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HYDROGEOLOGICAL STUDY

Proposed Residential Townhouse Development
821 Big Bay Point Road
Barrie, Ontario

Prepared For: Robert Gilroy
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1 Introduction

Central Earth Engineering Inc. (CEE) was retained by Robert Gilroy to complete a subsurface investigation and geotechnical report for the proposed residential townhouse development to be located at 821 Big Bay Point Road, in Barrie, Ontario. A site location plan is provided as Figure 1. The site is bounded by a commercial property to the east, residential properties to the south and west and Big Bay Point Road to the north. The existing property is approximately 55 metres wide (east-west) and 130 metres long (north-south) with a total lot area of 0.75 ha. The property currently contains two structures surrounded by a manicured lawn and mature trees.

CEE was provided with the following conceptual site plan drawing for review:

- “*Residential Seniors Townhouse Development, 821 Big Bay Point Road, Preliminary Grading Plan*”, Drawing No. FIG-6, Project No. 19105, dated August 2020, by Pearson Engineering Ltd.

Based on the provided grading plan, it is proposed to demolish the two existing buildings and construct 8 multi unit townhouse blocks (Blocks A to H). It is unknown if the proposed townhomes will have basement levels. There are no significant grade changes to accommodate the development and the development will be municipally serviced. A 6.4-metre-wide driveway / internal roadway will run from north to south through the middle of the site, connecting Big Bay Point Road and Birkhall Place. A parking lot will be located in the southeastern corner of the site and an amenity space will be located in the southwestern corner of the site.

The purpose of the hydrogeological study was to assess the subsurface soil conditions at the site by advancing three (3) exploratory boreholes, with three (3) monitoring well installations, to provide hydrogeological engineering recommendations in support of the proposed development. An impact assessment for groundwater quality and quantity and measures for mitigating the impacts are provided, including a water balance. This report has been prepared following Conservation Authority guidelines for hydrogeological report submissions. CEE has also completed a geotechnical report for the site which is provided under a separate cover.

2 Site Setting

2.1 Physiography, Surficial and Bedrock Geology

The site is located within the physiographic area denoted as The Peterborough Drumlin Field, which extends from Hastings County in the east to Simcoe County in the west (Chapman & Putnam, 1984). The physiographic region is dominated by drumlinized glacial till plains and contains approximately 3,000 drumlins.

Surficial and bedrock geology mapping of the site by the Ontario Geological Survey indicates that the surficial geology at the site consists primarily of ice-contact stratified deposits of sand and gravel with minor silt, clay, and glacial till, or consists of stone-poor silty sand glacial till on Paleozoic terrain. At depth, shale and limestone bedrock of the Verulam Formation is present.

2.2 Topography and Drainage

The site is in the Hewitts Creek watershed, within the jurisdiction of the Lake Simcoe Region Conservation Authority (LSRCA). Hewitts Creek is located approximately 850 metres west of the site and the creek flows north and outlets into Kempenfelt Bay of Lake Simcoe. Kempenfelt Bay is located about 950 metres north of the site.

The borehole elevations indicate a topographic relief of about 1 metre across the site and the site slopes gradually from the north to the south. County of Simcoe mapping shows 2 metre contour intervals and confirms that the site gradually slopes to the south or southeast.

Runoff from the site will likely flow to the south based on the site-specific topography. On a regional scale, the Ontario Flow Assessment Tool (OFAT) shows that the site and surrounding area generally drain into Hewitts Creek located about 850 metres west of the site.

2.3 MECP Well Records

Ministry of Environment, Conservation and Parks (MECP) water well records were obtained within 500 metres of the site area to assess the general nature of the groundwater resource in near vicinity of the site, and historical/current uses of wells in the area. Twenty-seven (27) well records were found, and a summary of the data obtained from this review is presented below. The approximate MECP well locations are shown on Figure 4 and the well records with a summary table of the well data are included in Appendix E.

The wells were installed for the following uses:

- Eight (8) for domestic water supply.
- One (1) for unknown usage.
- One (1) for irrigation water supply.
- Seven (7) were abandoned.
- Ten (10) for monitoring.

The stratigraphic descriptions within the MECP monitoring well records are typically inaccurate due to the methodology in which they are determined (observations of cuttings and no consistency between descriptions of soil between different drillers). Though this is the case, an overall sense of the deep stratigraphy can be determined by looking at commonalities between most stratigraphic descriptions and where the wells were terminated in an aquifer. In the area surrounding the site, the well records generally indicate that the stratigraphy consists primarily of sands with some interbedded clay deposits. Groundwater was encountered anywhere from 6 to 18 metres below grade in the wells. The screens of the domestic water wells are typically installed at or below a depth of 14 metres below grade.

It is expected that the newer residential developments to the east, west, and south of the site are serviced by municipal water. Some of the residential properties to the northeast of the site may still obtain their drinking water from private domestic wells but are typically greater than 250 metres away from the site.

2.4 Visual Inspection of Site

A visual site inspection was carried out on October 9, 2020 by senior CEE staff. The northern part of the site consists of a manicured lawn with some trees, and a gravel driveway that extends south from Big Bay Point Road. The southern part of the site consists primarily of a gravel parking area, and there is a shed and a garage with a few trees and a few grassed areas. The existing structures do not have basement levels. No surface water features or watercourses were observed. The site appears to slope gently to the south, but no significant changes in topographic relief were observed. A wooden fence runs along the eastern and southern property lines.

Based on our preliminary visual estimates, it appears the following hard cover and soft cover surfaces currently exist, which was confirmed using aerial images of the property:

- Hard Cover – gravel driveway and buildings (29%).
- Soft Cover – cut lawns and open green space (71%).

2.5 Regulatory Requirements

2.5.1 Source Water Protection

The following documents should be used in determination of the regulatory requirements when it comes to maintaining the hydrogeological function at this site:

- “*Lake Simcoe Protection Plan*,” dated July 2009, by MOECC, MNR & LSRCA.
- “*Approved South Georgian Bay Lake Simcoe Source Protection Plan*,” dated January 26, 2015, by LSRCA.
- “*Lake Simcoe Protection Plan Water Budget Policy for LSPP 4.8-DP and 6.40-DP*,” dated November 2018, by LSRCA.

The Lake Simcoe Protection Plan (LSPP) Designated Policy (DP) 6.36 builds on the Provincial Policy Statement (PPS) and *Clean Water Act, 2006*, to define a Significant Groundwater Recharge Area (SGRA). The definition from the LSPP is below.

- “6.36-DP: A significant groundwater recharge area is an area identified,
 - o as a significant groundwater recharge area by any public body for the purposes of implementing the PPS;
 - o as a significant groundwater recharge area in the assessment report required under the *Clean Water Act, 2006*, for the Lake Simcoe and Couchiching/Black River Source Protection Area; or
 - o by the LSRCA in partnership with MOE and MNR as an ecologically significant groundwater recharge area in accordance with the guidelines developed under policy 6.37.”

Based on Simcoe County online mapping, the following is noted:

- Wellhead Protection Area (WHPA): The site is not within a WHPA Q2 or A to D (see Figure 5A).
- Highly Vulnerable Aquifer (HVA): The site is not within an HVA (see Figure 5B).
- Significant Groundwater Recharge Area (SGRA): The site is not within an SGRA (see Figure 5C).
- Intake Protection Zone: The site is not within an Intake Protection Zone (see Figure 5D).

“Lake Simcoe Protection Plan Water Budget Policy for LSPP 4.8-DP and 6.40-DP,” (by LSRCA, dated November 2018) Section 6.0 describes the policy hierarchy for water balance required for Lake Simcoe Watershed. The policies from most to least stringent are described below:

1. Source Protection Plan Land Use Policy (SPP LUP) 12: *“Planning Approval Authorities shall only permit new major development (excluding single detached residential, barns and non-commercial structures that are accessory to an agricultural operation) in a WHPA-Q2 where the activity would be a significant drinking water threat, where it can be demonstrated through the submission of a hydrogeological study that the existing water balance can be maintained through the use of best management practices such as low impact development. Where necessary, implementation and maximization of off-site recharge enhancement within the same WHPA-Q2 to compensate for any predicted loss of recharge from the development.”*
2. Designated Policy (DP) 6.40: *“Outside of the Oak Ridges Moraine area, an application for major development within a significant groundwater recharge area (SGRA) shall be accompanied by an environmental impact study that demonstrates that the quality and quantity of groundwater in these areas and the function of the recharge areas will be protected, improved or restored.”*
3. Designated Policy (DP) 4.8 d): *“An application for major development shall be accompanied by a stormwater management plan that demonstrates: through an evaluation of anticipated changes in the water balance between pre-development and post-development, how such changes shall be minimized.”*

The proposed townhouse development is not within a WHPA-Q2 and is not within an SGRA, therefore SPP LUP-12 and DP-6.40 do not apply. The proposed development is considered a “major development” under the LSPP policy, therefore DP-4.8 applies. Water balance, quality and quantity of groundwater, and other mitigation measures are discussed in subsequent sections of the report.

The site is not within a WHPA, SGRA, or an HVA. Based on Table 2 in *“Lake Simcoe Protection Plan Water Budget Policy for LSPP 4.8-DP and 6.40-DP,”* infiltration-based practices should be permitted for this proposed low-density residential development for runoff from impervious areas. Infiltration of runoff from vegetated areas and rooftops is always permitted.

2.5.2 Groundwater Dewatering

The volume of water entering the excavation will be based on both ground water infiltration and precipitation events. Based on O.Reg. 63/16, the dewatering limits and requirements are as follows:

- Construction Dewatering less than 50,000 L/day: The takings of both groundwater and stormwater do not require a hydrogeological report and do not require a Permit to Take Water (PTTW) from the Ministry of Environment, Conservation and Parks (MECP).
- Construction Dewatering greater than 50,000 L/day and less than 400,000 L/day: The taking of groundwater and/or stormwater requires a hydrogeological report and registration on the Environmental Activity and Sector Registry (EASR) but does not require a PTTW from the MECP.
- Construction Dewatering greater than 400,000 L/day: The taking of groundwater and/or stormwater requires a hydrogeological report and requires a PTTW from the MECP.

3 Procedures and Methodology

Prior to the commencement of drilling activities, the locations of underground utilities including natural gas, electrical, telephone, water, etc. were marked out by public and private utility locating companies. The fieldwork for the drilling program was carried out on October 1, 2020. A total of three boreholes (Boreholes 1 to 3) were advanced on site using a track-mounted drill rig. To advance the boreholes, continuous flight hollow stem augers and standard soil sampling equipment was utilized. All samples were collected as per ASTM D1586 to assess the strength characteristics of the substrate.

The boreholes were advanced to depths of 7.6 to 7.9 metres below existing grade (local Elev. 94.0 to 91.9 metres). The horizontal locations were laid out in the field by CEE prior to the drilling operations. Ground surface elevations of the boreholes were measured using survey equipment in reference to a temporary benchmark (top of the catch basin located in eastbound lane of Big Bay Point Road near the property) with an assumed local elevation 100.00 metres. GPS coordinates were measured with a handheld GPS unit and referenced to the NAD 83 geodetic datum, UTM Zone 17T.

The CEE field staff examined and classified characteristics of the soils encountered in the boreholes, including the presence of fill materials, made groundwater observations during and upon completion of the drilling, recorded observations of borehole construction, and processed the recovered samples. Soil sampling was conducted at regular intervals for the full depth of the borehole. The boreholes were backfilled upon completion. All recovered soil samples were logged in the field, carefully packaged and transported to the laboratory for more detailed examination and classification. In the laboratory, the samples were classified as to their visual and textural characteristics and geotechnical laboratory testing was carried out with the results included in Appendix B. Three (3) monitoring wells were installed in the boreholes to facilitate long-term groundwater monitoring, sampling for groundwater chemistry, and rising head test analysis. Monitoring well construction is shown on the borehole logs in Appendix A.

4 Subsurface Conditions

4.1 General Overview

The detailed soil profiles encountered in the boreholes are indicated on the attached borehole logs in Appendix A. The borehole locations are shown on Figure 2A (aerial image) and 2B (proposed site plan) and the geotechnical laboratory results are included in Appendix B. A subsurface profile is included as Figure 3. It should be noted that the conditions indicated on the borehole logs are for specific locations only and can vary between and beyond the borehole locations. It should be noted that the soil boundaries indicated on the borehole logs are inferred from non-continuous sampling and observations during drilling. These boundaries are intended to reflect approximate transition zones and should not be interpreted as exact planes of geological change.

In addition, the descriptions provided in the borehole logs are inferred from a variety of factors, including: visual observations of the soil samples retrieved, laboratory testing, measurements prior to and after drilling, and the drilling process itself (speed of drilling, shaking/grinding of the augers, etc.). The passage of time also may result in changes in conditions interpreted to exist at locations where sampling was conducted.

4.2 Stratigraphy

Boreholes 1 to 3 encountered a topsoil layer at the ground surface that ranged from 200 to 250 mm thick.

A zone of earth fill was encountered in the boreholes underlying the topsoil layer. The earth fill consisted of sand and silt, with trace clay, trace organics, and trace rootlets, and extended to a depth of 0.8 metres below grade (local Elev. 100.8 to 99.0 metres). The earth fill was brown and moist. The Standard Penetration Test (SPT) results ("N" Values) measured in the earth fill ranged from 6 to 7 blows per 300 mm of penetration, indicating a loose relative density.

Underlying the earth fill, the boreholes encountered a glacial till deposit with a cohesionless matrix consisting of silty sand, with trace clay and trace gravel. Cobbles and boulders may be embedded within the deposit. The brown and moist glacial till was encountered at a depth of 0.8 metres below grade (local Elev. 100.8 to 99.0 metres) and extended to depths of 4.6 to 7.5 metres below grade (local Elev. 97.0 to 92.3 metres). The SPT "N" Values measured in the glacial till ranged from 14 to greater than 100 blows per 300 mm of penetration, indicating a compact to very dense relative density. The glacial till was generally compact to a depth of approximately 2 metres below grade and was dense to very dense below a depth of 2 metres.

Cohesionless deposits were encountered in the boreholes underlying the glacial till at depths of 4.6 to 7.5 metres below grade (local Elev. 97.0 to 92.3 metres) and extended beyond the vertical depth of investigation at 7.6 to 7.9 metres below grade (local Elev. 94.0 to 91.9 metres). The cohesionless deposits consisted of fine sand with trace silt in Borehole 1, silty sand with trace gravel in Borehole 2, and silt with trace sand and trace clay in Borehole 3. The deposits were brown and damp to moist, becoming wet at 6 to 7 metres below grade. The SPT "N" Values measured in the deposits were greater than 50 blows per 300 mm of penetration, indicating a very dense relative density.

4.3 Groundwater

4.3.1 Groundwater Levels

Unstabilized groundwater level measurements and cave measurements were taken upon completion of drilling of each borehole. These measurements provide a rough estimate of the possible excavation and temporary ground water control constructability considerations that may arise. Unstabilized groundwater was encountered at 6.1 to 7.0 metres below grade. Cave was measured at a depth of 7.2 metres below grade in Borehole 1 but Boreholes 2 and 3 remained open upon completion of drilling.

Each borehole was instrumented with a 50 mm diameter PVC monitoring well with a 1.5-metre-long screen to facilitate the measurement of stabilized groundwater levels. The results are shown on the borehole logs in Appendix A and are summarized in the table below.

