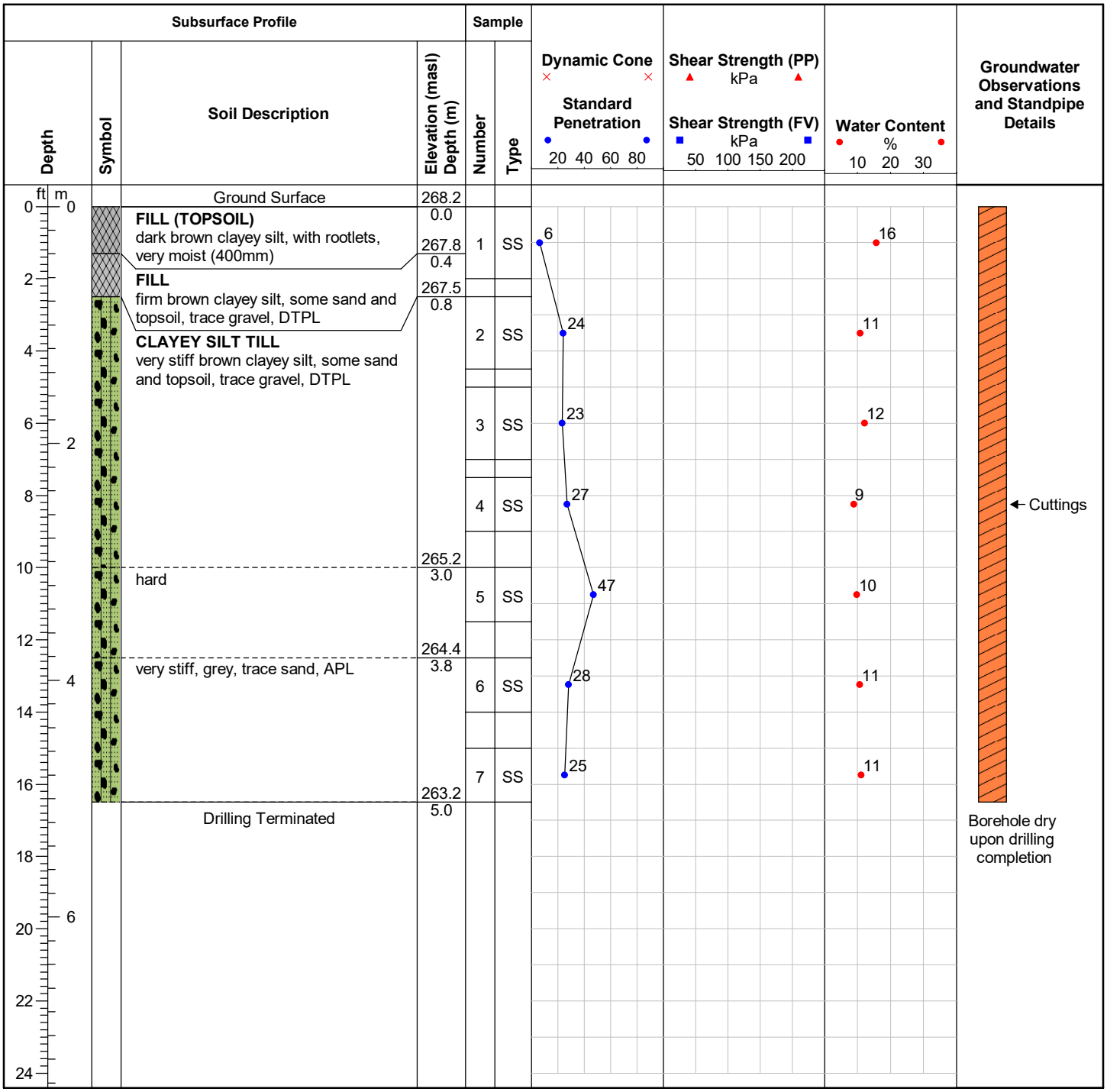
Drill Date: 10/27/2020

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

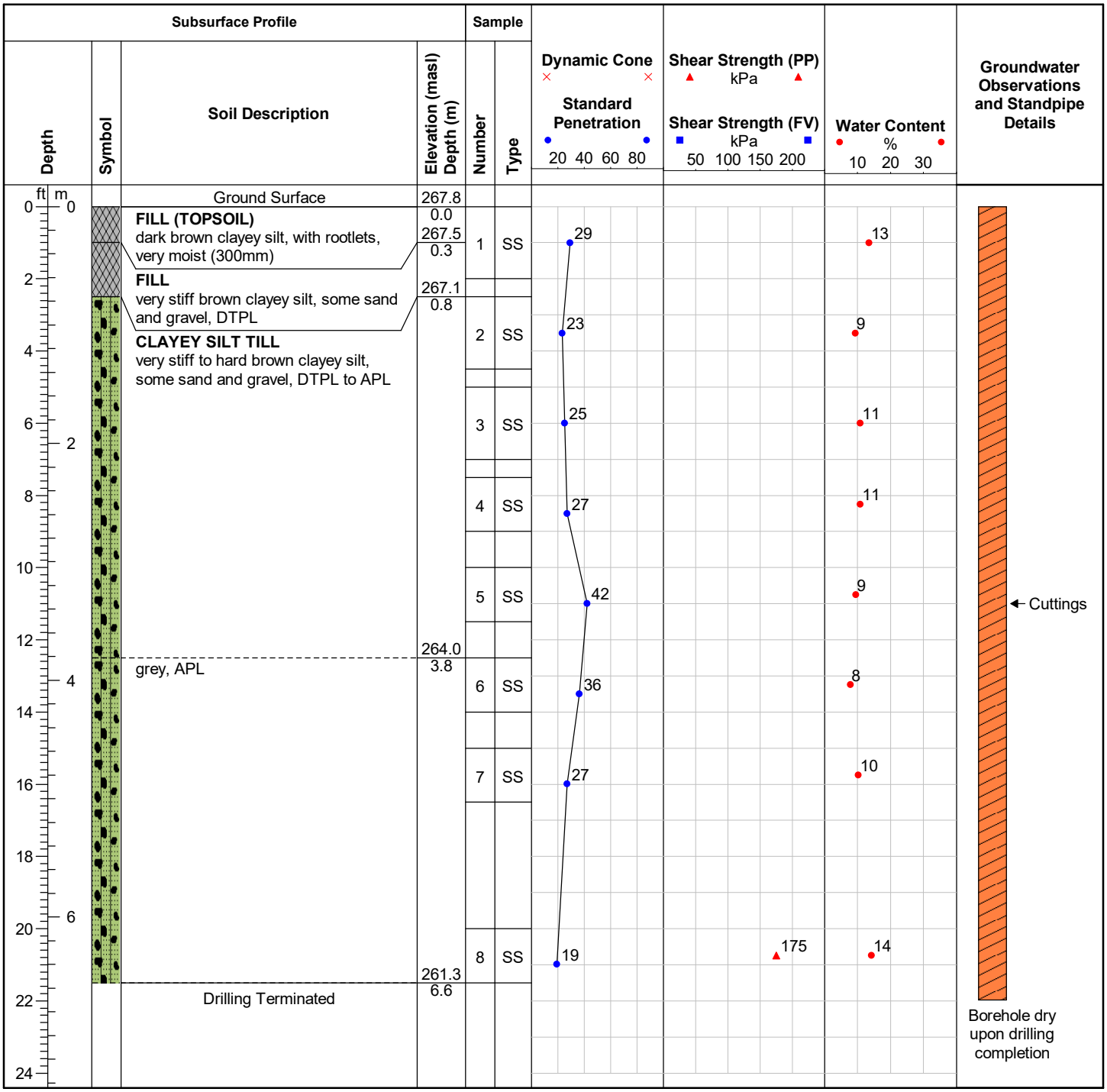
Drill Date: 10/27/2020

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 / 2 m		**FILL** stiff brown clayey silt, some sand and gravel, DTPL	268.3 0.8	2	SS	38		8	
4		**CLAYEY SILT TILL** hard to very stiff brown clayey silt, some sand and gravel, DTPL		3	SS	23		8	Cuttings
6 ft / 2 m				4	SS	29		7	
8				5	SS	45		5	
10			265.6						
12 ft / 4 m		Drilling Terminated	3.5						Borehole dry upon drilling completion
14									
16									
18 ft / 6 m									
20									
22									
24									

Field Technician: MBC

Drafted by: B. Graul

Reviewed by: B. Thorner

MTE

Sheet: 1 of 1

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

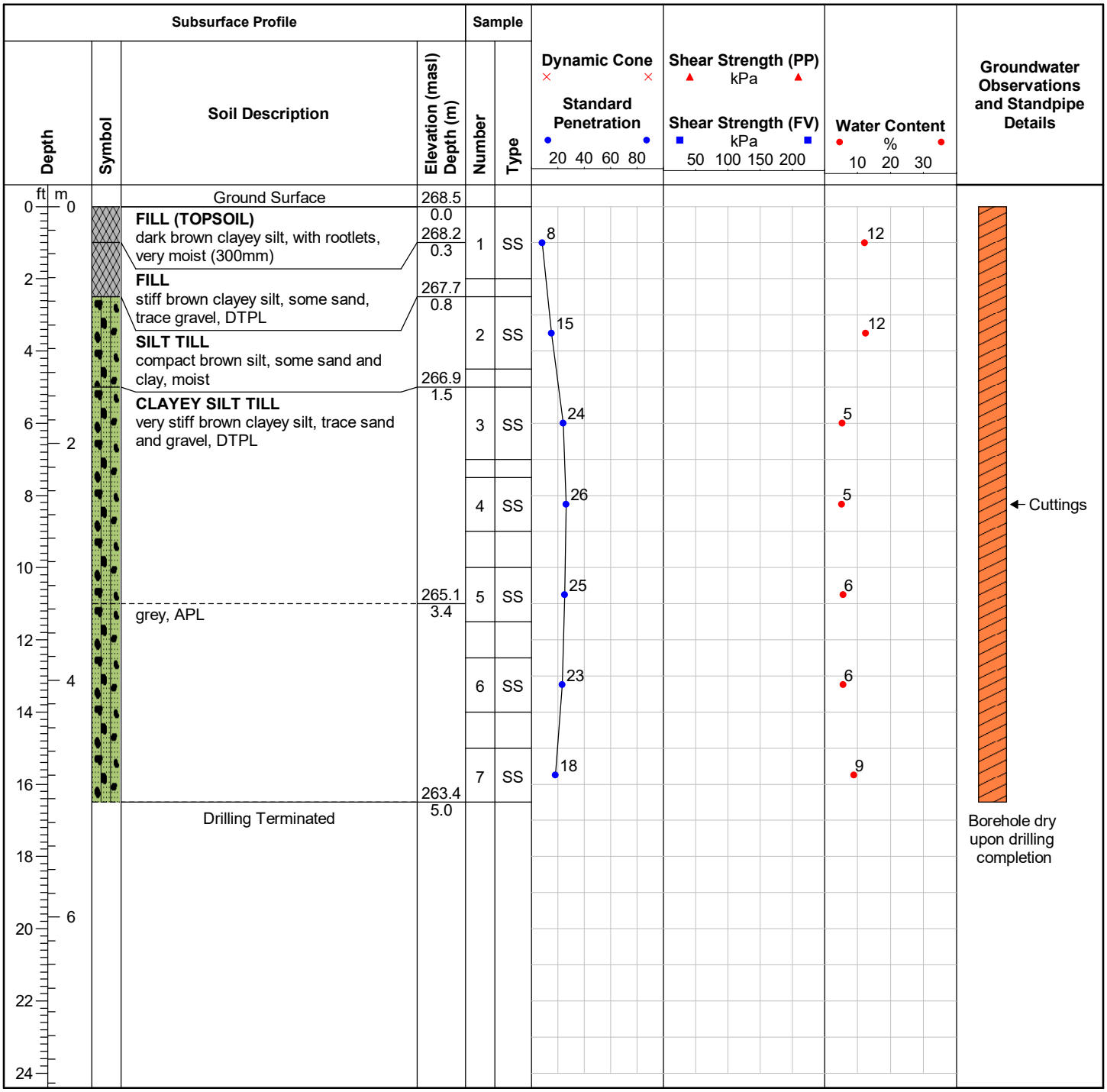
Drill Date: 10/27/2020

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

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

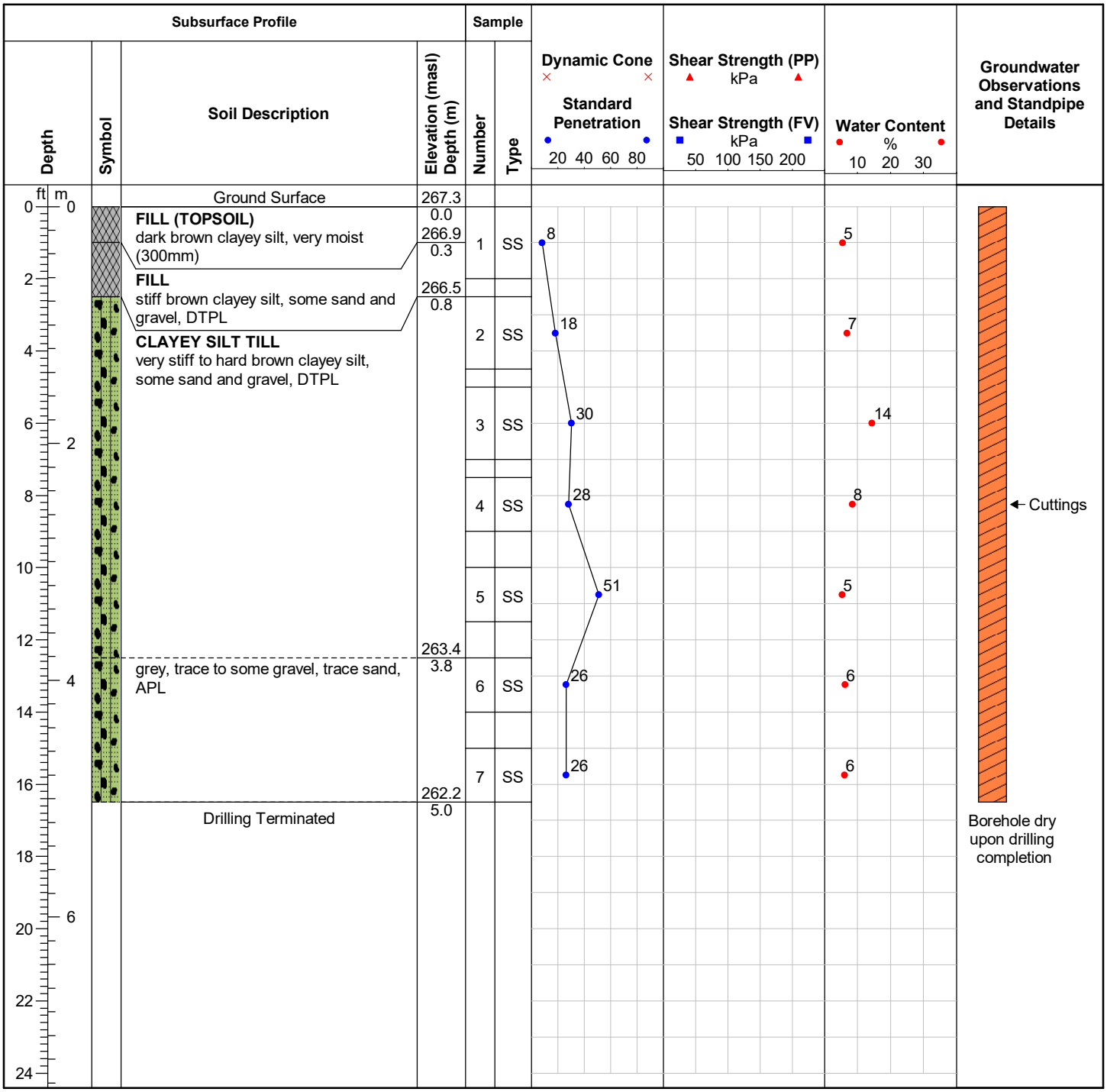
Drill Date: 10/27/2020

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				5	SS	28		11	
10			266.1 / 3.5						
12 / 4		Drilling Terminated							← Cuttings
14									Borehole dry upon drilling completion
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

