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# Hydrogeological Assessment & Water Balance Snell’s Hollow Secondary Plan Area

Snell’s Hollow Developers Group
Caledon, Ontario

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# Snell's Hollow Secondary Plan Area

## Snell's Hollow Developers Group
## Caledon, Ontario

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# 1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) was retained by the Snell's Hollow Developers Group to complete a hydrogeological assessment & water balance to support the Snell's Hollow East Secondary Plan for lands located at the northeast corner of Kennedy Road and Mayfield Road in the Town of Caledon and Region of Peel (herein referred to as the subject lands). The subject lands are approximately 61.7 ha in size and are bounded by Highway 410 to the north, Highway 410 to the east, Mayfield Road to the south and Kennedy Road to the west (Figure 1). A wetland is located in the southwestern portion of the subject lands which has been mapped as part of the Heart Lake Provincially Significant Wetland (PSW) complex. Current land use of the subject lands is primarily agricultural with rural residential in the uplands and meadows on the valley slopes adjacent to the PSW unit (Figure 2). The subject lands are located within the jurisdiction of the Toronto and Region Conservation Authority (TRCA).

A hydrogeological assessment and water balance for the subject lands was prepared by Burnside in May 2021 and submitted as part of the draft plan application. Since the May 2021 submission, Burnside has continued to monitor the groundwater conditions across the subject lands. The current report includes the data collected since the initial submission as well as additional field work requested by the TRCA in review of the first submission. Detailed water balance calculations have been updated to reflect the revised development plan and have been included in this report. The water balance calculations provide input to the stormwater management plans for the subject lands being designed by David Schaeffer Engineering Ltd. (DSEL) by providing recharge targets for the design of Low Impact Development (LID) measures to maintain, where possible, key hydrogeological functions.

## 1.1 Scope of Work

The scope of work for the hydrogeological assessment included completion of the following tasks:

1. Review of published geological and hydrogeological information: A review of existing regional mapping for the area was completed, including physiography, topography (Figure 3), surficial geology (Figure 4) and bedrock geology.
2. Review of soils data: Boreholes from hydrogeological and geotechnical investigations on the subject lands were reviewed. In 2022, Burnside drilled and installed one monitoring well. In 2019, a study conducted by Golder Associates Ltd. included 19 boreholes across the subject lands and the installation of 13 monitoring wells at 10 locations. In 2017, a study completed by Edward Wong & Associates Inc. included six boreholes of which three were completed as monitoring wells. The locations of these boreholes and monitoring wells are

shown on Figure 5. The borehole logs (Appendix A) were reviewed to characterize the surficial sediments and stratigraphy.

3. Review of the Ministry of the Environment, Conservation and Parks (MECP) well records: The MECP maintains a database that provides geological records of water supply wells drilled in the province. A list of the historical records for local wells is provided in Appendix B and the well locations are shown on Figure 5. It is noted that the well locations listed in the MECP records are approximations only of where they were and may not be representative of the precise well locations in the field.

4. Installation of drive-point piezometers and staff gauges: Twelve piezometers (six nests of two piezometers installed at different depths) and five staff gauges were installed to monitor groundwater and surface water interactions in the wetland. The locations of the piezometers and staff gauges are shown on Figure 2.

5. Review of grainsize analyses: Grainsize analyses completed as part of hydrogeological and geotechnical studies on the subject lands were reviewed to characterize the surficial sediments and estimate the hydraulic conductivity of the soils encountered. Copies of the soil grainsize analyses are provided in Appendix C.

6. Hydraulic conductivity testing: Single well response tests were completed in five groundwater monitoring wells to assess the in situ hydraulic conductivity of the shallow soils on the subject lands. The hydraulic conductivity field testing results are provided in Appendix D.

7. Monitoring of groundwater levels: Monitoring has been completed to characterize the seasonal water table and the horizontal and vertical groundwater flow conditions. Groundwater level measurements were obtained in monitoring wells and drive-point piezometers since April 2019. Automatic water level recorders (dataloggers) were installed in select monitoring wells and drive-point piezometers in order to record continuous water level fluctuations. The groundwater monitoring data collected to date and hydrographs are provided in Appendix E.

8. Monitoring of surface water levels: Monitoring has been completed to measure the surface water elevation along the watercourse and wetlands adjacent to the drive-point piezometers since April 2019. The surface water data are provided in Appendix F.

9. Water quality testing: Two groundwater samples (MW19-01 and MW19-04d) and one surface water sample (SW4) were collected to characterize the baseline

water quality. The water samples were submitted to a qualified laboratory for analysis of general quality indicators (e.g., pH, hardness, and conductivity), basic ions (including chloride and nitrate) and selected metals. The testing results are provided in Appendix G.

10. Water balance calculations: Pre-development water balance calculations (based on existing land use conditions) and post-development water balance calculations (based on the proposed development concept) were completed to assess the potential impacts of land development on the local groundwater recharge conditions. The local climate data and detailed water balance calculations are provided in Appendix H.

# 2.0 Physical Setting

## 2.1 Physiography and Topography

The subject lands are located in the physiographic region known as the South Slope of the Oak Ridges Moraine (Chapman and Putnam, 1984). The South Slope physiographic region is characterized by rolling till plains sloping down from the Oak Ridges Moraine (Chapman and Putnam, 1984).

The topography of the subject lands is shown on Figure 3. The subject lands have an undulating topography, dominated by steeply sloping lands down to a valley associated with a tributary to Spring Creek which crosses through the subject lands. The maximum relief across the subject lands is 16 m, with the highest elevation of 272 metres above sea level (masl) found along the northeast property boundary and the lowest elevations occurring in the central to southern portion along the tributary where the ground elevation is approximately 256 to 257 masl.

## 2.2 Drainage

The subject lands are within the Spring Creek subwatershed of the Etobicoke Creek watershed, within the jurisdiction of the TRCA. An unnamed tributary of Spring Creek originates in the southwestern portion of the subject lands. A stormwater management pond, which receives runoff from Mayfield Road, is located at the southwest corner of the subject lands and outlets to the tributary, providing baseflow to the feature. The tributary flows from west to east entering a ponded area at the southern boundary of the subject lands and exiting the subject lands at Mayfield Road approximately 400 m west of Heart Lake Road. A wetland is located at the bottom of the valley slope, surrounding the tributary. This wetland has been mapped as part of the Heart Lake Wetland Complex which is designated as a Provincially Significant Wetland (PSW).

There are three catchment areas located on the subject lands (Figure 3): Catchment Area 1 (~46.2 ha) is located in the western and central portions of the subject lands and generally drains towards the tributary and wetland area, flowing south beneath Mayfield Road towards Heart Lake, which is located approximately 1 km south of the subject lands (Figure 3); Catchment Area 2 (~12.6 ha) consists of lands on both the west and east sides of Heart Lake Road and drains south beneath Mayfield Road to an existing stormwater management pond located on the southwest corner of the Mayfield Road and Heart Lake Road intersection (Figure 3); and Catchment Area 3 (~2.9 ha) consist of the eastern most portion of the subject lands and drains to an existing stormwater management pond located adjacent to Highway 410, to the east of the subject lands (Figure 3).

The monitoring of the wetland and tributary was completed to understand the function and source of water to these features. The monitoring consisted of monthly water level measurements in 12 drive-point piezometers installed as six 'nests' (i.e., adjacent locations with different depths) and five staff gauges (Figure 2). All piezometers, with the exception of PZ5s/d, have been instrumented with dataloggers since March 2021.

The results of the monitoring show the following:

- At PZ1s/d, located at the head of the tributary of Spring Creek, groundwater levels in the shallow piezometer were generally higher than the deep piezometer indicating a downward gradient from 2019 through to the spring of 2022 (Figure E-15, Appendix E). The early monitoring data at PZ1d shows a slow stabilization of groundwater levels indicating low hydraulic conductivity soils. The drier conditions observed in 2022 resulted in the shallow groundwater levels falling below the deep groundwater levels showing an apparent upward gradient for the remainder of the year. The upward gradient is attributed to lower shallow groundwater levels due to drier conditions and increased evapotranspiration. In 2023, the deep groundwater levels rose above the shallow ground water levels in April and remained above the shallow groundwater levels for the remainder of the year. The high levels are attributed to a wetter than average year. The convergence of shallow groundwater towards the low-lying area is expected and results in groundwater pressures measured above ground surface indicating discharge conditions; however, any discharge would be interpreted to be minimal due to the surrounding low hydraulic conductivity silts and clays. Groundwater has not been observed to discharge in the area.

- PZ2s/d, located along the tributary of Spring Creek on the northern limits of the wetland, show groundwater levels ~0.1 mbgs to 1.6 mbgs. Upward gradients are observed during high water table conditions (December to May) and downward gradients are observed from about June through November. Similar to observations at PZ1s/d, convergence of shallow groundwater towards the low-lying area results in deeper groundwater pressures rising above the shallow. Groundwater is not observed to rise above ground surface to provide discharge conditions. The surface water level at SG2 was generally above groundwater levels when observed (Figure E-16, Appendix E).

- The groundwater levels at PZ3s/d, located in the central portion of the wetland and south of the tributary, were found to range from approximately 0.09 m above ground surface (mags) to 1.4 mbgs. A downward hydraulic gradient between PZ3s and PZ3d is observed indicating recharge conditions. During the late summer and fall of 2019, 2020 and 2021, a slight upward gradient is observed (Figure E-17, Appendix E). The upward gradient is attributed to lower shallow groundwater levels due to drier conditions and increased evapotranspiration. Surface water was observed at the staff gauge (SG3) during the 2019 and 2020 spring monitoring periods and has been observed dry or snow covered during all subsequent monitoring events. The surface water level at the SG3 was found to be approximately the same as the groundwater level in the deep piezometer (PZ3d) when observed.

- The groundwater levels in PZ4s/d, located at the west limit of the ponded area along the tributary, have been recorded from above ground surface to about 0.8 mbgs (Figure E-18, Appendix E). A slow stabilization of groundwater levels in both piezometers and slow response to precipitation events suggests low hydraulic conductivity soils. Similar to observations at PZ1s/d, the groundwater levels in the shallow piezometer were generally higher than the groundwater levels in the deep piezometer indicating a downward gradient from 2019 through to the spring of 2022. In the spring of 2022, a gradient reversal was observed, with the shallow groundwater levels falling below the deep groundwater levels showing an upward gradient and discharge conditions in the spring before returning to recharge conditions in mid-June. In 2023, the deep groundwater levels rose above the shallow groundwater levels in April through to early June, showing a small upward gradient. The groundwater levels in the shallow and deep piezometers remained similar for the remainder of the year.

- At PZ5s/d, located at the northeast extent of the wetland, groundwater levels were recorded from approximately 0.2 mbgs to 1.2 mbgs. The groundwater levels primarily show a downward gradient indicating recharge conditions (Figure E-19, Appendix E). In June and September of 2023, the deep groundwater levels were above the shallow groundwater levels, showing an apparent upward gradient. The reversal in gradient is attributed to the drier summer conditions and increases evapotranspiration. Groundwater levels in PZ5s were observed dry during the fall of 2019, 2020, 2021 and 2023. The staff gauge installed at this location (SG5) was found to be dry or frozen throughout the monitoring period, with the exception of the May readings in 2019.

- The groundwater levels in PZ6s/d, located near the southwest extent of the wetland, have been recorded from 0.16 mags to about 0.77 mbgs (PZ6s; Figure E-20, Appendix E). The early monitoring data for PZ6d shows a slow stabilization of water levels indicating low hydraulic conductivity soils. The groundwater levels show a downward gradient but reverse temporarily in the late summer/fall during low water table conditions and increased evapotranspiration. The surface water level at SG6 was found to be similar to the groundwater level in the shallow piezometer. In 2022 and 2023, the surface water levels were below the groundwater levels in the spring during the wetter portion of the year and observed above the groundwater during monitoring events shortly following precipitation events.

The groundwater levels measured in the piezometer nests generally show a downward gradient between the shallow and deep piezometers suggesting the wetland recharges the shallow soils and creates a shallow perch beneath the wetland. Seasonal upward gradients observed at PZ1s/d, PZ3s/d, PZ4s/d and PZ6s/d show potential for seasonal discharge conditions during the spring; however, any discharge would be interpreted to be minimal due to the surrounding low hydraulic conductivity silts and clays. The hydrographs for piezometers instrumented with dataloggers (Figures E-15, E-16, E-17, E-18 and E-20, Appendix E) show delayed responses to precipitation events, suggesting that recharging of the shallow water table is occurring following the rainfall events. This is especially noticeable when storm events are 40 mm and higher. The precipitation data obtained from Geo Morphix from a rain gauge installed on the subject lands, suggests on August 20 and 21, 2022, 68 mm and 158 mm of rain, respectively, fell on the subject lands with smaller subsequent events following. The groundwater levels at in all piezometers were observed to increase following these rainfall events, with increases as much as 0.71 m observed at PZ3d (Figure E-17, Appendix E). These conditions suggest that the primary sources of water to the wetland and tributary are direct precipitation and surface water runoff, including discharge from the stormwater management pond located at the southwest corner of the subject lands.

## 2.3 Geology

### 2.3.1 Surficial Geology

Surficial geology mapping published by the Ontario Geological Survey (2010) shows that the subject lands are covered by glaciolacustrine-derived silty to clayey till (Figure 4). Organic deposits are mapped along the watercourse and the wetland complex.

A geotechnical investigation completed by Edward Wong (2017) included the drilling of six boreholes across the subject lands in October 2017 (BH1 to BH6, Figure 5). Another geotechnical investigation was completed by Golder (2019) which included the drilling of 19 boreholes across the subject lands (BH19-01 to BH19-19) (Figure 5). In November 2022, Burnside drilled and installed a monitoring well (MW22-1) at a proposed stormwater management pond location, as requested by the TRCA. Copies of the borehole logs from these drilling investigations are provided in Appendix A.

The boreholes on the subject lands ranged in depth from 6.2 m below ground surface (mbgs) and 17.4 mbgs. The results of the drilling investigations are generally consistent with the published mapping, with silty clay till or silty clay encountered at surface (or beneath fill materials). The boreholes indicate that the subject lands are underlain by silty clay and silty clay till. Silty sand and sand were encountered beneath the till at depths of 7.6 mbgs to 10 mbgs.

### 2.3.2 Bedrock Geology

Bedrock beneath the subject lands consists of shale of the Queenston Formation (OGS, 2011). MECP well records in the vicinity of the subject lands indicate the depth to bedrock ranges from about 29 mbgs to 64 mbgs (Appendix B).

### 2.3.3 Stratigraphy

The local MECP well records (Appendix B) provide geological data that have been used along with the site-specific geological information obtained from the geotechnical boreholes and groundwater monitoring wells drilled on the subject lands (Appendix A) to assess the local stratigraphy.

To illustrate the local geological conditions, four schematic cross-sections through the subject lands have been prepared. The cross-section locations are shown on Figure 5 and the cross-sections are shown on Figures 6, 7 and 8. The cross-sections show a layer of silt and clay till soils at surface ranging in thickness of about 5 m to 20 m across the subject lands. These fine-grained deposits are underlain by a sand layer which is approximately 5 m to 12 m in thickness (encountered at an elevation of approximately 240 masl to 255 masl) below the subject lands (Figures 6, 7 and 8).

Regional hydrogeological mapping and modeling of the area by the TRCA as part of the Etobicoke and Mimico Creeks Watershed Technical Update Report (2010) has identified the major overburden aquifer systems in the area (in order of increasing depth) as the Oak Ridges Aquifer Complex (ORAC) and the Thorncliffe Aquifer. The general elevation ranges for these aquifers are as follows:

- Oak Ridges Aquifer (or equivalent) Complex: 225 masl – 250 masl
- Thorncliffe Aquifer: 220 masl

Based on these elevation ranges, it is concluded that the sandy layer found underlying the subject lands between elevations of about 240 masl and 255 masl likely represents the ORAC in this area (Figures 6, 7 and 8).

### 2.3.4 Soil Hydraulic Conductivity

There are various methods that can be used to assess soil hydraulic conductivity, i.e., the ability of the soil to transmit groundwater. Grainsize data and soil characteristics can be used to provide a general estimate of hydraulic conductivity. Single well bail-down or falling head tests are used in groundwater monitoring wells to assess in situ hydraulic conductivity. These methods have been used to estimate the hydraulic conductivity of the soils encountered in the subject lands as discussed below.

During geotechnical and hydrogeological investigations conducted across the subject lands, representative soil samples collected by Golder (17 samples), Edward Wong (4 samples) and Burnside (3 samples) were analysed for grainsize distribution (Appendix C). The grainsize analyses were conducted on various soil types found across the subject lands. A summary of the hydraulic conductivity estimated from the grainsize analyses using the Hazen approximation method is provided below in Table 1. The Hazen method is designed to approximate the hydraulic conductivity of more permeable sediments; however, it is still considered useful in finer grained sediments to provide a general indication of the low range of the hydraulic conductivity values.

To assess the in situ hydraulic conductivity of the shallow soils, bail-down tests were completed at monitoring wells MW19-02s, MW19-03, MW19-04s, MW19-04d and MW19-08 and BH5 (refer to Figure 2 for monitoring well locations and Appendix A for borehole logs). The results of these tests are provided in Appendix D and show the following:

- MW19-02s, MW19-03 and MW19-04s are screened in a sandy silty clay till. The results of the bail-down tests completed at these locations suggest moderately high hydraulic conductivities of 1.5 x $10^{-3}$ cm/sec to 3.9 x $10^{-4}$ cm/sec. This is higher than would generally be expected for a silty clay till and may reflect the presence of sand layers, cobbles and fracturing within the till.

- MW19-08 is screened across silty clay and clayey silt. The results of the bail-down test completed at this location suggest a moderately low hydraulic conductivity of 2.6 x $10^{-5}$ cm/sec.

- MW19-04d is screened across sand. The hydraulic conductivity test completed at this location suggests a moderately high hydraulic conductivity of 4.4 x $10^{-3}$ cm/sec.

- BH5 is screened in fill and silty clay. The hydraulic conductivity test completed by Edward Wong (2017) at this location suggests a low hydraulic conductivity of 7.8 x $10^{-7}$ cm/sec.

The calculated hydraulic conductivity values from the bail test data (Appendix D) are also summarized in Table 1 below.

**Table 1: Summary of Hydraulic Conductivity**

| Soil Type | Hydraulic Conductivity (cm/sec) Hazen Estimation | Hydraulic Conductivity (cm/sec) In Situ Bail Test |
|---|---|---|
| Sandy Clayey Silt | <1.0 x $10^{-6}$ | 2.6 x $10^{-5}$ to 7.8 x $10^{-7}$ |
| Silty Clay/Clayey Silt to Silty Clay and Sand – Till | <1.0 x $10^{-6}$ | 1.5 x $10^{-3}$ to 3.9 x $10^{-4}$ |
| Silt and Sand to Sandy Clayey Silt | 1.0 x $10^{-4}$ to <1.0 x $10^{-6}$ | - |
| Silty Sand/Sand | 4.2 x $10^{-3}$ to 2.3 x $10^{-5}$ | 4.4 x $10^{-3}$ |
| Sand Till, some silt, some gravel | 9.0 x $10^{-4}$ | - |

## 3.0 Hydrogeology

### 3.1 Local Groundwater Use

The lands surrounding the subject lands include residential subdivisions that are municipally serviced as well as some rural properties which may still rely on private well supplies. The Town of Caledon provides water from a combination of groundwater wells and Lake Ontario. The subdivisions north and west of the subject lands are serviced by water from Lake Ontario. South of the subject lands, residential subdivisions in the City of Brampton are also supplied with water from Lake Ontario. The proposed development will be municipally serviced and there is no proposed on-site groundwater use for the development.

A review of MECP well records within 500 m of the subject lands identified 81 well records. Of the 81 well records, 30 were water supply wells, 16 were test wells, 12 were monitoring wells, 1 was a dewatering well and 22 were abandonment records. Of the listed water supply well records, the majority are screened in the overburden materials, with only five wells screened in the bedrock. The overburden wells are screened at various depths ranging from 6.4 mbgs to 61 mbgs, but generally target the Thorncliffe Aquifer; however, some shallower wells which are completed in the ORAC are also present. It is noted that the well records do not indicate the current status of the well, i.e., whether or not the well is in use, and many of the wells listed within the developed areas surrounding the subject lands are assumed to be decommissioned.

Well Head Protection Areas (WHPAs) are zones around municipal water supply wells where land uses must be carefully planned and restricted to protect the quality of the water supply. Based on our review of WHPA mapping available from the Region of

Peel, the subject lands are not located within a WHPA, and as such, the development is not considered to pose a significant threat to municipal drinking water supplies.

## 3.2 Groundwater Levels

Groundwater levels have been monitored in monitoring wells and drive-point piezometers across the subject lands since April 2019 and the data are summarized in Table E-1 in Appendix E. Hydrographs for each monitoring location are also provided as Figures E-1 through E-14 (Appendix E) to illustrate the groundwater level fluctuations. In addition to the manual groundwater level measurements recorded at each location, automatic water level recorders (dataloggers) were installed in selected locations. The hydrographs also show precipitation data collected from a rain gauge installed on-site by Geo Morphix.

The groundwater monitoring data show the following (refer to Figure 2 for the monitoring locations and the data tables and hydrographs in Appendix E):

- MW19-01, MW19-02s, MW19-03, MW19-04s, MW19-06, MW19-08, BH2, BH3 and BH5 were installed in the shallow silty clay till soils. Groundwater in the till had seasonal variations ranging from about 2 m to 5 m. Groundwater in the silty clay till soils is interpreted to be a shallow perched water table in deposits of low hydraulic conductivity till encountered above the ORAC.

- Groundwater at MW19-01 and MW19-03, located along the higher lands along the northern boundary of the subject lands ranged in depths from 2.6 mbgs to 9.2 mbgs (Figures E-1 and E-3, Appendix E). These wells go dry during the late summer/early fall and are typically observed to recharge during the late fall through to the spring freshet. Groundwater levels did not recover to typical spring elevations following the 2020 fall and 2021 winter/spring, which can be attributed to low levels of precipitation during this period.

- At MW19-05, the 8.4 m deep well screened in silty clay and clayey silt till was found to be dry or have up to 12 centimetres of groundwater during all monitoring rounds (Figure E-5, Appendix E). The lack of a perched groundwater table may be due to sand seams/layers encountered within the till (see borehole log in Appendix B).

- MW19-02s, MW19-04s, MW19-08, BH2, BH3 and BH5 were installed in the vicinity of the wetland in silty clay sediments. Seasonal high groundwater within the perched water table near the wetlands was within 2 m of ground surface (Figures E-2, E-4, E-8, E-12, E-13 and E-14, Appendix E).

- MW19-06 is located on the tablelands within the low-lying area east of the PSW in the vicinity of the proposed stormwater management pond (SWM) Pond 2 location. The well is screened in silty clay till from 4.0 mbgs to 6.9 mbgs and the groundwater levels range from 1.6 mbgs to 0.44 m above ground surface (mags). The convergence of shallow groundwater towards the low-lying area is expected and results in groundwater pressures measured above ground surface; however, any discharge would be interpreted to be low due to the surrounding low hydraulic conductivity silts and clays. Groundwater has not been observed to discharge in the area.

- MW19-02d, MW19-04d, MW19-07d, MW19-09 and MW22-1 are installed in sand and silty sand interpreted to be part of the ORAC. The groundwater elevation in the sand was generally found to be between 249 masl and 252 masl. Seasonal variation in these wells ranged from 0.3 m to 0.5 m.

- MW19-13 was installed at an elevation ~257.2 masl within a pocket of silty sand/sandy silt. Groundwater levels at MW19-13 were measured with up to 0.42 m of water in the screen but were generally found to be dry (Figure E-10, Appendix E). The well was found to be damaged/destroyed during the 2023 spring and is no longer monitored.

- MW22-1 was installed in 2022 to a depth of about 16.8 mbgs (~247 masl) within the proposed SWM Pond 1 location. The well is screened in the ORAC and groundwater levels have consistently been approximately 249 masl (Figure E-11, Appendix E).

- Continuous groundwater level data show some response to precipitation events greater than about 40 mm at MW19-01, MW19-04s and MW19-08 (Figures E-1, E-4 and E-8, Appendix E). The precipitation data received from Geo Morphix note a significant rain event occurred on August 20, 2022 (i.e., 100 mm or greater) resulting in a rise in groundwater levels of about 2.5 m at MW19-08 over a two-day period before returning to previous levels and continuing to seasonally decline (Figure E-8, Appendix E). At MW19-01, a rise of about 1.4 m is observed during the same period whereas a rise of only about 0.05 m is observed at MW19-04s. The varying responses to precipitation suggests the surficial soils in some areas have quite low permeability and other areas support the presence of fractures and layering within the till and the moderate hydraulic conductivity values discussed in Section 2.4. There was no response to individual precipitation events observed in the wells screened in the ORAC (MW19-04d, MW19-07d and MW22-1) (Figures E-4, E-7 and E-11, Appendix E).

- Monitoring well nests (e.g., wells located adjacent to each other but completed at different depths) were installed in MW19-02s/d, MW19-04s/d and MW19-07s/d. The groundwater levels in shallow wells MW19-02s and MW19-04s were consistently higher than the deeper wells MW19-02d and MW19-04d, showing a strong downward hydraulic gradient and recharge conditions (Figures E-2 and E-4,

Appendix E). At MW19-07s/d, the shallow well MW19-07s is screened just above the sand aquifer and was mostly dry while water levels at MW19-07d screened in the ORAC were 12.3 mbgs to 12.9 mbgs showing recharge conditions (Figure E-7, Appendix E).

### 3.2.1 TRCA Monitoring Wells

Three monitoring wells owned by the TRCA (TRCA Mayfield MW-1 through MW-3) are located in the Heart Lake Conservation Area located just southeast of the subject lands (see Figure 2). In addition, one well nest is located adjacent to Etobicoke Creek southwest of the subject lands (TRCA Mayfield MW-4s/d). Monitoring data for these wells was provided by the TRCA for our review and is included in Appendix E. The monitoring wells ranged in depth from 6 mbgs to 14 mbgs. Groundwater levels at MW-1 through MW-3 ranged in elevations from ~246 masl to 254 masl. At monitoring well nest MW-4s/d, the shallow groundwater levels at MW-4s ranged from about 265 masl to 266 masl and the deep groundwater levels at MW-4d ranged from about 266.5 masl to 267 masl. The groundwater levels in the deep well (screened in sand) are higher than groundwater levels in the shallow well (screened in sandy silt) indicating upward gradients at this location.

## 3.3 Groundwater Flow Conditions

It is interpreted that the shallow perched water table in the surficial till deposits reflects the general surface topography and, where present, the shallow groundwater flow patterns in the till will mimic the surface water flow patterns, with flow generally moving from higher elevations towards lower elevations.

Review of regional groundwater mapping completed by TRCA as part of the Etobicoke and Mimico Creeks Watersheds Technical Update Memo (2010) shows the groundwater in the ORAC in the vicinity of the subject lands generally flows from northwest to southeast. This is consistent with interpreted groundwater flow from groundwater levels measured in the ORAC on the subject lands.

## 3.4 Recharge and Discharge Conditions

Site-specific findings for the subject lands show a downward gradient between the shallow till soils and underlying sand layer (refer to Section 3.2), indicating that the subject lands are in a recharge area. Monitoring at piezometers and staff gauges in the PSW generally shows a downward hydraulic gradient in this feature (refer to Section 2.2), however, seasonal upward gradients are present indicating potential for seasonal discharge conditions. Due to the low hydraulic conductivity of the silt and clay soils of the surrounding soils, discharge volumes would be minimal. It is interpreted that this feature is primarily supported by surface water runoff and discharge from the adjacent stormwater management pond located at the southwest corner of the subject lands as noted in Section 2.2.

Significant Groundwater Recharge Areas (SGRAs) have been mapped by TRCA and reproduced for this study as Figure 9. Review of this mapping shows that the south, and central portions of the subject lands are located within a SGRA. Although the results of the groundwater monitoring on the subject lands show that this is a recharge area, the results of the drilling investigations show that the subject lands is covered by a layer of relatively low hydraulic conductivity silty clay till (refer to Sections 2.3.1 and 2.3.3). As such, the actual amount of water that infiltrates and moves through the subsurface over most of the area is expected to be limited by the relatively low hydraulic conductivity of the surficial silt and clay sediments. Regardless, as discussed below in Sections 4.5 and 4.6, low impact development (LID) measures to promote post-development infiltration will be implemented to maintain the pre-development recharge volumes.

## 3.5 Aquifer Vulnerability

The aquifer vulnerability was mapped by CTC for the Approved Updated Assessment Report: Toronto Region Source Protection Area (2015). The aquifer vulnerability designation for the subject lands, as mapped by CTC, is provided on Figure 10. Aquifer vulnerability refers to the susceptibility of the aquifer to potential contamination. Some degree of protection for groundwater quality from natural and human impacts is provided by the soil above the water table. The degree of protection is dependent upon the depth to the water table (for unconfined aquifers) or to the depth of the aquifer (for confined aquifers) and the type of soil above the water table or aquifer. As these two properties vary over any given area, the degree of protection or vulnerability of the groundwater to contamination also varies.

CTC developed the aquifer vulnerability map shown on Figure 10 using the MECP water well records for the area to determine the soil types and depths to aquifer to develop an Aquifer Vulnerability Index (AVI). Areas within the subject lands along the valley of the tributary of Spring Creek are identified as having “high groundwater vulnerability”. It is noted in the CTC report that this is a very regional scale map and also, due to the uncertainty in the water well records, the mapping should only be used as a guide, and not for site specific planning decisions. The block like pattern is an indication of the grid that was used to assess aquifer vulnerability and reflects the uncertainty of the assessment.

Areas within the subject lands identified as having “high groundwater vulnerability” are located near the valley of the tributary of Spring Creek. These areas have likely been identified as a result of the change in topography along the tributary resulting in an interpreted decrease in the thickness of the overburden sediments overlying the ORAC. Cross-sections B-B’ and C-C’ (Figures 7 and 8, respectively) show that there is a decrease in the silty clay till overlying the ORAC at the incised valley. Impacts to the aquifer from the proposed development are not anticipated since the valley lands will remain undeveloped.

## 3.6 Water Quality

### 3.6.1 Groundwater Quality

Groundwater samples were collected from two monitoring wells on the subject lands on April 20, 2020 to assess the groundwater quality in the shallow till soils and the underlying ORAC (MW19-01 and MW19-04d, respectively). The samples were submitted to SGS Canada Inc. for analysis of general quality indicators (e.g., pH, hardness, and conductivity), basic ions (including chloride and nitrate) and selected metals. The results of the analyses were compared to the Ontario Drinking Water Quality Standards (ODWQS) and are provided in Table G-1 in Appendix G. The groundwater testing results from the analytical laboratory show the following:

- The groundwater is hard with reported hardness 613 mg/L at MW1 and 405 mg/L at MW19-04d. Groundwater from overburden sediments is commonly hard and it is likely that many of the local residents that rely on groundwater will have water softeners in their homes. For comparison, the operational guideline for hardness in municipal water systems is in the 80 to 100 mg/L range.

- The groundwater samples also had high turbidity (>4,000 NTU and 583 NTU for MW19-01 and MW19-04d, respectively), compared to the ODWQS of 5 NTU. The turbidity in monitoring well samples may be related to suspended sediments.

- Chloride and sodium concentrations were reported at MW19-01 to be 55 mg/L and 10.9 mg/L, respectively. The chloride and sodium concentrations reported for MW19-04d were 6 mg/L and 18.5 mg/L, respectively. The data suggests that road salt usage on adjacent streets have not impacted the groundwater (ORAC).

- Elevated nitrate was detected in MW19-01 at a concentration of 38.6 mg/L. This is well above the ODWQS for nitrate of 10 mg/L. Nitrate in shallow groundwater is typically associated with areas where agricultural land use results in elevated nitrates in groundwater. Current land use on the subject lands is agricultural and is interpreted to be the cause of the elevated nitrates. There was no nitrate detected in the deep well MW19-04d screened in the ORAC.

- The reported metal concentrations were generally low and below the ODWQS.

### 3.6.2 Surface Water Quality

Surface water was sampled from the watercourse near PZ4s/d (Sample ID SW4) in April 2020 to characterize the surface water quality. The surface water sample was analysed for pH, conductivity, basic ions and selected metals and the laboratory results are summarized in Table G-2 in Appendix G.

The surface water quality data show the following:

- SW4 had reported chloride concentrations of 370 mg/L and sodium concentrations of 199 mg/L. These concentrations are considered elevated as compared to rainwater and local groundwater concentrations and are interpreted to indicate road salt effects on the surface water runoff quality.

- The total reactive phosphorus concentration was reported below the Provincial Water Quality Objective (PWQO) for phosphorus of 0.03 mg/L.

- Aluminum was reported at a concentration of 0.499 mg/L which exceeds the PWQO of 0.075 mg/L.

- SW4 had elevated iron with a concentration of 3.95 mg/L which is well above the PWQO of 0.3 mg/L. Elevated iron was not observed in the groundwater samples collected.

## 4.0 Water Balance

A water balance is an accounting of the water resources within a given area. As a concept, the water balance is relatively simple and has been estimated herein using a spreadsheet model based on the following equation:

$$P = S + ET + R + I$$

where: P = precipitation
S = change in groundwater storage
ET = evapotranspiration/evaporation
R = surface water runoff
I = infiltration

The components of the water balance vary in space and time and depend on climatic conditions as well as the soil and land cover conditions (i.e., rainfall intensity, land slope, soil hydraulic conductivity and vegetation). Runoff, for example, occurs particularly during periods of snowmelt when the ground is frozen, or during intense rainfall events. Precise measurement of the water balance components is difficult and as such, approximations and simplifications are made to characterize the water balance of a study area. Field observations of the drainage conditions, land cover and soil types, groundwater levels and local climatic records are important considerations for the water balance calculations.

Water balance calculations have been completed for the subject lands using a spreadsheet model and monthly soil-moisture balance approach, which assumes that soils do not release water as potential recharge while a soil moisture deficit exists. During wetter periods, any excess of precipitation over evapotranspiration first goes to restore soil moisture. Once the soil moisture deficit is overcome, any further excess water can then pass through the soil as infiltration.

The SWM Planning and Design Manual (2003) methodology for calculating total infiltration based on topography, soil type and land cover was used, and a corresponding runoff component was calculated for the soil moisture storage conditions. It is very important to note that the infiltration and runoff components are estimates. Single values are used for the water balance calculations; however, the infiltration rates are dependent upon the hydraulic conductivity of the surficial soils which may vary over several orders of magnitude. As such, the margins of error for the calculated infiltration and runoff component values are potentially quite large. These margins of error are recognized; however, for the purposes of this assessment, the numbers used in the water balance calculations are considered reasonable estimates based on the site-specific conditions and provide a useful for comparison of pre- to post-development conditions.

The water balance components for the subject lands are discussed below.

## 4.1 Water Balance Components

### Precipitation (P)

The long-term average annual precipitation for the area is 786 mm based on data from the Environment Canada Toronto Lester B. Pearson International Airport climate station (Station 6158733 - 43°40'38.000" N, 79°37'50.000" W, elevation 173.40 masl) for the period between 1981 and 2010. Average monthly records of precipitation and temperature from this station have been used for the water balance component calculations in this study (Table H-1, Appendix H).

### Storage (S)

Although there are groundwater storage gains and losses on a short-term basis, the net change in groundwater storage on a long-term basis is assumed to be zero so this term is dropped from the equation.

### Evapotranspiration (ET)/Evaporation (E)

Evapotranspiration and evaporation components vary based on the characteristics of the land surface cover (i.e., type of vegetation, soil moisture conditions, perviousness of surfaces, etc.). Potential evapotranspiration (PET) refers to the water loss from a vegetated surface to the atmosphere under conditions of an unlimited water supply. The actual rate of evapotranspiration (AET) is often less than the PET under dry conditions (i.e., during the summer when there is a soil moisture deficit). In this report, the monthly PET and AET have been calculated using a soil-moisture balance approach, using average temperature data and climate information adjusted to the local latitude (refer to Table H-1, Appendix H).

**Water Surplus (R + I)**

The difference between the mean annual P and the mean annual ET is referred to as the water surplus. Part of the water surplus travels across the surface of the soil as surface or overland runoff and the remainder infiltrates the surficial soil.

The infiltration is comprised of two end member components: One component that moves vertically downward to the groundwater table (typically referred to as percolation, deep infiltration or net recharge) and a second component that moves laterally through the shallow soils as interflow that re-emerges locally to surface (i.e., as runoff) at some short time following cessation of precipitation. As opposed to the "direct" component of surface runoff that occurs overland during precipitation or snowmelt events, shallow interflow becomes an "indirect" component of runoff. The interflow component of surface water runoff is not accounted for in the water balance equation cited above since it is often difficult to distinguish between interflow and direct (overland) runoff, but both interflow and direct runoff contribute to the overall surface water runoff component in the spreadsheet calculations.

## 4.2 Existing Conditions

Representative soil moisture storage capacity values were selected for the silty to clayey till soils that reflect the various vegetation types and topography identified across the subject lands. The values are summarized as follow:

- 200 mm was selected for the existing agricultural vegetation across the majority of the subject lands on hilly to rolling topography (Table H-1, Appendix H).

- 250 mm was selected for the wetland vegetation on rolling to flat topography (Table H-2, Appendix H).

- 250 mm was selected for the dry-moist old field meadow on hilly land (Table H-3, Appendix H).

- 400 mm was selected for forested lands on hilly to rolling topography (Table H-4, Appendix H).

- 100 mm was selected for urban lawns on hilly to rolling topography areas (Table H-5, Appendix H).

Tables H-1 through H-5 in Appendix H detail the monthly potential evapotranspiration calculations accounting for latitude and climate, and then calculate the actual evapotranspiration and water surplus components of the water balance based on the monthly precipitation and soil moisture conditions.

The monthly water balance calculations show that a water surplus is generally available from January to April (Tables H-1 through H-4) for the majority of the vegetation found across the subject lands and from December to April (Table H-5) for the urban lawns. Infiltration occurs during periods when there is sufficient water available to overcome the soil moisture storage requirements. In winter climates, frozen conditions may affect when the actual infiltration will occur, however, the monthly balance calculations show the potential volumes available for this water balance component. The monthly calculations are summed to provide estimates of the annual water balance component values (Tables H-1 through H-5). A summary of these values is provided in Table 2.

**Table 2: Water Balance Component Values**

| Water Balance Component | Agricultural Lands (mm/year) | Wetland (mm/year) | Dry-Moist Old Field Meadow (mm/year) | Wooded Area (mm/year) | Urban Lawns (mm/year) |
|---|---|---|---|---|---|
| Average Precipitation | 786 | 786 | 786 | 786 | 786 |
| Actual Evapotranspiration | 617 | 617 | 617 | 617 | 560 |
| Water Surplus | 169 | 169 | 169 | 169 | 226 |
| Infiltration | 68 | 85 | 59 | 85 | 90 |
| Runoff | 102 | 85 | 110 | 85 | 135 |

The pre-development infiltration volume for the subject lands as calculated in Table H-7 (Appendix H) is about 42,100 $m^3$/year. It is important to recognize that this infiltration volume is an estimate provided for the purposes of this assessment.

## 4.3 Potential Urban Development Impacts to Water Balance

Development of an area affects the natural water balance. The most significant difference is the addition of impervious surfaces as a type of surface cover (i.e., roads, parking lots, driveways, and rooftops). Impervious surfaces prevent infiltration of water into the soils and the removal of the vegetation removes the evapotranspiration component of the natural water balance. The evaporation component from impervious surfaces is relatively minor (estimated to be 10% to 20% of precipitation) compared to the evapotranspiration component that occurs with vegetation (71% to 78% of precipitation in the study area). So, the net effect of the construction of impervious surfaces is that most of the precipitation that falls onto impervious surfaces becomes surplus water and direct runoff, and the infiltration is reduced.

A calculation of the potential water surplus for impervious areas is shown at the bottom of Table H-1 (Appendix H). For the purposes of the calculations in this study, the evaporation from impervious surfaces has been estimated to be 15% of precipitation. The remaining 85% of the precipitation that falls on impervious surfaces is assumed to become runoff. Therefore, assuming an evaporation/loss from impervious surfaces of 15% of the precipitation, there would be a potential water surplus from impervious areas of 668 mm/year.

It is noted that the proposed development will be serviced by municipal water supply and wastewater services. Therefore, there will be no impact on the water balance and local groundwater or surface water quantity and quality conditions related to any on-site groundwater supply pumping or disposal of septic effluent.

## 4.4 Post-Development with No LID Measures

In order to assess the potential development impact on infiltration volumes, the post-development infiltration volumes have been calculated for the subject lands in Table H-7 (Appendix H). The calculations provided in Table H-7 assume no low impact development (LID) measures to promote infiltration are in place.

The total areas for the proposed land uses have been estimated based on the proposed development concept and the infiltration and runoff components for the post-development land uses have been calculated using the SWM Planning and Design Manual (2003) methodology based on topography, soil type and land cover as shown on Table H-6 (Appendix H). The total calculated post-development infiltration volume (without mitigation) is about 26,900 $m^3$/year.

Comparison of the pre-development and post-development infiltration volumes from the water balance calculations shows that development has the potential to reduce the natural infiltration on the subject lands by 36%. Again, it is noted that with the assumptive nature of the input values and the wide margins of error associated with this type of analysis, the estimated infiltration deficit volume is simply considered as a reasonable estimate and may not reflect the actual volume of water that may infiltrate on the subject lands.

## 4.5 Water Balance Mitigation Strategies

The basic premise for low impact development is to try to manage stormwater to minimize the runoff of rainfall and increase the potential for infiltration. As outlined in the SWM Planning and Design Manual (2003) and Low Impact Development Stormwater Management Planning and Design Guide (2010), there are a wide variety of mitigation techniques that can be used to try to reduce the increases in direct runoff that occur with land development and increase the potential for post-development infiltration.

Techniques to maximize the water availability in pervious areas such as designing grades to direct roof runoff towards lawns, side and rear yard swales, and other pervious areas throughout the development where possible can considerably increase the volume of infiltration in developed areas. These types of surface LID techniques promote natural infiltration simply by providing additional water volumes in the pervious areas (i.e., these areas would receive precipitation as well as extra water from roof runoff). This may be particularly effective in the summer months, when natural infiltration would not generally occur because the additional water overcomes the natural soil moisture deficit.

Other mitigation techniques that can be considered to mitigate increases in runoff and reductions in infiltration include such measures as: permeable pavements, rain gardens, rain barrels, bioswales, subsurface infiltration trenches, galleries and pervious pipe systems. Subsurface methods should only be considered in areas where there is sufficient depth to water table to accommodate the systems within the unsaturated zone and sufficient soil hydraulic conductivity to function effectively. The 2003 SWM manual recommends that subsurface galleries or trenches should generally be about 1 m above the seasonally high water table.

As presented in the Functional Servicing & Stormwater Management Report prepared by David Schaeffer Engineering Ltd. (April 2025), the proposed SWM strategy includes the following LID measures as shown in the Potential LID Plan (DSEL, 2023) presented in Appendix H:

- Increased topsoil depth across all lots. The intention with increased topsoil depth is to aid retention of runoff through increased soil storage and promote more infiltration in these areas. Typically, topsoil is increased to about 300 mm. It is noted that additional topsoil will not be credited for providing infiltration in the water balance calculations as per the CLI-ECA.

- Downspout disconnection. Rear roof areas from Low Density lots will be discharged to pre-cast splash pads and directed to rear/side pervious areas. The TRCA and CVC Stormwater Management Criteria (2010) indicates that a conservative estimate for the reduction in runoff due to roof leader disconnection is 25% for silt to clayey soils. It is noted that downspout disconnection will not be credited for providing infiltration in the water balance calculations as per the CLI-ECA.

### Pond 1 Area

- Runoff from ~22,300 m$^2$ of Park area and 5,200 m$^2$ of ROW directed to an infiltration gallery designed to accommodate the 25 mm storm event.

- Runoff from ~92,700 m$^2$ directed to infiltration trenches in ROW designed to accommodate the 12.5 mm storm event.

**Pond 2 Area**

- Runoff from ~6,500 m$^2$ of Park area, 4,300 m$^2$ of ROW, 3,100 m$^2$ of Medium-High Density and 2,600 m$^2$ of Back-to-Back Townhouses directed to an infiltration gallery designed to accommodate the 25 mm storm event.

- Runoff from ~155,200 m$^2$ directed to infiltration trenches in ROW designed to accommodate the 12.5 mm storm event.

Based on the existing information, proposed grades and elevations of the bottom of the infiltration measures, it is anticipated that there is generally sufficient depth to groundwater for effective performance of the proposed infiltration measures across the Pond 1 Area and Pond 2 Area lands.

## 4.6 Post-Development with LID Measures in Place

Quantification of these surficial LID techniques is challenging and there are no widely accepted quantification standards. To assess the potential effectiveness of the recommended LID measures for groundwater infiltration and runoff reduction for the subject lands, the water balance component values were recalculated.

To calculate the annual infiltration volumes in the proposed infiltration trenches, the Toronto Wet Weather Flow Management Guidelines (City of Toronto, 2006) were used to correlate the storm event size these facilities are designed to infiltrate to a percentage of the average annual rainfall depth, which was then applied to the roof area directed to these trenches to calculate an infiltration volume, as shown in Table H-8 (Appendix H). It is reported in these Guidelines, based on the review of rainfall data from 16 rainfall stations across Toronto, the 12.5 mm storm accounts for approximately 76% of the annual rainfall volume (66% of annual precipitation) and the 25 mm storm accounts for approximately 94% of the annual rainfall volume (81% of annual precipitation).

Recalculation of the water balance for the subject lands with these LID measures in place demonstrates that there would be a 194% increase in infiltration compared to pre-development volumes (Table H-8, Appendix H). This shows the significant benefit of the proposed LID strategy in increasing recharge volumes in the developed area.

# 5.0 Construction Considerations

## 5.1 Dewatering Requirements

The construction dewatering requirements will vary significantly depending on the local soils, the climate conditions, the construction season and the depth and size of the excavations. The perched water table in the till ranges in depth from at ground surface to greater than 8 mbgs. Groundwater within the underlying sand aquifer ranges in depth from 6 m to 14 m. There is the potential for groundwater to be encountered during excavation for services and building foundations depending on the location and depth of excavations. Due to the relatively low hydraulic conductivity of these sediments they would not be expected to produce much water. Minor seepage into excavations within the clayey soils at the site can likely be handled, as required, by pumping from sumps within the trench excavations. Active dewatering may be required if excavations intersect saturated sand, silty sand and sandy silt soils.

Dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed servicing design. The MECP regulates water takings above 50,000 L/day. Dewatering associated to construction with volumes less than 400,000 L/day are permitted under the Environmental Activity and Sector Registry (EASR) process. Volumes greater than 400,000 L/day require a Permit to Take Water (PTTW). Based on our knowledge of the regulations, the dewatering will either be allowed by a Category 3 PTTW or under the EASR process depending on the expected volume of water taking.

## 5.2 Construction Below Water Table

The construction of buried services below the water table has the potential to capture and redirect groundwater flow through more permeable fill materials typically placed in the base of excavated trenches. Over the long-term, these impacts can lower the local groundwater table. To mitigate this effect, services to be installed below the water table should be constructed to prevent redirection of groundwater flow. This will involve the use of anti-seepage collars or clay plugs surrounding the pipes to provide barriers to flow and prevent groundwater flow along granular bedding material and erosion of the backfill materials.

## 5.3 Well Decommissioning

Prior to or during construction, it is necessary to ensure that all inactive wells within the development footprint have been located and properly decommissioned by a licensed water well contractor according to Ontario Regulation 903. This regulation applies to the groundwater monitoring wells installed for this study unless they are maintained throughout the construction for monitoring purposes.

## 6.0 References

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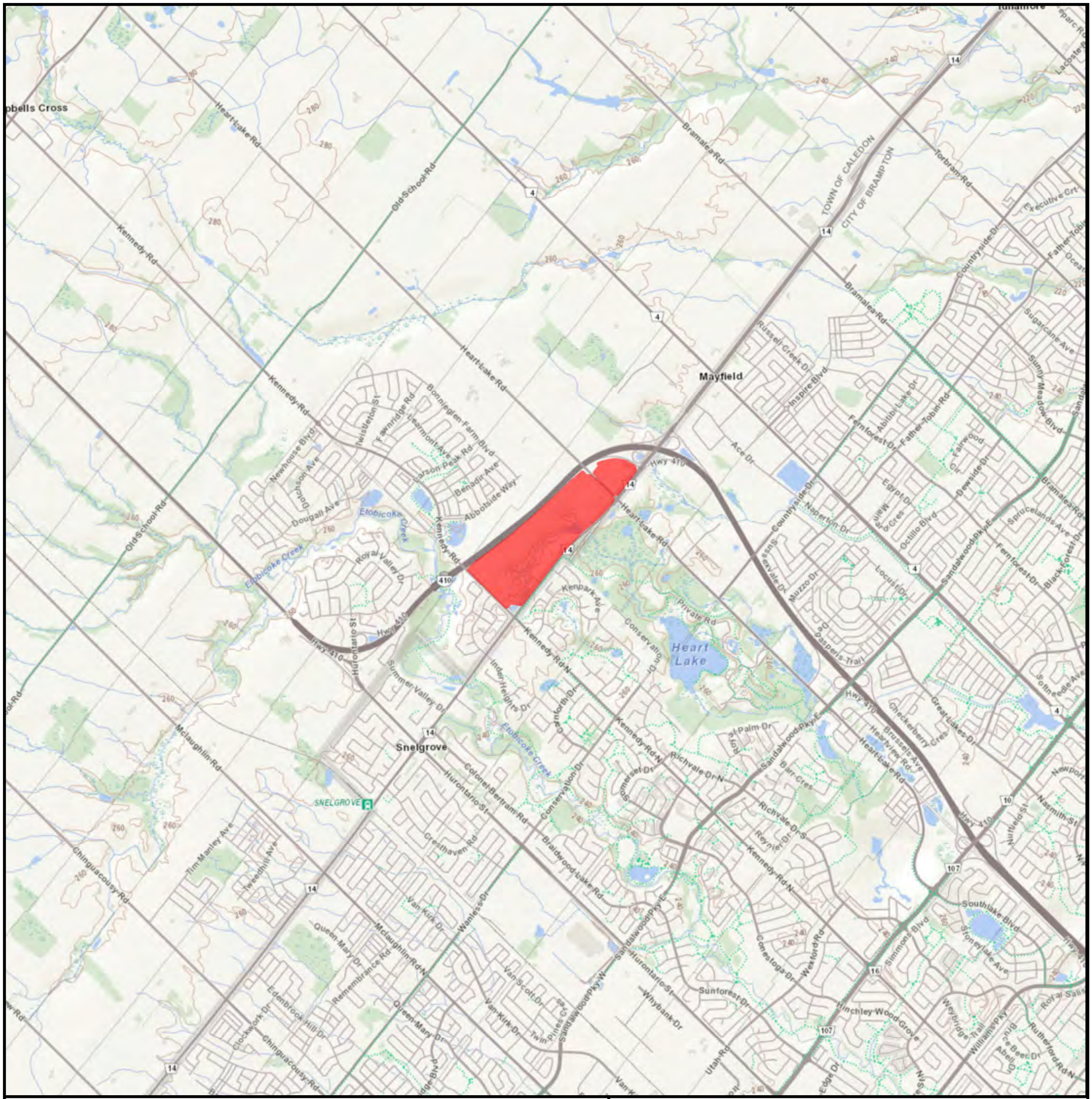
BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

# Figures



LEGEND

🟥 SUBJECT LANDS

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Metres

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Client / Report

SNELL'S HOLLOW DEVELOPERS GROUP
CALEDON, ONTARIO
*HYDROGEOLOGICAL ASSESSMENT*
*AND WATER BALANCE*

Figure Title:

## SITE LOCATION

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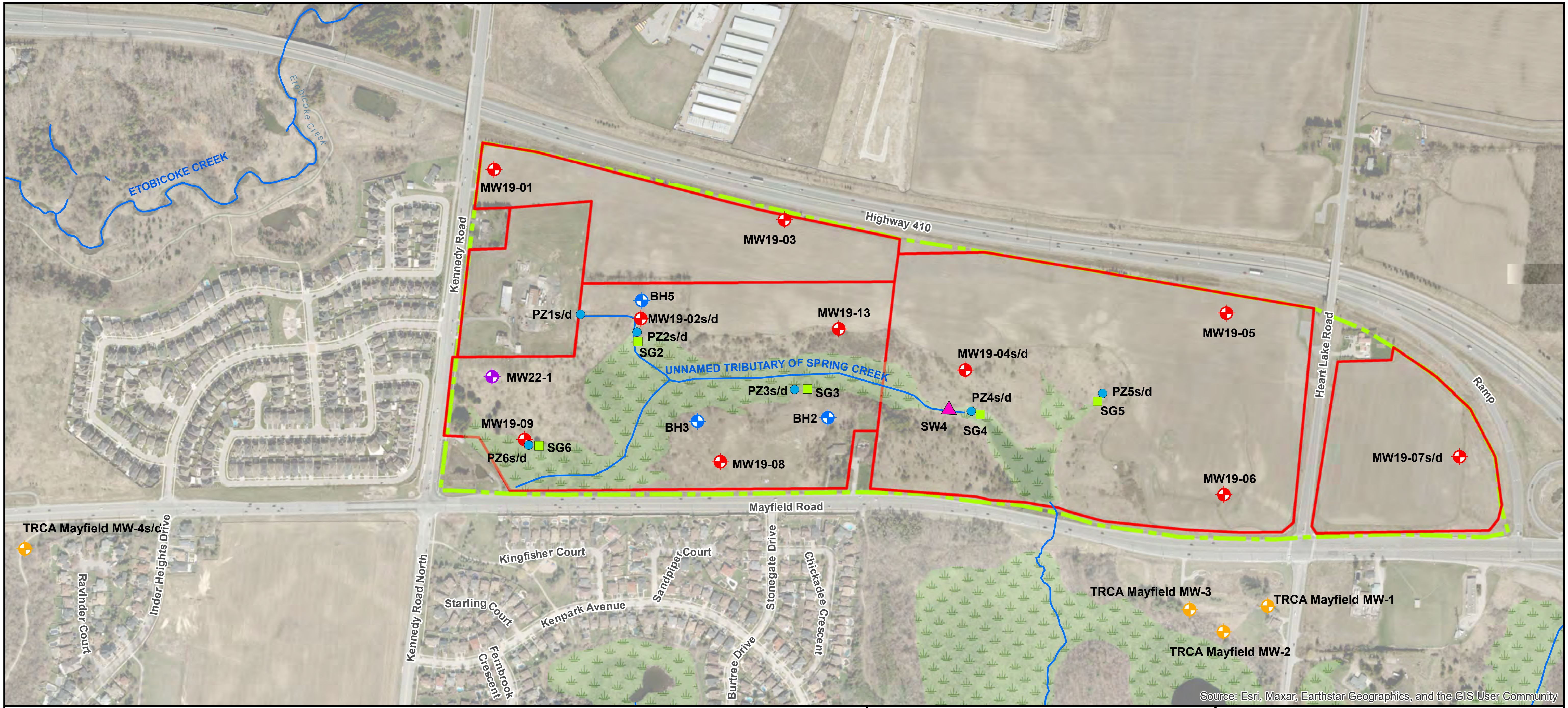

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

**LEGEND**

- 🟥 SUBJECT LANDS
- 🟩 SECONDARY PLAN AREA
- — WATERCOURSE
- ▨ WETLAND
- ⊕ MONITORING WELL (RJB, 2023)
- ⊕ MONITORING WELL (EDWARD WONG, 2017)
- ⊕ MONITORING WELL (TRCA)
- ⊕ MONITORING WELL (GOLDER, 2019)
- ● DRIVE POINT PIEZOMETER
- ■ STAFF GAUGE
- ▲ WATER QUALITY SAMPLING LOCATION

Sources:

1. Ministry of Natural Resources and Forestry, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. Sattelite Imagery - City of Brampton, 2017

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*AND WATER BALANCE*

Figure Title

## MONITORING NETWORK

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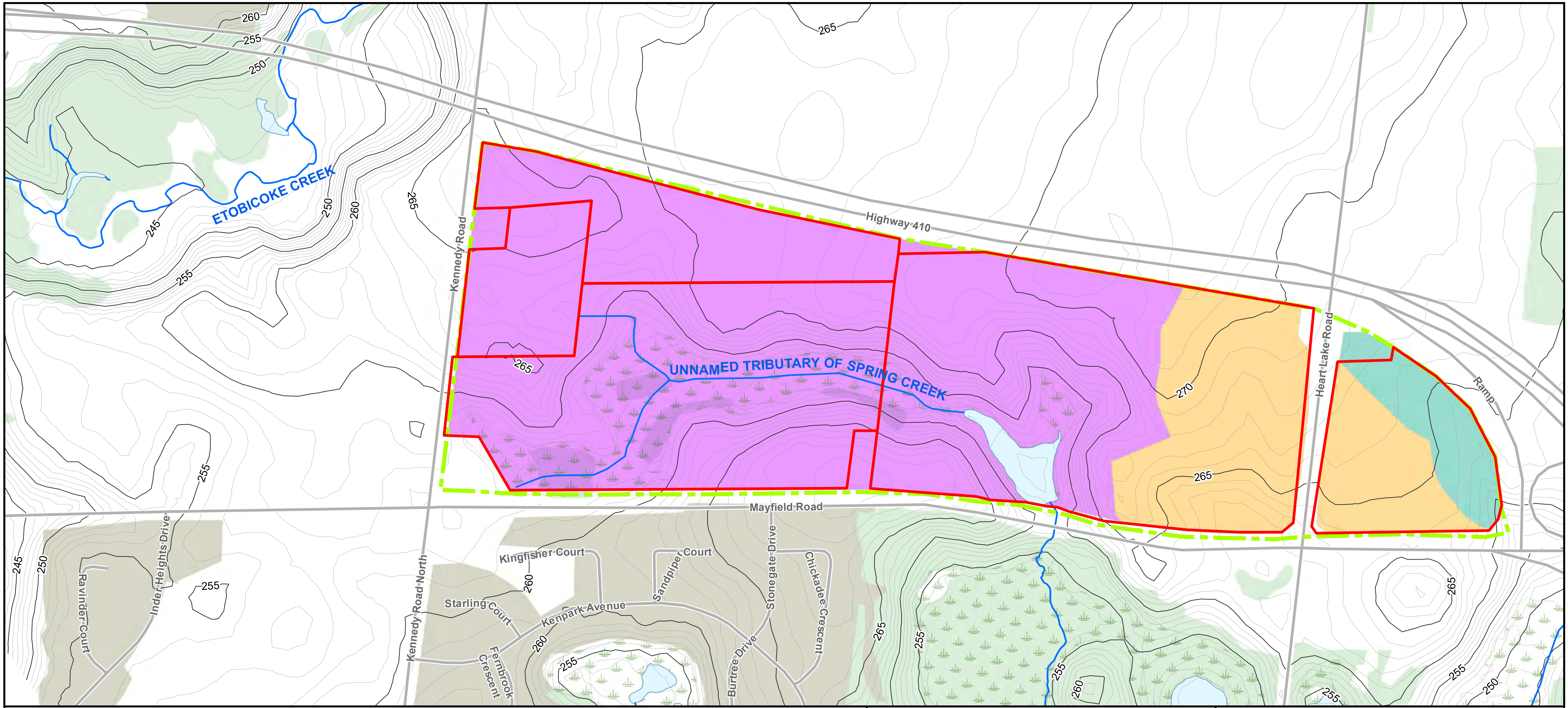

## LEGEND

🟥 SUBJECT LANDS

SECONDARY PLAN AREA

WATERCOURSE

CONTOUR (5m intervals - masl)

CONTOUR (1m intervals)

WOODED AREA

BUILT-UP AREA: IMPERVIOUS

OPEN WATER

WETLAND

PRE-DEVELOPMENT DRAINGE AREAS:

🟪 AREA 1

🟧 AREA 2

🟩 AREA 3

Sources:

1. Ministry of Natural Resources and Forestry, © Queen's Printer for Ontario
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CALEDON, ONTARIO
*HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE*

Figure Title

# TOPOGRAPHY AND DRAINAGE

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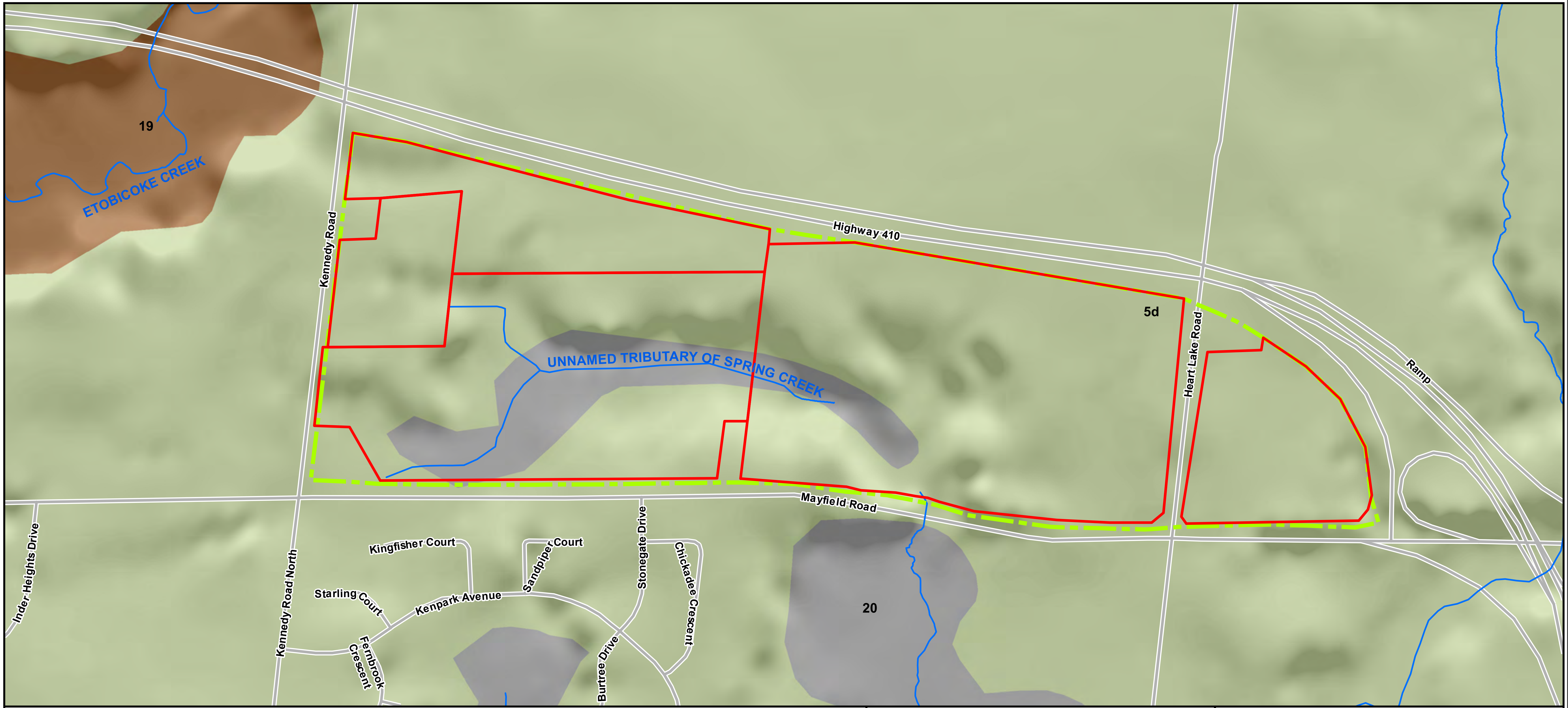


**LEGEND**

🟥 SUBJECT LANDS

▭ SECONDARY PLAN AREA

— WATERCOURSE

— ROADWAY

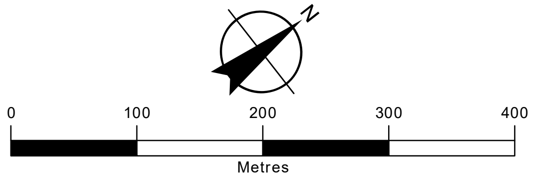
▨ 5d: Till: Glaciolacustrine-derived silty to clayey till

▨ 19: Modern alluvial deposits

▨ 20: Organic deposits

Sources:

1. Ministry of Natural Resources and Forestry, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. Ontario Geological Survey 2010. Surficial geology of southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 128 – Revised.