Monitoring Well	Well Screen Location		Strata Screened	Depth / Local Elev. (m) of Groundwater	
	Depth (m)	Local Elevation (m)		Oct. 9, 2020	Oct. 13, 2020
1	6.1 to 7.6	95.5 to 94.0	Fine Sand	6.37 / 95.23	6.40 / 95.20
2	6.1 to 7.6	94.1 to 92.6	Silty Sand	6.90 / 93.36	6.93 / 93.33

Monitoring Well	Well Screen Location		Strata Screened	Depth / Local Elev. (m) of Groundwater	
	Depth (m)	Local Elevation (m)		Oct. 9, 2020	Oct. 13, 2020
3	6.0 to 7.5	93.8 to 92.3	Silty Sand Glacial Till	5.59 / 94.14	5.56 / 99.73

Based on the groundwater level measurements and moisture contents of the recovered soil samples, it is expected that the groundwater table ranges from a depth of approximately 5.6 to 6.9 metres below grade. It is expected that groundwater has a hydraulic gradient that flows from the northeast to the southwest. Groundwater levels are expected to show seasonal fluctuations and vary in response to prevailing climate conditions.

4.3.2 In-Situ Permeability and Infiltration

Three (3) rising head tests were completed in the monitoring wells installed in Boreholes 1, 2 and 3 on October 9, 2020. The static water level within each monitoring well was measured prior to the start of testing, and the change in water level during the test was measured using an electronic level logger. The wells were pumped out using watterra with a foot valve. The tests were completed to estimate the horizontal hydraulic conductivity (K) of the soils at the well screen depths.

A hydraulic conductivity value was calculated from the rising head test data using Hvorslev's solution (1951), which requires the measurement of the time it takes for the water level to recharge to 37% of the initial change in water level (called T_0). All three tests recharged sufficiently to reach T_0 . The semi-log plot for the results are provided in Appendix D and are summarized in the table below.

Monitoring Well	Well Screen Location		Strata Screened	Hydraulic Conductivity
	Depth (m)	Local Elevation (m)		
BH 1	6.1 to 7.6	95.5 to 94.0	Fine Sand	6×10^{-5} m/s
BH 2	6.1 to 7.6	94.1 to 92.6	Silty Sand	9×10^{-6} m/s
BH 3	6.0 to 7.5	93.8 to 92.3	Silty Sand Glacial Till	2×10^{-7} m/s

In addition to the above-noted permeability data, the hydraulic conductivity of the soils encountered on site was estimated from grain size distribution curves (as provided in Appendix B). According to Freeze and Cherry (1979), the typical range in hydraulic conductivity is as follows:

- Silty Sand: 10^{-3} to 10^{-7} m/s
- Sand: 10^{-2} to 10^{-6} m/s
- Glacial Till: 10^{-6} to 10^{-12} m/s

The actual measured hydraulic conductivities are within the expected ranges. Based on the measured hydraulic conductivity, the silty sand glacial till deposit has a relatively lower permeability, precluding the free flow of water. The deeper cohesionless deposits of sand to silty sand will typically allow for the free flow of water when wet.

For the purposes of design, the recommended hydraulic conductivity to use for the glacial till deposit encountered beneath the site is 2×10^{-7} m/s. The recommended hydraulic conductivity of the sand to silty sand deposits is 6×10^{-5} m/s for design purposes.

Determination of percolation rates are based on the “*Ministry of Municipal Affairs and Housing (MMAH) Supplementary Guidelines SB-6, Percolation Time and Soil Descriptions, September 14, 2012.*” Under the Unified Soil Classification System, the near-surface glacial till would generally be characterized as S.M. Based on this document, the soil type, grain size distribution, and the results of the hydraulic conductivity testing, the estimated unfactored percolation rate (T-Time) for the near-surface cohesionless soils is 50 mins/cm (infiltration rate of 12 mm/hr). This infiltration rate is not applicable below the water table and infiltration into existing earth fill is not recommended.

4.3.3 Baseline Groundwater Chemical Testing

To establish baseline conditions and assess the suitability for discharge of pumped groundwater to the land surface during potential dewatering activities, the following groundwater samples were collected on October 13, 2020:

- One (1) unfiltered groundwater sample was collected from the monitoring well installed in Borehole 3 and tested relative to Provincial Water Quality Objectives (PWQO) for metals, inorganics, volatile organic compounds (VOC) and petroleum hydrocarbons with BTEX (PHC).
- One (1) filtered groundwater sample was collected from the monitoring well installed in Borehole 3 and tested relative to PWQO for metals.

The samples were collected and placed into pre-cleaned laboratory-supplied vials and/or bottles provided with analytical test group specific preservatives, as required. Dedicated nitrile gloves were used during sample handling. The field filtered sample was run through a 75 µm filter. The samples were submitted to CALA- accredited Caduceon Environmental Laboratories for analysis. The results of the groundwater chemistry are presented in the laboratory Certificates of Analysis provided in Appendix F.

A summary of the results is presented in the table below for samples relative to Provincial Water Quality Objectives (PWQO).

Sample Location	Parameters Tested	Water Sample Parameter Exceedances to PWQO
Borehole 3 (Unfiltered)	Metals, Inorganics, VOC, PHC	No exceedances detected.
Borehole 3 (Filtered)	Metals	

No exceedances were detected in the groundwater from Borehole 3 (both filtered and unfiltered) relative to PWQO. Groundwater quality mitigation measures and disposal recommendations are discussed in Section 5.5.

5 Discussion and Analysis

5.1 Proposed Development Plan

Based on the provided grading plan, it is proposed to demolish the two existing buildings and construct 8 multi unit townhouse blocks (Blocks A to H). It is unknown if the proposed townhomes will have basement levels. There are no significant grade changes to accommodate the development and the development will be municipally serviced. A 6.4-metre-wide driveway / internal roadway will run from north to south through the middle of the site, connecting

Big Bay Point Road and Birkhall Place. A parking lot will be located in the southeastern corner of the site and an amenity space will be located in the southwestern corner of the site.

5.2 Groundwater Control Methodology

Based on the groundwater level measurements and moisture contents of the recovered soil samples, it is expected that the groundwater table ranges from a depth of approximately 5.6 to 6.9 metres below grade. It is expected that groundwater has a hydraulic gradient that flows from the northeast to the southwest. Groundwater levels are expected to show seasonal fluctuations and vary in response to prevailing climate conditions.

The preliminary grading plan indicates that the grade of the site will stay roughly the same. It is unknown at this time if the townhouse blocks will contain basement levels or be slab-on-grade structures. It is understood that site servicing may extend as deep as approximately 3 metres below proposed grades. Based on this, no excavations (whether for site servicing or basements) will extend into the groundwater table which is relatively deep below the site.

5.2.1 Temporary Construction Groundwater Control

The volume of water entering excavations during construction will be based on both groundwater infiltration and precipitation events. Excavations are not expected to extend into the groundwater table which was encountered at 5.6 metres or deeper below grade. During times of high precipitation, some water may collect at the base of the excavation. Local sumps placed at the base of the excavation can typically control rainfall runoff or any perched groundwater seepage in this scenario.

Construction dewatering is expected to take less than 50,000 L/day. Per O.Reg. 63/16, it is anticipated that registration is not required on the Environmental Activity and Sector Registry (EASR) nor will a Permit to Take Water (PTTW) be required from the Ministry of Environment, Conservation and Parks (MECP).

Since there will be no groundwater taking during construction, there will be no impacts to nearby drinking water wells, environmental features, watercourses, groundwater levels, or aquifers. There will be no settlement of nearby land related to dewatering activities. This assessment should be verified by CEE once final site plans are available.

5.2.2 Permanent Building Drainage

For new structures that will be slab on grade with no basement levels, perimeter and under-slab drainage at the foundation level is not required, provided that the underside of concrete slab is at least 200 mm above the prevailing grade of the site and the surrounding surfaces slope away from the building at a gradient of at least 2% to promote surface water run-off and to reduce groundwater infiltration adjacent to foundations. To minimize infiltration of surface water, the upper 150 mm of backfill could comprise relatively impervious compacted soil material.

Where basements are constructed, all basement foundation walls must be provided with damp-proofing provisions in conformance to the Ontario Building Code. Backfill along the foundation wall must consist of Granular 'B' Type 1 (OPSS 1010) for a minimum lateral distance of 600 mm out from the foundation wall. Alternatively, if a filtered cellular drainage media is provided adjacent to the foundation wall, the backfill may consist of common earth fill.

For buildings with basements, a perimeter drainage system must be installed that will remove any water that infiltrates into the building backfill, to ensure that any water does not infiltrate into the basement. The perimeter drains must consist of minimum 100 mm diameter perforated pipes wrapped in filter socks, sufficiently covered on all sides by 19 mm clear stone. Perimeter drains should be directed to the sump underneath the basement floor in solid pipes so as not to surcharge the underfloor drainage layer with water. All sump pumps should be on emergency power for redundancy in case of a power outage. A typical basement drainage detail is included in Appendix C.

Since it is expected that the townhouses will either be on-grade structures or have basement levels that extend no deeper than 3 metres below grade, any basement levels will not extend below the groundwater table. It is expected that any basement levels on site will be kept at least approximately 2.5 metres above the prevailing groundwater table. A PTTW from the MECP is not expected to be required since there will not be permanent dewatering occurring at the site. There will be no impacts to nearby drinking water wells, environmental features, watercourses, groundwater levels, or aquifers. There will be no settlement of nearby land related to dewatering activities. This assessment should be verified by CEE once final site plans are available.

5.3 Water Balance

CEE was provided with the following report for review: “*Functional Servicing Report, 821 Big Bay Point Road – Residential Seniors Townhouse Development, City of Barrie, County of Simcoe*”, Reference No. 19105, dated September 2020, by Pearson Engineering Ltd. This report contains detailed calculations for site servicing, water balance and phosphorus budget. Though a water balance was provided within the Functional Servicing Report (FSR), CEE completed a water balance as well as was this within our scope of work, as well as to ensure general consistency with the water balance provided in the FSR.

5.3.1 Water Balance Components

A water balance is an accounting of the water resources within a given area. The water balance equates the precipitation (P) over a given area to the summation of the change in ground water storage (S), evapotranspiration/evaporation (ET), surface water runoff (R) and infiltration (I) using the following equation:

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

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). For example, runoff occurs at a higher percentage 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 property. Field observations of the drainage conditions, land cover and soil types, groundwater levels and local climatic records are important inputs to the water balance calculations.

- Precipitation (P): For the purposes of approximating the annual precipitation at this site, the monthly rainfall between 1981 and 2010 was used based on Environment Canada historical weather data from the Barrie

WPCC weather station (Climate ID 61105577, Latitude 44.38 N, Longitude -79.69 W, Elevation 221 metres), which is located about 5.5 km northwest of the site.

- 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.
- Evapotranspiration/Evaporation (PET): The 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 refers to the water loss from a vegetated surface to the atmosphere under conditions of an unlimited water supply. Evaporation occurs from a hard surface (e.g. flat rooftops, asphalt, gravel parking areas, etc.).
- Water Surplus (R + I): The difference between the mean precipitation and evapotranspiration is referred to as the water surplus. The water surplus is divided into two parts: as surface or overland runoff (R) and the infiltration into the surficial soil (I). The infiltration is comprised of two end member components: one component that moves vertically downward to underlying aquifers (referred to as percolation, deep infiltration or net recharge) and a second component that moves laterally through the near surface soil profile or shallow soils as interflow that re-emerges locally to surface at some short distance and time following precipitation.

5.3.2 Approach and Methodology

The analytical approach to calculate the water balance involves monthly soil-moisture balance calculations to determine the pre-development infiltration volumes. The detailed water balance calculation is provided in Appendix G, which is summarized in this and subsequent sections of the report. The following assumptions were used as part of the soil-moisture balance calculations:

- A soil moisture balance approach 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. Considering the nature of the cohesionless near surface soils (sandy earth fill or silty sand glacial till) and urban lawn cover, a soil moisture storage capacity of 75 mm was used for the soft cover areas. Based on the site plan, it is expected that open green spaces will remain as urban lawn cover so the same storage capacity was used in the post-development condition.
- Once the soil moisture deficit is overcome, any further excess water can then pass through the soil as infiltration and either become interflow (indirect runoff) or recharge (deep infiltration).

Monthly potential evapotranspiration calculations accounting for latitude, climate and the actual evapotranspiration and water surplus components of the water balance based on the monthly precipitation and soil moisture conditions was calculated. The MOECC SWM Planning and Design Manual (2003) methodology for calculating total infiltration based on topography, soil type and land cover was used, and a corresponding infiltration factor was calculated for pre- and post-development conditions. The water surplus was multiplied by the infiltration factor to determine both the pre-existing and post-development annual volumes for runoff and infiltration for the property.

The post-development water balance scenario was calculated based on the drawing, “*Residential Seniors Townhouse Development, 821 Big Bay Point Road, Preliminary Grading Plan*”, Drawing No. FIG-6, Project No. 19105, dated August 2020, by Pearson Engineering Ltd. This grading plan shows general information about the

locations of impermeable features including townhouse building roadways, driveways, and a parking lot, and permeable features such as an open amenity space or lawns. The total site area is approximately 7,500 square metres (0.75 hectares). The amount of impermeable area estimated from the concept plan was approximately 59% of the total site area (4,425 square metres), and the amount of permeable area was approximately 41% of the total site area (3,075 square metres). The water balance must be updated if the development concept is different than the current grading plan referenced.

It is noted that the infiltration and runoff values presented in Appendix G are estimates only. Single values are used for the water balance calculations, but it is important to understand that 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, but 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 useful for comparison of pre- to post-development conditions.

5.3.3 Pre and Post Development Water Balance

The detailed water balance calculations are included in Appendix G. The pre and post development calculations are summarized in the table below but must be updated if the site plans change.

Condition	Permeable Areas	Impermeable Areas	Average Annual Runoff Volume (m ³ /year)	Average Annual Infiltration Volume (m ³ /year)
Pre-Development Land Use	71% (open lawn)	29% (gravel driveway, buildings)	2,216	1,608
Post-Development Land Use (Concept Plan)	41% (grass lawns, amenity space)	59% (buildings, paved areas)	3,741	928

These calculations suggest that, without mitigation such as low impact development (LID) measures, the proposed development will decrease average infiltration by about 680 m³/year (42% decrease). This means about 680 m³/year of infiltration is required to maintain the water balance. The proposed development will increase runoff by about 1,525 m³/year (76% increase). The potential impacts of these changes and recommended mitigation measures are discussed below.

It is noted that the FSR provides similar values for both pre and post development infiltration and run-off volumes. CEE reviewed the FSR and is of the opinion that the general methodology followed is the same as what CEE performed, with the minor differences in final infiltration and run-off volumes coming from slightly different assumptions on amount of pervious versus impervious areas, size of site, adjustments to potential evapotranspiration, water holding capacity, etc.

The FSR indicates that a deficit of 770 m³/year needs to be accounted for and provides details on how that infiltration will be accommodated through collecting rooftop water and directing towards infiltration facilities. As the FSR provides an infiltration deficit of approximately 15% more than what CEE calculated, it is CEE's opinion that the site should be designed as per the water balance provided within the FSR.

5.4 Recommended Mitigation Measures

The three broad categories which typically need to be mitigated and accounted for are:

- Reducing the volume and speed in which additional surface water runoff occurs;
- Increasing the amount of infiltration to match pre-development conditions; and
- Ensuring that the quality of existing surface water features and groundwater will not be adversely impacted.

5.4.1 Runoff Quantity

Urban 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 (e.g. parking lots, driveways, and rooftops). Impervious surfaces prevent infiltration of water into the soils and the removal of the vegetation reduces the evapotranspiration component of the natural water balance. The evaporation component from impervious surfaces is relatively minor (estimated to be 15% of precipitation) compared to the evapotranspiration component that occurs with vegetation in this area (up to two thirds of precipitation). So, the net effect of the urbanization of the site is that most of the precipitation that falls onto impervious surfaces increases the surplus water resulting in more direct runoff from developed areas and reduced natural infiltration.

In conjunction with increased runoff, there is a reduction in infiltration to the shallow groundwater system. A reduction in infiltration can potentially lead to a lowering of the local water table and reduce the potential for this seasonal water table intersection and discharge.