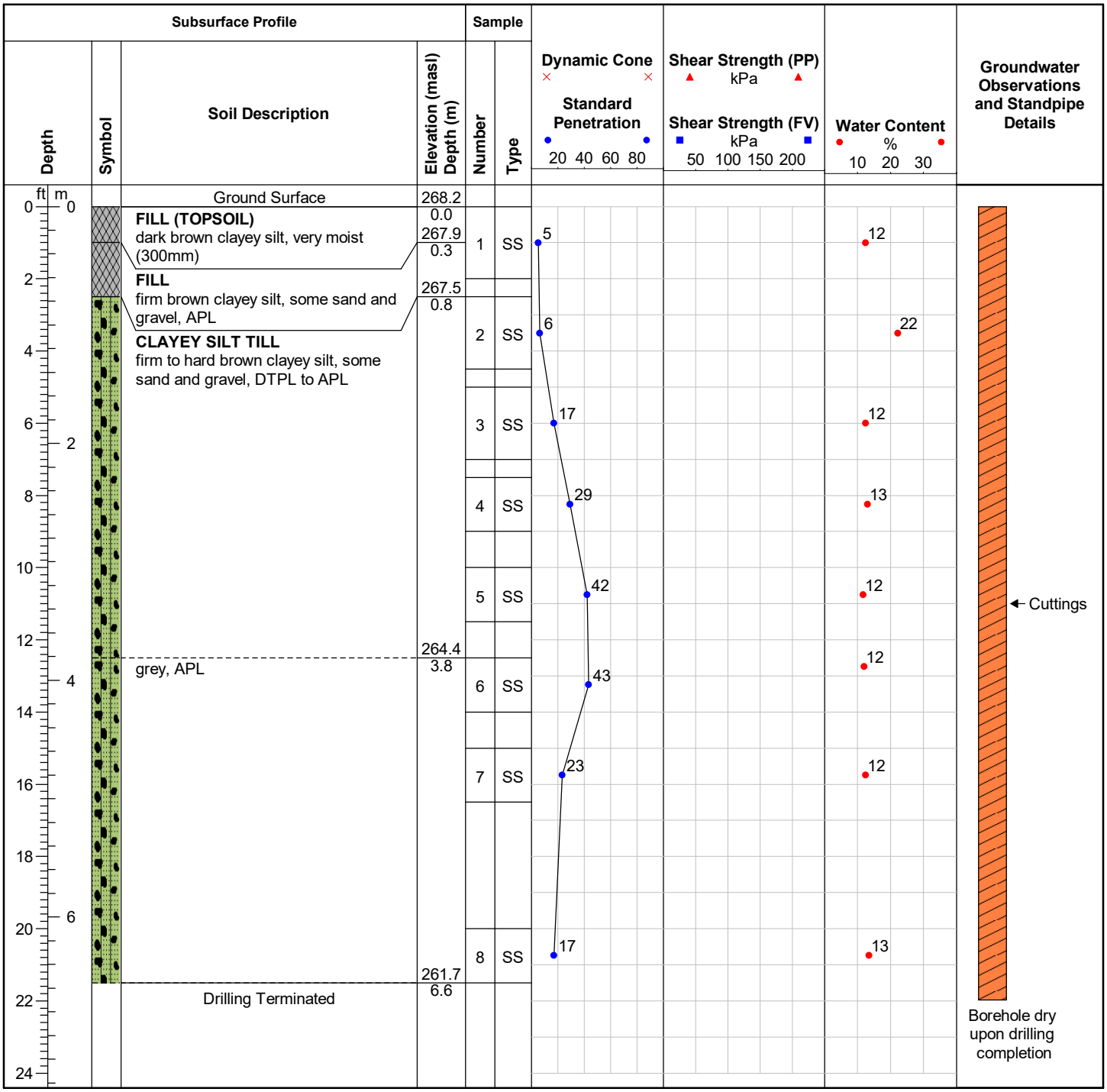
Drill Date: 10/27/2020

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

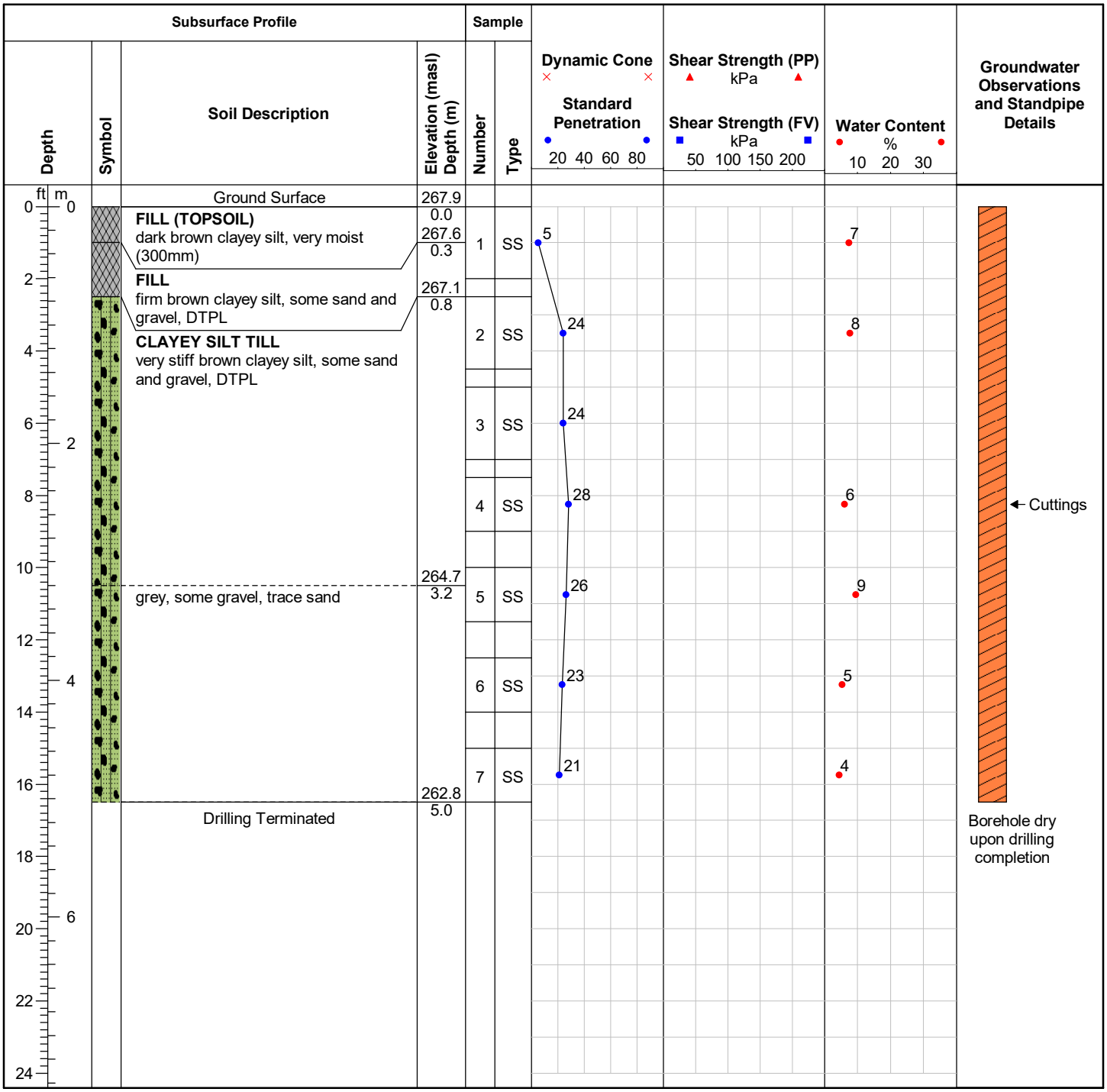
Drill Date: 10/27/2020

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

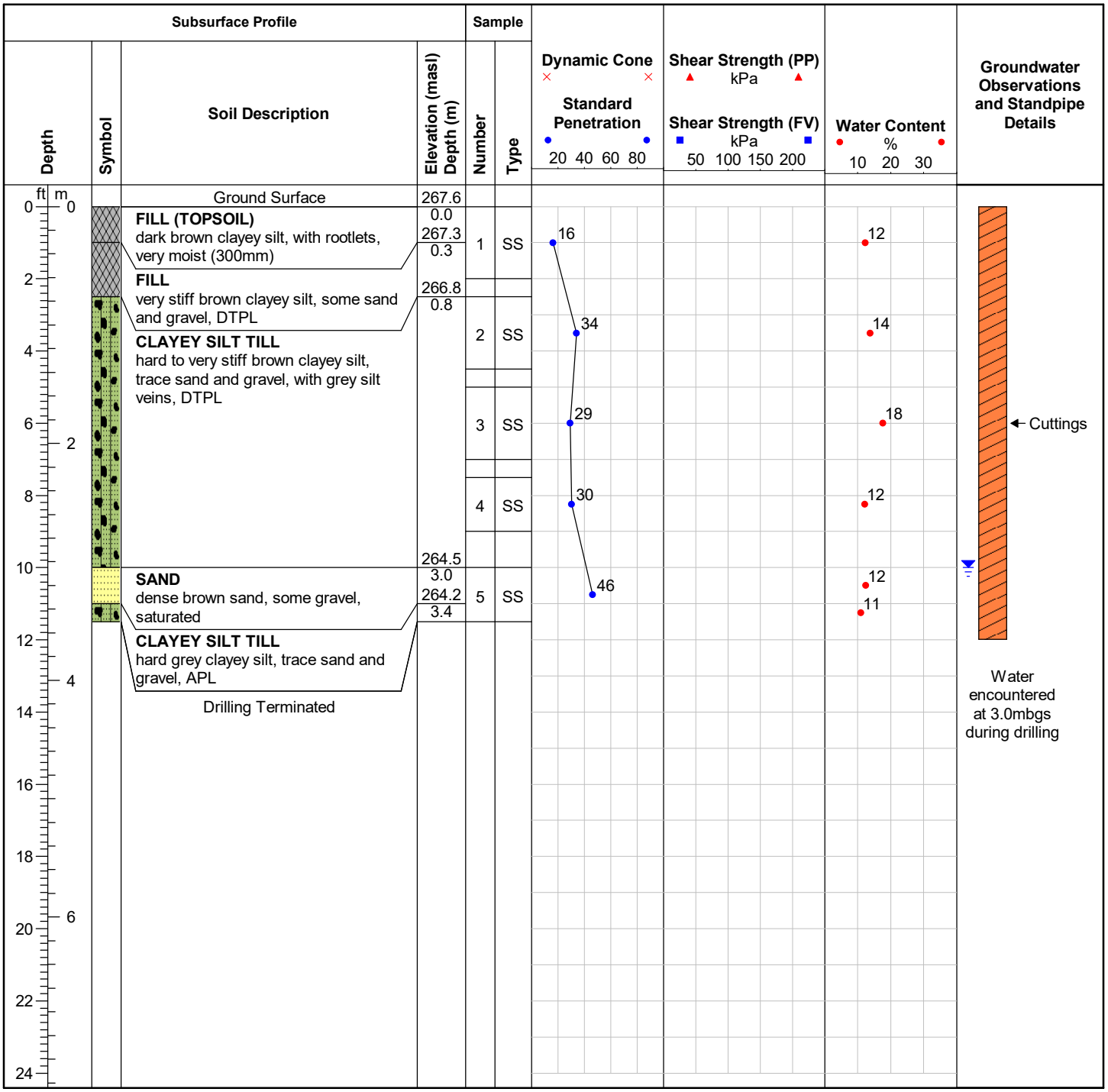
Drill Date: 10/28/2020

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

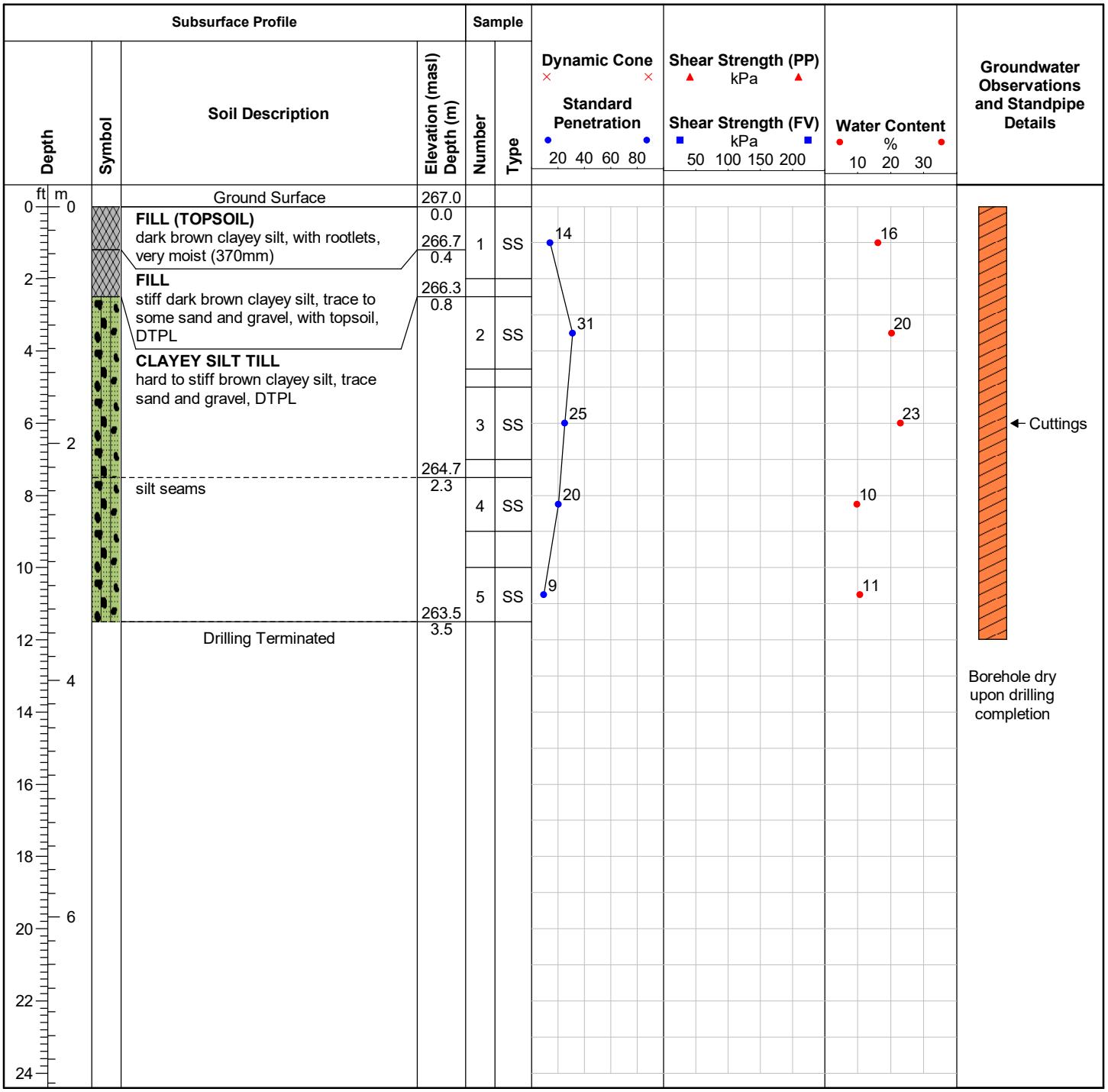
Drill Date: 10/28/2020

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: BH142-21

Project: 12892 Dixie Road: Engineering Consulting Services

Project No: 48043-100

Client: Tribal Partners (Canada) Inc.

Site Location: 12892 Dixie Road, Caledon, ON

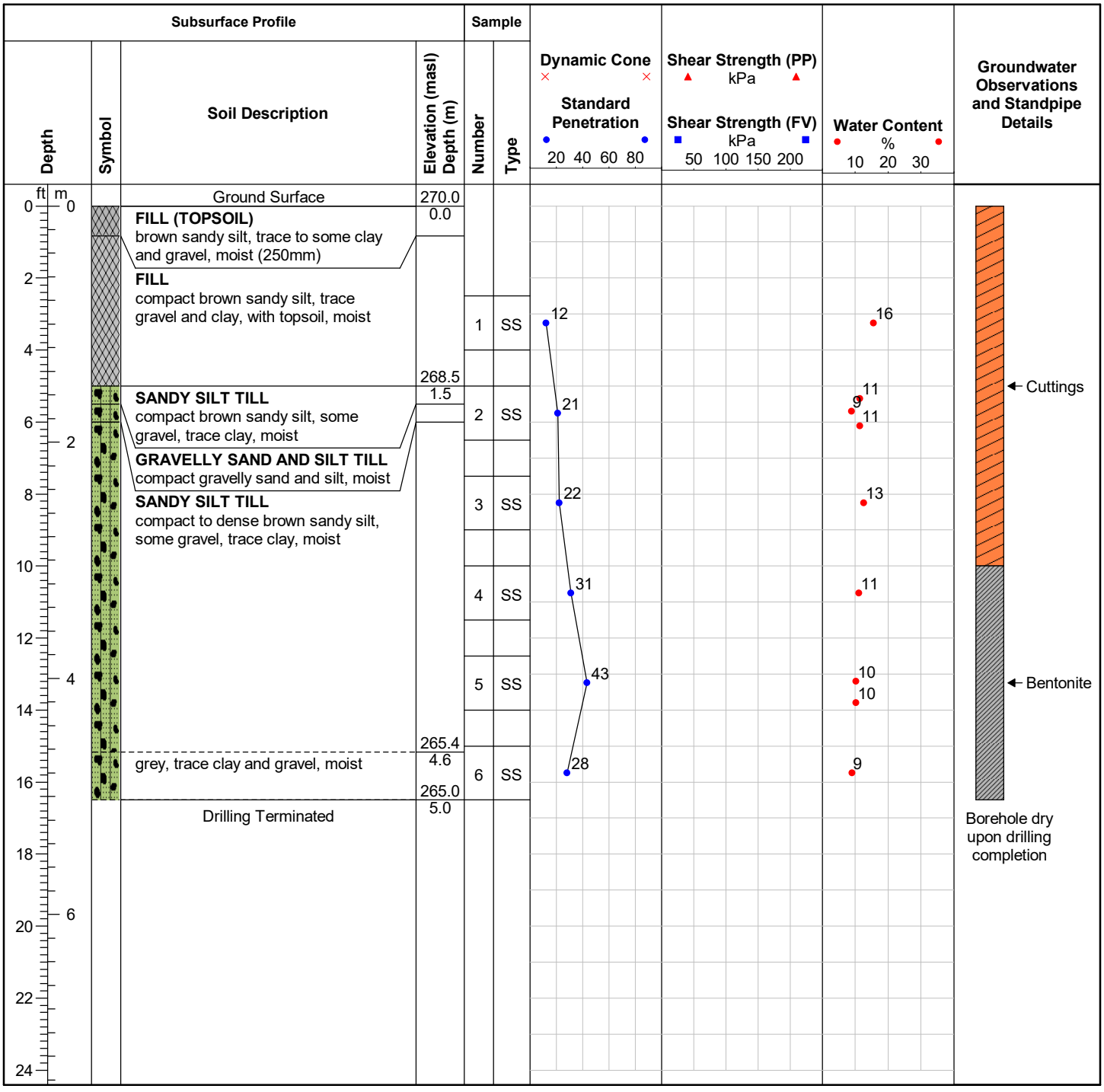
Drill Date: 2/9/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:



Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

Sheet: 1 of 1

ID Number: BH143-21

Project: 12892 Dixie Road: Engineering Consulting Services

Project No: 48043-100

Client: Tribal Partners (Canada) Inc.

Site Location: 12892 Dixie Road, Caledon, ON

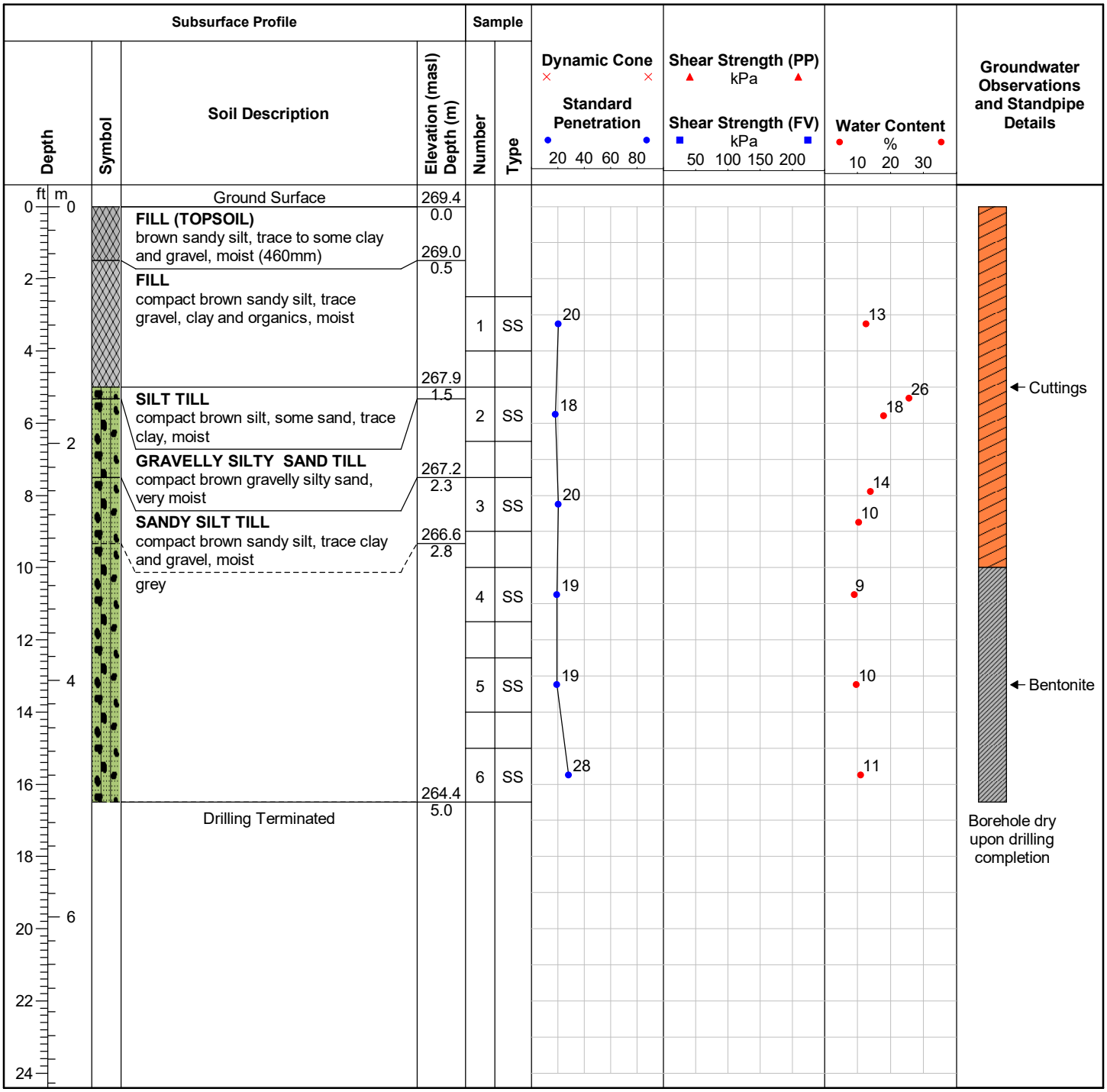
Drill Date: 2/9/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:



Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

Sheet: 1 of 1

ID Number: BH144-21

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: 2/9/2021

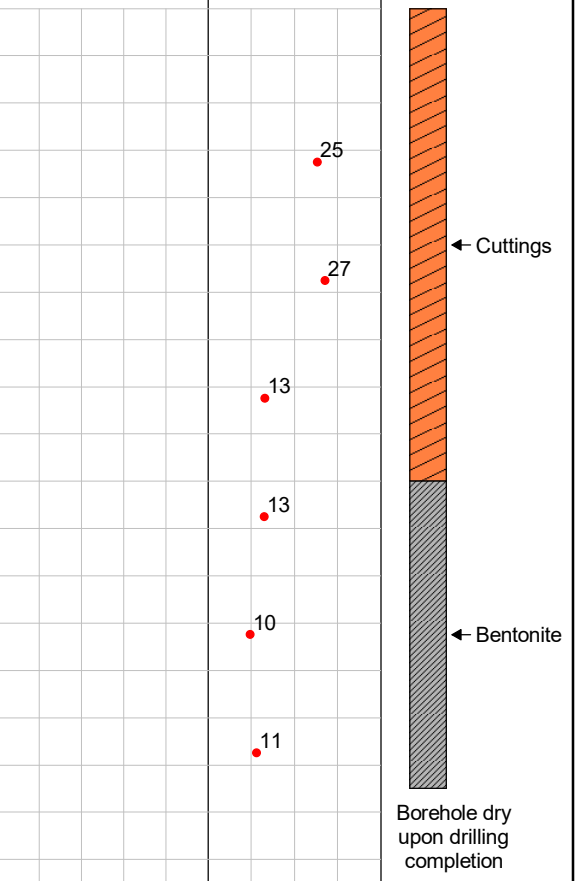
Drilling Contractor: Orbit Garant Drilling

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	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %	Groundwater Observations and Standpipe Details
0 / 0		Ground Surface	270.6						
		TOPSOIL brown sandy silt, trace to some clay and gravel, moist (760mm)	0.0 / 269.8						
2 /		**SANDY SILT TILL** loose brown sandy silt, trace clay and gravel, moist	0.8 / 269.1	1	SS	9		25	
4 /		**SILT TILL** loose brown silt, some sand trace clay, moist	1.5 / 268.3	2	SS	8		27	
6 / 2		**SAND** loose brown sand, some silt, trace gravel, very moist	2.3 / 267.5	3	SS	6		13	
8 /		**GRAVELLY SILTY SAND TILL** compact brown gravelly silty sand, very moist	3.0 / 266.8	4	SS	28		13	
10 /		**SANDY SILT TILL** compact grey sandy silt, trace clay and gravel, moist	3.8 / 265.5	5	SS	21		10	
12 / 4				6	SS	23		11	
14 /		Drilling Terminated	5.0						
16 /									
18 /									
20 / 6									
22 /									
24 /									



Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

MTE

Sheet: 1 of 1

ID Number: BH145-21

Project: 12892 Dixie Road: Engineering Consulting Services

Project No: 48043-100

Client: Tribal Partners (Canada) Inc.

Site Location: 12892 Dixie Road, Caledon, ON

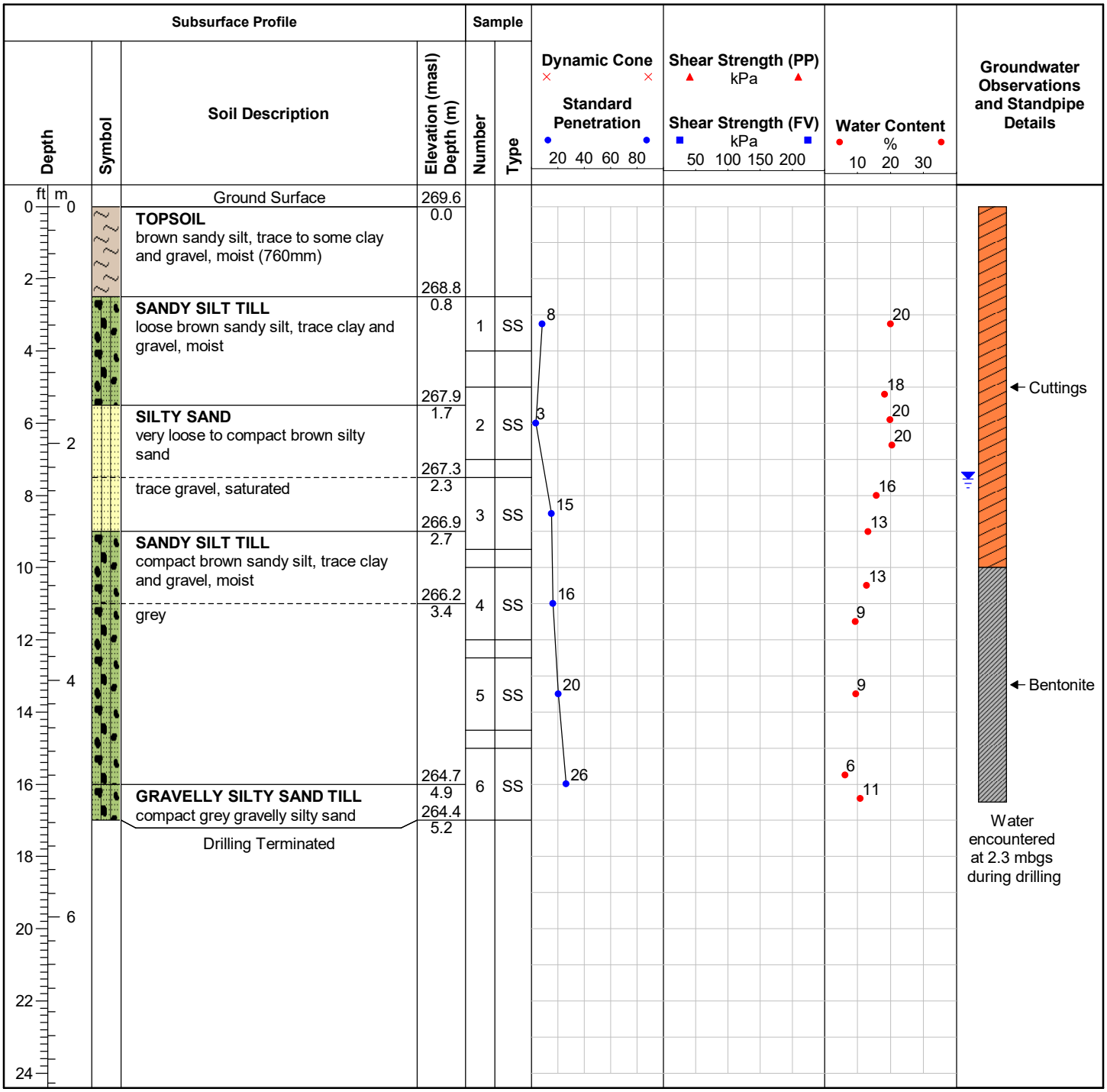
Drill Date: 2/8/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:



Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

Sheet: 1 of 1

ID Number: BH146-21

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: 2/8/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:

Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Standard Penetration (Dynamic Cone)	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %	Groundwater Observations and Standpipe Details
	Ground Surface	264.7						
0	**TOPSOIL** brown sandy silt, some clay, trace gravel, moist (300mm)	0.0 / 264.4 / 0.3						
2	**SANDY SILT TILL** compact brown sandy silt, some clay, trace gravel, moist		1	SS	16		16	
4			2	SS	28		17	
6			3	SS	23		17	← Cuttings
8			4	SS	25		16	
10			5	SS	10		15	
12	**CLAYEY SANDY SILT TILL** compact grey clayey sandy silt, trace gravel, DTPL	260.9 / 3.8 / 260.1 / 4.6	6	SS	7		16	
14	**CLAYEY SILT TILL** firm to stiff grey clay and silt, trace sand and gravel, DTPL		7	SS	10		17	← Bentonite
16								
18								
20								
22								
24								

Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

MTE

ID Number: BH146-21

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: 2/8/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:

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
			257.1						
26		**SANDY SILT TILL** compact grey sandy silt, some clay, trace gravel, moist	7.6	8	SS	11		12	
28			256.4						Borehole dry upon drilling completion
		Drilling Terminated	8.2						
30									
32									
34									
36									
38									
40									
42									
44									
46									
48									

8 10 12 14

Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

MTE

ID Number: BH147-21

Project: 12892 Dixie Road: Engineering Consulting Services

Project No: 48043-100

Client: Tribal Partners (Canada) Inc.