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CALEDON, ONTARIO
*HYDROGEOLOGICAL ASSESSMENT*
*AND WATER BALANCE*

Figure Title

## SURFICIAL GEOLOGY

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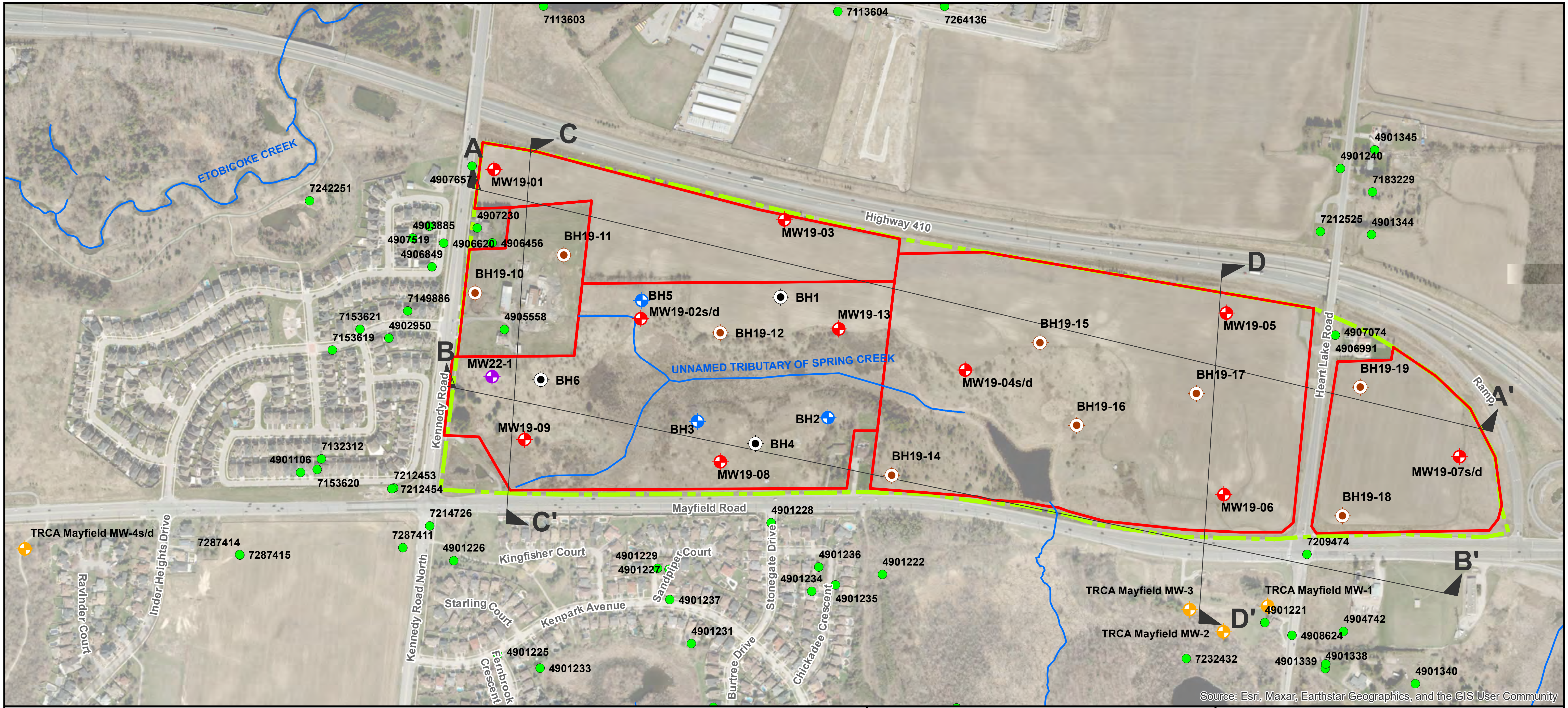

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

## LEGEND

- ▭ SUBJECT LANDS
- ▭ SECONDARY PLAN AREA
- — WATERCOURSE
- ⊕ MONITORING WELL (RJB, 2023)
- ⊕ MONITORING WELL (EDWARD WONG, 2017)
- ⊕ MONITORING WELL (TRCA)
- ⊕ MONITORING WELL (GOLDER, 2019)
- ⊙ BOREHOLE (GOLDER, 2019)
- ⊙ BOREHOLE (EDWARD WONG, 2017)
- ● MECP WELL RECORD LOCATION
- ⌴ CROSS SECTION LOCATION KEY

Sources:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
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3. Sattelite Imagery - City of Brampton, 2017

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SNELL'S HOLLOW DEVELOPERS GROUP
CALEDON, ONTARIO
*HYDROGEOLOGICAL ASSESSMENT*
*AND WATER BALANCE*

Figure Title
**BOREHOLE, WELL AND**
**CROSS-SECTION LOCATIONS**

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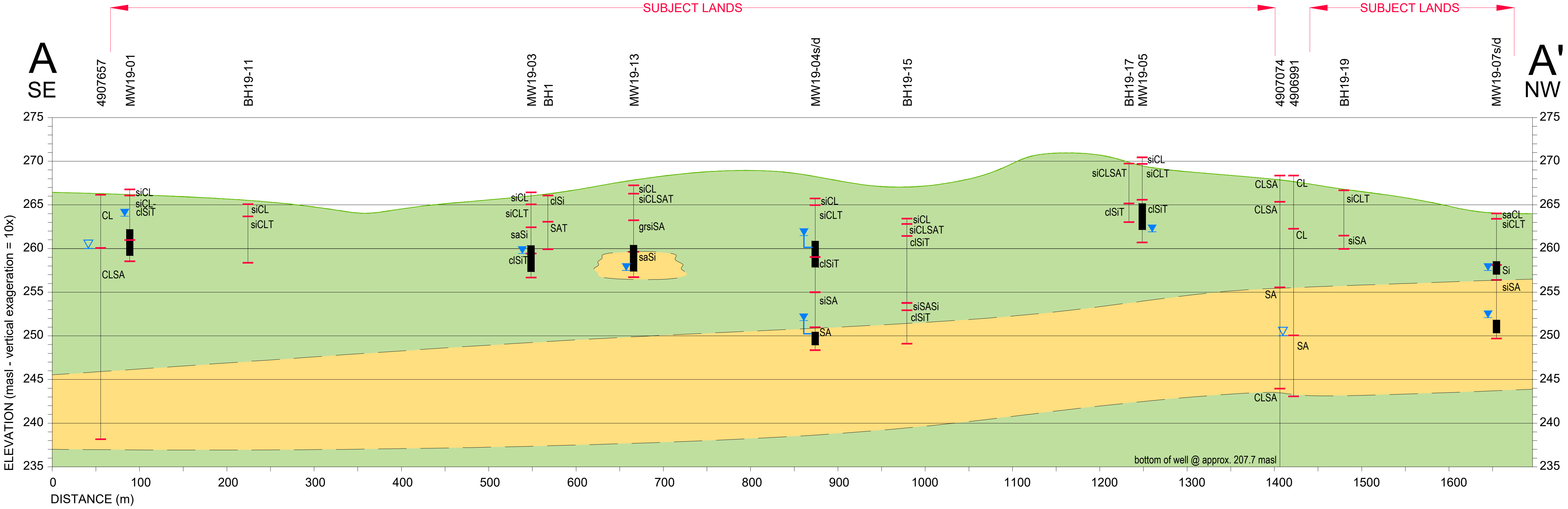
File Path:Nigel/Shared Work Areas/043952 Snell's Hollow/06_GIS/043952 Borehole & Well Locations.mxd



## LEGEND

BH1 WELL NUMBER / ID

EXISTING GROUND PROFILE

GEOLOGICAL CONTACT

▽ STATIC WATER LEVEL (MECP WELL RECORD)

▼ MEASURED WATER LEVEL (APRIL 20, 2020)

▮ WELL SCREEN

| | |
|---|---|
| si | SILTY |
| sa | SANDY |
| cl | CLAYEY |
| GR | GRAVEL |
| SA | SAND |
| Si | SILT |
| CL | CLAY |
| ST | STONES |
| LSMN | LIMESTONE |

— — INTERPRETED STRATIGRAPHY

🟨 SAND / SILT / GRAVEL

🟩 SILT CLAY TILL

BURNSIDE

Client / Report

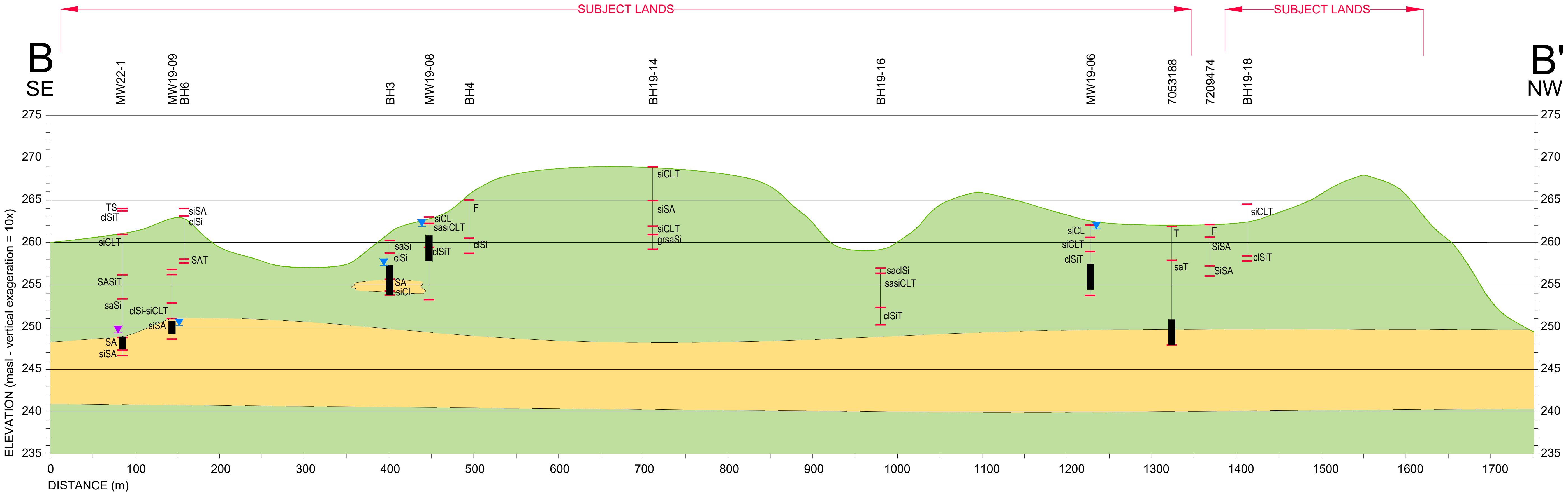
SNELL'S HOLLOW DEVELOPERS GROUP
CALEDON, ONTARIO
*HYDROGEOLOGICAL ASSESSMENT*
*AND WATER BALANCE*

Figure Title

**INTERPRETED GEOLOGICAL CROSS-SECTION A-A'**

| | | | |
|---|---|---|---|
| Drawn<br>SK | Checked<br>TM | Date<br>April 2025 | Figure No.<br>6 |
| Scale<br>1:5,000 | | Project No.<br>300043952 | |

File: \\NIGEL\Shared Work Areas\043952 Snell's Hollow\02_Production\043592 HG Study Drawing Set.dwg Date Plotted: January 23, 2024 - 2:49 PM



## LEGEND

BH1 WELL NUMBER / ID

EXISTING GROUND PROFILE

GEOLOGICAL CONTACT

▽ STATIC WATER LEVEL (MECP WELL RECORD)

▼ MEASURED WATER LEVEL (APRIL 20, 2020)

▼ MEASURED WATER LEVEL (SEPTEMBER, 2023)

▮ WELL SCREEN

| | |
|---|---|
| si | SILTY |
| sa | SANDY |
| cl | CLAYEY |
| GR | GRAVEL |
| SA | SAND |
| Si | SILT |
| CL | CLAY |
| ST | STONES |
| LSMN | LIMESTONE |

— — INTERPRETED STRATIGRAPHY

🟨 SAND / SILT / GRAVEL

🟩 SILT CLAY TILL

BURNSIDE

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*AND WATER BALANCE*

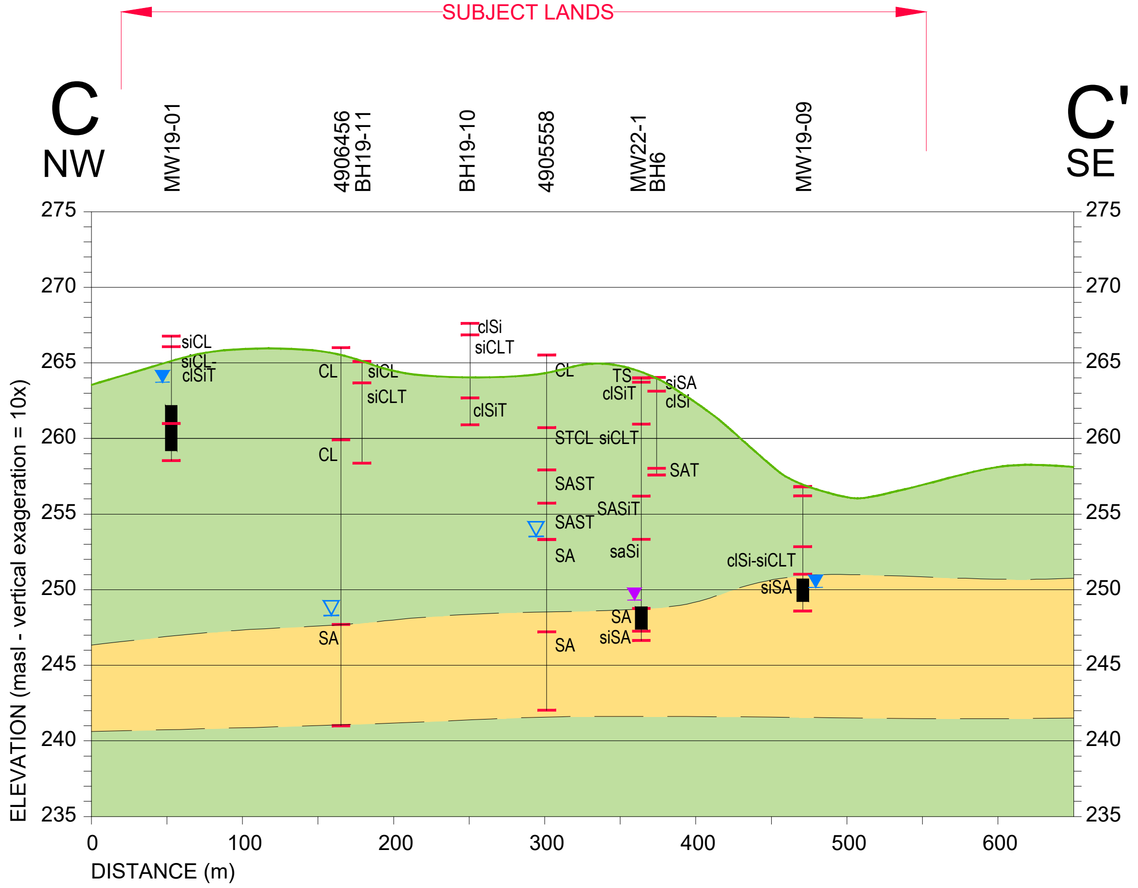
Figure Title

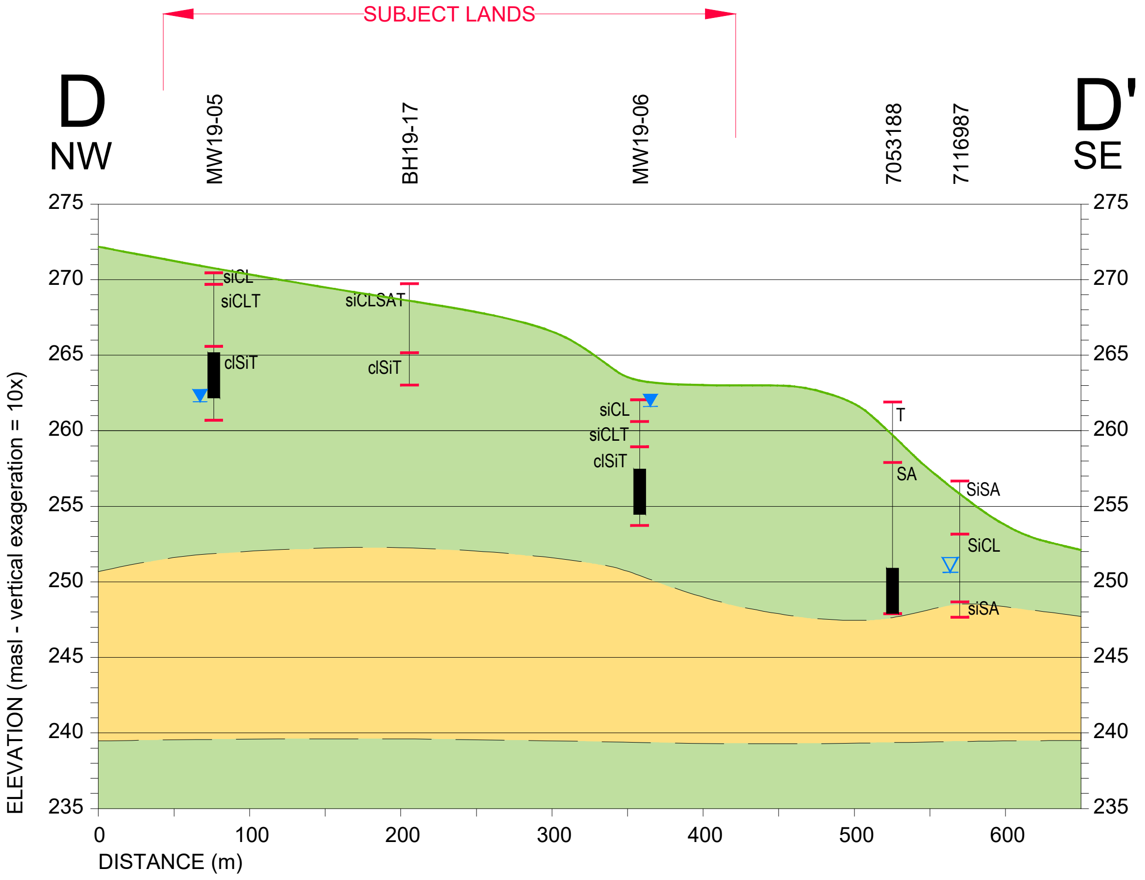
# INTERPRETED GEOLOGICAL CROSS-SECTION B-B'

| Drawn | Checked | Date | Figure No. |
|---|---|---|---|
| SK | TM | April 2025 | 7 |

| Scale | Project No. |
|---|---|
| 1:5,000 | 300043952 |

File: \\NIGEL\Shared Work Areas\043952 Snell's Hollow\02_Production\043592 HG Study Drawing Set.dwg Date Plotted: January 23, 2024 - 2:49 PM





## LEGEND

BH1 WELL NUMBER / ID

EXISTING GROUND PROFILE

GEOLOGICAL CONTACT

▽ STATIC WATER LEVEL (MECP WELL RECORD)

▼ MEASURED WATER LEVEL (APRIL 20, 2020)

▼ MEASURED WATER LEVEL (SEPTEMBER, 2023)

▮ WELL SCREEN

| | |
|---|---|
| si | SILTY |
| sa | SANDY |
| cl | CLAYEY |
| GR | GRAVEL |
| SA | SAND |
| Si | SILT |
| CL | CLAY |
| ST | STONES |
| LSMN | LIMESTONE |

— — INTERPRETED STRATIGRAPHY

🟨 SAND / SILT / GRAVEL

🟩 SILT CLAY TILL

BURNSIDE

Client / Report

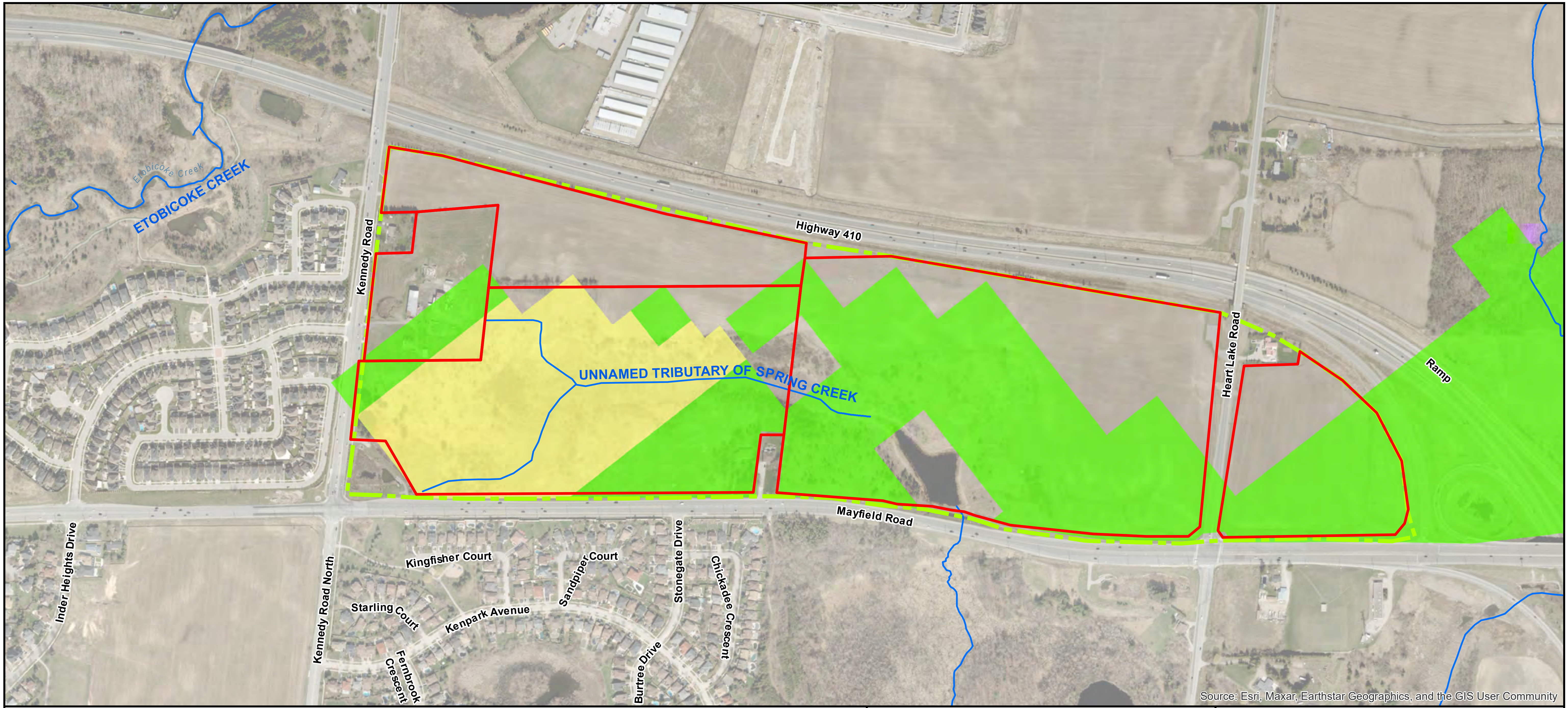
SNELL'S HOLLOW DEVELOPERS GROUP
CALEDON, ONTARIO
*HYDROGEOLOGICAL ASSESSMENT*
*AND WATER BALANCE*

Figure Title

**INTERPRETED GEOLOGICAL**
**CROSS-SECTION C-C' AND D-D'**

| Drawn | Checked | Date | Figure No. |
|---|---|---|---|
| SK | TM | April 2025 | 8 |
| Scale | | Project No. | |
| 1:5,000 | | 300043952 | |

File: \\NIGEL\Shared Work Areas\043952 Snell's Hollow\02_Production\043592 HG Study Drawing Set.dwg Date Plotted: January 24, 2024 - 3:45 PM



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

**LEGEND**

🟥 SUBJECT LANDS

🟩 SECONDARY PLAN AREA

— WATERCOURSE

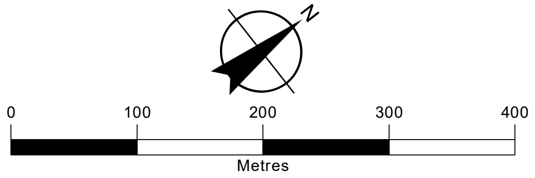
SIGNIFICANT GROUNDWATER RECHARGE AREAS (SGRA)

🟨 HIGH

🟩 MEDIUM

Sources:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. SGRA mapping derived from Source Protection Information Atlas, Ministry of the Environment, Conservation and Parks. Land Information Ontario online mapping.



BURNSIDE

Client / Report

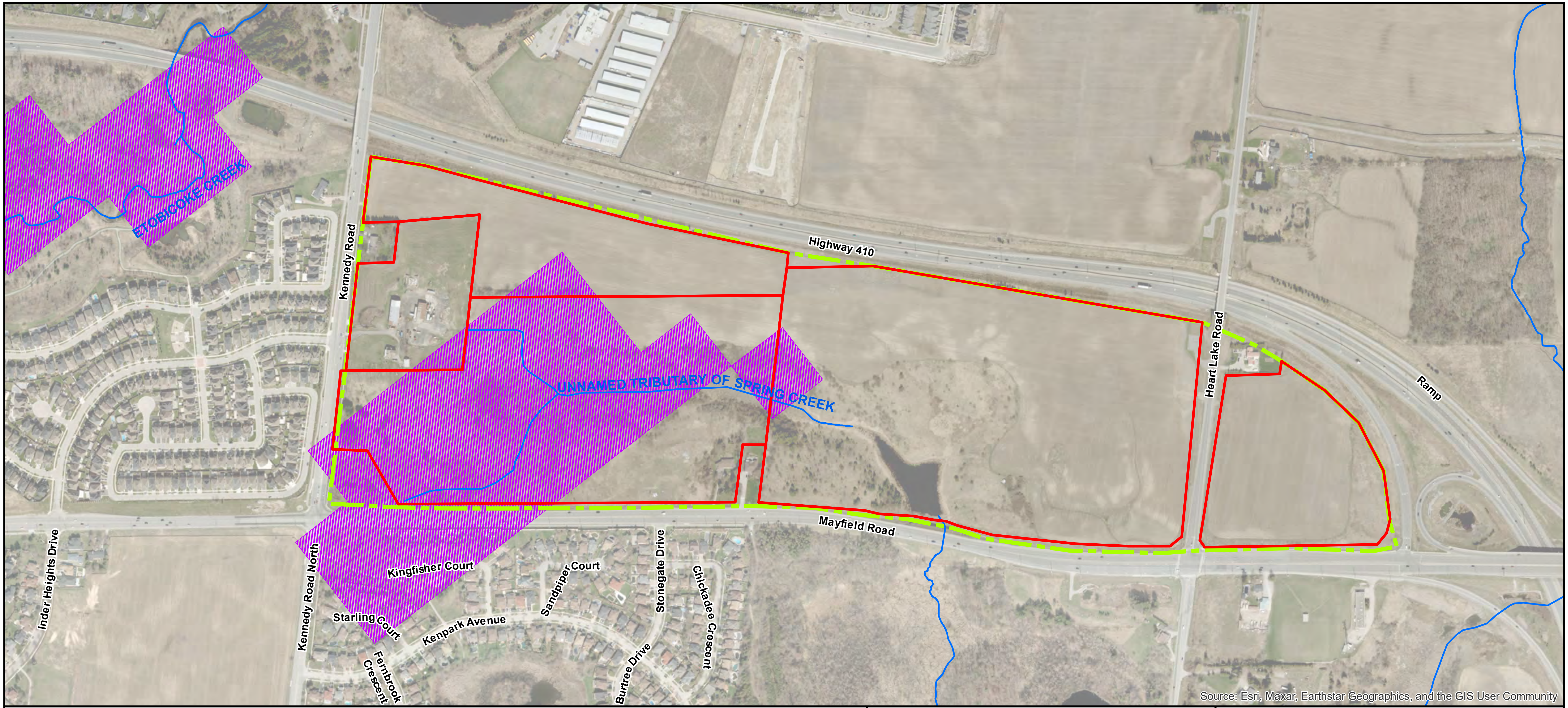
SNELL'S HOLLOW DEVELOPERS GROUP
CALEDON, ONTARIO
*HYDROGEOLOGICAL ASSESSMENT*
*AND WATER BALANCE*

Figure Title

## SIGNIFICANT RECHARGE AREAS

| | | | |
|---|---|---|---|
| Drawn<br>SK | Checked<br>TM | Date<br>April 2025 | Figure No. |
| Scale<br>1:6,000 | | Project No.<br>300043952 | 9 |

File Path:Nigel/Shared Work Areas/043952 Snell's Hollow/06GIS/043952 SGRA.mxd



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

**LEGEND**

🟥 SUBJECT LANDS

🟩 SECONDARY PLAN AREA

— WATERCOURSE

▨ HIGHLY VULNERABLE AQUIFER AREA

Sources:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. HVA mapping derived from Source Protection Information Atlas, Ministry of the Environment, Conservation and Parks. Land Information Ontario online mapping.

N

0 100 200 300 400

Metres

BURNSIDE

Client / Report

SNELL'S HOLLOW DEVELOPERS GROUP
CALEDON, ONTARIO
*HYDROGEOLOGICAL ASSESSMENT*
*AND WATER BALANCE*

Figure Title

# AQUIFER VULNERABILITY

| Drawn | Checked | Date | Figure No. |
|---|---|---|---|
| SK | TM | April 2025 | 10 |
| Scale | | Project No. | |
| 1:6,000 | | 300043952 | |

File Path: Nigel/Shared Work Areas/043925 Snell's Hollow/06_GIS/043952 HVA.mxd

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

# Appendix A

## Borehole Logs

PROJECT: 19115264-3000
LOCATION: Lat. 43.747371 Long. -79.818742
(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-01

BORING DATE: April 4, 2019

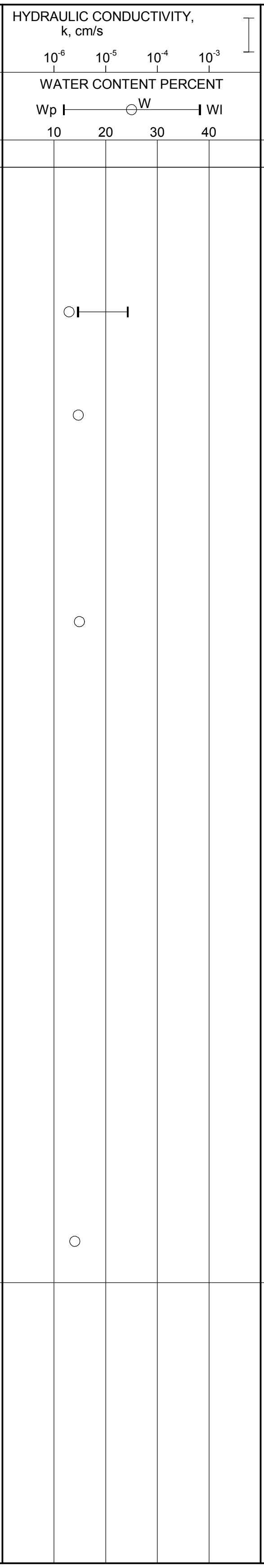
SHEET 1 OF 1
DATUM: Geodetic

BORING METHOD: CME 75 Track Mount Power Auger, 100 mm Solid Stem

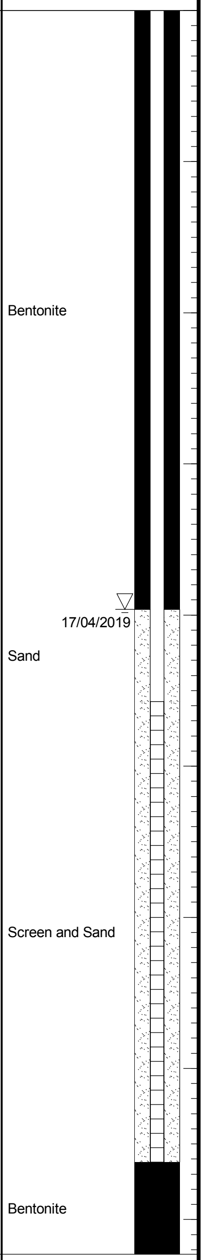
| SOIL PROFILE – DESCRIPTION | ELEV. DEPTH (m) |
|---|---|
| GROUND SURFACE | 266.80 |
| TOPSOIL (250 mm) | 0.00<br>266.55 |
| (CL) SILTY CLAY, trace sand, trace gravel, trace organics; brown; cohesive, w~PL, stiff | 0.25<br>266.10 |
| (CL) sandy SILTY CLAY, trace gravel; light brown with oxidation staining, (TILL); cohesive, w<PL, very stiff to hard<br>- Some to trace sand below depth of 1.6 m<br>- Silty sand layers/seams encountered below depth of 4.9 m | 0.70<br>261.01 |
| (CI/CL-ML) SILTY CLAY to CLAYEY SILT, trace to some sand, trace gravel, with inferred cobbles; grey, (TILL); cohesive, w~PL to w>PL, stiff to hard<br>- Sand layer, approximately 70 mm thick, encountered at a depth of 8.1 m | 5.79<br>258.57 |
| END OF BOREHOLE. | 8.23 |

| SAMPLES NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING |
|---|---|---|---|
| 1A | SS | 10 | |
| 1B | SS | | |
| 2 | SS | 16 | MH |
| 3 | SS | 21 | |
| 4 | SS | 23 | |
| 5 | SS | 32 | |
| 6 | SS | 21 | |
| 7 | SS | 12 | |
| 8 | SS | 48 | |

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80
SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80



PIEZOMETER OR STANDPIPE INSTALLATION



Notes:
1. Borehole dry upon completion of drilling.

2. Water level measured in monitoring well as follows:

| Date | Depth | Elev. (m) |
|---|---|---|
| April 17, 2019 | 3.95 mbgs | 262.85 m |

DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000/2000

LOCATION: Lat. 43.747664 Long. -79.814643

(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-02

BORING DATE: April 2, 2019

SHEET 1 OF 2

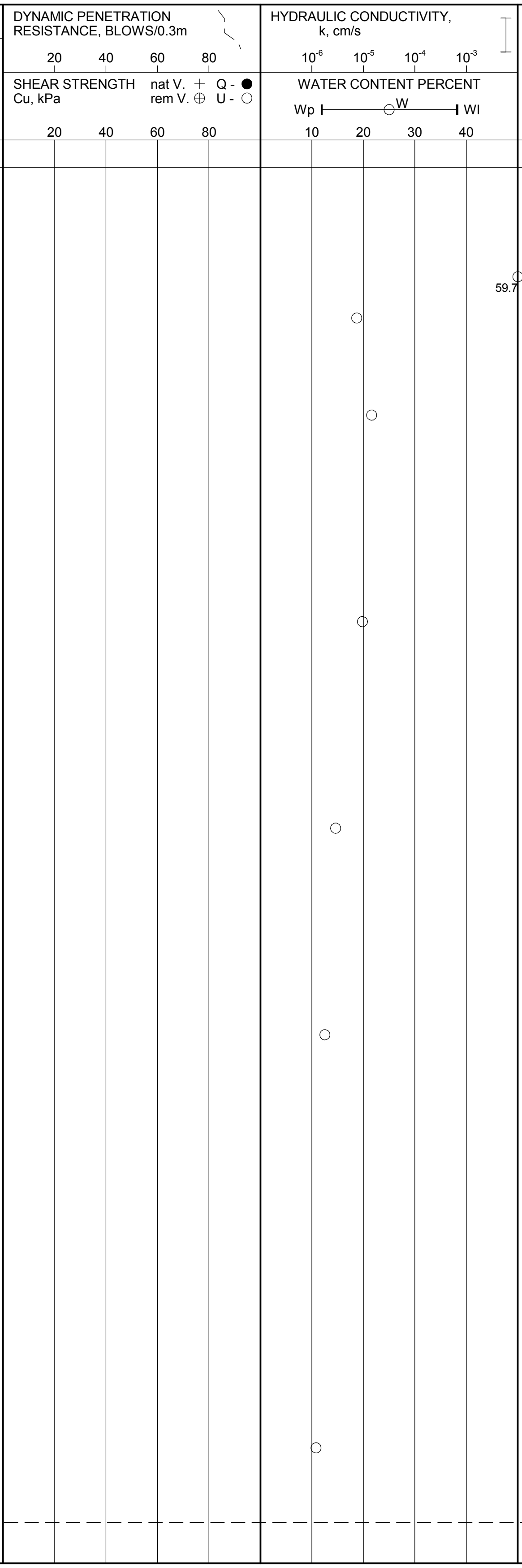
DATUM: Geodetic

BORING METHOD: CME 75 Track Mount Power Auger<br>100 mm Solid Stem

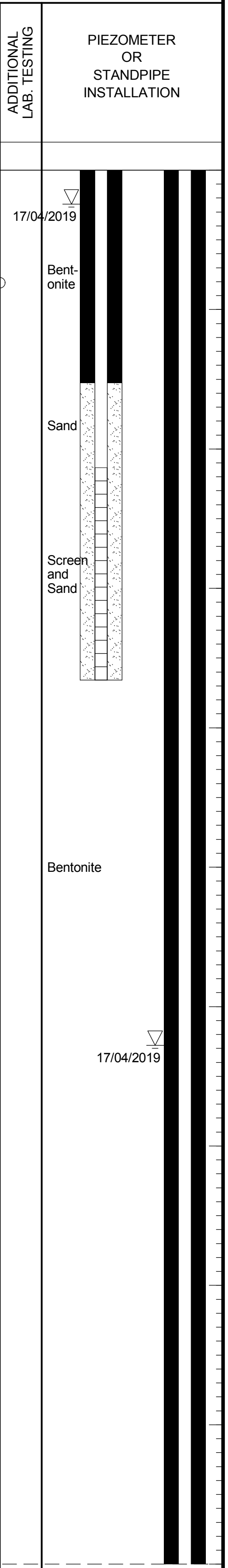
| SOIL PROFILE – DESCRIPTION | ELEV. DEPTH (m) |
|---|---|
| GROUND SURFACE | 257.20 |
| TOPSOIL (610 mm) | 0.00 |
| (CL)SILTY CLAY, some to trace sand, trace gravel, trace organics; brown/dark brown with oxidation staining; w>PL, firm | 256.59<br>0.61 |
| (CL) sandy SILTY CLAY, trace gravel; light brown with oxidation staining, (TILL); cohesive, w~PL, firm to stiff | 256.35<br>0.85 |
| - Silt/sand seams/layers below 1.7 m | |
| (CL-ML) CLAYEY SILT, some to trace sand, trace gravel; grey, (TILL); cohesive, w>PL, very stiff to stiff to hard | 253.24<br>3.96 |
| - Becoming sandy at 9.1 m | |
| - Auger grinding at a depth of 9.5 m to 11 m | |

*CONTINUED NEXT PAGE*

| SAMPLES NUMBER | TYPE | BLOWS/0.3m |
|---|---|---|
| 1 | SS | 4 |
| 2A | SS | |
| 2B | SS | 8 |
| 3 | SS | 8 |
| 4 | SS | 13 |
| 5 | SS | 9 |
| 6 | SS | 15 |
| 7 | SS | 13 |
| 8 | SS | 17 |
| 9 | SS | 57 |



ADDITIONAL LAB. TESTING



DEPTH SCALE

1 : 50

GOLDER

LOGGED: JD

CHECKED: EM

PROJECT: 19115264-1000/2000

LOCATION: Lat. 43.747664 Long. -79.814643

(See Figure 1)

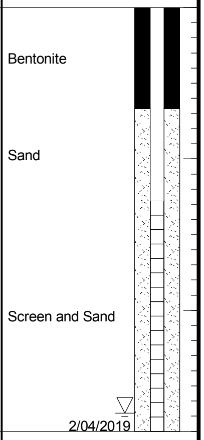
# RECORD OF BOREHOLE: BH/MW19-02

BORING DATE: April 2, 2019

SHEET 2 OF 2

DATUM: Geodetic

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | SAMPLES NUMBER | TYPE | BLOWS/0.3m | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 / SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80 | HYDRAULIC CONDUCTIVITY, k, cm/s 10⁻⁶ 10⁻⁵ 10⁻⁴ 10⁻³ / WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl 10 20 30 40 | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *--- CONTINUED FROM PREVIOUS PAGE ---* | | | | | | | | | |
| 10 | CME 75 Track Mount Power Auger<br>100 mm Solid Stem | (SW-SM) SAND to SILTY SAND, medium grained, contains inferred cobbles/boulders; light brown; non-cohesive, wet, compact to very dense | | 247.14<br>10.06 | | | | | | | Bentonite |
| 11 | | | | | 10 | SS | 26 | | | | Sand |
| 12 | | - Cobbles/boulders inferred from auger grinding at a depth of 12 m | | | | | | | | | Screen and Sand |
| | | | | | 11 | SS | 52 | | | | 2/04/2019 |
| | | END OF BOREHOLE. | | 244.40<br>12.80 | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |



Notes:
1. Water level measured in monitoring well as follows:

Deep Well

| Date | Depth | Elev. (m) |
|---|---|---|
| April 2, 2019 | 12.67 mbgs | 244.53 m |
| April 17, 2019 | 6.27 mbgs | 250.93 m |

Shallow Well

| Date | Depth | Elev. (m) |
|---|---|---|
| April 17, 2019 | 0.25 mbgs | 256.95 m |

DEPTH SCALE

1 : 50

GOLDER

LOGGED: JD

CHECKED: EM

PROJECT: 19115264-3000

LOCATION: Lat. 43.750098 Long. -79.814418
(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-03

BORING DATE: April 4, 2019

SHEET 1 OF 2

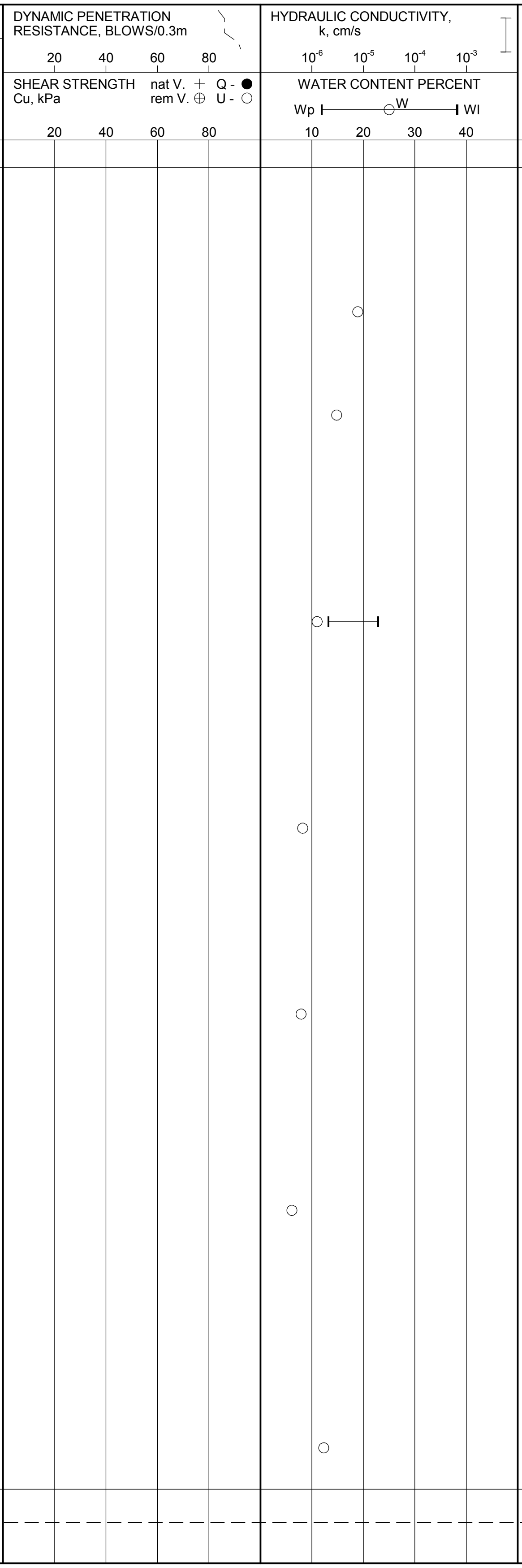
DATUM: Geodetic

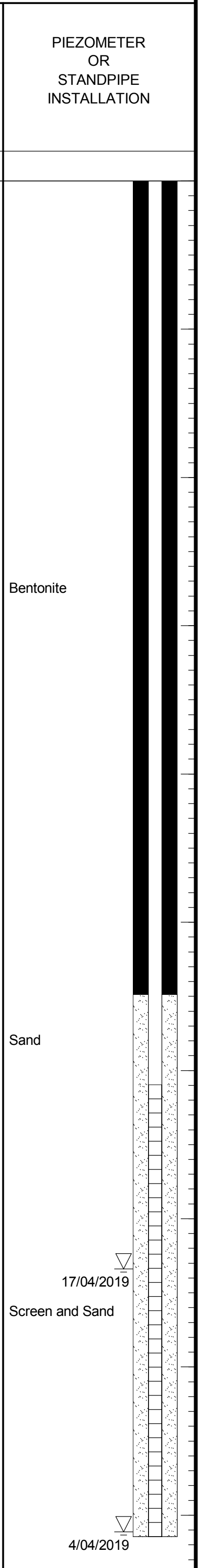
BORING METHOD: CME 75 Track Mount Power Auger, 100 mm Solid Stem

DEPTH SCALE METRES: 0 to 10

| SOIL PROFILE DESCRIPTION | ELEV. DEPTH (m) |
|---|---|
| GROUND SURFACE | 266.88 |
| TOPSOIL (350 mm) | 0.00 |
| (CL) SILTY CLAY, some sand, trace gravel, trace organics; brown with oxidation staining; cohesive, w<PL, firm | 266.53<br>0.35 |
| (CL) sandy SILTY CLAY, trace gravel, contains inferred cobbles; light brown with oxidation staining, (TILL); cohesive, w<PL, stiff to hard | 265.51<br>1.37 |
| (ML) gravelly sandy SILT, with slight plasticity, contains inferred cobbles; light brown; non-cohesive, moist, very dense<br>- Inferred cobbles/boulders from auger grindings at a depth of 2 m and 7.3 m | 262.89<br>3.99 |
| (CL-ML) CLAYEY SILT, some to trace sand; grey, (TILL); cohesive, w<PL, hard<br>- Cobbles/boulders inferred from auger grinding at a depth of 8.4 m | 259.88<br>7.00 |
| END OF BOREHOLE. | 257.13<br>9.75 |

| SAMPLES NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING |
|---|---|---|---|
| 1A | SS | 5 | |
| 1B | SS | | |
| 2 | SS | 7 | |
| 3 | SS | 11 | |
| 4 | SS | 24 | |
| 5 | SS | 30 | MH |
| 6 | SS | 75 | |
| 7 | SS | 100 | |
| 8 | SS | 100 | |
| 9 | SS | 77 | |





*CONTINUED NEXT PAGE*

DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-3000

LOCATION: Lat. 43.750098 Long. -79.814418
(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-03

BORING DATE: April 4, 2019

SHEET 2 OF 2

DATUM: Geodetic

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE<br>DESCRIPTION | STRATA PLOT | ELEV.<br>DEPTH (m) | SAMPLES<br>NUMBER | TYPE | BLOWS/0.3m | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m<br>20 40 60 80<br>SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○<br>20 40 60 80 | HYDRAULIC CONDUCTIVITY, k, cm/s<br>$10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$<br>WATER CONTENT PERCENT<br>Wp ⊢—○W—⊣ Wl<br>10 20 30 40 | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *--- CONTINUED FROM PREVIOUS PAGE ---* | | | | | | | | | |
| 10 | | Notes:<br>1. Water level measured at 9.1 mbgs upon completion of drilling.<br>2. Water level measured in monitoring well as follows:<br>Date Depth Elev. (m)<br>April 17, 2019 7.34 mbgs 259.54 m | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |

DEPTH SCALE
1 : 50

GOLDER

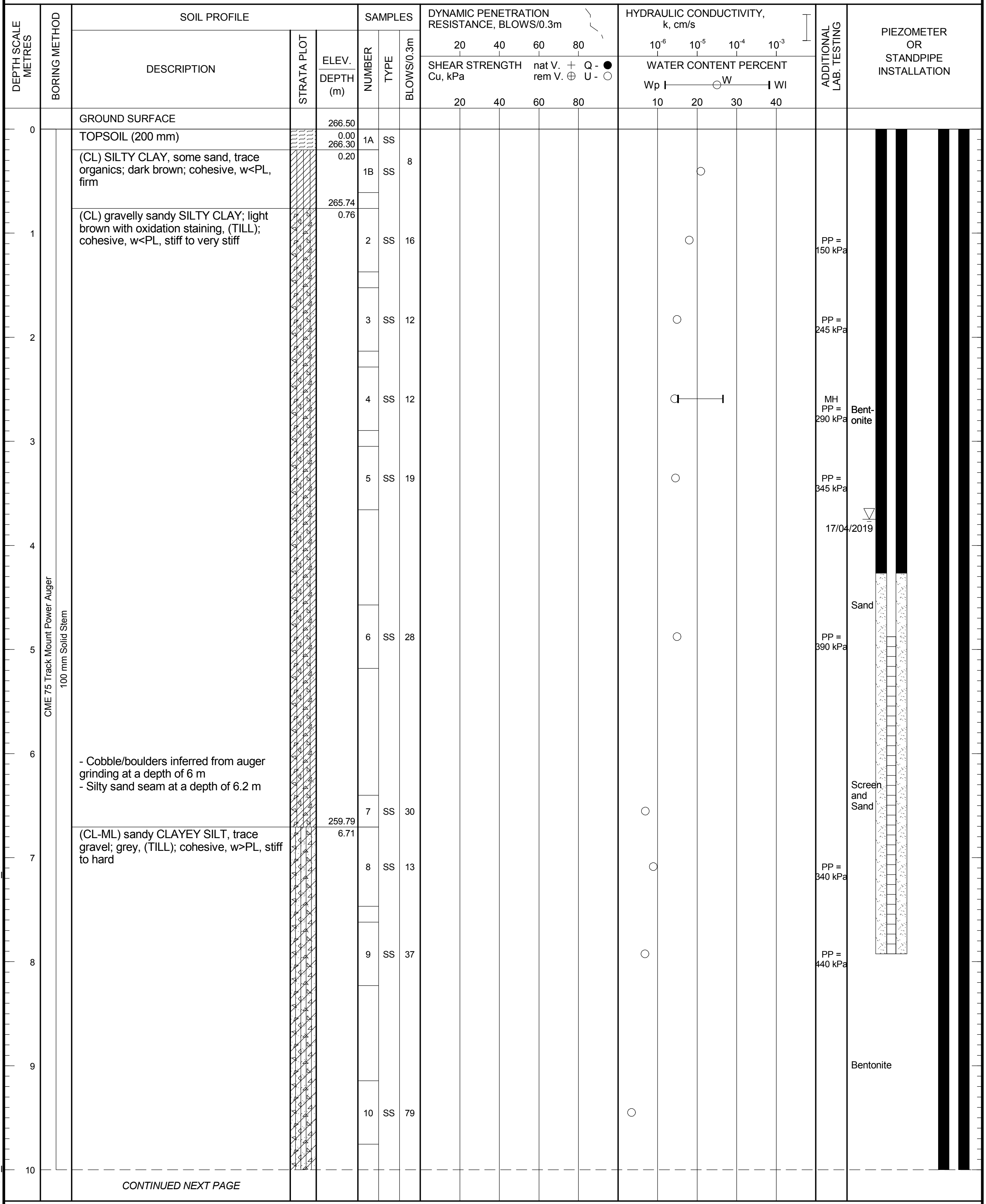
LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000/5000
LOCATION: Lat. 43.750748 Long. -79.810026
(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-04

BORING DATE: March 28, 2019

SHEET 1 OF 2
DATUM: Geodetic



| DESCRIPTION | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING |
|---|---|---|---|---|---|
| GROUND SURFACE | 266.50 | | | | |
| TOPSOIL (200 mm) | 0.00 | 1A | SS | | |
| (CL) SILTY CLAY, some sand, trace organics; dark brown; cohesive, w<PL, firm | 266.30<br>0.20 | 1B | SS | 8 | |
| (CL) gravelly sandy SILTY CLAY; light brown with oxidation staining, (TILL); cohesive, w<PL, stiff to very stiff | 265.74<br>0.76 | 2 | SS | 16 | PP = 150 kPa |
| | | 3 | SS | 12 | PP = 245 kPa |
| | | 4 | SS | 12 | MH<br>PP = 290 kPa |
| | | 5 | SS | 19 | PP = 345 kPa |
| | | 6 | SS | 28 | PP = 390 kPa |
| - Cobble/boulders inferred from auger grinding at a depth of 6 m<br>- Silty sand seam at a depth of 6.2 m | | 7 | SS | 30 | |
| (CL-ML) sandy CLAYEY SILT, trace gravel; grey, (TILL); cohesive, w>PL, stiff to hard | 259.79<br>6.71 | 8 | SS | 13 | PP = 340 kPa |
| | | 9 | SS | 37 | PP = 440 kPa |
| | | 10 | SS | 79 | |

*CONTINUED NEXT PAGE*

DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

GTA-BHS 001 G:_CLIENTS\CLEARBROOKDEVELOPMENTS\CALEDON\12_GINT\19115264-SNELLSHOLLOW BH LOGS.GPJ GAL-MIS.GDT 17/6/19 JMC

PROJECT: 19115264-1000/5000
LOCATION: Lat. 43.750748 Long. -79.810026
(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-04

BORING DATE: March 28, 2019

SHEET 2 OF 2

DATUM: Geodetic

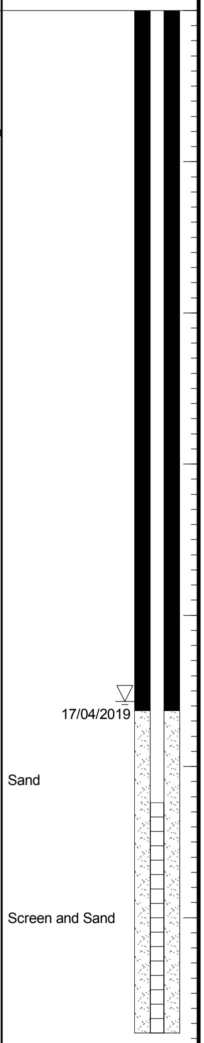
BORING METHOD: CME 75 Track Mount Power Auger<br>100 mm Solid Stem

--- CONTINUED FROM PREVIOUS PAGE ---

| DEPTH SCALE METRES | SOIL PROFILE DESCRIPTION | ELEV. / DEPTH (m) | SAMPLE NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING |
|---|---|---|---|---|---|---|
| 10 | (CL-ML) sandy CLAYEY SILT, trace gravel; grey, (TILL); cohesive, w>PL, stiff to hard | | | | | |
| | | 255.76<br>10.74 | 11A | SS | | PP = 150 kPa |
| | (SW/SM) gravelly SILTY SAND, coarse to fine; light brown to brown; non-cohesive, dry to wet, compact to very dense | | 11B | SS | 120/ 6" | |
| 12 | | | 12 | SS | 62 | |
| 14 | | | 13 | SS | 19 | |
| | (SP) SAND, some silt, trace clay; light grey; wet, compact to dense | 251.75<br>14.75 | | | | |
| 15 | | | 14 | SS | 31 | MH |
| 16 | | | 15 | SS | 22 | |
| 17 | END OF BOREHOLE. | 249.13<br>17.37 | | | | |

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80
SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ : 20 40 60 80
HYDRAULIC CONDUCTIVITY, k, cm/s: $10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$
WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl : 10 20 30 40

PIEZOMETER OR STANDPIPE INSTALLATION



Notes:
1. Water level measured in monitoring well as follows:

Deep Well

| Date | Depth | Elev. (m) |
|---|---|---|
| March 29, 2019 | 14.8 mbgs | 251.7 m |
| April 17, 2019 | 14.55 mbgs | 251.95 m |

Shallow Well

| Date | Depth | Elev. (m) |
|---|---|---|
| April 17, 2019 | 3.75 mbgs | 262.75 m |

2. PP = unconfined compressive strength measured using pocket penetrometer on sample in the field.

DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000/5000
LOCATION: Lat. 43.75409 Long. -79.807715
(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-05

BORING DATE: March 28, 2019

SHEET 1 OF 2
DATUM: Geodetic

BORING METHOD: CME 75 Track Mount Power Auger, 100 mm Solid Stem

| SOIL PROFILE | | | SAMPLES | | |
|---|---|---|---|---|---|
| DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.3m |
| GROUND SURFACE | | 270.50 | | | |
| TOPSOIL (280 mm) | | 0.00 | 1A | SS | 12 |
| (CL) SILTY CLAY, trace gravel, trace organics; dark to light brown; cohesive, w~PL, stiff | | 270.22<br>0.28 | 1B | SS | |
| (CL) SILTY CLAY, some sand, trace gravel; light brown with oxidation staining, (TILL); w<PL, very stiff | | 269.74<br>0.76 | 2 | SS | 24 |
| | | | 3 | SS | 26 |
| | | | 4 | SS | 23 |
| | | | 5 | SS | 26 |
| | | | 6A | SS | 44 |
| (CL-ML) CLAYEY SILT, trace sand to sandy, trace gravel; grey, (TILL); cohesive, w<PL, hard | | 265.64<br>4.86 | 6B | SS | |
| - Becoming sandy, with sand seams below a depth of 6.1 m | | | 7 | SS | 77 |
| - Silty sand layer/stratum encountered at a depth of 7.6 m | | | 8 | SS | 94 |
| | | 260.75 | 9 | SS | 100 |
| END OF BOREHOLE. | | 9.75 | | | |

DEPTH SCALE METRES: 0 – 10

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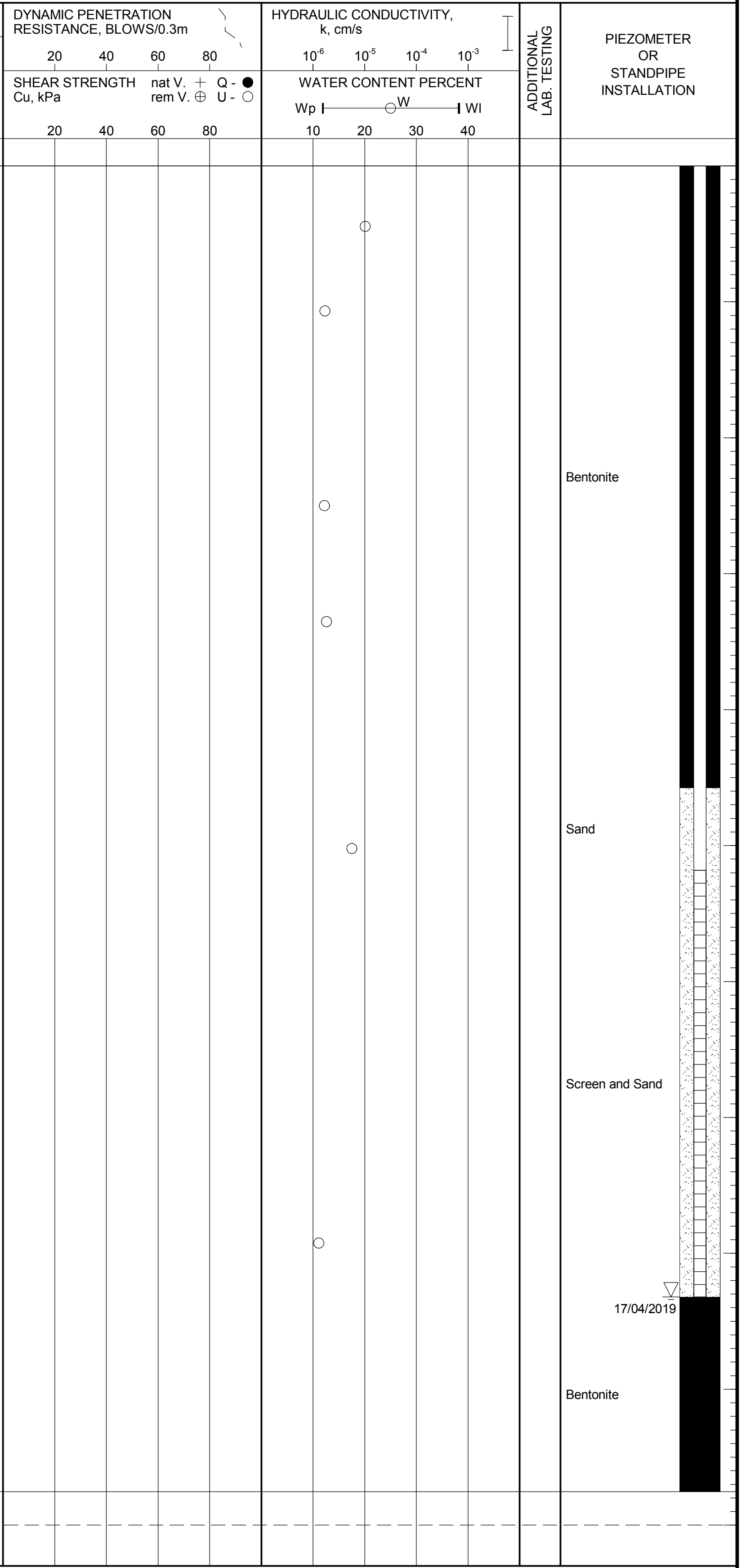


DEPTH SCALE
1 : 50

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000/5000

# RECORD OF BOREHOLE: BH/MW19-05

SHEET 2 OF 2

LOCATION: Lat. 43.75409 Long. -79.807715
(See Figure 1)

BORING DATE: March 28, 2019

DATUM: Geodetic

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE<br>DESCRIPTION | STRATA PLOT | ELEV.<br>DEPTH (m) | SAMPLES<br>NUMBER | TYPE | BLOWS/0.3m | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m<br>20 40 60 80<br>SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○<br>20 40 60 80 | HYDRAULIC CONDUCTIVITY, k, cm/s<br>$10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$<br>WATER CONTENT PERCENT<br>Wp ⊢ ○W ⊣ Wl<br>10 20 30 40 | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *--- CONTINUED FROM PREVIOUS PAGE ---* | | | | | | | | | |
| 10 | | Notes:<br>1. Borehole dry upon completion of drilling.<br>2. Water level measured in monitoring well as follows:<br>Date Depth Elev. (m)<br>March 28, 2019 Dry Dry<br>April 17, 2019 8.32 mbgs 262.18 m | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |

GTA-BHS 001 G:_CLIENTS\CLEARBROOKDEVELOPMENTS\CALEDON\12_GINT\19115264-SNELLSHOLLOW BH LOGS.GPJ GAL-MIS.GDT 17/6/19 JMC

DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000/5000
LOCATION: Lat. 43.752469 Long. -79.804999
(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-06

BORING DATE: March 2, 2019

SHEET 1 OF 1
DATUM: Geodetic

DEPTH SCALE METRES: 0 – 10

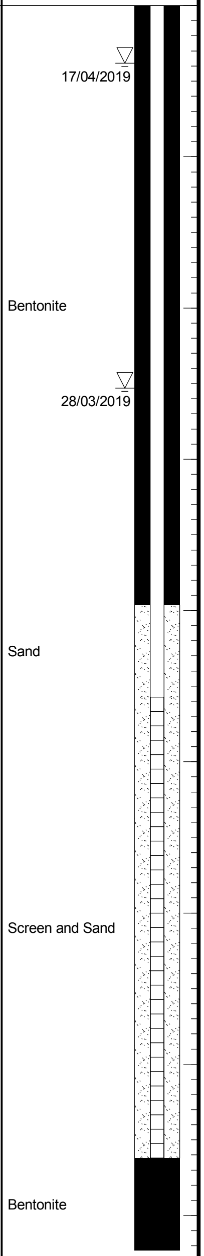
BORING METHOD: CME 75 Track Mount Power Auger
100 mm Solid Stem

| SOIL PROFILE DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) |
|---|---|---|
| GROUND SURFACE | | 262.00 |
| TOPSOIL (410 mm) | | 0.00 |
| (CL) SILTY CLAY, trace organics, some to trace sand, trace gravel; dark brown; cohesive, w>PL, firm | | 261.59<br>0.41 |
| (CL) SILTY CLAY, some sand to sandy, trace gravel; light brown, (TILL); cohesive, w>PL, stiff to very stiff | | 260.55<br>1.45 |
| (CL-ML) CLAYEY SILT, trace sand and gravel; grey, (TILL); cohesive, w>PL, very stiff to hard | | 258.88<br>3.12 |
| END OF BOREHOLE. | | 253.68<br>8.32 |

| SAMPLES NUMBER | TYPE | BLOWS/0.3m |
|---|---|---|
| 1A | SS | 9 |
| 1B | SS | |
| 2 | SS | 5 |
| 3 | SS | 14 |
| 4 | SS | 28 |
| 5A | SS | |
| 5B | SS | 39 |
| 6 | SS | 15 |
| 7 | SS | 27 |
| 8 | SS | 36 |

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80
SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80
HYDRAULIC CONDUCTIVITY, k, cm/s: $10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$
WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl 10 20 30 40
ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



Notes:
1. Water level measured in monitoring well as follows:

| Date | Depth | Elev. (m) |
|---|---|---|
| March 28, 2019 | 2.54 mbgs | 259.46 m |
| April 17, 2019 | 0.38 mbgs | 261.62 m |

DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

GTA-BHS 001 G:_CLIENTS\CLEARBROOKDEVELOPMENTS\CALEDON\12_GINT\19115264-SNELLSHOLLOW BH LOGS.GPJ GAL-MIS.GDT 17/6/19 JMC

PROJECT: 19115264-6000

LOCATION: Lat. 43.755372 Long. -79.802724

(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-07

BORING DATE: March 27, 2019

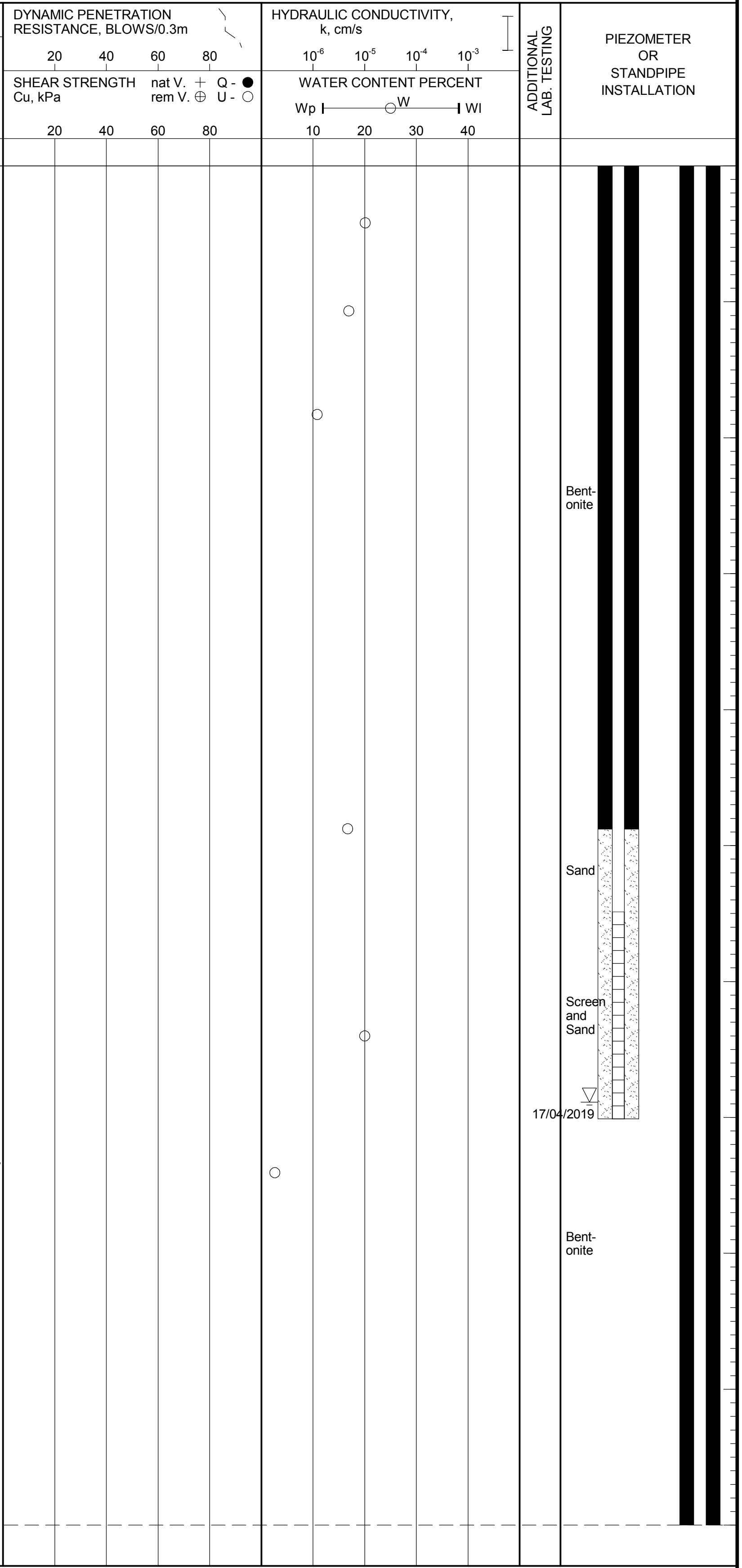
SHEET 1 OF 2

DATUM: Existing Ground Surface

BORING METHOD: CME 75 Track Mount Power Auger, 100 mm Solid Stem

| DEPTH SCALE METRES | SOIL PROFILE DESCRIPTION | ELEV. DEPTH (m) |
|---|---|---|
| | GROUND SURFACE | |
| 0 | TOPSOIL (230 mm) | 0.00 |
| | (CL) sandy CLAY, trace gravel, trace organics; dark brown; cohesive, w<PL, very stiff | 0.23 |
| | (CL) SILTY CLAY, some sand to sandy, trace gravel; light brown with oxidation staining, (TILL); cohesive, w<PL, very stiff to hard | 0.61 |
| 3 | - Becoming sandy at a depth of 3 m | |
| | (SM/ML) sandy SILT to SILT, trace to some clay, slight plasticity; light brown; non-cohesive,wet, dense to very dense | 5.90 |
| 7.3 | - Cobble/boulder inferred from auger grinding at a depth of 7.3 m | |
| | (SM) SILTY SAND, fine to medium grained, some to trace gravel; light brown; non-cohesive, moist, dense to very dense | 7.62 |
| 10 | *CONTINUED NEXT PAGE* | |

| SAMPLES NUMBER | TYPE | BLOWS/0.3m |
|---|---|---|
| 1A | SS | |
| 1B | SS | 19 |
| 2 | SS | 11 |
| 3 | SS | 11 |
| 4 | SS | 24 |
| 5 | SS | 45 |
| 6 | SS | 44 |
| 7 | SS | 36 |
| 8 | SS | 100/<br>2" |
| 9 | SS | 131 |



DEPTH SCALE

1 : 50

GOLDER

LOGGED: JD

CHECKED: EM

PROJECT: 19115264-6000
LOCATION: Lat. 43.755372 Long. -79.802724
(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-07

BORING DATE: March 27, 2019

SHEET 2 OF 2

DATUM: Existing Ground Surface

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES BLOWS/0.3m | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80) | HYDRAULIC CONDUCTIVITY, k, cm/s ($10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40) | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *--- CONTINUED FROM PREVIOUS PAGE ---* | | | | | | | | | |
| 10 | CME 75 Track Mount Power Auger<br>100 mm Solid Stem | (SM) SILTY SAND, fine to medium grained, some to trace gravel; light brown; non-cohesive, moist, dense to very dense | | | | | | | | | |
| 11 | | | | | 10 | SS | 94 | | ○ | | |
| 12 | | | | | | | | | | | Sand |
| | | - Contains wet sandy silt layer at a depth of 12.2 m | | | 11 | SS | 40 | | ○ | | Screen and Sand |
| 13 | | | | | | | | | | | ▽ 17/04/2019 |
| 14 | | | | | 12 | SS | 38 | | ○ | | Bentonite |
| | | END OF BOREHOLE. | | 14.33 | | | | | | | |

Notes:
1. Water level measured at 12.8 mbgs upon completion of drilling.

2. Water level measured in monitoring well as follows:

Deep Well

| Date | Depth | Elev. (m) |
|---|---|---|
| April 17, 2019 | 12.8 mbgs | N/A |

Shallow Well

| Date | Depth | Elev. (m) |
|---|---|---|
| April 17, 2019 | 6.9 mbgs | N/A |

15 16 17 18 19 20

DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000/2000

LOCATION: Lat. 43.747266 Long. -79.811592

(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-08

BORING DATE: April 5, 2019

SHEET 1 OF 2

DATUM: Geodetic

BORING METHOD: CME 75 Track Mount Power Auger, 100 mm Solid Stem

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

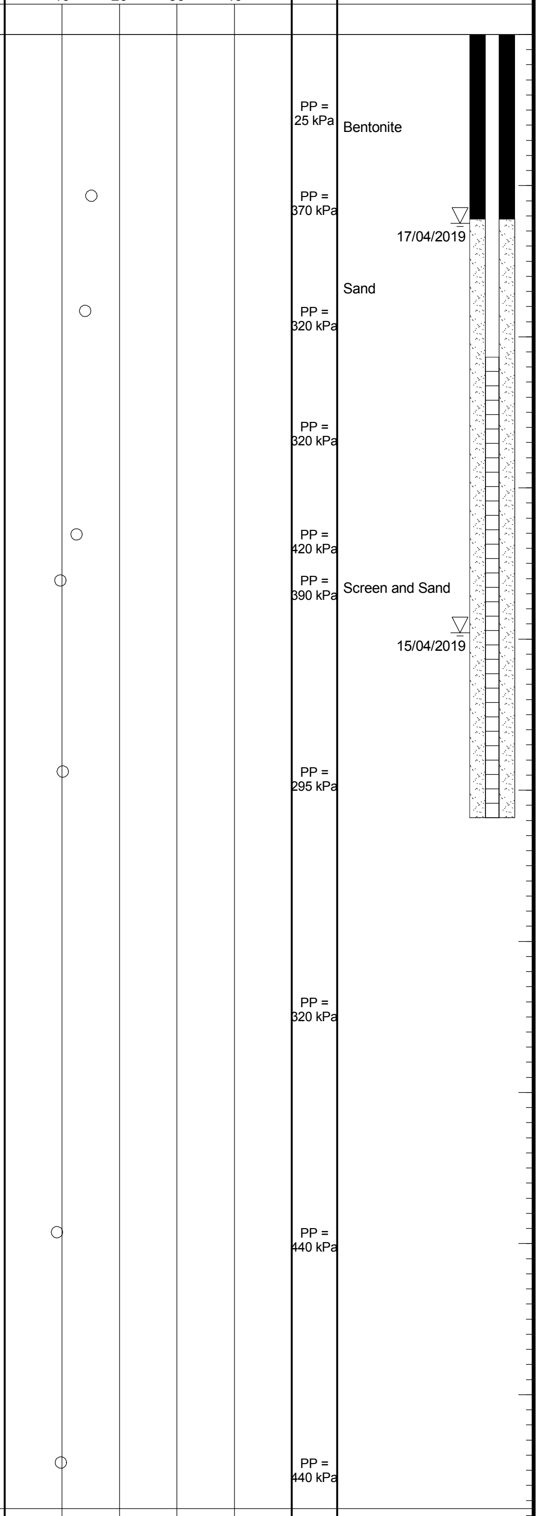
SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: $10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$

WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl 10 20 30 40

| DESCRIPTION | ELEV. DEPTH (m) |
|---|---|
| GROUND SURFACE | 263.00 |
| TOPSOIL (350 mm) | 0.00 |
| (CL) SILTY CLAY, trace sand and gravel, trace organics; dark brown; cohesive, w~PL, very soft to soft | 262.65<br>0.35 |
| (CL) sandy SILTY CLAY, trace gravel; light brown, (TILL); cohesive, w<PL, very stiff | 262.24<br>0.76 |
| (CI-ML) CLAYEY SILT, trace to some sand and gravel, contains inferred cobbles/boulders; grey, (TILL); cohesive, w>PL to w~PL, very stiff to hard<br>- Cobbles/boulders inferred from auger grinding at a depth of 5 m | 259.43<br>3.57 |
| END OF BOREHOLE. | 253.25<br>9.75 |

| NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING |
|---|---|---|---|
| 1A | SS | 2 | |
| 1B | SS | | PP = 25 kPa |
| 2 | SS | 16 | PP = 370 kPa |
| 3 | SS | 26 | PP = 320 kPa |
| 4 | SS | 24 | PP = 320 kPa |
| 5A | SS | 30 | PP = 420 kPa |
| 5B | SS | | PP = 390 kPa |
| 6 | SS | 16 | PP = 295 kPa |
| 7 | SS | 19 | PP = 320 kPa |
| 8 | SS | 50 | PP = 440 kPa |
| 9 | SS | 30 | PP = 440 kPa |



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DEPTH SCALE

1 : 50

GOLDER

LOGGED: JD

CHECKED: EM

PROJECT: 19115264-1000/2000

LOCATION: Lat. 43.747266 Long. -79.811592
(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-08

BORING DATE: April 5, 2019

SHEET 2 OF 2

DATUM: Geodetic

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE: DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | SAMPLES: NUMBER | TYPE | BLOWS/0.3m | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80<br>SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80 | HYDRAULIC CONDUCTIVITY, k, cm/s $10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$<br>WATER CONTENT PERCENT Wp ⊢ ○W ⊣ Wl 10 20 30 40 | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *--- CONTINUED FROM PREVIOUS PAGE ---* | | | | | | | | | |
| 10 | | Notes:<br>1. Water level measured in monitoring well as follows: | | | | | | | | | |

| Date | Depth | Elev. (m) |
|---|---|---|
| April 5, 2019 | 3.96 mbgs | 259.04 m |
| April 17, 2019 | 1.24 mbgs | 261.76 m |

11

2. PP= unconfined compressive strength measured with pocket penetrometer in the field.

12

13

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15

16

17

18

19

20

DEPTH SCALE
1 : 50

LOGGED: JD
CHECKED: EM

# RECORD OF BOREHOLE: BH/MW19-09

PROJECT: 19115264-1000/2000
LOCATION: Lat. 43.745322 Long. -79.814288
(See Figure 1)

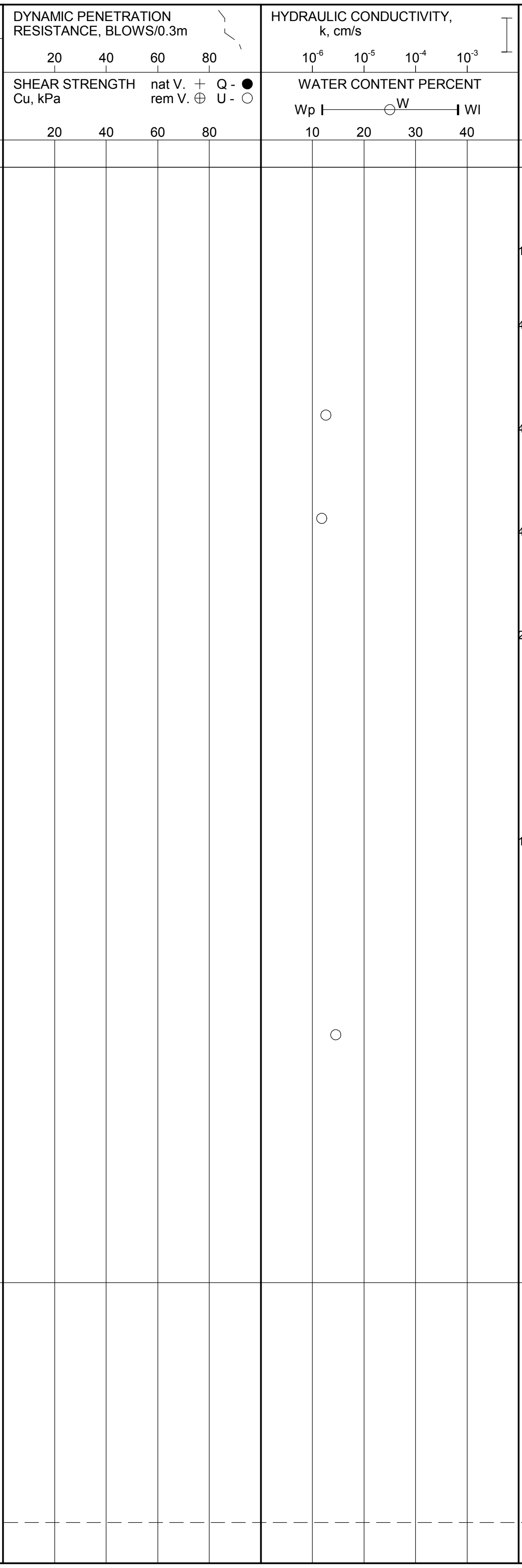
BORING DATE: April 3, 2019

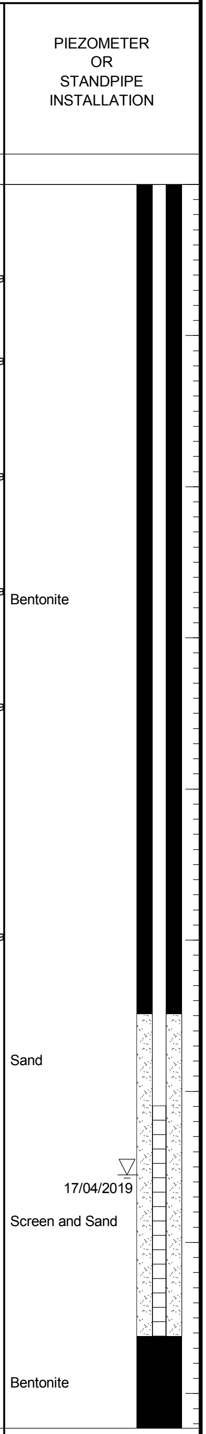
SHEET 1 OF 2

DATUM: Geodetic

BORING METHOD: CME 75 Track Mount Power Auger, 100 mm Solid Stem

| DEPTH SCALE METRES | SOIL PROFILE DESCRIPTION | ELEV. DEPTH (m) | SAMPLES NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING |
|---|---|---|---|---|---|---|
| | GROUND SURFACE | 256.95 | | | | |
| 0 | TOPSOIL (430 mm) | 0.00 | 1A | SS | 3 | |
| | (CL) sandy SILTY CLAY, trace organics, trace gravel; light brown mottled with oxidation staining; cohesive, w<PL, soft | 256.52<br>0.43 | 1B | SS | | PP = 125 kPa |
| 1 | (CL) SILTY CLAY, some sand, trace gravel, inferred cobbles; brown mottled with oxidation staining, (TILL); cohesive, w<PL, very stiff | 256.34<br>0.61 | 2 | SS | 17 | PP = 440 kPa |
| 2 | | | 3 | SS | 22 | PP = 440 kPa |
| | - SAND and silty clay encountered at a depth of 2.3 m to 5.5 m | | 4 | SS | 23 | PP = 420 kPa |
| 3 | - Cobbles/boulders inferred from auger grinding at a depth of 3 m | | 5 | SS | 23 | PP = 245 kPa |
| 4 | (CL-ML/CL) CLAYEY SILT to SILTY CLAY, trace sand, trace gravel; grey, (TILL); cohesive, w~PL, stiff | 252.99<br>3.96 | | | | |
| 5 | | | 6 | SS | 9 | PP = 125 kPa |
| 6 | (SM-SW) SILTY SAND to sand, medium grained, some silt, trace gravel; light brown; non-cohesive, wet, compact | 251.16<br>5.79 | 7 | SS | 27 | |
| 7 | | | | | | |
| 8 | | | 8 | SS | 16 | |
| | END OF BOREHOLE. | 248.72<br>8.23 | | | | |





Notes:
1. Water level measured at 6.57 mbgs upon completion of drilling.