Methods which do not necessarily increase infiltration rate, but decrease the volume and concentration of surface water runoff can be considered at this site include (but are not limited to):

- Increasing the topsoil thickness by about two times the normal thickness (up to 30 cm) to retain more water in storage; and
- Implementation of rainwater harvesting which intercepts, diverts and stores roof runoff (i.e. cisterns) for future use.

5.4.2 Mitigation Measures for Maintaining Infiltration

The increases in surface water runoff that will occur with urban development and mitigation of the potential impacts to the local water table due to reduction of infiltration may be minimized by using appropriate stormwater management and using low impact development (LID) measures to promote infiltration. Certain LID measures can likely be implemented on-site.

The basic premise for low impact development is to try to minimize changes to runoff and infiltration. As outlined in the MOECC SWMP Design Manual (2003) and Low Impact Development Stormwater Management Planning and Design Guide published by the CVC and TRCA (2010), there are a variety of techniques that may be considered to promote infiltration and reduce runoff. In order to maintain groundwater function at the site the following typical LID measures can be considered as part of typical site developments:

- Collection of runoff from the building rooftops and redirection to grass areas and overland flow. If feasible, it is recommended that there be a minimum 5 metre flow path over pervious areas to allow this mitigation method to be fully effective;
- Provision of gentle slopes in open areas or along grass swales in order to allow time for water infiltration;
- Construction of engineered infiltration measures such as soakaway pits, infiltration galleries or bioswales. Subsurface infiltration methods can only be considered in areas where there is sufficient soil permeability and depth to water table to accommodate the systems within the unsaturated zone (typically the infiltration elevation must be kept 1 metre or more above the seasonal high groundwater level); and
- Construction of grass channels or filter strips which allow infiltration, discharge at a lower rate and direct roof runoff to overland flow.

Implementation of LID measures will not only allow for infiltration of the surface water into the near-surface groundwater regime but will also allow for an increase in natural filtration of surficial runoff, prevent sedimentation transport and potential erosion, and help reduce flooding by increasing the transit time for water on the site. These types of LID techniques promote natural infiltration by providing additional water volumes in the pervious areas. This is particularly effective in the summer months when natural infiltration would not generally occur because the additional water overcomes the natural soil moisture deficit.

Details and designs for LID measures would be provided by a civil or water resources engineer. This includes demonstrating through plans and sections (including all dimensions, materials used and including the seasonal high groundwater level) how this infiltration deficit will be mitigated. In addition, the design should include calculations to demonstrate that the LID facilities will be adequately sized both volumetrically and for area to allow completed drawdown within a 24 to 48 hour time period.

As it is typically a requirement of maintaining the same levels of infiltration post-development, no appreciable change in the groundwater tables should occur over the long-term condition. No impacts are expected to nearby drinking water wells, environmental features, watercourses, groundwater levels, or aquifers.

5.4.3 Groundwater Quality

Depending on land use, runoff from urban developments may contain a variety of dilute contaminants such as suspended solids, chloride from road salt, oil and grease, metals, pesticide residues, phosphorous, bacteria and viruses. For groundwater, generally except for the dissolved constituents such as nitrogen and salt, most contaminants are attenuated by filtration during groundwater flow through the soils.

LID measures or end treatments such as oil/grit separators or wet ponds also help to remove suspended solids and other contaminants in runoff prior to infiltration or conveying the flows off the site, especially when a treatment train approach is taken for stormwater management. The stormwater management facilities (to be designed by others) must be designed such that the water quality is maintained or improved prior to discharging water from the site or infiltrating water into the ground.

The potential for effects on groundwater quality from infiltration in the proposed development area is expected to be low due to the low-density residential nature of the development. The site is not within a Wellhead Protection Zone, Significant Groundwater Recharge Area, Highly Vulnerable Aquifer, or an Intake Protection Zone. Based on Table 2 in "Lake Simcoe Protection Plan Water Budget Policy for LSPP 4.8-DP and 6.40-DP," infiltration-based

practices should be permitted for this proposed low-density residential development for runoff from impervious areas. Infiltration of runoff from vegetated areas and rooftops is always permitted.

5.5 Groundwater Disposal Recommendations

Baseline groundwater chemical testing was carried out at the site and the results are summarized in Section 4.3.3. No exceedances were detected in the groundwater from Borehole 3 (both filtered and unfiltered) relative to PWQO. It is not expected that excavations will extend below the groundwater table and therefore water taking and discharge from the site is not expected. If water taking and discharge will occur for any reason, the baseline groundwater chemistry indicates that treatment will not be required before discharging the groundwater to the land surface as the samples met PWQO. Additional sampling should be carried out to confirm the results prior to discharging any groundwater.

6 Limitations and Conclusion

6.1 Limitations

The investigation and comments are necessarily on-going as new information of underground conditions becomes available. More specific information with respect to the conditions between samples, or the lateral and vertical extent of materials may become apparent during excavation operations. The interpretation of the borehole information must, therefore, be validated during excavation operations. Consequently, during the future development of the property, conditions not observed during this investigation may become apparent. Should this occur, Central Earth Engineering should be contacted to assess the situation and additional testing and reporting may be required.

Central Earth Engineering should be retained for a general review of the final design drawings and specifications to verify that this report has been properly interpreted and implemented. If not accorded the privilege of making this review, Central Earth Engineering will assume no responsibility for interpretation of the recommendations in the report.

The comments given in this report are intended only for the guidance of the design engineers. The number of boreholes required to determine the localized underground conditions between boreholes affecting construction costs, techniques, sequencing, equipment, scheduling, etc. could be greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own interpretations of the factual borehole results, so that they may draw their own conclusions as to how the subsurface conditions may affect them.

This report was prepared by Central Earth Engineering for the account of Robert Gilroy. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Central Earth Engineering accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

6.2 Conclusion

It is recognized that municipal/regional governing bodies, in their capacity as the planning and building authority under Provincial statutes, will make use of and rely upon this report, cognizant of the limitations thereof, both as are expressed and implied.

We trust this report is complete within our terms of reference, and the information presented is sufficient for your present purposes. If you have any questions, or when we may be of further assistance, please do not hesitate to contact our office.

Yours Truly,

Central Earth Engineering Inc.



Alexander Winkelmann, P.Eng.
President, Senior Engineer



Russell Wiginton, P.Eng.
Project Engineer



Figures –

FIGURE 1 – SITE LOCATION PLAN

FIGURE 2A – BOREHOLE LOCATION PLAN (AERIAL IMAGE)

FIGURE 2B – BOREHOLE LOCATION PLAN (PROPOSED SITE PLAN)

FIGURE 3 – SUBSURFACE PROFILE (LOOKING EAST)

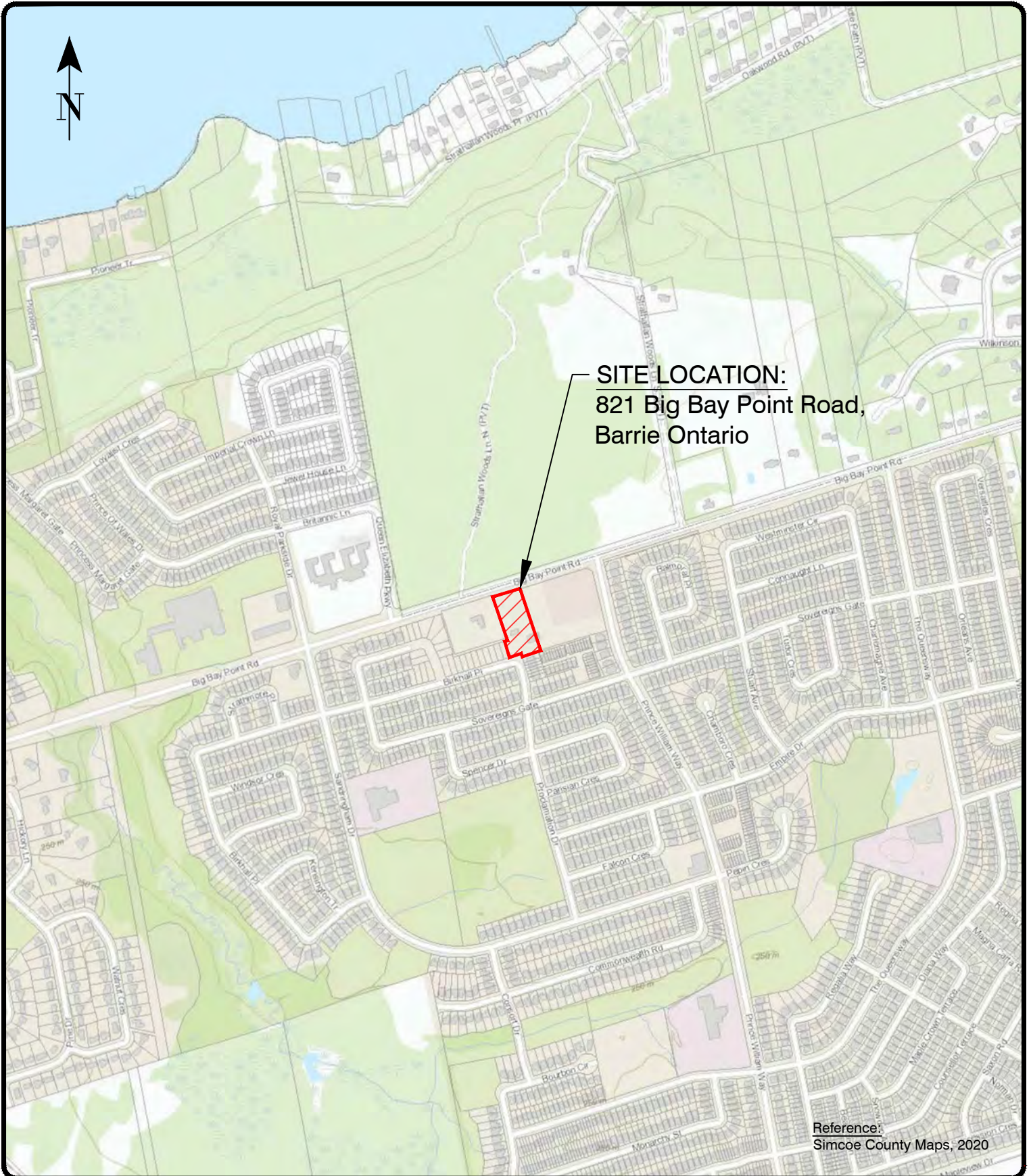
FIGURE 4 – MECP WELL RECORD LOCATIONS

FIGURE 5A – WELLHEAD PROTECTION AREAS

FIGURE 5B – HIGHLY VULNERABLE AQUIFERS

FIGURE 5C – SIGNIFICANT GROUNDWATER RECHARGE AREAS

FIGURE 5D – INTAKE PROTECTION ZONES



Geotechnical Engineering and Construction
Materials Testing & Inspection

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P: (705) 719-7994 | E: info@centralearth.ca

Project:

821 Big Bay Point Road, Barrie, ON

Title:

Site Location Plan

Approved by:

A.W.

Date:

October 2020

Project No.:

20-1199A

Drawn by:

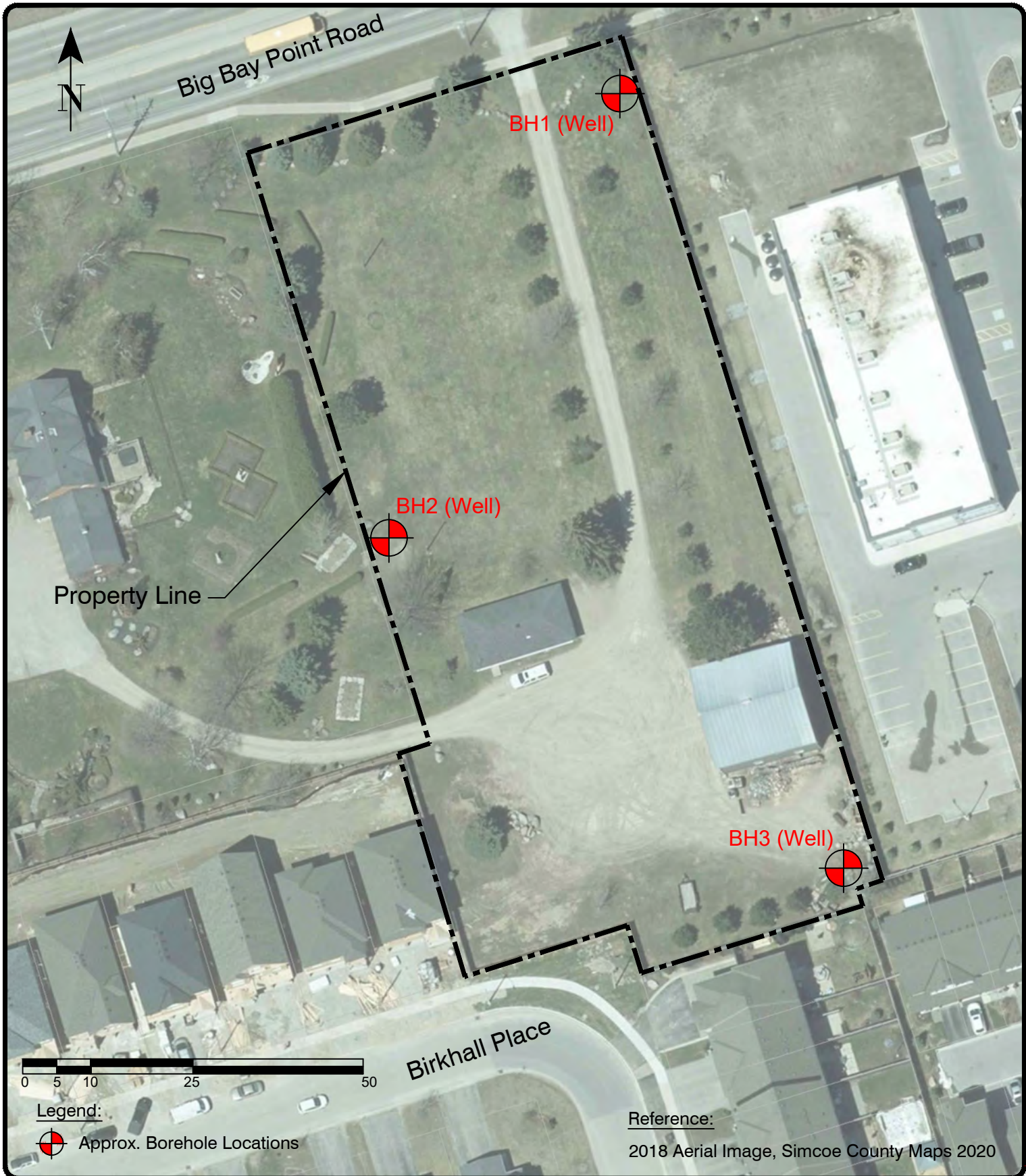
B.H.

Scale:

N.T.S.

Figure No.:

1



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647 Welham Rd, Unit 14, Barrie, ON, L4N 0B7
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Project:

821 Big Bay Point Road, Barrie, ON

Title:

Borehole Location Plan (Aerial Image)

Approved by:

A.W.

Date:

October 2020

Project No.:

20-1199A

Drawn by:

B.H.

Scale:

1:1000

Figure No.:

2A



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 P: (705) 719-7994 | E: info@centralearth.ca

Project:

821 Big Bay Point Road, Barrie, ON

Title:

Borehole Location Plan (Proposed Site Plan)

Approved by:

A.W.