Site Location: 12892 Dixie Road, Caledon, ON

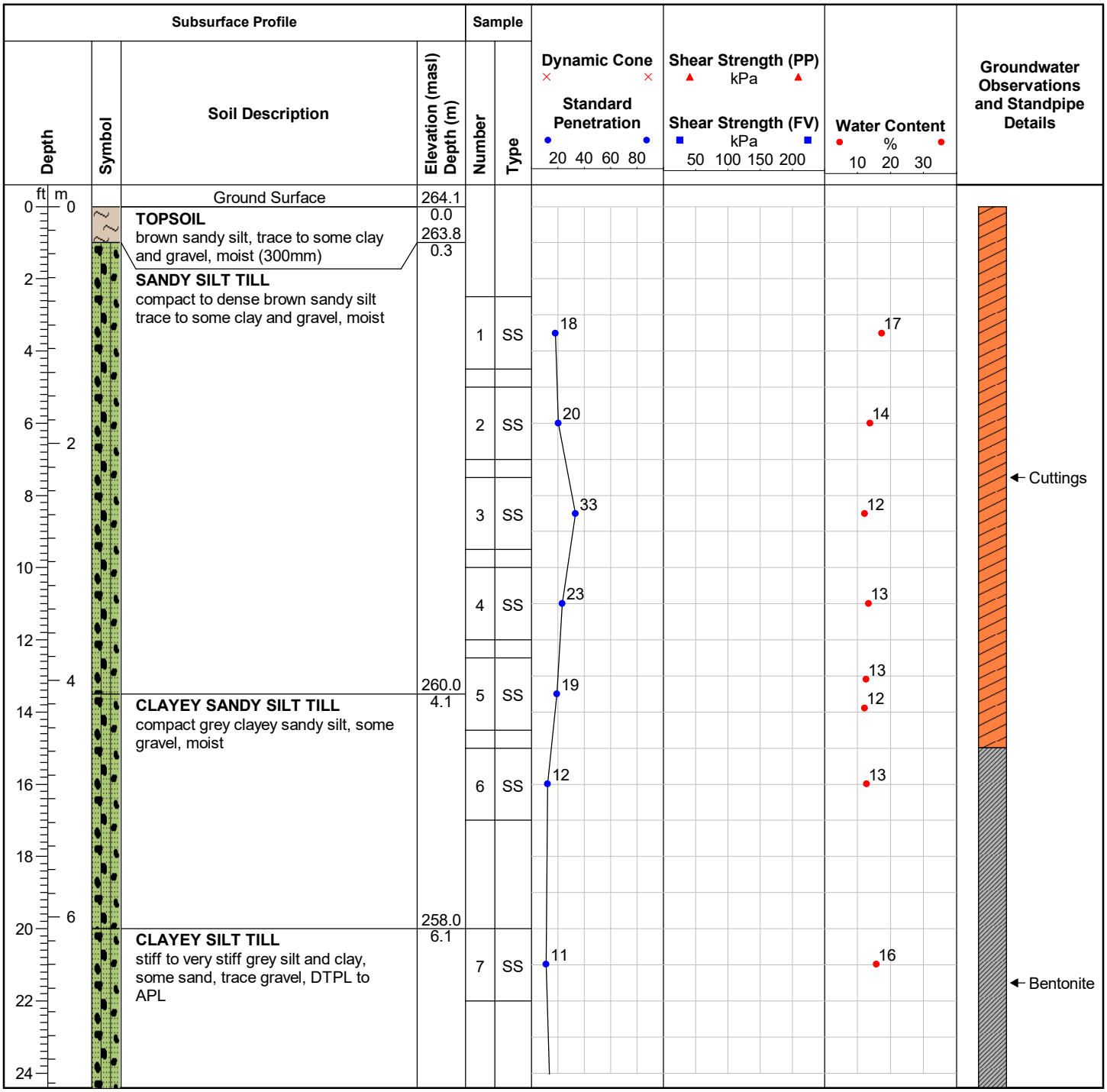
Drill Date: 2/8/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:



Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

MTE

ID Number: BH147-21

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: 2/8/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:

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
26 – 8									
		SANDY SILT TILL compact grey sandy silt, some clay, trace gravel, very moist	256.1 8.1	8	SS	15		13, 8	Borehole dry upon drilling completion
28		Drilling Terminated							
30									
32 – 10									
34									
36									
38									
40 – 12									
42									
44									
46 – 14									
48									

Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

MTE

ID Number: BH148-21

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: 2/8/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:

Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Standard Penetration (Dynamic Cone)	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %
0 / 0	Ground Surface	268.2					
	FILL (TOPSOIL) brown sandy silt, trace to some clay and gravel, moist (360mm)	0.0 / 267.8 / 0.4					
2	**FILL** compact brown sandy silt, trace clay and gravel, with topsoil, moist		1	SS	28		15
4		266.6					
6 / 2	**SANDY SILT TILL** dense brown sandy silt, trace clay and gravel, moist	1.5 / 265.9	2	SS	31		17
8	**SILT TILL** compact brown silt, some clay and sand, trace gravel	2.3 / 265.1	3	SS	23		20
10	**SANDY SILT TILL** compact brown sandy silt, trace clay and gravel, moist	3.0	4	SS	27		15
12							
14 / 4	grey, some gravel	264.1 / 4.1	5	SS	24		11 / 10
16		263.1	6	SS	24		11
18	Drilling Terminated	5.0					
20 / 6							
22							
24							

Groundwater Observations and Standpipe Details: Cuttings; Bentonite; Borehole dry upon drilling completion

Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

MTE

Sheet: 1 of 1

ID Number: BH149-21

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: 2/9/2021

Drilling Contractor: Orbit Garant Drilling

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	266.0						
		FILL (TOPSOIL) brown sandy silt, trace to some clay and gravel, moist (410mm)	0.0 / 265.6						
		FILL compact brown sandy silt, some clay, trace gravel, with topsoil, moist	0.4	1	SS	13		17	
4			264.5						
		SANDY SILT TILL compact brown sandy silt, trace to some gravel, trace clay, moist	1.5	2	SS	22		14	
8				3	SS	28		15	
10				4	SS	30		14	
12			262.2						
		grey, some clay	3.8	5	SS	13		12	
16			261.0	6	SS	13		15	
		Drilling Terminated	5.0						

Cuttings

Bentonite

Borehole dry upon drilling completion

Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

MTE

ID Number: BH150-21

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: 2/9/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:

Depth (ft / m)	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)
	Ground Surface	268.1					
0 – 2 ft	**FILL (TOPSOIL)** brown sandy silt, trace to some clay and gravel, moist (760mm)	0.0 / 267.3					
2 – 4 ft	**FILL** compact brown sandy silt, trace clay and gravel, with topsoil, moist	0.8 / 266.6	1	SS	19		16
4 – 6 ft	**SANDY SILT TILL** compact to dense brown sandy silt, trace clay and gravel, moist	1.5 / 264.8	2	SS	21		16
6 – 8 ft			3	SS	25		13
8 – 10 ft			4	SS	36		12, 13
10 – 12 ft	**SILTY SAND** dense brown silty sand, trace gravel, moist	3.3 / 264.3					
12 – 14 ft	**SANDY SILT TILL** compact to dense grey sandy silt, trace clay and gravel, moist	3.8	5	SS	37		9, 10
14 – 16 ft			6	SS	20		10
16 – 18 ft	Drilling Terminated	5.0 / 263.0					
18 – 24 ft							

Groundwater Observations and Standpipe Details: ← Cuttings; ← Bentonite; Borehole dry upon drilling completion

Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

MTE

ID Number: BH151-21

Project: 12892 Dixie Road: Engineering Consulting Services

Project No: 48043-100

Client: Tribal Partners (Canada) Inc.

Site Location: 12892 Dixie Road, Caledon, ON

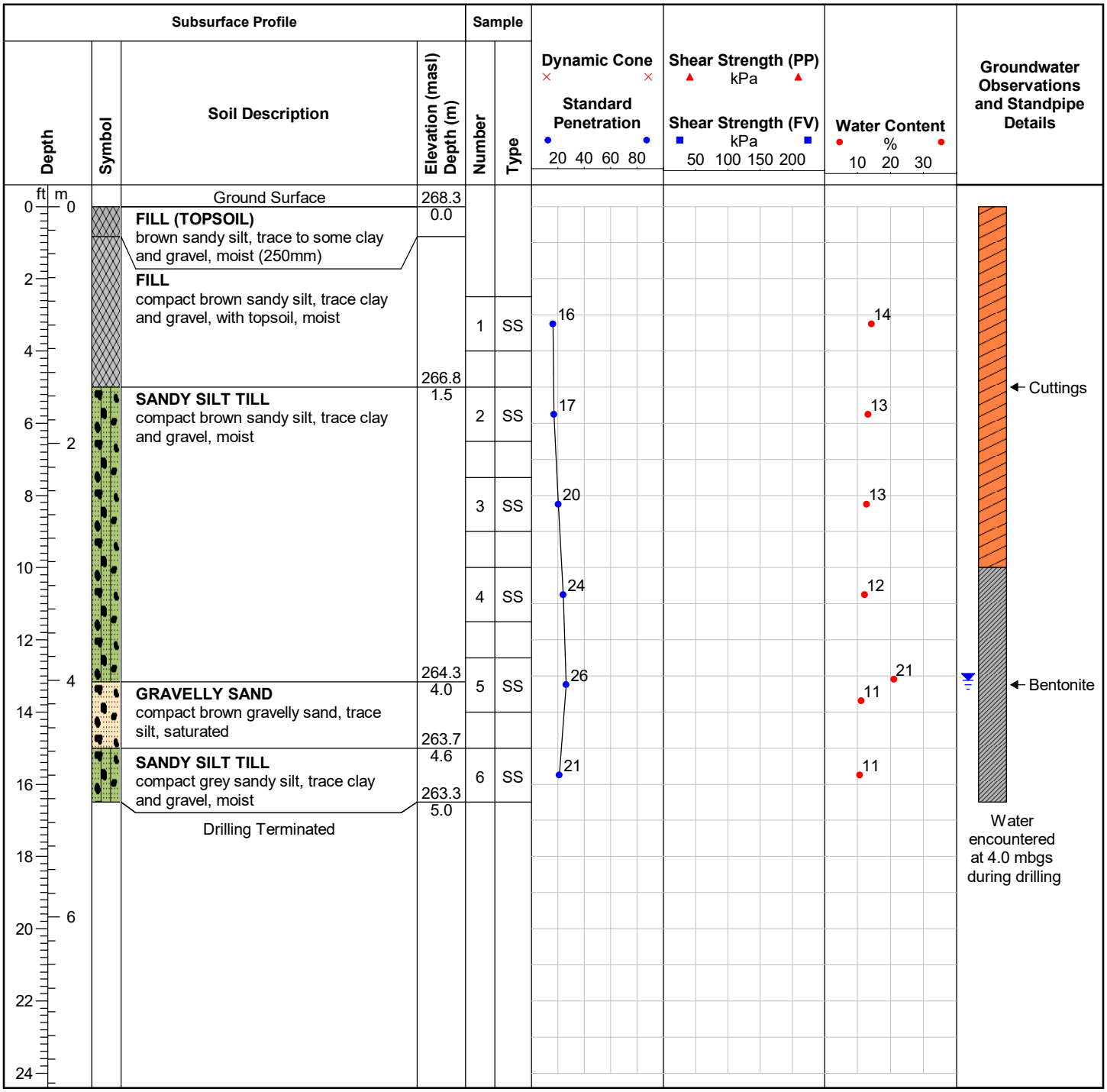
Drill Date: 2/10/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:



Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

Sheet: 1 of 1

ID Number: BH152-21

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: 2/10/2021

Drilling Contractor: Orbit Garant Drilling

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	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %	Groundwater Observations and Standpipe Details
0 ft / 0 m		Ground Surface	267.7						
		FILL (TOPSOIL) brown sandy silt, trace to some clay and gravel, moist (760mm)	0.0 / 266.9						
2		**FILL** compact brown sandy silt, trace clay and gravel, with topsoil, moist	0.8 / 266.2	1	SS	20		16	
4		**SANDY SILT TILL** compact to dense brown sandy silt, trace clay and gravel, moist	1.5	2	SS	28		15	← Cuttings
6 / 2				3	SS	33		13	
8				4	SS	23		18	
10				5	SS	28		17	← Bentonite
12 / 4				6	SS	40		11, 12	
14		grey	263.0 / 4.7 / 262.7						
16		Drilling Terminated	5.0						Borehole dry upon drilling completion
18									
20 / 6									
22									
24									

Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

MTE

ID Number: BH153-21

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: 2/10/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:

Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone / Standard Penetration	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %
0 / 0	Ground Surface	268.0					
	FILL (TOPSOIL) brown sandy silt, trace to some clay and gravel, moist (180mm)	0.0					
	FILL compact brown sandy silt, trace clay and gravel, with topsoil, moist		1	SS	19		15
		266.5					
	SANDY SILT TILL compact to dense brown sandy silt, trace clay and gravel, moist	1.5	2	SS	25		13
			3	SS	22		14
			4	SS	24		12
			5	SS	23		13
		263.4					
	some clay	4.6	6	SS	14		13
		263.0					
	Drilling Terminated	5.0					

Groundwater Observations and Standpipe Details: ← Cuttings; ← Bentonite; Borehole dry upon drilling completion

Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

MTE

Sheet: 1 of 1

ID Number: BH154-21

Project: 12892 Dixie Road: Engineering Consulting Services

Project No: 48043-100

Client: Tribal Partners (Canada) Inc.

Site Location: 12892 Dixie Road, Caledon, ON

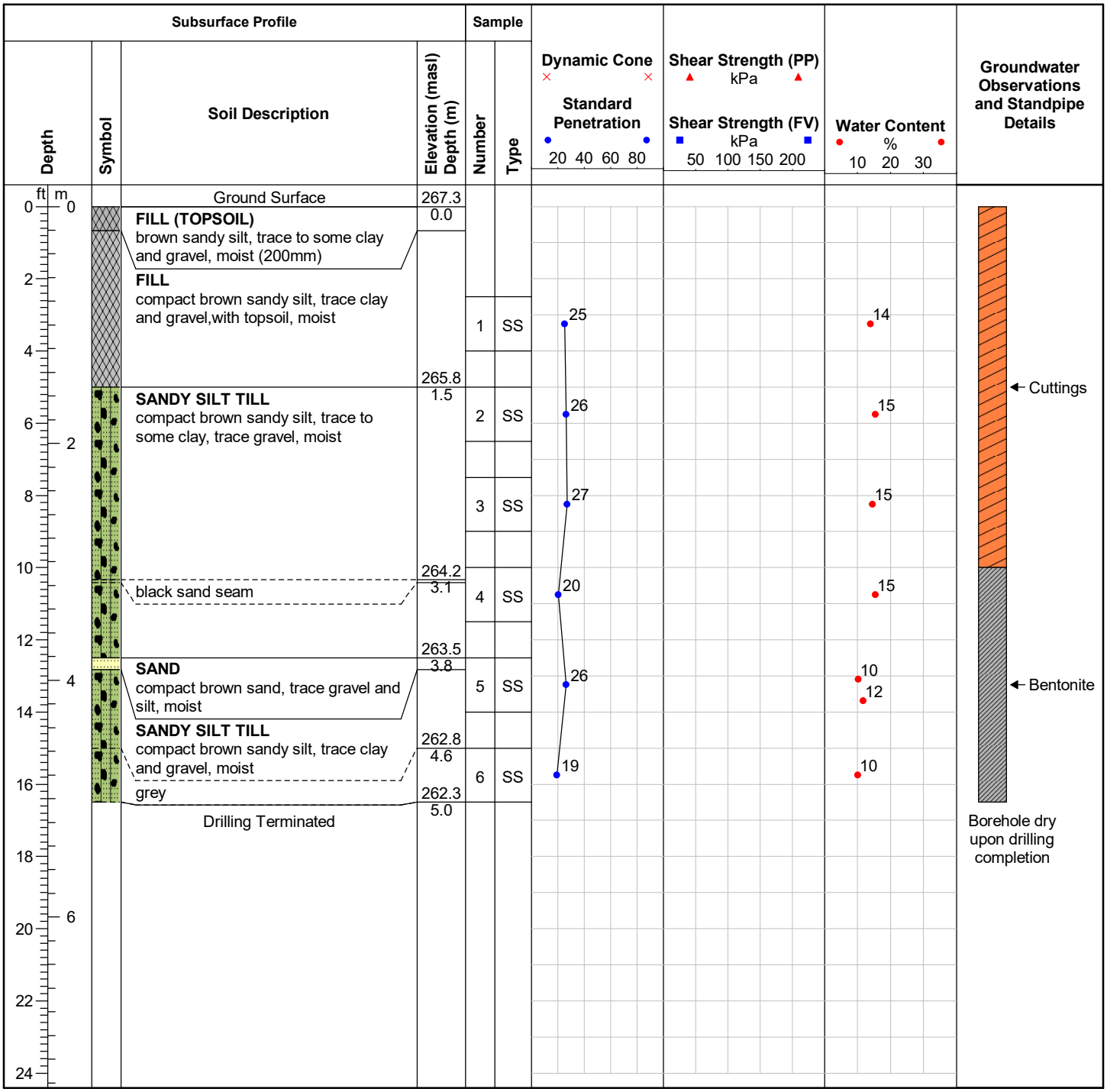
Drill Date: 2/10/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:



Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

Sheet: 1 of 1

ID Number: BH155-21

Project: 12892 Dixie Road: Engineering Consulting Services

Project No: 48043-100

Client: Tribal Partners (Canada) Inc.

Site Location: 12892 Dixie Road, Caledon, ON

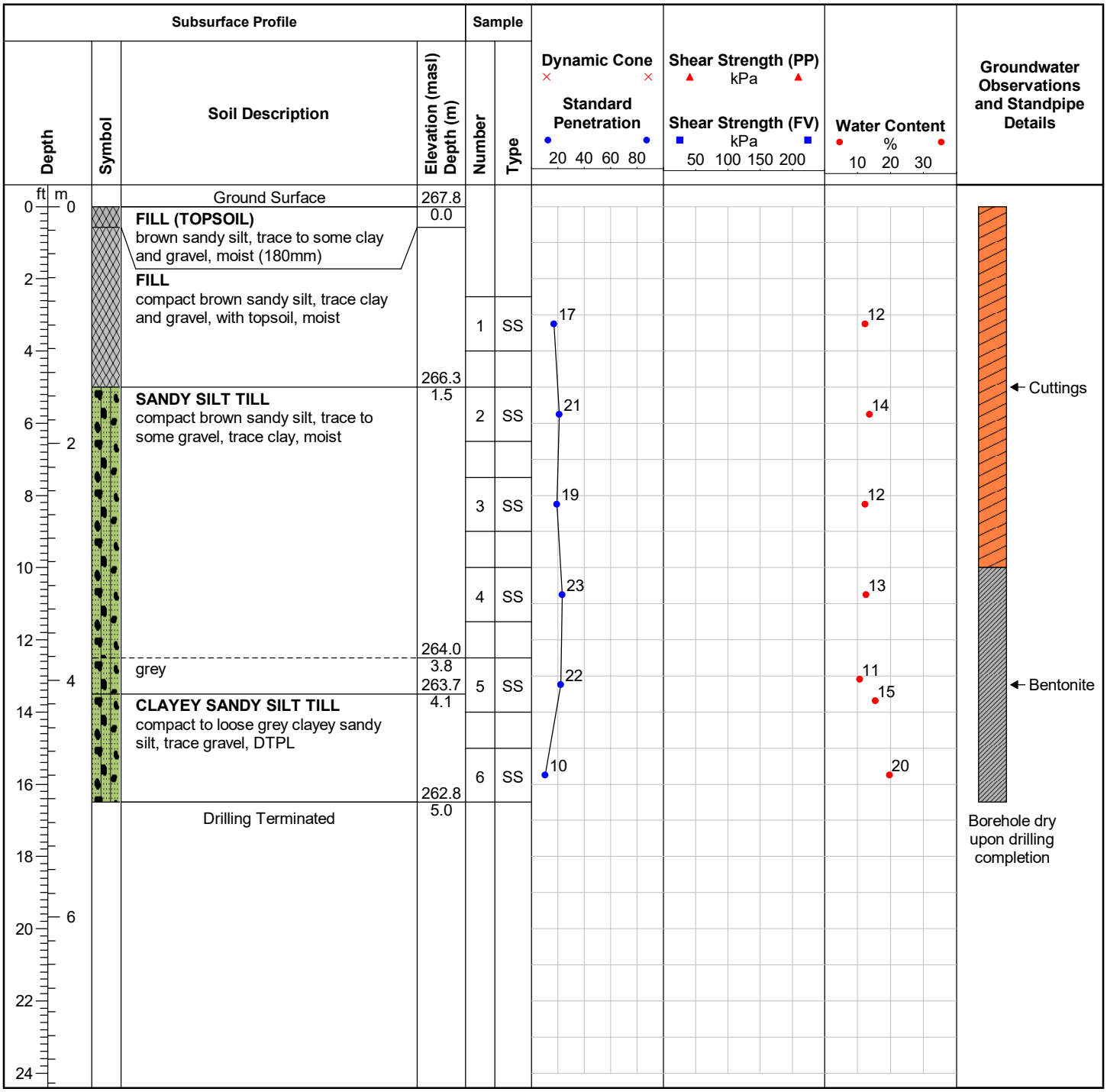
Drill Date: 2/10/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:



Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

Sheet: 1 of 1

ID Number: BH156-21

Project: 12892 Dixie Road: Engineering Consulting Services

Project No: 48043-100

Client: Tribal Partners (Canada) Inc.