2. Water level measured in monitoring well as follows:

| Date | Depth | Elev. (m) |
|---|---|---|
| April 17, 2019 | 6.54 mbgs | 250.41 m |

3. PP= unconfined compressive strength measured with pocket penetrometer in

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000/2000

LOCATION: Lat. 43.745322 Long. -79.814288

(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-09

BORING DATE: April 3, 2019

SHEET 2 OF 2

DATUM: Geodetic

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE | | | SAMPLES | | | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80<br>SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80 | HYDRAULIC CONDUCTIVITY, k, cm/s $10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$<br>WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl 10 20 30 40 | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DESCRIPTION | STRATA PLOT | ELEV.<br>DEPTH (m) | NUMBER | TYPE | BLOWS/0.3m | | | | |
| | | *--- CONTINUED FROM PREVIOUS PAGE ---* | | | | | | | | | |
| 10 | | the field. | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |

DEPTH SCALE

1 : 50

GOLDER

LOGGED: JD

CHECKED: EM

PROJECT: 19115264-4000
LOCATION: Lat. 43.74607 Long. -79.817117
(See Figure 1)

# RECORD OF BOREHOLE: BH19-10

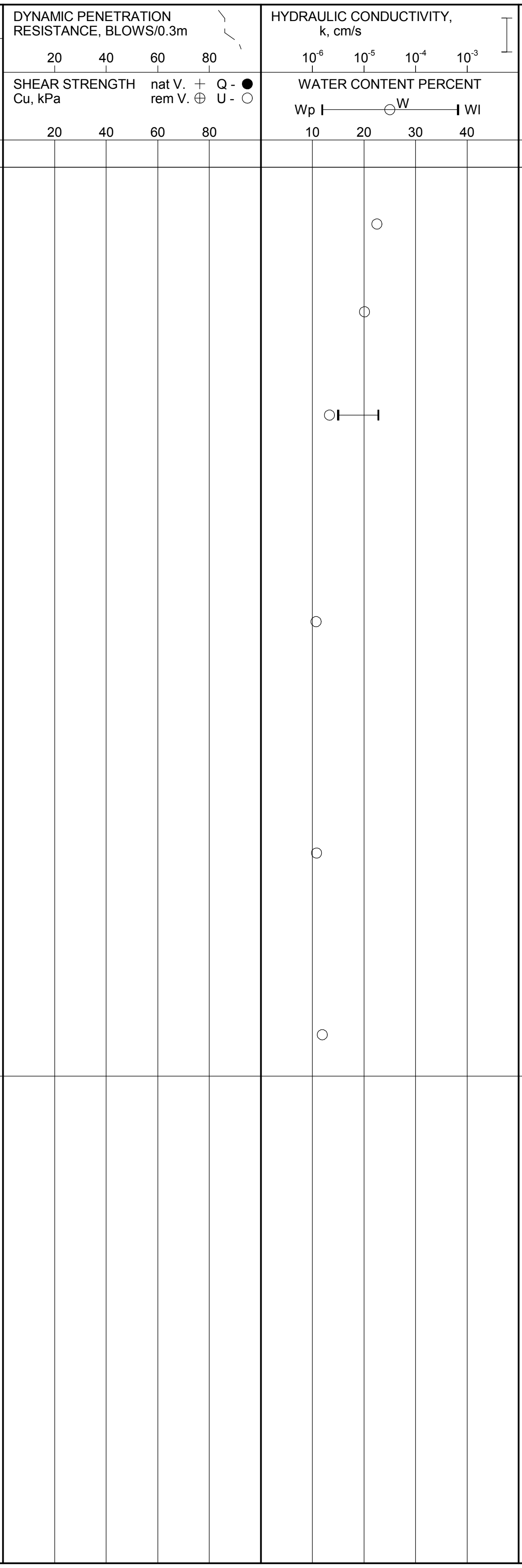
BORING DATE: April 3, 2019

SHEET 1 OF 1
DATUM: Geodetic

BORING METHOD: CME 75 Track Mount Power Auger, 100 mm Solid Stem

| SOIL PROFILE DESCRIPTION | ELEV. DEPTH (m) | SAMPLES NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|
| GROUND SURFACE | 267.80 | | | | | |
| TOPSOIL (230 mm) | 0.00 | 1A | SS | | | |
| (CL-ML) CLAYEY SILT, some sand, trace gravel; dark brown to brown, mottled; cohesive, w~PL, firm | 267.57<br>0.23 | 1B | SS | 5 | | |
| (CL) sandy SILTY CLAY, some sand, trace gravel, contains inferred cobbles/boulders; light brown with oxidation staining, (TILL); cohesive, w<PL, very stiff to hard | 267.04<br>0.76 | 2 | SS | 18 | | |
| | | 3 | SS | 29 | MH | |
| | | 4 | SS | 35 | | |
| - Auger grinding on inferred cobbles at a depth of 3 m | | 5 | SS | 31 | | |
| | | | | | | 2/04/2019 |
| | | 6A | SS | 25 | | |
| (CL-ML) CLAYEY SILT, some sand, some gravel; grey, (TILL); cohesive, w~PL to w>PL, stiff to very stiff | 262.86<br>4.94 | 6B | SS | | | |
| | | 7A | SS | 10 | | |
| | | 7B | SS | | | |
| | | 8 | SS | 22 | | |
| END OF BOREHOLE. | 261.09<br>6.71 | | | | | |

Notes:
1. Water level measured at 4.1 mbgs upon completion of drilling.



DEPTH SCALE
1 : 50

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-4000
LOCATION: Lat. 43.74736 Long. -79.816608
(See Figure 1)

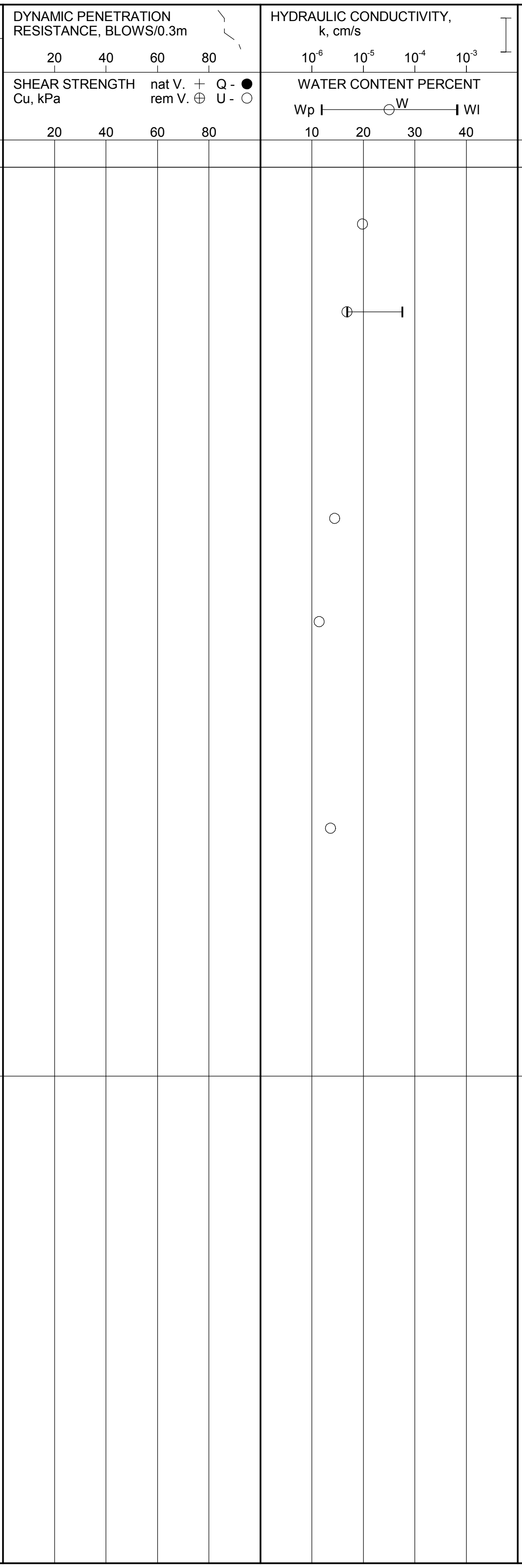
# RECORD OF BOREHOLE: BH19-11

BORING DATE: April 3, 2019

SHEET 1 OF 1
DATUM: Geodetic

BORING METHOD: CME 75 Track Mount Power Auger
100 mm Solid Stem

| DEPTH SCALE METRES | SOIL PROFILE DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | SAMPLES NUMBER | SAMPLES TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | | 265.00 | | | | | |
| 0 | TOPSOIL (230 mm) | | 0.00<br>264.77 | 1A | SS | | | |
| | (CL) sandy SILTY CLAY, trace gravel; brown, mottled brown/light brown; cohesive, w<PL, firm to stiff<br>- Cobbles/boulders inferred from auger grinding at 6 m | | 0.23 | 1B | SS | 10 | | |
| 1 | | | | 2 | SS | 4 | MH | |
| | (CL) sandy SILTY CLAY, trace gravel; mottled light brown to brown, (TILL); cohesive, w<PL, very stiff to hard | | 263.60<br>1.40 | | | | | |
| | | | | 3 | SS | 10 | | |
| | | | | 4 | SS | 28 | | |
| | | | | 5 | SS | 29 | | |
| 5 | | | | 6 | SS | 33 | | |
| 6 | | | 258.29 | 7 | SS | 30 | | |
| | END OF BOREHOLE.<br><br>Notes:<br>1. Borehole dry upon completion of drilling. | | 6.71 | | | | | |



DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000
LOCATION: Lat. 43.748408 Long. -79.813559
(See Figure 1)

# RECORD OF BOREHOLE: BH19-12

BORING DATE: April 4, 2019

SHEET 1 OF 2
DATUM: Geodetic

BORING METHOD: CME 75 Track Mount Power Auger, 100 mm Solid Stem

## SOIL PROFILE

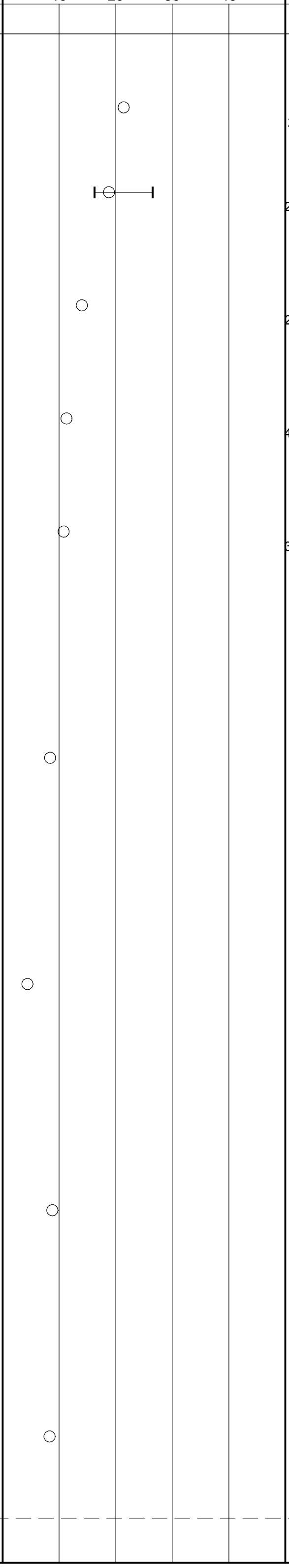
| DEPTH SCALE METRES | DESCRIPTION | ELEV. DEPTH (m) |
|---|---|---|
| | GROUND SURFACE | 266.33 |
| 0 | TOPSOIL (380 mm) | 0.00 |
| | (CL) sandy SILTY CLAY, trace gravel, trace organics; brown with oxidation staining; w<PL, firm | 265.95<br>0.38 |
| 1 | (CL) sandy SILTY CLAY, trace gravel; brown with oxidation staining, (TILL); cohesive, w<PL, stiff to hard | 265.57<br>0.76 |
| 3 | - Cobbles inferred from auger grinding at 3 m | |
| 4 | (SM) gravelly SILTY SAND, trace clay nodules, slight plasticity; light brown; non-cohesive, moist, dense to very dense | 262.23<br>4.10 |
| 5 | - Cobbles/boulders inferred from auger grinding at 5.3 m | |
| 6 | - Becoming silty sand, some gravel below a depth of 6.2 m | |
| 9 | - Contains layers of fine sand and silt, some clay below depth of 9.2 m | |
| 10 | *CONTINUED NEXT PAGE* | |

## SAMPLES

| NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING |
|---|---|---|---|
| 1A | SS | 5 | |
| 1B | SS | | PP = 25 kPa |
| 2 | SS | 10 | PP = 220 kPa<br>MH |
| 3 | SS | 9 | PP = 220 kPa |
| 4 | SS | 30 | PP = 440 kPa |
| 5 | SS | 33 | PP = 345 kPa |
| 6A | SS | 113 | |
| 6B | SS | | MH |
| 7 | SS | 150 | MH |
| 8 | SS | 32 | |
| 9 | SS | 47 | MH |
| 10 | SS | 42 | |

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80
SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○: 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: $10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$



PIEZOMETER OR STANDPIPE INSTALLATION

DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000

LOCATION: Lat. 43.748408 Long. -79.813559
(See Figure 1)

# RECORD OF BOREHOLE: BH19-12

BORING DATE: April 4, 2019

SHEET 2 OF 2

DATUM: Geodetic

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE<br>DESCRIPTION | STRATA PLOT | ELEV.<br>DEPTH (m) | SAMPLES<br>NUMBER | TYPE | BLOWS/0.3m | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m<br>20 40 60 80<br>SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○<br>20 40 60 80 | HYDRAULIC CONDUCTIVITY, k, cm/s<br>$10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$<br>WATER CONTENT PERCENT<br>Wp ⊢—○W—⊣ Wl<br>10 20 30 40 | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *--- CONTINUED FROM PREVIOUS PAGE ---* | | | | | | | | | |
| 10 | | (SM) gravelly SILTY SAND, trace clay nodules, slight plasticity; light brown; non-cohesive, moist, dense to very dense | | 255.81 | 10 | SS | 42 | | ○ | | |
| | | END OF BOREHOLE.<br>Notes:<br>1. Borehole dry upon completion of drilling.<br>2. PP= unconfined compressive strength measured with pocket penetrometer in the field. | | 10.52 | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |

DEPTH SCALE
1 : 50

LOGGED: JD
CHECKED: EM

GTA-BHS 001 G:_CLIENTS\CLEARBROOKDEVELOPMENTS\CALEDON\12_GINT\19115264-SNELLSHOLLOW BH LOGS.GPJ GAL-MIS.GDT 17/6/19 JMC

PROJECT: 19115264-1000/2000

LOCATION: Lat. 43.749709 Long. -79.812182
(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-13

BORING DATE: April 4, 2019

SHEET 1 OF 2

DATUM: Geodetic

BORING METHOD: CME 75 Track Mount Power Auger, 100 mm Solid Stem

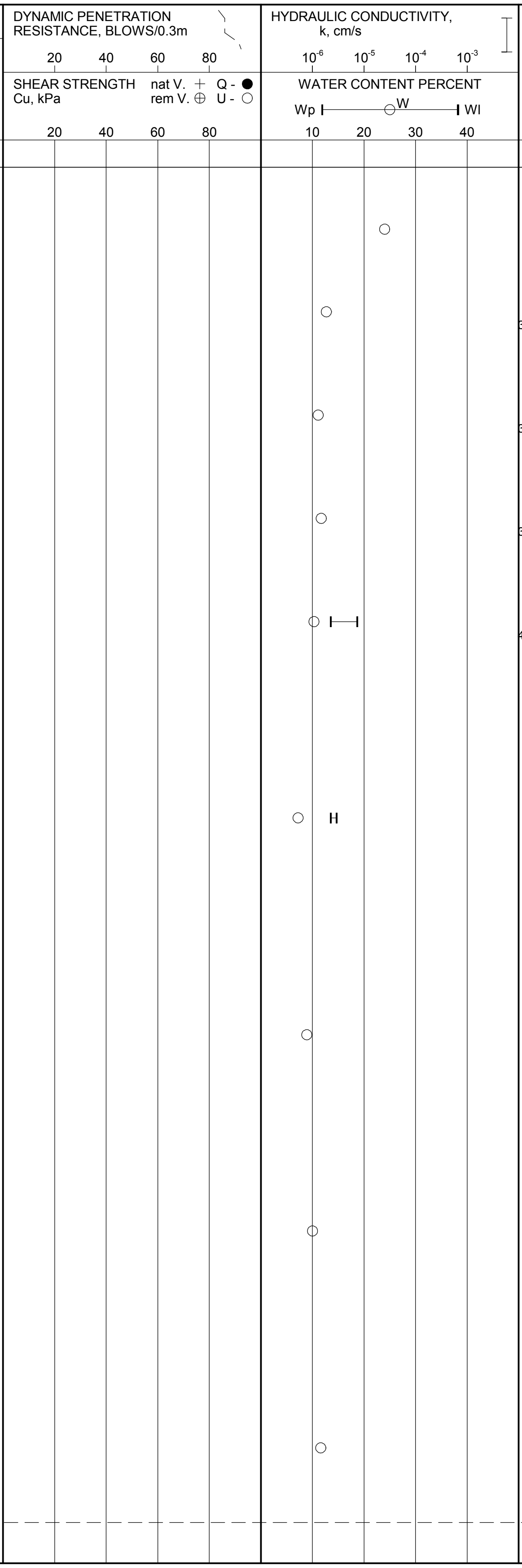
## SOIL PROFILE

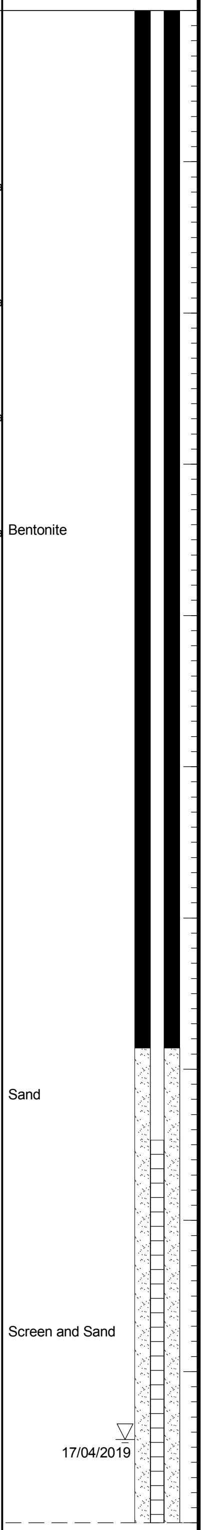
| DESCRIPTION | ELEV. / DEPTH (m) |
|---|---|
| GROUND SURFACE | 267.61 |
| TOPSOIL (300 mm) | 0.00 |
| (CL) SILTY CLAY, some sand, trace organics; dark brown; cohesive, w<PL, firm | 267.31<br>0.30 |
| (CL) SILTY CLAY and SAND, trace gravel, inferred cobbles/boulders; mottled light brown/brown, (TILL); w<PL, very stiff to hard<br>- Cobbles/boulders inferred from auger grinding at 1.7 m | 266.65<br>0.96 |
| (SM) gravelly SILTY SAND, cobbles/boulders inferred from auger grinding; light brown; non-cohesive, dry to moist, very dense<br>- Heavy auger grinding below depth of 5.4 m | 263.61<br>4.00 |
| (ML) sandy SILT, with slight plasticity, trace gravel; light brown; moist, very dense | 259.99<br>7.62 |

*CONTINUED NEXT PAGE*

## SAMPLES

| NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING |
|---|---|---|---|
| 1A | SS | 5 | |
| 1B | SS | | |
| 2 | SS | 17 | PP = 320 kPa |
| 3 | SS | 19 | PP = 320 kPa |
| 4 | SS | 22 | PP = 340 kPa |
| 5 | SS | 33 | PP = 440 kPa<br>MH |
| 6 | SS | 154 | MH |
| 7 | SS | 115 | |
| 8 | SS | 138 | MH |
| 9 | SS | 137 | |
| 10 | SS | 146 | |





DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000/2000

LOCATION: Lat. 43.749709 Long. -79.812182

(See Figure 1)

# RECORD OF BOREHOLE: BH/MW19-13

BORING DATE: April 4, 2019

SHEET 2 OF 2

DATUM: Geodetic

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES BLOWS/0.3m | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80<br>SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80 | HYDRAULIC CONDUCTIVITY, k, cm/s $10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$<br>WATER CONTENT PERCENT Wp ⊢ ○W ⊣ Wl 10 20 30 40 | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *--- CONTINUED FROM PREVIOUS PAGE ---* | | | | | | | | | |
| 10 | | (ML) sandy SILT, with slight plasticity, trace gravel; light brown; moist, very dense | | 257.09<br>10.52 | 10 | SS | 146 | | | MH | Screen and Sand |
| | | END OF BOREHOLE. | | | | | | | | | |

Notes:

1. Borehole dry upon completion of drilling.

2. Water level measured in monitoring well as follows:

| Date | Depth | Elev. (m) |
|---|---|---|
| April 17, 2019 | 9.45 mbgs | 258.16 m |

3. PP= unconfined compressive strength measured with pocket penetrometer in the field.

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DEPTH SCALE

1 : 50

GOLDER

LOGGED: JD

CHECKED: EM

PROJECT: 19115264-1000/5000

LOCATION: Lat. 43.749015 Long. -79.809338
(See Figure 1)

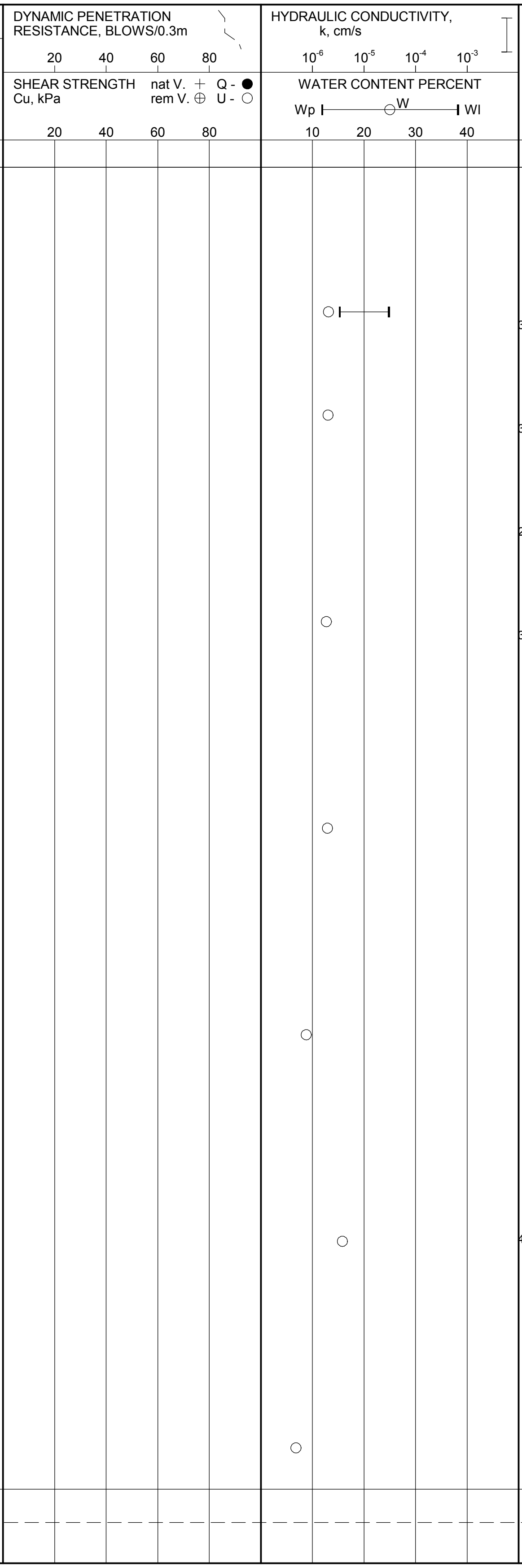
# RECORD OF BOREHOLE: BH19-14

BORING DATE: April 5, 2019

SHEET 1 OF 2

DATUM: Geodetic

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | SAMPLES NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|---|---|
| | | GROUND SURFACE | | 269.00 | | | | | |
| 0 | CME 75 Track Mount Power Auger<br>100 mm Solid Stem | TOPSOIL (300 mm) | | 0.00<br>268.70 | 1A | SS | 6 | | |
| | | (CL) sandy SILTY CLAY, trace to some gravel; brown with oxidation staining, (TILL); cohesive, w<PL, firm to hard | | 0.30 | 1B | SS | | | |
| 1 | | | | | 2 | SS | 19 | PP =<br>320 kPa<br>MH | |
| 2 | | | | | 3 | SS | 21 | PP =<br>320 kPa | |
| | | - Cobbles/boulders inferred from auger grinding at 2.3 m | | | 4 | SS | 23 | PP =<br>245 kPa | |
| 3 | | | | | 5 | SS | 36 | PP =<br>340 kPa | |
| 4 | | (SM) SILTY SAND, trace gravel; light brown; moist, compact to dense | | 265.00<br>4.00 | | | | | |
| 5 | | | | | 6 | SS | 24 | | |
| 6 | | | | | 7 | SS | 32 | MH | |
| 7 | | (CL) sandy SILTY CLAY, trace gravel; brown, (TILL); cohesive, w~PL, hard | | 261.99<br>7.01 | | | | | |
| | | | | | 8A | SS | 94 | PP =<br>440 kPa | |
| 8 | | (ML/SM) gravelly sandy SILT to gravelly SILTY SAND, fine grained, trace clay, slight plasticity, trace cobbles inferred from auger grinding; light brown; non-cohesive, moist, very dense | | 261.00<br>8.00 | 8B | SS | | | |
| 9 | | | | | 9 | SS | 96 | | |
| | | END OF BOREHOLE. | | 259.25<br>9.75 | | | | | |
| 10 | | *CONTINUED NEXT PAGE* | | | | | | | |



DEPTH SCALE
1 : 50

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000/5000

LOCATION: Lat. 43.749015 Long. -79.809338
(See Figure 1)

# RECORD OF BOREHOLE: BH19-14

BORING DATE: April 5, 2019

SHEET 2 OF 2

DATUM: Geodetic

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE DESCRIPTION | SOIL PROFILE STRATA PLOT | SOIL PROFILE ELEV. DEPTH (m) | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES BLOWS/0.3m | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 <br> SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80 | HYDRAULIC CONDUCTIVITY, k, cm/s $10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$ <br> WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl 10 20 30 40 | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *--- CONTINUED FROM PREVIOUS PAGE ---* | | | | | | | | | |
| 10 | | Notes:<br>1. Borehole dry upon completion of drilling.<br>2. PP= unconfined compressive strength measured with pocket penetrometer in the field. | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |

DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000/5000

LOCATION: Lat. 43.751797 Long. -79.80950
(See Figure 1)

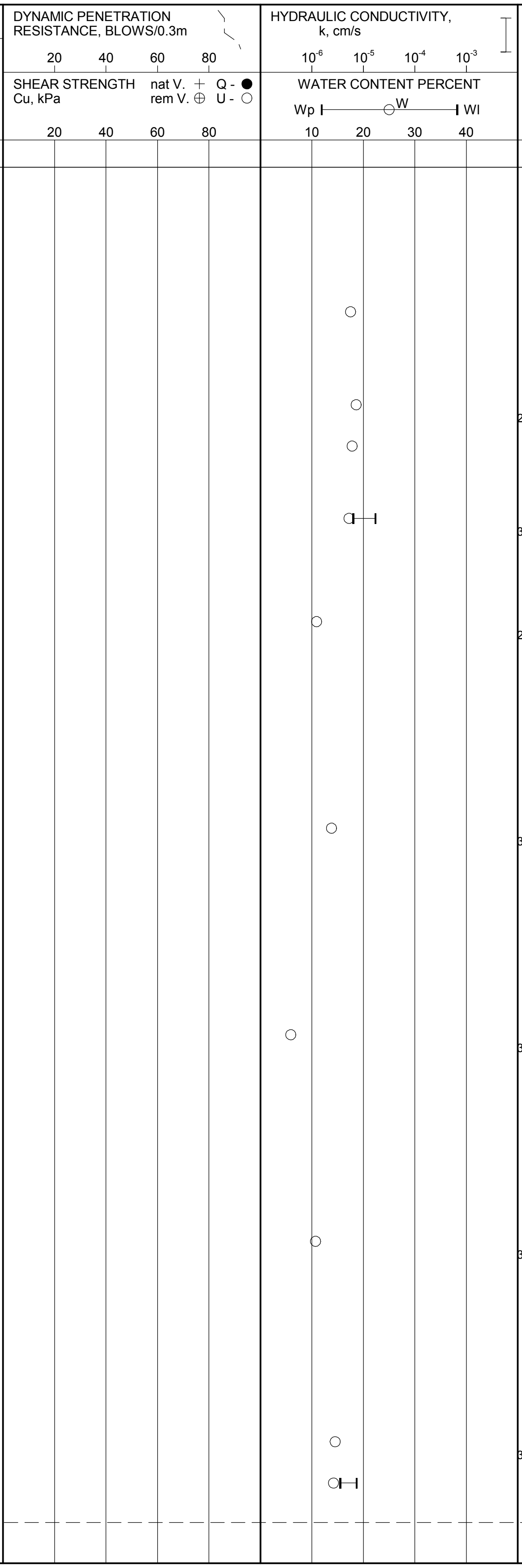
# RECORD OF BOREHOLE: BH19-15

BORING DATE: April 1, 2019

SHEET 1 OF 2

DATUM: Geodetic

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE DESCRIPTION | ELEV. DEPTH (m) | SAMPLES NUMBER | SAMPLES TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|---|
| | | GROUND SURFACE | 263.50 | | | | | |
| 0 | CME 75 Track Mount Power Auger<br>100 mm Solid Stem | TOPSOIL (300 mm) | 0.00 | 1A | SS | 7 | | |
| | | (CL) SILTY CLAY, trace organics, trace gravel; brown; cohesive, w>PL, firm | 263.20<br>0.30 | 1B | SS | | | |
| 1 | | (CL) SILTY CLAY and SAND, trace gravel; mottled light brown to brown, (TILL); cohesive, w<PL, firm to stiff | 262.89<br>0.61 | 2 | SS | 7 | | |
| | | | | 3A | SS | 13 | PP =<br>250 kPa | |
| 2 | | (CL-ML) CLAYEY SILT, some sand to sandy, trace gravel; grey, (TILL); cohesive, w<PL, stiff to hard | 261.52<br>1.98 | 3B | SS | | | |
| | | | | 4 | SS | 14 | PP =<br>345 kPa<br>MH | |
| 3 | | | | 5 | SS | 15 | PP =<br>250 kPa | |
| 4 | | | | | | | | |
| 5 | | | | 6 | SS | 31 | PP =<br>300 kPa | |
| 6 | | | | 7 | SS | 15 | PP =<br>320 kPa | |
| 7 | | | | | | | | |
| 8 | | - Contains sand layers at 7.8 m | | 8 | SS | 17 | PP =<br>320 kPa | |
| 9 | | | | 9A | SS | 27 | PP =<br>320 kPa | |
| | | (SM) SILTY SAND to SILT, trace to some clay; grey; wet, compact | 253.84<br>9.66 | 9B | SS | | MH | |
| 10 | | *CONTINUED NEXT PAGE* | | | | | | |



DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000/5000
LOCATION: Lat. 43.751797 Long. -79.80950
(See Figure 1)

# RECORD OF BOREHOLE: BH19-15

BORING DATE: April 1, 2019

SHEET 2 OF 2
DATUM: Geodetic

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE: DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | SAMPLES: NUMBER | TYPE | BLOWS/0.3m | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)<br>SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80) | HYDRAULIC CONDUCTIVITY, k, cm/s ($10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$)<br>WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl (10 20 30 40) | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *--- CONTINUED FROM PREVIOUS PAGE ---* | | | | | | | | | |
| 10 | CME 75 Track Mount Power Auger<br>100 mm Solid Stem | (SM) SILTY SAND to SILT, trace to some clay; grey; wet, compact | | 253.01<br>10.49 | | | | | | | |
| 11 | | (CL-ML) CLAYEY SILT, some sand to sandy, trace gravel; grey, (TILL); cohesive, w<PL, hard | | | 10 | SS | 45 | | | PP = 440 kPa | |
| 12 | | - Increased sand content below 12.5 m depth | | | 11 | SS | 41 | | | PP = 440 kPa<br>MH | |
| 13 | | | | | | | | | | | |
| 14 | | | | 249.17<br>14.33 | 12 | SS | 31 | | | PP = 420 kPa | |
| 15 | | END OF BOREHOLE.<br>Notes:<br>1. Water level measured at 6.0 mbgs upon completion of drilling.<br>2. PP= unconfined compressive strength measured with pocket penetrometer in the field. | | | | | | | | | |
| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |

DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-1000/5000
LOCATION: Lat. 43.751797 Long. -79.80950
(See Figure 1)

# RECORD OF BOREHOLE: BH19-16

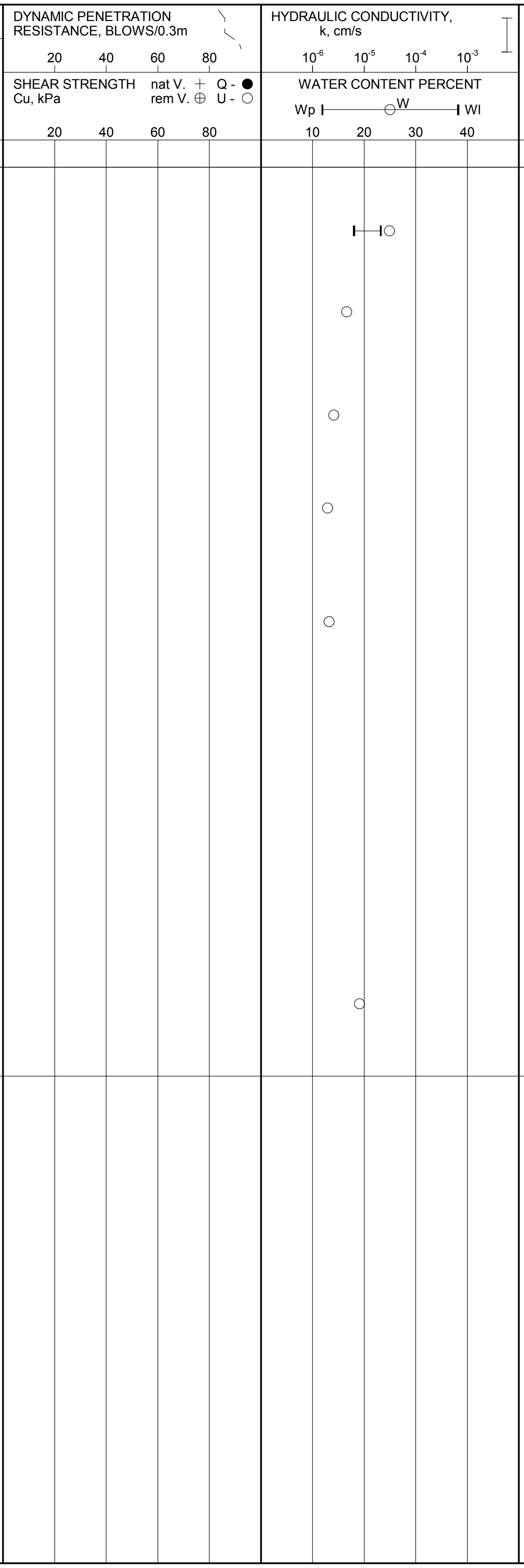
BORING DATE: March 26, 2019

SHEET 1 OF 1
DATUM: Geodetic

BORING METHOD: CME 75 Track Mount Power Auger
100 mm Solid Stem

| DEPTH SCALE METRES | SOIL PROFILE DESCRIPTION | ELEV. DEPTH (m) | SAMPLES NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|
|  | GROUND SURFACE | 257.00 |  |  |  |  |  |
| 0 | TOPSOIL (330 mm) | 0.00 | 1A | SS | 4 |  |  |
|  | (CL-ML) sandy CLAYEY SILT, trace to some gravel, trace organics; brown to grey; cohesive, w>PL, soft | 256.67<br>0.33 | 1B | SS |  | MH |  |
| 1 | (CL) sandy SILTY CLAY, trace sand, trace gravel; light brown, (TILL); cohesive, w<PL, stiff to very stiff | 256.39<br>0.61 | 2 | SS | 12 |  |  |
|  |  |  |  |  |  |  | 26/03/2019 |
| 2 |  |  | 3 | SS | 25 |  |  |
|  |  |  | 4 | SS | 21 |  |  |
| 3 |  |  | 5 | SS | 17 |  |  |
| 4 |  |  |  |  |  |  |  |
|  | (CL-ML) CLAYEY SILT, trace gravel; grey, (TILL); cohesive, w<PL, stiff to very stiff<br>- Silt/sand layer at a depth of 4.9 m | 252.35<br>4.65 | 6A<br>6B | SS | 14 |  |  |
| 5 |  |  |  |  |  |  |  |
| 6 | - Silty sand/sandy silt layer at a depth of 6 m - 6.2 m |  | 7A | SS |  |  |  |
|  |  |  | 7B | SS | 27 |  |  |
|  |  | 250.29 | 7C | SS |  |  |  |
|  | END OF BOREHOLE | 6.71 |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |  |
| 10 |  |  |  |  |  |  |  |

Notes:
1. Water level measured at 1.4 mbgs upon completion of drilling.



DEPTH SCALE
1 : 50

LOGGED: JD
CHECKED: EM

GTA-BHS 001 G:_CLIENTS\CLEARBROOKDEVELOPMENTS\CALEDON\12_GINT\19115264-SNELLSHOLLOW BH LOGS.GPJ GAL-MIS.GDT 17/6/19 JMC

PROJECT: 19115264-1000/5000
LOCATION: Lat. 43.753061 Long. -79.806846
(See Figure 1)

# RECORD OF BOREHOLE: BH19-17

BORING DATE: March 28, 2019

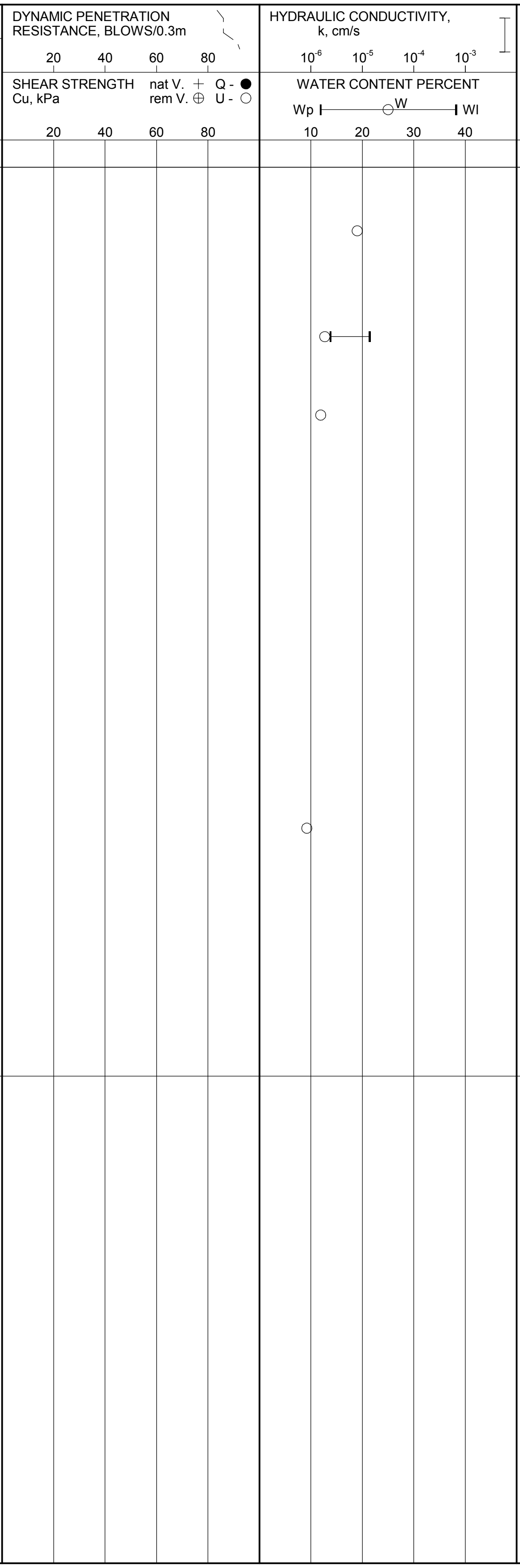
SHEET 1 OF 1

DATUM: Geodetic

BORING METHOD: CME 75 Track Mount Power Auger<br>100 mm Solid Stem

| DESCRIPTION | ELEV. DEPTH (m) |
|---|---|
| GROUND SURFACE | 269.50 |
| TOPSOIL (330 mm) | 0.00 |
| | 269.17 |
| (CL) SILTY CLAY and SAND to sandy SILTY CLAY, trace gravel; light brown with oxidation staining, (TILL); cohesive, w<PL, stiff to very stiff | 0.33 |
| | 264.93 |
| (CL-ML) CLAYEY SILT, some sand, trace gravel; grey, (TILL); cohesive, w<PL, hard | 4.57 |
| | 262.79 |
| END OF BOREHOLE. | 6.71 |

| SAMPLE NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING |
|---|---|---|---|
| 1A | SS | 12 | |
| 1B | SS | | |
| 2A | SS | 18 | |
| 2B | SS | | MH |
| 3 | SS | 29 | |
| 4 | SS | 14 | |
| 5 | SS | 29 | |
| 6 | SS | 34 | |
| 7 | SS | 46 | |



PIEZOMETER OR STANDPIPE INSTALLATION: ▽ 28/03/2019

Notes:
1. Water level measured at 3.4 mbgs upon completion of drilling.

DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-6000

LOCATION: Lat. 43.753587 Long. -79.803241
(See Figure 1)

# RECORD OF BOREHOLE: BH19-18

BORING DATE: March 27, 2019

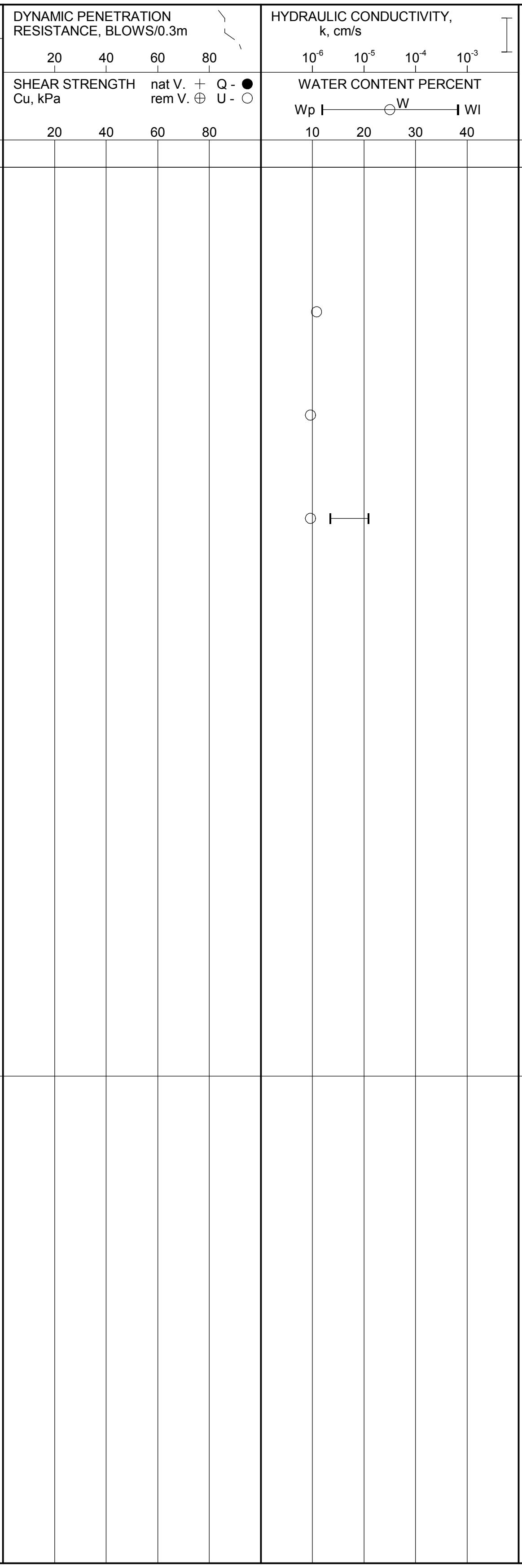
SHEET 1 OF 1

DATUM: Existing Ground Surface

BORING METHOD: CME 75 Track Mount Power Auger, 100 mm Solid Stem

| DEPTH SCALE METRES | SOIL PROFILE DESCRIPTION | ELEV. DEPTH (m) | SAMPLES NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|---|---|---|---|---|---|---|---|
|  | GROUND SURFACE |  |  |  |  |  |  |
| 0 | TOPSOIL (200 mm) | 0.00 | 1A | SS | 11 |  |  |
|  | (CL) sandy SILTY CLAY, trace to some gravel with cobbles/boulders inferred from auger grinding; brown to light brown with oxidation staining, (TILL); cohesive, w<PL, stiff to hard | 0.20 | 1B | SS |  |  |  |
| 1 |  |  | 2 | SS | 22 |  |  |
| 2 |  |  | 3 | SS | 38 |  |  |
|  |  |  | 4 | SS | 35 | MH | ▽ 27/03/2019 |
| 3 |  |  | 5 | SS | 35 |  |  |
| 5 |  |  | 6 | SS | 52 |  |  |
| 6 | (CL/ML) CLAYEY SILT, trace sand; grey, (TILL); cohesive, w>PL, hard | 6.10 | 7 | SS | 33 |  |  |
|  | END OF BOREHOLE | 6.71 |  |  |  |  |  |

Notes:
1. Water level measured at 2.7 mbgs upon completion of drilling.



DEPTH SCALE
1 : 50

GOLDER

LOGGED: JD
CHECKED: EM

PROJECT: 19115264-6000
LOCATION: Lat. 43.754896 Long. -79.804943
(See Figure 1)

# RECORD OF BOREHOLE: BH19-19

BORING DATE: March 26, 2019

SHEET 1 OF 1

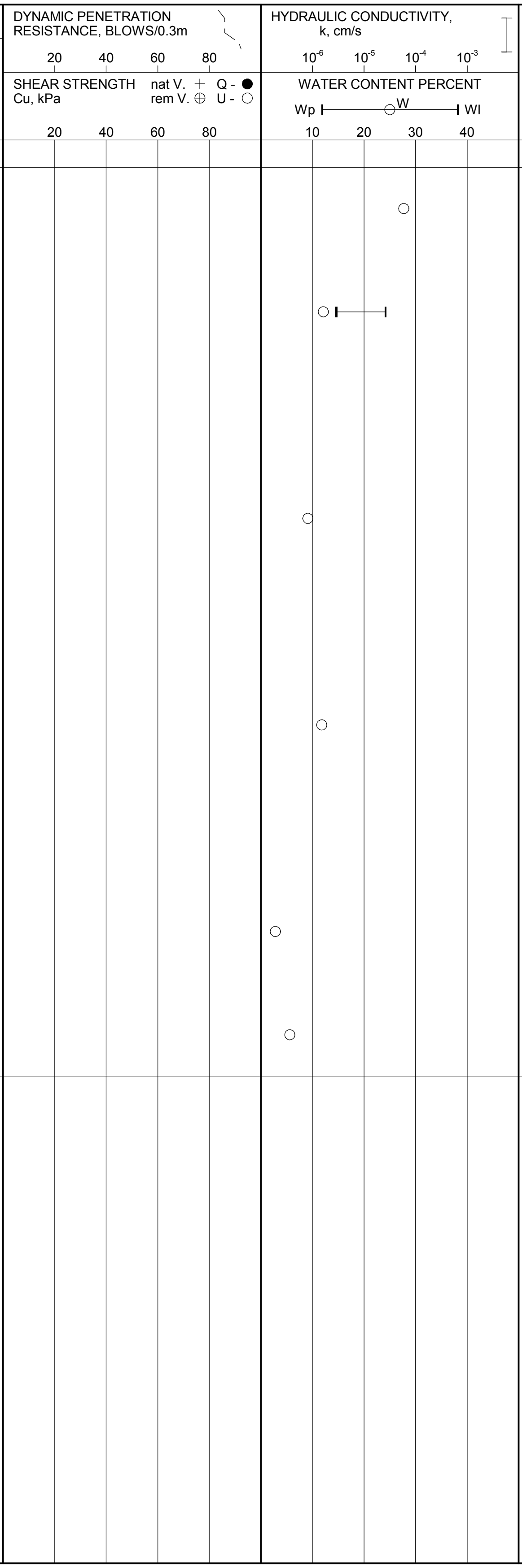
DATUM: Existing Ground Surface

BORING METHOD: CME 75 Track Mount Power Auger
100 mm Solid Stem

| SOIL PROFILE – DESCRIPTION | ELEV. DEPTH (m) |
|---|---|
| GROUND SURFACE | |
| TOPSOIL (610 mm) | 0.00 |
| (CL) sandy SILTY CLAY, some sand, trace gravel with cobbles/boulders inferred from auger grinding; brown with oxidation staining, (TILL); w<PL, very stiff to hard | 0.61 |
| - Increased sand content at a depth of 4.6 m | |
| (SM) SILTY SAND, fine grained, inferred cobbles/boulders; light brown; non-cohesive, moist, very dense | 5.18 |
| END OF BOREHOLE. | 6.71 |

Notes:
1. Borehole dry upon completion of drilling.

| NUMBER | TYPE | BLOWS/0.3m | ADDITIONAL LAB. TESTING |
|---|---|---|---|
| 1 | SS | 4 | |
| 2 | SS | 26 | MH |
| 3 | SS | 40 | |
| 4 | SS | 49 | |
| 5 | SS | 54 | |
| 6 | SS | 55 | |
| 7 | SS | 86 | |
| 8 | SS | 95 | |
| 9 | SS | 100 | |



PIEZOMETER OR STANDPIPE INSTALLATION

DEPTH SCALE METRES: 0 1 2 3 4 5 6 7 8 9 10

DEPTH SCALE
1 : 50

LOGGED: JD
CHECKED: EM

# BORING NUMBER 1

PAGE 1 OF 1

**CLIENT** Dilip Kumar Jain
**PROJECT NAME** 3278 Mayfield Road
**PROJECT NUMBER** Ma002995a
**PROJECT LOCATION** Town of Caledon

**DATE STARTED** 10/19/17 **COMPLETED** 10/19/17
**GROUND ELEVATION** 270 m **HOLE SIZE** 150 mm
**DRILLING CONTRACTOR** Fadroy Enterprise
**GROUND WATER LEVELS:**
**DRILLING METHOD** Solid Stem Augers
**AT TIME OF DRILLING** Dry
**LOGGED BY** J.J. **CHECKED BY** E.W.
**AT END OF DRILLING** Dry
**NOTES**
**AFTER DRILLING** ---

| DEPTH (m) | SAMPLE TYPE NUMBER | BLOW COUNTS (N VALUE) | TESTS | GRAPHIC LOG | MATERIAL DESCRIPTION |
|---|---|---|---|---|---|
| | | | | 0.20 | **TOPSOIL** - ~200 mm thick. 269.80 |
| | SS<br>1 | 3-4-5-7<br>(9) | MC = 17% | | **CLAYEY SILT** - some sand, occasional gravel, brown, very moist, hard. |
| 1 | SS<br>2 | 5-6-10<br>(16) | PP = 400 kPa<br>MC = 17% | | |
| 2 | SS<br>3 | 4-6-10<br>(16) | PP >450 kPa<br>MC = 15% | | |
| | SS<br>4 | 6-10-14<br>(24) | PP >450 kPa<br>MC = 14% | | |
| 3 | | | | 3.00 | 267.00 |
| | SS<br>5 | 5-10-12<br>(22) | PP >450 kPa<br>MC = 11% | | **SAND TILL** - trace clay, trace gravel, brown, very moist, compact. |
| 4 | | | | | |
| 5 | SS<br>6 | 6-16-20<br>(36) | PP >450 kPa<br>MC = 13% | | -becoming dense below ~4.5 m depth |
| 6 | SS<br>7 | 50-0-0/-<br>0.15 | PP >450 kPa<br>MC = 10% | 6.15 | -becoming very dense below ~6.0 m depth 263.85 |
| | | | | | Bottom of hole at 6.15 m. |

**EDWARD WONG**

# WELL NUMBER 2

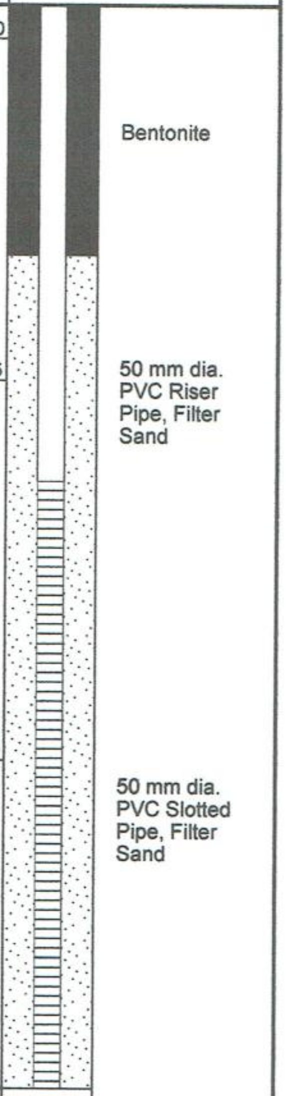
PAGE 1 OF 1

**CLIENT** Dilip Kumar Jain
**PROJECT NAME** 3278 Mayfield Road
**PROJECT NUMBER** Ma002995a
**PROJECT LOCATION** Town of Caledon

**DATE STARTED** 10/19/17 **COMPLETED** 10/19/17
**GROUND ELEVATION** 270 m **HOLE SIZE** 150 mm
**DRILLING CONTRACTOR** Fadroy Enterprise
**GROUND WATER LEVELS:**
**DRILLING METHOD** Solid Stem Augers
**AT TIME OF DRILLING** Dry
**LOGGED BY** J.J. **CHECKED BY** E.W.
**AT END OF DRILLING** Dry
**NOTES**
**AFTER DRILLING** ---

| DEPTH (m) | SAMPLE TYPE NUMBER | BLOW COUNTS (N VALUE) | TESTS | GRAPHIC LOG | MATERIAL DESCRIPTION | |
|---|---|---|---|---|---|---|
| | | | | 0.20 | **TOPSOIL** - ~200 mm thick. | 269.80 |
| | SS 1 | 3-7-10-7 (17) | MC = 15% | | **SILTY SAND** - scattered clay seams, brown, moist, loose. | |
| 1 | SS 2 | 2-2-3 (5) | MC = 5% | | -becoming loose below ~0.75 m depth | |
| 2 | SS 3 | 2-4-5 (9) | MC = 20% | | -becoming wet below ~1.5 m depth | |
| | | | | 2.25 | **CLAYEY SILT** - trace sand, brown, very moist, hard. | 267.75 |
| | SS 4 | 8-11-14 (25) | PP >450 kPa<br>MC = 14% | | | |
| 3 | SS 5 | 5-10-15 (25) | PP >450 kPa<br>MC = 14% | | | |
| 4 | | | | | | |
| | | | | 4.50 | **SILTY CLAY** - mottled brown and grey, very moist, hard. | 265.50 |
| 5 | SS 6 | 5-10-11 (21) | PP = 400 kPa<br>MC = 14% | | | |
| 6 | SS 7 | 4-8-11 (19) | PP = 300 kPa<br>MC = 12% | | -becoming grey and stiff below ~6.0 m depth | |
| | | | | 6.45 | Bottom of hole at 6.30 m. | 263.55 |

WELL DIAGRAM



**EDWARD WONG**

# WELL NUMBER 3

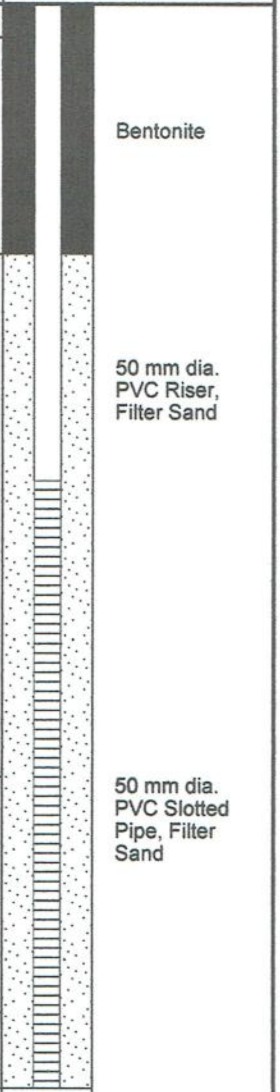
PAGE 1 OF 1

**CLIENT** Dilip Kumar Jain
**PROJECT NAME** 3278 Mayfield Road
**PROJECT NUMBER** Ma002995a
**PROJECT LOCATION** Town of Caledon

**DATE STARTED** 10/18/17
**COMPLETED** 10/18/17
**GROUND ELEVATION** 270 m
**HOLE SIZE** 150 mm
**DRILLING CONTRACTOR** Fadroy Enterprise
**GROUND WATER LEVELS:**
**DRILLING METHOD** Solid Stem Augers
**AT TIME OF DRILLING** Dry
**LOGGED BY** J.J.
**CHECKED BY** E.W.
▼ **AT END OF DRILLING** 5.25 m / Elev 264.75 m
**NOTES**
▽ **AFTER DRILLING** 5.25 m / Elev 264.75 m

| DEPTH (m) | SAMPLE TYPE NUMBER | BLOW COUNTS (N VALUE) | TESTS | MATERIAL DESCRIPTION | Elev. |
|---|---|---|---|---|---|
| 0.20 | | | | **TOPSOIL** - ~200 mm thick. | 269.80 |
| | SS 1 | 3-6-8-11 (14) | MC = 14% | **SANDY SILT** - rootlets, brown, very moist, compact. | |
| 1 | SS 2 | 6-12-27 (39) | MC = 11% | -becoming dense below ~0.75 m depth | |
| 1.50 | | | | | 268.50 |
| 2 | SS 3 | 10-15-17 (32) | PP >450 kPa<br>MC = 9% | **CLAYEY SILT**- some sand, trace gravel, oxidized, brown, very moist, hard. | |
| | SS 4 | 13-17-22 (39) | PP >450 kPa<br>MC = 13% | | |
| 3 | SS 5 | 11-16-22 (38) | PP >450 kPa<br>MC = 13% | | |
| 4 | | | | | |
| 4.60 | | | | | 265.40 |
| 5 | SS 6 | 19-28-25 (53) | MC = 9% | **FINE TO MEDIUM SAND** - some silt, trace clay, brown, wet, very dense. ▼ | |
| 6.00 | | | | | 264.00 |
| 6 | SS 7 | 12-23-30 (53) | PP = 400 kPa<br>MC = 10% | **SILTY CLAY** - scattered wet sand seams, grey, wet, hard. | |
| 6.45 | | | | Bottom of hole at 6.45 m. | 263.55 |

WELL DIAGRAM



EDWARD WONG

# BORING NUMBER 4

PAGE 1 OF 1

**CLIENT** Dilip Kumar Jain
**PROJECT NAME** 3278 Mayfield Road
**PROJECT NUMBER** Ma002995a
**PROJECT LOCATION** Town of Caledon

**DATE STARTED** 10/18/17 **COMPLETED** 10/18/17
**GROUND ELEVATION** 270 m **HOLE SIZE** 150 mm
**DRILLING CONTRACTOR** Fadroy Enterprise
**GROUND WATER LEVELS:**
**DRILLING METHOD** Solid Stem Augers
**AT TIME OF DRILLING** Dry
**LOGGED BY** J.J. **CHECKED BY** E.W.
**AT END OF DRILLING** Dry
**NOTES**
**AFTER DRILLING** Dry

| DEPTH (m) | SAMPLE TYPE NUMBER | BLOW COUNTS (N VALUE) | TESTS | GRAPHIC LOG | MATERIAL DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | **TOPSOIL** - ~200 mm thick. |
| | | | | 0.20 | 269.80 |
| | SS<br>1 | 3-11-13-12<br>(24) | MC = 8% | | **FILL** - ~ 1 m of brown sandy silt with rootlets, very moist over ~3,3 m of brown clayey silt, rootlets, organic inclusions, very moist. |
| 1 | SS<br>2 | 8-6-6<br>(12) | MC = 11% | | |
| 2 | SS<br>3 | 4-4-6<br>(10) | MC = 11% | | |
| | SS<br>4 | 4-7-8<br>(15) | MC = 14% | | |
| 3 | SS<br>5 | 4-7-7<br>(14) | MC = 17% | | |
| 4 | | | | | |
| | | | | 4.50 | 265.50 |
| 5 | SS<br>6 | 8-14-20<br>(34) | PP >450 kPa<br>MC = 10% | | **CLAYEY SILT** - some sand, trace gravel, brown, very moist, hard. |
| 6 | SS<br>7 | 20-50-0/0.00 | PP >450 kPa<br>MC = 8% | | |
| | | | | 6.30 | 263.70 |
| | | | | | Bottom of hole at 6.30 m. |

EDWARD WONG

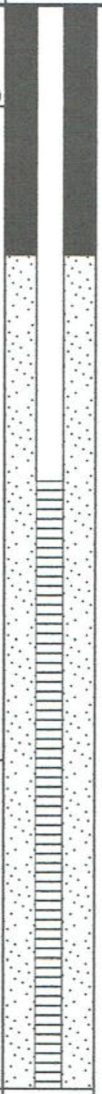
# WELL NUMBER 5

PAGE 1 OF 1

CLIENT Dilip Kumar Jain
PROJECT NUMBER Ma002995a
PROJECT NAME 3278 Mayfield Road
PROJECT LOCATION Town of Caledon

DATE STARTED 10/18/17 COMPLETED 10/18/17
GROUND ELEVATION 265 m HOLE SIZE 150 mm
DRILLING CONTRACTOR Fadroy Enterprise
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Augers
AT TIME OF DRILLING Dry
LOGGED BY J.J. CHECKED BY E.W.
▼ AT END OF DRILLING 2.85 m / Elev 262.15 m
NOTES
▼ AFTER DRILLING 2.85 m / Elev 262.15 m

| DEPTH (m) | SAMPLE TYPE NUMBER | BLOW COUNTS (N VALUE) | TESTS | GRAPHIC LOG | MATERIAL DESCRIPTION | | WELL DIAGRAM |
|---|---|---|---|---|---|---|---|
| | SS<br>1 | 1-3-3-3<br>(6) | MC = 23% | | TOPSOIL - ~600 mm thick. | | |
| | | | | | 0.60 | 264.40 | |
| 1 | SS<br>2 | 3-4-5<br>(9) | MC = 16% | | FILL - clayey silt, rootlets, topsoil inclusions, dark brown and brown, very moist. | | Bentonite |
| 2 | SS<br>3 | 2-4-5<br>(9) | MC = 22% | | | | |
| | SS<br>4 | 4-7-10<br>(17) | MC = 19% | | | | 50 mm dia. PVC Riser, Filter Sand |
| 3 | | | | | ▼ | | |
| | SS<br>5 | 2-5-9<br>(14) | MC = 21% | | | | |
| 4 | | | | | | | |
| | | | | | 4.50 | 260.50 | |
| 5 | SS<br>6 | 3-6-8<br>(14) | PP = 400 kPa<br>MC = 16% | | SILTY CLAY - trace gravel, grey, very moist, hard. | | 50 mm dia. PVC Slotted Pipe, Filter Sand |
| 6 | SS<br>7 | 4-6-8<br>(14) | PP = 250 kPa<br>MC = 16% | | -becoming very stiff below ~6.0 m depth | | |
| | | | | | 6.45 | 258.55 | |
| | | | | | Bottom of hole at 6.45 m. | | |



**EDWARD WONG**

# BORING NUMBER 6

PAGE 1 OF 1

**CLIENT** Dilip Kumar Jain
**PROJECT NAME** 3278 Mayfield Road
**PROJECT NUMBER** Ma002995a
**PROJECT LOCATION** Town of Caledon

**DATE STARTED** 10/18/17
**COMPLETED** 10/18/17
**GROUND ELEVATION** 260 m
**HOLE SIZE** 150 mm
**DRILLING CONTRACTOR** Fadroy Enterprise
**GROUND WATER LEVELS:**
**DRILLING METHOD** Solid Stem Augers
**AT TIME OF DRILLING** Dry
**LOGGED BY** J.J.
**CHECKED BY** E.W.
**AT END OF DRILLING** Dry
**NOTES**
**AFTER DRILLING** ---

| DEPTH (m) | SAMPLE TYPE NUMBER | BLOW COUNTS (N VALUE) | TESTS | GRAPHIC LOG | MATERIAL DESCRIPTION | |
|---|---|---|---|---|---|---|
| | | | | 0.20 | **TOPSOIL** - ~200 mm thick. | 259.80 |
| | SS 1 | 4-5-5-5 (10) | MC = 17% | | **SILTY SAND** - scattered clay seams, brown, loose. | |
| | | | | 0.90 | | 259.10 |
| 1 | SS 2 | 6-13-20 (33) | PP >450 kPa<br>MC = 14% | | **CLAYEY SILT** - some sand, trace gravel, oxidized, brown, very moist, hard. | |
| | SS 3 | 6-16-24 (40) | PP >450 kPa<br>MC = 13% | | | |
| 2 | | | | | | |
| | SS 4 | 12-17-27 (44) | PP >450 kPa<br>MC = 14% | | | |
| 3 | | | | | | |
| | SS 5 | 6-11-21 (32) | PP >450 kPa<br>MC = 15% | | | |
| 4 | | | | | | |
| | SS 6 | 7-24-15 (39) | PP >450 kPa<br>MC = 13% | | | |
| 5 | | | | | | |
| 6 | | | | 6.00 | | 254.00 |
| | SS 7 | 10-20-33 (53) | PP >450 kPa<br>MC = 12% | | **SAND TILL** - brown, very moist, very dense. | |
| | | | | 6.45 | | 253.55 |
| | | | | | Bottom of hole at 6.45 m. | |

BURNSIDE

R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2, Mississauga, ON, L5N 8R9
telephone (519)-941-5331

# LOG OF DRILLING OPERATIONS

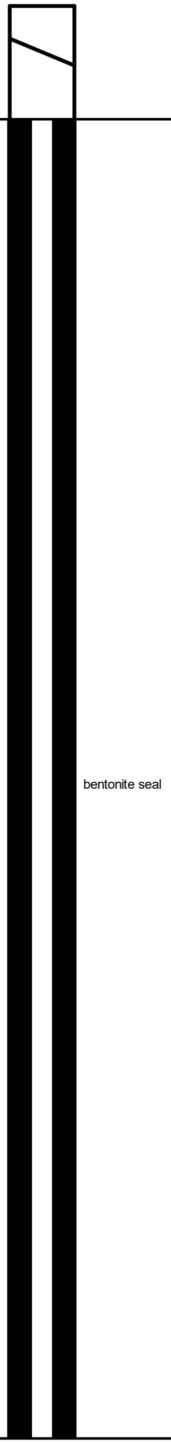
## MW22-1

Page 1 of 2

| | | |
|---|---|---|
| Client: **Snell's Hollow Developers Group** | Project Name: **Snell's Hollow** | Logged by: **S.Yeung** |
| Project No.: **300043952** | Location: **Brampton, Ontario** | Ground (m amsl): **263.80** |
| Drilling Co.: **Atcost Soil Drilling Inc.** | Date Started: **11/23/2022** | Static Water Level Depth (m): **15.98** |
| Drilling Method: **Solid Stem Auger** | Date Completed: **11/24/2022** | Sand Pack Depth (m) : **14.63-16.76** |

Surface Elevation (m): **263.80**

| Depth (m) | Stratigraphic Description |
|---|---|
| | TOPSOIL, dark brown, rootlets, soft, dry |
| 0.28 | CLAYEY SILT TILL, trace sand, trace gravel (< 1 cm diameter, subangular to subrounded), brown, moist, very stiff to hard, mottled, oxidized, medium plasticity |
| 3.05 | SILTY CLAY TILL, some sand, trace gravel (< 2 cm diameter, subangular to subrounded), brown, moist, very stiff to hard, oxidized, medium plasticity |
| 7.82 | SAND and SILT, trace clay, trace gravel, well graded, brown, moist, very dense, low plasticity, friable |



SAMPLE

| Num. | Type | Int. | N.Val |
|---|---|---|---|
| SS1 | SS | ☒ | 5 |
| SS2 | SS | ☒ | 16 |
| SS3 | SS | ☒ | 21 |
| SS4 | SS | ☒ | 42 |
| SS5 | SS | ☒ | 26 |
| SS6 | SS | ☒ | 27 |
| SS7 | SS | ☒ | 41 |
| SS8a | SS | ☒ | >100 |
| SS8b | SS | ☒ | >100 |
| SS9 | SS | ☒ | >100 |

Depth Scale (ft) (m): 5.0, 10.0, 15.0, 20.0, 25.0, 30.0 ft; 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0 m

Prepared By: **S.Yeung** Checked By: **T.Mikel** Date Prepared: **2/16/2023**

This borehole log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by R. J. Burnside & Associates Limited personnel before use by others.