Date:

October 2020

Project No.:

20-1199A

Drawn by:

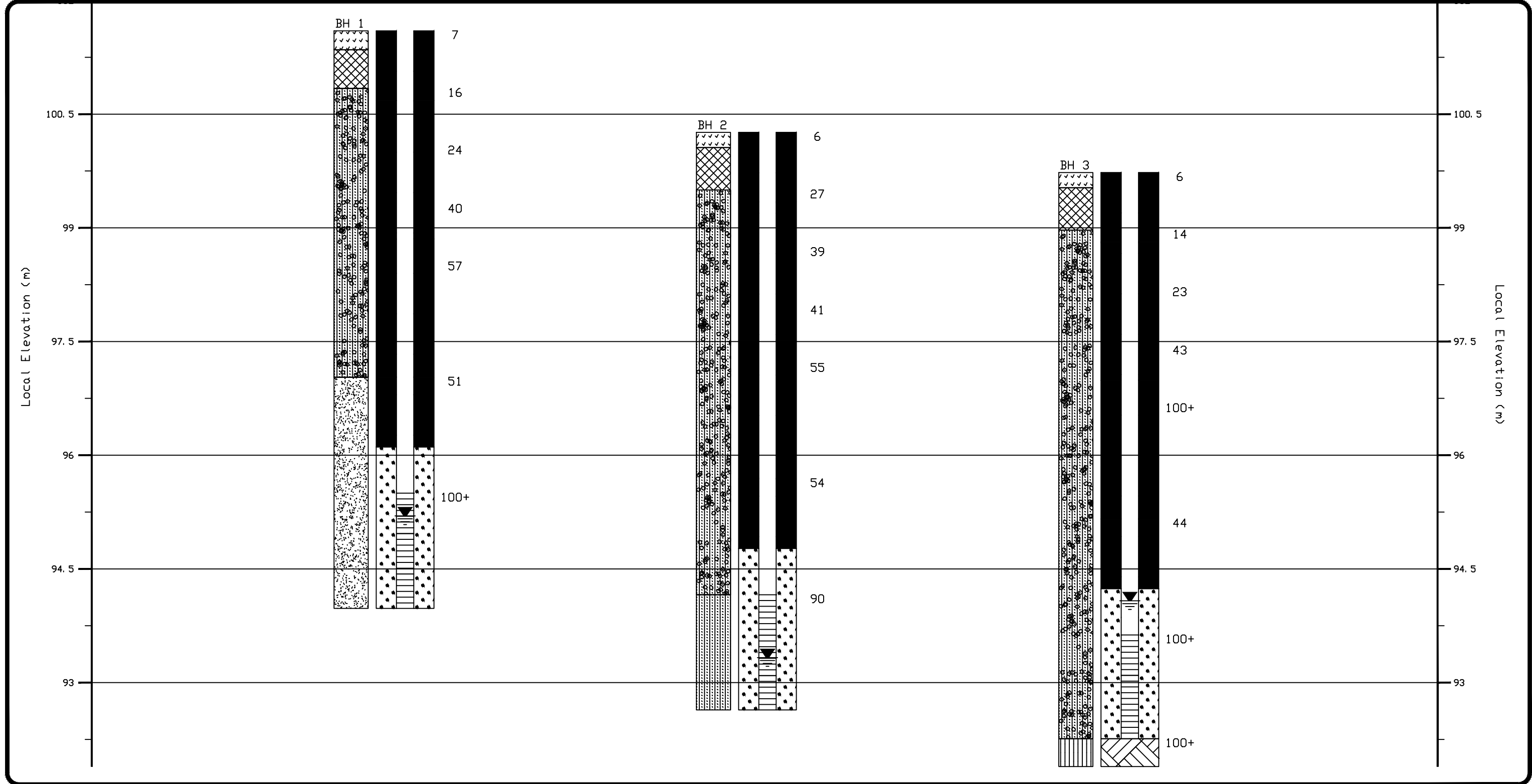
B.H.

Scale:

1:1000

Figure No.:

2B



Legend:

	Water Level in Monitoring Well		Silty Sand
	Topsoil		Silty Sand Glacial Till
	Earth Fill		Silt
	Sand		

Notes:

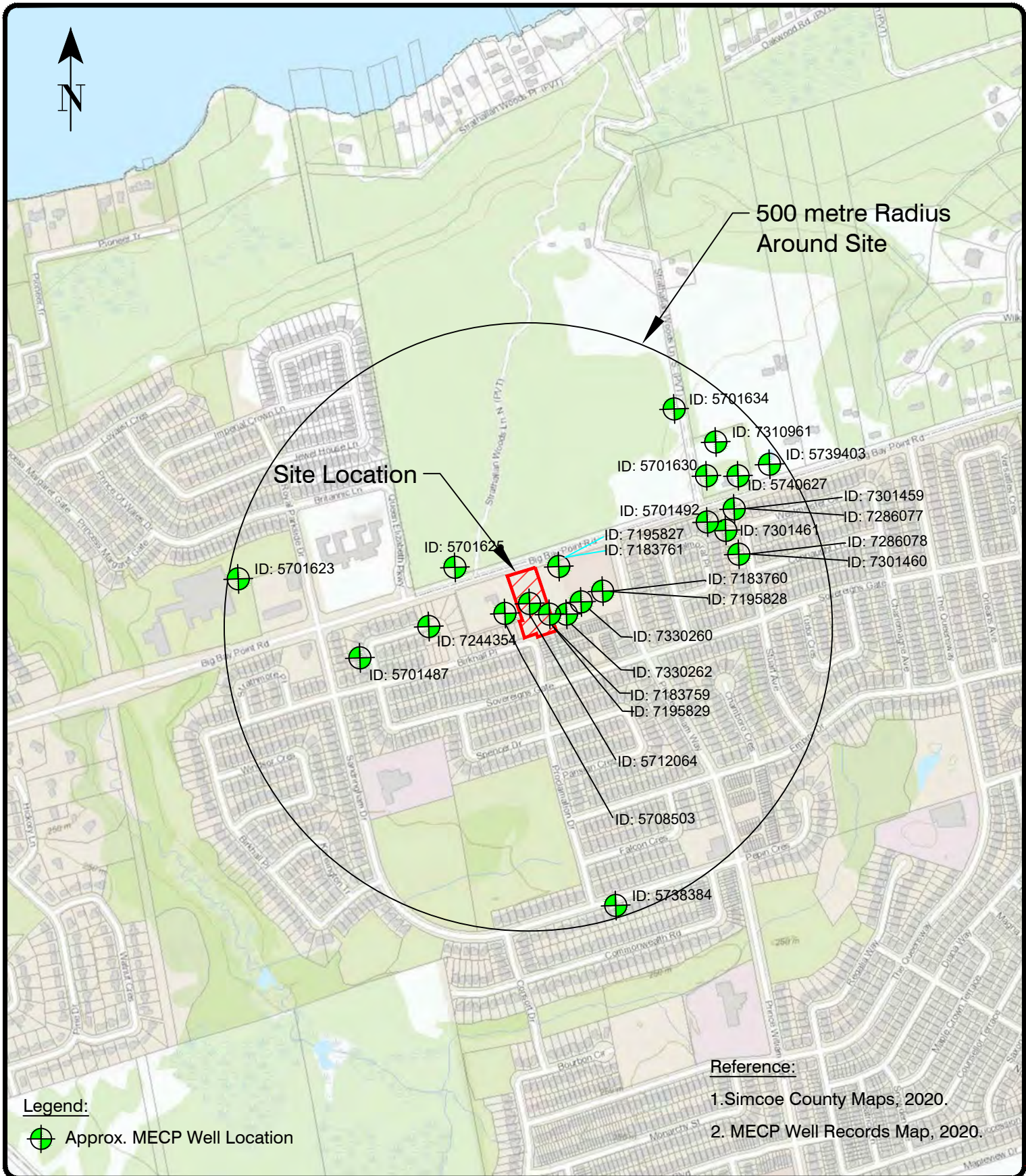
- Numbers shown next to boreholes are SPT "N" Values.
- Subsurface conditions known only at borehole locations.
- Water Levels measured in wells on October 13, 2020.

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Materials Testing & Inspection

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Project: 821 Big Bay Point Road, Barrie ON		
Title: Subsurface Profile (Looking East)		
Approved by: A.W.	Date: October 2020	Project No.: 20-1199A
Drawn by: B.H.	Scale: Vertical: 1:50 Horizontal: N.T.S.	Figure No.: 3



Legend:

Approx. MECP Well Location



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Project:

821 Big Bay Point Road, Barrie, ON

Title:

MECP Well Record Locations

Approved by:

A.W.

Date:

October 2020

Project No.:

20-1199A

Drawn by:

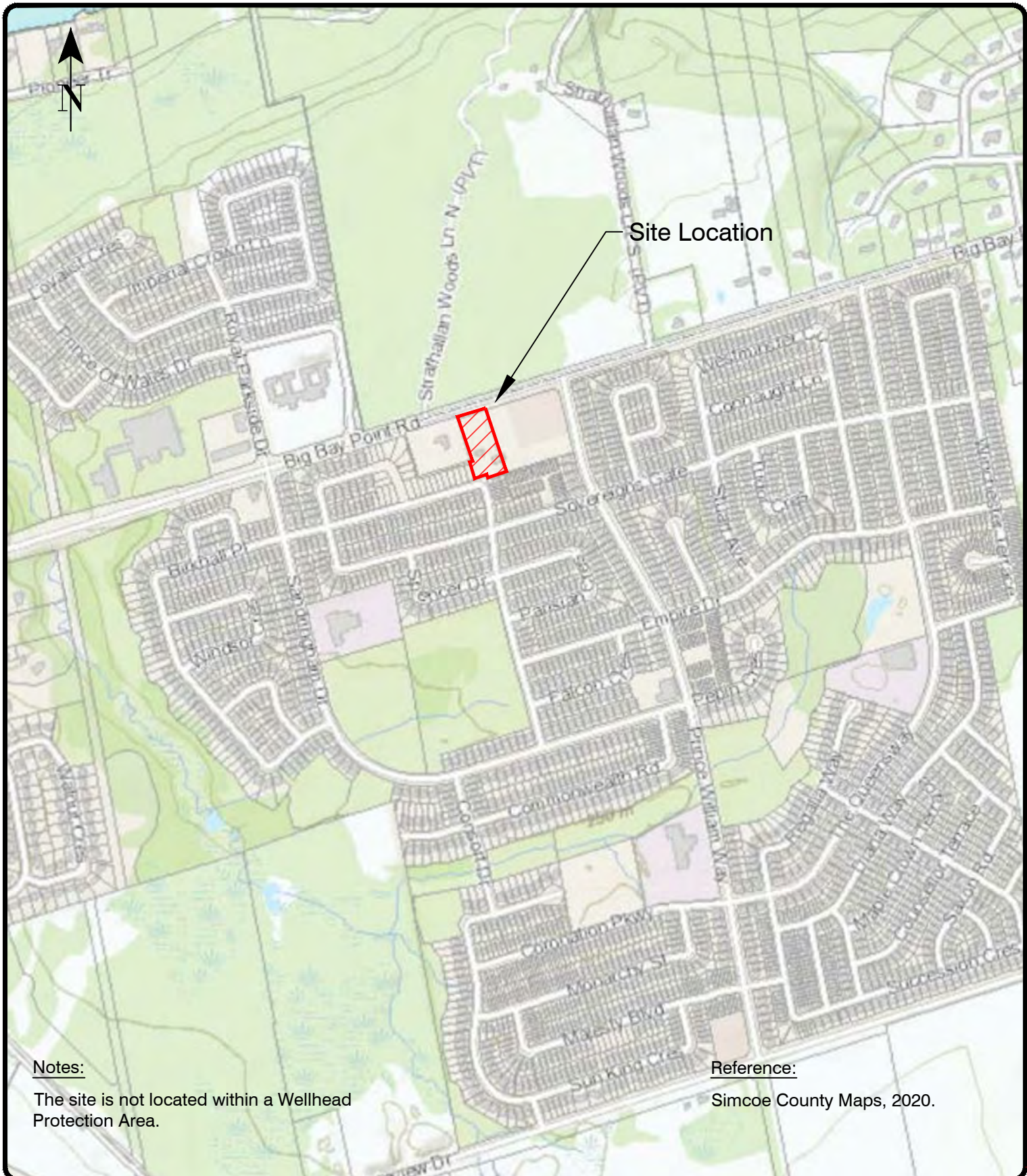
B.H.

Scale:

1:10,000

Figure No.:

4



Geotechnical Engineering and Construction
Materials Testing & Inspection

647 Welham Rd, Unit 14, Barrie, ON, L4N 0B7
P: (705) 719-7994 | E: info@centralearth.ca

Project:

821 Big Bay Point Road, Barrie, ON

Title:

Wellhead Protection Areas

Approved by:

A.W.

Date:

October 2020

Project No.:

20-1199A

Drawn by:

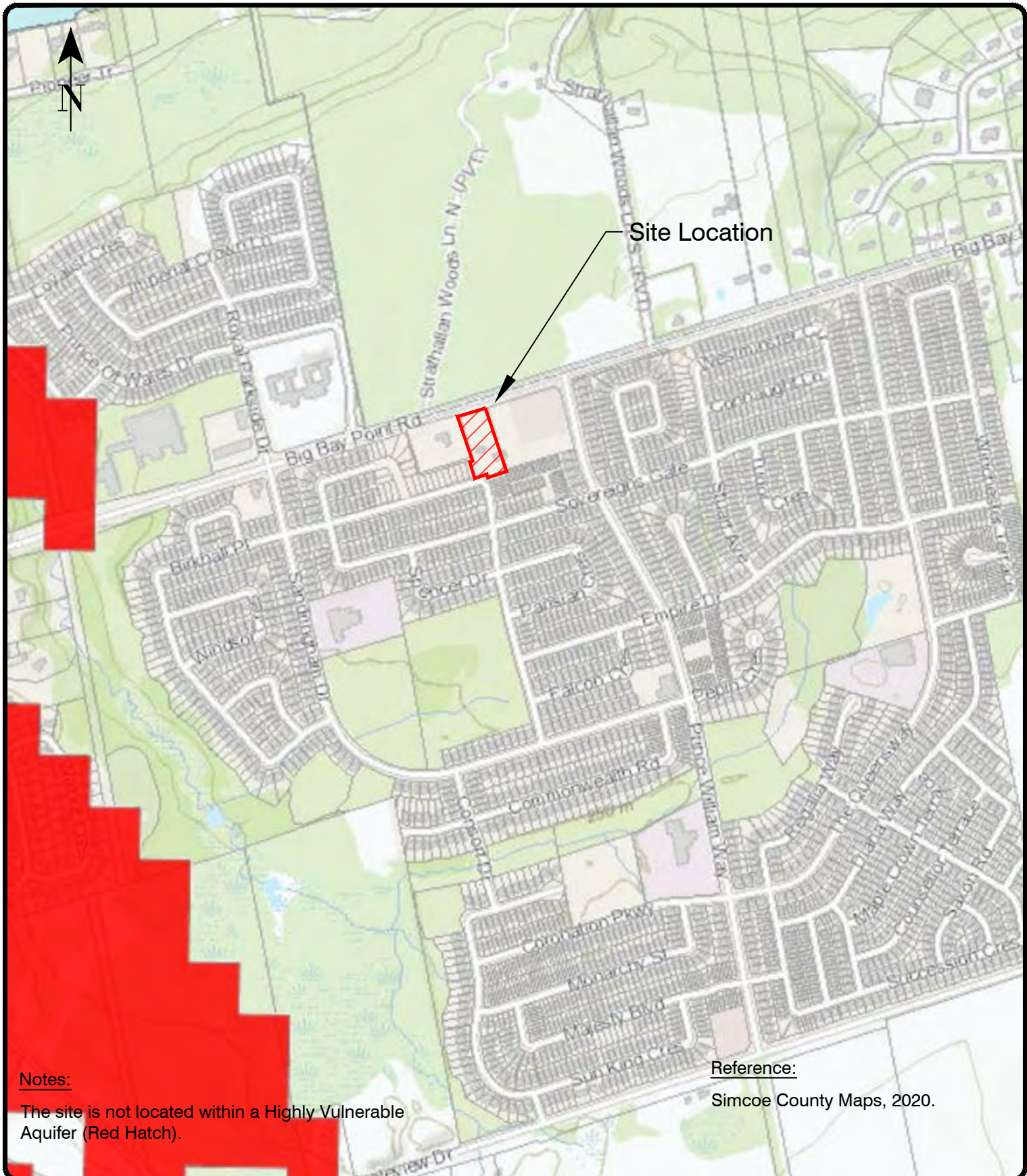
B.H.