Site Location: 12892 Dixie Road, Caledon, ON

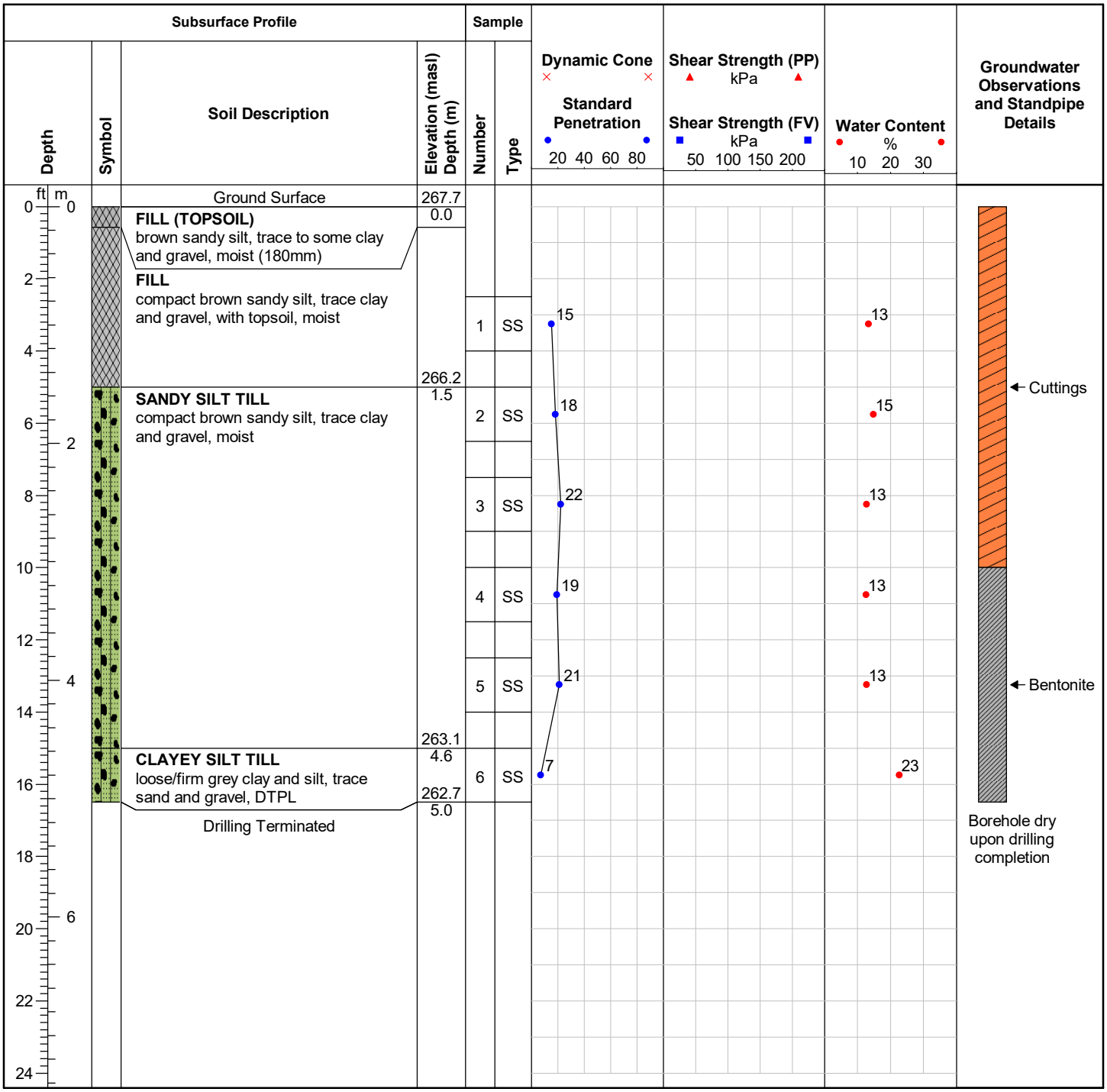
Drill Date: 2/10/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Solid Stem Auger

Protective Cover:



Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

Sheet: 1 of 1

ID Number: MW157-21

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: 2/10/2021

Drilling Contractor: Orbit Garant Drilling

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	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %	Groundwater Observations and Standpipe Details
		Ground Surface	265.5						
0 / 0		**FILL (TOPSOIL)** brown sandy silt, trace to some clay and gravel, moist (760mm)	0.0						
			264.8						
2		**FILL** compact brown sandy silt, trace clay and gravel, with topsoil, moist	0.8	1	SS	24		11	
			264.0						
6 / 2		**SANDY SILT TILL** compact to dense brown sandy silt, trace clay and gravel, moist	1.5	2	SS	30		13	
8				3	SS	38		12	
10				4	SS	36		12	
12 / 4		grey	261.7						
			3.8	5	SS	33		12	
16				6	SS	20		14	
18									
20 / 6				7	SS	13		11	
22									
24									

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: Concrete; Bentonite; 51mm PVC Riser

Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

Water encountered at 9.1 mbgs during drilling

ID Number: MW157-21

Project: 12892 Dixie Road: Engineering Consulting Services

Project No: 48043-100

Client: Tribal Partners (Canada) Inc.

Site Location: 12892 Dixie Road, Caledon, ON

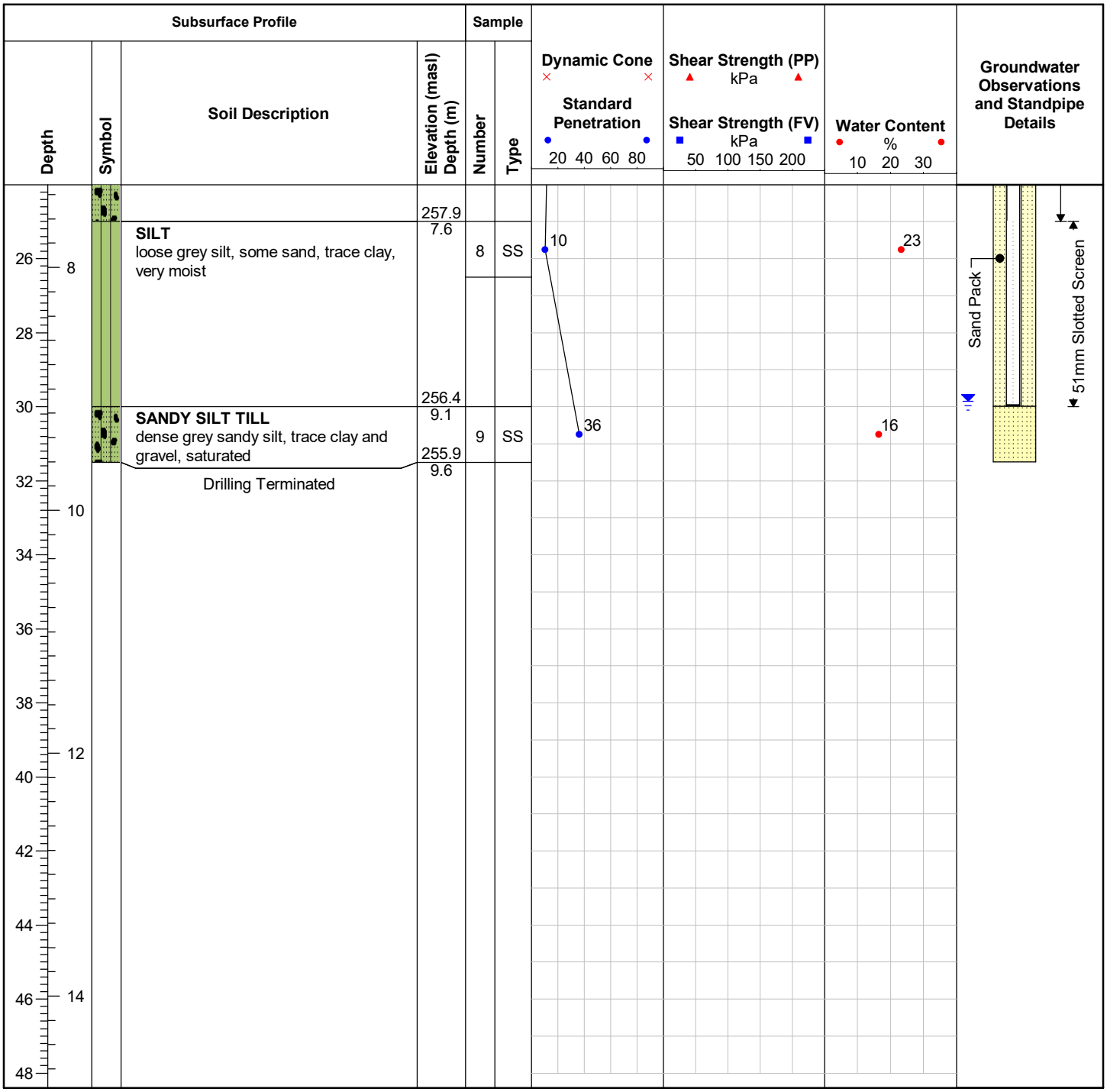
Drill Date: 2/10/2021

Drilling Contractor: Orbit Garant Drilling

Drill Rig: CME 75

Drill Method: Hollow Stem Auger

Protective Cover:



Field Technician: B. Jagger

Drafted by: B. Graul

Reviewed by: B. Thorner

Water encountered at 9.1 mbgs during drilling

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		**TOPSOIL** Dark brown, clayey silt with rootlets, damp	0.0							
			0.2		SS	60	Metals, OCs, CPs, PHCs	0	0	
2		**FILL** Brown, clayey silt with sand, some gravel, moist								
				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			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		**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	3	SS	100		0	0	
6 / 2										
8				4	SS	100		0	0	
10				5	SS	100		0	0	
12			3.7							

Field Technician:

Drafted by:

Reviewed by:

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		**TOPSOIL** Dark brown, clayey silt with rootlets, damp	0.0							
		FILL Brown, clayey silt with sand, trace to some gravel, moist		1	SS	0	Metals	0	0	
2				2	SS	90		0	0	
4										
6 / 2		**CLAYEY SILT** Light brown to grey, trace sand and gravel, moist	1.5	3	SS	90		0	0	
8				4	SS	95		0	0	
10										
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		**TOPSOIL** Dark brown, clayey silt with rootlets, damp	0.0							
		FILL Brown, clayey silt, trace sand and gravel, trace rootlets Higher gravel content from 0.15m to 0.30m		1	SS	70	PHCs	0	0	
2				2	SS	80		0	0	
4		Grey mottling at 1.22m								
6 / 2		**CLAYEY SILT** Light brown to grey, trace sand and gravel, moist	1.7	3	SS	75		0	0	
8				4	SS	85		0	0	
10			2.9							
12										

Field Technician:

Drafted by:

Reviewed by:

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		**TOPSOIL** Dark brown, clayey silt with rootlets, damp to moist								
			0.2	1	SS	90	Metals, OCs, CPs, PHCs	0	0	
		FILL Brown, clayey silt, some sand and gravel, moist								
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			2.9							
12										

Field Technician:

Drafted by:

Reviewed by:

MTE

ID No.: MP-1

Project Name: 12892 Dixie Road: Engineering Consulting Services

MTE File No.: 48043-300

Client: Tribal Partners (Canada) Inc.

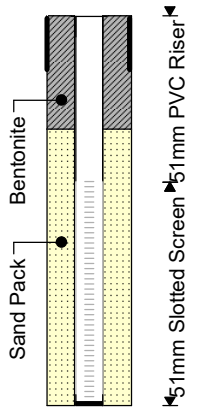
Site Location: 12892 Dixie Road, Caledon, ON

Date Completed: 5/4/2021

Construction Materials: 25mm Schedule 40 PVC

Installation Method: Manual Auger

Subsurface Profile				Soil Sample Lab Analysis	Piezometer
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)		
0 / 0		Ground Surface	266.3		
		FILL (TOPSOIL) dark brown clayey silt, APL with rootlets (450mm)	0.0 265.9		
2		**CLAYEY SILT** brown clayey silt, trace sand, DTPL	0.4 265.3		
4		Excavation Terminated	1.1		
6 / 2					
8					
10					



Field Technician: MBC

Drafted by: MBC

Reviewed by: JDM

Auger refusal at 1.1m bgs.
Water level measured to be Dry on June 16, 2021.

ID No.: MP-2

Project Name: 12892 Dixie Road: Engineering Consulting Services

MTE File No.: 48043-300

Client: Tribal Partners (Canada) Inc.

Site Location: 12892 Dixie Road, Caledon, ON

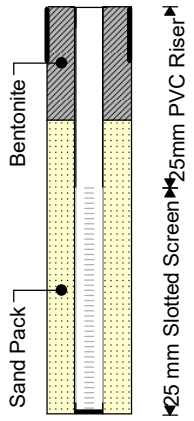
Date Completed: 5/4/2021

Construction Materials: 25mm Schedule 40 PVC

Installation Method: Manual Auger

Subsurface Profile

Depth (ft)	Depth (m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Soil Sample Lab Analysis	Piezometer
0	0		Ground Surface	268.3		
			FILL (TOPSOIL) dark brown clayey silt, APL with rootlets (350mm)	0.0 267.9		
			CLAYEY SILT brown clayey silt, some sand, DTPL	0.4 267.8		
2			**SANDY CLAYEY SILT** brown sandy clayey silt, some gravel, WTPL	0.5 267.2		
4			Excavation Terminated	1.1		
6	2					
8						
10						



Field Technician: MBC

Drafted by: MBC

Reviewed by: JDM

Auger refusal at 1.1m bgs.
Water level measured to be 267.50m asl on June 16, 2021.

ID No.: MP-3

Project Name: 12892 Dixie Road: Engineering Consulting Services

MTE File No.: 48043-300

Client: Tribal Partners (Canada) Inc.

Site Location: 12892 Dixie Road, Caledon, ON

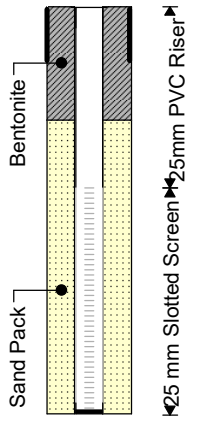
Date Completed: 5/4/2021

Construction Materials: 25mm Schedule 40 PVC

Installation Method: Manual Auger

Subsurface Profile

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Soil Sample Lab Analysis	Piezometer
0 / 0		Ground Surface	263.9		
		FILL (TOPSOIL) dark brown clayey silt, APL with rootlets (300mm)	0.0		
			263.6		
		SANDY CLAYEY SILT brown sandy clayey silt, trace gravel, DTPL	0.3		
		SILT brown silt, some gravel, clay and sand, wet			
2			263.1		
		SANDY CLAYEY SILT brown sandy clayey silt, some gravel, DTPL	0.8		
			263.0		
		SILT brown silt, some gravel, clay and sand, wet	1.0		
4		Excavation Terminated			
6 / 2					
8					
10					



Field Technician: MBC

Drafted by: MBC

Reviewed by: JDM

Auger refusal at 1.1m bgs.
Water level measured to be dry on June 16, 2021.

Appendix C

Particle Size Distributions

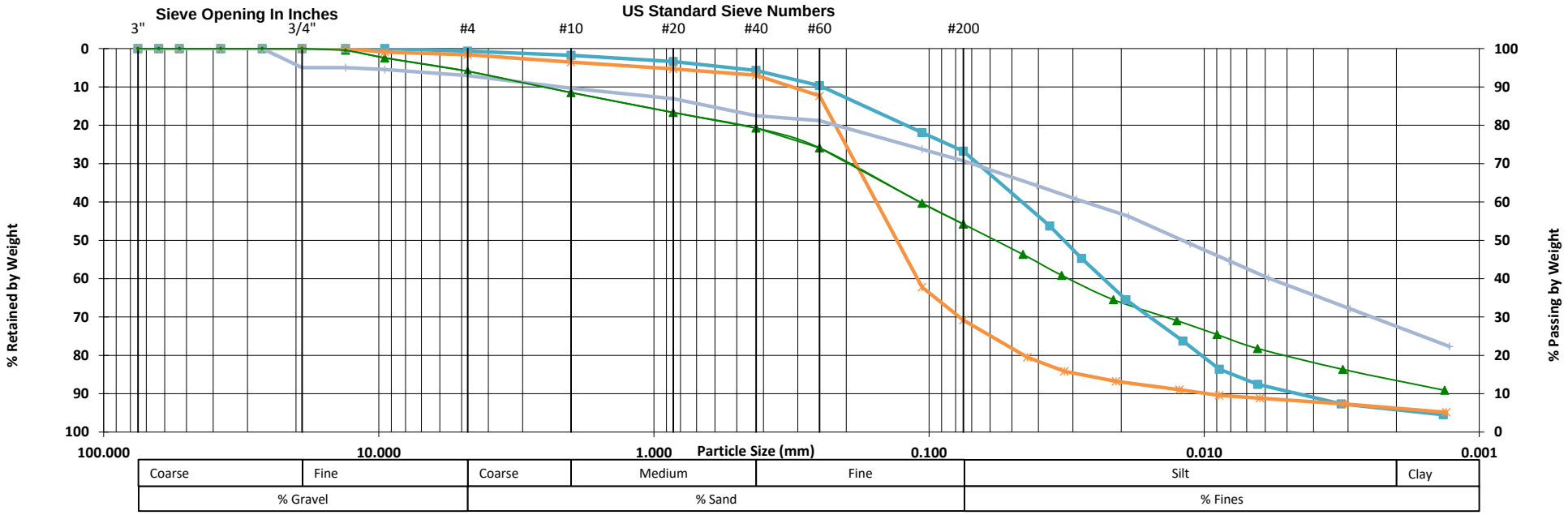
Particle Size Distribution Analysis Test Results

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:

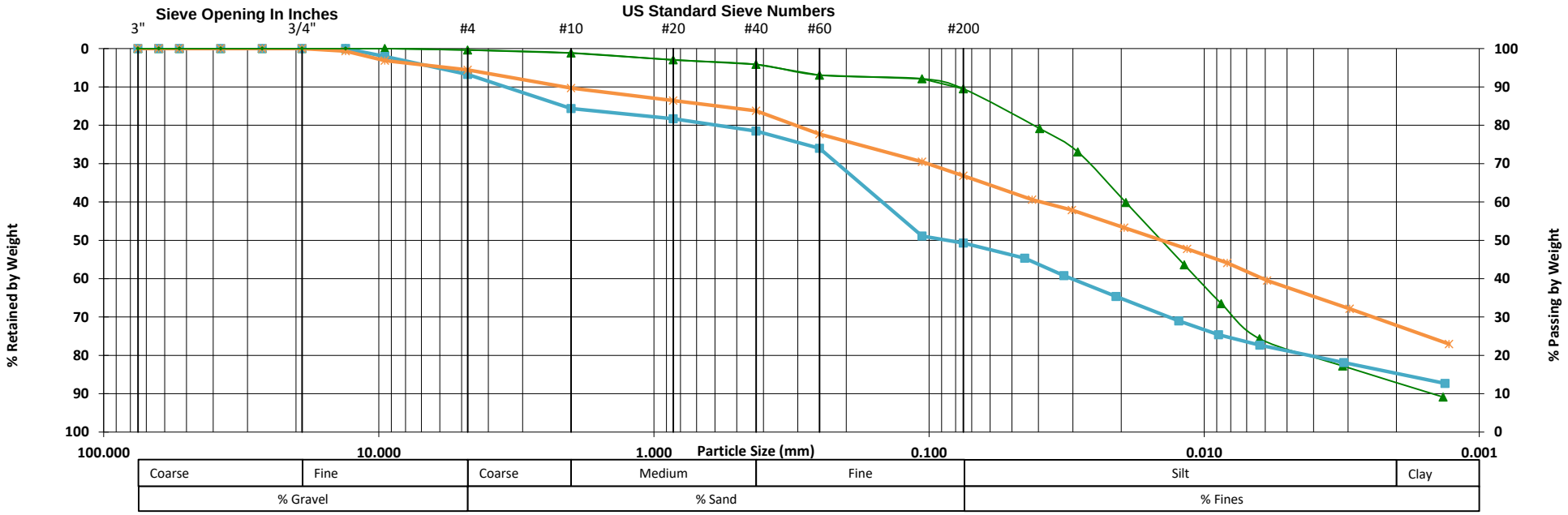
Particle Size Distribution Analysis Test Results

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

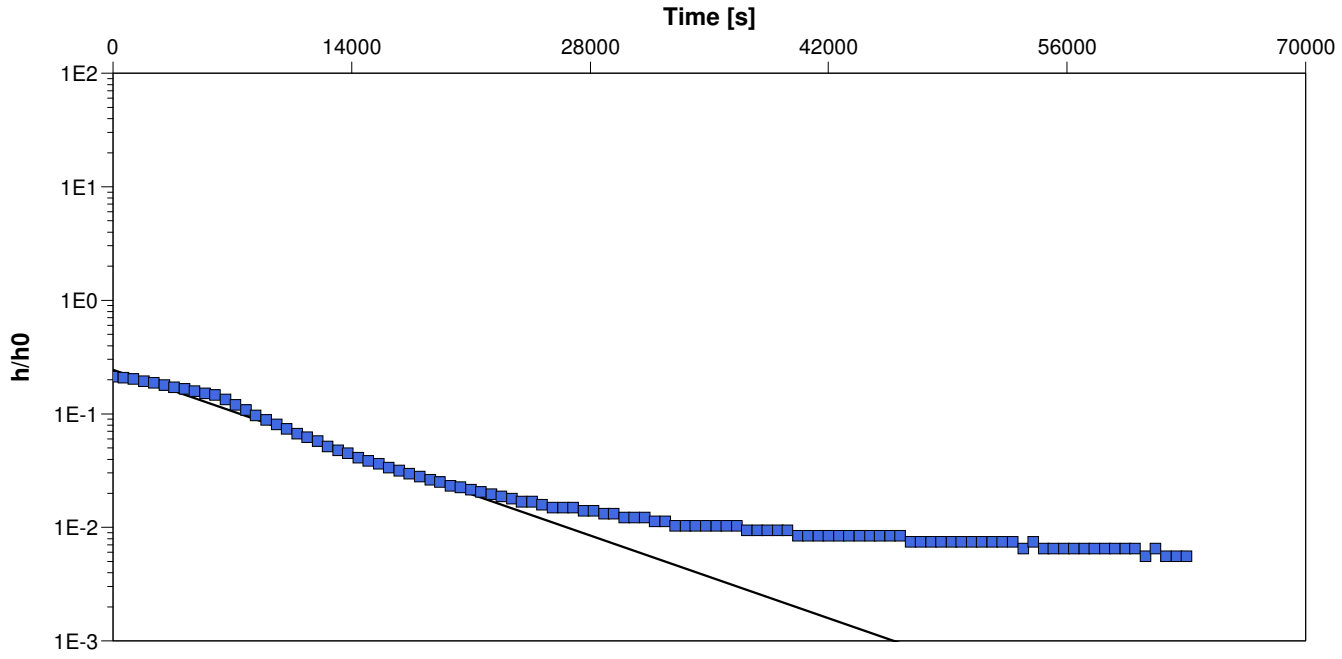
NOTES:

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		

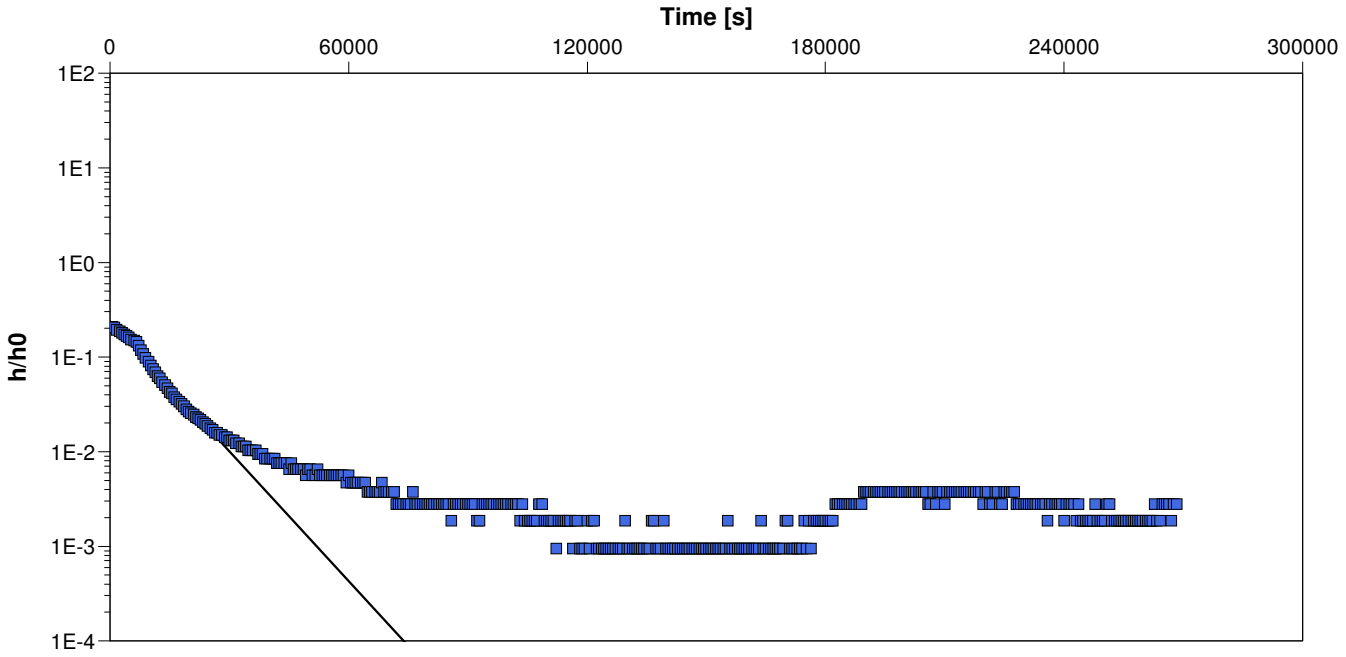


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MW101-20	8.95×10^{-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		

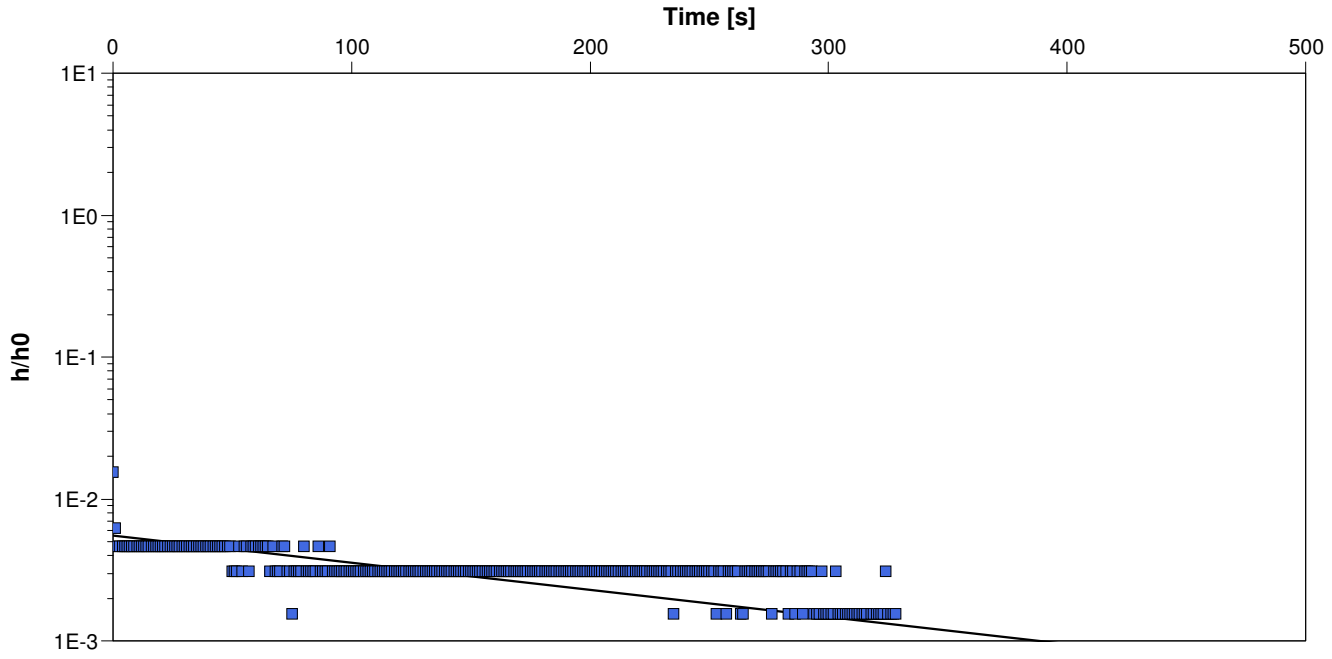


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MW101-20	7.85×10^{-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		

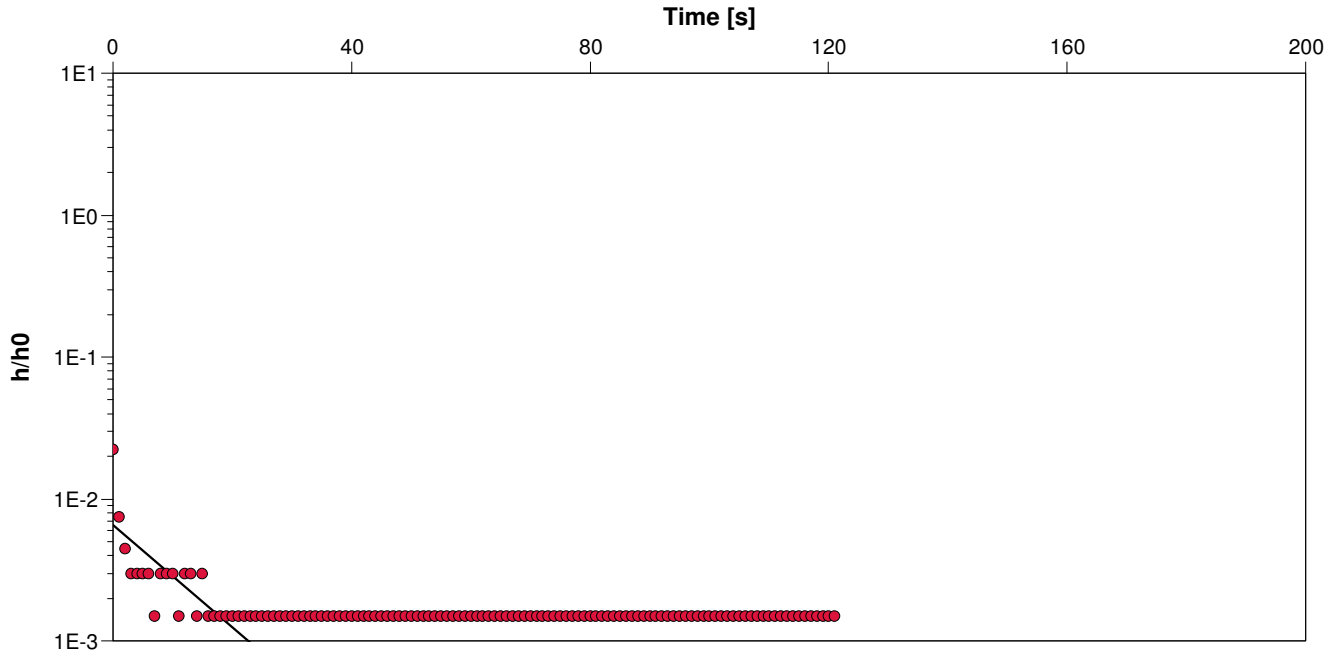


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MW101-20	3.27×10^{-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		

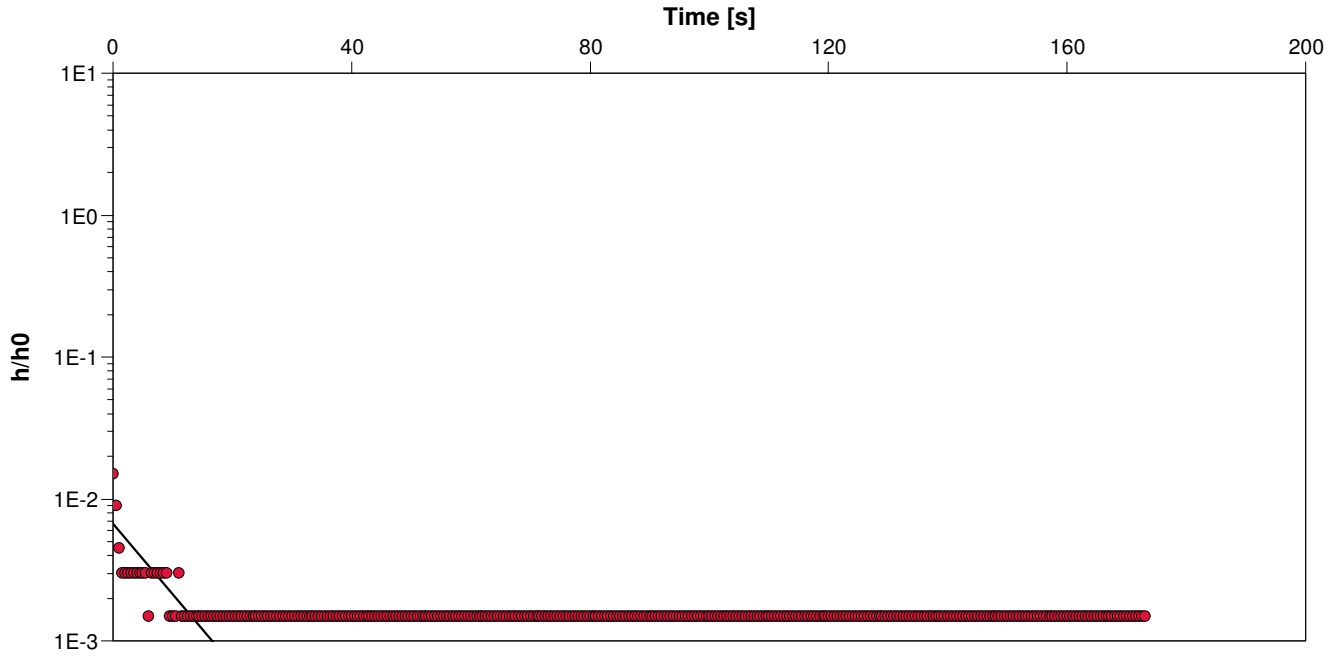


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MW103-20	5.37×10^{-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		

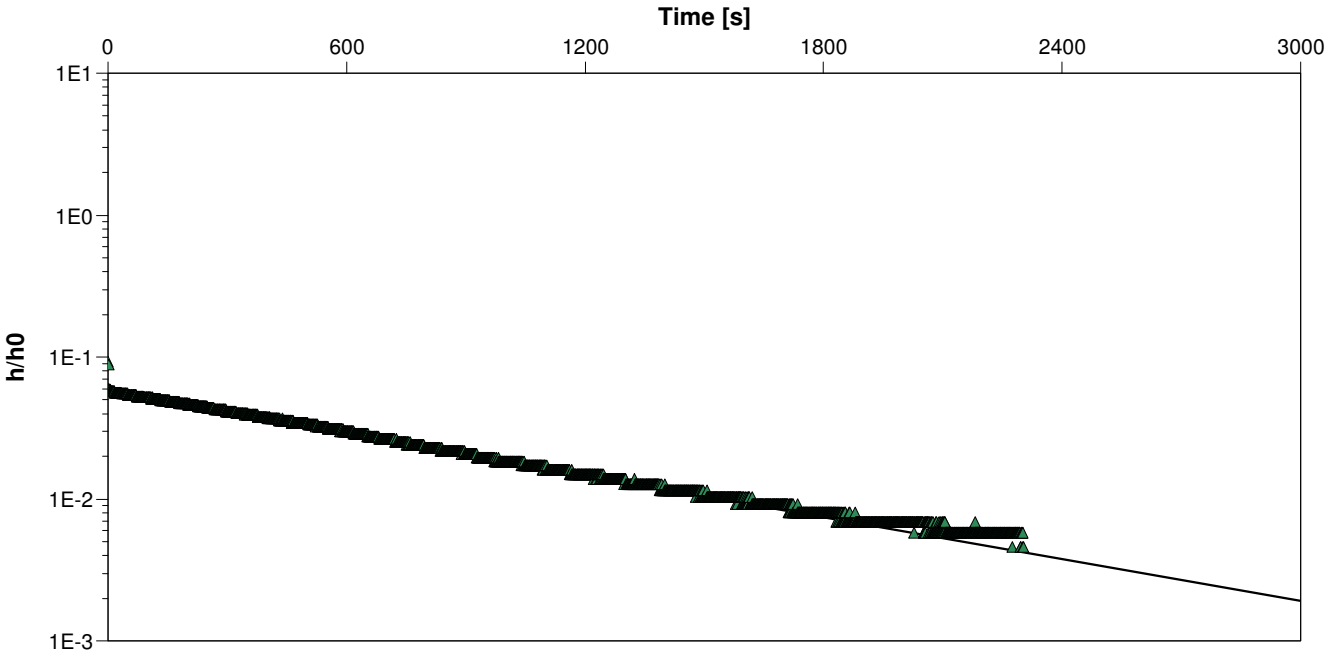


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MW103-20	7.41×10^{-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		

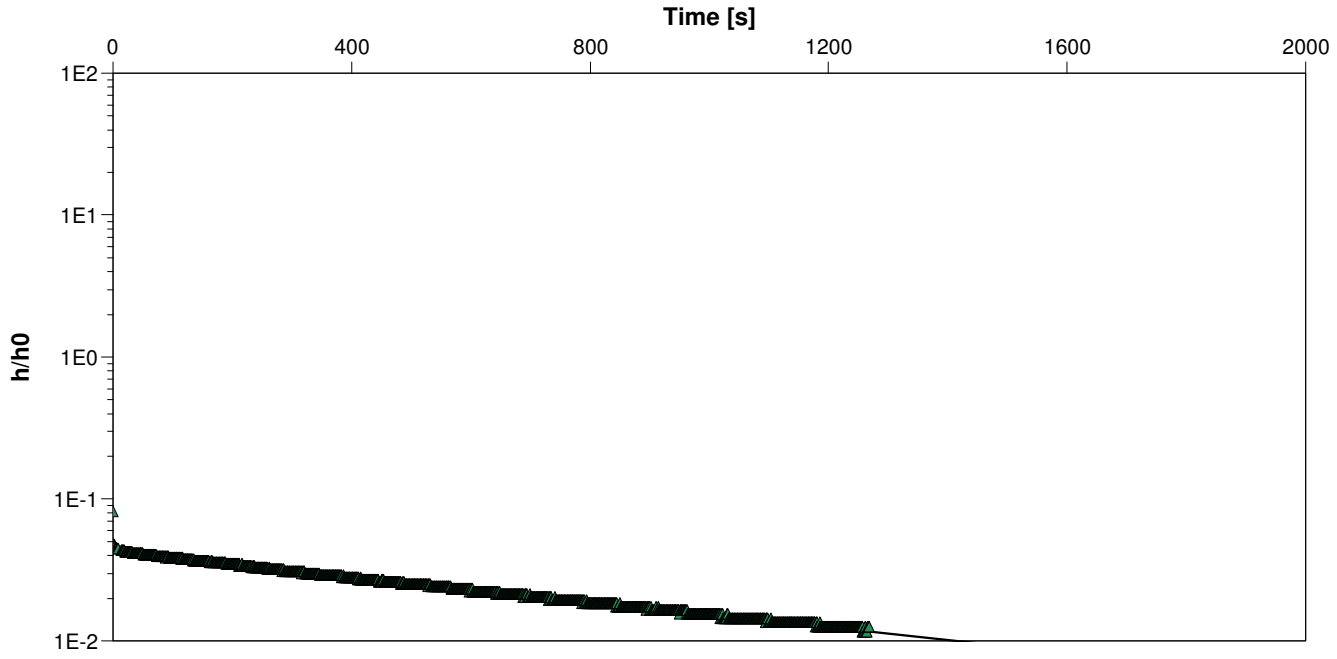


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MW106-20	1.49×10^{-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		

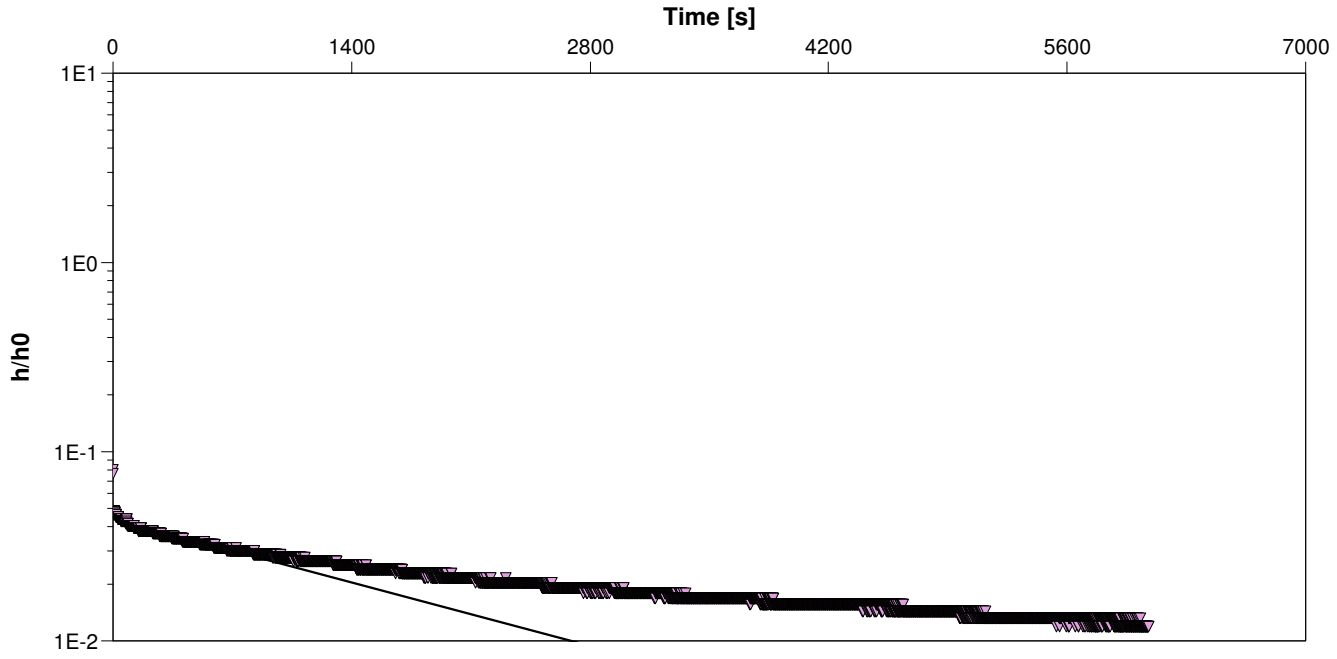


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MW106-20	1.37×10^{-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		

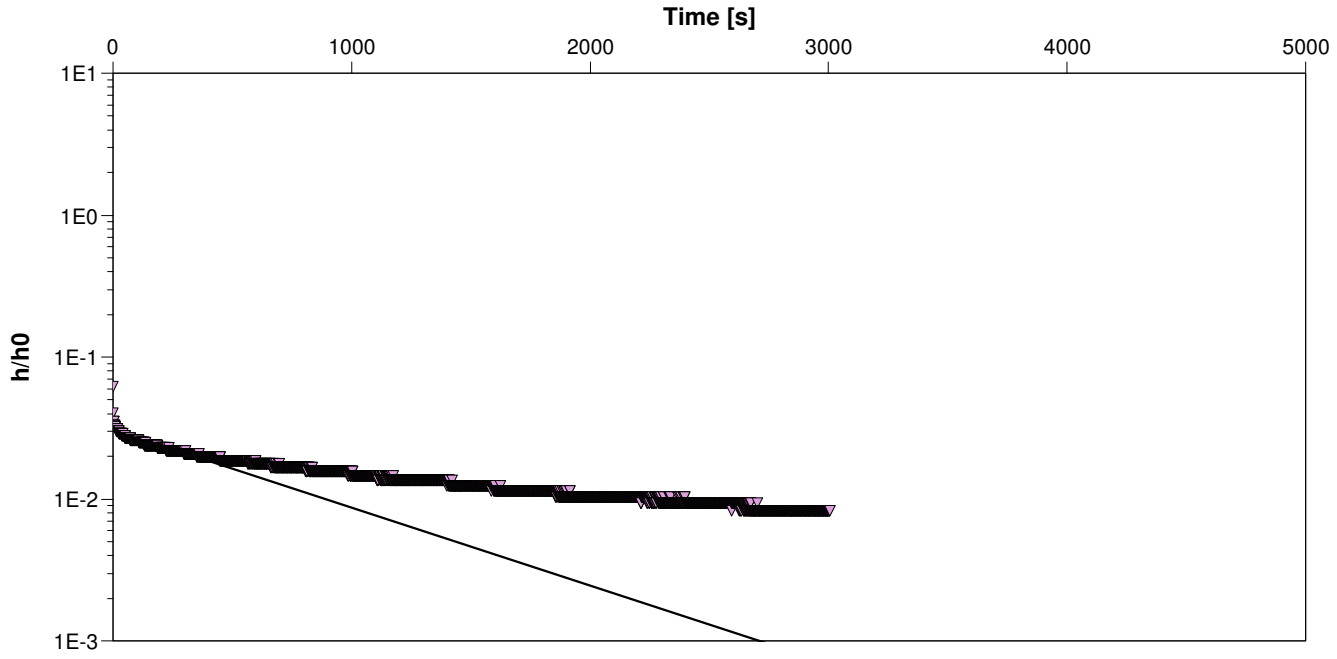


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MW107-20	4.34×10^{-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		