LEGEND
- ▼ Water found @ time of drilling
- ▽ Static Water Level - 12/1/2022

MONITORING WELL DATA
Pipe: **51 mm dia. PVC**
Screen: **51 mm dia. PVC #10 slot**

SAMPLE TYPE

| | | | |
|---|---|---|---|
| AC | Auger Cutting | SS | Split Spoon |
| CS | Continuous | AR | Air Rotary |
| RC | Rock Core | WC | Wash Cuttings |

BURNSIDE

R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2, Mississauga, ON, L5N 8R9
telephone (519)-941-5331

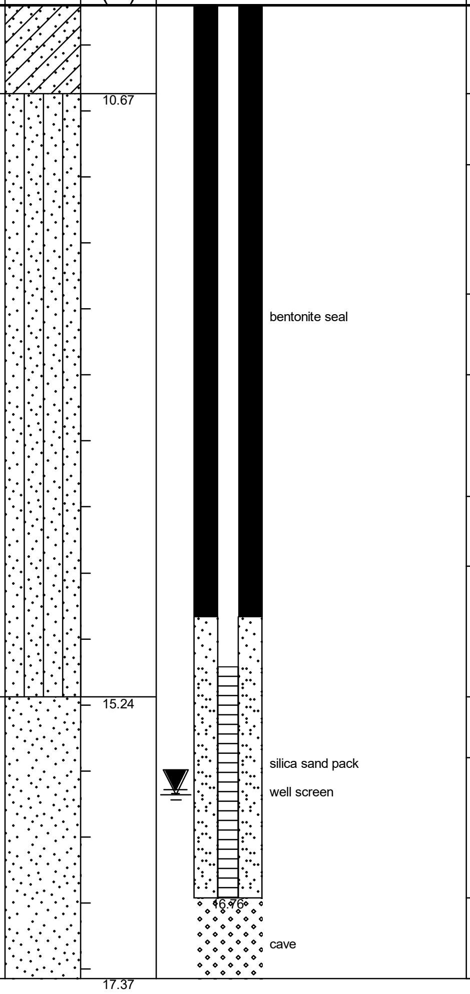
# LOG OF DRILLING OPERATIONS

## MW22-1

| | | |
|---|---|---|
| Client: **Snell's Hollow Developers Group** | Project Name: **Snell's Hollow** | Logged by: **S.Yeung** |
| Project No.: **300043952** | Location: **Brampton, Ontario** | Ground (m amsl): **263.80** |
| Drilling Co.: **Atcost Soil Drilling Inc.** | Date Started: **11/23/2022** | Static Water Level Depth (m): **15.98** |
| Drilling Method: **Solid Stem Auger** | Date Completed: **11/24/2022** | Sand Pack Depth (m) : **14.63-16.76** |

Surface Elevation (m): **263.80**

| Depth Scale (ft) | Depth Scale (m) | Stratigraphic Description | Depth (m) |
|---|---|---|---|
| 35.0 | 11.0 | SANDY SILT, trace clay, poorly graded, brown, moist, very dense | 10.67 |
| 50.0 | 15.0 | SILTY SAND, trace clay, poorly graded, brown, wet, medium dense | 15.24 |
| | | | 17.37 |



| Num. | Type | Int. | N.Val |
|---|---|---|---|
| SS10 | SS | ☒ | 58 |
| SS11 | SS | ☒ | 58 |
| SS12 | SS | ☒ | 53 |
| SS13 | SS | ☒ | 29 |
| SS14 | SS | ☒ | 28 |

Prepared By: **S.Yeung** Checked By: **T.Mikel** Date Prepared: **2/16/2023**

This borehole log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by R. J. Burnside & Associates Limited personnel before use by others.

LEGEND
▼ Water found @ time of drilling
▽ Static Water Level - 12/1/2022

MONITORING WELL DATA
Pipe: **51 mm dia. PVC**
Screen: **51 mm dia. PVC #10 slot**

SAMPLE TYPE

| | | | |
|---|---|---|---|
| AC | Auger Cutting | SS ☒ | Split Spoon |
| CS | Continuous | AR | Air Rotary |
| RC | Rock Core | WC | Wash Cuttings |

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

# Appendix B

# MECP Well Records

# Water Well Records

Wednesday, March 10, 2021

9:37:41 AM

| TOWNSHIP CON LOT | UTM | DATE CNTR | CASING DIA | WATER | PUMP TEST | WELL USE | SCREEN | WELL | FORMATION |
|---|---|---|---|---|---|---|---|---|---|
| BRAMPTON CITY | 17 596375<br>4844940 W | 2008/10 6607 | 2.31 | FR 0020 | | DE | | 7116987<br>(M03959)<br>A078526 | BRWN SILT SAND LOAM 0000 BRWN SILT SAND CLAY 0011 GREY SILT CLAY SAND 0026 GREY SAND SLTY 0030 |
| BRAMPTON CITY | 17 596297<br>4844987 W | 2008/01 7238 | | | ///: | | | 7101931<br>(Z75197) A | |
| BRAMPTON CITY | 17 596386<br>4845019 W | 2007/11 7238 | 2.00 | | | | 0036 10 | 7053188<br>(Z72692)<br>A045333 | BRWN TILL DNSE 0013 GREY TILL SAND DNSE 0046 |
| BRAMPTON CITY (CHING | 17 595484<br>4844068 W | 2013/12 7238 | | | | | | 7214726<br>(Z178723) A | |
| BRAMPTON CITY (CHING | 17 596372<br>4844869 W | 7341 | | | | | | 7317249<br>(Z280513)<br>A161274 A | |
| BRAMPTON CITY (CHING | 17 596834<br>4845546 W | 2005/04 6607 | 2.00 | 0021 | | | 0044 5 | 4909799<br>(Z27785)<br>A026564 | BRWN LOAM 0000 BRWN CLAY HARD 0015 BRWN SILT SAND 0025 BRWN SAND WBRG 0050 |
| BRAMPTON CITY (CHING | 17 596360<br>4845117 W | 2013/09 7201 | 2 | | | MO | 0015 5 | 7209474<br>(Z167937)<br>A088481 | BRWN FILL SAND PCKD 0005 GREY SILT SAND HARD 0016 GREY SILT SAND WBRG 0020 |
| BRAMPTON CITY (CHING | 17 596864<br>4844951 W | 2004/10 7230 | 1.97 | | | NU | 0005 10 | 4909676<br>(Z25166)<br>A019982 | BRWN SILT LOAM CLAY 0008 GREY SILT CLAY DNSE 0012 GREY SAND GRVL DNSE 0015 |
| BRAMPTON CITY (CHING | 17 596372<br>4844869 W | 2014/05 7360 | | | | | | 7232432<br>(C25987)<br>A161274 P | |
| BRAMPTON CITY (CHING | 17 596581<br>4845283 W | 2014/09 7472 | | | | | | 7232910<br>(Z197043) A | |
| BRAMPTON CITY (CHING | 17 595485<br>4844014 W | 2017/04 7472 | 2 | | | MO | 0010 10 | 7287411<br>(Z259492)<br>A222955 | BRWN LOAM LOOS 0001 BRWN CLAY SILT GRVL 0010 GREY TILL GRVL PCKD 0020 |
| BRAMPTON CITY (CHING | 17 595338<br>4843807 W | 2017/04 7472 | 2 | | | MO | 0010 10 | 7287414<br>(Z259489)<br>A222978 | BRWN LOAM LOOS 0001 BRWN CLAY SILT GRVL 0015 BRWN SAND SILT GRVL 0020 |
| BRAMPTON CITY (CHING | 17 595337<br>4843807 W | 2017/04 7472 | 2 | | | MO | 0032 10 | 7287415<br>(Z259488)<br>A227330 | BRWN LOAM LOOS 0001 BRWN CLAY SILT PCKD 0015 BRWN SAND SILT GRVL 0030 GREY SAND SILT GRVL 0042 |
| BRAMPTON CITY (CHING | 17 595353<br>4843730 W | 2017/10 7383 | 2 | | | TH MO | 0017 5 | 7300013<br>(Z269793)<br>A238990 | TILL CLAY SLTY 0022 |

| TOWNSHIP CON LOT | UTM | DATE CNTR | CASING DIA | WATER | PUMP TEST | WELL USE | SCREEN | WELL | FORMATION |
|---|---|---|---|---|---|---|---|---|---|
| BRAMPTON CITY (CHING | 17 595319<br>4843745 W | 2017/11 7383 | 2 | | | TH MO | 0015 5 | 7300014<br>(Z269813)<br>A238885 | BRWN SAND GRVL 0020 |
| BRAMPTON CITY (CHING | 17 595386<br>4843688 W | 2017/11 7383 | 3 | | | TH MO | 0018 5 | 7300015<br>(Z269812)<br>A238884 | BRWN SAND GRVL 0023 |
| BRAMPTON CITY (CHING HS E 01 018 | 17 595154<br>4843733 W | 1969/10 5420 | 5 | FR 0105 | 88/118/6/5:0 | DO | 0124 4 | 4903391 () | FILL 0002 BLUE CLAY MSND 0065 BLUE CLAY SILT 0085 GREY FSND 0105 GREY CSND 0128 |
| BRAMPTON CITY (CHING HS E 02 016 | 17 595764<br>4843844 W | 1962/07 3512 | 7 | FR 0079 | 36/38/10/11:30 | DO | 0079 4 | 4901213 () | LOAM 0001 YLLW CLAY 0038 BLUE CLAY 0044 BLUE CLAY MSND 0049 BLUE CLAY GRVL 0062 GRVL MSND 0071 GRVL 0083 |
| BRAMPTON CITY (CHING HS E 02 016 | 17 595766<br>4843839 W | 1964/08 1307 | 30 | FR 0021 | 10//2/: | DO | | 4901214 () | BRWN LOAM 0005 RED SHLE 0021 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 595978<br>4844577 W | 1958/11 2801 | 5 | | | NU | | 4901222 () | CLAY 0002 BLCK MUCK 0006 MSND GRVL 0036 BLUE CLAY GRVL 0096 LMSN 0097 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 595908<br>4844506 W | 1964/07 2801 | 5 | | | NU | | 4901236 () | BRWN CLAY GRVL 0008 BLUE CLAY GRVL 0026 GRVL MSND CLAY 0043 MSND GRVL SILT 0063 FSND SILT 0085 FSND CLAY GRVL 0127 MSND GRVL SILT 0141 MSND SILT 0143 MSND GRVL 0148 SHLE 0160 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 596404<br>4845000 W | 1953/08 4623 | 5 | FR 0127 | 45/100/10/48:0 | DO | | 4901221 () | BRWN CLAY 0010 BRWN CLAY GRVL 0070 HPAN 0120 MSND GRVL 0127 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 596184<br>4844274 W | 1960/12 1307 | 30 | FR 0053 | 53//1/2:0 | PS | | 4901224 () | BRWN LOAM MSND 0053 BRWN MSND 0060 GREY MSND 0067 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 596294<br>4844495 W | 1960/07 3512 | 4 | SA 0300 | 60/300/1/0:30 | NU | | 4901223 () A | YLLW CLAY 0090 FSND CLAY 0140 FSND 0142 BLUE CLAY MSND 0210 BLUE SHLE 0312 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 595708<br>4844028 W | 1964/01 2801 | 2 | FR 0136 | 60///: | NU | 0136 11 | 4901225 () | BRWN CLAY 0016 BRWN CLAY GRVL 0029 GRVL MSND 0032 MSND GRVL 0043 FSND SILT 0116 GRVL MSND 0119 CLAY MSND GRVL 0145 SHLE 0160 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 595550<br>4844064 W | 1964/01 2801 | 5 | | | NU | | 4901226 () | BLCK MUCK 0002 BLUE CLAY 0019 MSND GRVL 0021 FSND SILT 0044 BLUE CLAY 0045 SILT FSND 0082 RED CLAY GRVL MSND 0112 FSND SILT GRVL 0128 BLUE SHLE 0140 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 595766<br>4844320 W | 1964/01 2801 | 2 | FR 0112 | 32/49/20/6:0 | NU | 0118 22 | 4901227 () | LOAM 0001 CLAY GRVL 0020 MSND CLAY 0037 SILT 0063 SILT CLAY FSND 0112 GRVL FSND 0121 GRVL MSND CLAY 0125 MSND GRVL 0140 CLAY GRVL 0151 SHLE 0161 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 595808<br>4844490 W | 1964/01 2801 | 2 | FR 0133 | 66///: | NU | 0145 11 | 4901228 () | BRWN CLAY GRVL 0027 BLUE CLAY 0048 FSND SILT 0117 FSND SILT CSND 0130 FSND SILT 0133 FSND SILT CSND 0148 GRVL MSND BLDR 0155 BLUE CLAY MSND GRVL 0181 SHLE 0182 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 595804<br>4844292 W | 1964/07 2801 | 5 | | | NU | | 4901237 () | BRWN CLAY GRVL 0010 BLUE CLAY GRVL 0021 MSND GRVL 0035 CLAY SILT MSND 0109 GRVL FSND 0115 GRVL FSND CLAY 0118 CLAY MSND GRVL 0140 STNS SHLE 0160 |

| TOWNSHIP CON LOT | UTM | DATE CNTR | CASING DIA | WATER | PUMP TEST | WELL USE | SCREEN | WELL | FORMATION |
|---|---|---|---|---|---|---|---|---|---|
| BRAMPTON CITY (CHING HS E 02 017 | 17 595946 4844509 W | 1964/07 2801 | 2 | FR 0148 | 68///: | NU | 0148 11 | 4901235 () | BRWN CLAY GRVL 0037 BLUE CLAY 0045 BRWN MSND GRVL 0053 BLUE CLAY SILT 0058 FSND SILT CLAY 0110 MSND FSND GRVL 0136 GRVL MSND SILT 0159 GREY CLAY MSND 0167 SHLE 0188 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 595930 4844474 W | 1964/07 2801 | 5 | | | NU | | 4901234 () | BRWN CLAY GRVL 0006 BRWN GRVL MSND 0010 BRWN CLAY MSND GRVL 0028 FSND SILT 0109 MSND FSND GRVL 0131 CLAY MSND GRVL 0171 LMSN 0179 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 595764 4844067 W | 1964/07 2801 | 2 | FR 0046 | 26///: | NU | | 4901233 () | BRWN CLAY 0010 BLUE CLAY MSND GRVL 0028 BRWN MSND GRVL 0031 BLUE CLAY MSND GRVL 0046 FSND SILT GRVL 0059 SILT 0085 FSND GRVL BLDR 0095 RED CLAY MSND 0097 BLUE CLAY 0106 RED CLAY MSND 0110 BLUE SHLE 0118 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 595978 4844242 W | 1964/07 2801 | 2 | FR 0031 | 37///: | NU | | 4901232 () | BRWN CLAY GRVL 0027 BLUE CLAY 0031 FSND SILT CLAY 0107 GRVL MSND CLAY 0129 LMSN SHLE 0139 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 595880 4844276 W | 1964/06 2801 | 2 | | | NU | | 4901231 () | BRWN CLAY 0006 MSND GRVL BLDR 0021 BLUE CLAY MSND GRVL 0063 FSND CLAY 0105 MSND FSND GRVL 0112 GREY CLAY GRVL MSND 0137 SHLE 0144 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 595754 4844307 W | 1964/02 2801 | 5 | | | NU | | 4901229 () | LOAM 0001 CLAY MSND 0015 MSND GRVL CLAY 0032 CLAY SILT GRVL 0092 MSND GRVL SILT 0097 CLAY SILT 0117 MSND GRVL CLAY 0132 CLAY GRVL 0153 CLAY GRVL SHLE 0157 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 596445 4845021 W | 2000/09 6409 | 6 | FR 0080 | 45/72/7/1:30 | DO | 0093 4 | 4908624 (219860) | BLCK LOAM 0001 BRWN CLAY SAND LOAM 0023 BRWN SAND CLAY 0045 BLUE CLAY 0050 GREY SAND CLAY 0080 GREY SAND CLN 0097 |
| BRAMPTON CITY (CHING HS E 02 017 | 17 596212 4844540 W | 1964/02 2801 | 5 | | | NU | | 4901230 () | LOAM 0001 CLAY MSND GRVL 0034 CLAY SILT 0055 SILT CLAY 0120 GRVL SILT CLAY 0131 CLAY GRVL 0149 CLAY SHLE 0159 |
| BRAMPTON CITY (CHING HS E 03 017 | 17 596720 4844871 W | 1964/12 5203 | 5 | FR 0069 | 69/150/4/72:0 | DO | 0162 8 | 4901343 () | PRDG 0047 MSND CLAY 0158 MSND GRVL 0166 BLUE SHLE 0170 |
| BRAMPTON CITY (CHING HS E 03 017 | 17 596758 4844952 W | 1957/02 3514 | 4 | FR 0080 | 39/69/6/4:0 | DO | | 4901337 () | PRDG 0048 BLUE CLAY 0080 FSND 0150 GRVL 0165 |
| BRAMPTON CITY (CHING HS E 03 017 | 17 596518 4845030 W | 1958/09 2801 | 5 | FR 0114 | 25/28/30/1:0 | NU | | 4901338 () | LOAM 0001 CLAY GRVL BLDR 0114 MSND BLDR 0129 MSND 0132 GRVL 0140 CLAY GRVL 0142 LMSN 0143 |
| BRAMPTON CITY (CHING HS E 03 017 | 17 596512 4845035 W | 1958/10 2801 | 5 | FR 0095 | 28/36/90/6:0 | NU | | 4901339 () | LOAM 0001 CLAY MSND 0010 CLAY GRVL 0050 CLAY MSND GRVL 0063 MSND SILT 0095 MSND 0121 GRVL 0138 CLAY GRVL 0139 |
| BRAMPTON CITY (CHING HS E 03 017 | 17 596622 4845126 W | 1958/10 2801 | 5 | FR 0053 | 25/36/120/8:0 | NU | 0136 13 | 4901340 () | LOAM 0001 CLAY MSND BLDR 0053 FSND 0067 GRVL 0110 CLAY GRVL 0149 |
| BRAMPTON CITY (CHING HS E 03 017 | 17 596760 4844826 W | 1962/10 4813 | 4 | FR 0078 | 50/71/3/3:0 | DO | 0083 4 | 4901341 () | BLCK LOAM 0001 BRWN CLAY 0026 BLUE CLAY 0067 QSND 0078 MSND 0087 |
| BRAMPTON CITY (CHING HS E 03 017 | 17 596806 4845639 W | 2002/03 1663 | | | | NU | | 4908962 (240034) A | |
| BRAMPTON CITY (CHING HS E 03 017 | 17 596824 4845628 W | 1963/08 1325 | 30 | FR 0032 | 2/20/5/1:0 | DO | | 4901342 () | BRWN CLAY MSND 0006 BLUE CLAY MSND 0032 BLUE CLAY 0033 |

| TOWNSHIP CON LOT | UTM | DATE CNTR | CASING DIA | WATER | PUMP TEST | WELL USE | SCREEN | WELL | FORMATION |
|---|---|---|---|---|---|---|---|---|---|
| BRAMPTON CITY (CHING HS E 03 017 | 17 596992 4845439 L | 2003/11 6865 | | | | NU | | 4909279 (266867) A | |
| BRAMPTON CITY (CHING HS E 03 017 | 17 596490 4845088 W | 1975/07 4320 | 5 | FR 0103 | 65/71/5/3:0 | DO | 0103 3 | 4904742 () | BRWN CLAY 0030 BLUE CLAY 0103 BLUE SAND 0106 BLUE CLAY GRVL SHLE 0155 |
| CALEDON TOWN (ALBION | 17 595244 4845062 W | 2008/07 6875 | | | | MO | | 7113604 (Z87823) A | |
| CALEDON TOWN (ALBION | 17 594955 4844706 W | 2008/07 6875 | | | | MO | | 7113603 (Z87824) A | |
| CALEDON TOWN (ALBION | 17 594892 4844697 W | 2008/07 6875 | | | | MO | | 7113602 (Z87825) A | |
| CALEDON TOWN (ALBION | 17 594781 4844912 W | 2008/10 6875 | 1.97 | | | | | 7113601 (Z87868) A | |
| CALEDON TOWN (CHINGU | 17 595340 4845198 W | 2016/05 7148 | | | | | | 7264136 (Z218595) A | |
| CALEDON TOWN (CHINGU | 17 595467 4844139 W | 2013/11 7238 | | | | | | 7213014 (Z178703) A | |
| CALEDON TOWN (CHINGU | 17 594880 4844685 W | 2008/10 6875 | 35.4 | | | NU | | 7120410 (Z87862) A | |
| CALEDON TOWN (CHINGU 01 018 | 17 595168 4844319 W | 1988/01 4919 | 30 30 | UK 0050 | 50/70//1:0 | DO | | 4906849 (25712) | BRWN LOAM HARD 0001 BRWN CLAY HARD 0020 GREY CLAY HARD 0050 GREY SAND LOOS 0075 |
| CALEDON TOWN (CHINGU HS E 01 018 | 17 595294 4843961 W | 1964/02 1325 | 18 | FR 0047 | 44/52/1/1:0 | DO | | 4901106 () | PRDG 0047 BRWN FSND 0054 BLUE CLAY 0055 |
| CALEDON TOWN (CHINGU HS E 01 018 | 17 595298 4843999 W | 2009/10 7219 | 29 | | 37///: | NU | | 7132312 (Z098404) A085720 A | |
| CALEDON TOWN (CHINGU HS E 01 018 | 17 595199 4844247 W | 2010/05 7219 | 30 | | 45///: | NU | | 7149886 (Z111913) A097062 A | |
| CALEDON TOWN (CHINGU HS E 01 018 | 17 595175 4844117 W | 2010/08 3349 | | | | NU | | 7153619 (Z121403) A | |
| CALEDON TOWN (CHINGU HS E 01 018 | 17 595307 4843984 W | 2010/08 3349 | | | | | | 7153620 (Z121404) A | |
| CALEDON TOWN (CHINGU HS E 01 018 | 17 595176 4844171 W | 2010/08 3349 | | | | | | 7153621 (Z121405) A | |
| CALEDON TOWN (CHINGU HS E 01 018 | 17 595214 4844198 W | 1968/04 1308 | 30 | FR 0059 | 59/65/1/0:30 | ST DO | | 4902950 () | LOAM 0001 BRWN CLAY 0005 GRVL CLAY 0007 BRWN CLAY 0023 HPAN 0047 BRWN MSND 0069 |
| CALEDON TOWN (CHINGU HS E 01 018 | 17 594970 4844232 W | 2015/05 7147 | 70.8 | FR 0003 | | | | 7242251 (Z203295) A | |
| CALEDON TOWN (CHINGU HS E 01 018 | 17 595114 4844323 W | 1972/10 3413 | 30 | FR 0056 | 56/62/3/4:0 | DO | | 4903885 () | BRWN CLAY 0048 CSND 0056 BLUE SILT 0067 |

| TOWNSHIP CON LOT | UTM | DATE CNTR | CASING DIA | WATER | PUMP TEST | WELL USE | SCREEN | WELL | FORMATION |
|---|---|---|---|---|---|---|---|---|---|
| CALEDON TOWN (CHINGU HS E 01 019 | 17 594864 4844623 W | 1980/07 1663 | 5 | FR 0120 | 55/125/25/1:0 | DO | 0132 3 | 4905788 () | BLCK LOAM 0001 YLLW CLAY 0016 BLUE CLAY GRVL SILT 0051 GREY GRVL CLAY 0054 BLUE CLAY GRVL 0082 GREY SAND GRVL DRTY 0087 BLUE CLAY GRVL 0105 GREY FSND SILT 0118 GREY MSND CGRD 0142 |
| CALEDON TOWN (CHINGU HS E 01 019 | 17 594632 4844724 W | 1959/01 1325 | 30 | FR 0028 | 20///: | ST | | 4901110 () | BRWN HPAN 0028 MSND 0032 |
| CALEDON TOWN (CHINGU HS E 01 019 | 17 594702 4844653 W | 2014/10 7147 | 1.97 | FR 0008 | | MO | 0003 10 | 7231012 (Z192028) A160985 | BRWN SILT SAND 0027 |
| CALEDON TOWN (CHINGU HS E 01 019 | 17 594624 4844799 W | 1967/11 3413 | 30 | FR 0015 | 15/22/5/24:0 | DO | | 4901114 () | BRWN CLAY 0002 MSND 0015 CSND 0026 |
| CALEDON TOWN (CHINGU HS E 02 018 | 17 595314 4844348 W | 1979/11 3637 | 30 32 | FR 0060 | 59//14/3:0 | ST DO | | 4905558 () | BLCK LOAM 0002 BRWN CLAY 0016 BRWN STNS CLAY PCKD 0025 BRWN SAND STNS PCKD 0032 BRWN CSND STNS LOOS 0040 BRWN FSND 0060 GREY FSND MUCK 0077 |
| CALEDON TOWN (CHINGU HS E 02 018 | 17 595150 4844356 W | 1986/12 4919 | 30 | UK 0042 | 42/58//1:0 | DO | | 4906620 (NA) | BRWN LOAM HARD 0001 BRWN SAND PCKD 0062 |
| CALEDON TOWN (CHINGU HS E 02 018 | 17 595678 4844817 L | 2003/09 3108 | | | | NU | | 4909283 (262185) A | |
| CALEDON TOWN (CHINGU HS E 02 018 | 17 595196 4844416 W | 1985/09 4919 | 30 30 | UK 0060 | 58/75//:30 | DO | | 4906456 () | BRWN LOAM HARD 0001 BRWN CLAY HARD 0020 GREY CLAY HARD 0060 GREY SAND LOOS 0082 |
| CALEDON TOWN (CHINGU HS E 02 019 | 17 594860 4844766 W | 1961/09 1325 | 30 | FR 0025 | 20///: | ST | | 4901238 () | BRWN CLAY 0011 BLUE CLAY MSND BLDR 0025 GRVL BLDR 0028 |
| CALEDON TOWN (CHINGU HS E 02 019 | 17 595918 4845528 W | 1966/05 4813 | 5 | FR 0163 | 77/109/10/4:0 | DO | 0173 4 | 4901240 () | BRWN CLAY 0016 BLUE CLAY 0037 MSND CLAY 0163 MSND 0177 |
| CALEDON TOWN (CHINGU HS E 02 020 | 17 595116 4844355 W | 1991/06 4005 | 6 6 | UK 0192 | 52//0/3:0 | DO | | 4907519 (76473) | BRWN CLAY SAND LOOS 0015 BRWN CLAY GRVL LOOS 0035 BRWN SAND GRVL LOOS 0040 GREY CLAY SAND LOOS 0105 GREY GRVL SAND LOOS 0108 GREY CLAY 0130 GREY GRVL SAND 0135 GREY CLAY 0155 GREY SHLE LYRD 0415 |
| CALEDON TOWN (CHINGU HS E 02 020 | 17 595083 4844465 W | 1992/05 4919 | 30 | UK 0089 | 20/40/10/1:0 | DO | | 4907657 (110916) | BRWN LOAM HARD 0001 BRWN CLAY HARD 0020 GREY CLAY SAND PCKD 0092 |
| CALEDON TOWN (CHINGU HS E 03 018 | 17 596030 4845503 W | 1964/11 4813 | 4 | FR 0145 | 110/155/3/: | DO | 0160 4 | 4901344 () | BLCK LOAM 0001 MSND CLAY 0145 SILT LMSN 0164 |
| CALEDON TOWN (CHINGU HS E 03 018 | 17 596118 4845362 W | 1988/11 4919 | 30 | UK 0060 | 60/80/5/1:0 | DO | | 4906991 (35163) | BRWN LOAM HARD 0001 BRWN CLAY HARD 0020 GREY CLAY HARD 0060 GREY SAND LOOS 0083 |
| CALEDON TOWN (CHINGU HS E 03 018 | 17 596118 4845362 W | 1989/03 4005 | 6 | UK 0200 | 65/160/7/8:30 | DO | | 4907074 (42474) | BRWN CLAY SAND LOOS 0010 GREY CLAY SAND PCKD 0042 GREY SAND PCKD 0080 GREY CLAY SAND LOOS 0135 GREY CLAY LOOS 0180 GREY SAND FGVL PCKD 0181 GREY CLAY GRVL PCKD 0199 GREY GRVL FSND PCKD 0200 |
| CALEDON TOWN (CHINGU HS E 03 019 | 17 595928 4845588 W | 1959/05 1325 | 30 | FR 0065 | 55///: | DO | | 4901345 () | HPAN 0025 MSND 0055 BLUE HPAN 0065 |

| TOWNSHIP CON LOT | UTM | DATE CNTR | CASING DIA | WATER | PUMP TEST | WELL USE | SCREEN | WELL | FORMATION |
|---|---|---|---|---|---|---|---|---|---|
| CALEDON TOWN (CHINGU HS E 03 019 | 17 595164 4844412 W | 1989/11 3132 | 6 6 | FR 0169 | 58//12/2:30 | DO | 0165 4 | 4907230 (65768) | BRWN CLAY STNS DNSE 0022 BLUE CLAY STNS DNSE 0036 BLUE CLAY GRVL DNSE 0047 BLUE SILT SOFT 0161 BLUE SAND STNS LOOS 0172 BLUE CLAY DNSE 0175 |
| CALEDON TOWN (CHINGU HS E 03 019 | 17 595978 4845545 W | 2012/04 2576 | | | | NU | | 7183229 (Z149233) A | |

Notes:
UTM: UTM in Zone, Easting, Northing and Datum is NAD83; L: UTM estimated from Centroid of Lot; W: UTM not from Lot Centroid
DATE CNTR: Date Work Completedand Well Contractor Licence Number
CASING DIA: .Casing diameter in inches
WATER: Unit of Depth in Fee. See Table 4 for Meaning of Code

PUMP TEST: Static Water Level in Feet / Water Level After Pumping in Feet / Pump Test Rate in GPM / Pump Test Duration in Hour : Minutes
WELL USE: See Table 3 for Meaning of Code
SCREEN: Screen Depth and Length in feet
WELL: WEL ( AUDIT # ) Well Tag . A: Abandonment; P: Partial Data Entry Only
FORMATION: See Table 1 and 2 for Meaning of Code

## 1. Core Material and Descriptive terms

| Code | Description | Code | Description | Code | Description | Code | Description | Code | Description |
|---|---|---|---|---|---|---|---|---|---|
| BLDR | BOULDERS | FCRD | FRACTURED | IRFM | IRON FORMATION | PORS | POROUS | SOFT | SOFT |
| BSLT | BASALT | FGRD | FINE-GRAINED | LIMY | LIMY | PRDG | PREVIOUSLY DUG | SPST | SOAPSTONE |
| CGRD | COARSE-GRAINED | FGVL | FINE GRAVEL | LMSN | LIMESTONE | PRDR | PREV. DRILLED | STKY | STICKY |
| CGVL | COARSE GRAVEL | FILL | FILL | LOAM | TOPSOIL | QRTZ | QUARTZITE | STNS | STONES |
| CHRT | CHERT | FLDS | FELDSPAR | LOOS | LOOSE | QSND | QUICKSAND | STNY | STONEY |
| CLAY | CLAY | FLNT | FLINT | LTCL | LIGHT-COLOURED | QTZ | QUARTZ | THIK | THICK |
| CLN | CLEAN | FOSS | FOSILIFEROUS | LYRD | LAYERED | ROCK | ROCK | THIN | THIN |
| CLYY | CLAYEY | FSND | FINE SAND | MARL | MARL | SAND | SAND | TILL | TILL |
| CMTD | CEMENTED | GNIS | GNEISS | MGRD | MEDIUM-GRAINED | SHLE | SHALE | UNKN | UNKNOWN TYPE |
| CONG | CONGLOMERATE | GRNT | GRANITE | MGVL | MEDIUM GRAVEL | SHLY | SHALY | VERY | VERY |
| CRYS | CRYSTALLINE | GRSN | GREENSTONE | MRBL | MARBLE | SHRP | SHARP | WBRG | WATER-BEARING |
| CSND | COARSE SAND | GRVL | GRAVEL | MSND | MEDIUM SAND | SHST | SCHIST | WDFR | WOOD FRAGMENTS |
| DKCL | DARK-COLOURED | GRWK | GREYWACKE | MUCK | MUCK | SILT | SILT | WTHD | WEATHERED |
| DLMT | DOLOMITE | GVLY | GRAVELLY | OBDN | OVERBURDEN | SLTE | SLATE | | |
| DNSE | DENSE | GYPS | GYPSUM | PCKD | PACKED | SLTY | SILTY | | |
| DRTY | DIRTY | HARD | HARD | PEAT | PEAT | SNDS | SANDSTONE | | |
| DRY | DRY | HPAN | HARDPAN | PGVL | PEA GRAVEL | SNDY | SANDYOAPSTONE | | |

## 2. Core Color

| Code | Description |
|---|---|
| WHIT | WHITE |
| GREY | GREY |
| BLUE | BLUE |
| GREN | GREEN |
| YLLW | YELLOW |
| BRWN | BROWN |
| RED | RED |
| BLCK | BLACK |
| BLGY | BLUE-GREY |

## 3. Well Use

| Code | Description | Code | Description |
|---|---|---|---|
| DO | Domestic | OT | Other |
| ST | Livestock | TH | Test Hole |
| IR | Irrigation | DE | Dewatering |
| IN | Industrial | MO | Monitoring |
| CO | Commercial | MT | Monitoring TestHole |
| MN | Municipal | | |
| PS | Public | | |
| AC | Cooling And A/C | | |
| NU | Not Used | | |

## 4. Water Detail

| Code | Description | Code | Description |
|---|---|---|---|
| FR | Fresh | GS | Gas |
| SA | Salty | IR | Iron |
| SU | Sulphur | | |
| MN | Mineral | | |
| UK | Unknown | | |

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

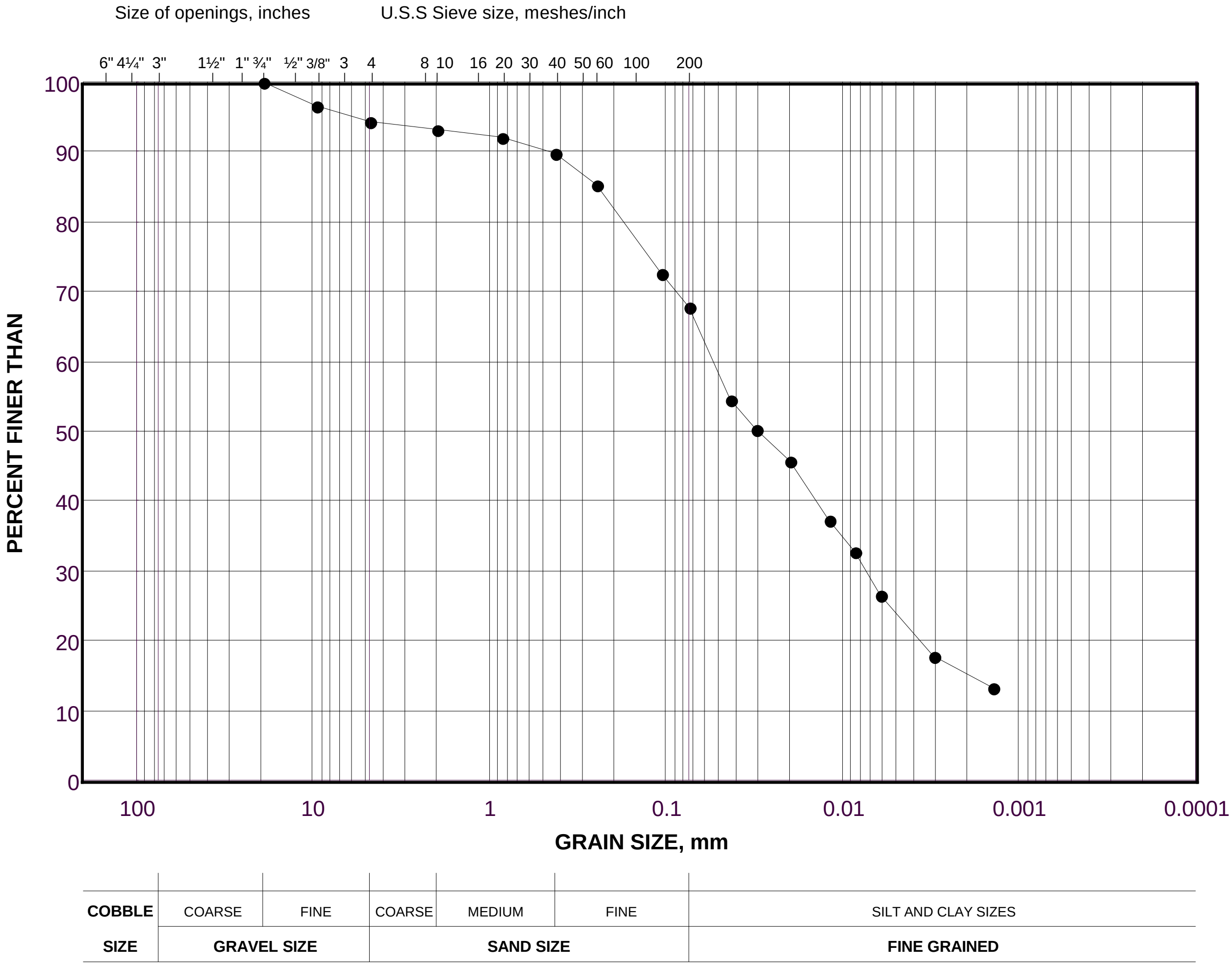
# Appendix C

## Grainsize Analysis

# GRAIN SIZE DISTRIBUTION

Sandy Clayey SILT (CL-ML) - Reworked

FIGURE B1



## LEGEND

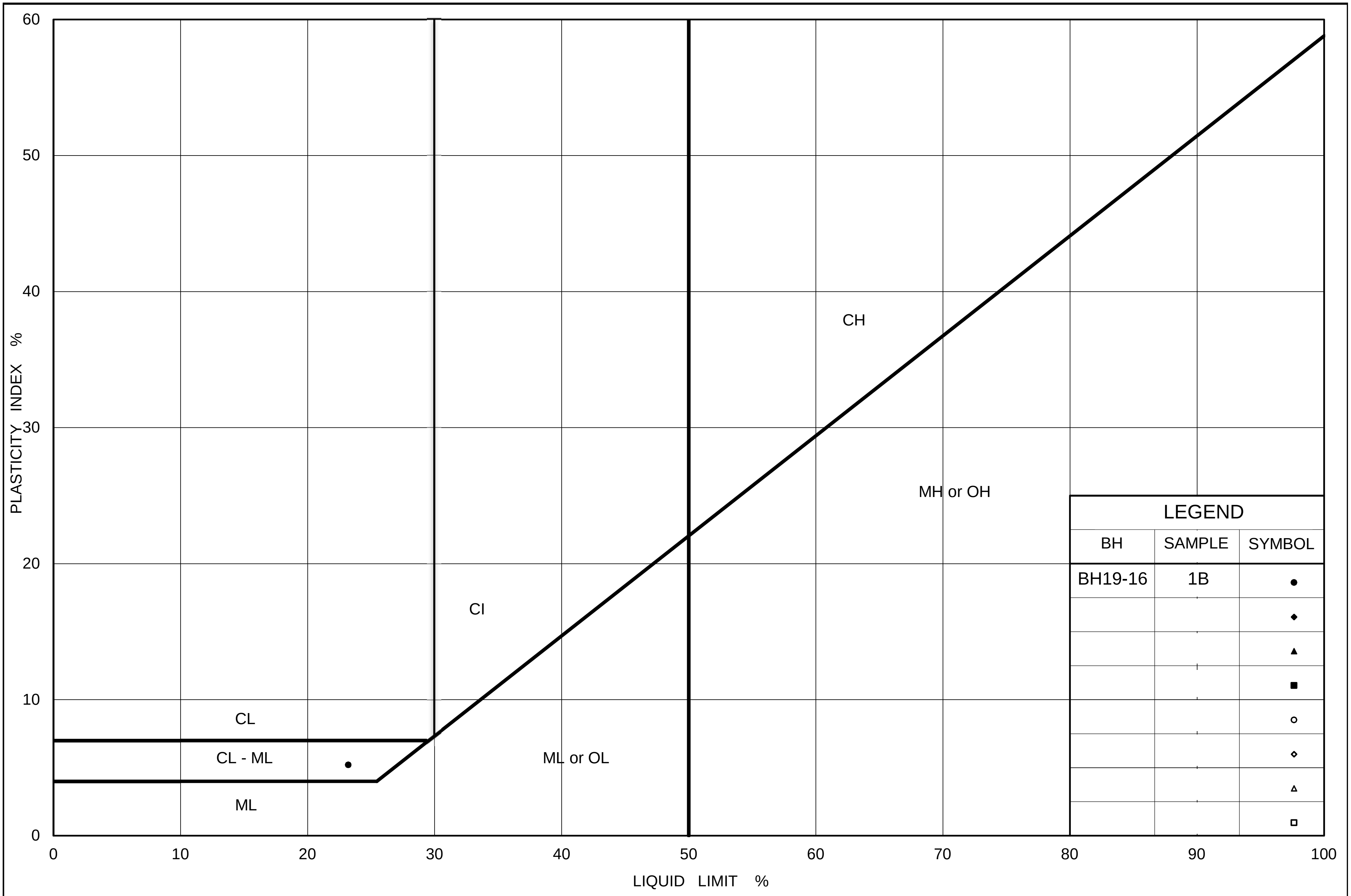
| SYMBOL | Borehole | SAMPLE | DEPTH(m) |
|---|---|---|---|
| ● | BH 19-16 | 1B | 0.34 - 0.61 |

Project Number: 19115264

Checked By: ____________________

**Golder Associates**

Date: 30-May-19



GOLDER

# PLASTICITY CHART
## Sandy CLAYEY SILT (CL-ML)

Figure No. B2

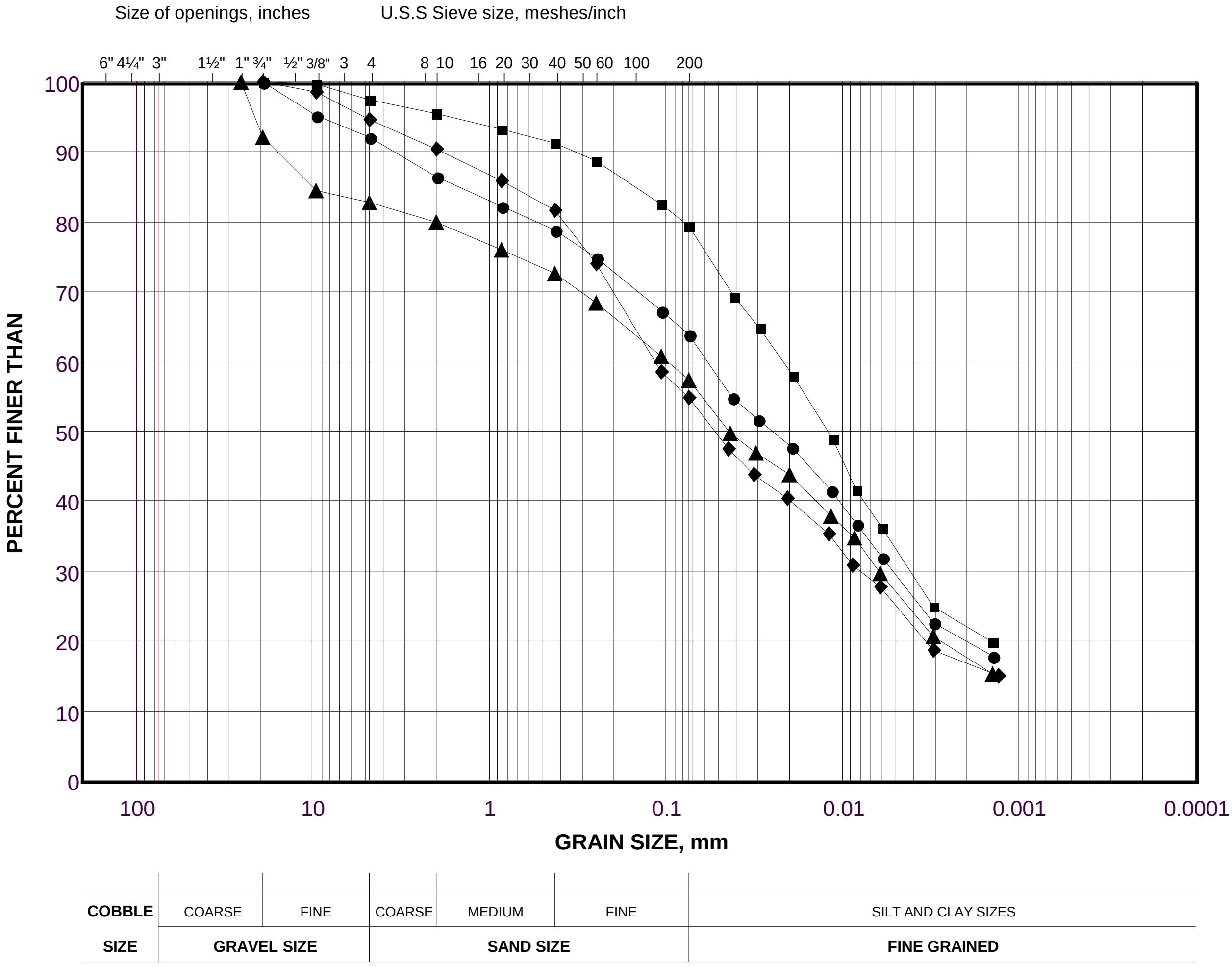
Project No. 19115264

Checked By:

# GRAIN SIZE DISTRIBUTION

SILTY CLAY to SILTY CLAY and SAND (CL) - TILL

FIGURE B3



## LEGEND

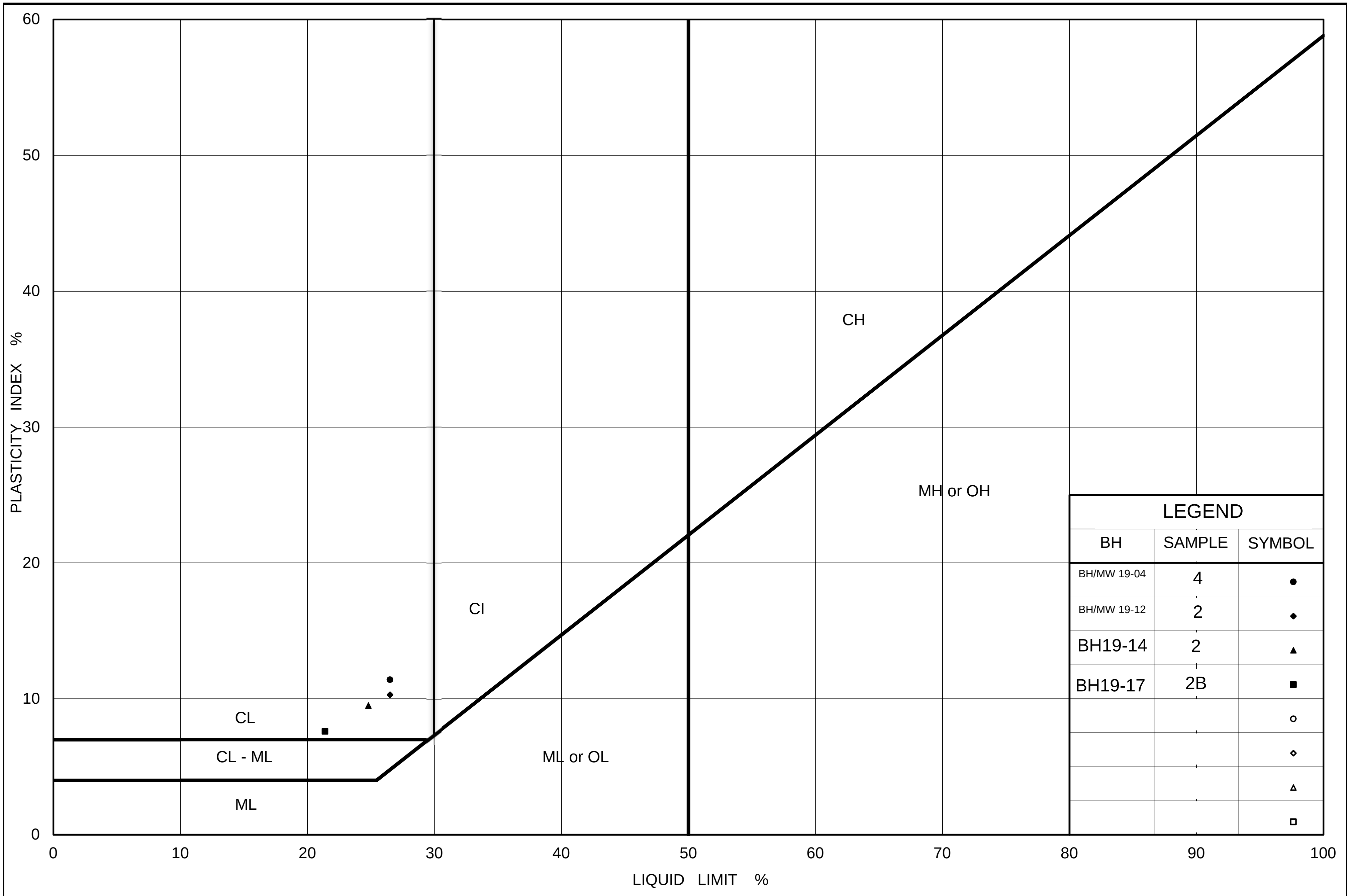
| SYMBOL | Borehole | SAMPLE | DEPTH(m) |
|---|---|---|---|
| ● | BH 19-14 | 2 | 0.76 - 1.37 |
| ■ | BH/MW 19-12 | 2 | 0.76 - 1.37 |
| ◆ | BH 19-17 | 2B | 1.13 - 1.37 |
| ▲ | BH/MW 19-04 | 4 | 2.29 - 2.90 |

Project Number: 19115264

Checked By: ____________________

**Golder Associates**

Date: 30-May-19



GOLDER

# PLASTICITY CHART

## SILTY CLAY to SILTY CLAY and SAND (CL) - TILL

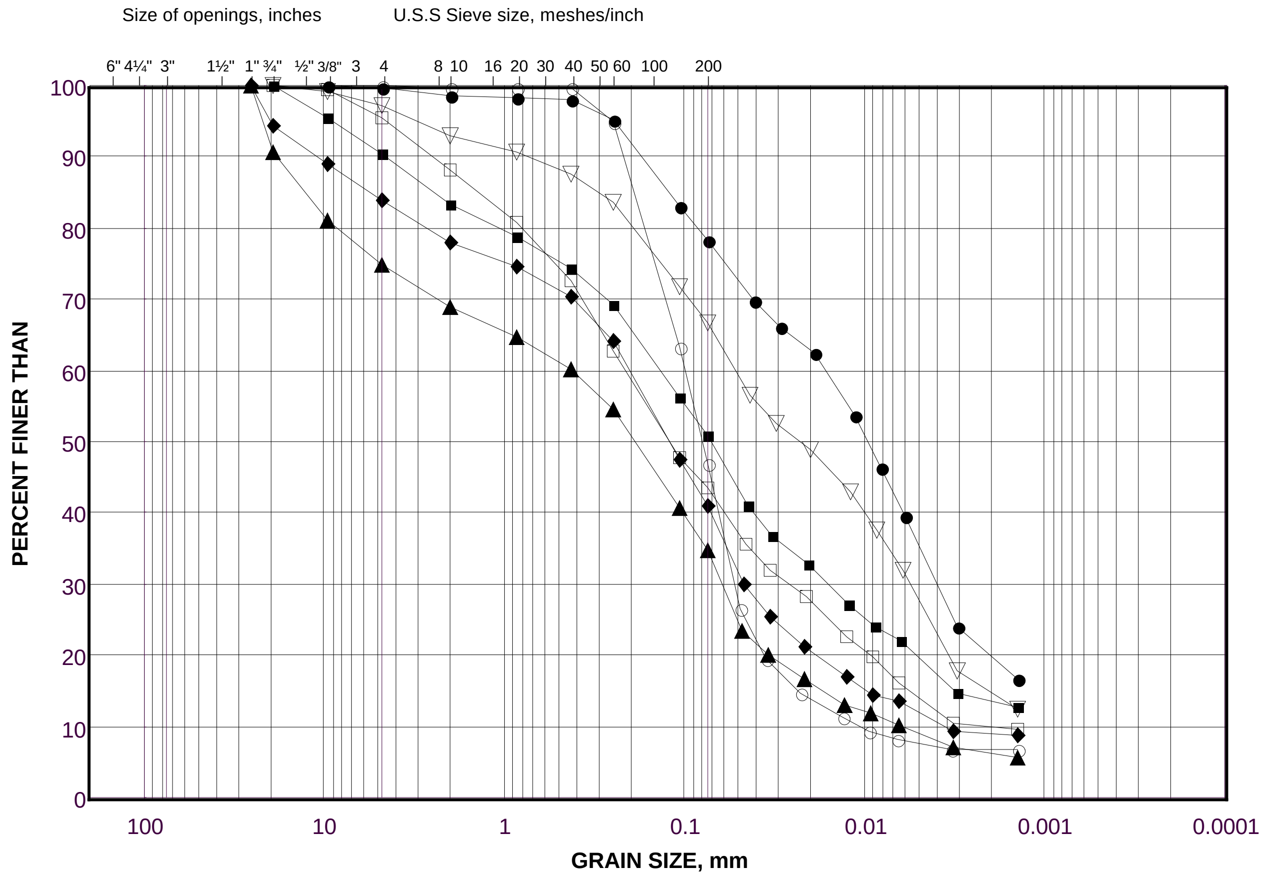
Figure No. B4

Project No. 19115264

Checked By:

# GRAIN SIZE DISTRIBUTION
SILT and SAND to sandy CLAYEY SILT (ML/SM to CL-ML)

FIGURE B5



| | | | | | | |
|---|---|---|---|---|---|---|
| **COBBLE** | COARSE | FINE | COARSE | MEDIUM | FINE | SILT AND CLAY SIZES |
| **SIZE** | **GRAVEL SIZE** | | **SAND SIZE** | | | **FINE GRAINED** |

## LEGEND

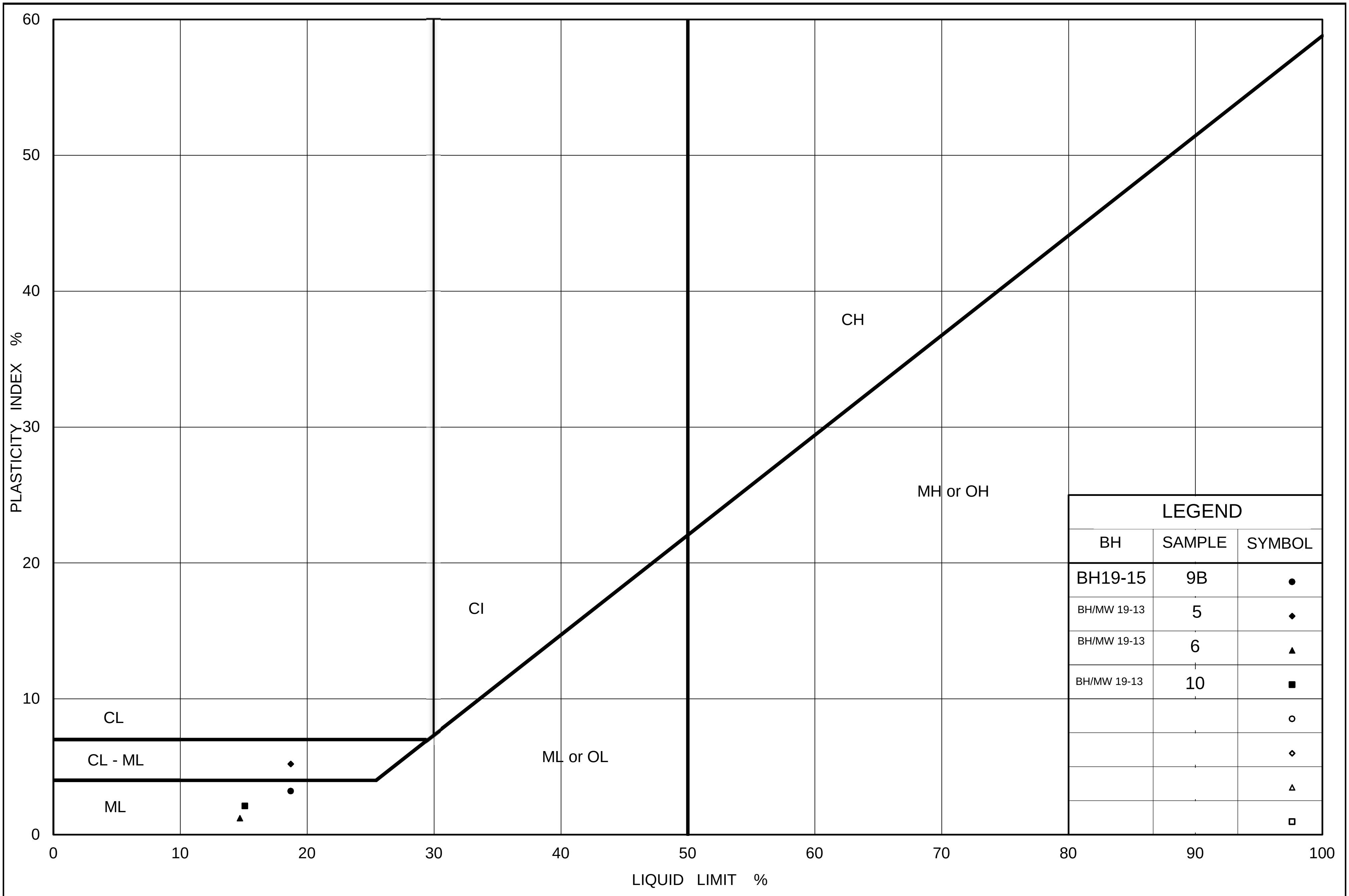
| SYMBOL | Borehole | SAMPLE | DEPTH(m) |
|---|---|---|---|
| ● | BH/MW 19-13 | 10 | 10.67 - 11.28 |
| ■ | BH/MW 19-13 | 5 | 3.05 - 3.66 |
| ◆ | BH/MW 19-13 | 6 | 4.57 - 5.18 |
| ▲ | BH/MW 19-12 | 6B | 3.05 - 3.66 |
| ▽ | BH 19-13 | 8 | 7.62 - 8.23 |
| ◑ | BH/MW 19-12 | 9 | 9.14 - 9.75 |
| □ | BH 19-15 | 9B | 9.69 - 9.75 |

Project Number: 19115264

Checked By: ____________________

**Golder Associates**

Date: 30-May-19



LEGEND

| BH | SAMPLE | SYMBOL |
|---|---|---|
| BH19-15 | 9B | ● |
| BH/MW 19-13 | 5 | ◆ |
| BH/MW 19-13 | 6 | ▲ |
| BH/MW 19-13 | 10 | ■ |
| | | ○ |
| | | ◇ |
| | | △ |
| | | □ |

GOLDER

# PLASTICITY CHART

## SILT and SAND to sandy CLAYEY SILT (ML/SM to CL-ML)

Figure No. B6

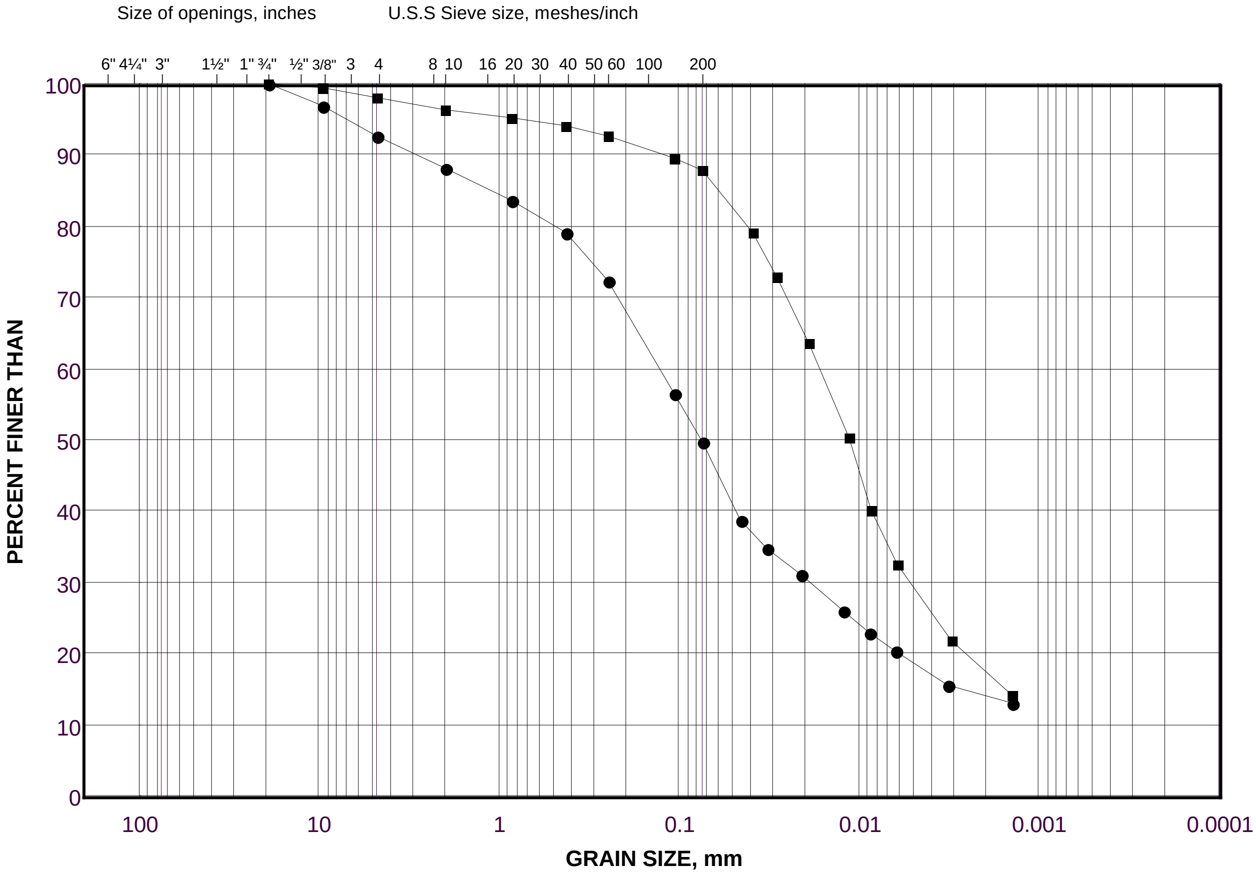
Project No. 19115264

Checked By:

# GRAIN SIZE DISTRIBUTION

CLAYEY SILT to sandy CLAYEY SILT (CL-ML) - TILL

FIGURE B7



| | | | | | | |
|---|---|---|---|---|---|---|
| **COBBLE** | COARSE | FINE | COARSE | MEDIUM | FINE | SILT AND CLAY SIZES |
| **SIZE** | **GRAVEL SIZE** | | **SAND SIZE** | | | **FINE GRAINED** |

## LEGEND

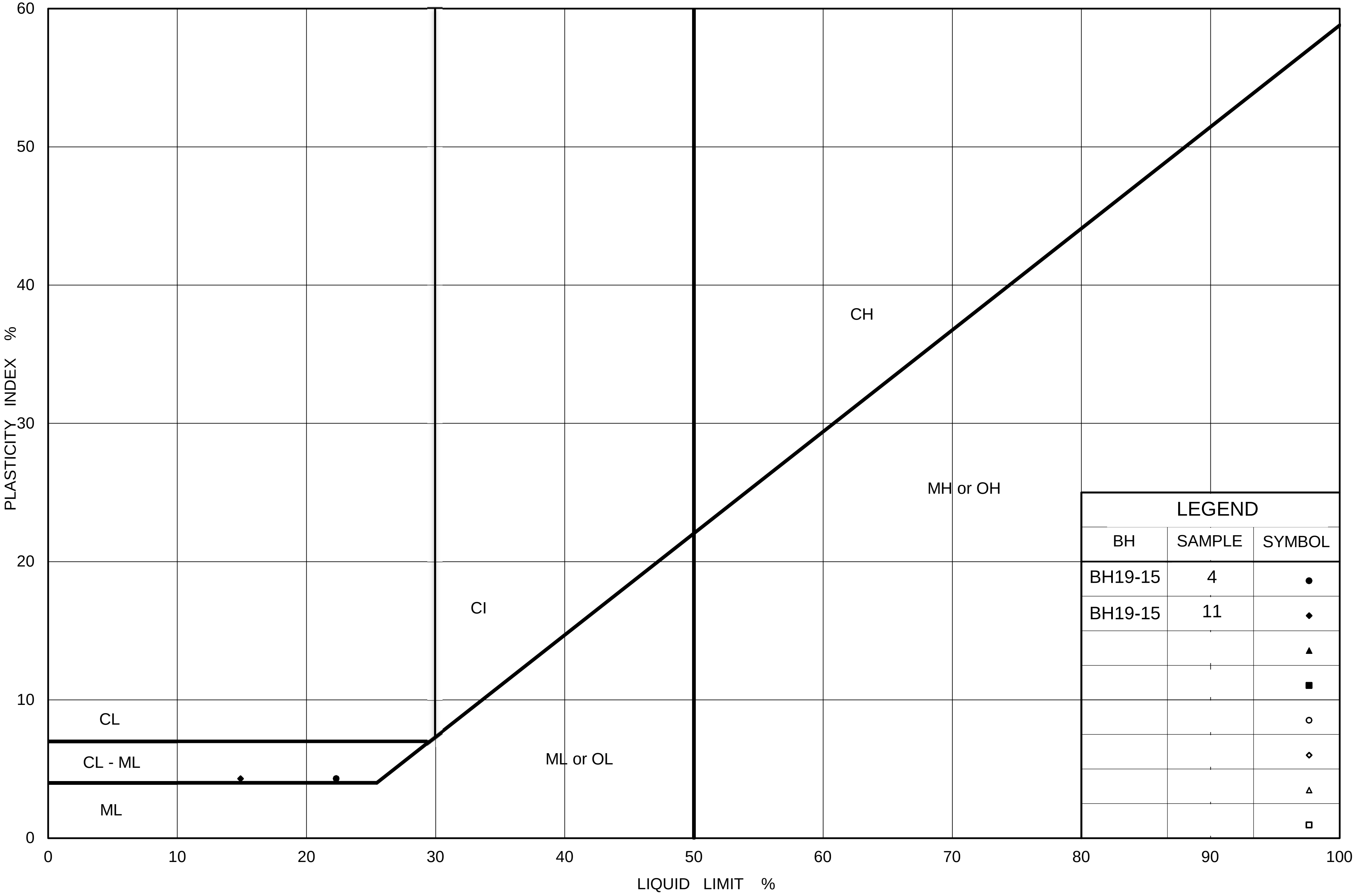
| SYMBOL | Borehole | SAMPLE | DEPTH(m) |
|---|---|---|---|
| ● | BH 19-15 | 11 | 12.19 - 12.80 |
| ■ | BH 19-15 | 4 | 2.29 - 2.90 |

Project Number: 19115264

Checked By: ____________________

**Golder Associates**

Date: 30-May-19



GOLDER

# PLASTICITY CHART

## CLAYEY SILT to sandy CLAYEY SILT (CL-ML) - TILL

Figure No. B8

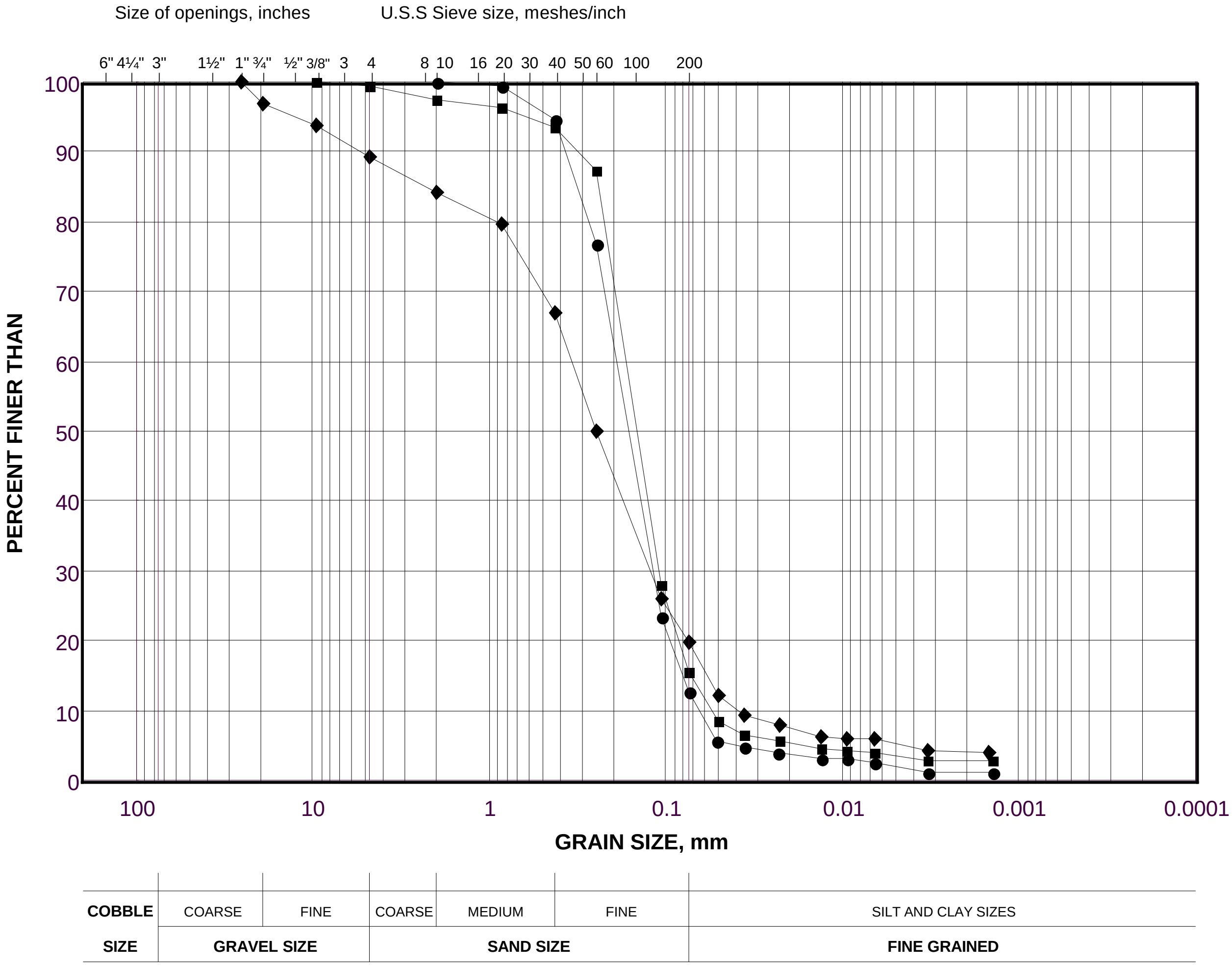
Project No. 19115264

Checked By:

# GRAIN SIZE DISTRIBUTION

SILTY SAND to SAND (SM-SW)

FIGURE B9



## LEGEND

| SYMBOL | Borehole | SAMPLE | DEPTH(m) |
|---|---|---|---|
| ● | BH/MW 19-04 | 14 | 15.24 - 15.85 |
| ■ | BH 19-14 | 7 | 6.10 - 6.71 |
| ◆ | BH/MW 19-12 | 7 | 6.10 - 6.71 |

Project Number: 19115264

Checked By: ______________________

**Golder Associates**

Date: 30-May-19

EDWARD WONG

Edward Wong & Associates Inc.
441 Esna Park Drive, Unit 19
Markham, Ontario L3R 1H7
Telephone: (416) 903-4288
Fax: (416) 221-0795

# Grain Size Analysis and Hydrometer Test

**Sample Test No.:** 02995c-1 **Report No.:** 1 **Date Reported:** 27/10/2017

**Project No.:** Ma002995c
**Project Name:** 3728 Mayfield Road, Town of Caledon

***Grain Size Proportion (%)***

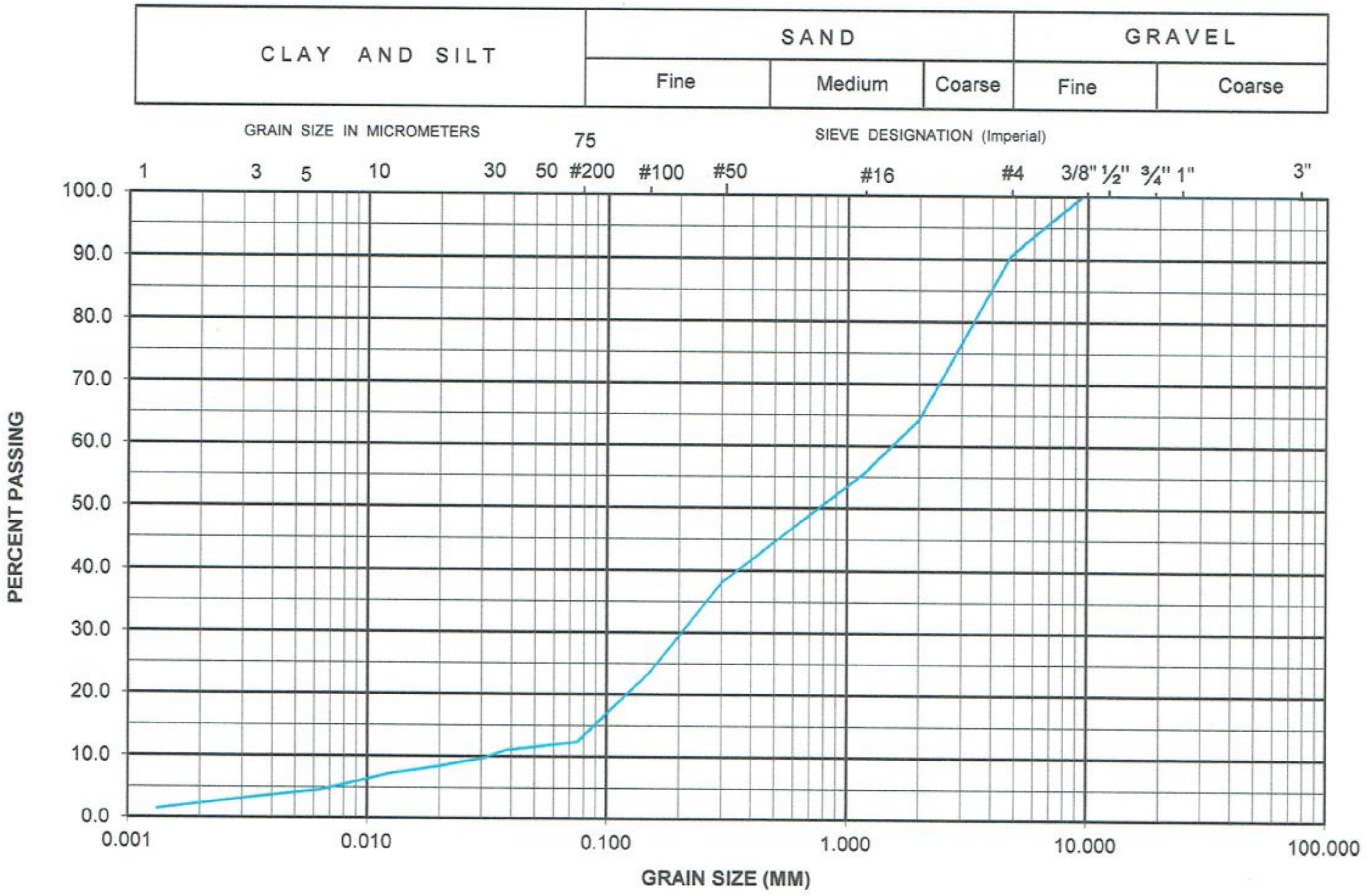
| | |
|---|---|
| **Gravel (> 4.75mm):** | 9.5 |
| **Sand (> 75μm, < 4.75mm):** | 78.1 |
| **Silt (> 2μm), < 75μm):** | 10.1 |
| **Clay (< 2μm):** | 2.3 |

***Sample Information***

**Sample Location:** 1
**Sample No.:** 6
**Sample Method:** SPT
**Depth (m):** 4.5 - 4.95
**Sample Description:** Brown Sand Till
some silt, some gravel, trace clay
**Sampled By:** S.R.
**Sampling Date:** 19/10/2017
**Client Sample ID:**
**Comments:**

| Grain Size (mm) | % Passing | Grain Size (mm) | % Passing |
|---|---|---|---|
| **75.00** | 100.0 | **0.009** | 5.9 |
| **26.50** | 100.0 | **0.006** | 4.6 |
| **19.00** | 100.0 | **0.003** | 3.3 |
| **13.25** | 100.0 | **0.001** | 1.5 |
| **9.50** | 100.0 | | |
| **4.75** | 90.5 | | |
| **2.00** | 64.3 | | |
| **1.180** | 55.6 | | |
| **0.600** | 46.9 | | |
| **0.300** | 38.1 | | |
| **0.150** | 23.5 | | |
| **0.075** | 12.4 | | |
| **0.038** | 11.1 | | |
| **0.031** | 9.8 | | |
| **0.020** | 8.5 | | |
| **0.012** | 7.2 | | |
| | | | |

UNIFIED SOIL CLASSIFICATION SYSTEM



**EDWARD WONG**

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# Grain Size Analysis and Hydrometer Test

**Sample Test No.:** 02995c-2 **Report No.:** 2 **Date Reported:** 27/10/2017

**Project No.:** Ma002995c
**Project Name:** 3728 Mayfield Road, Town of Caledon

***Grain Size Proportion (%)***

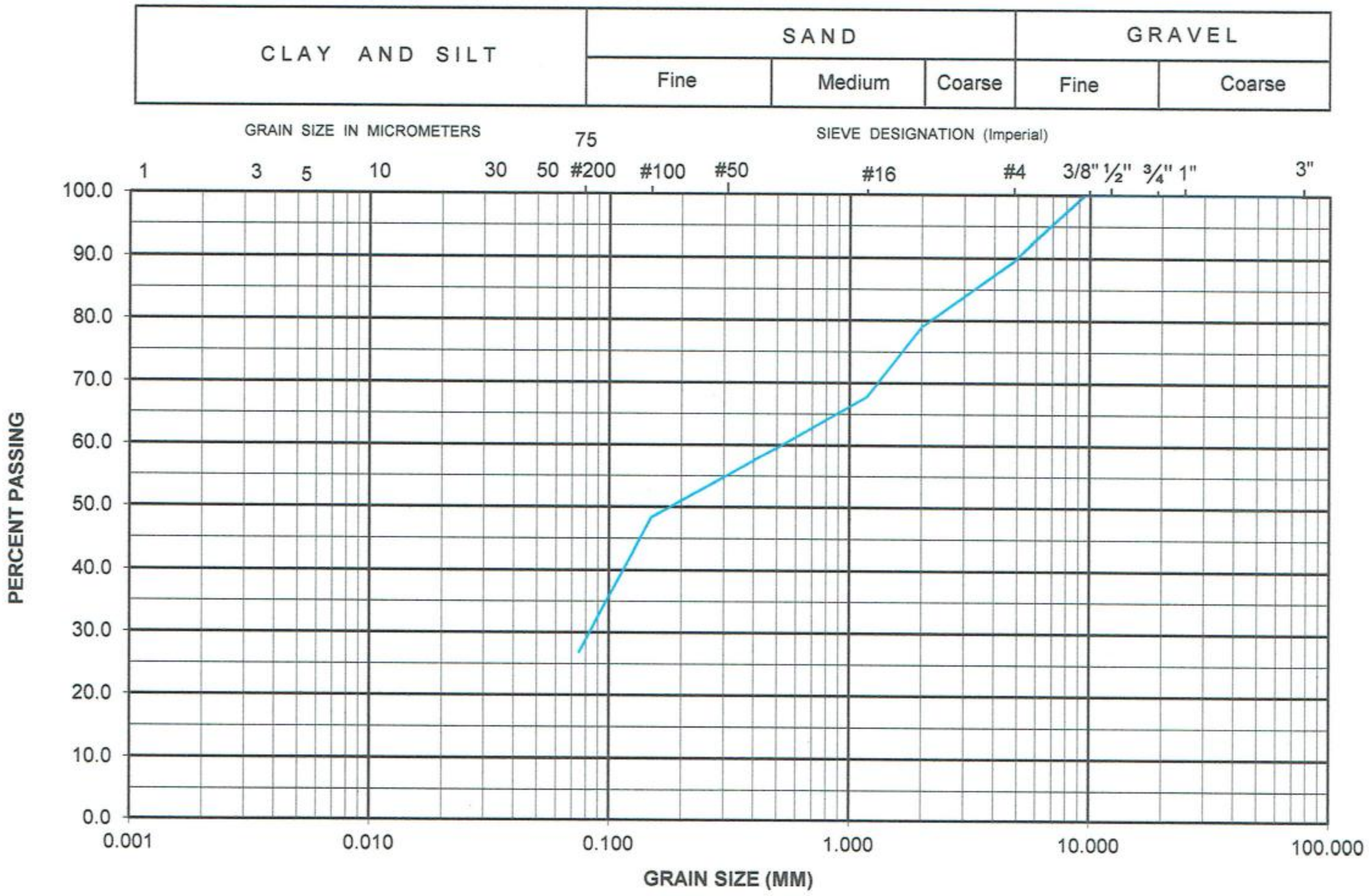
| | |
|---|---|
| **Gravel (> 4.75mm):** | 10.7 |
| **Sand (> 75μm, < 4.75mm):** | 62.4 |
| **Silt (> 2μm), < 75μm):** | 26.9 |
| **Clay (< 2μm):** | |

***Sample Information***

| | |
|---|---|
| **Sample Location:** | 2 |
| **Sample No.:** | 3 |
| **Sample Method:** | SPT |
| **Depth (m):** | 1.5-1.95 |
| **Sample Description:** | Brown Silty Sand some gravel |
| **Sampled By:** | S.R. |
| **Sampling Date:** | 18/10/2017 |
| **Client Sample ID:** | |
| **Comments:** | |

| Grain Size (mm) | % Passing | Grain Size (mm) | % Passing |
|---|---|---|---|
| **75.00** | 100.0 | | |
| **26.50** | 100.0 | | |
| **19.00** | 100.0 | | |
| **13.25** | 100.0 | | |
| **9.50** | 100.0 | | |
| **4.75** | 89.3 | | |
| **2.00** | 79.0 | | |
| **1.180** | 67.8 | | |
| **0.600** | 61.3 | | |
| **0.300** | 54.8 | | |
| **0.150** | 48.3 | | |
| **0.075** | 26.9 | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

UNIFIED SOIL CLASSIFICATION SYSTEM



EDWARD WONG

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Fax: (416) 221-0795

# Grain Size Analysis and Hydrometer Test

**Sample Test No.:** 02995c-3 **Report No.:** 3 **Date Reported:** 27/10/2017

**Project No.:** Ma002995c
**Project Name:** 3728 Mayfield Road, Town of Caledon

***Grain Size Proportion (%)***

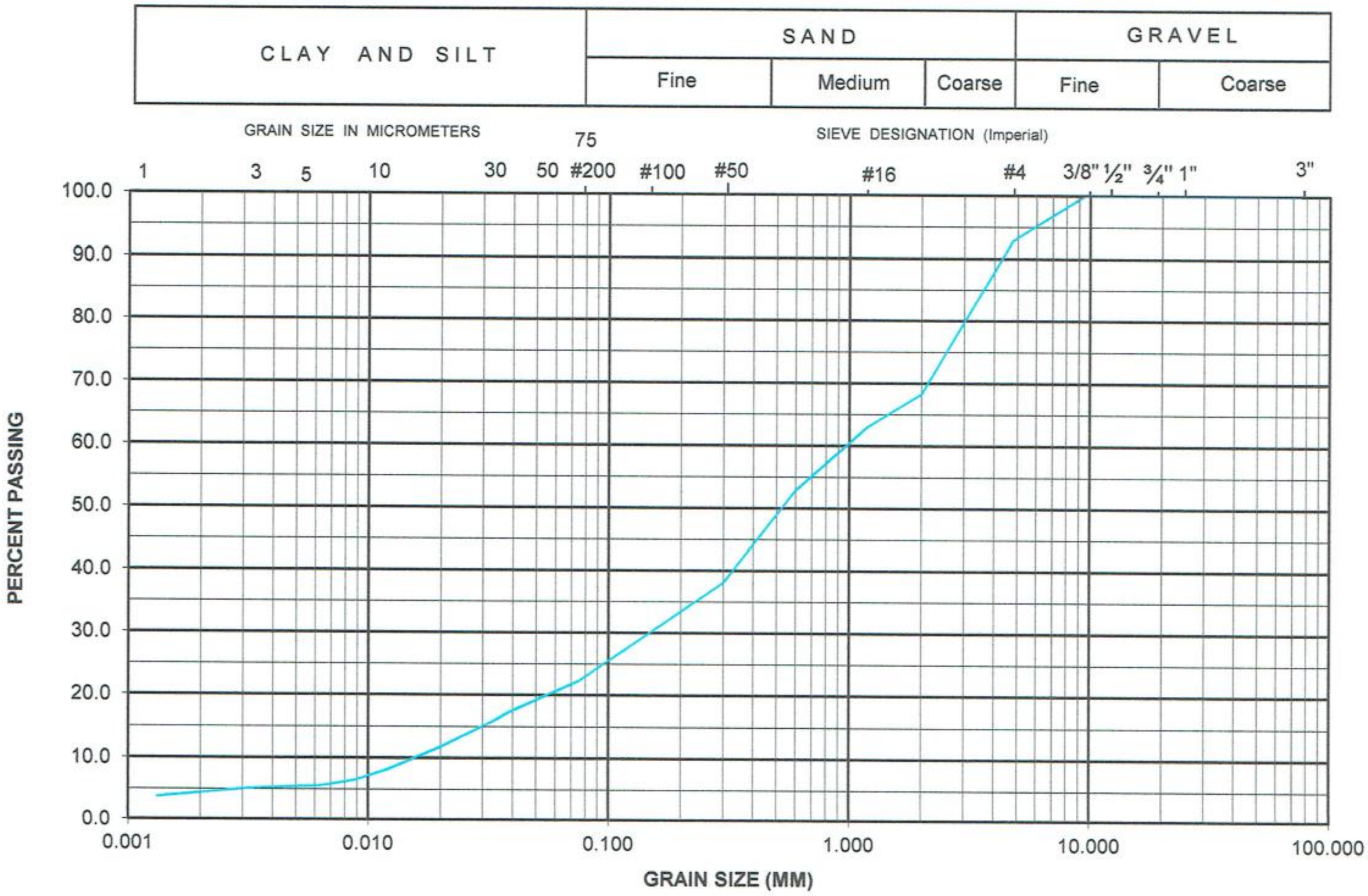
| | |
|---|---|
| **Gravel (> 4.75mm):** | **7.2** |
| **Sand (> 75μm, < 4.75mm):** | **70.5** |
| **Silt (> 2μm), < 75μm):** | **17.8** |
| **Clay (< 2μm):** | **4.5** |

***Sample Information***

| | |
|---|---|
| **Sample Location:** | 3 |
| **Sample No.:** | 6 |
| **Sample Method:** | SPT |
| **Depth (m):** | 4.5 - 4.95 |
| **Sample Description:** | Brown Fine to Medium Sand some silt trace gravel, trace clay |
| **Sampled By:** | S.R. |
| **Sampling Date:** | 19/10/2017 |
| **Client Sample ID:** | |
| **Comments:** | |

| Grain Size (mm) | % Passing | Grain Size (mm) | % Passing |
|---|---|---|---|
| **75.00** | 100.0 | **0.009** | 6.5 |
| **26.50** | 100.0 | **0.006** | 5.6 |
| **19.00** | 100.0 | **0.003** | 5.1 |
| **13.25** | 100.0 | **0.001** | 3.8 |
| **9.50** | 100.0 | | |
| **4.75** | 92.8 | | |
| **2.00** | 68.3 | | |
| **1.180** | 62.9 | | |
| **0.600** | 52.9 | | |
| **0.300** | 38.1 | | |
| **0.150** | 30.2 | | |
| **0.075** | 22.3 | | |
| **0.038** | 17.3 | | |
| **0.031** | 15.3 | | |
| **0.020** | 11.8 | | |
| **0.012** | 8.8 | | |
| | | | |

UNIFIED SOIL CLASSIFICATION SYSTEM



# Grain Size Analysis and Hydrometer Test

**Sample Test No.:** 02995c-4 **Report No.:** 4 **Date Reported:** 27/10/2017

**Project No.:** Ma002995c
**Project Name:** 3728 Mayfield Road, Town of Caledon

***Grain Size Proportion (%)***

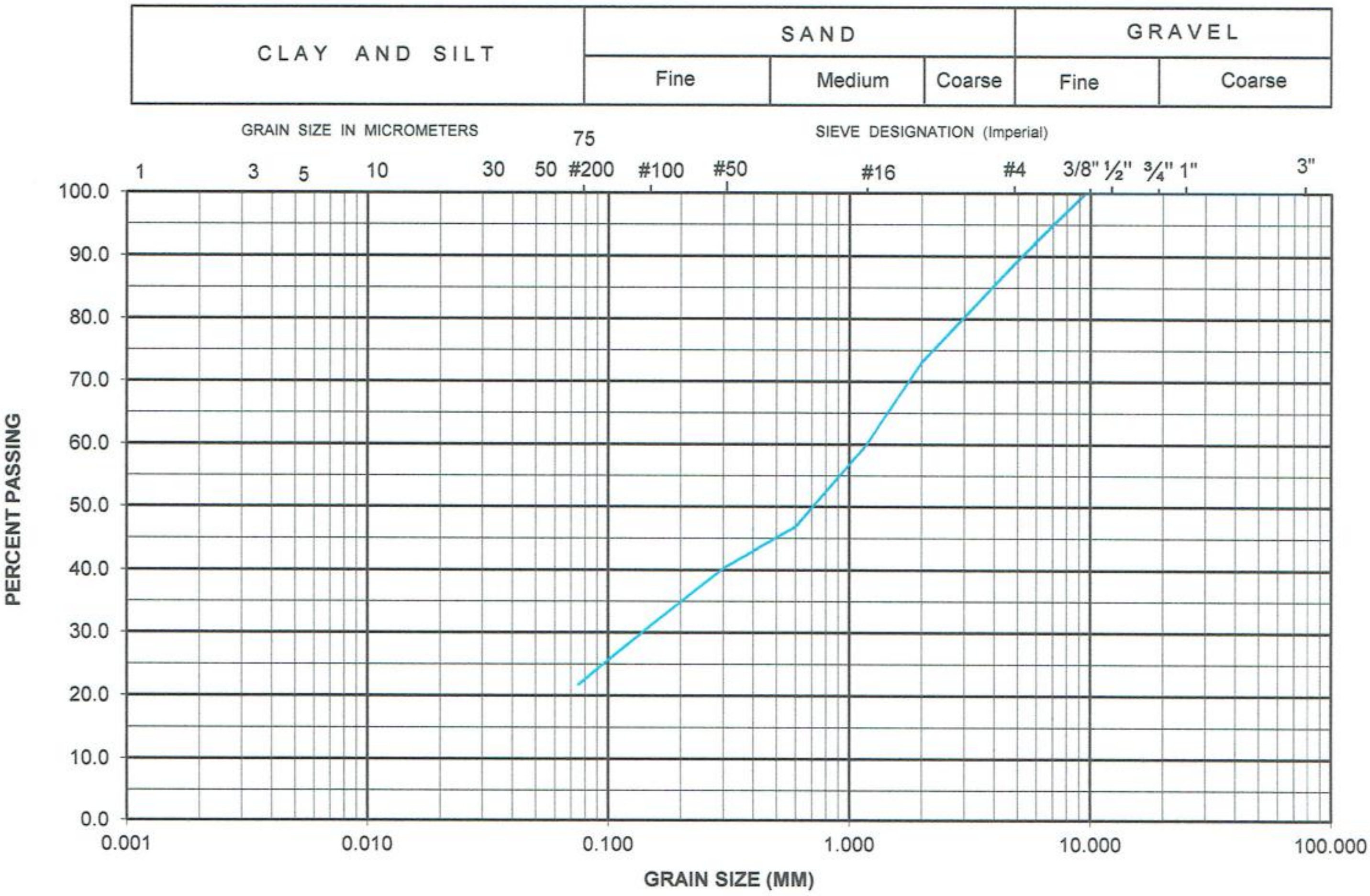
| | |
|---|---|
| **Gravel (> 4.75mm):** | 11.5 |
| **Sand (> 75μm, < 4.75mm):** | 66.7 |
| **Silt (> 2μm), < 75μm):** | 21.8 |
| **Clay (< 2μm):** | |

***Sample Information***

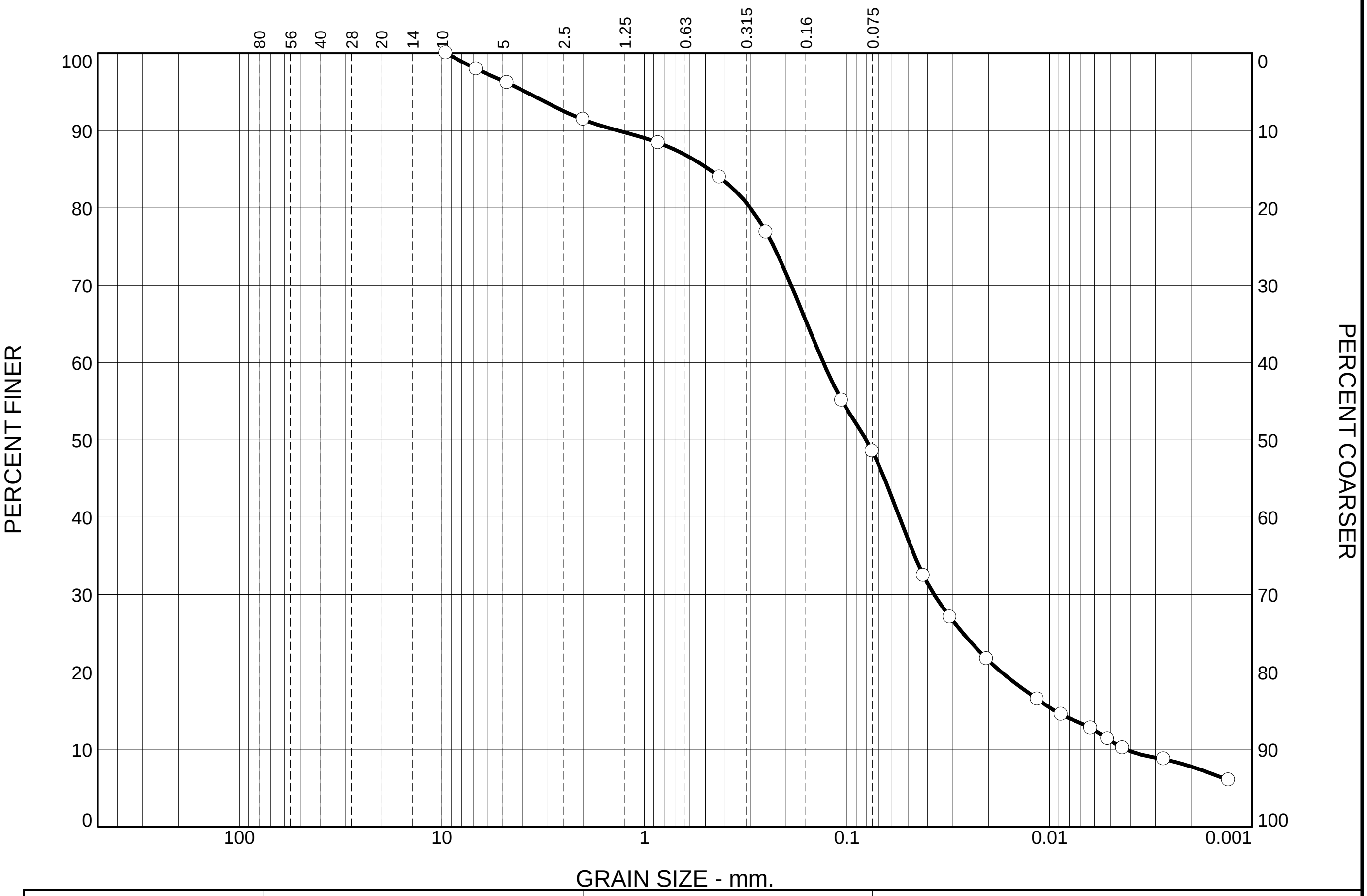
| | |
|---|---|
| **Sample Location:** | 6 |
| **Sample No.:** | 2 |
| **Sample Method:** | SPT |
| **Depth (m):** | 0.75 - 1.2 |
| **Sample Description:** | Brown Silty Sand some gravel |
| **Sampled By:** | S.R. |
| **Sampling Date:** | 18/10/2017 |
| **Client Sample ID:** | |
| **Comments:** | |

| Grain Size (mm) | % Passing | Grain Size (mm) | % Passing |
|---|---|---|---|
| **75.00** | 100.0 | | |
| **26.50** | 100.0 | | |
| **19.00** | 100.0 | | |
| **13.25** | 100.0 | | |
| **9.50** | 100.0 | | |
| **4.75** | 88.5 | | |
| **2.00** | 73.1 | | |
| **1.180** | 60.0 | | |
| **0.600** | 46.8 | | |
| **0.300** | 40.3 | | |
| **0.150** | 31.1 | | |
| **0.075** | 21.8 | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

UNIFIED SOIL CLASSIFICATION SYSTEM



# Particle Size Distribution Report



| | % +3" | % Gravel | % Sand | | % Fines | |
|---|---|---|---|---|---|---|
| | | | Coarse | Fine | Silt | Clay |
| ○ | 0.0 | 8.6 | 7.5 | 35.4 | 40.8 | 7.7 |
| | | | | | | |
| | | | | | | |

| ☒ | LL | PL | $D_{85}$ | $D_{60}$ | $D_{50}$ | $D_{30}$ | $D_{15}$ | $D_{10}$ | $C_c$ | $C_u$ |
|---|---|---|---|---|---|---|---|---|---|---|
| ○ | | | 0.4820 | 0.1309 | 0.0804 | 0.0372 | 0.0095 | 0.0042 | 2.49 | 30.93 |
| | | | | | | | | | | |
| | | | | | | | | | | |

| Material Description | USCS | AASHTO |
|---|---|---|
| ○ SAND AND SILT trace gravel trace clay | | |

**Project No.** CA20069 **Client:** RJBurnside

**Project:** RJB#300043952

○ **Sample Number:** MW22-1 SS9

**Remarks:**

○HYDROMETER DETAILS: Spec. Grav. 2.75(assumed);Vb=53cm^3; L2=13.8cm; L1=10.7cm; hs= 0.16cm/Div; A=30.2cm^2; Mass of Disp. Agent=24g/1 Test Date: March 15, 2023

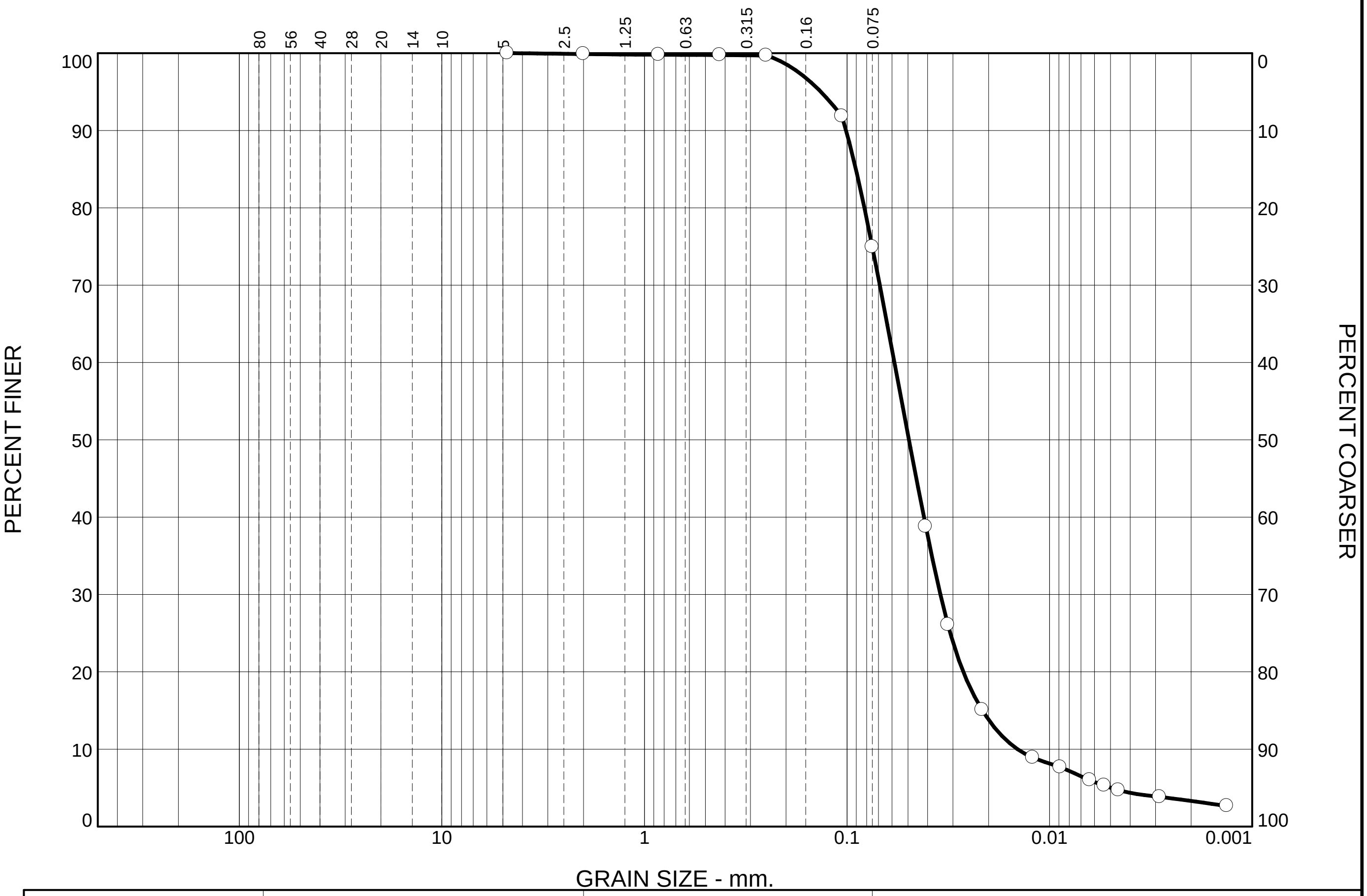
**Terrapex**

**Toronto, Ontario**

**Figure** 1

**Tested By:** AC

# Particle Size Distribution Report



| | % +3" | % Gravel | % Sand | | % Fines | |
|---|---|---|---|---|---|---|
| | | | Coarse | Fine | Silt | Clay |
| ○ | 0.0 | 0.1 | 0.2 | 24.8 | 71.6 | 3.3 |
| | | | | | | |
| | | | | | | |

| | LL | PL | $D_{85}$ | $D_{60}$ | $D_{50}$ | $D_{30}$ | $D_{15}$ | $D_{10}$ | $C_c$ | $C_u$ |
|---|---|---|---|---|---|---|---|---|---|---|
| ○ | | | 0.0904 | 0.0583 | 0.0495 | 0.0346 | 0.0214 | 0.0144 | 1.43 | 4.06 |
| | | | | | | | | | | |
| | | | | | | | | | | |

| Material Description | USCS | AASHTO |
|---|---|---|
| ○ SANDY SILT trace clay | | |

**Project No.** CA20069 **Client:** RJBurnside

**Project:** RJB#300043952

○ **Sample Number:** MW22-1 SS11

**Terrapex**

**Toronto, Ontario**

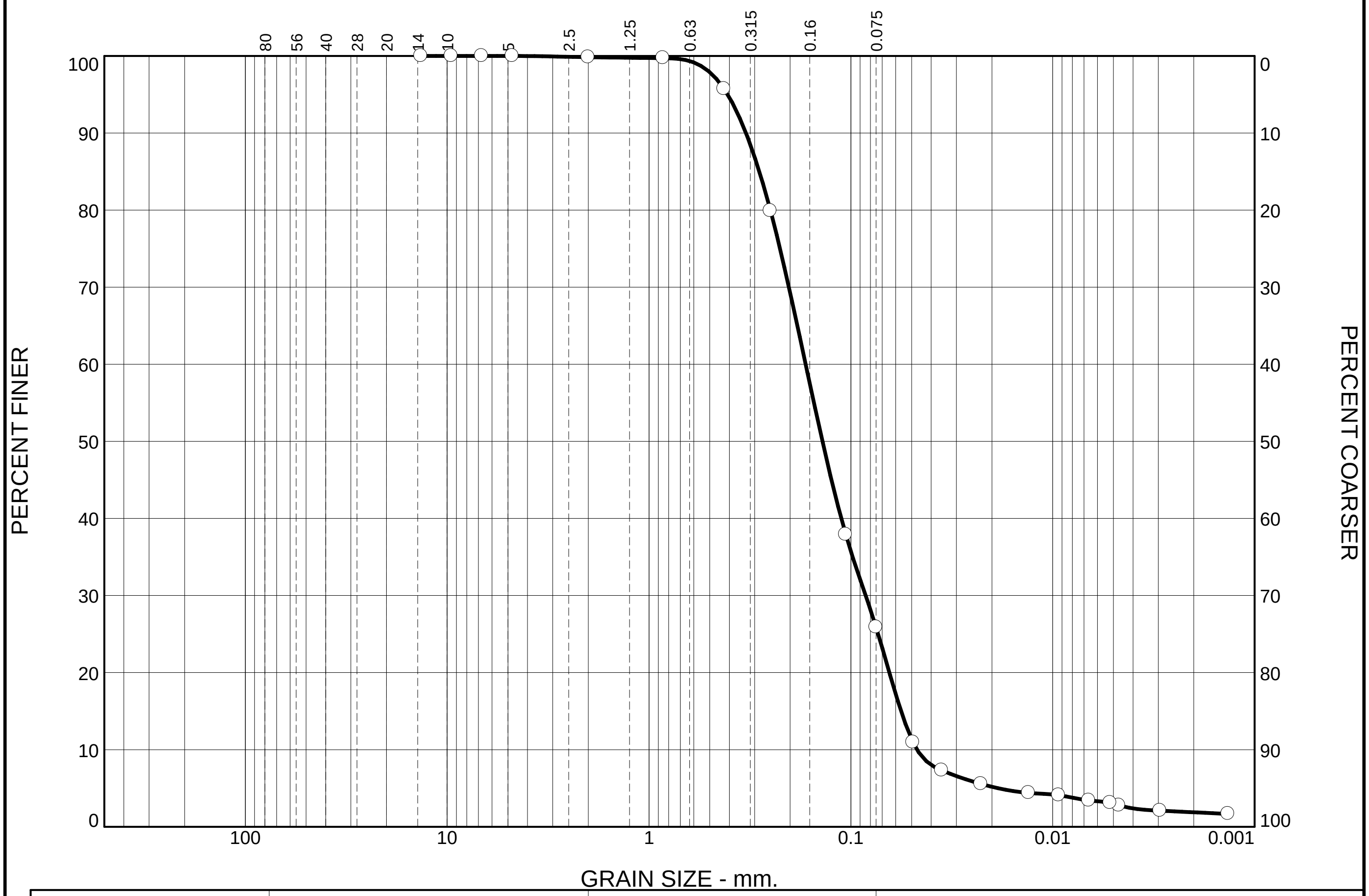
**Remarks:**

○HYDROMETER DETAILS: Spec. Grav. 2.75(assumed);Vb=53cm^3; L2=13.8cm; L1=10.7cm; hs= 0.16cm/Div; A=30.2cm^2; Mass of Disp. Agent=24g/1 Test Date: March 15, 2023

**Figure** 2

**Tested By:** AC

# Particle Size Distribution Report



|  | % +3" | % Gravel | % Sand |  | % Fines |  |
|---|---|---|---|---|---|---|
|  |  |  | Coarse | Fine | Silt | Clay |
| ○ | 0.0 | 0.2 | 4.1 | 69.8 | 24.0 | 1.9 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

| ☒ | LL | PL | $D_{85}$ | $D_{60}$ | $D_{50}$ | $D_{30}$ | $D_{15}$ | $D_{10}$ | $C_c$ | $C_u$ |
|---|---|---|---|---|---|---|---|---|---|---|
| ○ |  |  | 0.2841 | 0.1675 | 0.1383 | 0.0845 | 0.0564 | 0.0470 | 0.91 | 3.56 |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |

| Material Description | USCS | AASHTO |
|---|---|---|
| ○ SILTY SAND trace clay |  |  |

**Project No.** CA20069 **Client:** RJBurnside
**Project:** RJB#300043952

○ **Sample Number:** MW22-1 SS14

**Terrapex**

**Toronto, Ontario**

**Remarks:**
○HYDROMETER DETAILS: Spec. Grav. 2.75(assumed);Vb=53cm^3; L2=13.8cm; L1=10.7cm; hs= 0.16cm/Div; A=30.2cm^2; Mass of Disp. Agent=24g/1 Test Date: March 15, 2023

**Figure** 3

**Tested By:** AC

BURNSIDE

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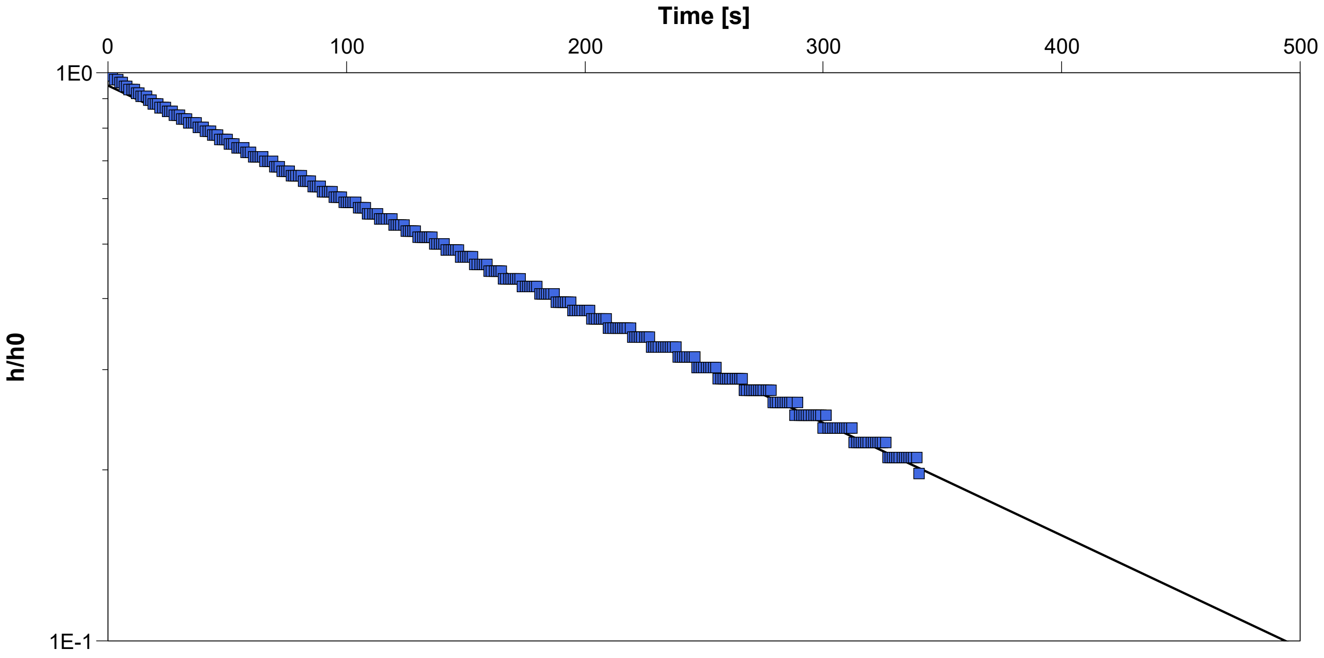
# Appendix D

## Single Well Response Tests

| | |
|---|---|
| | **Slug Test Analysis Report** |
| | Project: Snell's Hollow |
| | Number: 300043952.0000 |
| | Client: Snell’s Hollow Developers Group |

| | | |
|---|---|---|
| Location: Brampton, Ontario | Slug Test: Slug Test | Test Well: MW2S |
| Test Conducted by: MV | | Test Date: 1/29/2020 |
| Analysis Performed by: MV | Screened in Silty Clay | Analysis Date: 4/5/2020 |
| Aquifer Thickness: | | |

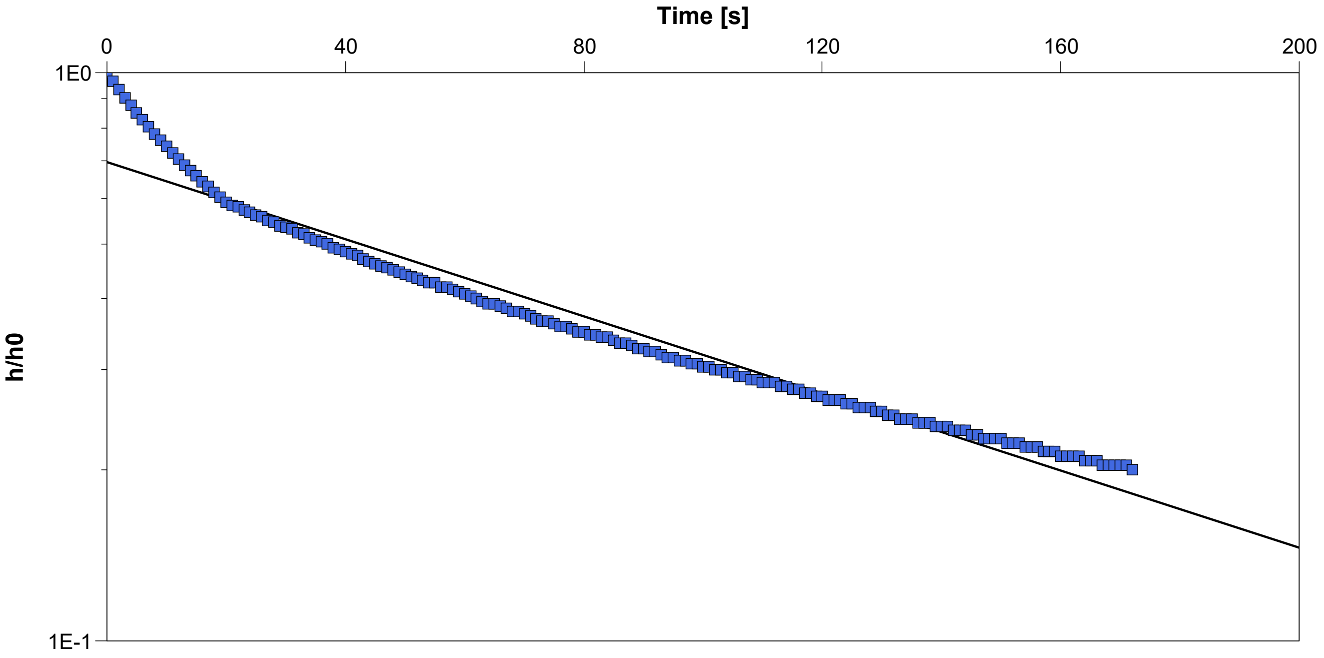


Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity [cm/s] | |
|---|---|---|
| MW2S | $3.97 \times 10^{-4}$ | |

| | |
|---|---|
| BURNSIDE | **Slug Test Analysis Report** |
| | Project: Snell's Hollow |
| | Number: 300043952.0000 |
| | Client: Snell's Hollow Developers Group |

| | | |
|---|---|---|
| Location: Brampton, Ontario | Slug Test: Slug Test | Test Well: MW3 |
| Test Conducted by: MV | | Test Date: 1/30/2020 |
| Analysis Performed by: MV | Screened in Sandy Silt & Clayey Silt | Analysis Date: 4/5/2020 |
| Aquifer Thickness: | | |

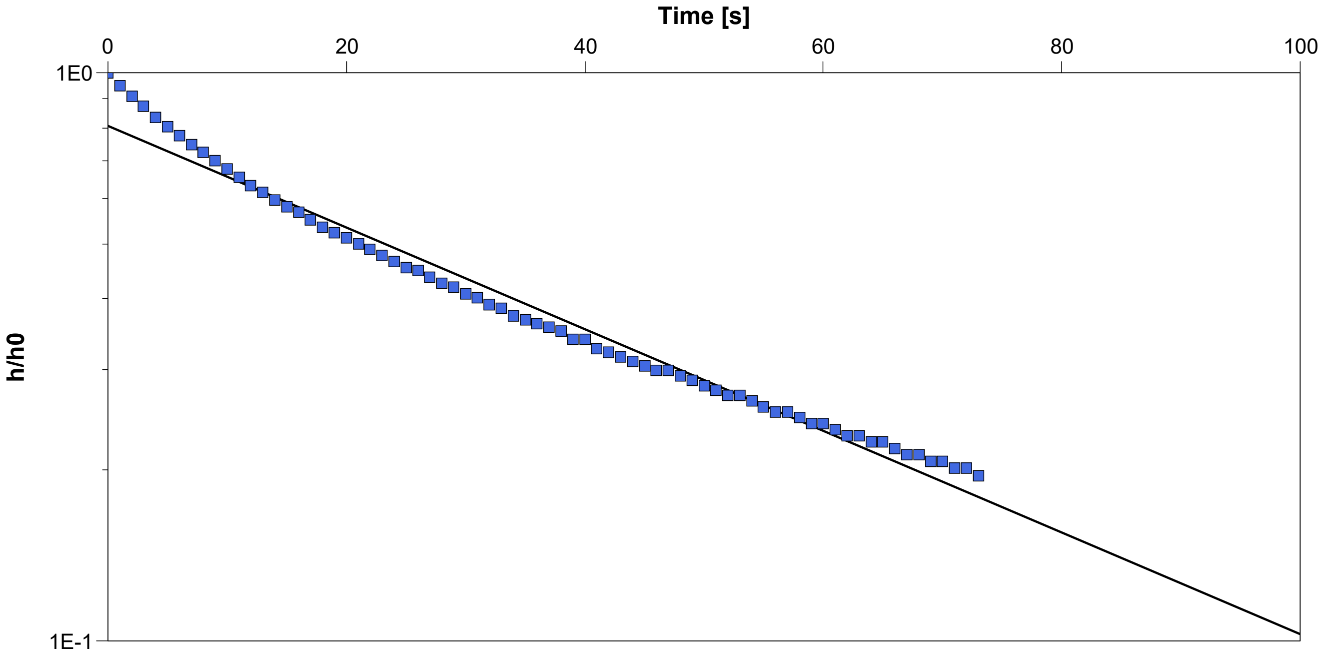


Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity<br>[cm/s] | |
|---|---|---|
| MW3 | $3.99 \times 10^{-4}$ | |

| | |
|---|---|
| BURNSIDE | **Slug Test Analysis Report** |
| | Project: Snell's Hollow |
| | Number: 300043952.0000 |
| | Client: Snell’s Hollow Developers Group |

| | | |
|---|---|---|
| Location: Brampton, Ontario | Slug Test: Slug Test | Test Well: MW4S |
| Test Conducted by: MV | | Test Date: 1/30/2020 |
| Analysis Performed by: MV | Screened in Sandy Silty Clay | Analysis Date: 4/5/2020 |
| Aquifer Thickness: | | |

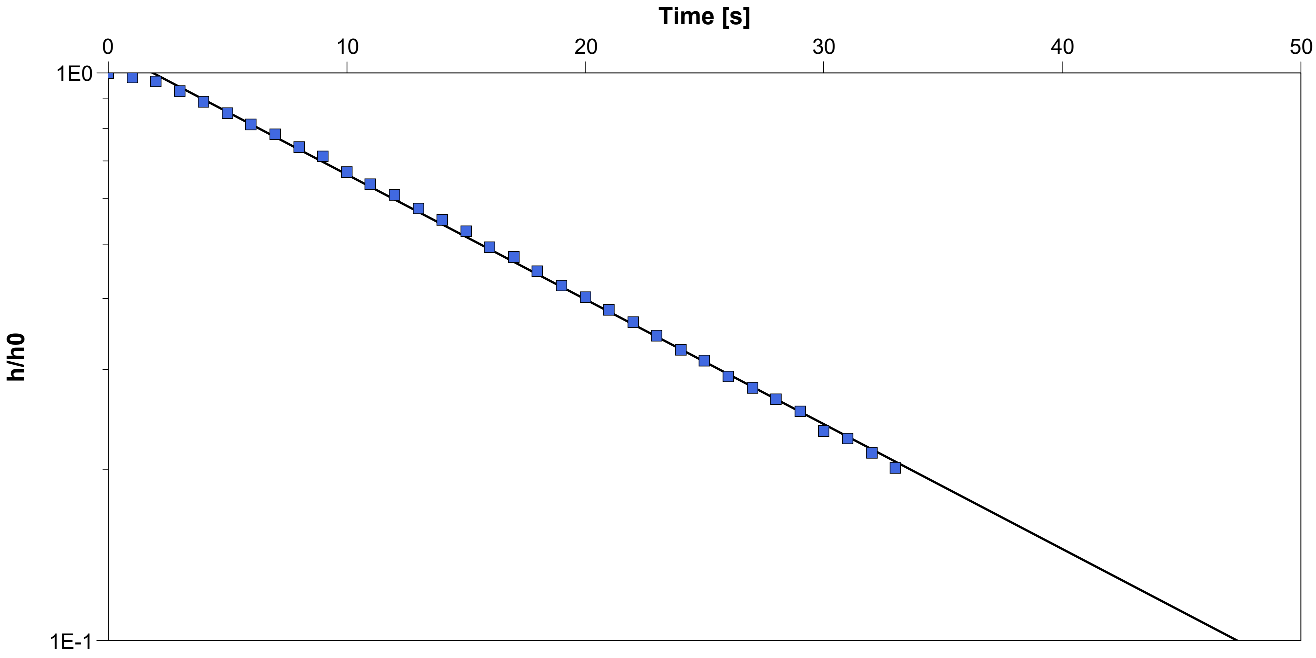


Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity [cm/s] | |
|---|---|---|
| MW4S | $1.05 \times 10^{-3}$ | |

| | |
|---|---|
| BURNSIDE | **Slug Test Analysis Report** |
| | Project: Snell's Hollow |
| | Number: 300043952.0000 |
| | Client: Snell's Hollow Developers Group |

| | | |
|---|---|---|
| Location: Brampton, Ontario | Slug Test: Slug Test | Test Well: MW4D |
| Test Conducted by: MV | | Test Date: 1/30/2020 |
| Analysis Performed by: MV | Screened in Sand | Analysis Date: 4/5/2020 |
| Aquifer Thickness: | | |

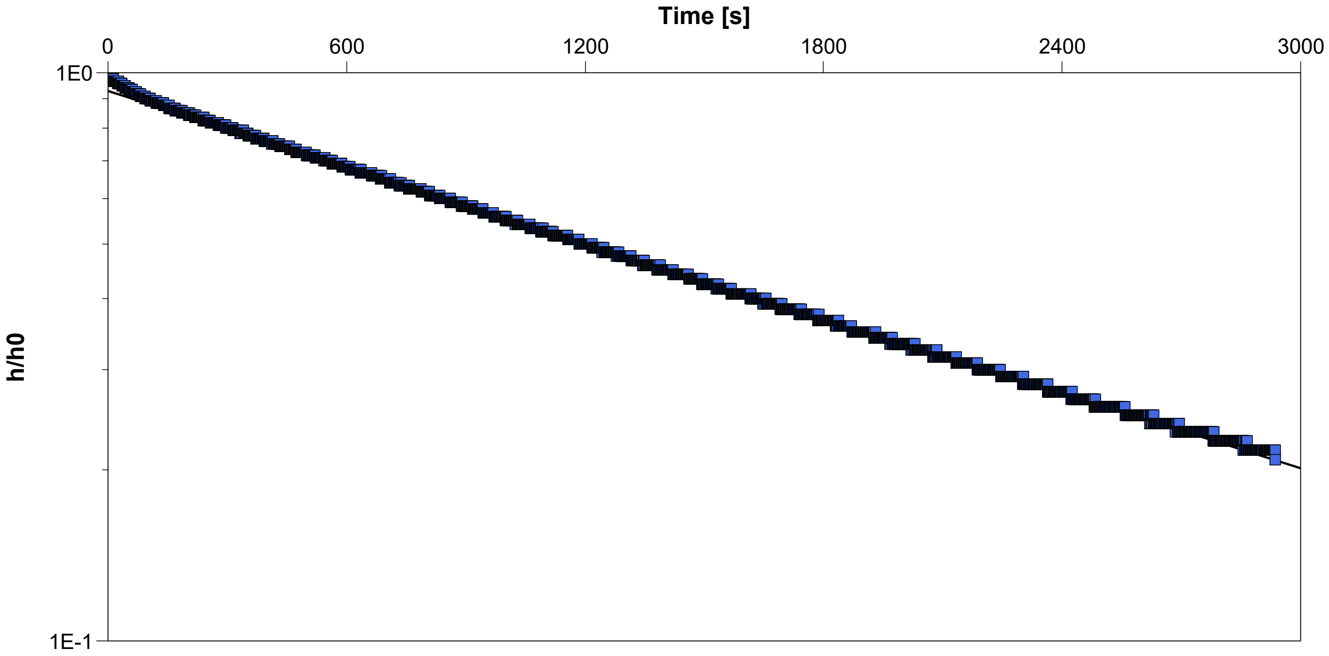


Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity [cm/s] | |
|---|---|---|
| MW4D | $4.42 \times 10^{-3}$ | |

| | |
|---|---|
| | **Slug Test Analysis Report** |
| | Project: Snell's Hollow |
| | Number: 300043952.0000 |
| | Client: Snell’s Hollow Developers Group |

| | | |
|---|---|---|
| Location: Brampton, Ontario | Slug Test: Slug Test | Test Well: MW8 |
| Test Conducted by: Matt Valeriote | | Test Date: 1/29/2020 |
| Analysis Performed by: MV | Screened in Silty Clay and Clayey Silt | Analysis Date: 4/5/2020 |
| Aquifer Thickness: | | |

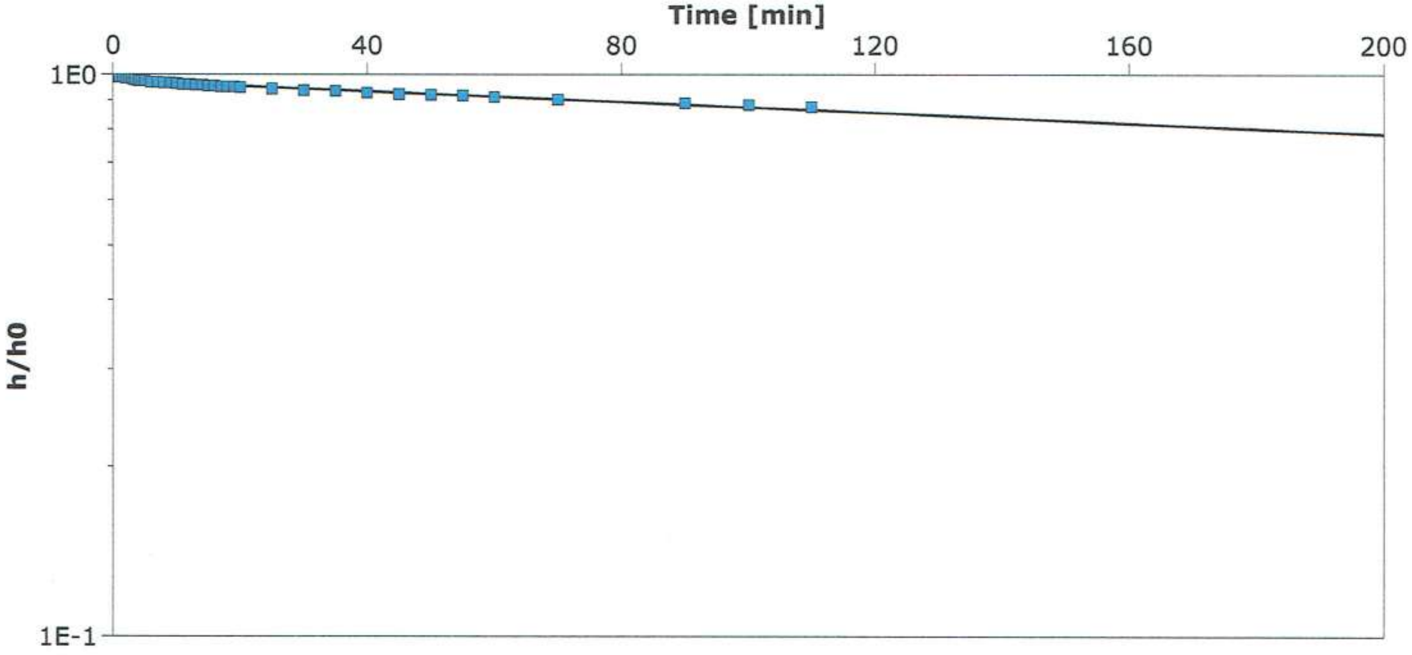


Calculation using Hvorslev

| Observation Well | Hydraulic Conductivity [cm/s] | |
|---|---|---|
| MW8 | $2.60 \times 10^{-5}$ | |

|  |  |
|---|---|
| **Edward Wong & Associates Inc.**<br>**441 Esna Park Drive, Unit 19**<br>**Markham, Ontario**<br>**L3R 1H7** | **Slug Test Analysis Report**<br>Project: 3728 Mayfield Road<br>Number: Ma002995c<br>Client: Mr. Dilip Kumar Jain |

|  |  |  |
|---|---|---|
| Location: Town of Caledon | Slug Test: Slug Test 1 | Test Well: Borehole 5 |
| Test conducted by: Sofel Rana |  | Test date: 10/26/2017 |
| Analysis performed by: Sofel Rana | New analysis 1 | Analysis date: 10/26/2017 |
| Aquifer Thickness: |  |  |



Calculation after Hvorslev

| Observation well | Hydraulic Conductivity [m/s] |  |
|---|---|---|
| Borehole 5 | $7.80 \times 10^{-9}$ |  |

BURNSIDE

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# Appendix E

## Groundwater Elevations

# Table E-1
## Groundwater Elevations - Monitoring Wells and Piezometers

| Instrument | Well Depth (mbgs) | Ground Surface Elevation (masl) | 17-Apr-19 | | 2-May-19 | | 22-May-19 | | 19-Jun-19 | | 24-Jul-19 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) |
| **MW19-01** | 7.69 | 266.55 | 3.80 | 262.75 | 3.18 | 263.37 | 3.37 | 263.18 | 3.50 | 263.05 | 4.12 | 262.43 |
| **MW19-02s** | 3.57 | 256.99 | 0.24 | 256.75 | - | - | 0.36 | 256.63 | 0.71 | 256.28 | 1.29 | 255.70 |
| **MW19-02d** | 12.86 | 257.02 | 6.33 | 250.69 | - | - | 6.23 | 250.79 | 6.11 | 250.91 | 6.11 | 250.91 |
| **MW19-03** | 9.30 | 266.41 | 7.34 | 259.07 | - | - | 6.71 | 259.70 | 7.15 | 259.26 | 8.30 | 258.11 |
| **MW19-04s** | 7.92 | 265.68 | 3.49 | 262.19 | 2.23 | 263.45 | 3.22 | 262.46 | 4.73 | 260.95 | 5.10 | 260.58 |
| **MW19-04d** | 16.39 | 265.86 | 14.57 | 251.29 | 14.49 | 251.37 | 14.40 | 251.46 | 14.24 | 251.62 | 14.24 | 251.62 |
| **MW19-05** | 8.42 | 270.24 | 8.40 | 261.84 | 8.40 | 261.85 | 8.38 | 261.86 | 8.37 | 261.87 | 8.37 | 261.87 |
| **MW19-06** | 6.90 | 261.50 | -0.43 | 261.93 | - | - | -0.29 | 261.79 | 0.12 | 261.38 | 0.79 | 260.71 |
| **MW19-07s** | 6.91 | 264.28 | 6.84 | 257.44 | 6.84 | 257.44 | 6.84 | 257.44 | 6.84 | 257.44 | 6.84 | 257.44 |
| **MW19-07d** | 13.60 | 264.40 | 12.79 | 251.61 | 12.64 | 251.76 | 12.51 | 251.89 | 12.43 | 251.97 | 12.51 | 251.89 |
| **MW19-08** | 5.23 | 262.75 | 1.29 | 261.46 | 0.41 | 262.34 | 0.56 | 262.19 | 1.82 | 260.93 | 2.64 | 260.11 |
| **MW19-09** | 7.60 | 256.39 | 6.53 | 249.86 | - | - | 6.37 | 250.02 | 6.27 | 250.12 | 6.29 | 250.10 |
| **MW19-13** | 9.74 | 266.98 | 9.57 | 257.41 | - | - | 9.57 | 257.41 | 9.64 | 257.34 | 9.56 | 257.42 |
| **MW22-1** | 16.76 | 263.80 | - | - | - | - | - | - | - | - | - | - |
| **BH2** | 5.93 | 263.11 | - | - | - | - | - | - | - | - | - | - |
| **BH3** | 5.76 | 260.05 | 3.00 | 257.05 | - | - | 2.53 | 257.52 | 3.12 | 256.93 | 3.91 | 256.14 |
| **BH5** | 4.56 | 257.98 | - | - | - | - | - | - | - | - | - | - |
| **PZ1s** | 0.76 | 259.88 | - | - | Dry | Dry | -0.01 | 259.89 | 0.02 | 259.86 | 0.06 | 259.82 |
| **PZ1d** | 1.55 | 259.94 | - | - | Dry | Dry | 1.14 | 258.80 | 0.92 | 259.02 | 0.73 | 259.21 |
| **PZ2s** | 1.32 | 256.44 | - | - | Dry | Dry | 0.86 | 255.58 | 0.61 | 255.83 | - | - |
| **PZ2d** | 1.91 | 256.46 | - | - | Dry | Dry | 0.84 | 255.62 | 0.45 | 256.01 | - | - |
| **PZ3s** | 1.34 | 255.78 | - | - | 0.91 | 254.87 | 0.04 | 255.74 | 0.09 | 255.69 | 0.22 | 255.56 |
| **PZ3d** | 1.86 | 255.72 | - | - | 1.39 | 254.33 | 0.02 | 255.70 | 0.09 | 255.63 | 0.23 | 255.49 |
| **PZ4s** | 1.30 | 255.24 | - | - | 1.25 | 253.99 | 0.51 | 254.73 | 0.20 | 255.04 | 0.11 | 255.13 |
| **PZ4d** | 1.59 | 255.24 | - | - | Dry | Dry | 0.79 | 254.45 | 0.27 | 254.97 | 0.18 | 255.06 |
| **PZ5s** | 1.23 | 260.39 | - | - | Dry | Dry | 0.34 | 260.05 | 0.60 | 259.79 | 0.84 | 259.55 |
| **PZ5d** | 1.78 | 260.40 | - | - | Dry | Dry | 0.73 | 259.67 | 0.61 | 259.79 | 0.94 | 259.46 |
| **PZ6s** | 1.27 | 255.87 | - | - | Dry | Dry | 0.23 | 255.64 | 0.17 | 255.70 | 0.32 | 255.55 |
| **PZ6d** | 1.79 | 255.86 | - | - | 1.50 | 254.36 | 1.04 | 254.82 | 0.60 | 255.26 | 0.46 | 255.40 |

'-' denotes data unavailable

'--' denotes well removed

mbgs - metres below ground level

masl - metres above sea level

Underlined - estimated ground elevation

# Table E-1
# Groundwater Elevations - Monitoring Wells and Piezometers

| Instrument | Well Depth (mbgs) | Ground Surface Elevation (masl) | 27-Aug-19 | | 25-Sep-19 | | 1-Nov-19 | | 26-Nov-19 | | 20-Dec-19 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) |
| **MW19-01** | 7.69 | 266.55 | 5.34 | 261.21 | 6.87 | 259.68 | 7.61 | 258.94 | 6.70 | 259.85 | 4.29 | 262.26 |
| **MW19-02s** | 3.57 | 256.99 | 1.69 | 255.30 | 1.98 | 255.01 | 1.42 | 255.57 | 0.77 | 256.22 | 0.63 | 256.36 |
| **MW19-02d** | 12.86 | 257.02 | 6.10 | 250.92 | 6.13 | 250.89 | 6.25 | 250.77 | 6.24 | 250.78 | 6.32 | 250.70 |
| **MW19-03** | 9.30 | 266.41 | 9.20 | 257.21 | 9.21 | 257.20 | 9.23 | 257.18 | 9.23 | 257.18 | 9.21 | 257.20 |
| **MW19-04s** | 7.92 | 265.68 | 5.33 | 260.35 | 5.47 | 260.21 | 5.59 | 260.09 | 5.60 | 260.08 | 5.48 | 260.20 |
| **MW19-04d** | 16.39 | 265.86 | 14.23 | 251.63 | 14.27 | 251.59 | 14.42 | 251.44 | 14.40 | 251.46 | 14.52 | 251.34 |
| **MW19-05** | 8.42 | 270.24 | 8.36 | 261.88 | 8.35 | 261.89 | 8.33 | 261.91 | 8.33 | 261.91 | 8.34 | 261.90 |
| **MW19-06** | 6.90 | 261.50 | 1.11 | 260.39 | 1.43 | 260.07 | 1.60 | 259.90 | 0.64 | 260.86 | 0.45 | 261.05 |
| **MW19-07s** | 6.91 | 264.28 | 6.85 | 257.43 | 6.85 | 257.43 | 6.84 | 257.44 | 6.84 | 257.44 | 6.85 | 257.43 |
| **MW19-07d** | 13.60 | 264.40 | 12.54 | 251.86 | 12.60 | 251.80 | 12.52 | 251.88 | 12.67 | 251.73 | 12.71 | 251.69 |
| **MW19-08** | 5.23 | 262.75 | 3.34 | 259.41 | 3.98 | 258.77 | 4.35 | 258.40 | 4.72 | 258.03 | 3.46 | 259.29 |
| **MW19-09** | 7.60 | 256.39 | 6.31 | 250.08 | 6.35 | 250.04 | 6.46 | 249.93 | 6.47 | 249.92 | 6.52 | 249.87 |
| **MW19-13** | 9.74 | 266.98 | 9.66 | 257.32 | 9.68 | 257.30 | 9.38 | 257.60 | Dry | Dry | 9.57 | 257.41 |
| **MW22-1** | 16.76 | 263.80 | - | - | - | - | - | - | - | - | - | - |
| **BH2** | 5.93 | 263.11 | - | - | - | - | - | - | - | - | - | - |
| **BH3** | 5.76 | 260.05 | 4.41 | 255.64 | 4.76 | 255.29 | 5.17 | 254.88 | 5.35 | 254.70 | 5.22 | 254.83 |
| **BH5** | 4.56 | 257.98 | - | - | - | - | - | - | - | - | - | - |
| **PZ1s** | 0.76 | 259.88 | 0.24 | 259.64 | 0.16 | 259.72 | 0.10 | 259.78 | 0.07 | 259.81 | 0.10 | 259.78 |
| **PZ1d** | 1.55 | 259.94 | 0.63 | 259.31 | 0.58 | 259.36 | 0.52 | 259.42 | 0.47 | 259.47 | 0.49 | 259.45 |
| **PZ2s** | 1.32 | 256.44 | 0.87 | 255.57 | 1.19 | 255.25 | 1.19 | 255.25 | 0.94 | 255.50 | 0.82 | 255.62 |
| **PZ2d** | 1.91 | 256.46 | 0.88 | 255.58 | 1.26 | 255.20 | 1.57 | 254.89 | 1.02 | 255.44 | 0.70 | 255.76 |
| **PZ3s** | 1.34 | 255.78 | 0.44 | 255.34 | 0.53 | 255.25 | 0.55 | 255.23 | 0.33 | 255.45 | 0.22 | 255.56 |
| **PZ3d** | 1.86 | 255.72 | 0.53 | 255.19 | 0.63 | 255.09 | 0.44 | 255.28 | 0.24 | 255.48 | 0.16 | 255.56 |
| **PZ4s** | 1.30 | 255.24 | 0.48 | 254.76 | 0.71 | 254.53 | 0.82 | 254.42 | 0.44 | 254.80 | 0.23 | 255.01 |
| **PZ4d** | 1.59 | 255.24 | 0.34 | 254.90 | 0.57 | 254.67 | 0.77 | 254.47 | 0.60 | 254.64 | 0.45 | 254.79 |
| **PZ5s** | 1.23 | 260.39 | 1.10 | 259.29 | 1.21 | 259.18 | Dry | Dry | Dry | Dry | 1.03 | 259.36 |
| **PZ5d** | 1.78 | 260.40 | 1.29 | 259.11 | 1.43 | 258.97 | Dry | Dry | Dry | Dry | 1.53 | 258.87 |
| **PZ6s** | 1.27 | 255.87 | 0.53 | 255.34 | 0.55 | 255.32 | 0.42 | 255.45 | 0.31 | 255.56 | 0.26 | 255.61 |
| **PZ6d** | 1.79 | 255.86 | 0.48 | 255.38 | 0.52 | 255.34 | 0.49 | 255.37 | 0.41 | 255.45 | 0.38 | 255.48 |

'-' denotes data unavailable
'--' denotes well removed
mbgs - metres below ground level
masl - metres above sea level
Underlined - estimated ground elevation