Scale:

1:10,000

Figure No.:

5A



Geotechnical Engineering and Construction
Materials Testing & Inspection

647 Welham Rd, Unit 14, Barrie, ON, L4N 0B7
P: (705) 719-7994 | E: info@centralearth.ca

Project:

821 Big Bay Point Road, Barrie, ON

Title:

Highly Vulnerable Aquifers

Approved by:

A.W.

Date:

October 2020

Project No.:

20-1199A

Drawn by:

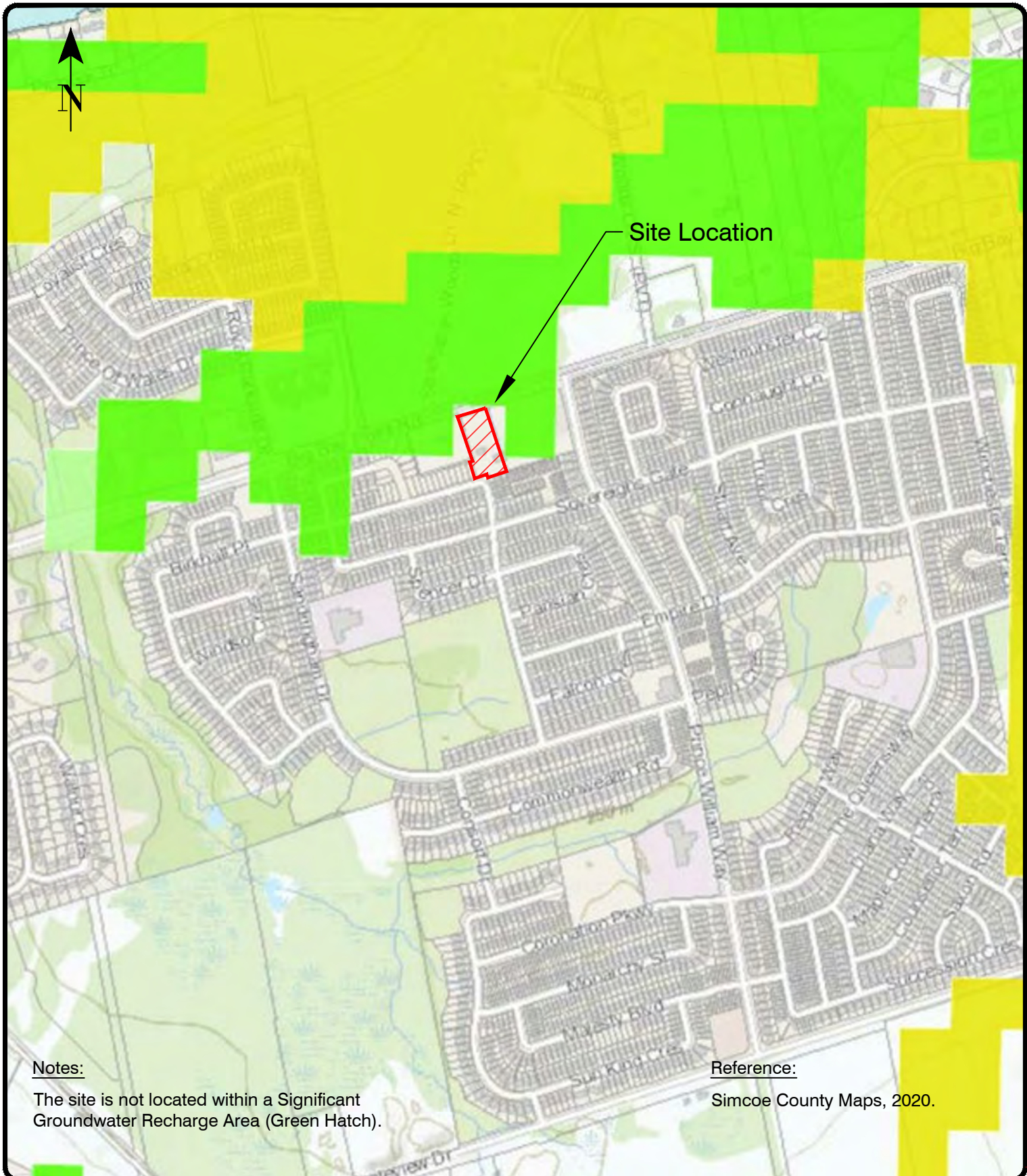
B.H.

Scale:

1:10,000

Figure No.:

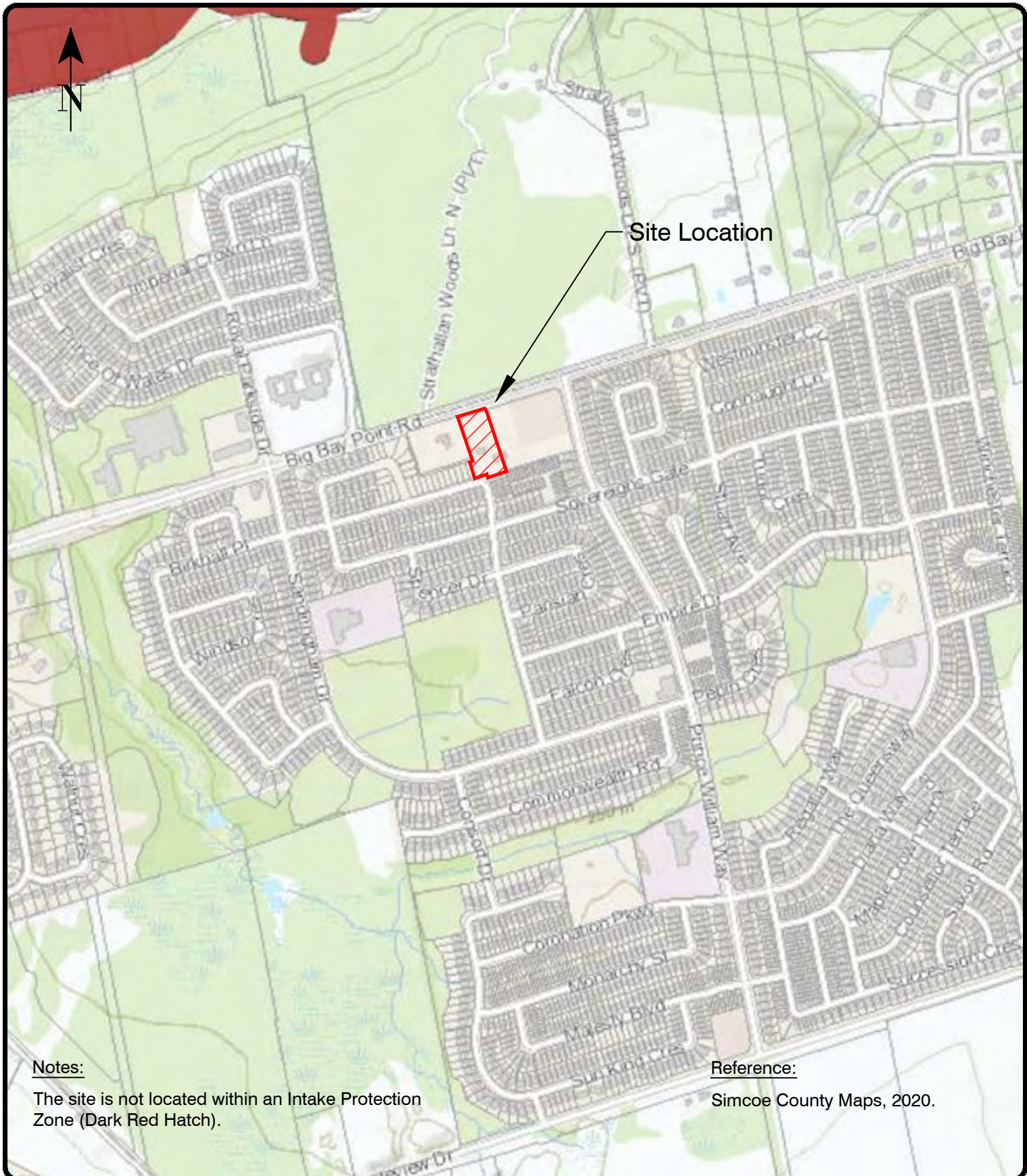
5B



Geotechnical Engineering and Construction
Materials Testing & Inspection

647 Welham Rd, Unit 14, Barrie, ON, L4N 0B7
P: (705) 719-7994 | E: info@centralearth.ca

Project: 821 Big Bay Point Road, Barrie, ON			
Title: Significant Groundwater Recharge Areas			
Approved by:	A.W.	Date:	October 2020
Drawn by:	B.H.	Scale:	1:10,000
Project No.:		20-1199A	
Figure No.:		5C	



Notes:

The site is not located within an Intake Protection Zone (Dark Red Hatch).

Reference:

Simcoe County Maps, 2020.



Geotechnical Engineering and Construction
Materials Testing & Inspection

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P: (705) 719-7994 | E: info@centralearth.ca

Project:

821 Big Bay Point Road, Barrie, ON

Title:

Intake Protection Zones

Approved by:

A.W.

Date:

October 2020

Project No.:

20-1199A

Drawn by:

B.H.

Scale:

1:10,000

Figure No.:

5D

Appendix A – **BOREHOLE LOGS**

RECORD OF BOREHOLE No. 1



Project Number: **20-1199A**
 Project Client: **Baldwin Planning and Development**
 Project Name: **821 Big Bay Point Rd.**
 Project Location: **Barrie, Ontario**
 Drilling Location: **Northeast corner of site**

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
 Logged By: **BH** Northing: **4913188** Date Started: **Oct. 1, 2020**
 Reviewed By: **AW** Easting: **610162** Date Completed: **Oct. 1, 2020**

LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING		LAB TESTING		Instrumentation Installation	COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value			Shear Strength Testing (kPa)		Atterberg Limits			GR SA SI CL			
	Local	101.60m						Penetration Testing		Water Content (%)						
	0.3 Topsoil = 250mm	SS	1	100	7	0	101.60	○	7	○	12					
	0.8 FILL: Sand & Silt, Trace Organics & Rootlets, Trace Clay, Loose, Brown, Moist							○	16	○	7					
	SILTY SAND GLACIAL TILL, Trace Gravel, Trace Clay, Compact to Dense, Brown, Moist	SS	2	100	16			○	24	○	9					
								○	40	○	6					
	--- Very Dense ---	SS	4	100	40			○	57	○	8					
		SS	5	100	57											
	4.6 FINE SAND, Trace Silt, Very Dense, Brown, Damp	SS	6	100	51			○	51	○	2					
	--- Moist ---	SS	7	100	100+			○	100+		15					
	7.6 --- Wet ---	AS	8	100							26					
	End of Borehole @7.6m															

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Groundwater depth encountered on completion of drilling: **6.1m**

Groundwater depth observed on **Oct. 9/20** at a depth of: **6.37m**

Cave depth after auger removal: **7.2m**

Observed on **Oct. 13/20** at a depth of: **6.40m**

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: **1 :75**

Page: **1 of 1**

RECORD OF BOREHOLE No. 2



Project Number: **20-1199A**
 Project Client: **Baldwin Planning and Development**
 Project Name: **821 Big Bay Point Rd.**
 Project Location: **Barrie, Ontario**
 Drilling Location: **Middle West of site**

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
 Logged By: **BH** Northing: **4913123** Date Started: **Oct. 1, 2020**
 Reviewed By: **AW** Easting: **610131** Date Completed: **Oct. 1, 2020**

LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING	LAB TESTING	Instrumentation Installation	COMMENTS & GRAIN SIZE DISTRIBUTION (%)					
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value			Shear Strength Testing (kPa)			Atterberg Limits		GR	SA	SI	CL
								Other Test	Penetration Testing		Combustible Organic Vapour (ppm)	Water Content (%)				
	Local 100.26m							Other Test Pocket Penetrometer Field Vane (Intact) Field Vane (Remolded) SPT DCPT	Combustible Organic Vapour (ppm) Combustible Organic Vapour (%LEL) Total Organic Vapour (ppm) 100 200 300 400							
	0.2 Topsoil = 200mm 100.1	SS	1	100	6	0		6	12							
	0.8 FILL: Sand & Silt, Trace Organics & Rootlets, Trace Clay, Loose, Brown, Moist 99.5								8							
	SILTY SAND GLACIAL TILL, Trace Gravel, Trace Clay, Compact to Dense, Brown, Moist	SS	2	100	27			27	9							
						1.5		39	8							
		SS	3	100	39			41	8							
								55	8							
	--- Very Dense ---	SS	4	100	41											
								54	10							
6.1	94.2	SS	6	100	54	4.5		54								
								90	15							
7.6	92.6	AS	7	100	90	6										
									19							
	End of Borehole @7.6m					7.5										
									</							

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Groundwater depth encountered on completion of drilling: **6.7m**

Groundwater depth observed on **Oct. 9/20** at a depth of: **6.90m**

Cave depth after auger removal: **Open**

Observed on **Oct. 13/20** at a depth of: **6.93m**

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: **1 :75**

Page: **1 of 1**

RECORD OF BOREHOLE No. 3



Project Number: **20-1199A**
 Project Client: **Baldwin Planning and Development**
 Project Name: **821 Big Bay Point Rd.**
 Project Location: **Barrie, Ontario**
 Drilling Location: **South east of site**

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
 Logged By: **BH** Northing: **4913077** Date Started: **Oct. 1, 2020**
 Reviewed By: **AW** Easting: **610194** Date Completed: **Oct. 1, 2020**

LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING	LAB TESTING	Instrumentation Installation	COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value			Shear Strength Testing (kPa)						
								Other Test Pocket Penetrometer Field Vane (Intact) Field Vane (Remolded)	Combustible Organic Vapour (ppm) Combustible Organic Vapour (%LEL) Total Organic Vapour (ppm)					
Local	99.73m					Penetration Testing SPT DCPT	Atterberg Limits PL Water Content (%) LL			GR	SA	SI	CL	
	0.2 Topsoil = 200mm 99.5	SS	1	100	6	0	6	10						
	0.8 FILL: Silt & Sand, Trace Organics & Rootlets, Trace Clay, Loose, Brown, Moist 99.0	SS	2	100	14	0.99	14	8						
	SILTY SAND GLACIAL TILL, Trace Gravel, Trace Clay, Compact, Brown, Moist	SS	3	100	23	1.5	23	8						
		SS	4	100	43	1.97.5	43	7						
		SS	5	100	100+	3	100+	7						
		SS	6	100	44	4.5	44	8						
		SS	7	100	100+	6	100+	9						
	7.5 92.3	SS	8	100	100+	7.5	100+	15						
7.9	End of Borehole @7.9m													

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Groundwater depth encountered on completion of drilling: **7.0m**