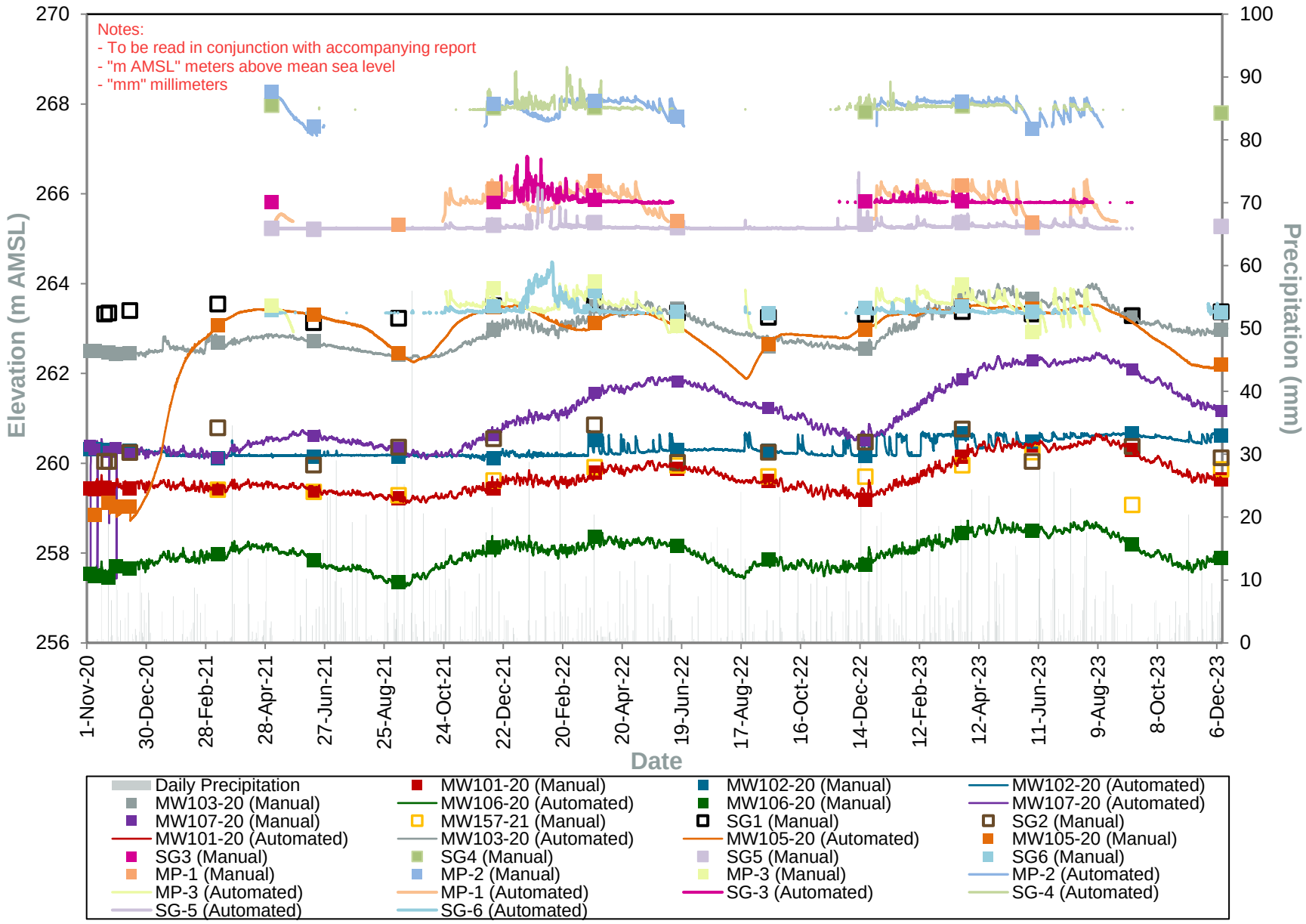
Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MW107-20	9.94×10^{-7}	

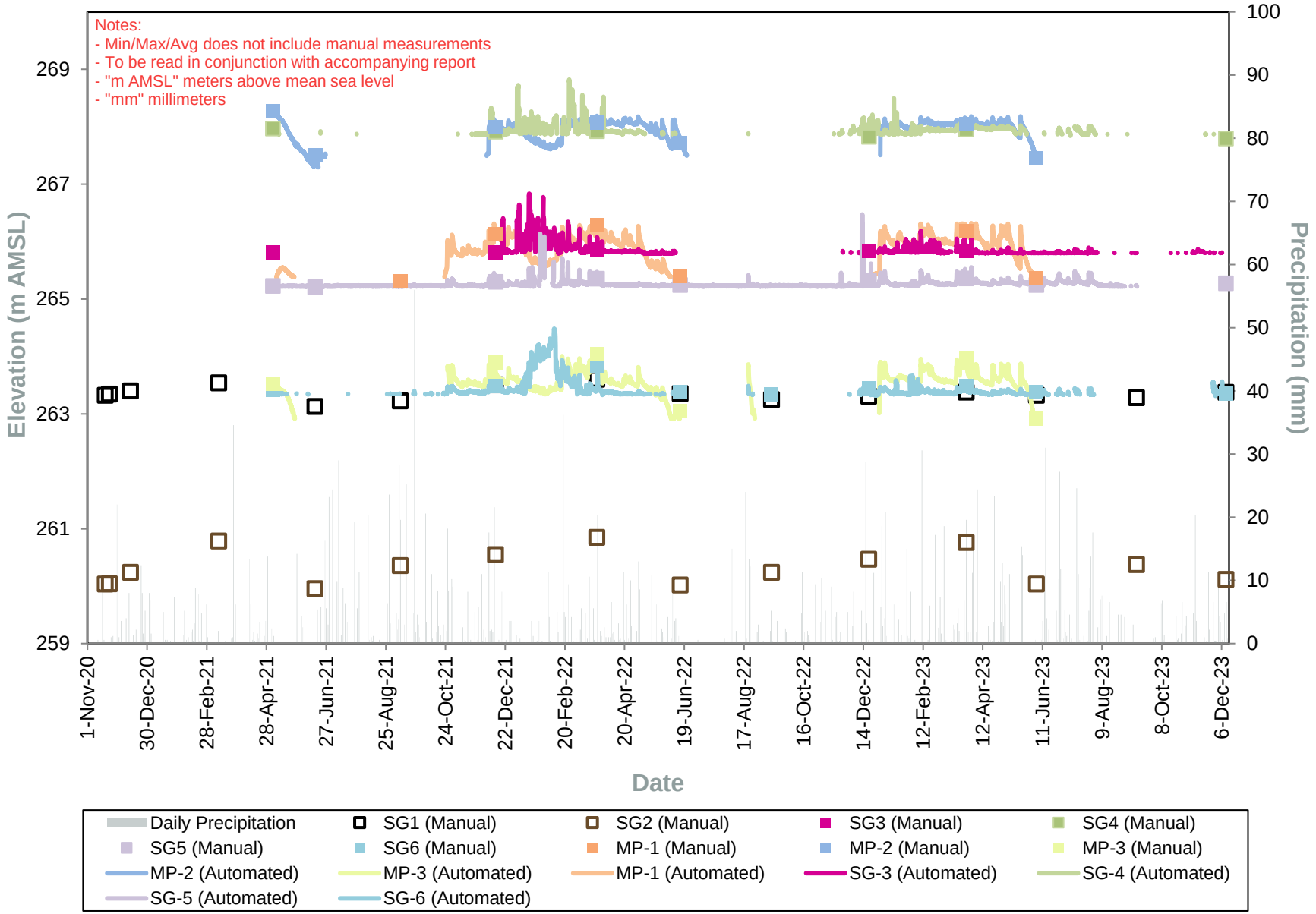
Appendix E

Hydrographs

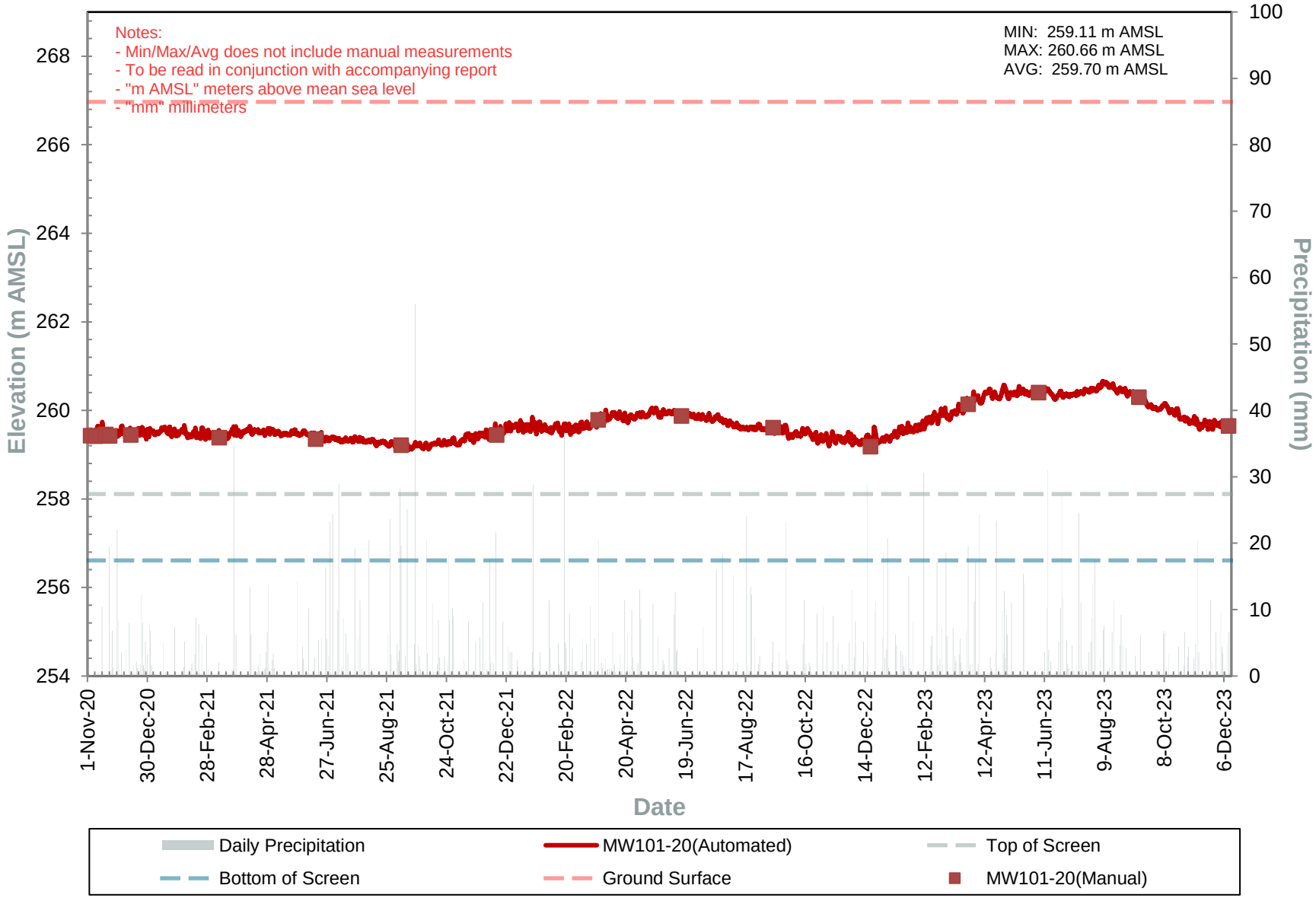
Hydrograph 1: Groundwater and Surface Water Elevations



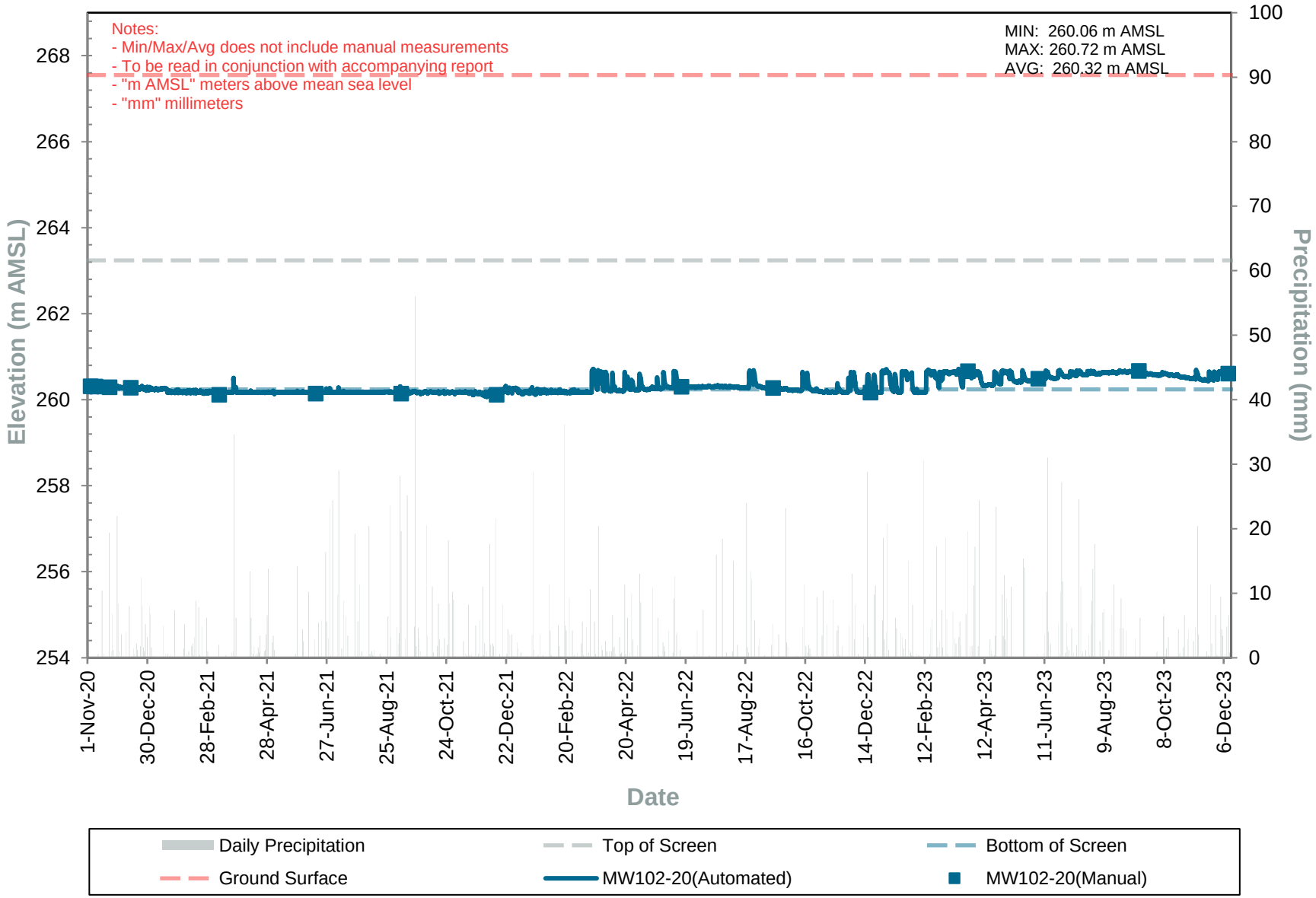
Hydrograph 1b: Water Elevations at SGs and MPs



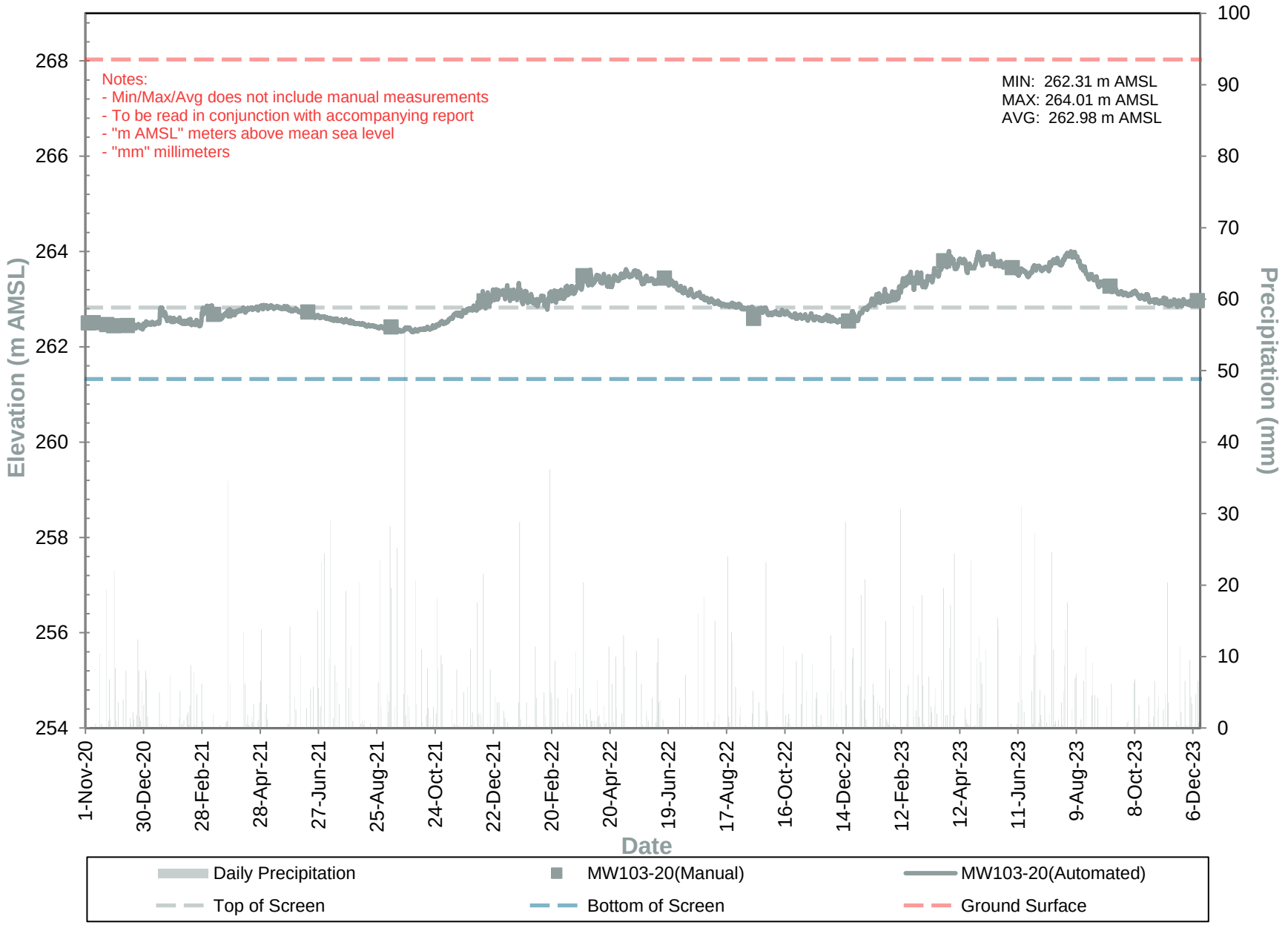
Hydrograph 2: Groundwater Elevations - MW101-20



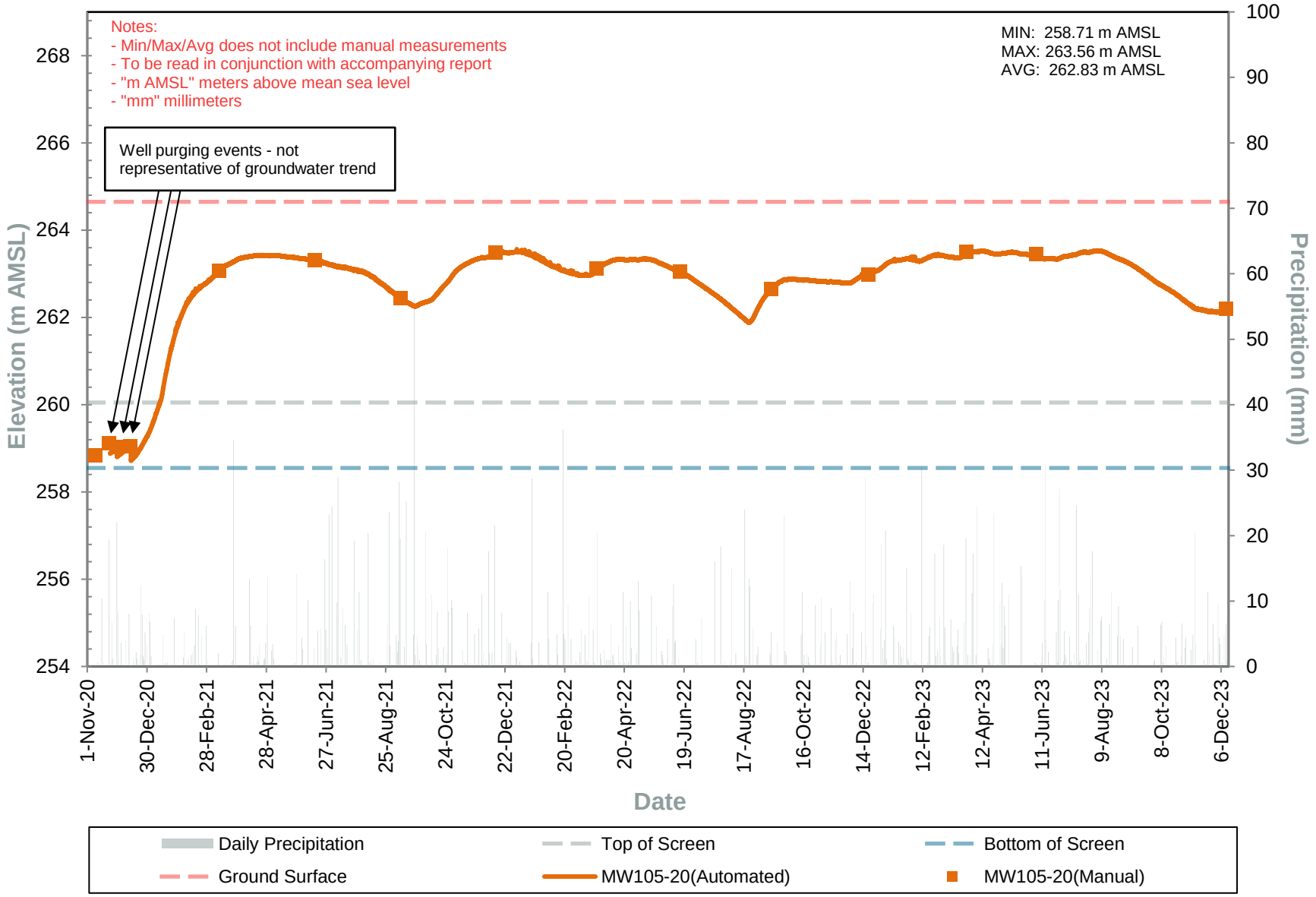
Hydrograph 3: Groundwater Elevations - MW102-20