# Table E-1
# Groundwater Elevations - Monitoring Wells and Piezometers

| Instrument | Well Depth (mbgs) | Ground Surface Elevation (masl) | 30-Jan-20 | | 22-Feb-20 | | 19-Mar-20 | | 20-Apr-20 | | 28-May-20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) |
| **MW19-01** | 7.69 | 266.55 | 2.93 | 263.62 | 3.13 | 263.42 | 2.60 | 263.95 | 2.83 | 263.72 | 3.38 | 263.17 |
| **MW19-02s** | 3.57 | 256.99 | 0.15 | 256.84 | 0.30 | 256.69 | 0.23 | 256.76 | 0.38 | 256.61 | 0.58 | 256.41 |
| **MW19-02d** | 12.86 | 257.02 | 6.24 | 250.78 | 6.14 | 250.88 | 6.09 | 250.93 | 5.99 | 251.03 | 5.95 | 251.07 |
| **MW19-03** | 9.30 | 266.41 | 7.79 | 258.62 | 7.23 | 259.18 | 6.73 | 259.68 | 6.97 | 259.44 | 8.13 | 258.28 |
| **MW19-04s** | 7.92 | 265.68 | 3.04 | 262.64 | 4.39 | 261.29 | 2.89 | 262.79 | 4.19 | 261.49 | 5.08 | 260.60 |
| **MW19-04d** | 16.39 | 265.86 | 14.41 | 251.45 | 14.29 | 251.57 | 14.24 | 251.62 | 14.12 | 251.74 | 14.09 | 251.77 |
| **MW19-05** | 8.42 | 270.24 | 8.34 | 261.90 | 8.34 | 261.90 | 8.34 | 261.90 | 8.32 | 261.92 | 8.34 | 261.90 |
| **MW19-06** | 6.90 | 261.50 | Frozen | Frozen | -0.44 | 261.94 | -0.33 | 261.83 | -0.09 | 261.59 | 0.42 | 261.08 |
| **MW19-07s** | 6.91 | 264.28 | 6.95 | 257.33 | 6.87 | 257.41 | 6.86 | 257.42 | 6.86 | 257.42 | 6.86 | 257.42 |
| **MW19-07d** | 13.60 | 264.40 | 12.58 | 251.82 | 12.52 | 251.88 | 12.43 | 251.97 | 12.32 | 252.08 | 12.37 | 252.03 |
| **MW19-08** | 5.23 | 262.75 | 0.29 | 262.46 | 1.25 | 261.50 | 0.48 | 262.27 | 0.85 | 261.90 | 2.09 | 260.66 |
| **MW19-09** | 7.60 | 256.39 | 6.41 | 249.98 | 6.35 | 250.04 | 6.31 | 250.08 | 6.22 | 250.17 | 6.22 | 250.17 |
| **MW19-13** | 9.74 | 266.98 | 9.62 | 257.36 | 9.67 | 257.31 | 9.32 | 257.66 | 9.40 | 257.58 | 9.65 | 257.33 |
| **MW22-1** | 16.76 | 263.80 | - | - | - | - | - | - | - | - | - | - |
| **BH2** | 5.93 | 263.11 | - | - | 2.61 | 260.50 | 1.89 | 261.22 | 2.35 | 260.76 | 3.09 | 260.02 |
| **BH3** | 5.76 | 260.05 | 1.82 | 258.23 | 2.94 | 257.11 | 2.55 | 257.50 | 2.79 | 257.26 | 3.56 | 256.49 |
| **BH5** | 4.56 | 257.98 | - | - | 0.58 | 257.40 | 0.21 | 257.77 | 0.55 | 257.43 | 1.19 | 256.79 |
| **PZ1s** | 0.76 | 259.88 | 0.07 | 259.81 | 0.12 | 259.76 | 0.14 | 259.74 | 0.18 | 259.70 | 0.24 | 259.64 |
| **PZ1d** | 1.55 | 259.94 | 0.38 | 259.56 | 0.36 | 259.58 | 0.34 | 259.60 | 0.31 | 259.63 | 0.28 | 259.66 |
| **PZ2s** | 1.32 | 256.44 | 0.61 | 255.83 | 0.53 | 255.91 | 0.46 | 255.98 | 0.39 | 256.05 | 0.45 | 255.99 |
| **PZ2d** | 1.91 | 256.46 | 0.36 | 256.10 | 0.30 | 256.16 | 0.23 | 256.23 | 0.23 | 256.23 | 0.39 | 256.07 |
| **PZ3s** | 1.34 | 255.78 | 0.11 | 255.67 | 0.13 | 255.65 | 0.06 | 255.72 | 0.09 | 255.69 | 0.13 | 255.65 |
| **PZ3d** | 1.86 | 255.72 | Frozen | Frozen | 0.13 | 255.59 | 0.10 | 255.62 | 0.09 | 255.63 | 0.13 | 255.59 |
| **PZ4s** | 1.30 | 255.24 | 0.09 | 255.15 | 0.08 | 255.16 | 0.03 | 255.21 | 0.01 | 255.23 | -0.04 | 255.28 |
| **PZ4d** | 1.59 | 255.24 | 0.22 | 255.02 | 0.15 | 255.09 | 0.06 | 255.18 | 0.08 | 255.16 | 0.02 | 255.22 |
| **PZ5s** | 1.23 | 260.39 | 0.29 | 260.10 | 0.34 | 260.05 | 0.25 | 260.14 | 0.29 | 260.10 | 0.58 | 259.81 |
| **PZ5d** | 1.78 | 260.40 | 0.88 | 259.52 | 0.73 | 259.67 | 0.63 | 259.77 | 0.53 | 259.87 | 0.59 | 259.81 |
| **PZ6s** | 1.27 | 255.87 | 0.19 | 255.68 | 0.19 | 255.68 | 0.17 | 255.70 | 0.19 | 255.68 | 0.23 | 255.64 |
| **PZ6d** | 1.79 | 255.86 | 0.31 | 255.55 | 0.27 | 255.59 | 0.25 | 255.61 | 0.24 | 255.62 | 0.24 | 255.62 |

'-' denotes data unavailable

'--' denotes well removed

mbgs - metres below ground level

masl - metres above sea level

Underlined - estimated ground elevation

# Table E-1
# Groundwater Elevations - Monitoring Wells and Piezometers

| Instrument | Well Depth (mbgs) | Ground Surface Elevation (masl) | 30-Sep-20 | | 16-Dec-20 | | 22-Mar-21 | | 25-Jun-21 | | 12-Aug-21 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) |
| **MW19-01** | 7.69 | 266.55 | 7.60 | 258.95 | Dry | Dry | 7.64 | 258.91 | 7.52 | 259.03 | 7.59 | 258.96 |
| **MW19-02s** | 3.57 | 256.99 | 1.53 | 255.46 | 0.52 | 256.47 | 0.42 | 256.57 | 1.42 | 255.57 | 1.81 | 255.18 |
| **MW19-02d** | 12.86 | 257.02 | 6.05 | 250.97 | 6.16 | 250.86 | 6.28 | 250.74 | 6.33 | 250.69 | 6.39 | 250.63 |
| **MW19-03** | 9.30 | 266.41 | 9.21 | 257.20 | 9.22 | 257.19 | 9.21 | 257.20 | 9.21 | 257.20 | 9.22 | 257.19 |
| **MW19-04s** | 7.92 | 265.68 | 5.57 | 260.11 | - | - | 5.62 | 260.06 | 5.49 | 260.19 | 5.61 | 260.07 |
| **MW19-04d** | 16.39 | 265.86 | 14.23 | 251.63 | 14.41 | 251.45 | 14.50 | 251.36 | 14.59 | 251.27 | 14.64 | 251.22 |
| **MW19-05** | 8.42 | 270.24 | 8.34 | 261.90 | 8.34 | 261.90 | 8.32 | 261.92 | 8.32 | 261.92 | 8.33 | 261.91 |
| **MW19-06** | 6.90 | 261.50 | 1.50 | 260.00 | Frozen | Frozen | 0.19 | 261.31 | 0.96 | 260.54 | 1.31 | 260.19 |
| **MW19-07s** | 6.91 | 264.28 | 6.85 | 257.43 | 6.87 | 257.41 | 6.87 | 257.41 | Dry | Dry | 6.87 | 257.41 |
| **MW19-07d** | 13.60 | 264.40 | 12.59 | 251.81 | 12.73 | 251.67 | 12.78 | 251.62 | 12.88 | 251.52 | 12.92 | 251.48 |
| **MW19-08** | 5.23 | 262.75 | 4.38 | 258.37 | 5.20 | 257.55 | 0.66 | 262.09 | 3.04 | 259.71 | - | - |
| **MW19-09** | 7.60 | 256.39 | 6.37 | 250.02 | 6.50 | 249.89 | 6.61 | 249.78 | 6.70 | 249.69 | 6.76 | 249.63 |
| **MW19-13** | 9.74 | 266.98 | 9.69 | 257.29 | 9.64 | 257.34 | 9.51 | 257.47 | 9.65 | 257.33 | 9.71 | 257.27 |
| **MW22-1** | 16.76 | 263.80 | - | - | - | - | - | - | - | - | - | - |
| **BH2** | 5.93 | 263.11 | 4.45 | 258.66 | 5.04 | 258.07 | 3.16 | 259.95 | 3.48 | 259.63 | 3.97 | 259.14 |
| **BH3** | 5.76 | 260.05 | 4.99 | 255.06 | 5.66 | 254.39 | 5.01 | 255.04 | 4.49 | 255.56 | 4.97 | 255.08 |
| **BH5** | 4.56 | 257.98 | 2.41 | 255.57 | 2.14 | 255.84 | 0.76 | 257.22 | 2.17 | 255.81 | 2.94 | 255.04 |
| **PZ1s** | 0.76 | 259.88 | 0.30 | 259.58 | 0.19 | 259.69 | 0.23 | 259.65 | 0.34 | 259.54 | 0.34 | 259.54 |
| **PZ1d** | 1.55 | 259.94 | 0.43 | 259.51 | 0.49 | 259.45 | 0.40 | 259.54 | 0.37 | 259.57 | 0.44 | 259.50 |
| **PZ2s** | 1.32 | 256.44 | 0.86 | 255.58 | 0.95 | 255.49 | 0.61 | 255.83 | 0.68 | 255.76 | Dry | Dry |
| **PZ2d** | 1.91 | 256.46 | 1.06 | 255.40 | 0.92 | 255.54 | 0.47 | 255.99 | 0.78 | 255.68 | 1.30 | 255.16 |
| **PZ3s** | 1.34 | 255.78 | 0.40 | 255.38 | 0.30 | 255.48 | 0.12 | 255.66 | 0.27 | 255.51 | 0.49 | 255.29 |
| **PZ3d** | 1.86 | 255.72 | 0.46 | 255.26 | 0.22 | 255.50 | 0.11 | 255.61 | 0.30 | 255.42 | 0.61 | 255.11 |
| **PZ4s** | 1.30 | 255.24 | 0.27 | 254.97 | 0.33 | 254.91 | 0.16 | 255.08 | 0.23 | 255.01 | 0.52 | 254.72 |
| **PZ4d** | 1.59 | 255.24 | 0.43 | 254.81 | 0.35 | 254.89 | 0.15 | 255.09 | 0.23 | 255.01 | 0.63 | 254.61 |
| **PZ5s** | 1.23 | 260.39 | 1.18 | 259.21 | Dry | Dry | 0.66 | 259.73 | 0.94 | 259.45 | Dry | Dry |
| **PZ5d** | 1.78 | 260.40 | 1.23 | 259.17 | 1.68 | 258.72 | 1.22 | 259.18 | 1.01 | 259.39 | 1.37 | 259.03 |
| **PZ6s** | 1.27 | 255.87 | 0.51 | 255.36 | 0.32 | 255.55 | 0.19 | 255.68 | 0.32 | 255.55 | 0.28 | 255.59 |
| **PZ6d** | 1.79 | 255.86 | 0.32 | 255.54 | 0.42 | 255.44 | 0.30 | 255.56 | 0.29 | 255.57 | 0.29 | 255.57 |

'-' denotes data unavailable
'--' denotes well removed
mbgs - metres below ground level
masl - metres above sea level
Underlined - estimated ground elevation

# Table E-1
## Groundwater Elevations - Monitoring Wells and Piezometers

| Instrument | Well Depth (mbgs) | Ground Surface Elevation (masl) | 25-Nov-21 | | 24-Feb-22 | | 15-Jun-22 | | 15-Sep-22 | | 1-Dec-22 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) |
| **MW19-01** | 7.69 | 266.55 | 3.68 | 262.87 | 4.16 | 262.39 | 3.42 | 263.13 | 3.83 | 262.72 | 7.52 | 259.03 |
| **MW19-02s** | 3.57 | 256.99 | 0.75 | 256.24 | 0.25 | 256.74 | 0.94 | 256.05 | 1.01 | 255.98 | 1.28 | 255.71 |
| **MW19-02d** | 12.86 | 257.02 | 6.47 | 250.55 | 6.50 | 250.52 | 6.02 | 251.00 | 6.04 | 250.98 | 6.19 | 250.83 |
| **MW19-03** | 9.30 | 266.41 | 9.09 | 257.32 | 8.29 | 258.12 | 8.29 | 258.12 | 8.85 | 257.56 | 9.20 | 257.21 |
| **MW19-04s** | 7.92 | 265.68 | 5.67 | 260.01 | 4.24 | 261.44 | 5.09 | 260.59 | 5.33 | 260.35 | 5.60 | 260.08 |
| **MW19-04d** | 16.39 | 265.86 | 14.69 | 251.17 | 14.83 | 251.03 | 14.58 | 251.28 | 14.83 | 251.03 | 14.79 | 251.07 |
| **MW19-05** | 8.42 | 270.24 | 8.32 | 261.92 | 8.31 | 261.93 | 8.30 | 261.94 | 8.31 | 261.93 | 8.31 | 261.93 |
| **MW19-06** | 6.90 | 261.50 | 0.15 | 261.35 | Frozen | Frozen | 0.40 | 261.10 | 0.64 | 260.86 | 1.35 | 260.15 |
| **MW19-07s** | 6.91 | 264.28 | 6.86 | 257.42 | Dry | Dry | 6.89 | 257.39 | Dry | Dry | 6.90 | 257.38 |
| **MW19-07d** | 13.60 | 264.40 | 12.94 | 251.46 | 13.01 | 251.39 | 12.76 | 251.64 | 12.91 | 251.49 | 12.98 | 251.42 |
| **MW19-08** | 5.23 | 262.75 | 3.38 | 259.37 | 1.91 | 260.84 | 2.48 | 260.27 | - | - | 3.81 | 258.94 |
| **MW19-09** | 7.60 | 256.39 | 6.81 | 249.58 | 6.87 | 249.52 | 6.68 | 249.71 | 6.81 | 249.58 | 6.90 | 249.49 |
| **MW19-13** | 9.74 | 266.98 | 9.68 | 257.30 | Dry | Dry | -- | -- | -- | -- | -- | -- |
| **MW22-1** | 16.76 | 263.80 | - | - | - | - | - | - | - | - | 15.00 | 248.80 |
| **BH2** | 5.93 | 263.11 | 4.14 | 258.97 | 3.10 | 260.01 | 3.14 | 259.97 | 3.77 | 259.34 | 4.07 | 259.04 |
| **BH3** | 5.76 | 260.05 | Dry | Dry | 3.68 | 256.37 | 3.65 | 256.40 | 4.81 | 255.24 | 5.19 | 254.86 |
| **BH5** | 4.56 | 257.98 | 2.54 | 255.44 | Frozen | Frozen | 1.06 | 256.92 | 1.00 | 256.98 | 2.38 | 255.60 |
| **PZ1s** | 0.76 | 259.88 | 0.15 | 259.73 | -0.12 | 260.00 | 0.12 | 259.76 | 0.26 | 259.62 | 0.25 | 259.63 |
| **PZ1d** | 1.55 | 259.94 | 0.36 | 259.58 | 0.05 | 259.89 | 0.14 | 259.80 | 0.30 | 259.64 | 0.30 | 259.64 |
| **PZ2s** | 1.32 | 256.44 | 0.57 | 255.87 | Frozen | Frozen | 0.39 | 256.05 | 0.54 | 255.90 | 0.44 | 256.00 |
| **PZ2d** | 1.91 | 256.46 | 0.64 | 255.82 | Frozen | Frozen | 0.58 | 255.88 | 1.08 | 255.38 | 0.99 | 255.47 |
| **PZ3s** | 1.34 | 255.78 | 0.19 | 255.59 | Frozen | Frozen | 0.10 | 255.68 | 0.23 | 255.55 | 0.15 | 255.63 |
| **PZ3d** | 1.86 | 255.72 | 0.16 | 255.56 | 0.08 | 255.64 | 0.21 | 255.51 | 0.19 | 255.53 | 0.16 | 255.56 |
| **PZ4s** | 1.30 | 255.24 | 0.57 | 254.67 | Frozen | Frozen | 0.08 | 255.16 | 0.41 | 254.83 | 0.19 | 255.05 |
| **PZ4d** | 1.59 | 255.24 | 0.50 | 254.74 | Frozen | Frozen | 0.07 | 255.17 | 0.45 | 254.79 | 0.22 | 255.02 |
| **PZ5s** | 1.23 | 260.39 | Dry | Dry | Frozen | Frozen | 0.62 | 259.77 | 0.91 | 259.48 | 1.17 | 259.22 |
| **PZ5d** | 1.78 | 260.40 | 1.68 | 258.72 | Frozen | Frozen | 0.66 | 259.74 | 1.10 | 259.30 | 1.21 | 259.19 |
| **PZ6s** | 1.27 | 255.87 | 0.15 | 255.72 | Frozen | Frozen | 0.24 | 255.63 | 0.36 | 255.51 | 0.18 | 255.69 |
| **PZ6d** | 1.79 | 255.86 | 0.29 | 255.57 | 0.26 | 255.60 | 0.13 | 255.73 | 0.32 | 255.54 | 0.28 | 255.58 |

'-' denotes data unavailable
'--' denotes well removed
mbgs - metres below ground level
masl - metres above sea level
Underlined - estimated ground elevation

# Table E-1
# Groundwater Elevations - Monitoring Wells and Piezometers

| Instrument | Well Depth (mbgs) | Ground Surface Elevation (masl) | 6-Mar-23 | | 7-Jun-23 | | 19-Sep-23 | | 4-Dec-23 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) | Water Level (mbgs) | Water Elevation (masl) |
| **MW19-01** | 7.69 | 266.55 | 2.48 | 264.07 | 3.18 | 263.37 | 3.76 | 262.79 | 7.49 | 259.06 |
| **MW19-02s** | 3.57 | 256.99 | 0.23 | 256.76 | 0.99 | 256.00 | 1.39 | 255.60 | 1.11 | 255.88 |
| **MW19-02d** | 12.86 | 257.02 | 6.10 | 250.92 | 5.83 | 251.19 | 5.67 | 251.35 | 5.75 | 251.27 |
| **MW19-03** | 9.30 | 266.41 | 7.16 | 259.25 | 7.76 | 258.65 | 9.20 | 257.21 | 9.21 | 257.20 |
| **MW19-04s** | 7.92 | 265.68 | 3.70 | 261.98 | 4.92 | 260.76 | 5.36 | 260.32 | 5.57 | 260.11 |
| **MW19-04d** | 16.39 | 265.86 | 14.70 | 251.16 | 14.21 | 251.65 | 14.15 | 251.71 | 14.27 | 251.59 |
| **MW19-05** | 8.42 | 270.24 | 8.32 | 261.92 | 8.31 | 261.93 | 8.31 | 261.93 | 8.32 | 261.92 |
| **MW19-06** | 6.90 | 261.50 | Frozen | Frozen | 0.69 | 260.81 | 0.56 | 260.94 | 0.81 | 260.69 |
| **MW19-07s** | 6.91 | 264.28 | 6.87 | 257.41 | 6.85 | 257.43 | 6.87 | 257.41 | 6.88 | 257.40 |
| **MW19-07d** | 13.60 | 264.40 | 12.84 | 251.56 | 12.36 | 252.04 | 12.43 | 251.97 | 12.58 | 251.82 |
| **MW19-08** | 5.23 | 262.75 | 0.45 | 262.30 | 2.04 | 260.71 | 2.96 | 259.79 | -- | -- |
| **MW19-09** | 7.60 | 256.39 | 6.76 | 249.63 | 6.32 | 250.07 | - | - | 6.44 | 249.95 |
| **MW19-13** | 9.74 | 266.98 | -- | -- | -- | -- | -- | -- | -- | -- |
| **MW22-1** | 16.76 | 263.80 | 14.87 | 248.93 | 14.51 | 249.29 | 14.44 | 249.36 | 14.57 | 249.23 |
| **BH2** | 5.93 | 263.11 | 2.40 | 260.71 | 3.73 | 259.38 | - | - | 3.95 | 259.16 |
| **BH3** | 5.76 | 260.05 | 2.82 | 257.23 | 3.22 | 256.83 | 4.16 | 255.89 | 4.91 | 255.14 |
| **BH5** | 4.56 | 257.98 | 0.22 | 257.76 | 1.21 | 256.77 | 2.07 | 255.91 | 2.50 | 255.48 |
| **PZ1s** | 0.76 | 259.88 | 0.10 | 259.78 | 0.07 | 259.81 | 0.14 | 259.74 | 0.29 | 259.59 |
| **PZ1d** | 1.55 | 259.94 | 0.24 | 259.70 | -0.05 | 259.99 | 0.05 | 259.89 | 0.25 | 259.69 |
| **PZ2s** | 1.32 | 256.44 | 0.43 | 256.01 | 0.28 | 256.16 | 0.16 | 256.28 | 0.23 | 256.21 |
| **PZ2d** | 1.91 | 256.46 | 0.38 | 256.08 | 0.39 | 256.07 | 0.78 | 255.68 | 1.08 | 255.38 |
| **PZ3s** | 1.34 | 255.78 | 0.07 | 255.71 | -0.04 | 255.82 | 0.17 | 255.61 | 0.24 | 255.54 |
| **PZ3d** | 1.86 | 255.72 | 0.06 | 255.66 | 0.10 | 255.62 | 0.20 | 255.52 | 0.22 | 255.50 |
| **PZ4s** | 1.30 | 255.24 | 0.13 | 255.11 | -0.02 | 255.26 | 0.08 | 255.16 | 0.20 | 255.04 |
| **PZ4d** | 1.59 | 255.24 | 0.11 | 255.13 | 0.01 | 255.23 | 0.10 | 255.14 | 0.24 | 255.00 |
| **PZ5s** | 1.23 | 260.39 | 0.24 | 260.15 | 0.53 | 259.86 | 0.88 | 259.51 | Dry | Dry |
| **PZ5d** | 1.78 | 260.40 | 0.68 | 259.72 | 0.52 | 259.88 | 0.83 | 259.57 | 1.20 | 259.20 |
| **PZ6s** | 1.27 | 255.87 | 0.11 | 255.76 | 0.13 | 255.74 | 0.23 | 255.64 | 0.24 | 255.63 |
| **PZ6d** | 1.79 | 255.86 | -0.01 | 255.87 | 0.03 | 255.83 | 0.17 | 255.69 | 0.27 | 255.59 |

'-' denotes data unavailable

'--' denotes well removed

mbgs - metres below ground level

masl - metres above sea level

Underlined - estimated ground elevation

## MW19-01 (Well Depth: 7.69 m, Screened in Silty Clay/ Clayey Silt)
## Groundwater Elevations

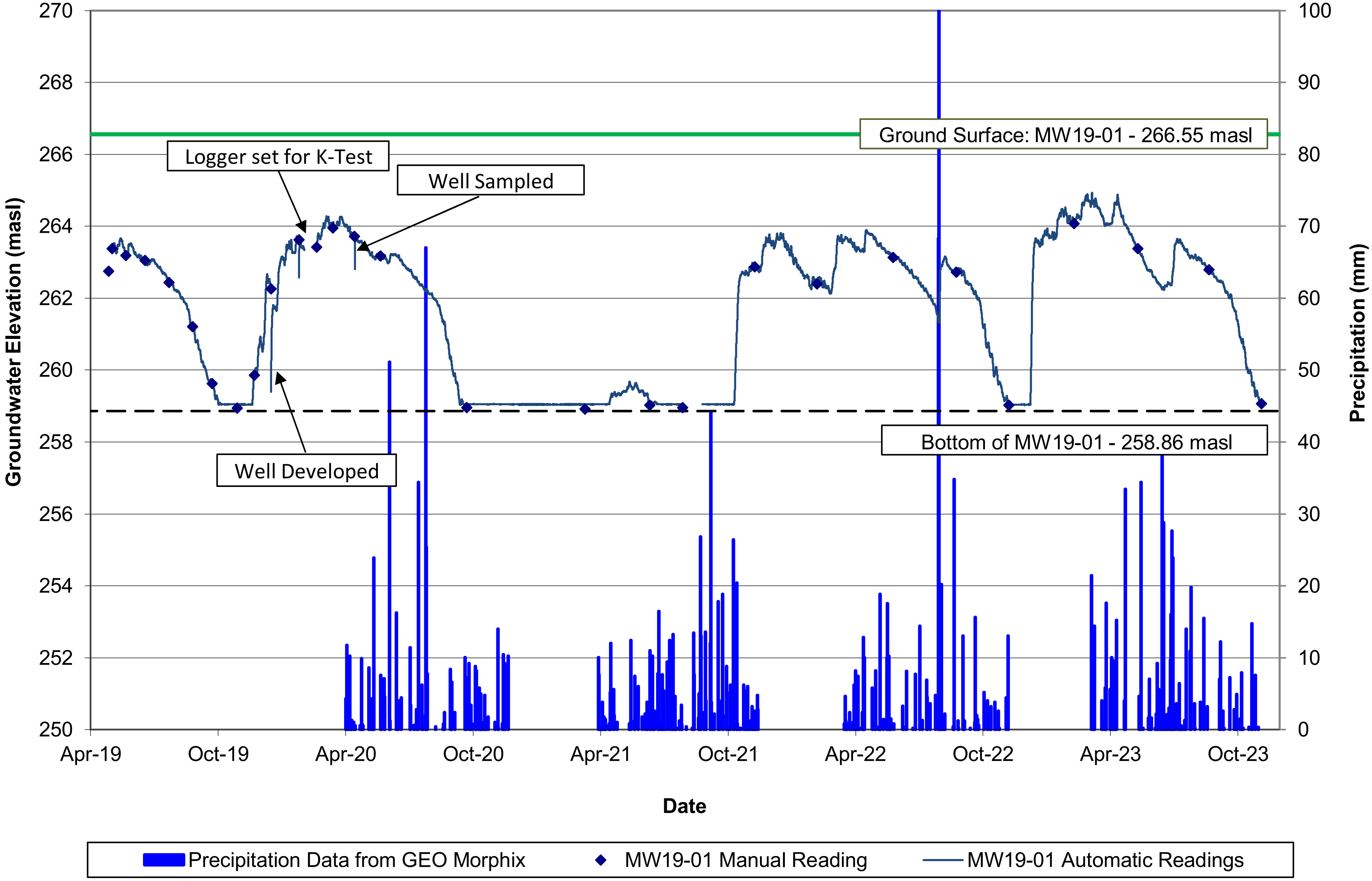

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Figure E-1

# MW19-02s (Well Depth: 3.57 m, Screened in Sandy Silty Clay)
# MW19-02d (Well Depth: 12.86 m, Screened in Sand/ Silty Sand)
# Groundwater Elevations

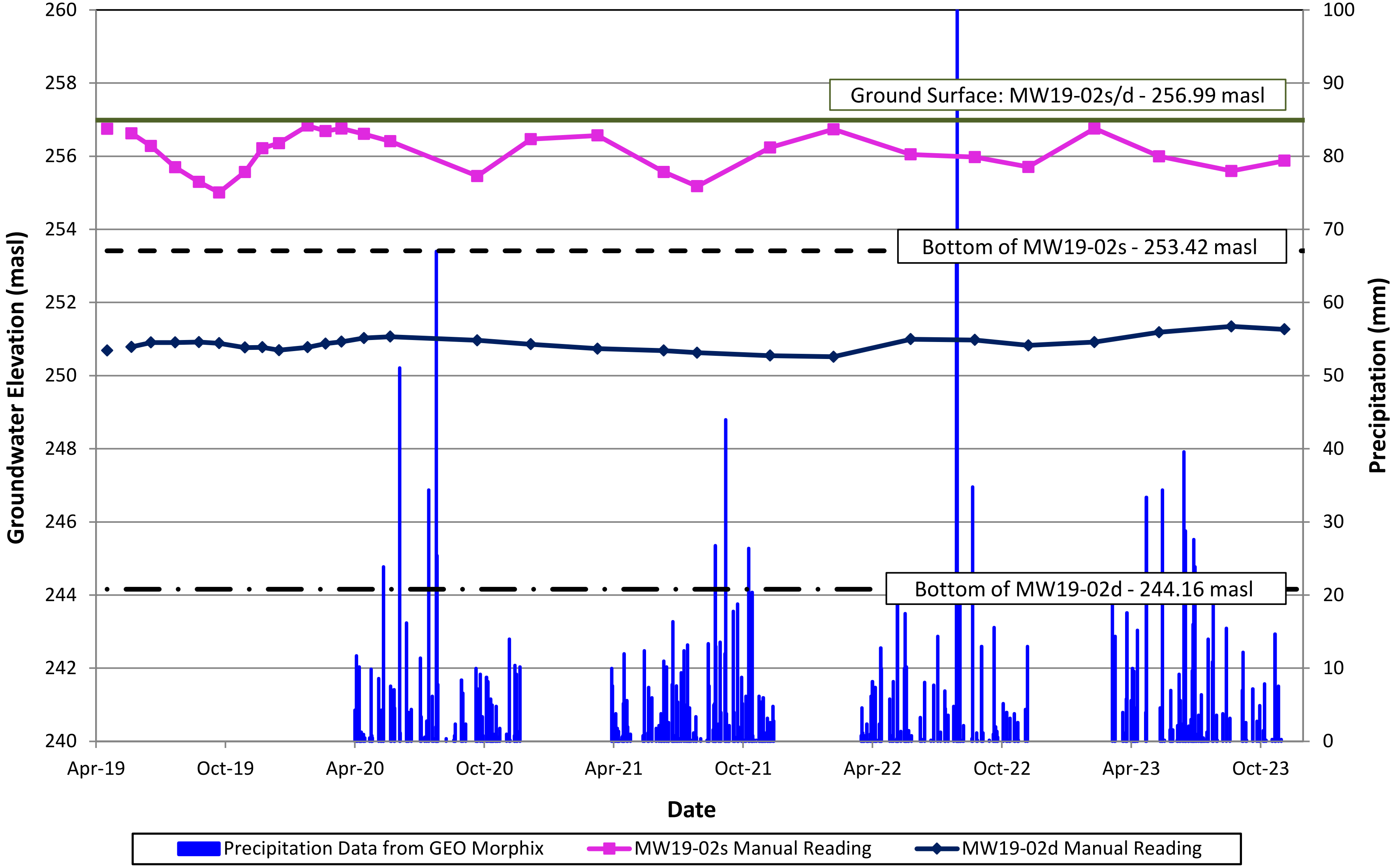

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Figure E-2

# MW19-03 (Well Depth: 9.30 m, Screened Clayey Silt)
# Groundwater Elevations

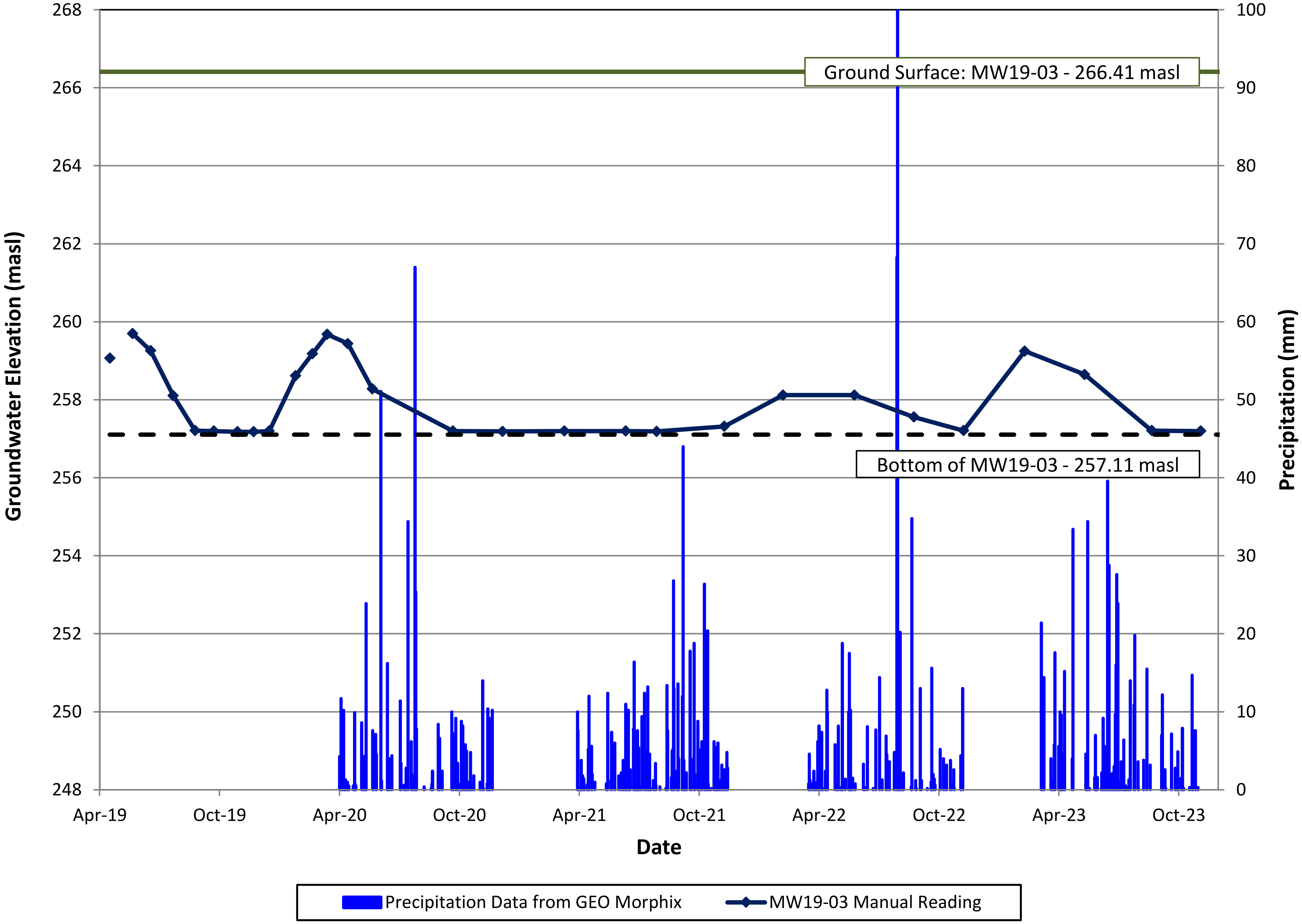

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Figure E-3

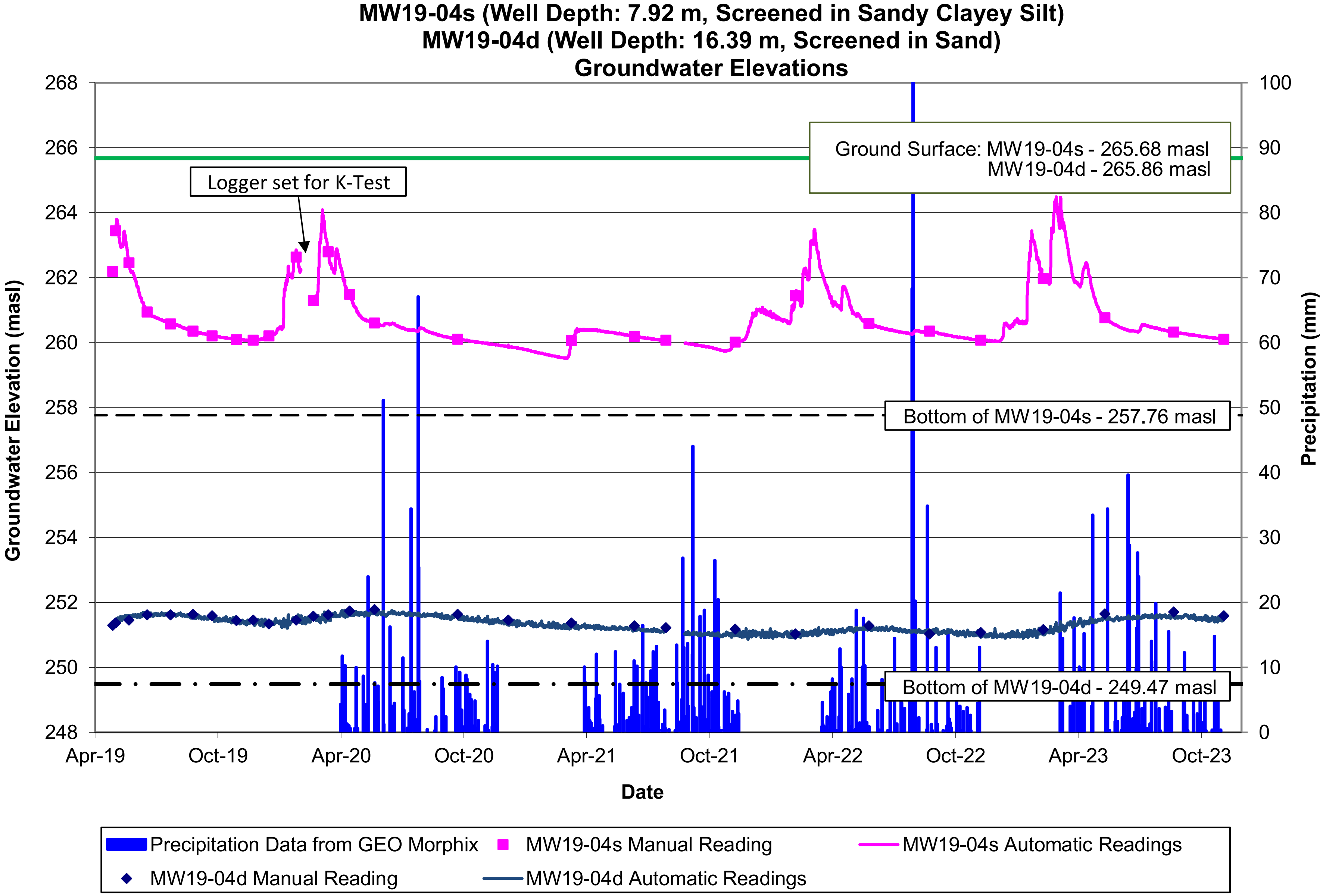

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Figure E-4

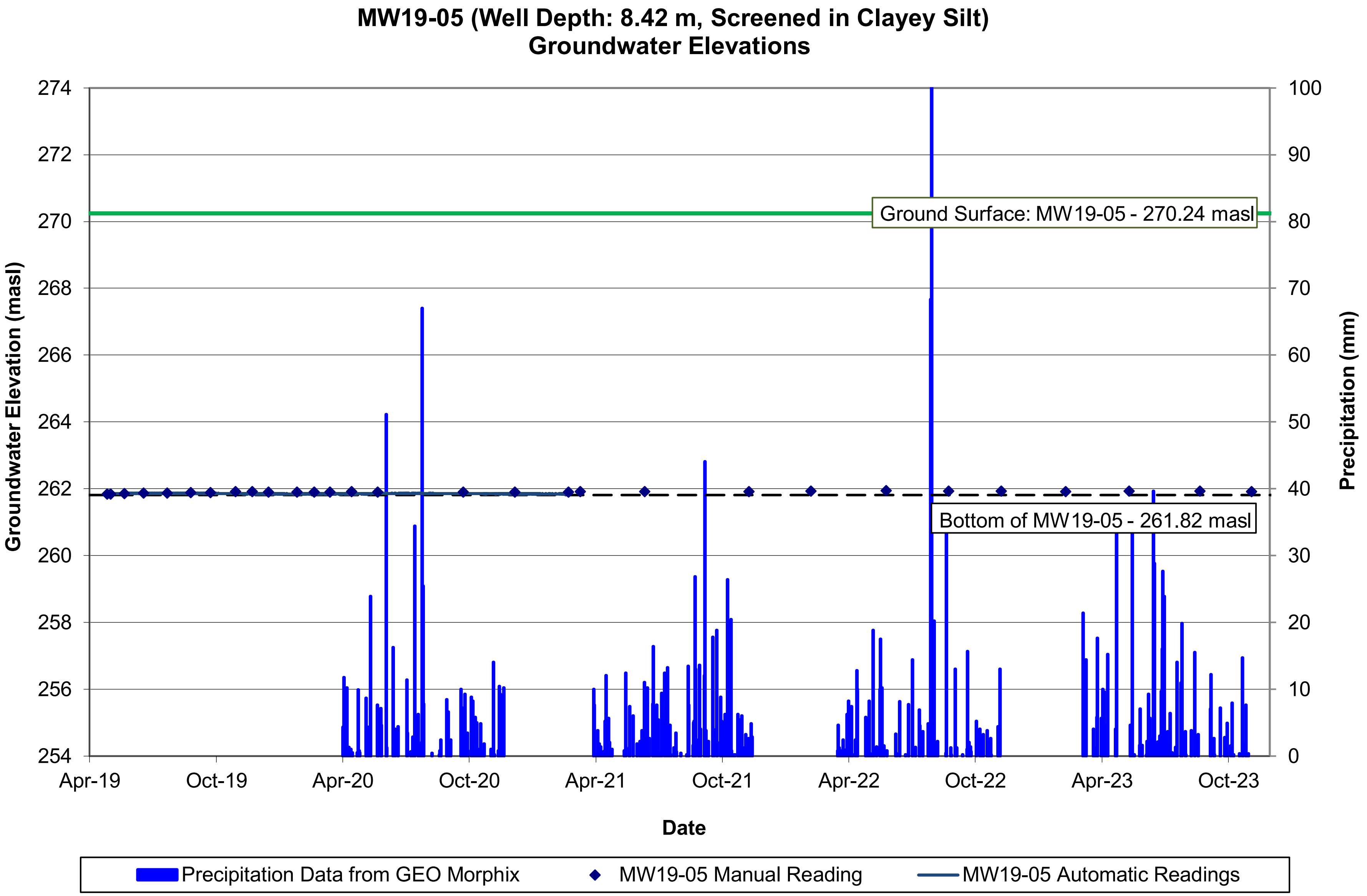
MW19-05 (Well Depth: 8.42 m, Screened in Clayey Silt)
Groundwater Elevations
Groundwater Elevation (masl)
Precipitation (mm)
274
272
270
268
266
264
262
260
258
256
254
100
90
80
70
60
50
40
30
20
10
0
Ground Surface: MW19-05 - 270.24 masl
Bottom of MW19-05 - 261.82 masl
Apr-19
Oct-19
Apr-20
Oct-20
Apr-21
Oct-21
Apr-22
Oct-22
Apr-23
Oct-23
Date
Precipitation Data from GEO Morphix
MW19-05 Manual Reading
MW19-05 Automatic Readings

Figure E-5

# MW19-06 (Well Depth: 6.90 m, Screened in Silty Sand Clayey Silt)
# Groundwater Elevations

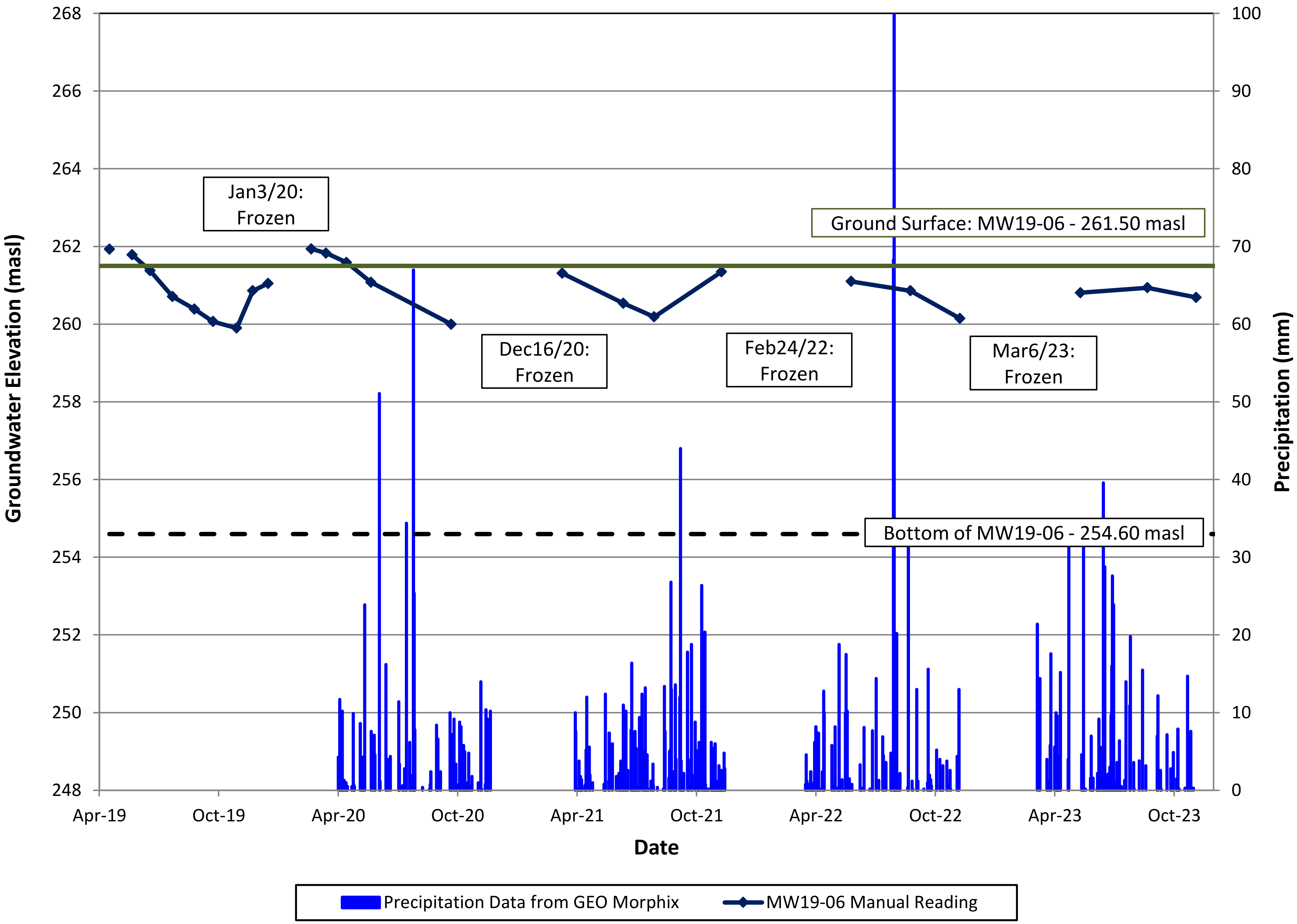

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Figure E-6

## MW19-07s (Well Depth: 6.91 m, Screened in Silty Clay/Sandy Silt)
## MW19-07d (Well Depth: 13.60 m, Screened in Silty Sand)
## Groundwater Elevations

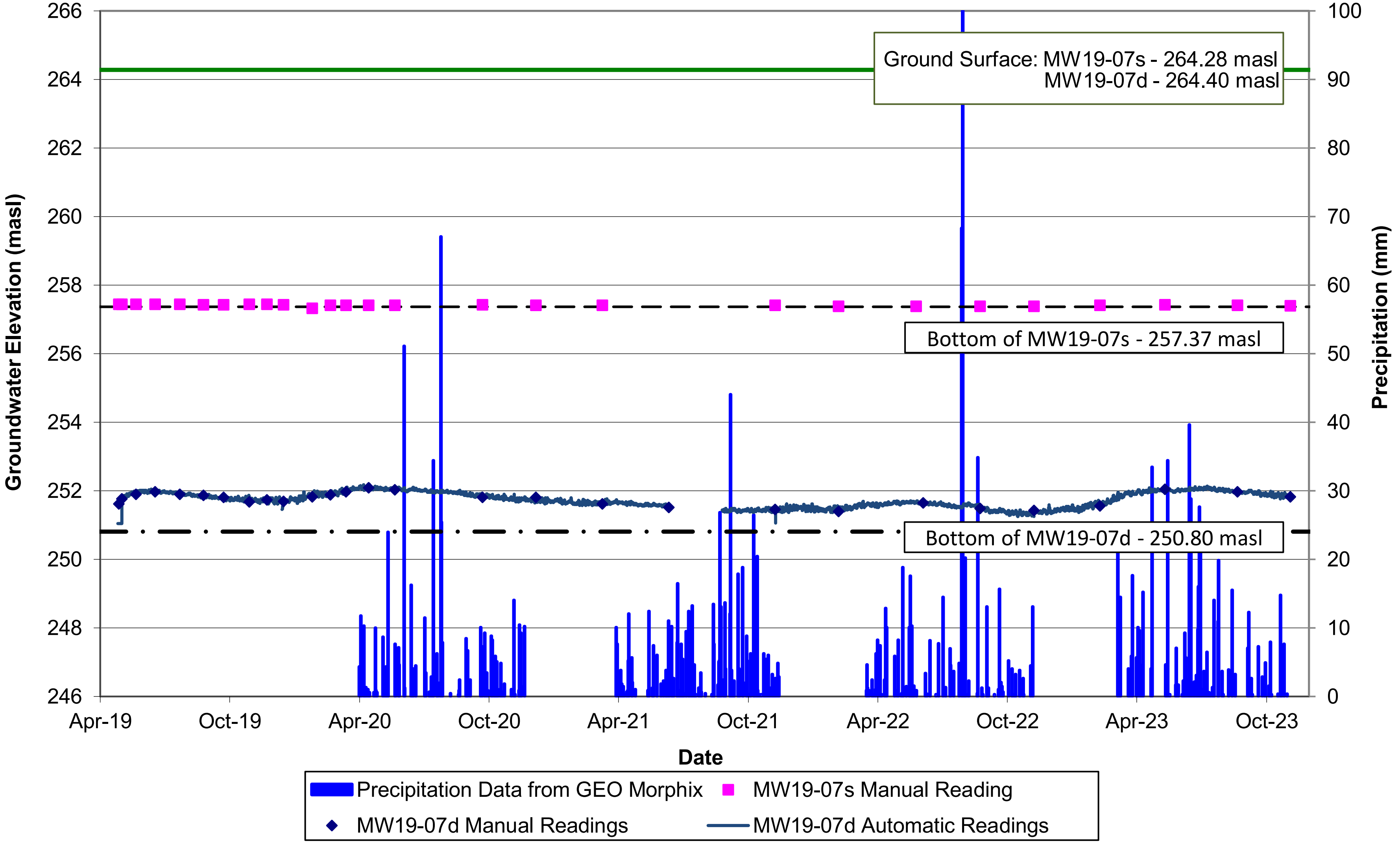

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Figure E-7

## MW19-08 (Well Depth: 5.23 m, Screened in Silty Clay/ Clayey Silt)
## Groundwater Elevations

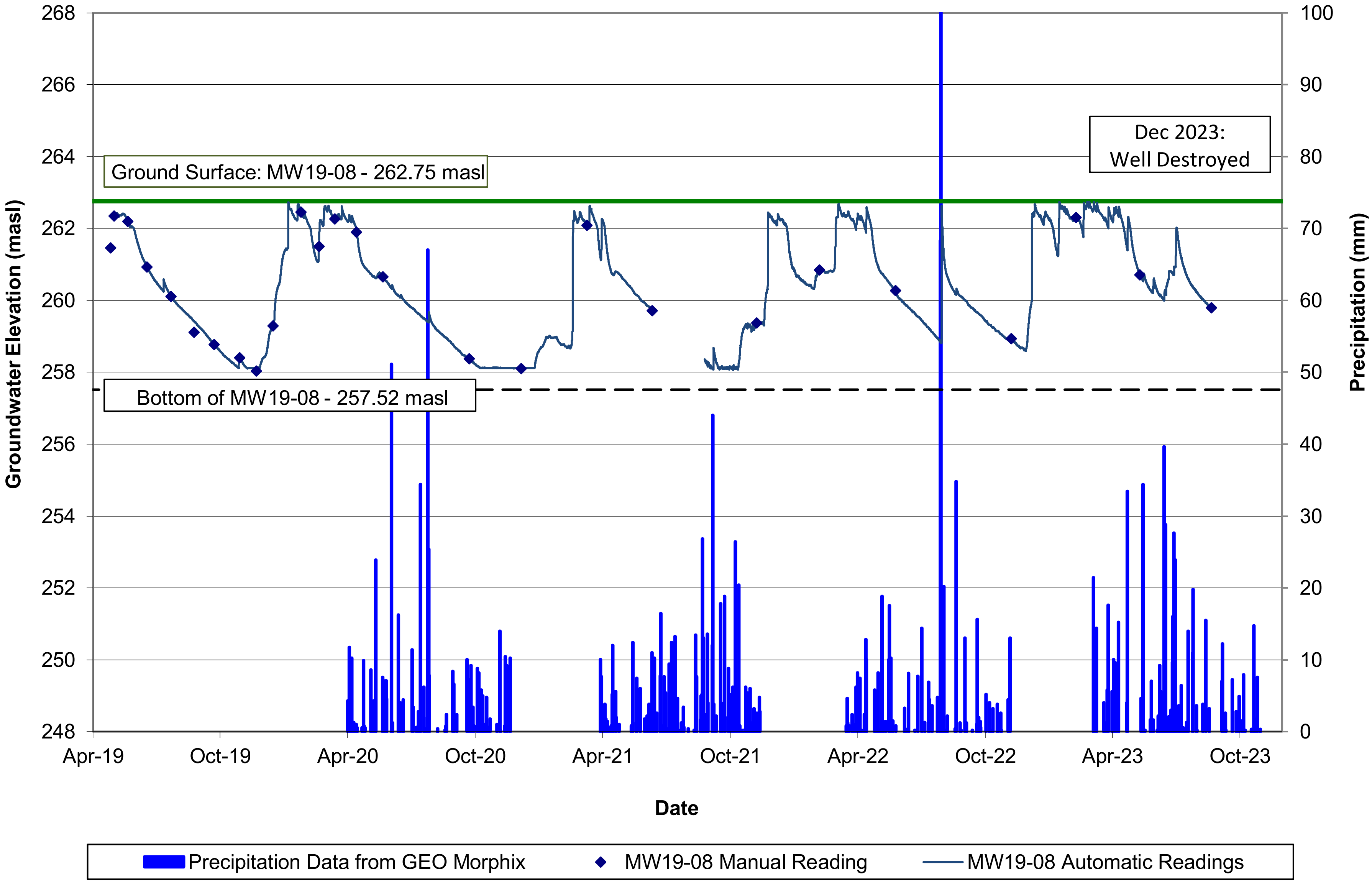

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Figure E-8

# MW19-09 (Well Depth: 7.6 m, Screened in Silty Sand)
# Groundwater Elevations

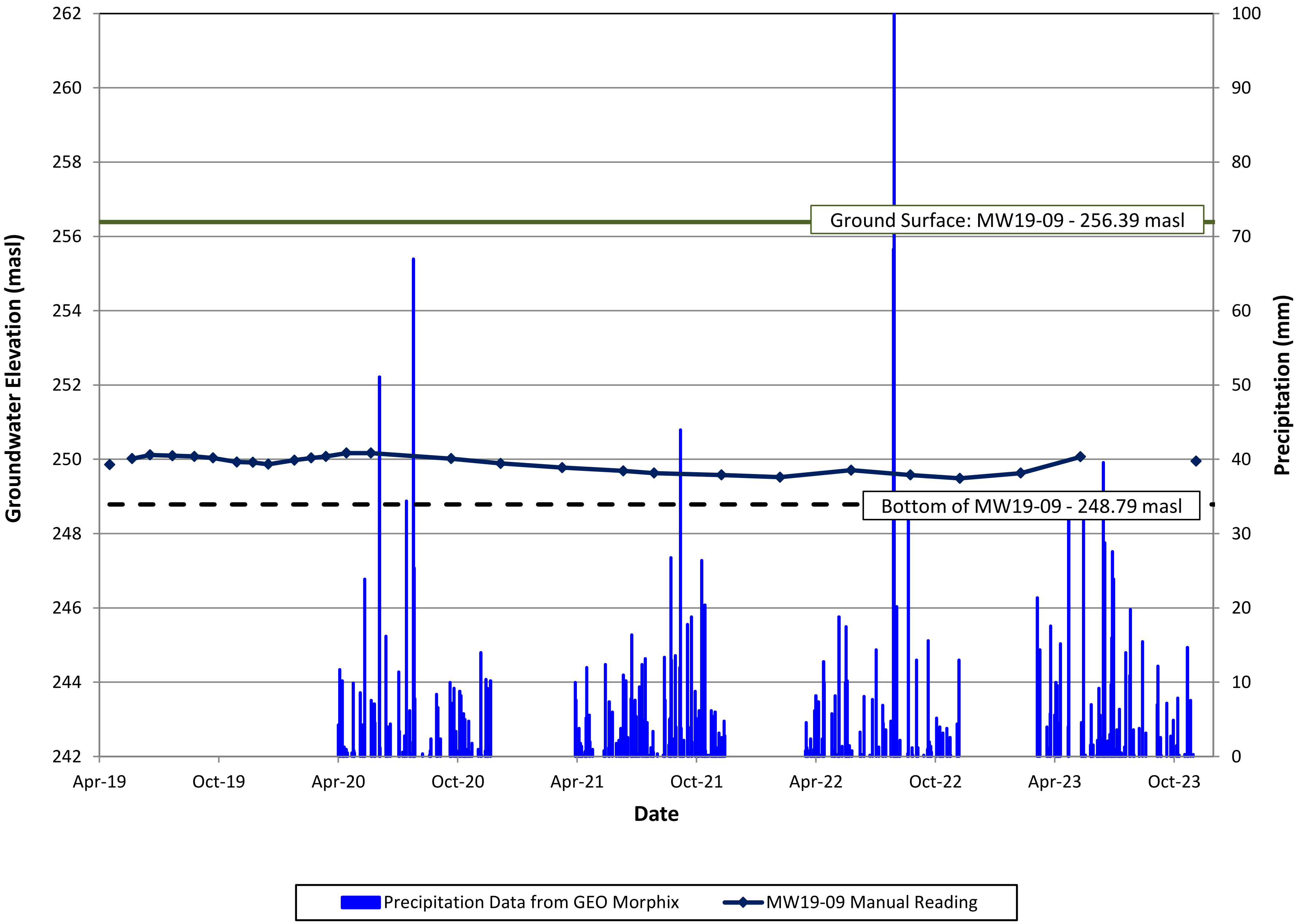

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Figure E-9

# MW19-13 (Well Depth: 9.74 m, Screened in Gravelly Silt Sand)
# Groundwater Elevations

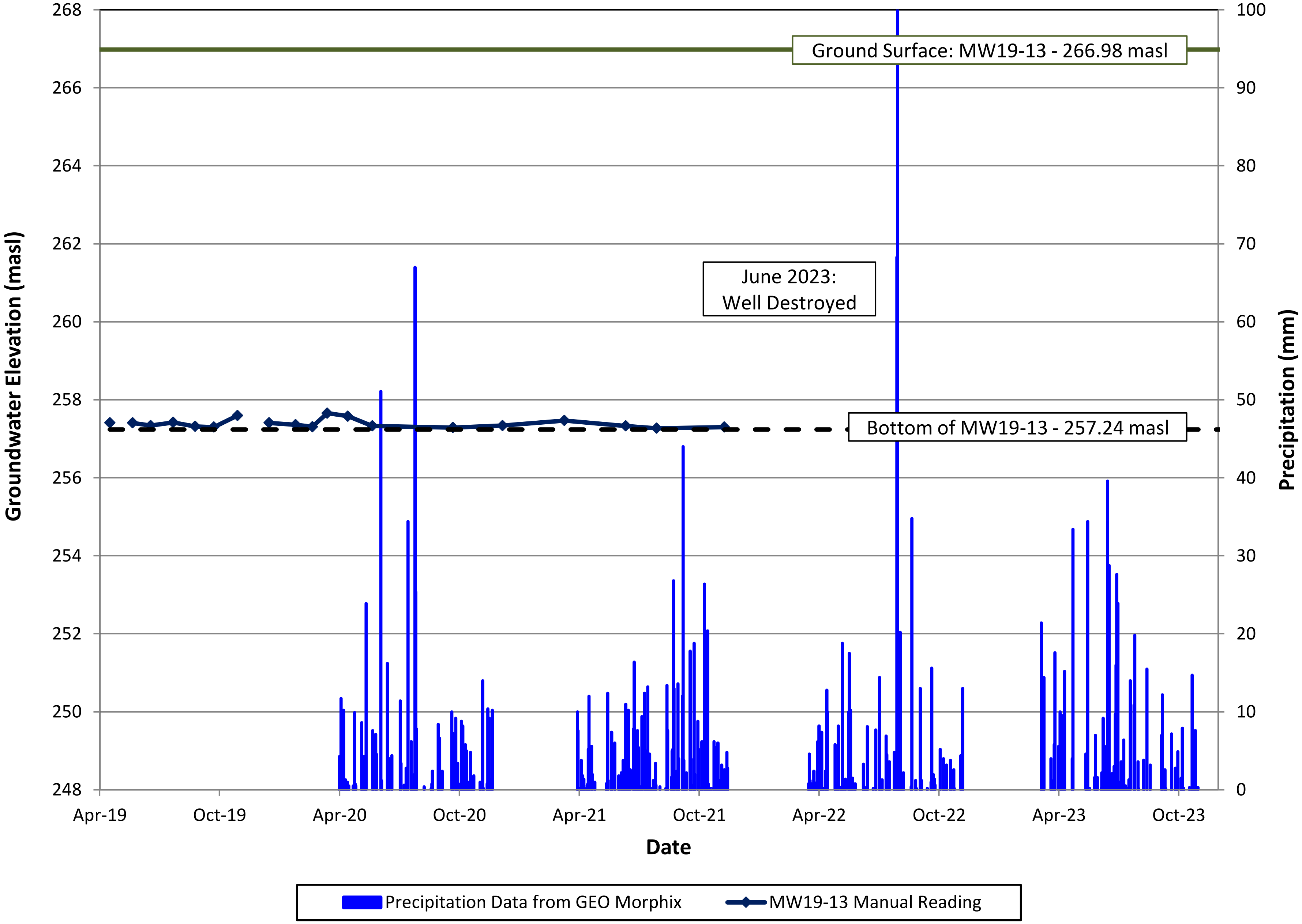

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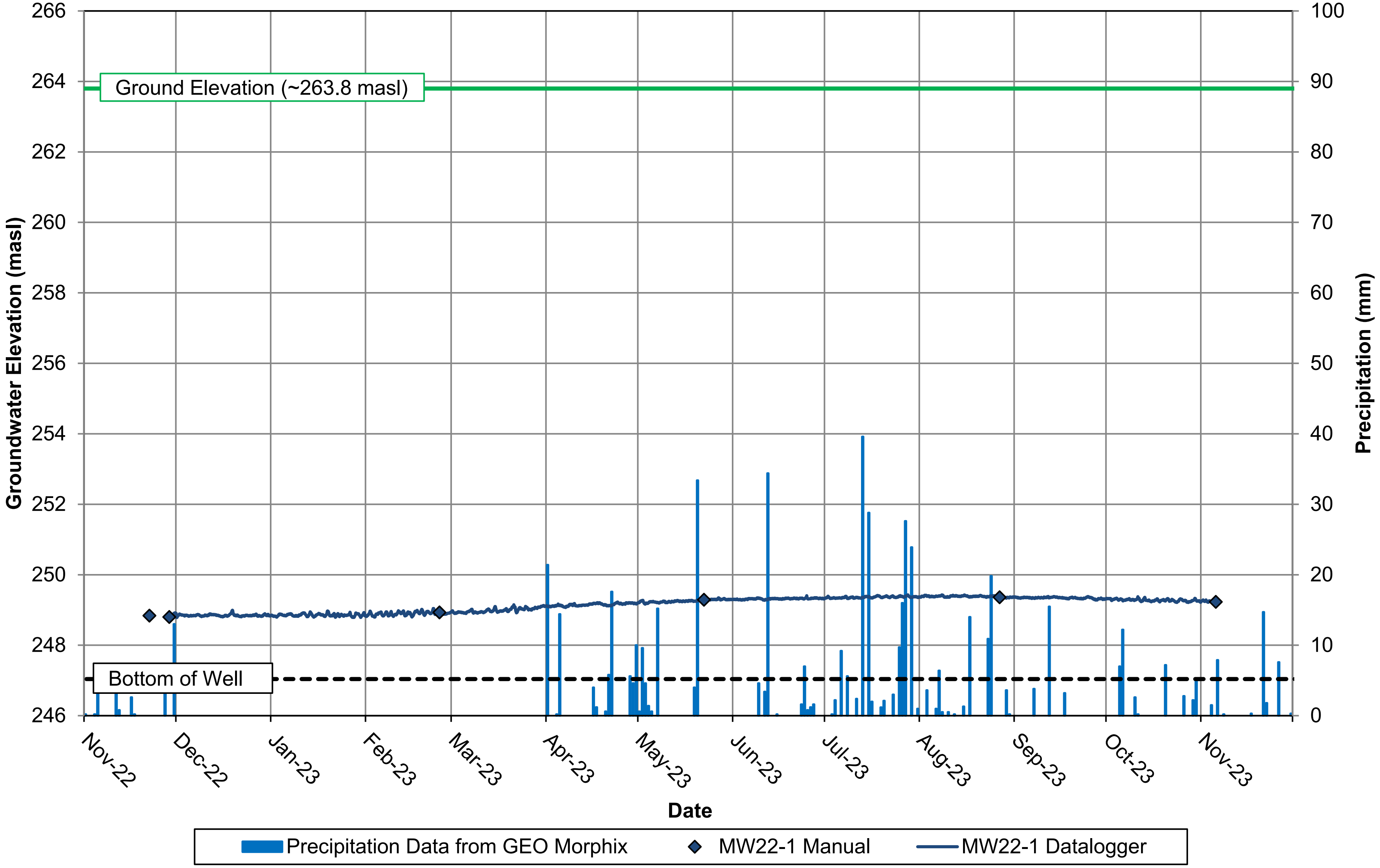
Figure E-10