Cave depth after auger removal: **Open**

Groundwater depth observed on **Oct. 9/20** at a depth of: **5.59m**

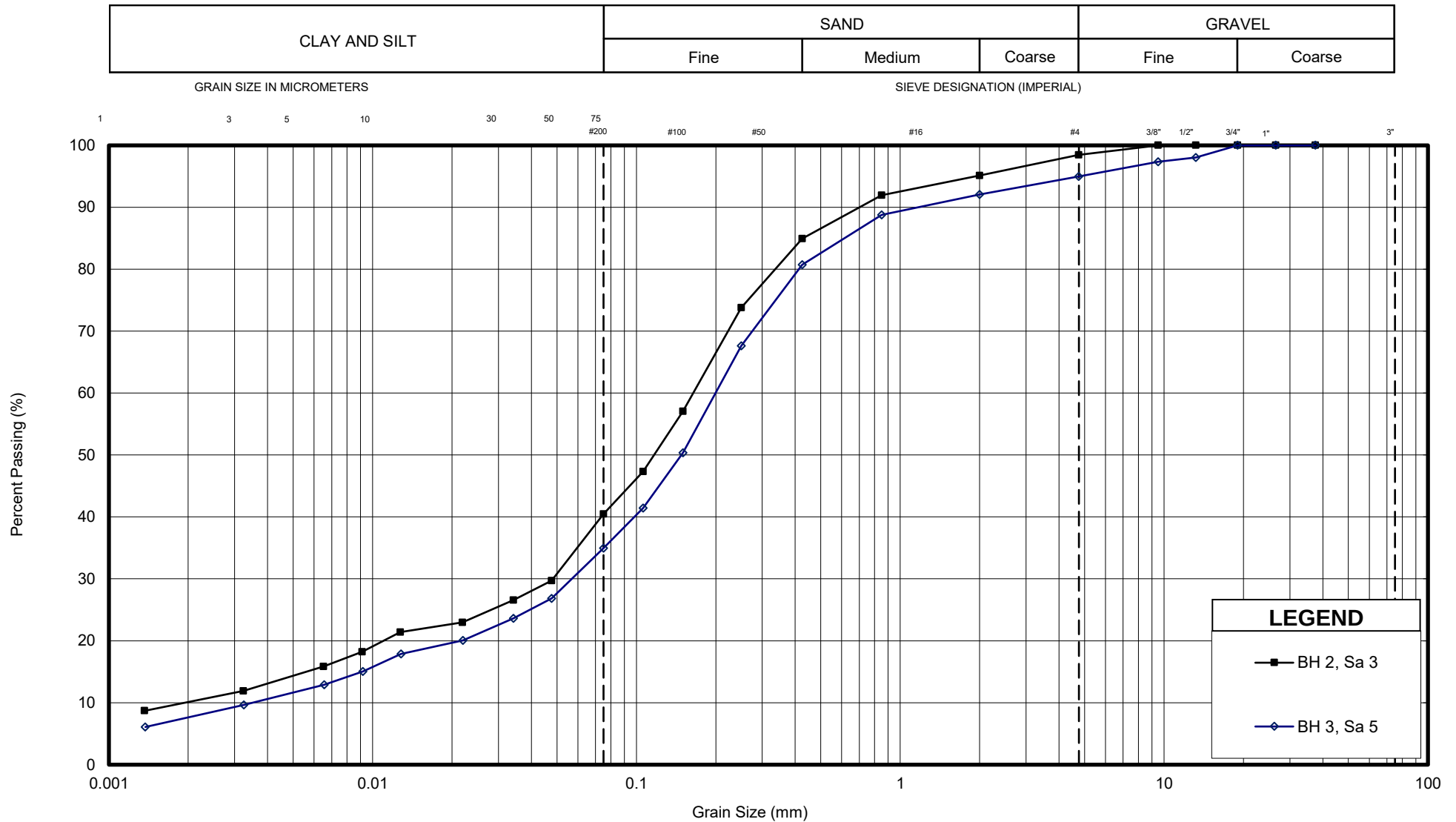
Observed on **Oct. 13/20** at a depth of: **5.65m**

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: **1 :75**
 Page: **1 of 1**

Appendix B –
GEOTECHNICAL LABORATORY DATA

UNIFIED SOIL CLASSIFICATION SYSTEM



Sample	Description	Gr.	Sa.	Si.	Cl.	D ₁₀	D ₃₀	D ₆₀	C _u	C _c
BH 2, Sa 3	SILTY SAND GLACIAL TILL, Trace Clay, Trace Gravel	2	58	30	10	0.001	0.048	0.15	84.87	7.32
BH 3, Sa 5	SILTY SAND GLACIAL TILL, Trace Clay, Trace Gravel	5	60	27	8	0.003	0.077	0.15	57.05	4.63

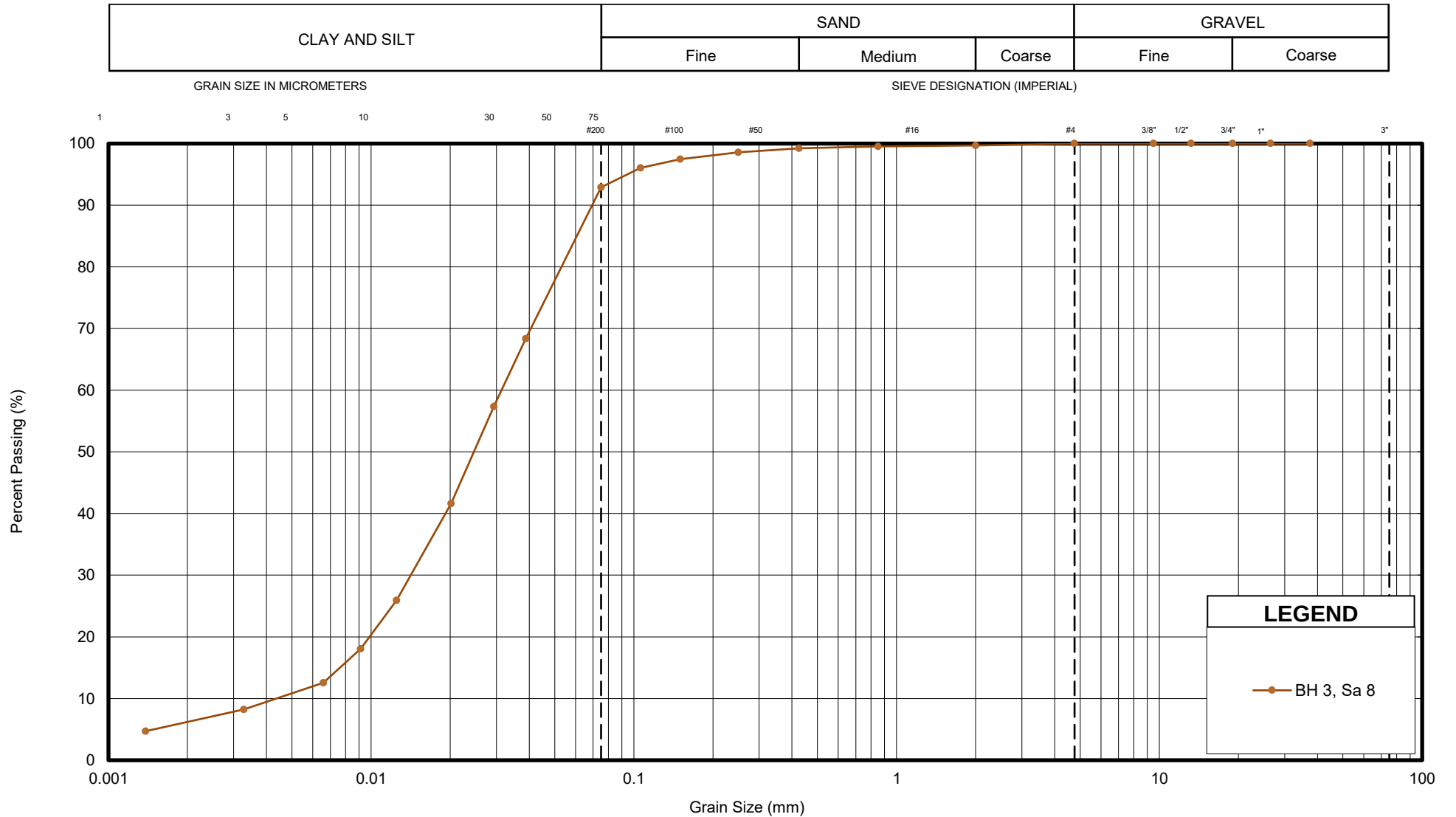


GRAIN SIZE DISTRIBUTION

SILTY SAND GLACIAL TILL

APP. No.	B1
REF. No.	20-1199A
DATE	October 2020

UNIFIED SOIL CLASSIFICATION SYSTEM



Sample	Description	Gr.	Sa.	Si.	Cl.	D ₁₀	D ₃₀	D ₆₀	C _u	C _c
BH 3, Sa 8	SILT, Trace Sand, Trace Clay	0	7	87	6	0.003	0.012	0.029	7.22	1.46

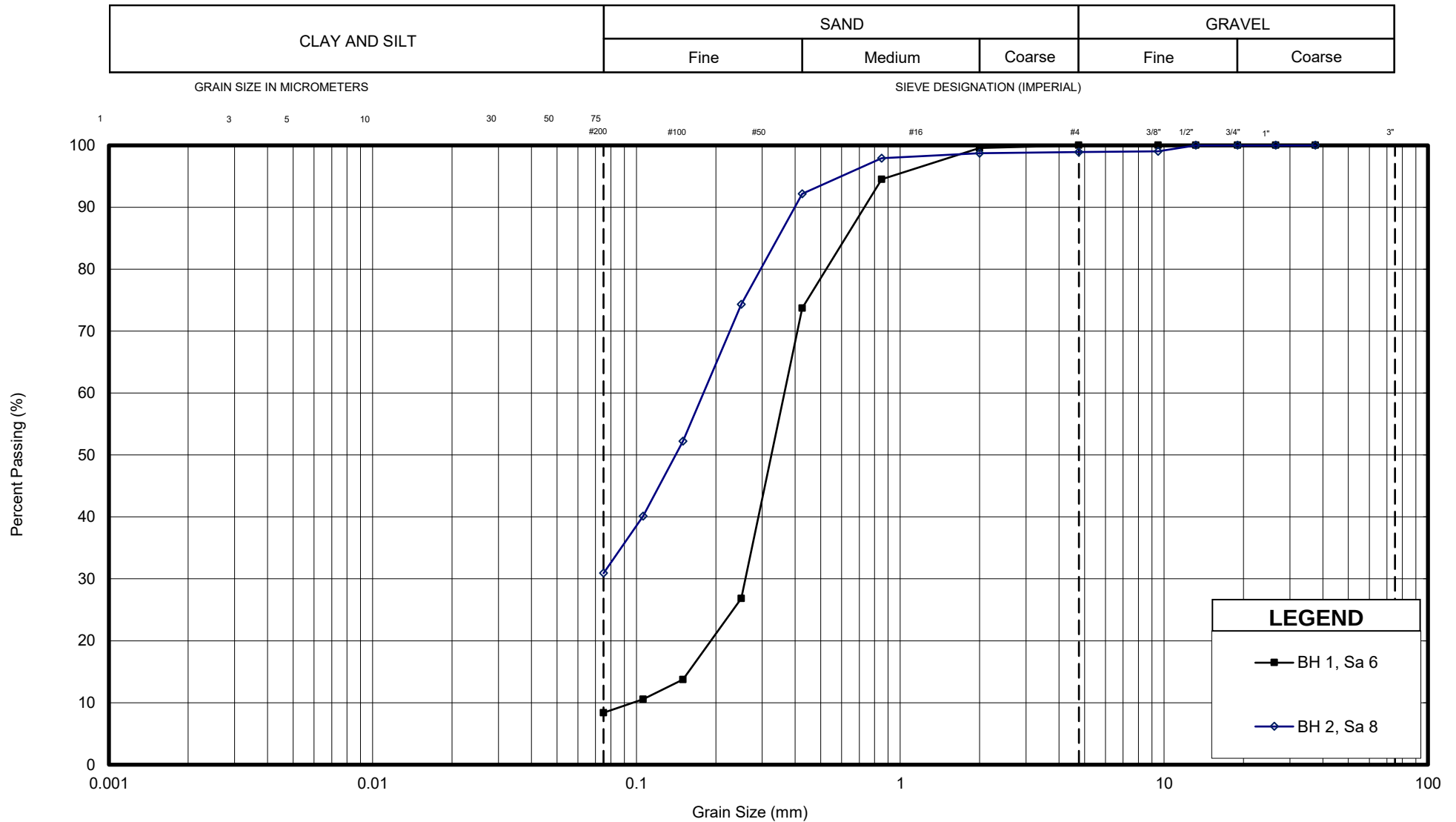


GRAIN SIZE DISTRIBUTION

SILT

APP. No.	B2
REF. No.	20-1199A
DATE	October 2020

UNIFIED SOIL CLASSIFICATION SYSTEM



Sample	Description	Gr.	Sa.	Si.	Cl.	D ₁₀	D ₃₀	D ₆₀	C _u	C _c
BH 1, Sa 6	SAND, Trace Fines	0	92	8		0.075	0.25	0.25	3.76	1.91
BH 2, Sa 8	SAND, Some fines, Trace Gravel	1	68	21		0	0	0.15	-	-