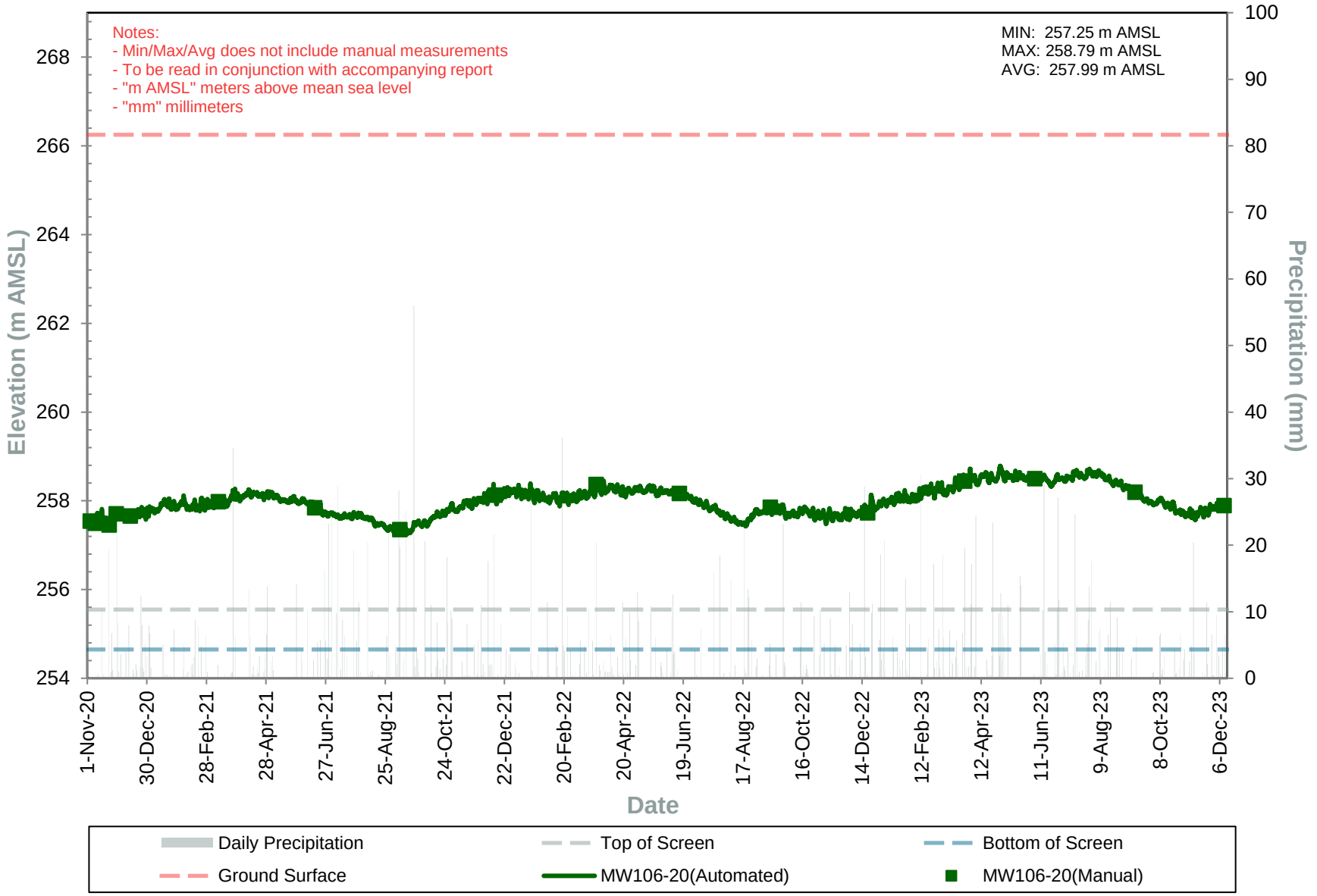
Hydrograph 4: Groundwater Elevations - MW103-20



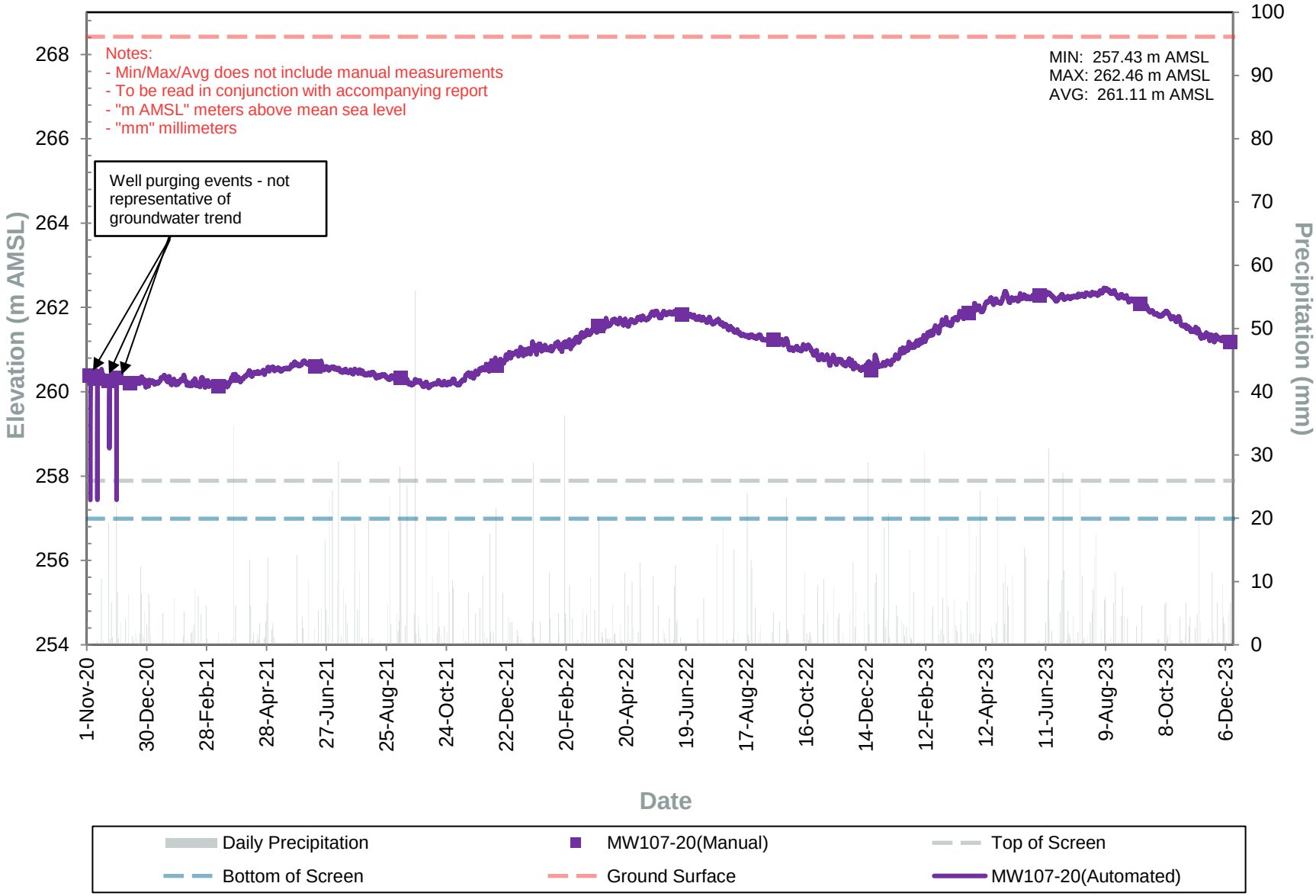
Hydrograph 5: Groundwater Elevations - MW105-20



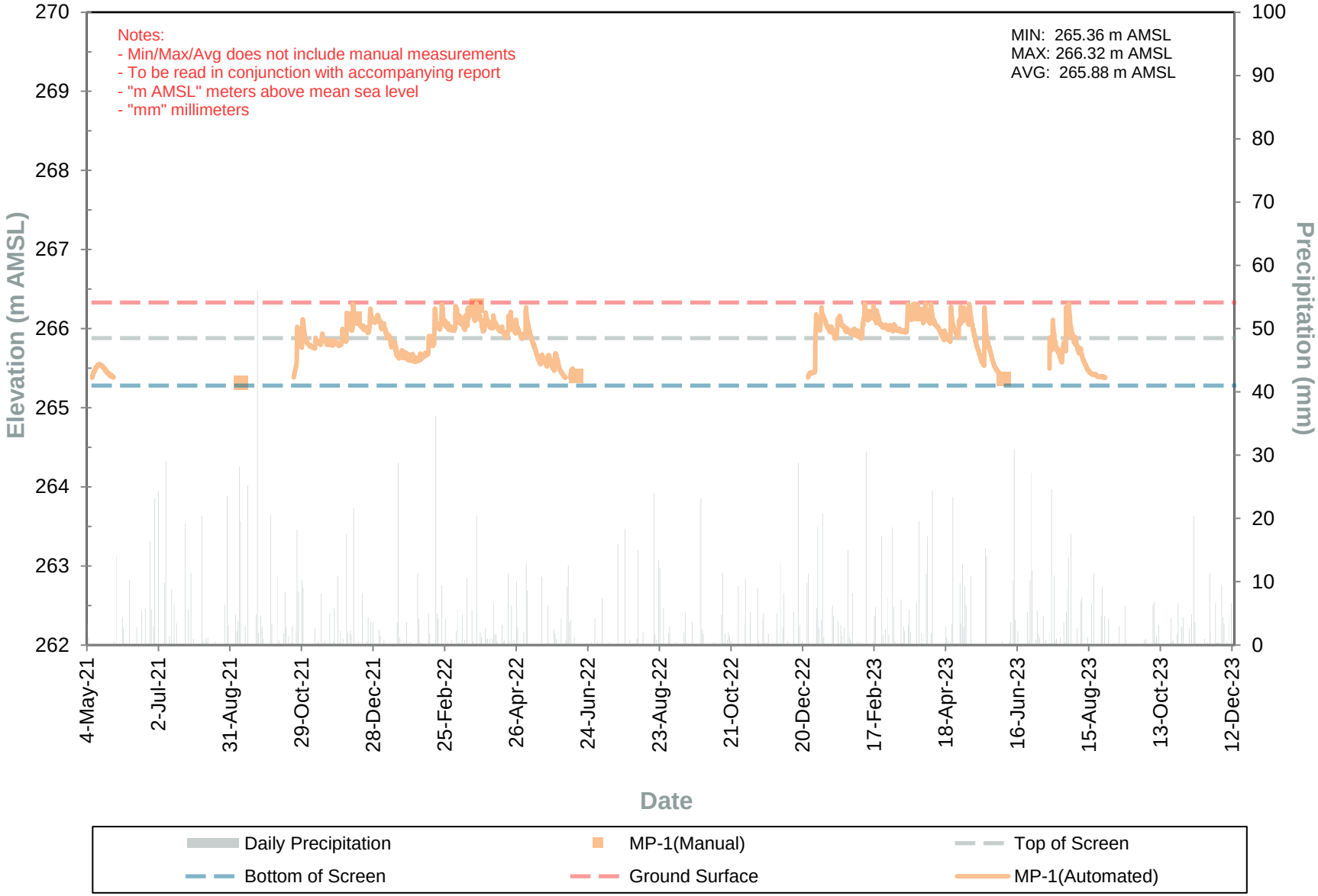
Hydrograph 6: Groundwater Elevations - MW106-20



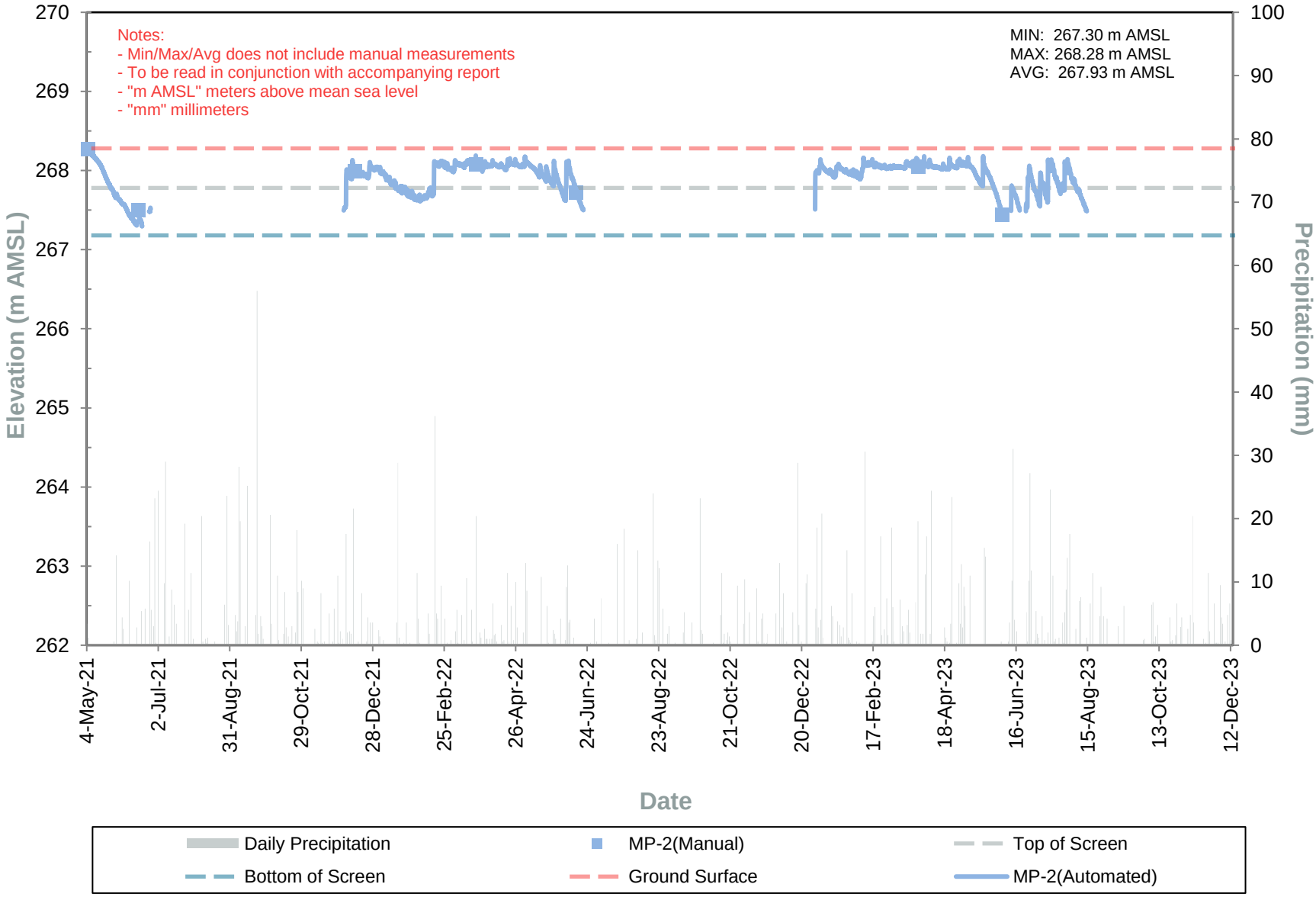
Hydrograph 7: Groundwater Elevations - MW107-20



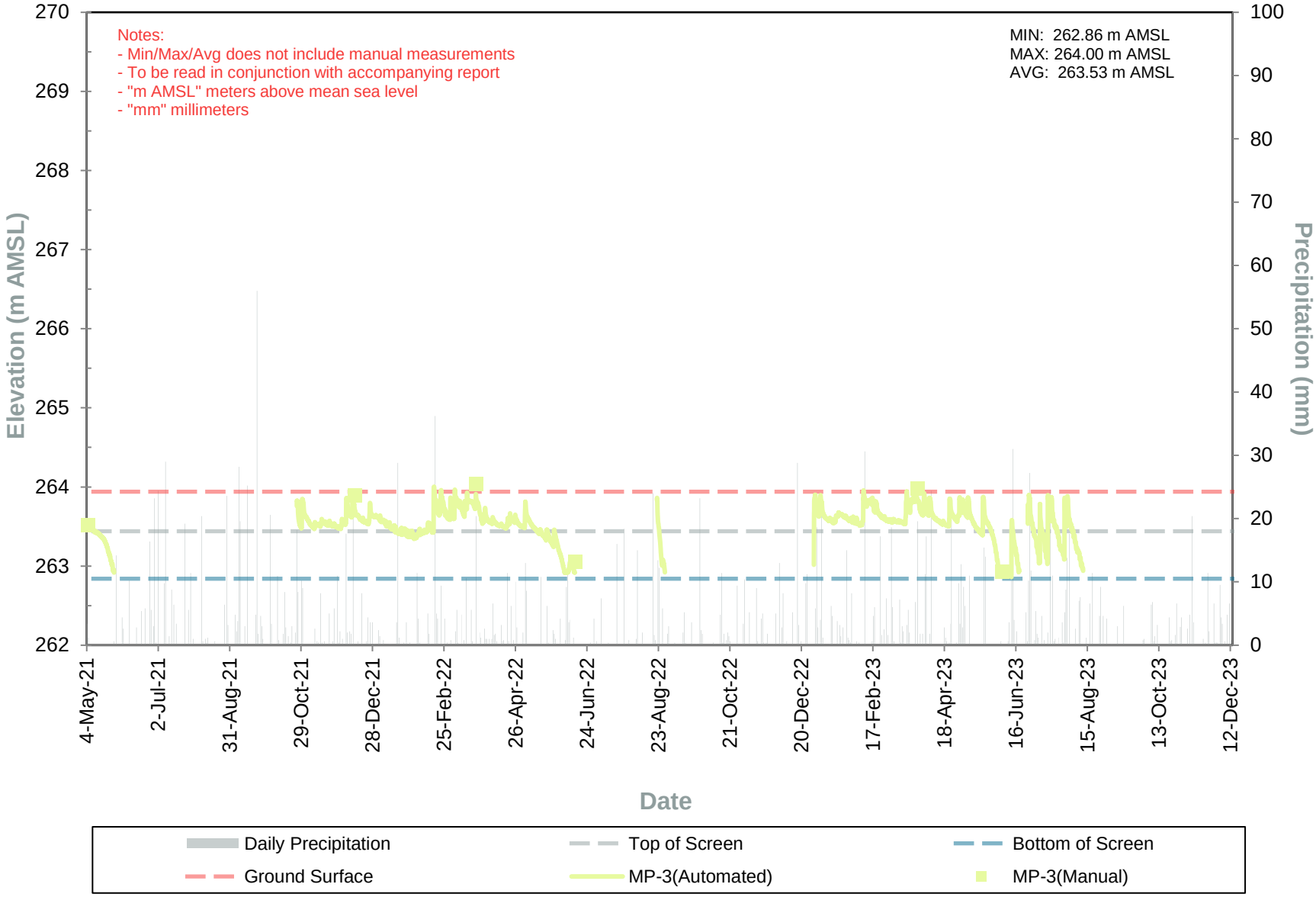
Hydrograph 8: Groundwater Elevations - MP-1



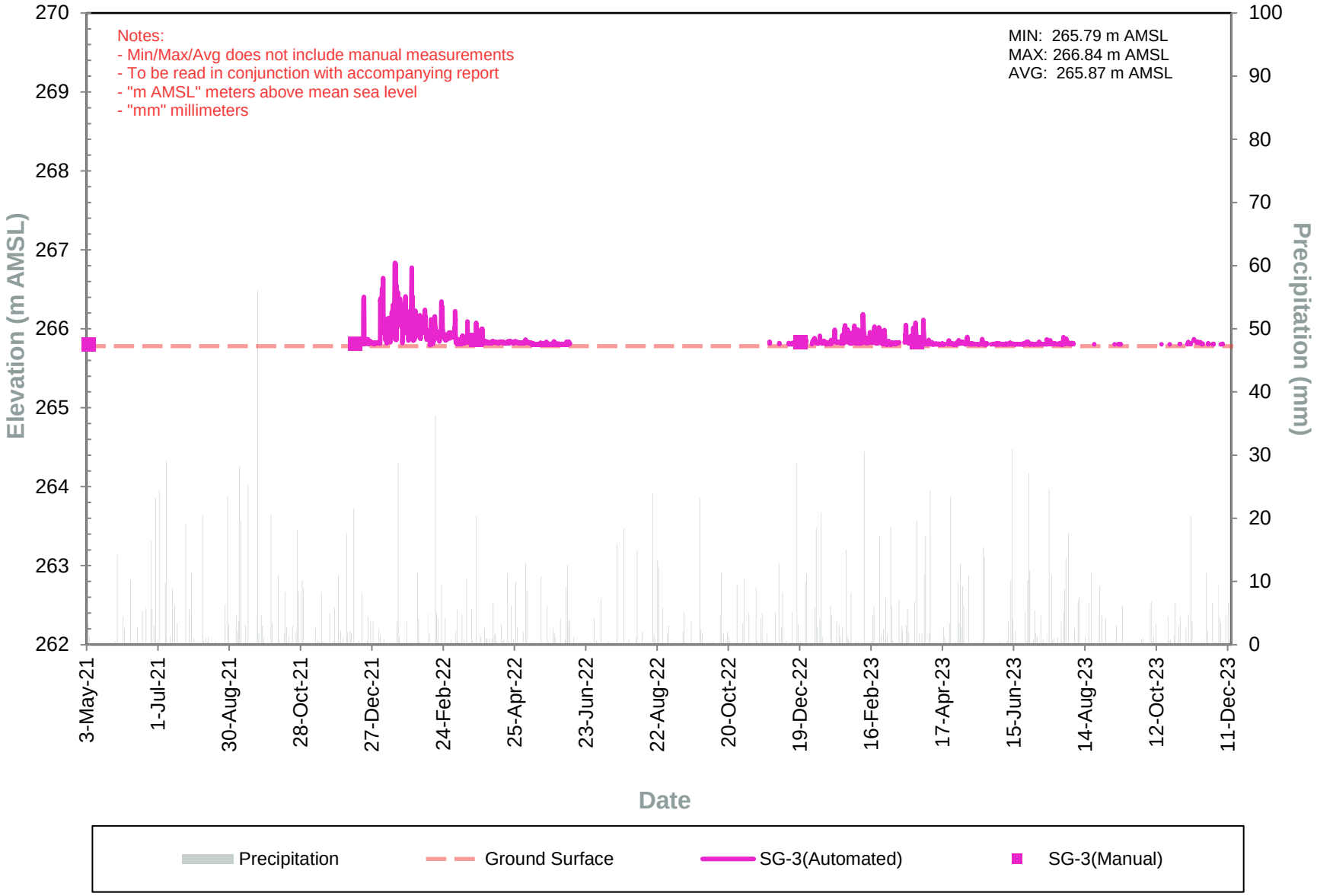
Hydrograph 9: Groundwater Elevations - MP-2



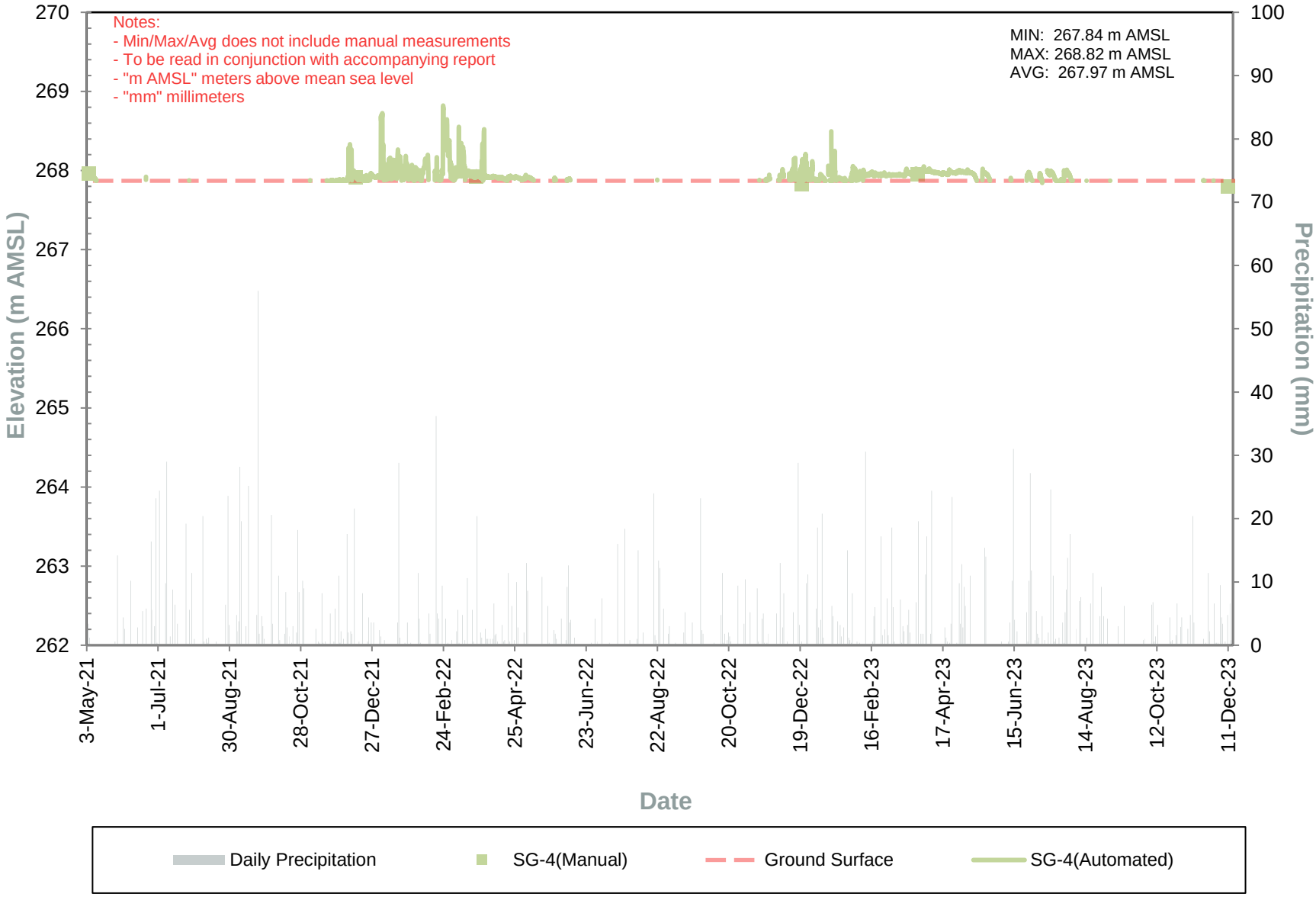
Hydrograph 10: Groundwater Elevations - MP-3