# MW22-1
# Groundwater Elevation
# (Well Depth: 16.5 m, Screened in Silty Sand/Sand)



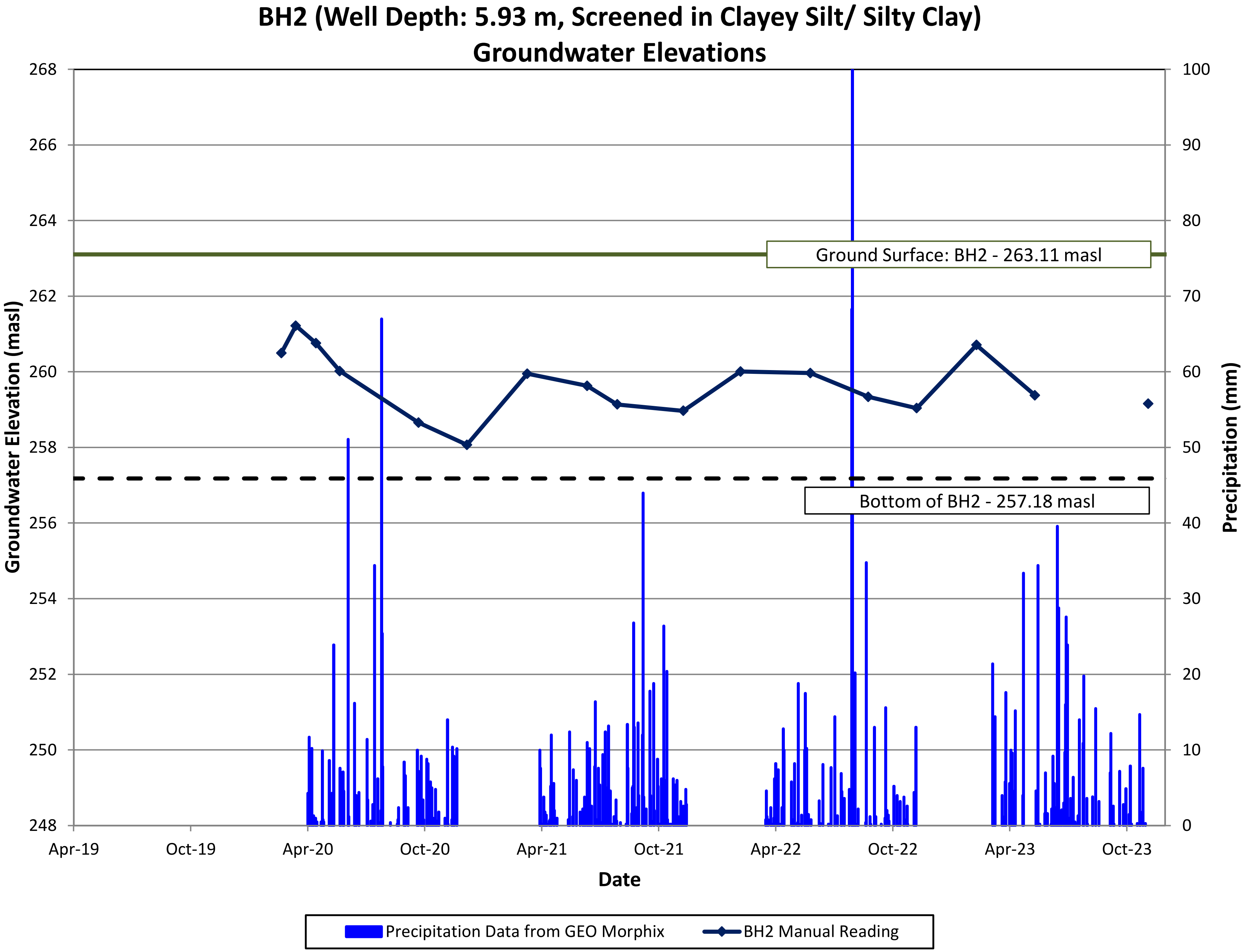


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Figure E-12

# BH3 (Well Depth: 5.76 m, Screened in Clayey Silt/ Sand/ Silty Clay)
# Groundwater Elevations

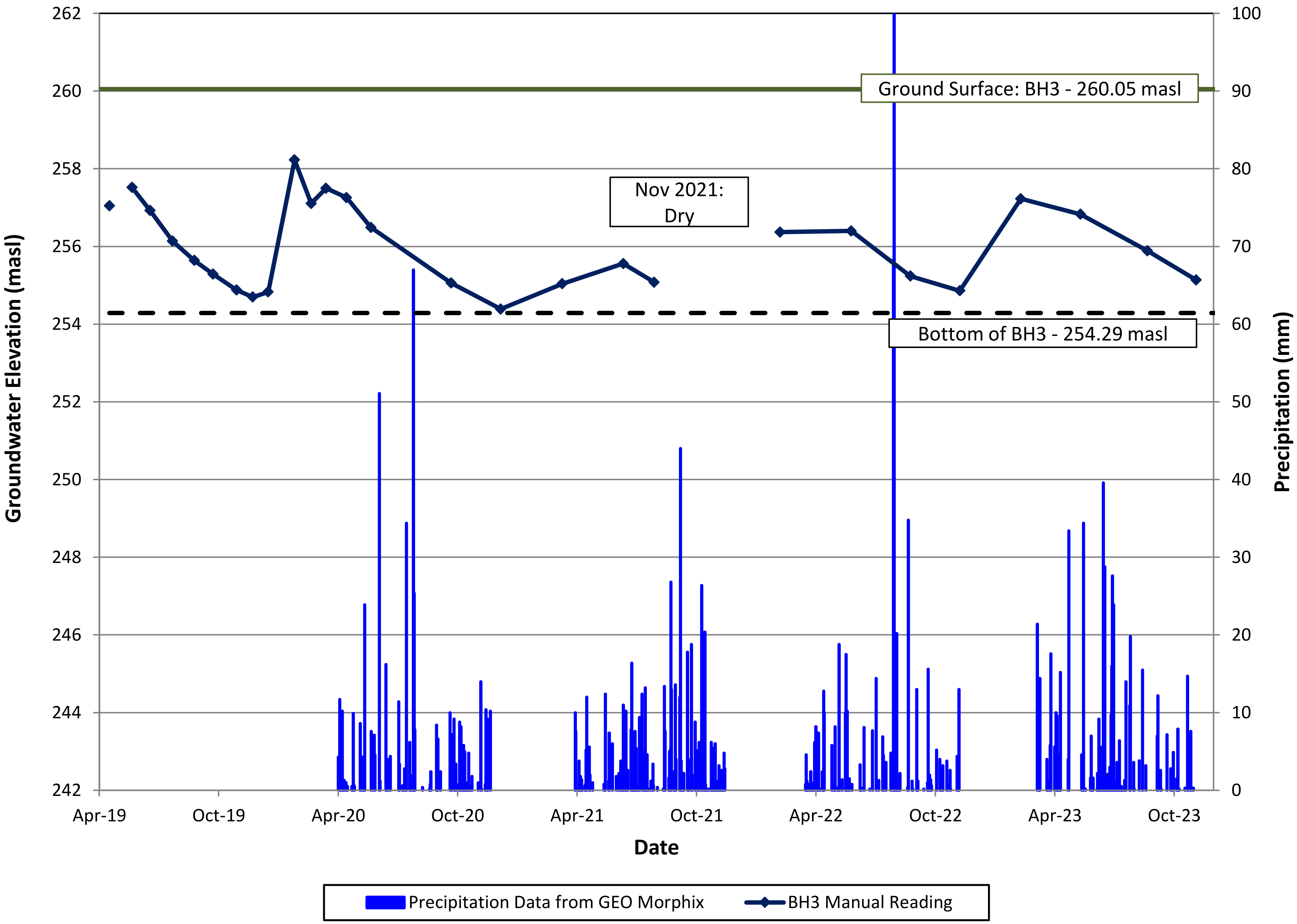

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Figure E-13

# BH5 (Well Depth: 4.56 m, Screened in Fill/ Silty Clay)
# Groundwater Elevations

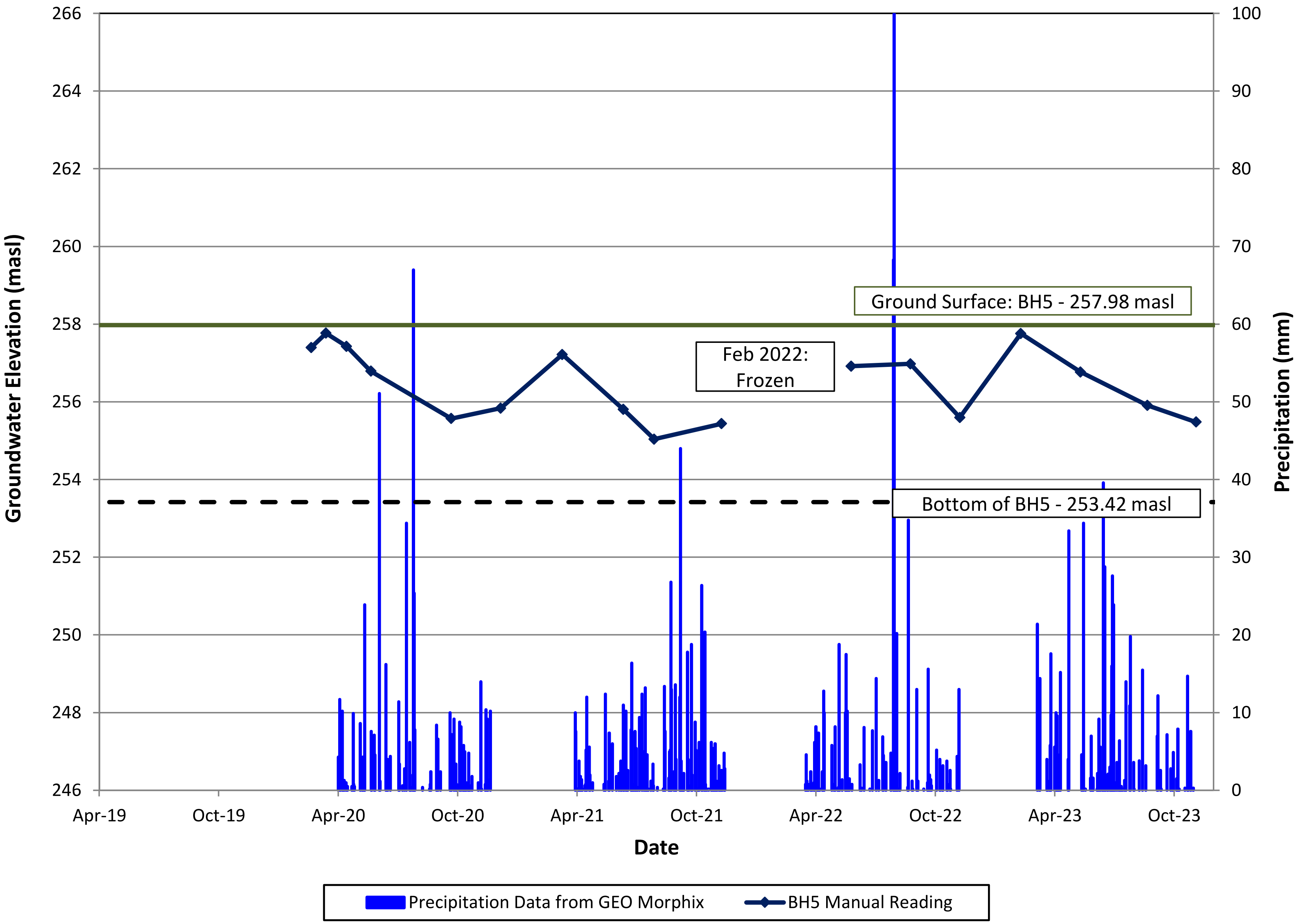

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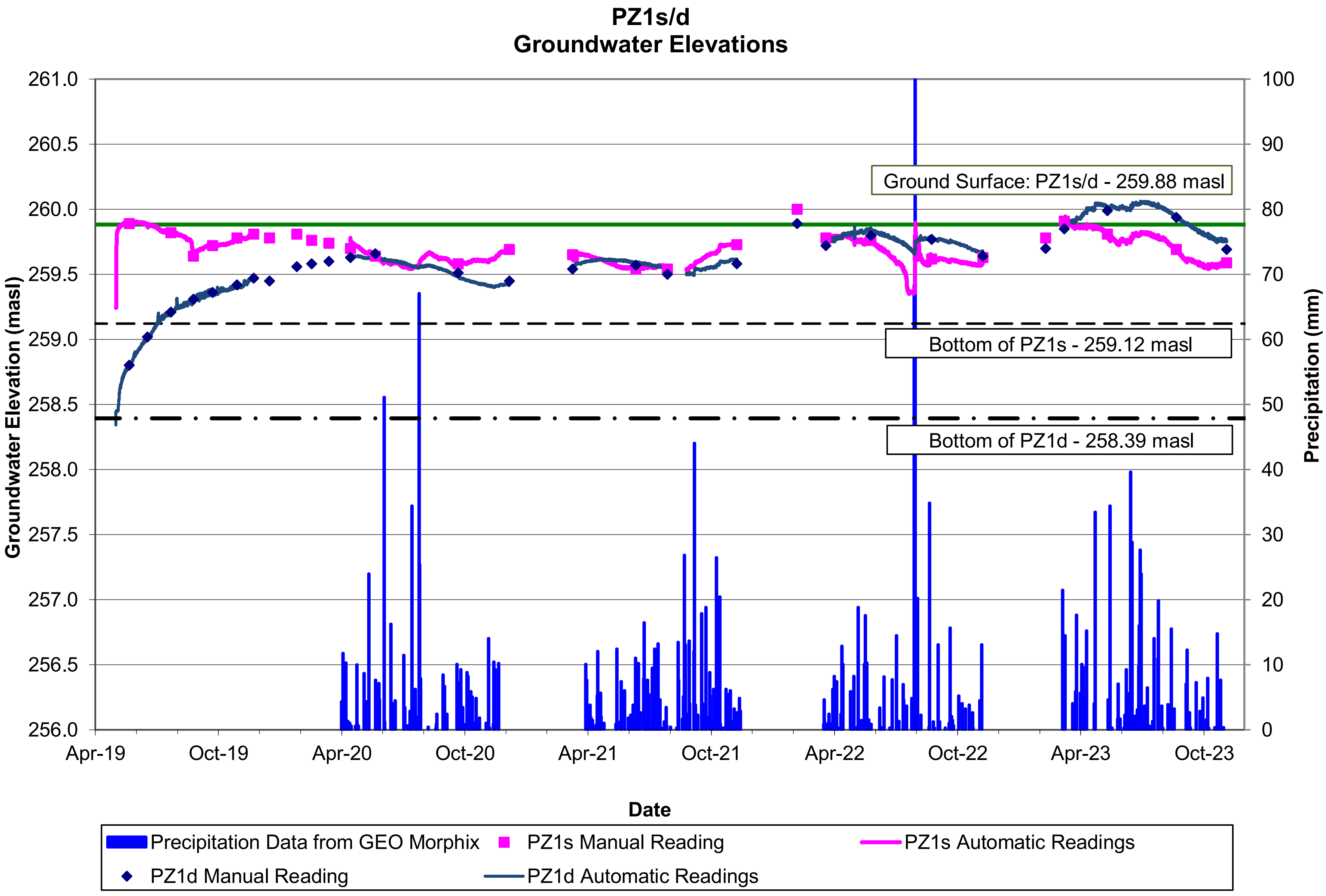
Figure E-14


PZ1s/d
Groundwater Elevations
Groundwater Elevation (masl)
Precipitation (mm)
261.0
260.5
260.0
259.5
259.0
258.5
258.0
257.5
257.0
256.5
256.0
100
90
80
70
60
50
40
30
20
10
0
Ground Surface: PZ1s/d - 259.88 masl
Bottom of PZ1s - 259.12 masl
Bottom of PZ1d - 258.39 masl
Apr-19
Oct-19
Apr-20
Oct-20
Apr-21
Oct-21
Apr-22
Oct-22
Apr-23
Oct-23
Date
Precipitation Data from GEO Morphix
PZ1s Manual Reading
PZ1s Automatic Readings
PZ1d Manual Reading
PZ1d Automatic Readings

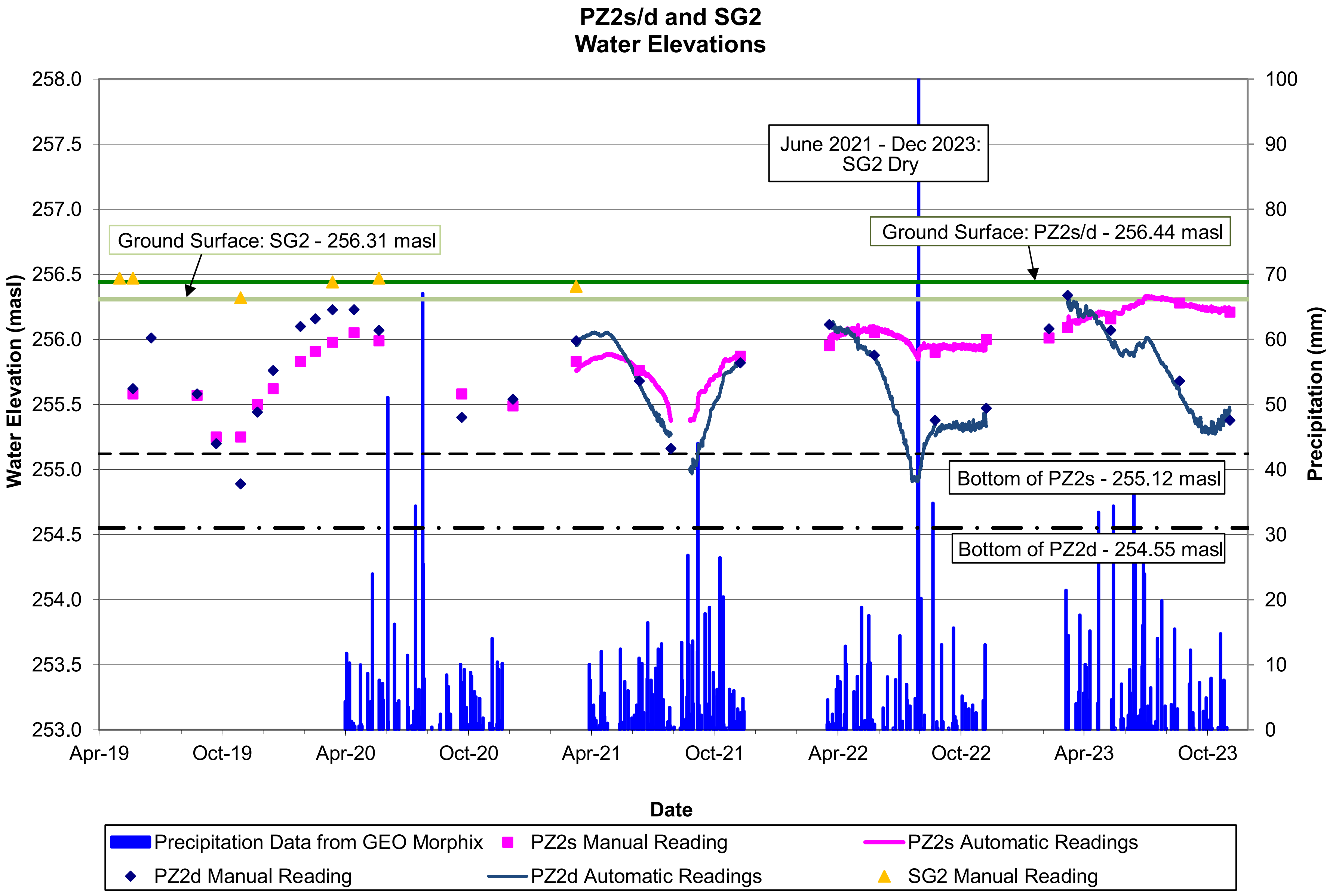


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Figure E-16

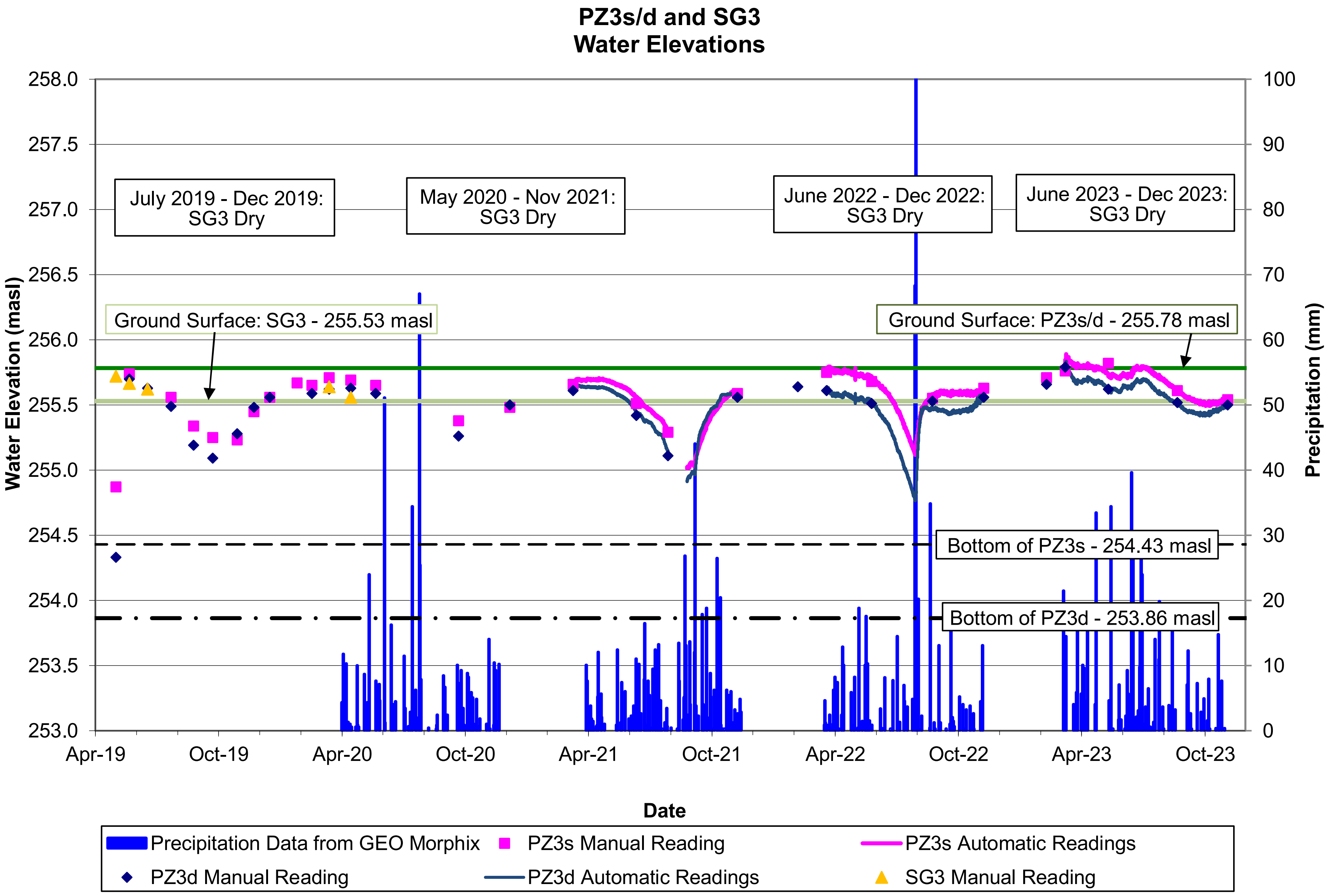

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Figure E-17

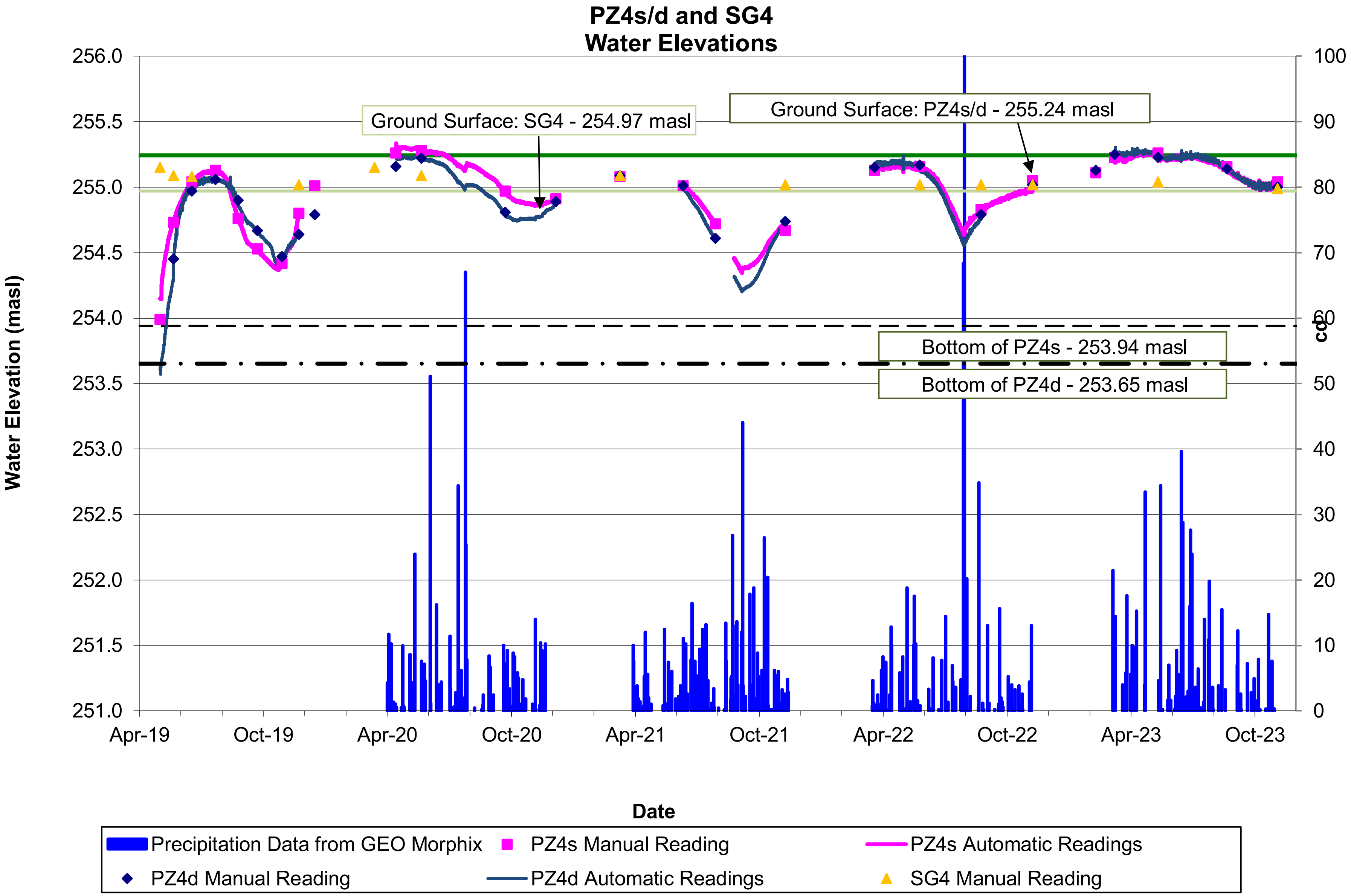
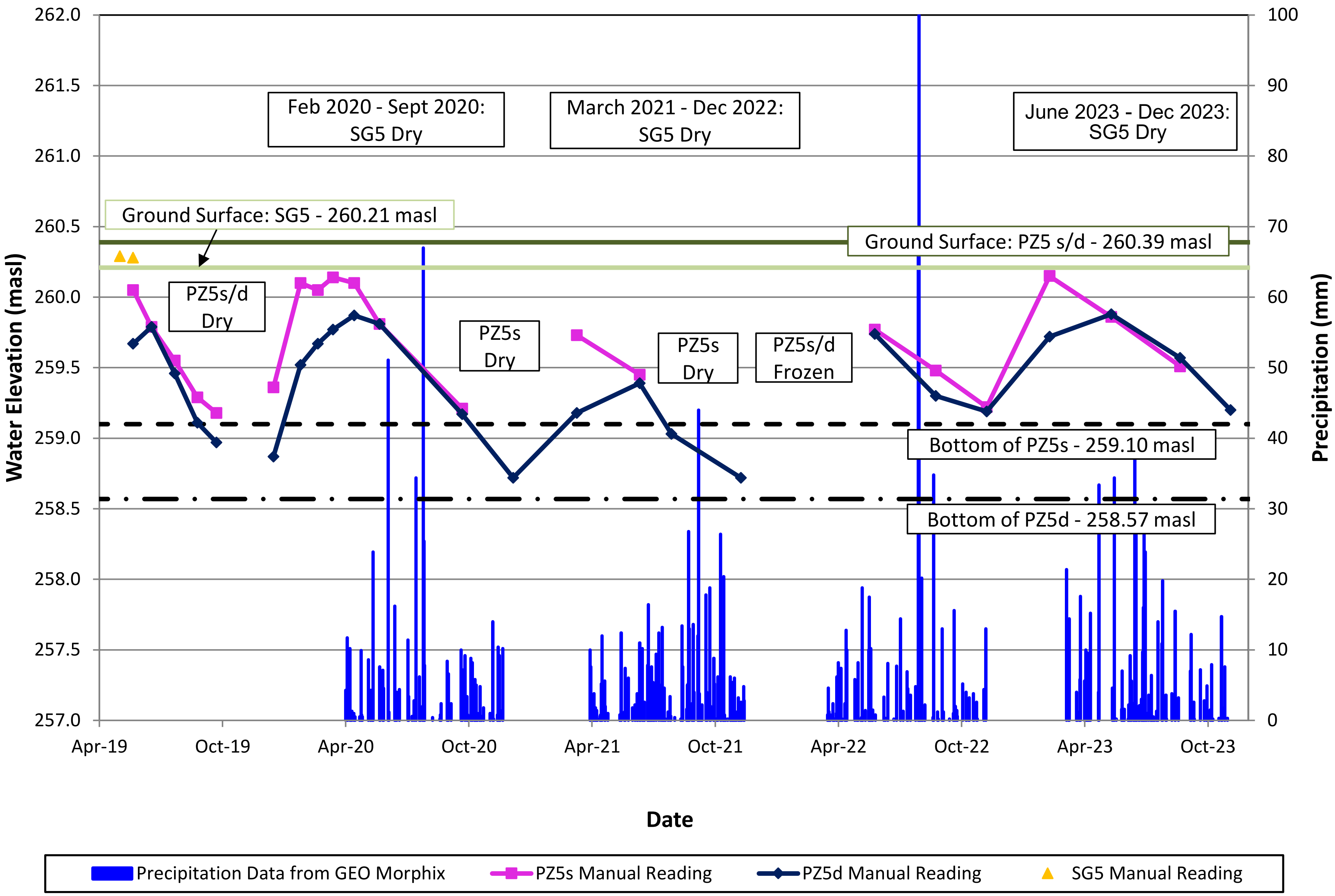

PZ4s/d and SG4
Water Elevations
Ground Surface: SG4 - 254.97 masl
Ground Surface: PZ4s/d - 255.24 masl
Bottom of PZ4s - 253.94 masl
Bottom of PZ4d - 253.65 masl
Water Elevation (masl)
256.0
255.5
255.0
254.5
254.0
253.5
253.0
252.5
252.0
251.5
251.0
100
90
80
70
60
50
40
30
20
10
0
cc
Apr-19
Oct-19
Apr-20
Oct-20
Apr-21
Oct-21
Apr-22
Oct-22
Apr-23
Oct-23
Date
Precipitation Data from GEO Morphix
PZ4s Manual Reading
PZ4s Automatic Readings
PZ4d Manual Reading
PZ4d Automatic Readings
SG4 Manual Reading

Figure E-18

# PZ5s/d and SG5
# Water Elevations



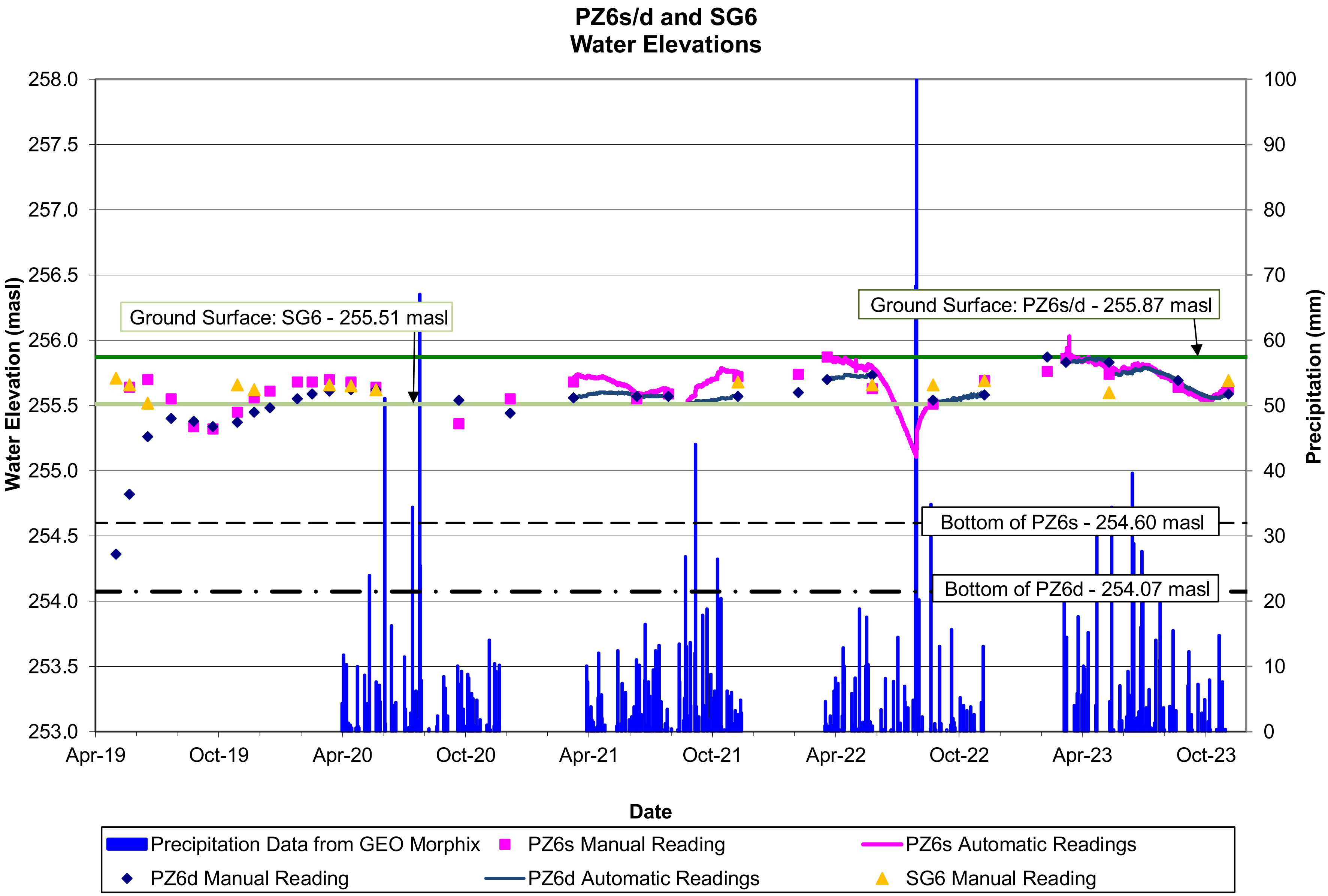


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Figure E-20

# Appendix E-2

## TRCA Groundwater Data

# Appendix A

# Water Levels

| | Alternate Name | MECP Well Tag No. | Interval ID | Northing | Easting | Ground Elevation (masl) | Stickup (m) | Screen Top (masl) | Screen Bottom (masl) | Logger Serial Number | Logger Type | Cable Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRCA Mayfield MW-1 | TRCA Teapot MW-1 | A045333 | 55823960 | 4845019 | 596386 | 262.53 | 0.75 | 251.53 | 248.53 | 1037747 | | 11.5[1] |
| TRCA Mayfield MW-2 | TRCA Teapot MW-2 | A078526 | 55835988 | 4844940 | 596375 | 251.45 | 0.71 | 246.88 | 243.83 | 2040136 | | 6.73 |
| TRCA Mayfield MW-3 | TRCA Teapot MW-3 | | 480000015 | 4844920 | 596318 | 254.4 | 0.675 | 248.3 | 245.26 | 2040132 | | 5.5 |
| TRCA Mayfield MW-4S | TRCA Etobicoke Creek Trail MW1S | A213521 | -827483639 | 4843547 | 595125 | 269.55 | 0.81 | 265.11 | 263.59 | 2069875 | | 6.47 |
| TRCA Mayfield MW-4D | TRCA Etobicoke Creek Trail MW1D | A213521 | -827483638 | | | | 0.835 | 259.62 | 258.10 | 2068686 | | 6.961 |

[1] On May 13, 2016 the cable was shortened from 12.5 to 11.5 mbtc to deal with sedimentation issue.

| | **Date Time** | **Static Water Level (mbtc)** | **Date Time** | **Static Water Level (mbtc)** | **Date Time** | **Static Water Level (mbtc)** | **Date Time** | **Static Water Level (mbtc)** | **Date Time** | **Static Water Level (mbtc)** | **Date Time** | **Static Water Level (mbtc)** | **Date Time** | **Static Water Level (mbtc)** | **Date Time** | **Static Water Level (mbtc)** | **Date Time** | **Static Water Level (mbtc)** | **Date Time** | **Static Water Level (mbtc)** | **Date Time** | **Static Water Level (mbtc)** | **Date Time** | **Static Water Level (mbtc)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRCA Mayfield MW-1 | 11/20/2015 12:00 | 11.88 | 5/13/2016 11:15 | 10.62 | 9/28/2016 12:11 | 10.85 | 2/1/2017 11:30 | 10.73 | 4/19/2017 12:00 | 9.96 | 9/28/2017 11:18[1] | 10.34 | 6/11/2018 12:00 | 9.57 | 11/14/2018 9:55 | 10.67 | 7/3/2019 9:50 | 9.99 | | | | | 10/28/2019 9:44 | 10.62 |
| TRCA Mayfield MW-2 | 11/20/2015 12:00 | 5.31 | 5/13/2016 11:55 | 4.44 | 9/28/2016 12:38 | 5.71 | 2/1/2017 10:30 | 5.73 | 4/19/2017 12:00 | 4.15 | 9/28/2019 11:25[1] | 5.28 | 6/11/2018 12:00 | 4.5 | 11/14/2018 11:33 | 5.4 | 7/3/2019 10:06 | 4.48 | | | | | 10/28/2019 9:55 | 5.42 |
| TRCA Mayfield MW-3 | 11/18/2015 12:00 | 4.52 | 5/13/2016 12:20 | 3.24 | 9/28/2016 12:52 | 4.43 | 2/1/2017 11:00 | 4.82 | 4/19/2017 12:00 | 2.95 | 9/28/2017 11:34[1] | 4.06 | 6/11/2018 12:00 | 3.37 | 11/14/2018 13:05 | 4.55 | 7/3/2019 10:32 | 3.14 | 08/09/2019 13:28[1] | 3.73[1] | 08/12/2019 10:44[1] | 3.66[1] | 10/28/2019 11:01 | 4.35 |
| TRCA Mayfield MW-4S | - | - | - | - | - | - | - | - | - | - | - | - | 6/11/2018 12:00 | 5.12 | 10/10/2018 11:06 | 5.26 | 7/3/2019 11:19 | 4.89 | | | | | 10/28/2019 10:12 | 5.15 |
| TRCA Mayfield MW-4D | - | - | - | - | - | - | - | - | - | - | - | - | 6/11/2018 12:00 | 3.86 | 10/11/2018 9:58 | 3.80 | 7/3/2019 11:31[2] | 3.69 | | | | | 10/28/2019 | 3.77 |

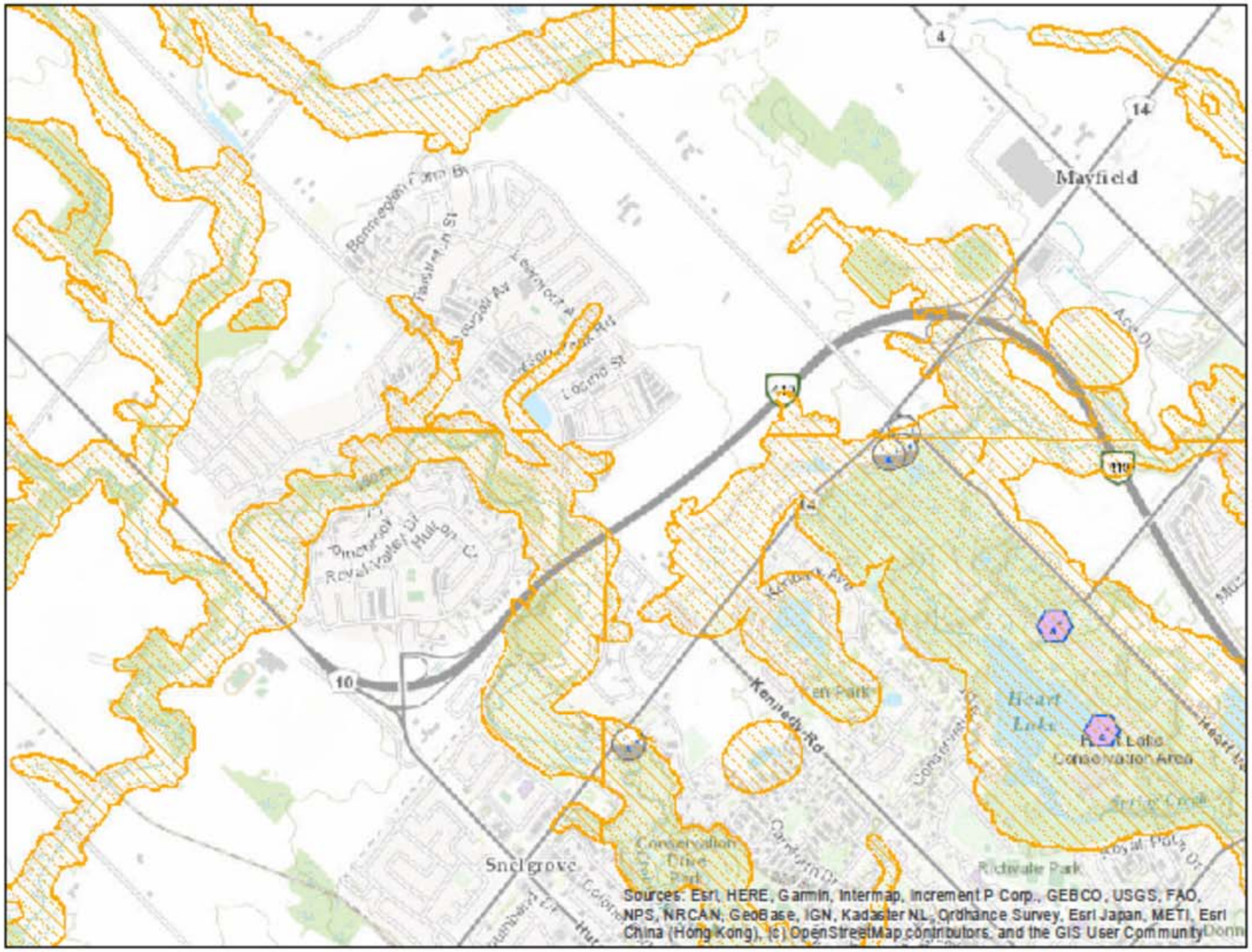
[1] Manuals to be entered into Sitefx

[2] Manual time to be corrected in Sitefx

# Appendix B

# Location Plan

# Mayfield CAMP Phase I Groundwater Monitoring



Sources: Esri, HERE, Garmin, Intermap, Increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

**Legend**

**TRCA Property**

TRCA/TRCA

TRCA / Other

▨ Regulation Limit

● TRCA Groundwater Monitoring

⬢ PGMN Wells

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Toronto and Region Conservation Authority

Date: 2019-12-13
Author: Web AppBuilder for ArcGIS

0 Kilometers

# Appendix C

# Hydrographs

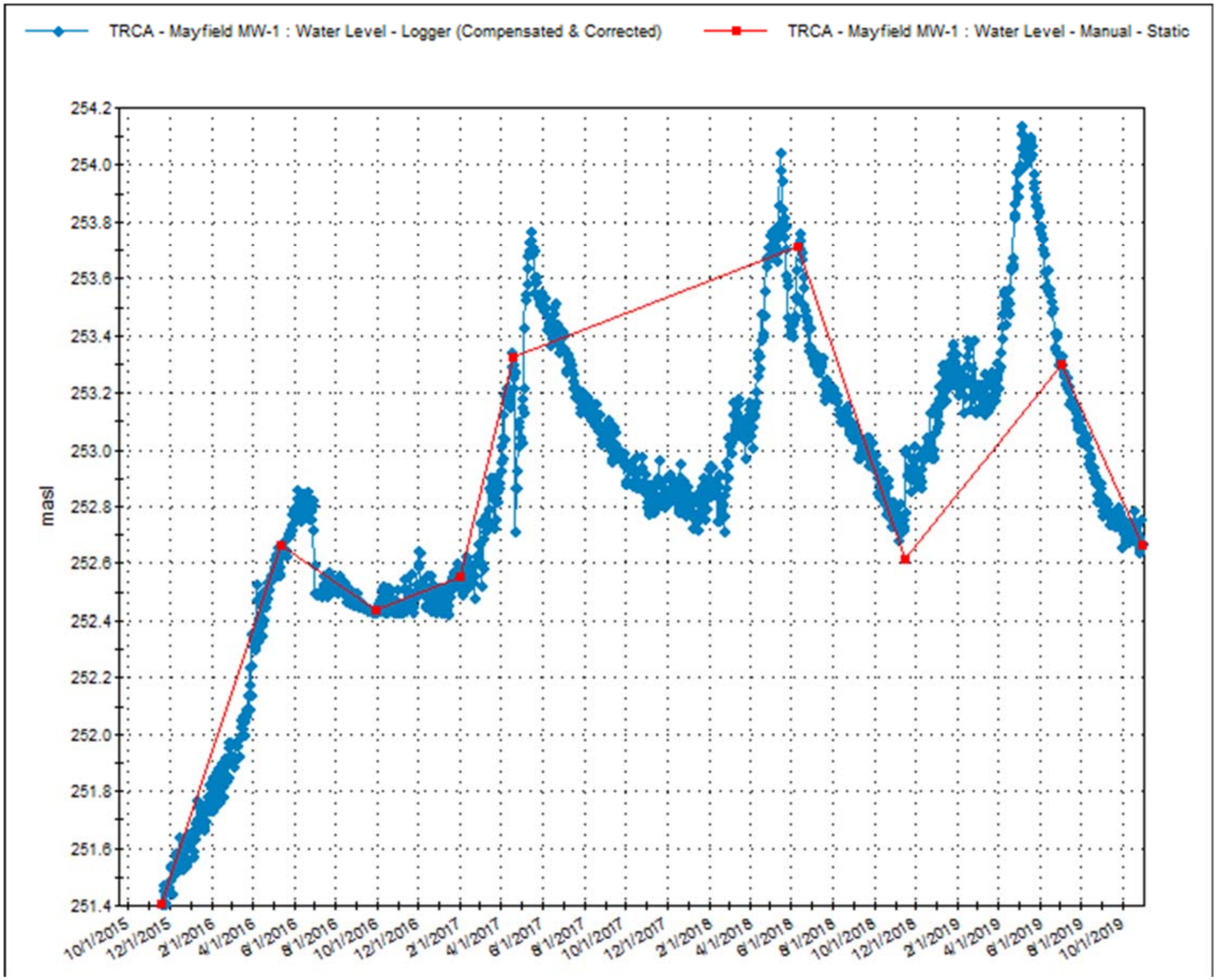


*Figure 1 TRCA Mayfield MW1 Hydrograph*

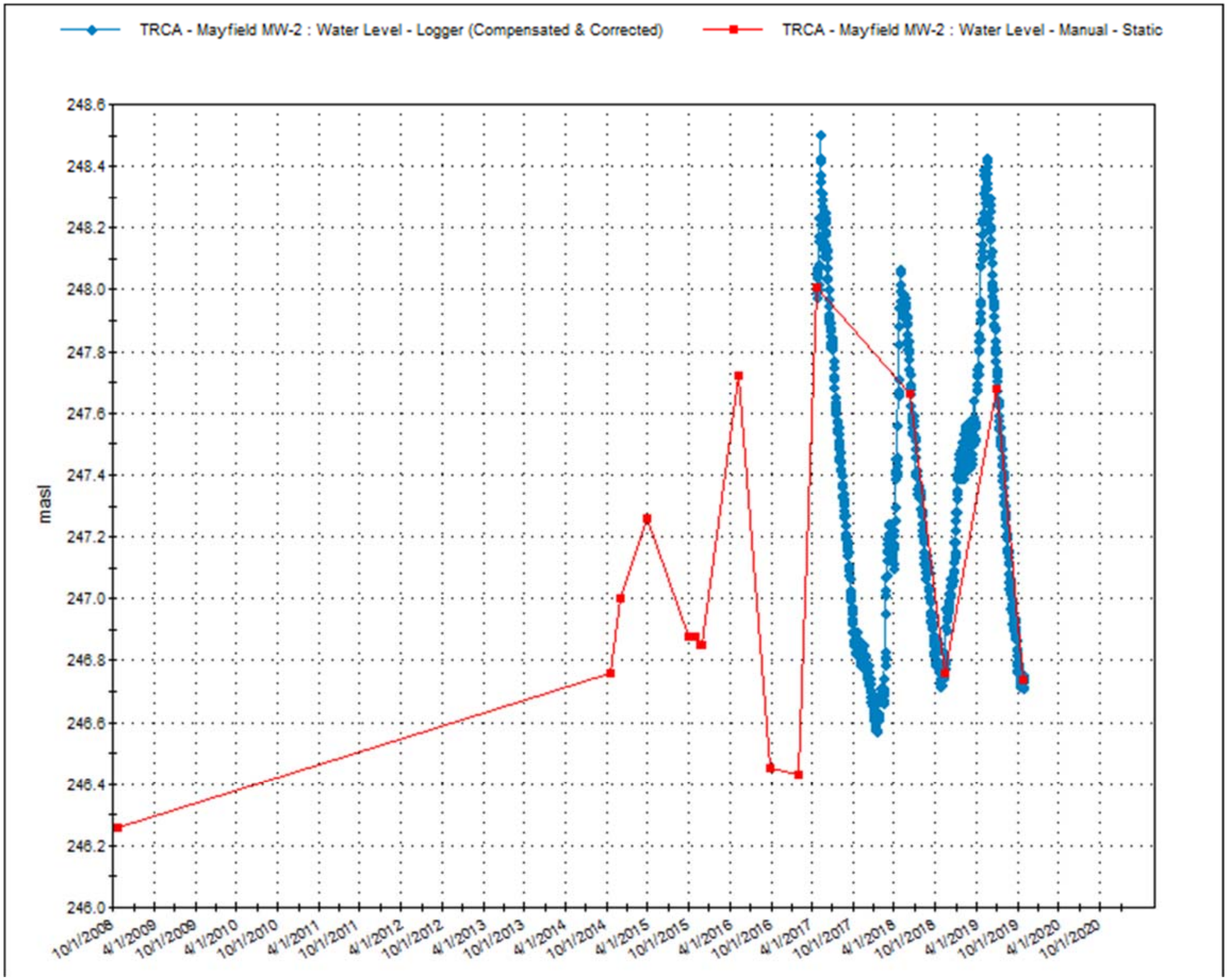


*Figure 2 TRCA Mayfield MW2 Hydrograph*

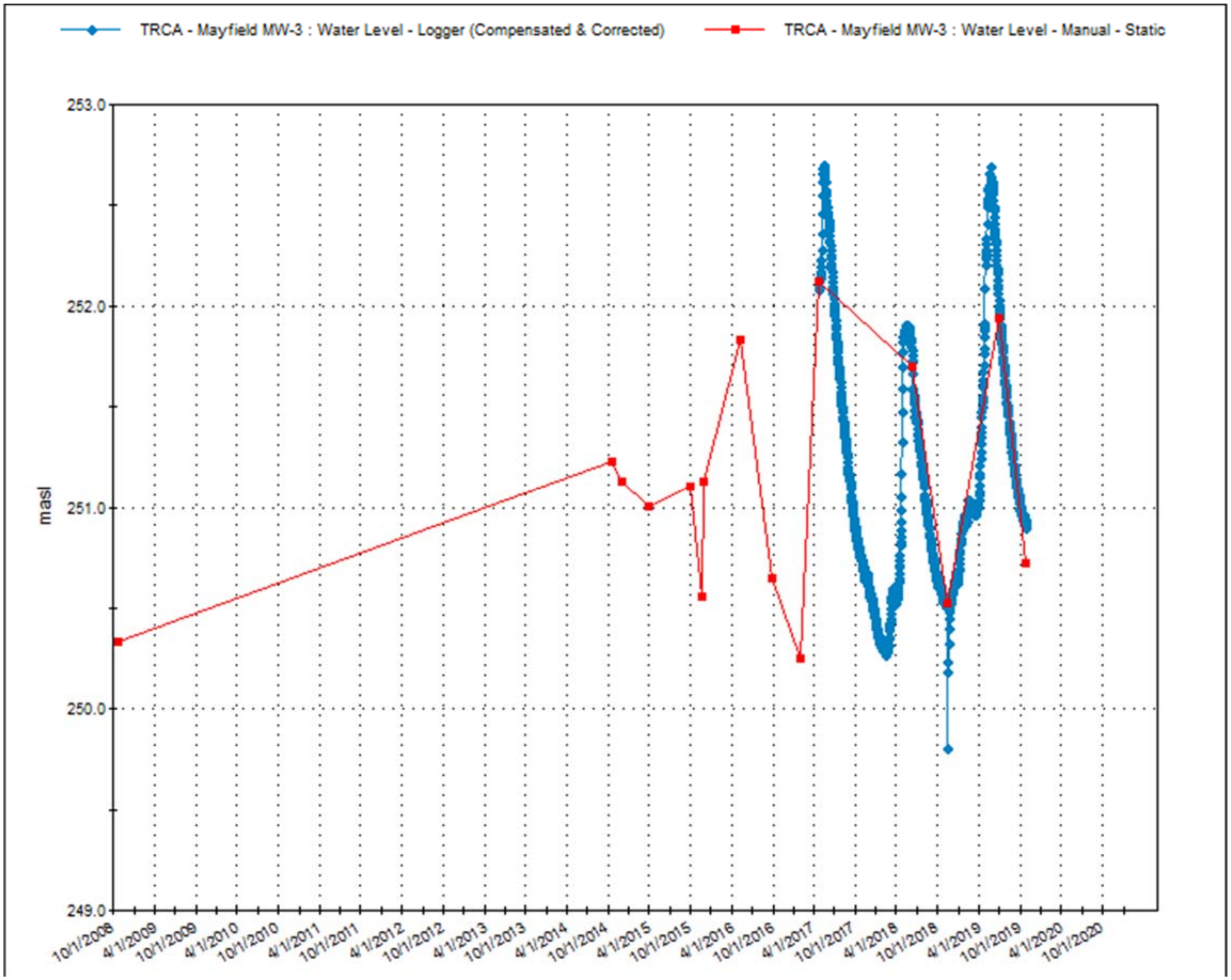


*Figure 3 TRCA Mayfield MW3 Hydrograph*

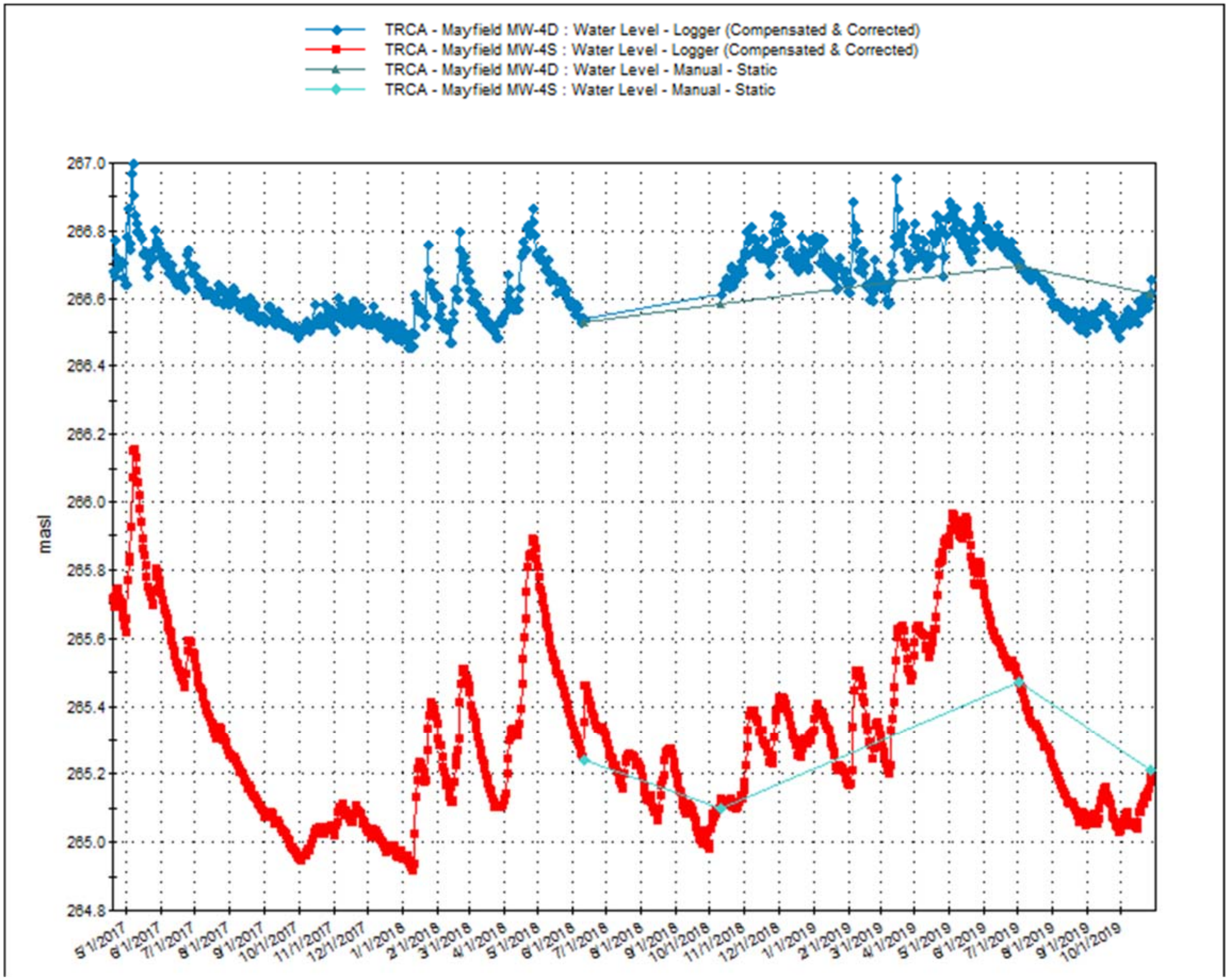
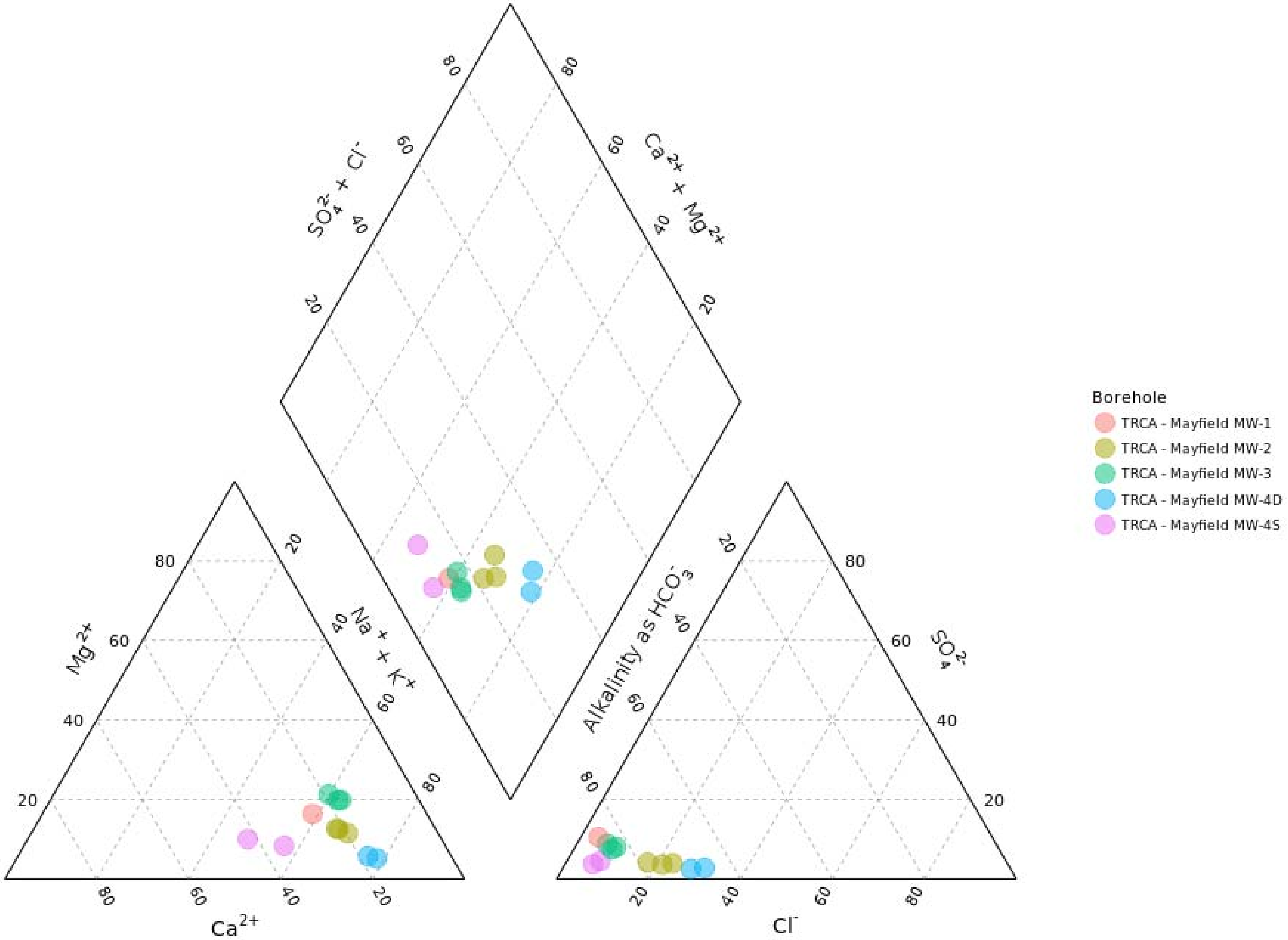


*Figure 4 TRCA Mayfield MW4s/d*

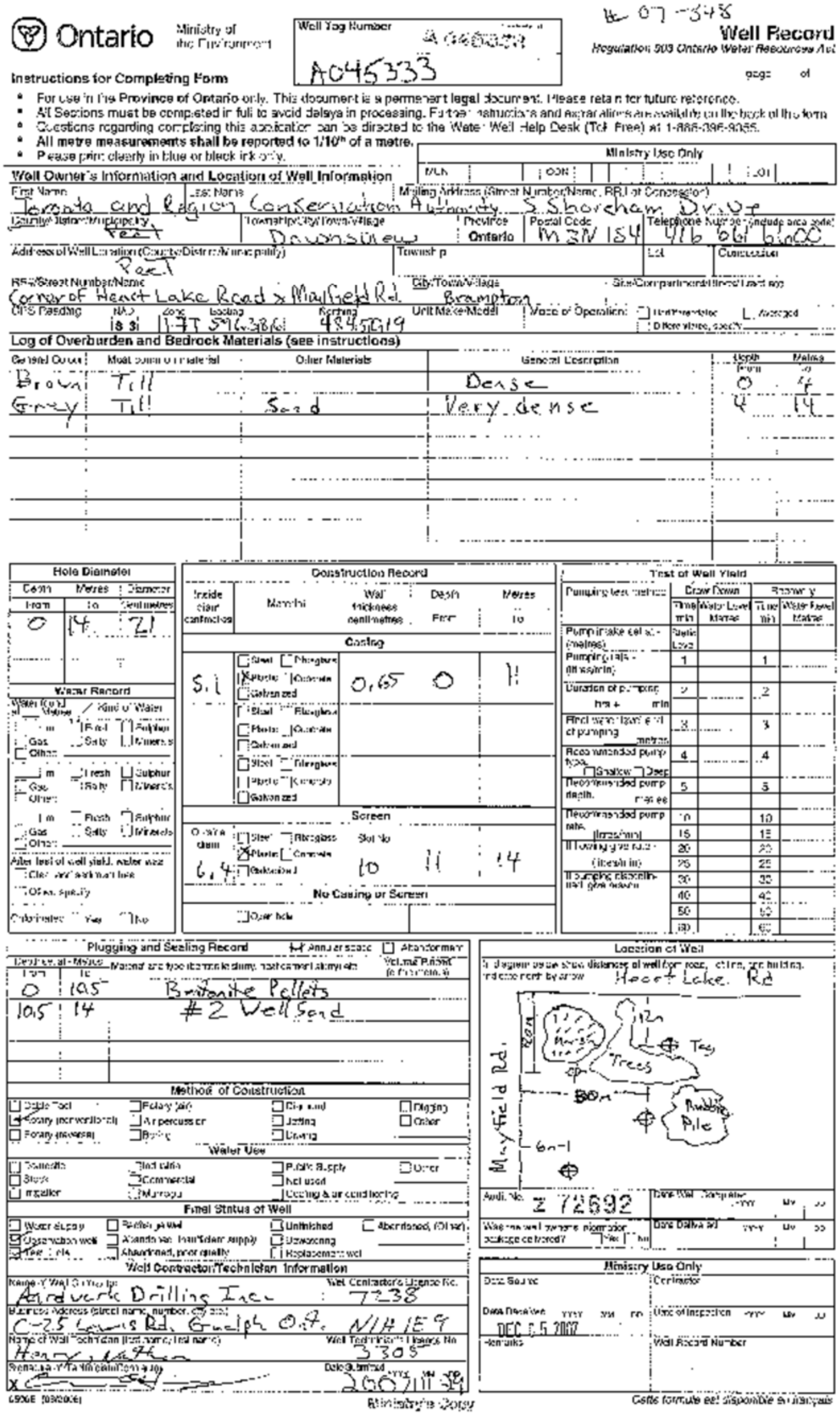
# Appendix D

# Chemistry


SO$_4^{2-}$ + Cl$^-$
Ca$^{2+}$ + Mg$^{2+}$
Mg$^{2+}$
Na$^+$ + K$^+$
Ca$^{2+}$
Alkalinity as HCO$_3^-$
SO$_4^{2-}$
Cl$^-$
20
40
60
80
Borehole
TRCA - Mayfield MW-1
TRCA - Mayfield MW-2
TRCA - Mayfield MW-3
TRCA - Mayfield MW-4D
TRCA - Mayfield MW-4S

# Appendix E

# Well Logs



07-348

Ontario Ministry of the Environment

Well Tag Number: A045333

**Well Record**

*Regulation 903 Ontario Water Resources Act*

page of

**Instructions for Completing Form**

- For use in the Province of Ontario only. This document is a permanent legal document. Please retain for future reference.
- All Sections must be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of the form.
- Questions regarding completing this application can be directed to the Water Well Help Desk (Toll Free) at 1-888-396-9355.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only: MUN | CON | LOT

**Well Owner's Information and Location of Well Information**

First Name / Last Name: Toronto and Region Conservation Authority
Mailing Address (Street Number/Name, RR, Lot, Concession): 5 Shoreham Drive
County/District/Municipality: Peel
Township/City/Town/Village: Downsview
Province: Ontario
Postal Code: M3N 1S4
Telephone Number (include area code): 416 661 6600
Address of Well Location (County/District/Municipality): Peel
Township:
Lot:
Concession:
RR#/Street Number/Name: Corner of Heart Lake Road & Mayfield Rd.
City/Town/Village: Brampton
Site/Compartment/Block/Tract etc.:
GPS Reading: NAD 83 Zone 17T Easting 596386 Northing 4845619
Unit Make/Model:
Mode of Operation: ☐ Undifferentiated ☐ Averaged ☐ Differentiated, specify

**Log of Overburden and Bedrock Materials (see instructions)**

| General Colour | Most common material | Other Materials | General Description | Depth Metres From | To |
|---|---|---|---|---|---|
| Brown | Till | | Dense | 0 | 4 |
| Grey | Till | Sand | Very dense | 4 | 14 |

**Hole Diameter**

| Depth Metres From | To | Diameter Centimetres |
|---|---|---|
| 0 | 14 | 21 |

**Construction Record**

| Inside diam centimetres | Material | Wall thickness centimetres | Depth Metres From | To |
|---|---|---|---|---|
| Casing | | | | |
| 5.1 | ☐ Steel ☐ Fibreglass ☒ Plastic ☐ Concrete ☐ Galvanized | 0.65 | 0 | 11 |
| | ☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized | | | |
| | ☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized | | | |
| Screen | | Slot No. | | |
| Outside diam 6.4 | ☐ Steel ☐ Fibreglass ☒ Plastic ☐ Concrete ☐ Galvanized | 10 | 11 | 14 |
| No Casing or Screen | | | | |
| | ☐ Open hole | | | |

**Water Record**

Water found at Metres / Kind of Water
m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other
m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other
m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other
After test of well yield, water was ☐ Clear and sediment free ☐ Other, specify
Chlorinated ☐ Yes ☐ No

**Test of Well Yield**

| | Draw Down Time min | Water Level Metres | Recovery Time min | Water Level Metres |
|---|---|---|---|---|
| Pumping test method | | | | |
| Pump intake set at (metres) | Static Level | | | |
| Pumping rate (litres/min) | 1 | | 1 | |
| Duration of pumping hrs + min | 2 | | 2 | |
| Final water level end of pumping metres | 3 | | 3 | |
| Recommended pump type ☐ Shallow ☐ Deep | 4 | | 4 | |
| Recommended pump depth metres | 5 | | 5 | |
| Recommended pump rate (litres/min) | 10 | | 10 | |
| If flowing give rate (litres/min) | 15 | | 15 | |
| | 20 | | 20 | |
| If pumping discontinued, give reason | 25 | | 25 | |
| | 30 | | 30 | |
| | 40 | | 40 | |
| | 50 | | 50 | |
| | 60 | | 60 | |

**Plugging and Sealing Record** ☒ Annular space ☐ Abandonment

| Depth set at Metres From | To | Material and type (bentonite slurry, neat cement slurry) etc. | Volume Placed (cubic metres) |
|---|---|---|---|
| 0 | 10.5 | Bentonite Pellets | |
| 10.5 | 14 | #2 Well Sand | |

**Location of Well**

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.

Audit No. Z 72692
Date Well Completed YYYY MM DD
Was the well owner's information package delivered? ☐ Yes ☐ No
Date Delivered YYYY MM DD

**Method of Construction**

☐ Cable Tool ☒ Rotary (conventional) ☐ Rotary (reverse) ☐ Rotary (air) ☐ Air percussion ☐ Boring ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging ☐ Other

**Water Use**

☐ Domestic ☐ Stock ☐ Irrigation ☐ Industrial ☐ Commercial ☐ Municipal ☐ Public Supply ☐ Not used ☐ Cooling & air conditioning ☐ Other

**Final Status of Well**

☐ Water Supply ☑ Observation well ☑ Test Hole ☐ Recharge well ☐ Abandoned, insufficient supply ☐ Abandoned, poor quality ☐ Unfinished ☐ Dewatering ☐ Replacement well ☐ Abandoned, (Other)

**Well Contractor/Technician Information**

Name of Well Contractor: Aardvark Drilling Inc.
Well Contractor's Licence No.: 7238
Business Address (street name, number, city etc.): C-25 Lewis Rd, Guelph Ont. N1H 1E9
Name of Well Technician (last name, first name): Henry, Kathan
Well Technician's Licence No.: 3305
Signature of Technician/Contractor: X
Date Submitted YYYY MM DD: 2007 11 29

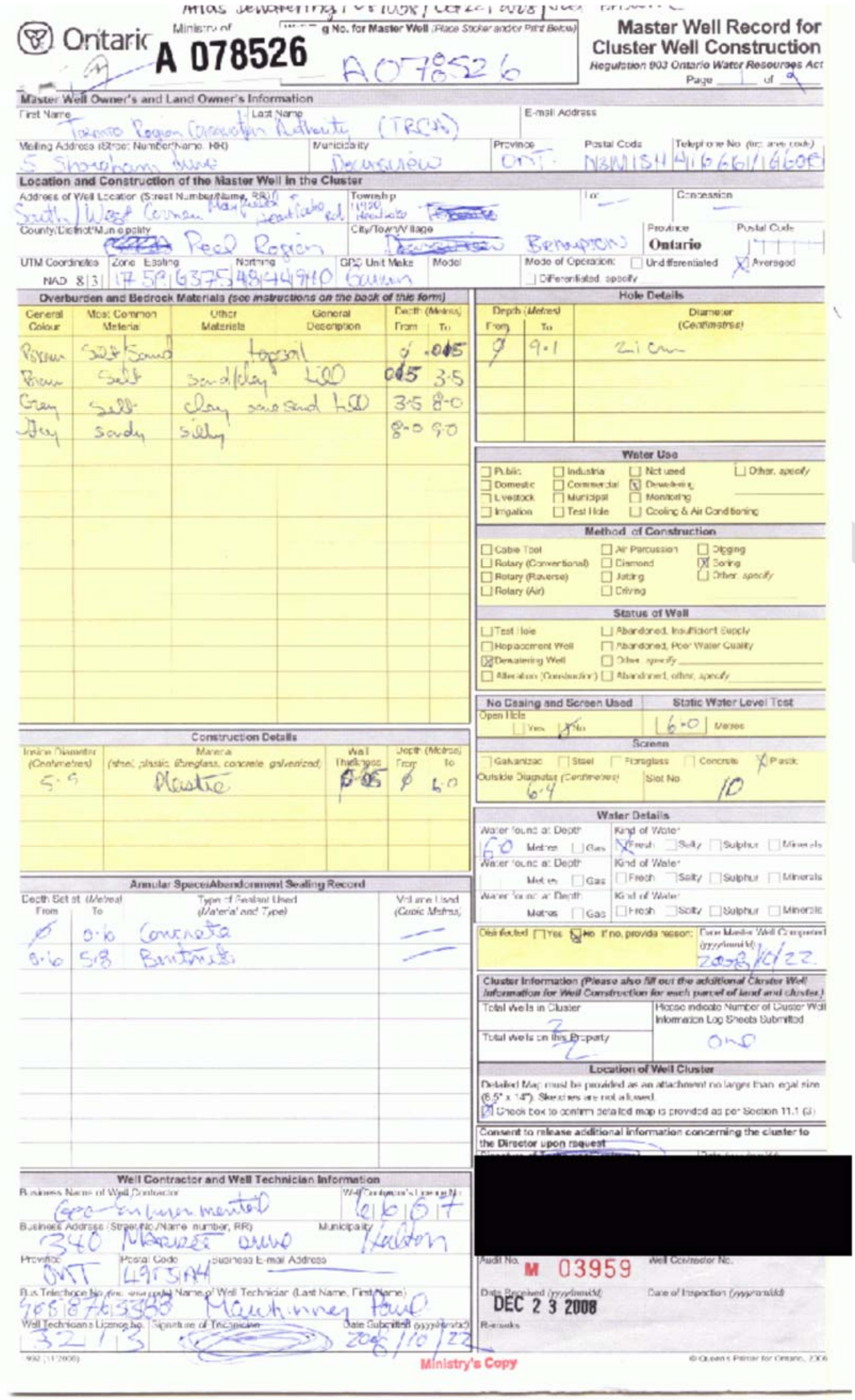
**Ministry Use Only**

Data Source
Contractor
Date Received YYYY MM DD: DEC 05 2007
Date of Inspection YYYY MM DD
Remarks
Well Record Number

0506E (09/2006) Ministry's Copy

Cette formule est disponible en français

Figure 5: TRCA Mayfield MW1



Ontario Ministry of

**A 078526**

g No. for Master Well *(Place Sticker and/or Print Below)* A078526

## Master Well Record for Cluster Well Construction

*Regulation 903 Ontario Water Resources Act*

Page 1 of 2

**Master Well Owner's and Land Owner's Information**

First Name / Last Name: Toronto Region Conservation Authority (TRCA)

E-mail Address:

Mailing Address (Street Number/Name, RR): 5 Shoreham Drive

Municipality: Downsview

Province: ONT.

Postal Code: N3N1S4

Telephone No. (inc. area code): 416 661/6600

**Location and Construction of the Master Well in the Cluster**

Address of Well Location (Street Number/Name, RR): South West Corner Mayfield + Heartlake rd.