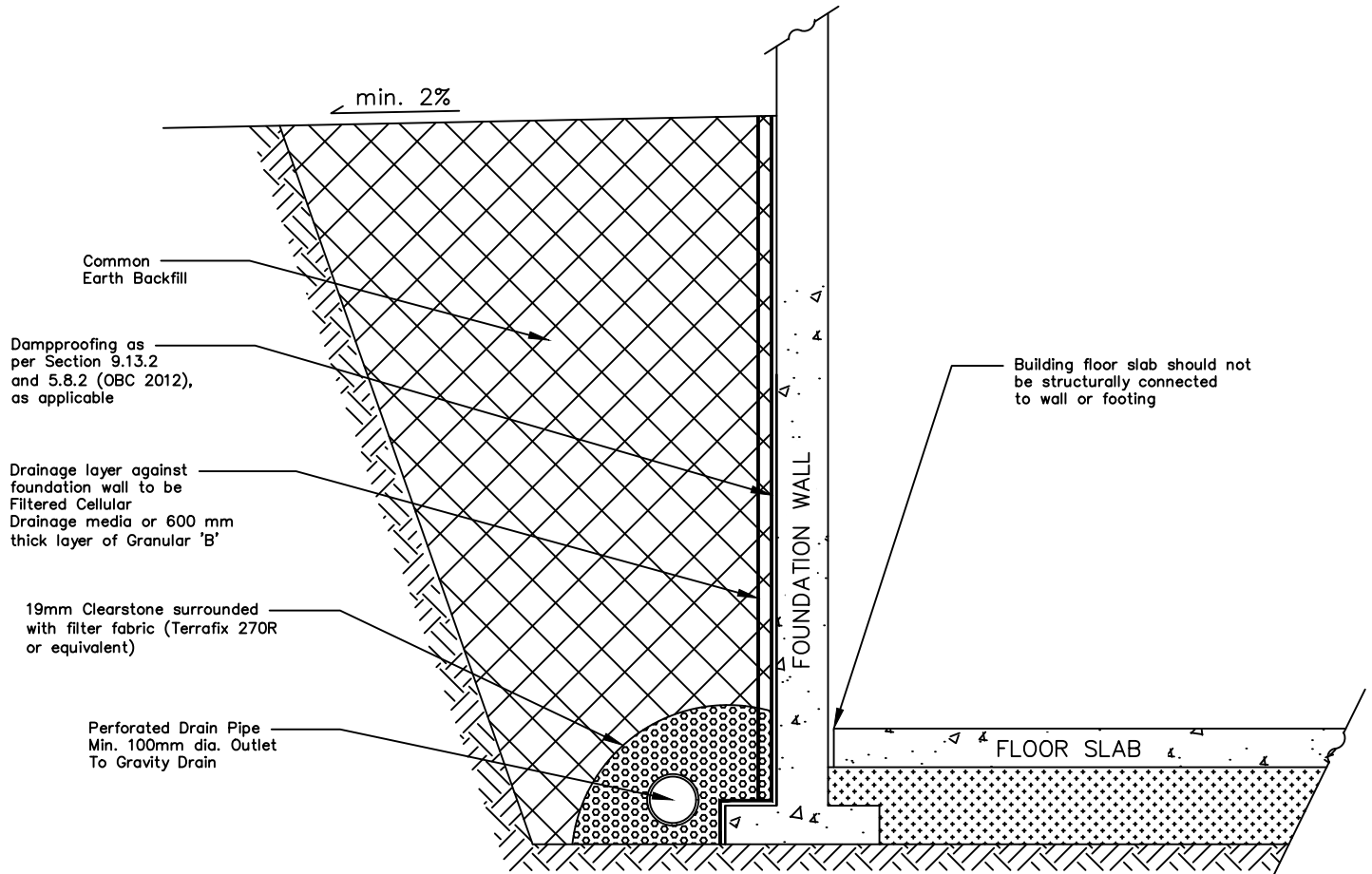


GRAIN SIZE DISTRIBUTION

SAND

APP. No.	B3
REF. No.	20-1199A
DATE	October 2020

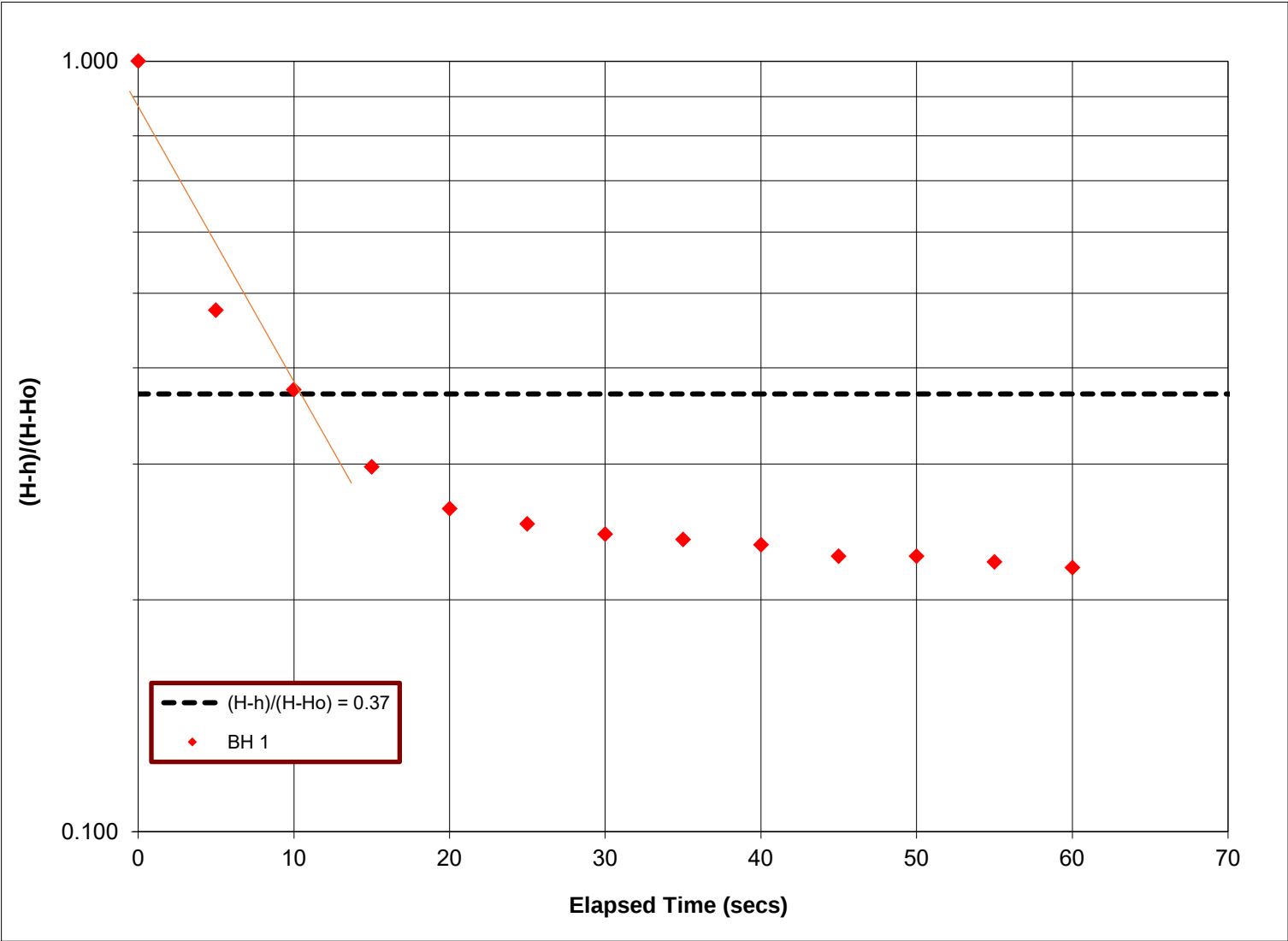
Appendix C – **TYPICAL DETAILS**



Appendix D –
RISING HEAD TEST DATA

Recovery Testing - Hvorslev Method (1951)

BH 1					
Time	Elapsed Time (mins)	Elapsed Time (sec)	Water Level (m)	H-h	(H-h)/(H-Ho)
			6.370		
10:21:35 AM	0.00	0	7.147	0.777	1.000
10:21:40 AM	0.08	5	6.739	0.369	0.475
10:21:45 AM	0.17	10	6.661	0.291	0.375
10:21:50 AM	0.25	15	6.601	0.231	0.297
10:21:55 AM	0.33	20	6.574	0.204	0.263
10:22:00 AM	0.42	25	6.565	0.195	0.251
10:22:05 AM	0.50	30	6.559	0.189	0.243
10:22:10 AM	0.58	35	6.556	0.186	0.239
10:22:15 AM	0.67	40	6.553	0.183	0.236
10:22:20 AM	0.75	45	6.547	0.177	0.228
10:22:25 AM	0.83	50	6.547	0.177	0.228
10:22:30 AM	0.92	55	6.544	0.174	0.224
10:22:35 AM	1.00	60	6.541	0.171	0.220



K = Hydraulic Conductivity
r = radius of well casing
R = Radius of well screen or filter pack
L = Length of the well screen (in Slug Test) or the length of submerged portion of the well screen (in Rising Head)
T₀ = time for water level to rise or fall to 37% of the initial change

r (m) = 0.025
 L (m) = 1.5
 R (m) = 0.075
 T₀ (sec) = 11

K (m/s) = 6E-05

Notes:
 1 - All water levels are in metres from ground surface
 2 - R is radius of sand pack
 3 - T₀ is determined from plots where (H-h)/(H-Ho) = 0.37
 4 - Analysis based off of Horslev (1951)

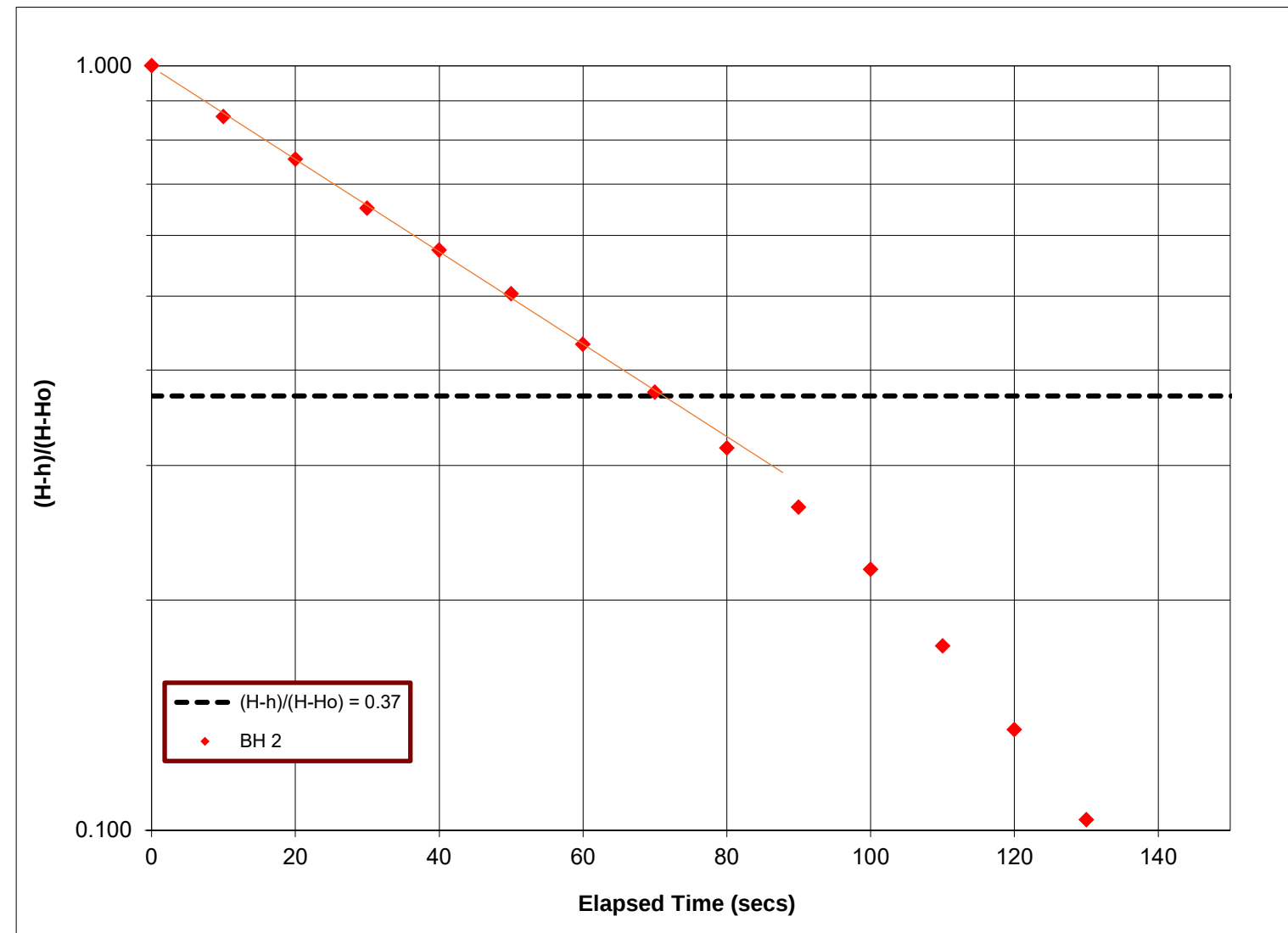


RISING HEAD TEST - Borehole 1

APPENDIX:	D
REF. No.:	20-1199A
DATE:	October 2020

Recovery Testing - Hvorslev Method (1951)

BH 2					
Time	Elapsed Time (mins)	Elapsed Time (sec)	Water Level (m)	H-h	(H-h)/(H-Ho)
			6.900		
10:11:15 AM	0.00	0	7.365	0.465	1.000
10:11:25 AM	0.17	10	7.299	0.399	0.858
10:11:35 AM	0.33	20	7.251	0.351	0.755
10:11:45 AM	0.50	30	7.203	0.303	0.652
10:11:55 AM	0.67	40	7.167	0.267	0.574
10:12:05 AM	0.83	50	7.134	0.234	0.503
10:12:15 AM	1.00	60	7.101	0.201	0.432
10:12:25 AM	1.17	70	7.074	0.174	0.374
10:12:35 AM	1.33	80	7.047	0.147	0.316
10:12:45 AM	1.50	90	7.023	0.123	0.265
10:12:55 AM	1.67	100	7.002	0.102	0.219
10:13:05 AM	1.83	110	6.981	0.081	0.174
10:13:15 AM	2.00	120	6.963	0.063	0.135
10:13:25 AM	2.17	130	6.948	0.048	0.103
10:13:35 AM	2.33	140	6.933	0.033	0.071
10:13:45 AM	2.50	150	6.921	0.021	0.045
10:13:55 AM	2.67	160	6.909	0.009	0.019



K = Hydraulic Conductivity

r = radius of well casing

R = Radius of well screen or filter pack

L = Length of the well screen (in Slug Test) or the length of submerged portion of the well screen (in Rising Head)

T₀ = time for water level to rise or fall to 37% of the initial change

r (m) = 0.025

L (m) = 1.5

R (m) = 0.075

T₀ (sec) = 72

K (m/s) = 9E-06

Notes:

1 - All water levels are in metres from ground surface

2 - R is radius of sand pack

3 - T₀ is determined from plots where $(H-h)/(H-H_o) = 0.37$

4 - Analysis based off of Hvorslev (1951)



RIISING HEAD TEST - Borehole 2

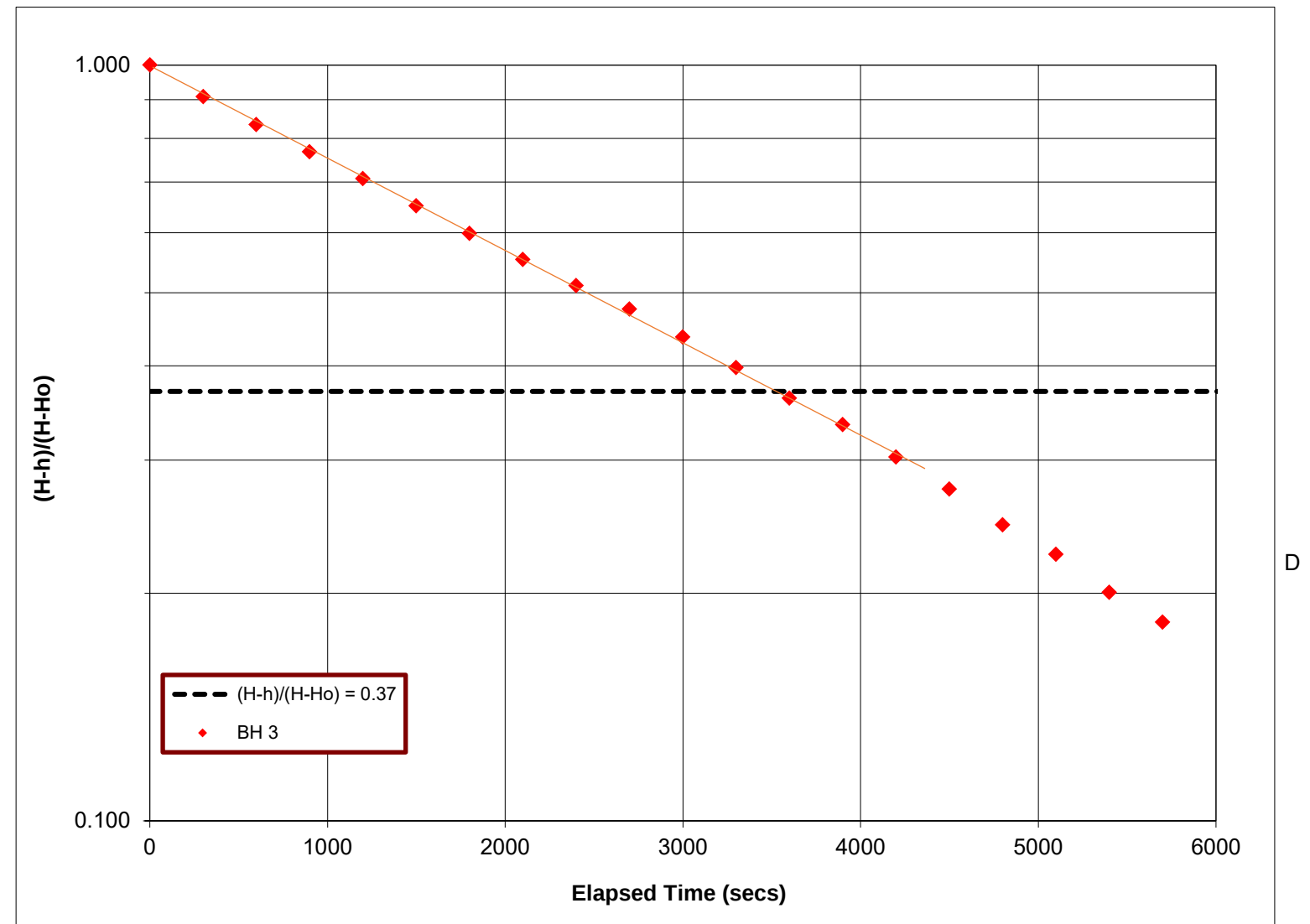
APPENDIX: D

REF. No.: 20-1199A

DATE: October 2020

Recovery Testing - Hvorslev Method (1951)