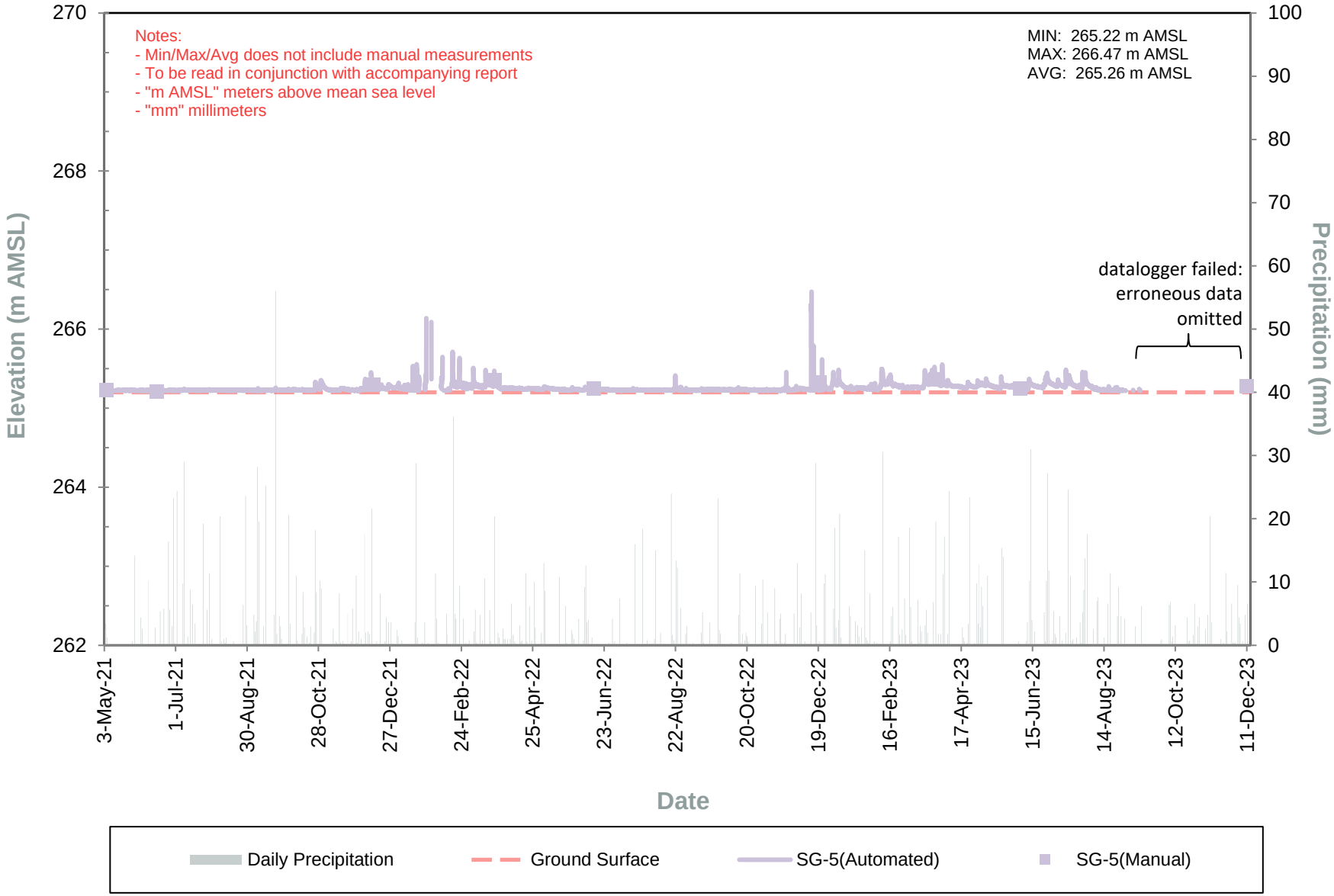
Hydrograph 11: Surface Water Elevations - SG-3



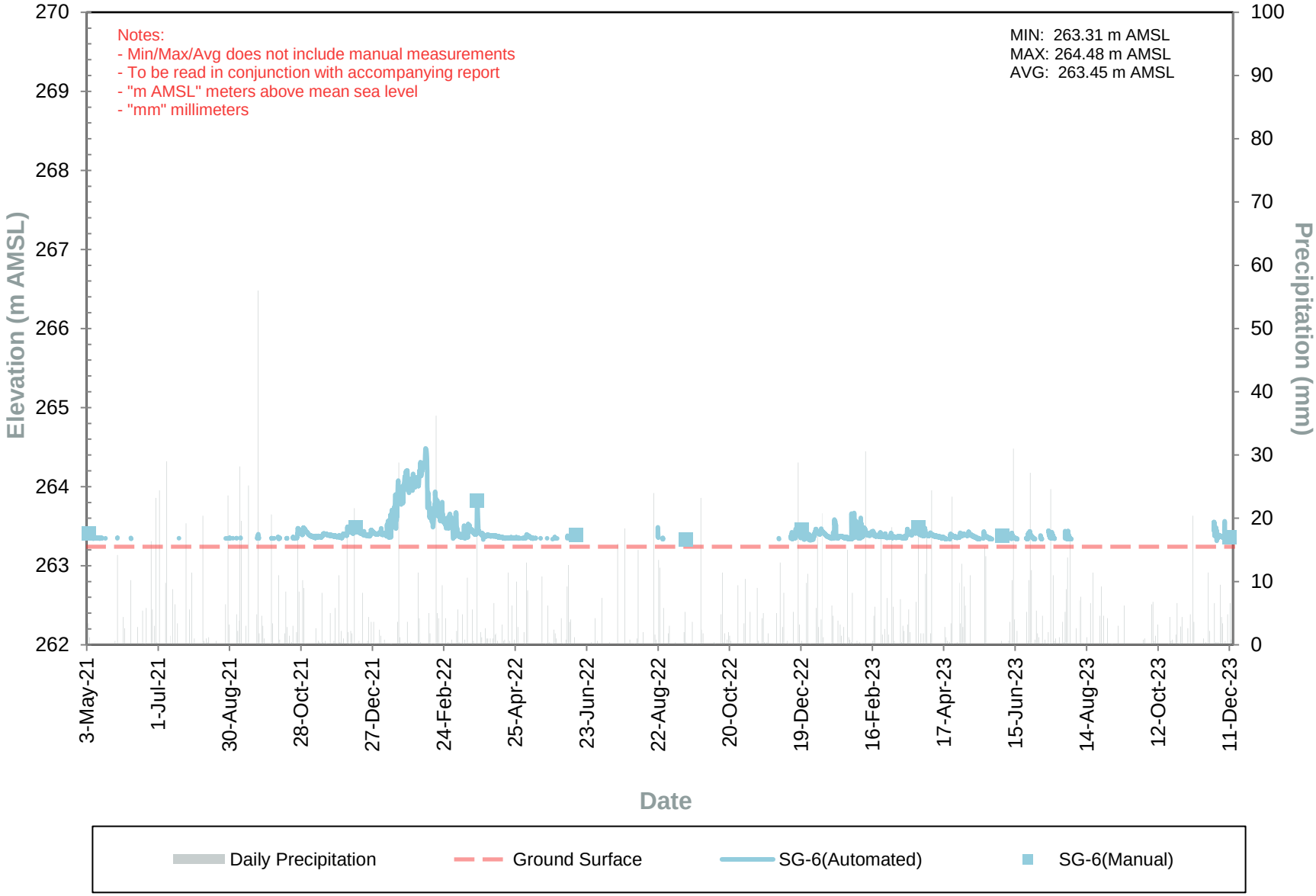
Hydrograph 12: Surface Water Elevations - SG-4



Hydrograph 13: Surface Water Elevations - SG-5



Hydrograph 14: Surface Water Elevations - SG-6



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

Ronklin Gracian
Project Manager
01 Dec 2020 10:57:09

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

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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 (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

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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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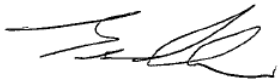
VALIDATION SIGNATURE PAGE

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): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558. ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ ☒ PWQO ☐ Reg 406 Table ☐ Other * Lower DL

Special Instructions:

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

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

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

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

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	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

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes	No
Mackenzie Costello	20/11/23	16:15		20/11/23	17:58			2 2 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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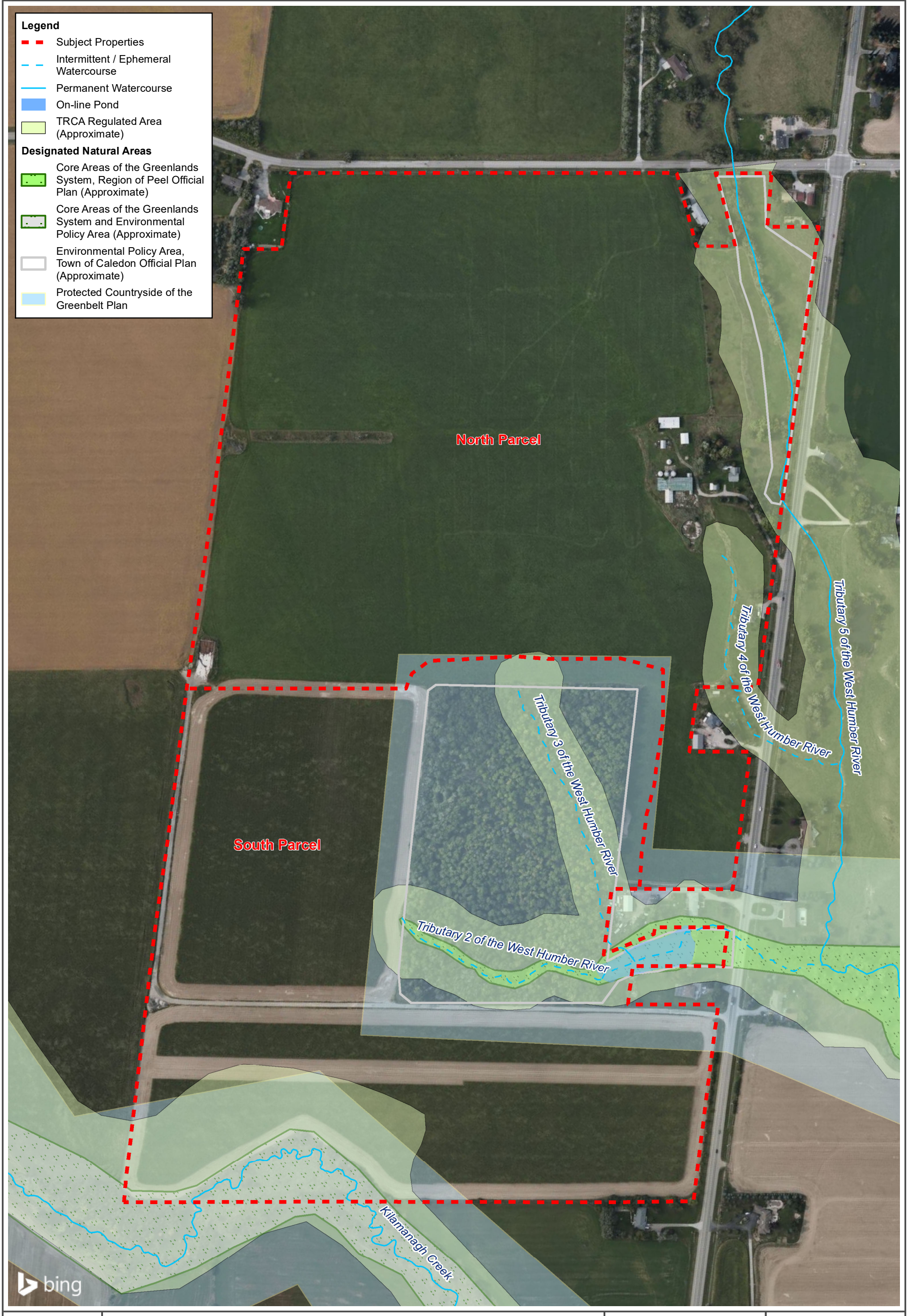
Appendix G

CEISMP Figures (WSP, 2024)

L:\Projects\2020\01275_00_12892DixieRd\MXDs\2023\CA0011264_12892DixieRd_DesignatedFeatures_202312_10.6.mxd 13 Dec 2023



wsp

12892 and 12668 Dixie Road - Caledon, Ontario
Comprehensive Environmental Impact Study and Management Plan
Designated Natural Areas

0 40 80
Metres
1:4,000

N

Date: December 2023
Project No: CA0011264
Figure No: 1

L:\Projects\2020\01275_00_12892DixieRd\MXDs\2023\CA0011264_12892DixieRd_NaturalFeatures_202312.mxd 13 Dec 2023

Legend

- Subject Properties
- Intermittent / Ephemeral Watercourse
- Permanent Watercourse
- On-line Pond
- Flow Direction
- Barn Swallow Nesting Kiosk
- Amphibian Calling Stations
- Vegetation Community
- Occupied Redside Dace Habitat (MECP, 2020)

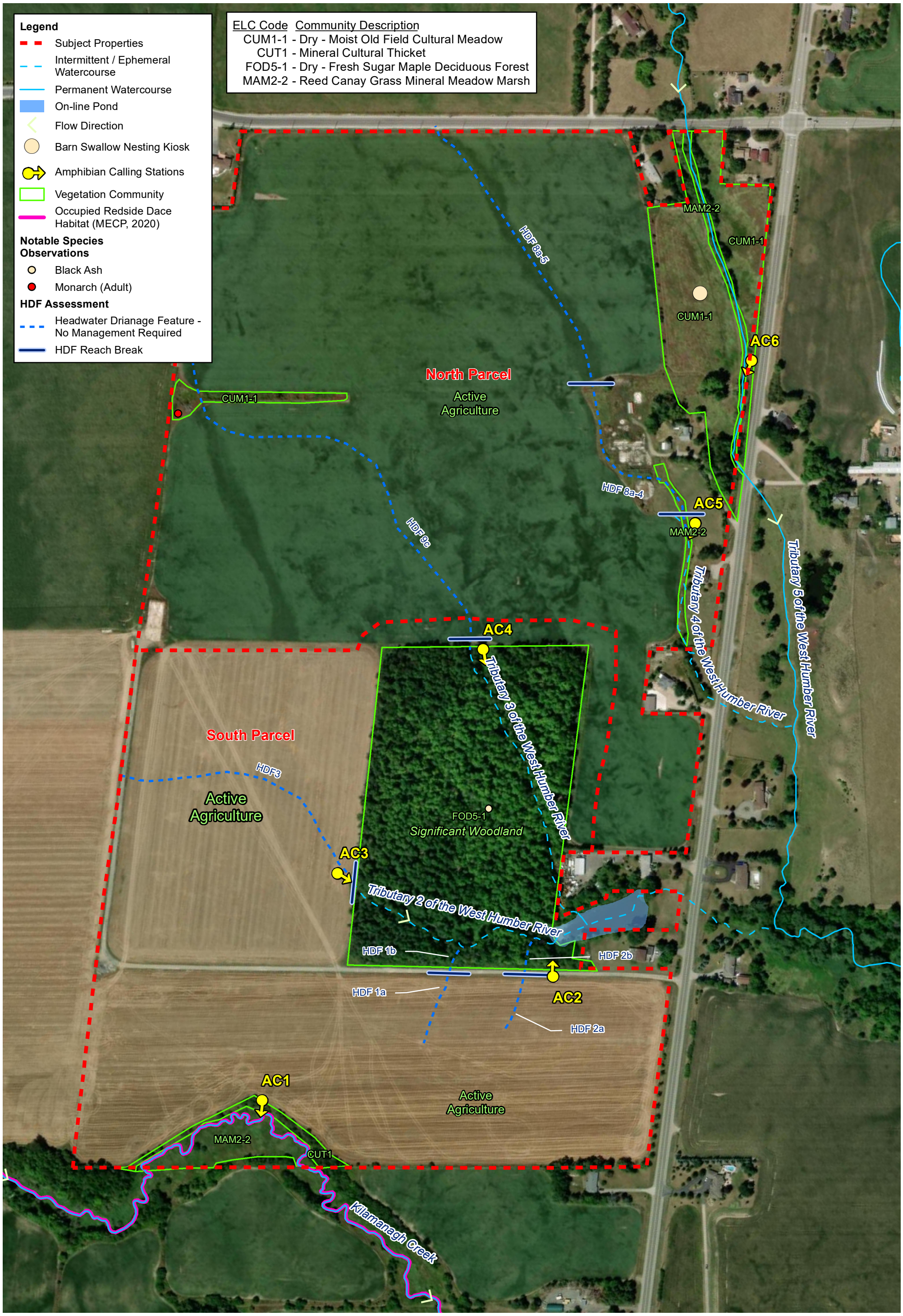
Notable Species Observations

- Black Ash
- Monarch (Adult)

HDF Assessment

- Headwater Drianage Feature - No Management Required
- HDF Reach Break

ELC Code	Community Description
CUM1-1	Dry - Moist Old Field Cultural Meadow
CUT1	Mineral Cultural Thicket
FOD5-1	Dry - Fresh Sugar Maple Deciduous Forest
MAM2-2	Reed Canay Grass Mineral Meadow Marsh



12892 and 12668 Dixie Road - Caledon, Ontario
Comprehensive Environmental Impact Study and Management Plan
Existng Conditions and Survey Locations

0 40 80
Metres
1:4,000

N

Date: December 2023
Project No: CA0011264
Figure No: 2

L:\Projects\2020\01275_00_12892DixieRd\MXDs\2023\CA0011264_12892DixieRd_FeatureLimits_202312.mxd 13 Dec 2023

WSP

12892 and 12668 Dixie Road - Caledon, Ontario
Comprehensive Environmental Impact Study and Management Plan
Natural Feature Limits and Recommended Setbacks

0 40 80
Metres
1:4,000

N

Date: December 2023
Project No: CA0011264
Figure No: 3

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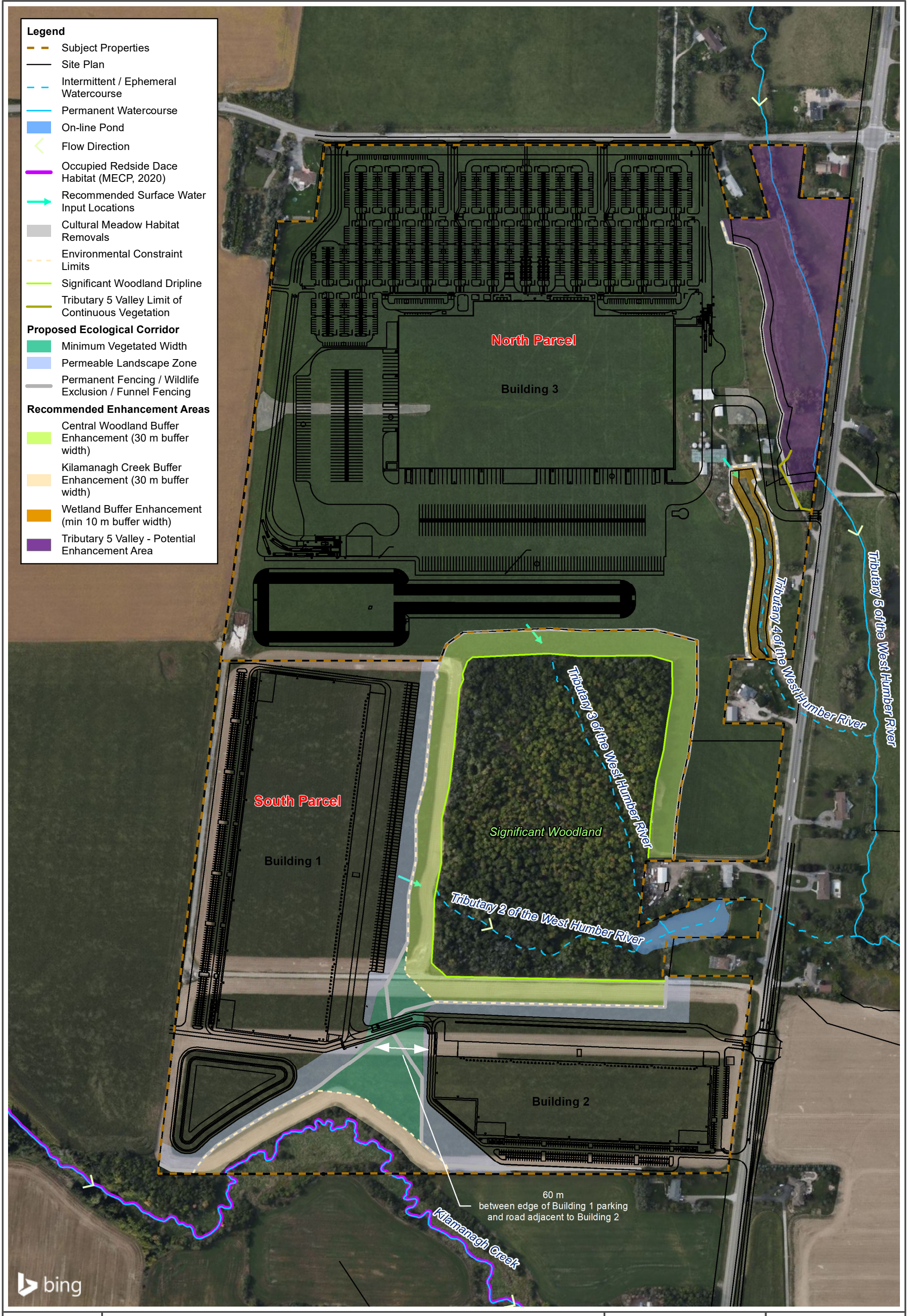

wsp

12892 and 12668 Dixie Road - Caledon, Ontario
Comprehensive Environmental Impact Study and Management Plan
Site Plan and Environmental Management Recommendations

0 40 80
Metres
1:4,000

N

Date: December 2023
Project No: CA0011264
Figure No: 4