Township: Heartlake

Lot: —

Concession: —

County/District/Municipality: Peel Region

City/Town/Village: ~~Downsview~~ Brampton

Province: **Ontario**

Postal Code:

UTM Coordinates: NAD 8|3| Zone 17 Easting 596375 Northing 4844910

GPS Unit Make: Garmin

Model:

Mode of Operation: ☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

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

| General Colour | Most Common Material | Other Materials | General Description | Depth (Metres) From | Depth (Metres) To |
|---|---|---|---|---|---|
| Brown | Silt Sand | topsoil | | 0 | .045 |
| Brown | Silt | sand/clay | LOD | 0.45 | 3.5 |
| Grey | Silt | clay some sand | LOD | 3.5 | 8.0 |
| Grey | sandy | silty | | 8.0 | 9.0 |

**Hole Details**

| Depth (Metres) From | Depth (Metres) To | Diameter (Centimetres) |
|---|---|---|
| 0 | 9.1 | 21 Cm |

**Water Use**

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

**Method of Construction**

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

**Status of Well**

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

**No Casing and Screen Used** — Open Hole ☐ Yes ☒ No

**Static Water Level Test**: 6.0 Metres

**Construction Details**

| Inside Diameter (Centimetres) | Material (steel, plastic, fibreglass, concrete, galvanized) | Wall Thickness | Depth (Metres) From | Depth (Metres) To |
|---|---|---|---|---|
| 5.5 | Plastic | 0.05 | 0 | 6.0 |

**Screen**

☐ Galvanized ☐ Steel ☐ Fibreglass ☐ Concrete ☒ Plastic

Outside Diameter (Centimetres): 6.4

Slot No.: 10

**Annular Space/Abandonment Sealing Record**

| Depth Set at (Metres) From | Depth Set at (Metres) To | Type of Sealant Used (Material and Type) | Volume Used (Cubic Metres) |
|---|---|---|---|
| 0 | 0.6 | Concrete | — |
| 0.6 | 5.8 | Bentonite | — |

**Water Details**

Water found at Depth: 6.0 Metres ☐ Gas — Kind of Water: ☒ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

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

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

Disinfected ☐ Yes ☒ No If no, provide reason:

Date Master Well Completed (yyyy/mm/dd): 2008/10/22

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

Total Wells in Cluster: 2

Total wells on this Property: 2

Please indicate Number of Cluster Well Information Log Sheets Submitted: One

**Location of Well Cluster**

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

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

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

[redacted]

**Well Contractor and Well Technician Information**

Business Name of Well Contractor: Geo-Environmental

Well Contractor's Licence No.: 6617

Business Address (Street No./Name, number, RR): 340 Marker Drive

Municipality: Halton

Province: ONT

Postal Code: L9T 5H4

Business E-mail Address: —

Bus. Telephone No. (inc. area code): 905 876 3388

Name of Well Technician (Last Name, First Name): Mackinney Paul

Well Technician's Licence No.: 3213

Signature of Technician:

Date Submitted (yyyy/mm/dd): 2008/10/22

Audit No. **M 03959**

Well Contractor No.

Date Received (yyyy/mm/dd): DEC 2 3 2008

Date of Inspection (yyyy/mm/dd):

Remarks

0902 (11/2006)

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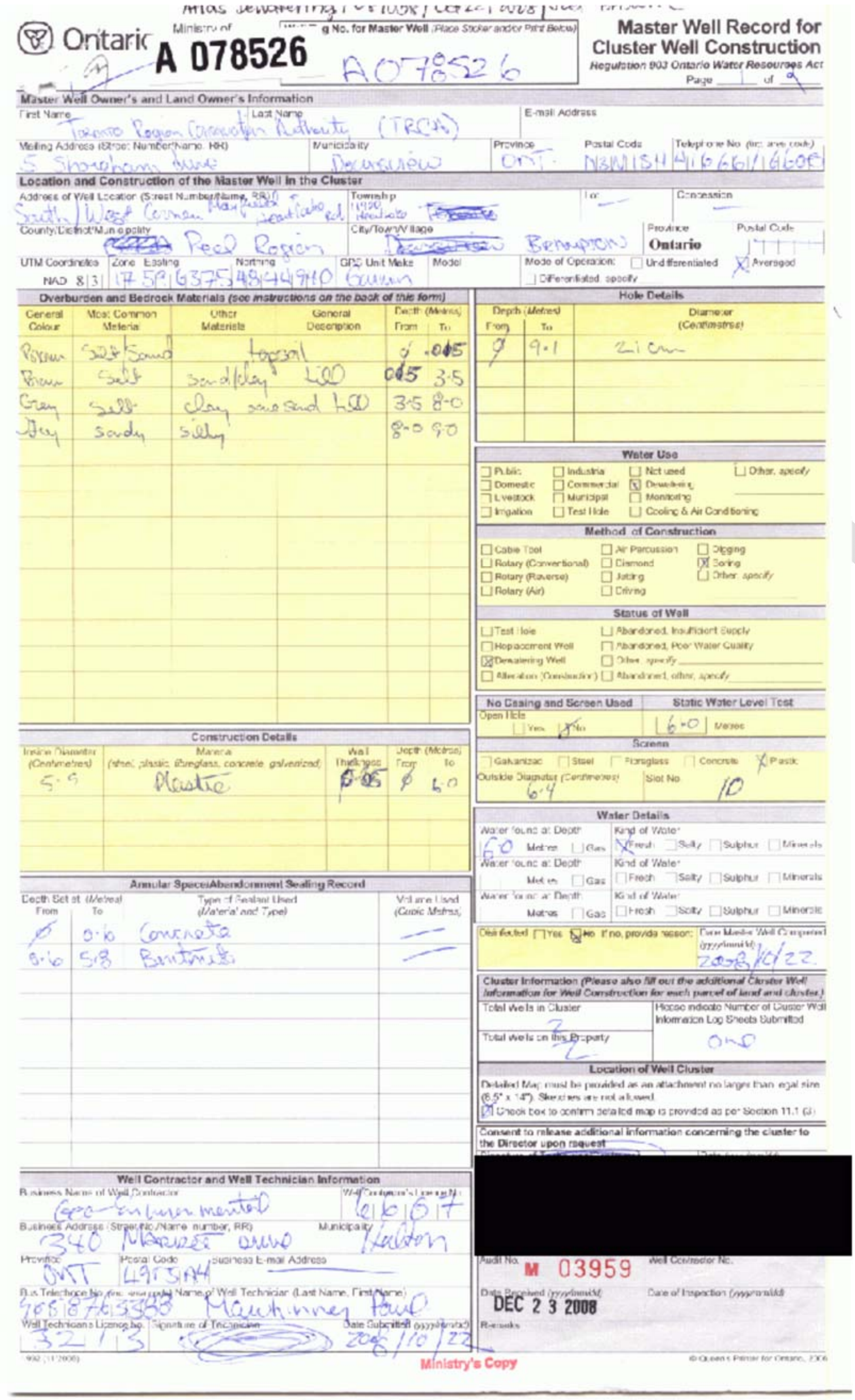
*Figure 6: TRCA Mayfield MW2*



Atlas Dewatering / [illegible] / Oct 22 / 2008 / [illegible]

Ontario Ministry of [illegible]

**A 078526**

Well Tag No. for Master Well (Place Sticker and/or Print Below): A078526

## Master Well Record for Cluster Well Construction

*Regulation 903 Ontario Water Resources Act*

Page 1 of 2

**Master Well Owner's and Land Owner's Information**

First Name / Last Name: Toronto Region Conservation Authority (TRCA)
E-mail Address:
Mailing Address (Street Number/Name, RR): 5 Shoreham Drive
Municipality: Downsview
Province: ONT.
Postal Code: N3N 1S4
Telephone No. (inc. area code): 416 661 6600

**Location and Construction of the Master Well in the Cluster**

Address of Well Location (Street Number/Name, RR): South / West Corner Mayfield Heart Lake rd.
Township: 11990 Heart Lake ~~[illegible]~~
Lot: —
Concession: —
County/District/Municipality: ~~[illegible]~~ Peel Region
City/Town/Village: ~~Downsview~~ Brampton
Province: Ontario
Postal Code:
UTM Coordinates: NAD 8 3 | Zone 17 | Easting 5P 6375 | Northing 4844910
GPS Unit Make: Garmin
Model:
Mode of Operation: ☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

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

| General Colour | Most Common Material | Other Materials | General Description | Depth (Metres) From | Depth (Metres) To |
|---|---|---|---|---|---|
| Brown | Silt Sand | topsoil | | 0 | .005 |
| Brown | Silt | sand/clay | LOD | 005 | 3.5 |
| Grey | Silt | clay some sand | LOD | 3.5 | 8.0 |
| Grey | sandy | silty | | 8.0 | 9.0 |

**Hole Details**

| Depth (Metres) From | Depth (Metres) To | Diameter (Centimetres) |
|---|---|---|
| 0 | 9.1 | 21 cm |

**Water Use**

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

**Method of Construction**

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

**Status of Well**

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

**No Casing and Screen Used**

Open Hole ☐ Yes ☒ No

**Static Water Level Test**

6.0 Metres

**Construction Details**

| Inside Diameter (Centimetres) | Material (steel, plastic, fibreglass, concrete, galvanized) | Wall Thickness | Depth (Metres) From | Depth (Metres) To |
|---|---|---|---|---|
| 5.5 | Plastic | 0.05 | 0 | 6.0 |

**Screen**

☐ Galvanized ☐ Steel ☐ Fibreglass ☐ Concrete ☒ Plastic

Outside Diameter (Centimetres): 6.4
Slot No.: 10

**Water Details**

| Water found at Depth | Kind of Water |
|---|---|
| 6.0 Metres ☐ Gas | ☒ Fresh ☐ Salty ☐ Sulphur ☐ Minerals |
| Metres ☐ Gas | ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals |
| Metres ☐ Gas | ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals |

Disinfected ☐ Yes ☒ No If no, provide reason:
Date Master Well Completed (yyyy/mm/dd): 2008/10/22

**Annular Space/Abandonment Sealing Record**

| Depth Set at (Metres) From | Depth Set at (Metres) To | Type of Sealant Used (Material and Type) | Volume Used (Cubic Metres) |
|---|---|---|---|
| 0 | 0.6 | Concrete | — |
| 0.6 | 5.8 | Bentonite | — |

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

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

**Location of Well Cluster**

Detailed Map must be provided as an attachment no larger than legal size (8.5" x 14"). Sketches are not allowed.
☒ Check box to confirm detailed map is provided as per Section 11.1 (3)

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

[redacted]

**Well Contractor and Well Technician Information**

Business Name of Well Contractor: Geo-Environmental
Well Contractor's Licence No.: 6 6 6 7
Business Address (Street No./Name, number, RR): 340 Market Drive
Municipality: Halton
Province: ONT
Postal Code: L9T 3A4
Business E-mail Address: —
Bus. Telephone No. (inc. area code): 905 876 3388
Name of Well Technician (Last Name, First Name): Mackinney Paul
Well Technician's Licence No.: 3 2 1 3
Signature of Technician:
Date Submitted (yyyy/mm/dd): 2008/10/22

Audit No. M 03959
Well Contractor No.
Date Received (yyyy/mm/dd): DEC 2 3 2008
Date of Inspection (yyyy/mm/dd):
Remarks

0902 (11/2006)

Ministry's Copy

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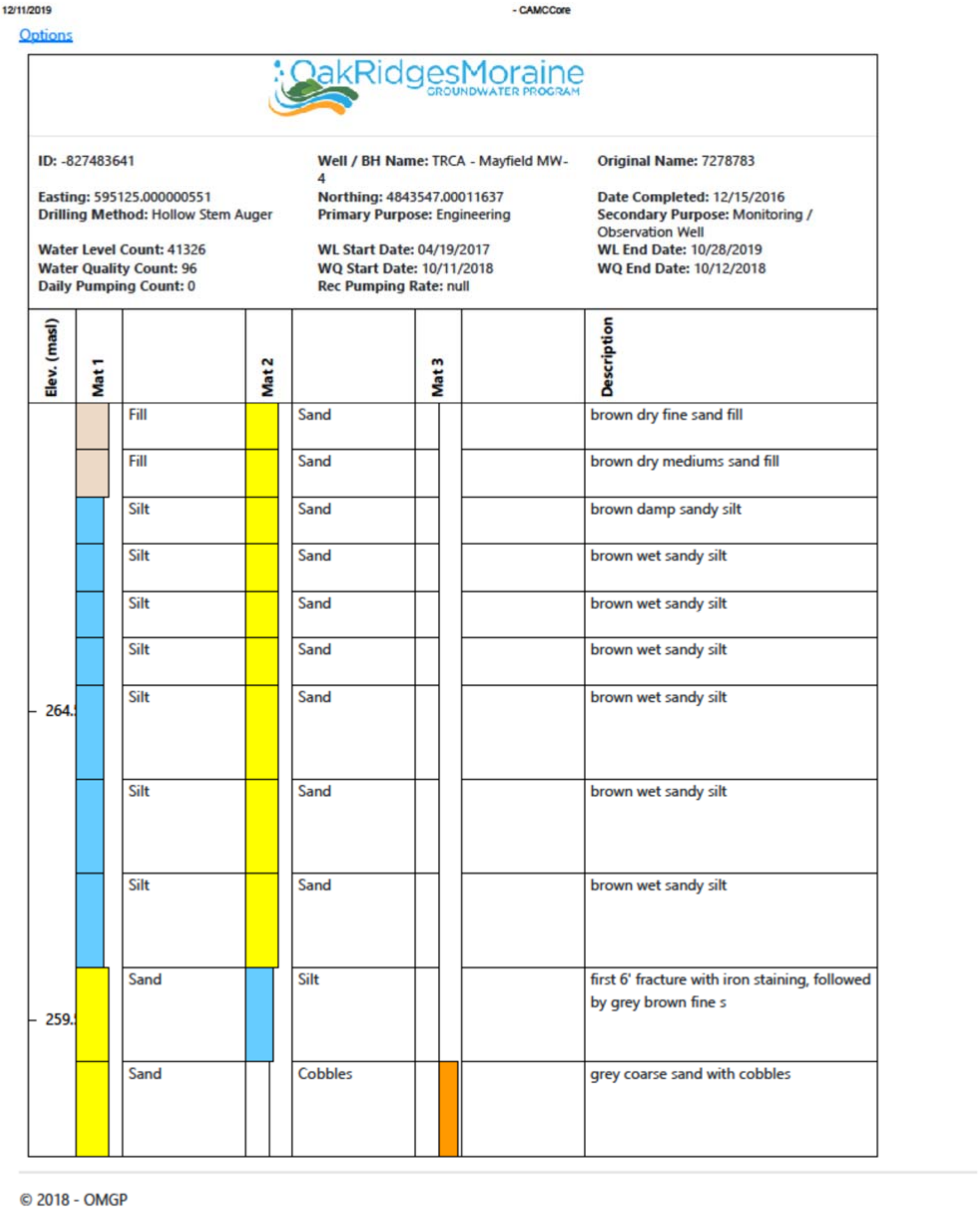
*Figure 7: TRCA Mayfield MW3*



12/11/2019 - CAMCCore

Options

**ID:** -827483641

**Well / BH Name:** TRCA - Mayfield MW-4

**Original Name:** 7278783

**Easting:** 595125.000000551

**Northing:** 4843547.00011637

**Date Completed:** 12/15/2016

**Drilling Method:** Hollow Stem Auger

**Primary Purpose:** Engineering

**Secondary Purpose:** Monitoring / Observation Well

**Water Level Count:** 41326

**WL Start Date:** 04/19/2017

**WL End Date:** 10/28/2019

**Water Quality Count:** 96

**WQ Start Date:** 10/11/2018

**WQ End Date:** 10/12/2018

**Daily Pumping Count:** 0

**Rec Pumping Rate:** null

| Elev. (masl) | Mat 1 | | Mat 2 | | Mat 3 | | Description |
|---|---|---|---|---|---|---|---|
| | 🟫 | Fill | 🟨 | Sand | | | brown dry fine sand fill |
| | 🟫 | Fill | 🟨 | Sand | | | brown dry mediums sand fill |
| | 🟦 | Silt | 🟨 | Sand | | | brown damp sandy silt |
| | 🟦 | Silt | 🟨 | Sand | | | brown wet sandy silt |
| | 🟦 | Silt | 🟨 | Sand | | | brown wet sandy silt |
| | 🟦 | Silt | 🟨 | Sand | | | brown wet sandy silt |
| 264. | 🟦 | Silt | 🟨 | Sand | | | brown wet sandy silt |
| | 🟦 | Silt | 🟨 | Sand | | | brown wet sandy silt |
| | 🟦 | Silt | 🟨 | Sand | | | brown wet sandy silt |
| 259. | 🟨 | Sand | 🟦 | Silt | | | first 6' fracture with iron staining, followed by grey brown fine s |
| | 🟨 | Sand | | Cobbles | 🟧 | | grey coarse sand with cobbles |

*Figure 8: TRCA Mayfield MW4S/D*

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# Appendix F

# Surface Water

# Table F-1
## Surface Water Levels at Staff Gauges

| **Staff Gauge No.** | **SG2** | **SG3** | **SG4** | **SG5** | **SG6** |
|---|---|---|---|---|---|
| **Ground Elevation (masl)** | **256.31** | **255.53** | **254.97** | **260.21** | **255.51** |
| **Date** | **Water Elevation (masl)** | **Water Elevation (masl)** | **Water Elevation (masl)** | **Water Elevation (masl)** | **Water Elevation (masl)** |
| 2-May-19 | 256.47 | 255.72 | 255.15 | 260.29 | 255.71 |
| 22-May-19 | 256.47 | 255.67 | 255.09 | 260.28 | 255.66 |
| 19-Jun-19 | Dry | 255.62 | 255.08 | Dry | 255.52 |
| 24-Jul-19 | - | Dry | Dry | Dry | Dry |
| 27-Aug-19 | Dry | Dry | Dry | Dry | Dry |
| 25-Sep-19 | Dry | Dry | Dry | Dry | Dry |
| 1-Nov-19 | 256.32 | Dry | Dry | Dry | 255.66 |
| 26-Nov-19 | Dry | Dry | 255.02 | Dry | 255.62 |
| 20-Dec-19 | Frozen | Dry | Frozen | Frozen | Frozen |
| 30-Jan-20 | Frozen | Frozen | Frozen | Frozen | Frozen |
| 25-Feb-20 | Dry | Frozen | Dry | Dry | Frozen |
| 19-Mar-20 | 256.44 | 255.64 | 255.15 | Dry | 255.66 |
| 20-Apr-20 | Dry | 255.56 | Dry | Dry | 255.65 |
| 28-May-20 | 256.47 | Dry | 255.09 | Dry | 255.62 |
| 30-Sep-20 | Dry | Dry | Dry | Dry | Dry |
| 16-Dec-20 | Frozen | Dry | Dry | Dry | Dry |
| 22-Mar-21 | 256.41 | Dry | 255.09 | Dry | Frozen |
| 25-Jun-21 | Dry | Dry | Dry | Dry | Dry |
| 12-Aug-21 | Dry | Dry | Dry | Dry | Dry |
| 25-Nov-21 | Dry | Dry | 255.02 | Dry | 255.68 |
| 24-Feb-22 | Snow covered | Frozen | Frozen | Frozen | Snow covered |
| 15-Jun-22 | Dry | Dry | 255.02 | Dry | 255.66 |
| 15-Sep-22 | Dry | Dry | 255.02 | Dry | 255.66 |
| 1-Dec-22 | Dry | Dry | 255.02 | Dry | 255.69 |
| 6-Mar-23 | Snow covered | Snow covered | Snow covered | Snow covered | Snow covered |
| 7-Jun-23 | Dry | Dry | 255.04 | Dry | 255.60 |
| 19-Sep-23 | Dry | Dry | Dry | Dry | Dry |
| 4-Dec-23 | Dry | Dry | 254.99 | Dry | 255.69 |

Notes:
masl - meters above sea level
'-' denotes data unavailable

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# Appendix G

## Water Quality

# Table G-1
## Groundwater Chemistry

| | | | Sample ID | MW19-01 | MW19-04d |
|---|---|---|---|---|---|
| | | | Sample Date | 20-Apr-20 | 20-Apr-20 |
| **Parameter** | **Units** | **ODWQS** | **Type of Standard** | | |
| Conductivity (calculated) | uS/cm | --- | | 1432 | 923 |
| Conductivity | uS/cm | --- | | 1090 | 742 |
| pH | pH units | 6.5-8.5 | OG | 7.80 | 8.02 |
| Langeliers Index 4° C | | --- | | 0.83 | 0.60 |
| Langeliers Index 20° C | | --- | | 1.15 | 0.92 |
| Saturation pH 4°C | pH units | --- | | 6.97 | 7.42 |
| Saturation pH 20° C | pH units | --- | | 6.65 | 7.10 |
| Total Dissolved Solids | mg/L | 500 | AO | **709** | 411 |
| Total Dissolved Solids (calculated) | mg/L | --- | | 769 | 467 |
| Total Hardness (as CaCO3) | mg/L | 80-100 | OG | **613** | **405** |
| Alkalinity (as CaCO3) | mg/L | 30-500 | OG | **592** | 393 |
| Bicarbonate (as CaCO3) | mg/L | --- | | 592 | 393 |
| Carbonate (as CaCO3) | mg/L | --- | | < 2 | < 2 |
| Hydroxide (as CaCO3) | mg/L | --- | | < 2 | < 2 |
| Colour | TCU | --- | | 17 | 15 |
| Reactive Silica | mg/L | --- | | 15.4 | 11.2 |
| Turbidity | NTU | 5 | AO | **>4000** | **583** |
| Total Organic Carbon | mg/L | --- | | 1 | < 1 |
| Chloride | mg/L | 250 | AO | 55 | 6 |
| Fluoride | mg/L | 1.5 | MAC | 0.12 | 0.13 |
| Ammonia+Ammonium (as N) | mg/L | --- | | < 0.04 | < 0.04 |
| Sulphate | mg/L | 500 | AO | 93 | 68 |
| Bromide | mg/L | --- | | < 0.3 | < 0.3 |
| Nitrite (as N) | mg/L | 1 | MAC | < 0.03 | < 0.03 |
| Nitrate (as N) | mg/L | 10 | MAC | **34.8** | 0.75 |
| Phosphorus (total) | mg/L | --- | | 2.87 | 0.68 |
| Phosphorus (total reactive) | mg/L | | | 0.04 | < 0.03 |
| Mercury (dissolved) | mg/L | 0.001 | MAC | < 0.00001 | < 0.00001 |
| Aluminum (dissolved) | mg/L | 0.1 | OG | 0.020 | < 0.001 |
| Antimony (dissolved) | mg/L | 0.006 | IMAC | < 0.0009 | < 0.0009 |
| Arsenic (dissolved) | mg/L | 0.01 | IMAC | < 0.0002 | < 0.0002 |
| Barium (dissolved) | mg/L | 1 | MAC | 0.0844 | 0.0718 |
| Beryllium (dissolved) | mg/L | --- | | < 0.000007 | < 0.000007 |
| Boron (dissolved) | mg/L | 5 | IMAC | 0.021 | 0.039 |
| Cadmium (dissolved) | mg/L | 0.005 | MAC | 0.000006 | 0.000011 |
| Calcium (dissolved) | mg/L | --- | | 176 | 90.1 |
| Chromium (dissolved) | mg/L | 0.05 | MAC | 0.00026 | 0.00011 |
| Cobalt (dissolved) | mg/L | --- | | 0.000102 | 0.000089 |
| Copper (dissolved) | mg/L | 1 | AO | 0.0011 | 0.0003 |
| Iron (dissolved) | mg/L | 0.3 | AO | 0.018 | < 0.007 |
| Lead (dissolved) | mg/L | 0.01 | MAC | 0.00001 | < 0.00001 |
| Magnesium (dissolved) | mg/L | --- | | 42.1 | 43.7 |
| Manganese (dissolved) | mg/L | 0.05 | AO | 0.00751 | 0.0291 |
| Molybdenum (dissolved) | mg/L | --- | | 0.00026 | 0.00939 |
| Nickel (dissolved) | mg/L | --- | | 0.0004 | 0.0005 |
| Phosphorus (dissolved) | mg/L | --- | | < 0.003 | < 0.003 |
| Potassium (dissolved) | mg/L | --- | | 1.41 | 3.97 |
| Selenium (dissolved) | mg/L | 0.05 | MAC | 0.00038 | 0.00060 |
| Silicon (dissolved) | mg/L | --- | | 7.82 | 6.41 |
| Silver (dissolved) | mg/L | --- | | < 0.00005 | < 0.00005 |
| Sodium (dissolved) | mg/L | 200 | AO | 10.9 | 18.5 |
| Strontium (dissolved) | mg/L | --- | | 0.379 | 0.351 |
| Thallium (dissolved) | mg/L | --- | | < 0.000005 | 0.000048 |
| Tin (dissolved) | mg/L | --- | | < 0.00006 | < 0.00006 |
| Titanium (dissolved) | mg/L | --- | | 0.00050 | 0.00005 |
| Uranium (dissolved) | mg/L | 0.02 | MAC | 0.00174 | 0.00478 |
| Vanadium (dissolved) | mg/L | --- | | 0.00020 | 0.00012 |
| Tungsten (dissolved) | mg/L | --- | | < 0.00002 | < 0.00002 |
| Zinc (dissolved) | mg/L | 5 | AO | < 0.002 | < 0.002 |
| Zirconium (dissolved) | mg/L | --- | | < 0.002 | < 0.002 |
| Cation sum | meq/L | --- | | 12.8 | 9.01 |
| Anion Sum | meq/L | --- | | 15.9 | 9.45 |
| Anion-Cation Balance | % difference | --- | | -10.84 | -2.39 |

ODWQS- Ontario Drinking Water Quality Standard
AO- Aesthetic Objective
OG- Operational Guideline
MAC-Maximum Allowable Concentration
IMAC- Interim Maximum Acceptable Concentration
**Bold-** Exceeds ODWQS

# Table G-2
## Surface Water Chemistry

| | | Sample ID | SW4 |
|---|---|---|---|
| | | Sample Date | 20-Apr-20 |
| **Parameter** | **Units** | **PWQO** | |
| Conductivity | uS/cm | --- | 1390 |
| Conductivity (calculated) | uS/cm | --- | 1325 |
| pH | no unit | 6.5-8.5 | 8.01 |
| Langeliers Index @ 4° C | - | --- | -0.02 |
| Saturation pH @ 4°C | - | --- | 8.03 |
| Total Suspended Solids | mg/L | --- | 323 |
| Total Dissolved Solids | mg/L | --- | 726 |
| Total Dissolved Solids (calculated) | mg/L | --- | 746 |
| Alkalinity (as CaCO3) | mg/L | --- | 138 |
| Bicarbonate (as CaCO3) | mg/L | --- | 138 |
| Carbonate (as CaCO3) | mg/L | --- | < 2 |
| Hydroxide (as CaCO3) | mg/L | --- | < 2 |
| Total Hardness (as CaCO3) | mg/L | --- | 201 |
| Colour | TCU | --- | 77 |
| Reactive Silica | mg/L | --- | 0.95 |
| Fluoride | mg/L | --- | 0.12 |
| Turbidity | NTU | --- | 33.1 |
| Chloride | mg/L | --- | 370 |
| Sulphate | mg/L | --- | 15 |
| Bromide | mg/L | --- | < 0.3 |
| Nitrite (as N) | mg/L | --- | < 0.03 |
| Nitrate (as N) | mg/L | --- | < 0.06 |
| Unionized Ammonia (as N) | mg/L | --- | <0.002 |
| Ammonia+Ammonium (as N) | mg/L | --- | < 0.1 |
| Phosphorus (total reactive) | mg/L | --- | < 0.03 |
| Total Organic Carbon | mg/L | --- | 11 |
| Mercury | mg/L | --- | < 0.00001 |
| Silver | mg/L | 0.0001 | < 0.00005 |
| Aluminum | mg/L | --- | 0.0780 |
| Aluminum | mg/L | 0.075 | **0.499** |
| Arsenic | mg/L | 0.005 | 0.0007 |
| Barium | mg/L | --- | 0.0404 |
| Beryllium | mg/L | 1.1 | 0.000028 |
| Boron | mg/L | 0.2 | 0.022 |
| Calcium | mg/L | --- | 67.1 |
| Cadmium | mg/L | 0.0005 | 0.000012 |
| Cobalt | mg/L | 0.0009 | 0.000436 |
| Chromium | mg/L | --- | 0.00105 |
| Copper | mg/L | 0.005 | 0.0021 |
| Iron | mg/L | 0.3 | **3.95** |
| Potassium | mg/L | --- | 3.45 |
| Magnesium | mg/L | --- | 8.09 |
| Manganese | mg/L | --- | 0.138 |
| Molybdenum | mg/L | 0.04 | 0.00021 |
| Sodium | mg/L | --- | 199 |
| Nickel | mg/L | 0.025 | 0.0009 |
| Phosphorus | mg/L | --- | 0.495 |
| Lead | mg/L | 0.005 | 0.00067 |
| Antimony | mg/L | 0.02 | < 0.00009 |
| Selenium | mg/L | 0.1 | 0.0001 |
| Silicon | mg/L | --- | 2.15 |
| Tin | mg/L | --- | 0.00008 |
| Strontium | mg/L | --- | 0.201 |
| Titanium | mg/L | --- | 0.0124 |
| Thallium | mg/L | 0.0003 | < 0.000005 |
| Uranium | mg/L | 0.005 | 0.000229 |
| Vanadium | mg/L | 0.006 | 0.00126 |
| Tungsten | mg/L | --- | 0.00003 |
| Zinc | mg/L | 0.02 | 0.005 |
| Zirconium | mg/L | --- | < 0.002 |
| Anion Sum | meq/L | --- | 13.5 |
| Cation sum | meq/L | --- | 13.0 |
| Anion-Cation Balance | % difference | --- | -1.98 |

PWQO- Provincial Water Quality Objectives
**Bold-** Exceeds PWQO

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

# Appendix H

# Water Balance

**WATER BALANCE CALCULATIONS**
Snell's Hollow
Town of Caledon, Ontario
Apr-25
PROJECT No.300043952.0000

# TABLE H-1

**Pre- Development Monthly Water Balance Components**

**Based on Thornthwaite's Soil Moisture Balance Approach with a Soil Moisture Retention of 200 mm (moderately rooted vegetation in silt and clay till soils)**

**Precipitation data from Toronto Lester B. Pearson International Airport Climate Station (1981 - 2010)**

| **Potential Evapotranspiration Calculation** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **YEAR** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Temperature (Degree C) | -5.5 | -4.5 | 0.1 | 7.1 | 13.1 | 18.6 | 21.5 | 20.6 | 16.2 | 9.5 | 3.7 | -2.2 | **8.2** |
| Heat index: $i = (t/5)^{1.514}$ | 0.00 | 0.00 | 0.00 | 1.70 | 4.30 | 7.31 | 9.10 | 8.53 | 5.93 | 2.64 | 0.63 | 0.00 | **40.1** |
| Unadjusted Daily Potential Evapotranspiration U (mm) | 0.00 | 0.00 | 0.25 | 30.43 | 60.72 | 90.16 | 106.17 | 101.17 | 77.16 | 42.26 | 14.59 | 0.00 | **523** |
| Adjusting Factor for U (Latitude 43° 40' N) | 0.81 | 0.82 | 1.02 | 1.12 | 1.26 | 1.28 | 1.29 | 1.2 | 1.04 | 0.95 | 0.81 | 0.77 | |
| Adjusted Potential Evapotranspiration PET (mm) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| | | | | | | | | | | | | | |
| **COMPONENTS** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **YEAR** |
| Precipitation (P) | 52 | 48 | 50 | 69 | 74 | 72 | 76 | 78 | 75 | 61 | 75 | 58 | **786** |
| Potential Evapotranspiration (PET) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| P - PET | 52 | 48 | 50 | 34 | -2 | -44 | -61 | -43 | -6 | 21 | 63 | 58 | **169** |
| Change in Soil Moisture Storage | 14 | 0 | 0 | 0 | -2 | -44 | -61 | -43 | -6 | 21 | 63 | 58 | **0** |
| Soil Moisture Storage max 200 mm | 200 | 200 | 200 | 200 | 198 | 154 | 93 | 49 | 44 | 65 | 128 | 186 | |
| Actual Evapotranspiration (AET) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| Soil Moisture Deficit max 200 mm | 0 | 0 | 0 | 0 | 2 | 46 | 107 | 151 | 156 | 135 | 72 | 14 | |
| Water Surplus - available for infiltration or runoff | 38 | 48 | 50 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **169** |
| Potential Infiltration (based on MOE metholodogy*; independent of temperature) | 15 | 19 | 20 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **68** |
| Potential Direct Surface Water Runoff (independent of temperature) | 23 | 29 | 30 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **102** |
| | | | | | | | | | | | | | |
| **IMPERVIOUS AREA WATER SURPLUS** | | | | | | | | | | | | | |
| Precipitation (P) | 786 | mm/year | | | | | | | | | | | |
| Potential Evaporation (PE) from impervious areas (assume 15%) | 118 | mm/year | | | | | | | | | | | |
| P-PE (surplus available for runoff from impervious areas) | 668 | mm/year | | | | | | | | | | | |

Assume January storage is 100% of Soil Moisture Storage
Soil Moisture Storage 200 mm <-- See "Water Holding Capacity" values in Table 3.1, MOE SWMPDM, 2003

*MOE SWM infiltration calculations
topography - hilly to rolling land 0.15 <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003
soils - silty and clayey till 0.15 <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003
cover - agricultural lands 0.1 <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003
**Infiltration factor** **0.4**

Latitude of site (or climate station) 43 ° N.

**WATER BALANCE CALCULATIONS**
Snell's Hollow
Town of Caledon, Ontario
Apr-25
PROJECT No.300043952.0000

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# TABLE H-2

**Pre- Development Monthly Water Balance Components**

**Based on Thornthwaite's Soil Moisture Balance Approach with a Soil Moisture Retention of 250 mm (wetland in silt and clay till soils)**

**Precipitation data from Toronto Lester B. Pearson International Airport Climate Station (1981 - 2010)**

| **Potential Evapotranspiration Calculation** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **YEAR** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Temperature (Degree C) | -5.5 | -4.5 | 0.1 | 7.1 | 13.1 | 18.6 | 21.5 | 20.6 | 16.2 | 9.5 | 3.7 | -2.2 | **8.2** |
| Heat index: $i = (t/5)^{1.514}$ | 0.00 | 0.00 | 0.00 | 1.70 | 4.30 | 7.31 | 9.10 | 8.53 | 5.93 | 2.64 | 0.63 | 0.00 | **40.1** |
| Unadjusted Daily Potential Evapotranspiration U (mm) | 0.00 | 0.00 | 0.25 | 30.43 | 60.72 | 90.16 | 106.17 | 101.17 | 77.16 | 42.26 | 14.59 | 0.00 | **523** |
| Adjusting Factor for U (Latitude 43° 40' N) | 0.81 | 0.82 | 1.02 | 1.12 | 1.26 | 1.28 | 1.29 | 1.2 | 1.04 | 0.95 | 0.81 | 0.77 | |
| Adjusted Potential Evapotranspiration PET (mm) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| | | | | | | | | | | | | | |
| **COMPONENTS** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **YEAR** |
| Precipitation (P) | 52 | 48 | 50 | 69 | 74 | 72 | 76 | 78 | 75 | 61 | 75 | 58 | **786** |
| Potential Evapotranspiration (PET) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| P - PET | 52 | 48 | 50 | 34 | -2 | -44 | -61 | -43 | -6 | 21 | 63 | 58 | **169** |
| Change in Soil Moisture Storage | 14 | 0 | 0 | 0 | -2 | -44 | -61 | -43 | -6 | 21 | 63 | 58 | **0** |
| Soil Moisture Storage max 250 mm | 250 | 250 | 250 | 250 | 248 | 204 | 143 | 99 | 94 | 115 | 178 | 236 | |
| Actual Evapotranspiration (AET) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| Soil Moisture Deficit max 250 mm | 0 | 0 | 0 | 0 | 2 | 46 | 107 | 151 | 156 | 135 | 72 | 14 | |
| Water Surplus - available for infiltration or runoff | 38 | 48 | 50 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **169** |
| Potential Infiltration (based on MOE metholodogy*; independent of temperature) | 19 | 24 | 25 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **85** |
| Potential Direct Surface Water Runoff (independent of temperature) | 19 | 24 | 25 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **85** |
| | | | | | | | | | | | | | |
| **IMPERVIOUS AREA WATER SURPLUS** | | | | | | | | | | | | | |
| Precipitation (P) | 786 | mm/year | | | | | | | | | | | |
| Potential Evaporation (PE) from impervious areas (assume 15%) | 118 | mm/year | | | | | | | | | | | |
| P-PE (surplus available for runoff from impervious areas) | 668 | mm/year | | | | | | | | | | | |

Assume January storage is 100% of Soil Moisture Storage

Soil Moisture Storage 250 mm <-- See "Water Holding Capacity" values in Table 3.1, MOE SWMPDM, 2003

*MOE SWM infiltration calculations

| | | |
|---|---|---|
| topography - rolling to flat land | 0.25 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| soils - silty and clayey till | 0.15 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| cover - wetland (pasture & shrubs) | 0.1 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| **Infiltration factor** | **0.5** | |

Latitude of site (or climate station) 43 °N.

**WATER BALANCE CALCULATIONS**
Snell's Hollow
Town of Caledon, Ontario
Apr-25
PROJECT No.300043952.0000

# TABLE H-3

**Pre- Development Monthly Water Balance Components**

**Based on Thornthwaite's Soil Moisture Balance Approach with a Soil Moisture Retention of 250 mm (dry-moist old field meadow in silt and clay till soils)**

**Precipitation data from Toronto Lester B. Pearson International Airport Climate Station (1981 - 2010)**

| **Potential Evapotranspiration Calculation** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **YEAR** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Temperature (Degree C) | -5.5 | -4.5 | 0.1 | 7.1 | 13.1 | 18.6 | 21.5 | 20.6 | 16.2 | 9.5 | 3.7 | -2.2 | **8.2** |
| Heat index: i = $(t/5)^{1.514}$ | 0.00 | 0.00 | 0.00 | 1.70 | 4.30 | 7.31 | 9.10 | 8.53 | 5.93 | 2.64 | 0.63 | 0.00 | **40.1** |
| Unadjusted Daily Potential Evapotranspiration U (mm) | 0.00 | 0.00 | 0.25 | 30.43 | 60.72 | 90.16 | 106.17 | 101.17 | 77.16 | 42.26 | 14.59 | 0.00 | **523** |
| Adjusting Factor for U (Latitude 43° 40' N) | 0.81 | 0.82 | 1.02 | 1.12 | 1.26 | 1.28 | 1.29 | 1.2 | 1.04 | 0.95 | 0.81 | 0.77 | |
| Adjusted Potential Evapotranspiration PET (mm) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| | | | | | | | | | | | | | |
| **COMPONENTS** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **YEAR** |
| Precipitation (P) | 52 | 48 | 50 | 69 | 74 | 72 | 76 | 78 | 75 | 61 | 75 | 58 | **786** |
| Potential Evapotranspiration (PET) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| P - PET | 52 | 48 | 50 | 34 | -2 | -44 | -61 | -43 | -6 | 21 | 63 | 58 | **169** |
| Change in Soil Moisture Storage | 14 | 0 | 0 | 0 | -2 | -44 | -61 | -43 | -6 | 21 | 63 | 58 | **0** |
| Soil Moisture Storage max 250 mm | 250 | 250 | 250 | 250 | 248 | 204 | 143 | 99 | 94 | 115 | 178 | 236 | |
| Actual Evapotranspiration (AET) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| Soil Moisture Deficit max 250 mm | 0 | 0 | 0 | 0 | 2 | 46 | 107 | 151 | 156 | 135 | 72 | 14 | |
| Water Surplus - available for infiltration or runoff | 38 | 48 | 50 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **169** |
| Potential Infiltration (based on MOE methodology*; independent of temperature) | 13 | 17 | 17 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **59** |
| Potential Direct Surface Water Runoff (independent of temperature) | 24 | 31 | 32 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **110** |
| | | | | | | | | | | | | | |
| **IMPERVIOUS AREA WATER SURPLUS** | | | | | | | | | | | | | |
| Precipitation (P) | 786 | mm/year | | | | | | | | | | | |
| Potential Evaporation (PE) from impervious areas (assume 15%) | 118 | mm/year | | | | | | | | | | | |
| P-PE (surplus available for runoff from impervious areas) | 668 | mm/year | | | | | | | | | | | |

Assume January storage is 100% of Soil Moisture Storage

| | | |
|---|---|---|
| Soil Moisture Storage | 250 mm | <-- See "Water Holding Capacity" values in Table 3.1, MOE SWMPDM, 2003 |

*MOE SWM infiltration calculations

| | | |
|---|---|---|
| topography - hilly land | 0.1 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| soils - silty and clayey till | 0.15 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| cover - dry-moist old field meadow (pasture and shrubs) | 0.1 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| **Infiltration factor** | **0.35** | |

Latitude of site (or climate station) 43 ° N.

**WATER BALANCE CALCULATIONS**
Snell's Hollow
Town of Caledon, Ontario
Apr-25
PROJECT No.300043952.0000

# TABLE H-4

**Pre- Development Monthly Water Balance Components**

**Based on Thornthwaite's Soil Moisture Balance Approach with a Soil Moisture Retention of 400 mm (forested lands in silt and clay till soils)**

**Precipitation data from Toronto Lester B. Pearson International Airport Climate Station (1981 - 2010)**

| **Potential Evapotranspiration Calculation** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **YEAR** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Temperature (Degree C) | -5.5 | -4.5 | 0.1 | 7.1 | 13.1 | 18.6 | 21.5 | 20.6 | 16.2 | 9.5 | 3.7 | -2.2 | **8.2** |
| Heat index: $i = (t/5)^{1.514}$ | 0.00 | 0.00 | 0.00 | 1.70 | 4.30 | 7.31 | 9.10 | 8.53 | 5.93 | 2.64 | 0.63 | 0.00 | **40.1** |
| Unadjusted Daily Potential Evapotranspiration U (mm) | 0.00 | 0.00 | 0.25 | 30.43 | 60.72 | 90.16 | 106.17 | 101.17 | 77.16 | 42.26 | 14.59 | 0.00 | **523** |
| Adjusting Factor for U (Latitude 43° 40' N) | 0.81 | 0.82 | 1.02 | 1.12 | 1.26 | 1.28 | 1.29 | 1.2 | 1.04 | 0.95 | 0.81 | 0.77 | |
| Adjusted Potential Evapotranspiration PET (mm) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| | | | | | | | | | | | | | |
| **COMPONENTS** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **YEAR** |
| Precipitation (P) | 52 | 48 | 50 | 69 | 74 | 72 | 76 | 78 | 75 | 61 | 75 | 58 | **786** |
| Potential Evapotranspiration (PET) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| P - PET | 52 | 48 | 50 | 34 | -2 | -44 | -61 | -43 | -6 | 21 | 63 | 58 | **169** |
| Change in Soil Moisture Storage | 14 | 0 | 0 | 0 | -2 | -44 | -61 | -43 | -6 | 21 | 63 | 58 | **0** |
| Soil Moisture Storage max 400 mm | 400 | 400 | 400 | 400 | 398 | 354 | 293 | 249 | 244 | 265 | 328 | 386 | |
| Actual Evapotranspiration (AET) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| Soil Moisture Deficit max 400 mm | 0 | 0 | 0 | 0 | 2 | 46 | 107 | 151 | 156 | 135 | 72 | 14 | |
| Water Surplus - available for infiltration or runoff | 38 | 48 | 50 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **169** |
| Potential Infiltration (based on MOE metholodogy*; independent of temperature) | 19 | 24 | 25 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **85** |
| Potential Direct Surface Water Runoff (independent of temperature) | 19 | 24 | 25 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **85** |
| | | | | | | | | | | | | | |
| **IMPERVIOUS AREA WATER SURPLUS** | | | | | | | | | | | | | |
| Precipitation (P) | 786 | mm/year | | | | | | | | | | | |
| Potential Evaporation (PE) from impervious areas (assume 15%) | 118 | mm/year | | | | | | | | | | | |
| P-PE (surplus available for runoff from impervious areas) | 668 | mm/year | | | | | | | | | | | |

Assume January storage is 100% of Soil Moisture Storage
Soil Moisture Storage 400 mm <-- See "Water Holding Capacity" values in Table 3.1, MOE SWMPDM, 2003

*MOE SWM infiltration calculations

| | | |
|---|---|---|
| topography - hilly to rolling land | 0.15 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| soils - silty and clayey till | 0.15 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| cover - forested lands | 0.2 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| **Infiltration factor** | **0.5** | |

Latitude of site (or climate station) 43 ° N.

**WATER BALANCE CALCULATIONS**
Snell's Hollow
Town of Caledon, Ontario
Apr-25
PROJECT No.300043952.0000

# TABLE H-5

**Pre- Development Monthly Water Balance Components**

**Based on Thornthwaite's Soil Moisture Balance Approach with a Soil Moisture Retention of 100 mm (urban lawns in silt and clay till soils)**

**Precipitation data from Toronto Lester B. Pearson International Airport Climate Station (1981 - 2010)**

| **Potential Evapotranspiration Calculation** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **YEAR** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Temperature (Degree C) | -5.5 | -4.5 | 0.1 | 7.1 | 13.1 | 18.6 | 21.5 | 20.6 | 16.2 | 9.5 | 3.7 | -2.2 | **8.2** |
| Heat index: $i = (t/5)^{1.514}$ | 0.00 | 0.00 | 0.00 | 1.70 | 4.30 | 7.31 | 9.10 | 8.53 | 5.93 | 2.64 | 0.63 | 0.00 | **40.1** |
| Unadjusted Daily Potential Evapotranspiration U (mm) | 0.00 | 0.00 | 0.25 | 30.43 | 60.72 | 90.16 | 106.17 | 101.17 | 77.16 | 42.26 | 14.59 | 0.00 | **523** |
| Adjusting Factor for U (Latitude 43° 40' N) | 0.81 | 0.82 | 1.02 | 1.12 | 1.26 | 1.28 | 1.29 | 1.2 | 1.04 | 0.95 | 0.81 | 0.77 | |
| Adjusted Potential Evapotranspiration PET (mm) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| | | | | | | | | | | | | | |
| **COMPONENTS** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **YEAR** |
| Precipitation (P) | 52 | 48 | 50 | 69 | 74 | 72 | 76 | 78 | 75 | 61 | 75 | 58 | **786** |
| Potential Evapotranspiration (PET) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| P - PET | 52 | 48 | 50 | 34 | -2 | -44 | -61 | -43 | -6 | 21 | 63 | 58 | **169** |
| Change in Soil Moisture Storage | 0 | 0 | 0 | 0 | -2 | -44 | -54 | 0 | 0 | 21 | 63 | 16 | **0** |
| Soil Moisture Storage max 100 mm | 100 | 100 | 100 | 100 | 98 | 54 | 0 | 0 | 0 | 21 | 84 | 100 | |
| Actual Evapotranspiration (AET) | 0 | 0 | 0 | 34 | 77 | 115 | 130 | 78 | 75 | 40 | 12 | 0 | **560** |
| Soil Moisture Deficit max 100 mm | 0 | 0 | 0 | 0 | 2 | 46 | 100 | 100 | 100 | 79 | 16 | 0 | |
| Water Surplus - available for infiltration or runoff | 52 | 48 | 50 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | **226** |
| Potential Infiltration (based on MOE methology*; independent of temperature) | 21 | 19 | 20 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | **90** |
| Potential Direct Surface Water Runoff (independent of temperature) | 31 | 29 | 30 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | **135** |
| | | | | | | | | | | | | | |
| **IMPERVIOUS AREA WATER SURPLUS** | | | | | | | | | | | | | |
| Precipitation (P) | 786 | mm/year | | | | | | | | | | | |
| Potential Evaporation (PE) from impervious areas (assume 15%) | 118 | mm/year | | | | | | | | | | | |
| P-PE (surplus available for runoff from impervious areas) | 668 | mm/year | | | | | | | | | | | |

Assume January storage is 100% of Soil Moisture Storage

| | | |
|---|---|---|
| Soil Moisture Storage | 100 mm | <-- See "Water Holding Capacity" values in Table 3.1, MOE SWMPDM, 2003 |

*MOE SWM infiltration calculations

| | | |
|---|---|---|
| topography - hilly to rolling land | 0.15 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| soils - silty and clayey till | 0.15 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| cover - urban lawns | 0.1 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| **Infiltration factor** | **0.4** | |

Latitude of site (or climate station) 43 ° N.

**WATER BALANCE CALCULATIONS**
Snell's Hollow
Town of Caledon, Ontario
Apr-25
PROJECT No.300043952.0000

BURNSIDE

# TABLE H-6

**Pre- Development Monthly Water Balance Components**

**Based on Thornthwaite's Soil Moisture Balance Approach with a Soil Moisture Retention of 100 mm (urban lawns in silt and clay till soils) - graded**

**Precipitation data from Toronto Lester B. Pearson International Airport Climate Station (1981 - 2010)**

| **Potential Evapotranspiration Calculation** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **YEAR** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Temperature (Degree C) | -5.5 | -4.5 | 0.1 | 7.1 | 13.1 | 18.6 | 21.5 | 20.6 | 16.2 | 9.5 | 3.7 | -2.2 | **8.2** |
| Heat index: $i = (t/5)^{1.514}$ | 0.00 | 0.00 | 0.00 | 1.70 | 4.30 | 7.31 | 9.10 | 8.53 | 5.93 | 2.64 | 0.63 | 0.00 | **40.1** |
| Unadjusted Daily Potential Evapotranspiration U (mm) | 0.00 | 0.00 | 0.25 | 30.43 | 60.72 | 90.16 | 106.17 | 101.17 | 77.16 | 42.26 | 14.59 | 0.00 | **523** |
| Adjusting Factor for U (Latitude 43° 40' N) | 0.81 | 0.82 | 1.02 | 1.12 | 1.26 | 1.28 | 1.29 | 1.2 | 1.04 | 0.95 | 0.81 | 0.77 | |
| Adjusted Potential Evapotranspiration PET (mm) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| | | | | | | | | | | | | | |
| **COMPONENTS** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **YEAR** |
| Precipitation (P) | 52 | 48 | 50 | 69 | 74 | 72 | 76 | 78 | 75 | 61 | 75 | 58 | **786** |
| Potential Evapotranspiration (PET) | 0 | 0 | 0 | 34 | 77 | 115 | 137 | 121 | 80 | 40 | 12 | 0 | **617** |
| P - PET | 52 | 48 | 50 | 34 | -2 | -44 | -61 | -43 | -6 | 21 | 63 | 58 | **169** |
| Change in Soil Moisture Storage | 0 | 0 | 0 | 0 | -2 | -44 | -54 | 0 | 0 | 21 | 63 | 16 | **0** |
| Soil Moisture Storage max 100 mm | 100 | 100 | 100 | 100 | 98 | 54 | 0 | 0 | 0 | 21 | 84 | 100 | |
| Actual Evapotranspiration (AET) | 0 | 0 | 0 | 34 | 77 | 115 | 130 | 78 | 75 | 40 | 12 | 0 | **560** |
| Soil Moisture Deficit max 100 mm | 0 | 0 | 0 | 0 | 2 | 46 | 100 | 100 | 100 | 79 | 16 | 0 | |
| Water Surplus - available for infiltration or runoff | 52 | 48 | 50 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | **226** |
| Potential Infiltration (based on MOE methodology*; independent of temperature) | 23 | 21 | 22 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | **102** |
| Potential Direct Surface Water Runoff (independent of temperature) | 28 | 26 | 27 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | **124** |
| | | | | | | | | | | | | | |
| **IMPERVIOUS AREA WATER SURPLUS** | | | | | | | | | | | | | |
| Precipitation (P) | 786 | mm/year | | | | | | | | | | | |
| Potential Evaporation (PE) from impervious areas (assume 15%) | 118 | mm/year | | | | | | | | | | | |
| P-PE (surplus available for runoff from impervious areas) | 668 | mm/year | | | | | | | | | | | |

Assume January storage is 100% of Soil Moisture Storage

| | | |
|---|---|---|
| Soil Moisture Storage | 100 mm | <-- See "Water Holding Capacity" values in Table 3.1, MOE SWMPDM, 2003 |

*MOE SWM infiltration calculations

| | | |
|---|---|---|
| topography - hilly to rolling land - graded | 0.2 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| soils - silty and clayey till | 0.15 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| cover - urban lawns | 0.1 | <-- Infiltration Factors from the bottom section of Table 3.1, MOE SWMPDM, 2003 |
| **Infiltration factor** | **0.45** | |

Latitude of site (or climate station) 43 ° N.

**WATER BALANCE CALCULATIONS**
Snell's Hollow
Town of Caledon, Ontario
Apr-25
PROJECT No.300043952.0000

# TABLE H-7

## Water Balance - Existing Conditions and Post-Development with No Mitigation

| Land Use | | Approx. Land Area** ($m^2$) | Estimated Impervious Fraction for Land Use** | Estimated Impervious Area ($m^2$) | Runoff from Impervious Area* (m/a) | Runoff Volume from Impervious Area ($m^3$/a) | Estimated Pervious Area ($m^2$) | Runoff from Pervious Area* (m/a) | Runoff Volume from Pervious Area ($m^3$/a) | Infiltration from Pervious Area* (m/a) | Infiltration Volume from Pervious Area ($m^3$/a) | Total Runoff Volume ($m^3$/a) | Total Infiltration Volume ($m^3$/a) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Existing Land Use** | | | | | | | | | | | | | |
| Area 1 | Agricultural Lands | 183,850 | 0.00 | 0 | 0.668 | 0 | 183,850 | 0.102 | 18,662 | 0.068 | 12,441 | 18,662 | 12,441 |
| | Rural Property & Agricultural Buildings | 29,700 | 0.08 | 2,471 | 0.668 | 1,651 | 27,229 | 0.135 | 3,686 | 0.090 | 2,457 | 5,336 | 2,457 |
| | NHS - Dry-Moist Old Field Meadow | 166,300 | 0.00 | 0 | 0.668 | 0 | 166,300 | 0.110 | 18,287 | 0.059 | 9,847 | 18,287 | 9,847 |
| | NHS - Mixed Forest & Hedge Row | 8,200 | 0.00 | 0 | 0.668 | 0 | 8,200 | 0.085 | 694 | 0.085 | 694 | 694 | 694 |
| | NHS - Wetland Area | 73,600 | 0.00 | 0 | 0.668 | 0 | 73,600 | 0.085 | 6,226 | 0.085 | 6,226 | 6,226 | 6,226 |
| | *Sub-Total* | *461,650* | | *2,471* | | *1,651* | *459,179* | | *47,553* | | *31,664* | *49,204* | *31,664* |
| Area 2 | Agricultural Lands | 111,000 | 0.00 | 0 | 0.668 | 0 | 111,000 | 0.102 | 11,267 | 0.068 | 7,511 | 11,267 | 7,511 |
| | Rural Property | 3,750 | 0.00 | 0 | 0.668 | 0 | 3,750 | 0.135 | 508 | 0.090 | 338 | 508 | 338 |
| | NHS - Dry-Moist Old Field Meadow | 10,600 | 0.00 | 0 | 0.668 | 0 | 10,600 | 0.110 | 1,166 | 0.059 | 628 | 1,166 | 628 |
| | *Sub-Total* | *125,350* | | *0* | | *0* | *125,350* | | *12,940* | | *8,477* | *12,940* | *8,477* |
| Area 3 | Agricultural Lands | 17,700 | 0.00 | 0 | 0.668 | 0 | 17,700 | 0.102 | 1,797 | 0.068 | 1,198 | 1,797 | 1,198 |
| | Rural Property & Agricultural Buildings | 3,100 | 0.10 | 295 | 0.668 | 197 | 2,806 | 0.135 | 380 | 0.090 | 253 | 576 | 253 |
| | NHS - Dry-Moist Old Field Meadow | 8,000 | 0.00 | 0 | 0.668 | 0 | 8,000 | 0.110 | 880 | 0.059 | 474 | 880 | 474 |
| | *Sub-Total* | *28,800* | | *295* | | *197* | *28,506* | | *3,056* | | *1,925* | *3,253* | *1,925* |
| **TOTAL PRE-DEVELOPMENT** | | **615,800** | | **2,766** | | **1,848** | **613,034** | | **63,549** | | **42,066** | **65,397** | **42,066** |
| **Post-Development Land Use** | | | | | | | | | | | | | |
| Pond 1 | Low Density | 35,300 | 0.64 | 22,592 | 0.668 | 15,094 | 12,708 | 0.124 | 1,577 | 0.102 | 1,290 | 16,670 | 1,290 |
| | Dual Frontage | 4,600 | 0.93 | 4,278 | 0.668 | 2,858 | 322 | 0.124 | 40 | 0.102 | 33 | 2,898 | 33 |
| | Back-to-Back Townhouses | 6,600 | 0.93 | 6,138 | 0.668 | 4,101 | 462 | 0.124 | 57 | 0.102 | 47 | 4,158 | 47 |
| | Medium Density | 8,200 | 0.93 | 7,626 | 0.668 | 5,095 | 574 | 0.124 | 71 | 0.102 | 58 | 5,166 | 58 |
| | SWM Pond | 15,900 | 0.50 | 7,950 | 0.668 | 5,311 | 7,950 | 0.124 | 986 | 0.102 | 807 | 6,298 | 807 |
| | Park | 23,100 | 0.30 | 6,930 | 0.668 | 4,630 | 16,170 | 0.124 | 2,006 | 0.102 | 1,641 | 6,636 | 1,641 |
| | Roads | 41,400 | 0.93 | 38,502 | 0.668 | 25,723 | 2,898 | 0.124 | 360 | 0.102 | 294 | 26,083 | 294 |
| | Open Space | 10,100 | 0.00 | 0 | 0.668 | 0 | 10,100 | 0.124 | 1,253 | 0.102 | 1,025 | 1,253 | 1,025 |
| | NHS - Mixed Forest & Hedge Row | 7,400 | 0.00 | 0 | 0.668 | 0 | 7,400 | 0.085 | 626 | 0.085 | 626 | 626 | 626 |
| | NHS - Dry-Moist Old Field Meadow | 166,300 | 0.00 | 0 | 0.668 | 0 | 166,300 | 0.110 | 18,287 | 0.059 | 9,847 | 18,287 | 9,847 |
| | NHS - Wetland Area | 73,600 | 0.00 | 0 | 0.668 | 0 | 73,600 | 0.085 | 6,226 | 0.085 | 6,226 | 6,226 | 6,226 |
| | *Sub-Total* | *392,500* | | *94,016* | | *62,812* | *298,484* | | *31,489* | | *21,894* | *94,301* | *21,894* |
| Pond 2 | Low Density | 55,300 | 0.64 | 35,392 | 0.668 | 23,645 | 19,908 | 0.124 | 2,470 | 0.102 | 2,021 | 26,115 | 2,021 |
| | Dual Frontage | 11,900 | 0.93 | 11,067 | 0.668 | 7,394 | 833 | 0.124 | 103 | 0.102 | 85 | 7,497 | 85 |
| | Back-to-Back Townhouses | 16,100 | 0.93 | 14,973 | 0.668 | 10,003 | 1,127 | 0.124 | 140 | 0.102 | 114 | 10,143 | 114 |
| | Medium-High Density | 15,800 | 0.93 | 14,694 | 0.668 | 9,817 | 1,106 | 0.124 | 137 | 0.102 | 112 | 9,954 | 112 |
| | SWM Pond | 16,300 | 0.50 | 8,150 | 0.668 | 5,445 | 8,150 | 0.124 | 1,011 | 0.102 | 827 | 6,456 | 827 |
| | Park | 6,500 | 0.30 | 1,950 | 0.668 | 1,303 | 4,550 | 0.124 | 565 | 0.102 | 462 | 1,867 | 462 |
| | Roads | 67,700 | 0.93 | 62,961 | 0.668 | 42,064 | 4,739 | 0.124 | 588 | 0.102 | 481 | 42,652 | 481 |
| | Open Space | 8,600 | 0.00 | 0 | 0.668 | 0 | 8,600 | 0.124 | 1,067 | 0.102 | 873 | 1,067 | 873 |
| | *Sub-Total* | *198,200* | | *149,187* | | *99,672* | *49,013* | | *6,081* | | *4,976* | *105,753* | *4,976* |
| South Block | Mixed Use | 23,000 | 1.00 | 23,000 | 0.668 | 15,366 | 0 | 0.124 | 0 | 0.102 | 0 | 15,366 | 0 |
| | Roads | 2,100 | 0.93 | 1,953 | 0.668 | 1,305 | 147 | 0.124 | 18 | 0.102 | 15 | 1,323 | 15 |
| | *Sub-Total* | *25,100* | | *24,953* | | *16,671* | *147* | | *18* | | *15* | *16,689* | *15* |
| **TOTAL POST-DEVELOPMENT** | | **615,800** | | **268,156** | | **179,155** | **347,644** | | **37,588** | | **26,885** | **216,743** | **26,885** |
| | | | | | | | | | | | % Change from Pre to Post | 331 | 36 |
| | | | | | | | | | | | Effect of development (with no mitigation) | 3.3 times increase | 36% reduction in infiltration |

* figures from Tables H-1 through H-6

** data provided by David Schaeffer Engineering Ltd.

To balance pre- to post-,
the infiltration target ($m^3$/a)= **15,181**

**WATER BALANCE CALCULATIONS**
Snell's Hollow
Town of Caledon, Ontario
Apr-25
PROJECT No.300043952.0000

# TABLE H-8

## Water Balance - Existing Conditions and Post-Development with Mitigation (with LIDs)

| | Land Use | | Approx. Land Area** (m$^2$) | Estimated Impervious Fraction for Land Use** | Estimated Impervious Area (m$^2$) | Runoff from Impervious Area* (m/a) | Runoff Volume from Impervious Area (m$^3$/a) | Estimated Pervious Area (m$^2$) | Runoff from Pervious Area* (m/a) | Runoff Volume from Pervious Area (m$^3$/a) | Infiltration from Pervious Area* (m/a) | Infiltration Volume from Pervious Area (m$^3$/a) | Total Runoff Volume (m$^3$/a) | Total Infiltration Volume (m$^3$/a) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Existing Land Use** | | | | | | | | | | | | | | |
| Area 1 | Agricultural Lands | | 183,850 | 0.00 | 0 | 0.668 | 0 | 183,850 | 0.102 | 18,662 | 0.068 | 12,441 | 18,662 | 12,441 |
| | Rural Property & Agricultural Buildings | | 29,700 | 0.08 | 2,471 | 0.668 | 1,651 | 27,229 | 0.135 | 3,686 | 0.090 | 2,457 | 5,336 | 2,457 |
| | NHS - Dry-Moist Old Field Meadow | | 166,300 | 0.00 | 0 | 0.668 | 0 | 166,300 | 0.110 | 18,287 | 0.059 | 9,847 | 18,287 | 9,847 |
| | NHS - Mixed Forest & Hedge Row | | 8,200 | 0.00 | 0 | 0.668 | 0 | 8,200 | 0.085 | 694 | 0.085 | 694 | 694 | 694 |
| | NHS - Wetland Area | | 73,600 | 0.00 | 0 | 0.668 | 0 | 73,600 | 0.085 | 6,226 | 0.085 | 6,226 | 6,226 | 6,226 |
| | | *Sub-Total* | *461,650* | | *2,471* | | *1,651* | *459,179* | | *47,553* | | *31,664* | *49,204* | *31,664* |
| Area 2 | Agricultural Lands | | 111,000 | 0.00 | 0 | 0.668 | 0 | 111,000 | 0.102 | 11,267 | 0.068 | 7,511 | 11,267 | 7,511 |
| | Rural Property | | 3,750 | 0.00 | 0 | 0.668 | 0 | 3,750 | 0.135 | 508 | 0.090 | 338 | 508 | 338 |
| | NHS - Dry-Moist Old Field Meadow | | 10,600 | 0.00 | 0 | 0.668 | 0 | 10,600 | 0.110 | 1,166 | 0.059 | 628 | 1,166 | 628 |
| | | *Sub-Total* | *125,350* | | *0* | | *0* | *125,350* | | *12,940* | | *8,477* | *12,940* | *8,477* |
| Area 3 | Agricultural Lands | | 17,700 | 0.00 | 0 | 0.668 | 0 | 17,700 | 0.102 | 1,797 | 0.068 | 1,198 | 1,797 | 1,198 |
| | Rural Property & Agricultural Buildings | | 3,100 | 0.10 | 295 | 0.668 | 197 | 2,806 | 0.135 | 380 | 0.090 | 253 | 576 | 253 |
| | NHS - Dry-Moist Old Field Meadow | | 8,000 | 0.00 | 0 | 0.668 | 0 | 8,000 | 0.110 | 880 | 0.059 | 474 | 880 | 474 |
| | | *Sub-Total* | *28,800* | | *295* | | *197* | *28,506* | | *3,056* | | *1,925* | *3,253* | *1,925* |
| **TOTAL PRE-DEVELOPMENT** | | | **615,800** | | **2,766** | | **1,848** | **613,034** | | **63,549** | | **42,066** | **65,397** | **42,066** |
| **Post-Development Land Use** | | | | | | | | | | | | | | |
| Pond 1 | Low Density | | 35,300 | 0.64 | 22,592 | 0.668 | 15,094 | 12,708 | 0.124 | 1,577 | 0.102 | 1,290 | 5,075 | 1,290 |
| | Dual Frontage | | 4,600 | 0.93 | 4,278 | 0.668 | 2,858 | 322 | 0.124 | 40 | 0.102 | 33 | 2,898 | 33 |
| | Back-to-Back Townhouses | | 6,600 | 0.93 | 6,138 | 0.668 | 4,101 | 462 | 0.124 | 57 | 0.102 | 47 | 4,158 | 47 |
| | Medium Density | | 8,200 | 0.93 | 7,626 | 0.668 | 5,095 | 574 | 0.124 | 71 | 0.102 | 58 | 5,166 | 58 |
| | SWM Pond | | 15,900 | 0.50 | 7,950 | 0.668 | 5,311 | 7,950 | 0.124 | 986 | 0.102 | 807 | 6,298 | 807 |
| | Park | | 23,100 | 0.30 | 6,930 | 0.668 | 4,630 | 16,170 | 0.124 | 2,006 | 0.102 | 1,641 | 1,443 | 1,641 |
| | | Runoff from 2.23 ha of Park (impervious (0.67 ha) and pervious (1.56 ha)) and 0.52 ha from ROW (impervious (0.48 ha) and pervious (0.04 ha)) sent to infiltration gallery designed to accommodate the 25 mm storm event. The 25 mm storm event accounts for approximately 94% of all rain (i.e., 81% of all precipitation).[a] | NA | NA | NA | NA | NA | NA | NA | NA | NA | 7,831 | NA | 7,831 |
| | ROW | | 41,400 | 0.93 | 38,502 | 0.668 | 25,723 | 2,898 | 0.124 | 360 | 0.102 | 294 | 6,052 | 294 |
| | | Runoff from 9.27 ha (impervious (5.9593 ha) and pervious (3.3107 ha)) sent to infiltration trench designed to accommodate the 12.5 mm storm event. The 12.5 mm storm event accounts for approximately 76% of all rain (i.e., 66% of all precipitation).[a] | NA | NA | NA | NA | NA | NA | NA | NA | NA | 28,988 | NA | 28,988 |
| | Open Space | | 10,100 | 0.00 | 0 | 0.668 | 0 | 10,100 | 0.124 | 1,253 | 0.102 | 1,025 | 1,253 | 1,025 |
| | NHS - Mixed Forest & Hedge Row | | 7,400 | 0.00 | 0 | 0.668 | 0 | 7,400 | 0.085 | 626 | 0.085 | 626 | 626 | 626 |
| | NHS - Dry-Moist Old Field Meadow | | 166,300 | 0.00 | 0 | 0.668 | 0 | 166,300 | 0.110 | 18,287 | 0.059 | 9,847 | 18,287 | 9,847 |
| | NHS - Wetland Area | | 73,600 | 0.00 | 0 | 0.668 | 0 | 73,600 | 0.085 | 6,226 | 0.085 | 6,226 | 6,226 | 6,226 |
| | | *Sub-Total* | *392,500* | | *94,016* | | *62,812* | *298,484* | | *31,489* | | *58,714* | *57,481* | *58,714* |
| Pond 2 | Low Density | | 55,300 | 0.64 | 35,392 | 0.668 | 23,645 | 19,908 | 0.124 | 2,470 | 0.102 | 2,021 | 4,792 | 2,021 |
| | Dual Frontage | | 11,900 | 0.93 | 11,067 | 0.668 | 7,394 | 833 | 0.124 | 103 | 0.102 | 85 | 7,497 | 85 |
| | Back-to-Back Townhouses | | 16,100 | 0.93 | 14,973 | 0.668 | 10,003 | 1,127 | 0.124 | 140 | 0.102 | 114 | 8,736 | 114 |
| | Medium-High Density | | 15,800 | 0.93 | 14,694 | 0.668 | 9,817 | 1,106 | 0.124 | 137 | 0.102 | 112 | 8,277 | 112 |
| | SWM Pond | | 16,300 | 0.50 | 8,150 | 0.668 | 5,445 | 8,150 | 0.124 | 1,011 | 0.102 | 827 | 6,456 | 827 |
| | Park | | 6,500 | 0.30 | 1,950 | 0.668 | 1,303 | 4,550 | 0.124 | 565 | 0.102 | 462 | 355 | 462 |
| | | Runoff from 1.65 ha (Park (0.65 ha), ROW (0.43 ha), Med-High Density (0.31 ha) and Back-to-Back Townhouses (0.26 ha)) sent to infiltration gallery designed to accommodate the 25 mm storm event. The 25 mm storm event accounts for approximately 94% of all rain (i.e., 81% of all precipitation).[a] | NA | NA | NA | NA | NA | NA | NA | NA | NA | 6,789 | NA | 6,789 |
| | ROW | | 67,700 | 0.93 | 62,961 | 0.668 | 42,064 | 4,739 | 0.124 | 588 | 0.102 | 481 | 8,476 | 481 |
| | | Runoff from 15.52 ha (impervious (11.307 ha) and pervious (4.213 ha)) sent to infiltration trench designed to accommodate the 12.5 mm storm event. The 12.5 mm storm event accounts for approximately 76% of all rain (i.e., 66% of all precipitation).[a] | NA | NA | NA | NA | NA | NA | NA | NA | NA | 53,308 | NA | 53,308 |
| | Open Space | | 8,600 | 0.00 | 0 | 0.668 | 0 | 8,600 | 0.124 | 1,067 | 0.102 | 873 | 1,067 | 873 |
| | | *Sub-Total* | *198,200* | | *149,187* | | *99,672* | *49,013* | | *6,081* | | *65,072* | *45,656* | *65,072* |
| South Block | Mixed Use | | 23,000 | 1.00 | 23,000 | 0.668 | 15,366 | 0 | 0.124 | 0 | 0.102 | 0 | 15,366 | 0 |
| | ROW | | 2,100 | 0.93 | 1,953 | 0.668 | 1,305 | 147 | 0.124 | 18 | 0.102 | 15 | 1,323 | 15 |
| | | *Sub-Total* | *25,100* | | *24,953* | | *16,671* | *147* | | *18* | | *15* | *16,689* | *15* |
| **TOTAL POST-DEVELOPMENT** | | | **615,800** | | **268,156** | | **179,155** | **347,644** | | **37,588** | | **123,801** | **119,827** | **123,801** |
| | | | | | | | | | | | | % Change from Pre to Post | 183 | -194 |
| | | | | | | | | | | | | Effect of development (with mitigation) | 1.8 times increase | 194% increase in infiltration |

* figures from Tables H-1 through H-6

** data provided by David Schaeffer Engineering Ltd.

[a] based on the Toronto Wet Weather Flow Management Guidelines (City of Toronto, 2006)

To balance pre- to post-,
the infiltration target (m$^3$/a)= **-81,735**

R.J. Burnside & Associates Limited