BH 3					
Time	Elapsed Time (mins)	Elapsed Time (sec)	Water Level (m)	H-h	(H-h)/(H-Ho)
			5.590		
10:10:00 AM	0.00	0	6.442	0.852	1.000
10:15:00 AM	5.00	300	6.364	0.774	0.908
10:20:00 AM	10.00	600	6.301	0.711	0.835
10:25:00 AM	15.00	900	6.244	0.654	0.768
10:30:00 AM	20.00	1200	6.193	0.603	0.708
10:35:00 AM	25.00	1500	6.145	0.555	0.651
10:40:00 AM	30.00	1800	6.1	0.510	0.599
10:45:00 AM	35.00	2100	6.061	0.471	0.553
10:50:00 AM	40.00	2400	6.025	0.435	0.511
10:55:00 AM	45.00	2700	5.995	0.405	0.475
11:00:00 AM	50.00	3000	5.962	0.372	0.437
11:05:00 AM	55.00	3300	5.929	0.339	0.398
11:10:00 AM	60.00	3600	5.899	0.309	0.363
11:15:00 AM	65.00	3900	5.875	0.285	0.335
11:20:00 AM	70.00	4200	5.848	0.258	0.303
11:25:00 AM	75.00	4500	5.824	0.234	0.275
11:30:00 AM	80.00	4800	5.8	0.210	0.246
11:35:00 AM	85.00	5100	5.782	0.192	0.225
11:40:00 AM	90.00	5400	5.761	0.171	0.201
11:45:00 AM	95.00	5700	5.746	0.156	0.183



K = Hydraulic Conductivity
r = radius of well casing
R = Radius of well screen or filter pack
L = Length of the well screen (in Slug Test) or the length of submerged portion of the well screen (in Rising Head)
T₀ = time for water level to rise or fall to 37% of the initial change

r (m) = 0.025
L (m) = 1.5
R (m) = 0.075
T₀ (sec) = 3,500

K (m/s) = 2E-07

Notes:

- 1 - All water levels are in metres from ground surface
- 2 - R is radius of sand pack
- 3 - T₀ is determined from plots where $(H-h)/(H-H_o) = 0.37$
- 4 - Analysis based off of Hvorslev (1951)



RISING HEAD TEST - Borehole 3

APPENDIX:	D
REF. No.:	20-1199A
DATE:	October 2020

Appendix E –
MECP WELL RECORDS AND SUMMARY TABLE

APPENDIX E - MECP Well Record Summary Table

20-1199A

821 Big Bay Point Rd., Barrie, Ontario

Well ID	Date Installed	Well Use	Depth to Top of Screen (m)	Water Level (m)	Stratigraphy Summary (Depth in m)
5701487	01/25/1966	Domestic Water Supply	0	0	0 to 10.7 - Clay & Boulders 10.7 to 19.8 - Sand 19.8 to 40.8 - Sand & Clay 40.8 to 56.4 - Sand 56.4 to 66.8 - Clay 66.8 to 83.2 - Sand
5701492	02/22/1964	Domestic Water Supply	17.1	6.1	0 to 13.7 - Clay with Gravel 13.7 to 17.7 - Gravelly Clay & Sand 17.7 to 18.9 - Fine Sand
5701623	07/09/1965	Irrigation Water Supply	25.9	14.3	0 to 15.2 - Unknown (Dug Well) 15.2 to 24.4 - Clayey Sand 24.4 to 26.8 - Sand
5701625	08/01/1947	Unknown	Unknown	Unknown	0 to 9.1 - Sand 9.1 to 39.6 - Clay
5701630	10/27/1964	Domestic Water Supply	18.6	7.9	0 to 8.5 - Unknown (Dug Well) 8.5 to 18 - Clay & Sand 18 to 19.5 - Fine Sand
5701634	03/14/1966	Domestic Water Supply	36.6	18.3	0 to 13.1 - Unknown (Dug Well) 13.1 to 23.2 - Clay 23.2 to 30.2 - Silt 30.2 to 33.8 - Clay 33.8 to 37.5 - Fine Sand
5708503	12/21/1971	Domestic Water Supply	15.8	7.6	0 to 8.5 - Clay 8.5 to 17.1 - Sand
5712064	10/02/1974	Domestic Water Supply	14.3	6.1	0 to 6.4 - Sand & Clay 6.4 to 14.6 - Clay & Gravel 14.6 to 16.2 - Fine Sand
5738384	11/25/2003	Abandoned Well	Unknown	Unknown	Unknown
5739403	11/24/2004	Domestic Water Supply	26.2	5.9	0 to 7 - Gravelly Clay 7 to 24.4 - Clayey Sand 24.4 to 27.4 - Sand
5740627	02/26/2006	Domestic Water Supply	15.1	14.3	0 to 14.6 - Sand 14.6 to 47.2 - Sand & Clay 47.2 to 50.3 - Fine Sand
7183759	05/29/2012	Monitoring Well	3.3	Unknown	0 to 1.2 - Fill 1.2 to 5.1 - Clayey Silt 5.1 to 6.4 - Silty Sand
7183760	05/29/2012	Monitoring Well	3	Unknown	0 to 1.2 - Fill 1.2 to 4.8 - Silt 4.8 to 6.0 - Sand
7183761	05/29/2012	Monitoring Well	3	Unknown	0 to 1.2 - Fill 1.2 to 4.8 - Silt 4.8 to 6.0 - Sand
7195827	01/03/2013	Abandoned Well	Unknown	Unknown	Unknown
7195828	01/03/2013	Abandoned Well	Unknown	Unknown	Unknown
7195829	01/03/2013	Abandoned Well	Unknown	Unknown	Unknown
7244354	N/A	Monitoring Well	3	Unknown	0 to 2.1 - Fill 2.1 to 5 - Sand
7286077	03/14/2017	Monitoring Well	3	Unknown	0 to 3 - Silty Clay 3 to 5 - Clayey Silt
7286078	03/14/2017	Monitoring Well	3	Unknown	0 to 3 - Silty Clay 3 to 5 - Clayey Silt
7301459	11/09/2017	Abandoned Well	Unknown	Unknown	Unknown
7301460	11/09/2017	Abandoned Well	Unknown	Unknown	Unknown
7301461	11/09/2017	Abandoned Well	Unknown	Unknown	Unknown
7310961	02/27/2018	Monitoring Well	3	Unknown	0 to 5 - Silty Clay 5 to 6.5 - Sandy Silt
7330260	03/04/2019	Monitoring Well	6	6.5	0 to 10 - Sand
7330261	03/04/2019	Monitoring Well	6	6.5	0 to 10 - Sand
7330262	03/04/2019	Monitoring Well	5.6	6.5	0 to 2.4 - Silty Sand 2.4 to 8.7 - Sand

pmw



WATER RESOURCE
DIVISION
57 No 1487
MAR 21 1966
ONTARIO WATER
RESOURCES COMMISSION

UTM 1172 609795E

SR 4912789N

The Ontario Water Resources Commission Act

Elev. SAR 0805

WATER WELL RECORD

Basin 72
County or District Simcoe

Township, Village, Town or City Lanes Fil

Con. 12 Lot 16

Date completed 25 JAN 1966
(day month year)

Address RR#4 BARRIE ONT.

Casing and Screen Record

Inside diameter of casing 6 1/4"
Total length of casing down to 240' 5" - 273'
Type of screen Johnsons
Length of screen 5'
Depth to top of screen 268'
Diameter of finished hole 5"

Pumping Test

Static level 105
Test-pumping rate 5 G.P.M.
Pumping level 240'
Duration of test pumping 3 hrs
Water clear or cloudy at end of test CLEAR
Recommended pumping rate 5 G.P.M.
with pump setting of 240 feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record

	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Top Soil	0	2		
Brown clay with boulders	2	35		
DRY SAND	35	65		
Grey sand with blue clay	65	134		
Fine grey. cemented sand.	134	185		
Blue clay	185	219		
Fine grey sand	219	265		
Med. grey sand	265	273	265	Fresh

For what purpose(s) is the water to be used? Domestic and Stock

Is well on upland, in valley, or on hillside? upland

Drilling or Boring Firm Henry HAMMERS

Address RR#3 BARRIE

Licence Number 1662

Name of Driller or Borer John Vander Meulen and H. HAMMERS

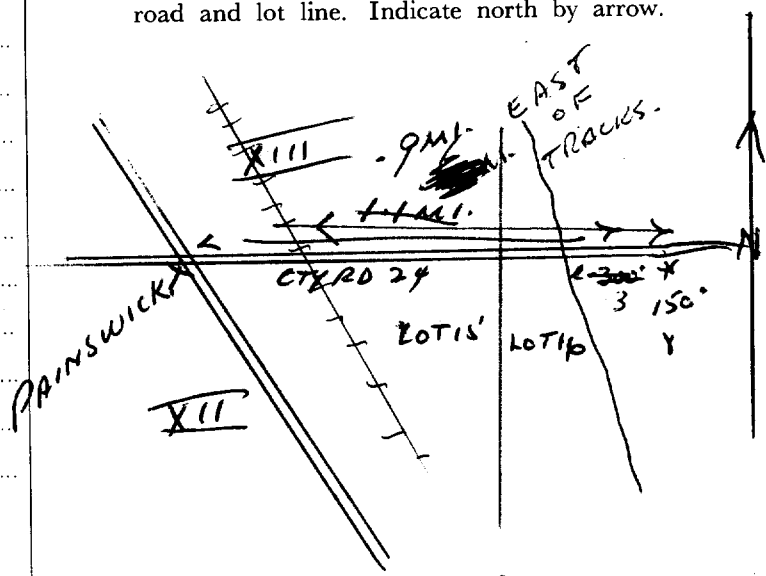
Address

Date Jan 25/66

(Signature of Licensed Drilling or Boring Contractor) Henry HAMMERS

Location of Well

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



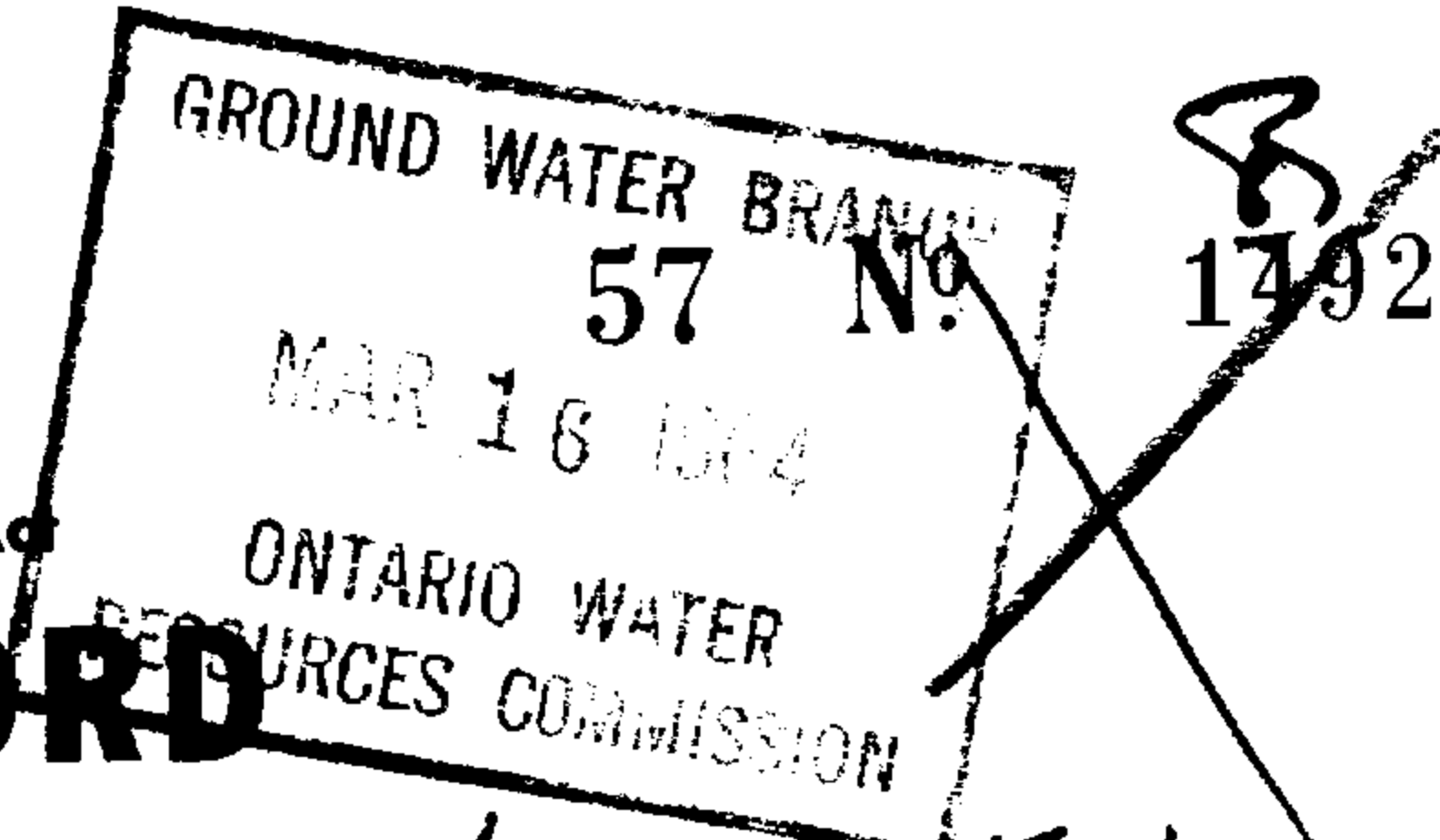
UTM | 1 | 7 | 6 | 1 | 0 | 4 | 7 | 7 | E

Coast R 1049 130.62 N

Elev 10850



The Ontario Water Resources Commission Act



WATER WELL RECORD

Basin | 12 | 5 | M | C | O | e
County or District

Township, Village, Town or City | INNESFILL

Con. | 12 | Lot | 19

Date completed | 22 | Feb | 1964
(day month year)

Owner | [Redacted] |
(print in block letters)

Address | RR#4 BARRIE

Casing and Screen Record

Inside diameter of casing | 6 1/4 inch
Total length of casing | 59 60 Feet
Type of screen | JOHNSONS (slot &)
Length of screen | 3 Feet
Depth to top of screen | 59 60 Feet
Diameter of finished hole | 6 1/4 inch

Pumping Test

Static level | 20 Feet
Test-pumping rate | 2 1/2 G.P.M.
Pumping level | 60 Feet
Duration of test pumping | 2 HRS
Water clear or cloudy at end of test | CLEAR
Recommended pumping rate | 2 1/2 G.P.M.
with pump setting of | 60 feet below ground surface

Well Log

Overburden and Bedrock Record

BROWN CLAY with
pebbles
BROWN CLAY GRAVEL,
SAND
Fine yellow SAND

From
ft.

To
ft.

Depth(s) at
which water(s)
found

Kind of water
(fresh, salty,
sulphur)

0

45

45

58

58

62

59

FRESH

For what purpose(s) is the water to be used? | DOMESTIC
(house).

Is well on upland, in valley, or on hillside? | UPLAND

Drilling or Boring Firm | HENRY HAMMERS
RR#3 BARRIE.

Address

Licence Number | 1303

Name of Driller or Borer

Address | SAME

Date | Feb 22 / 64

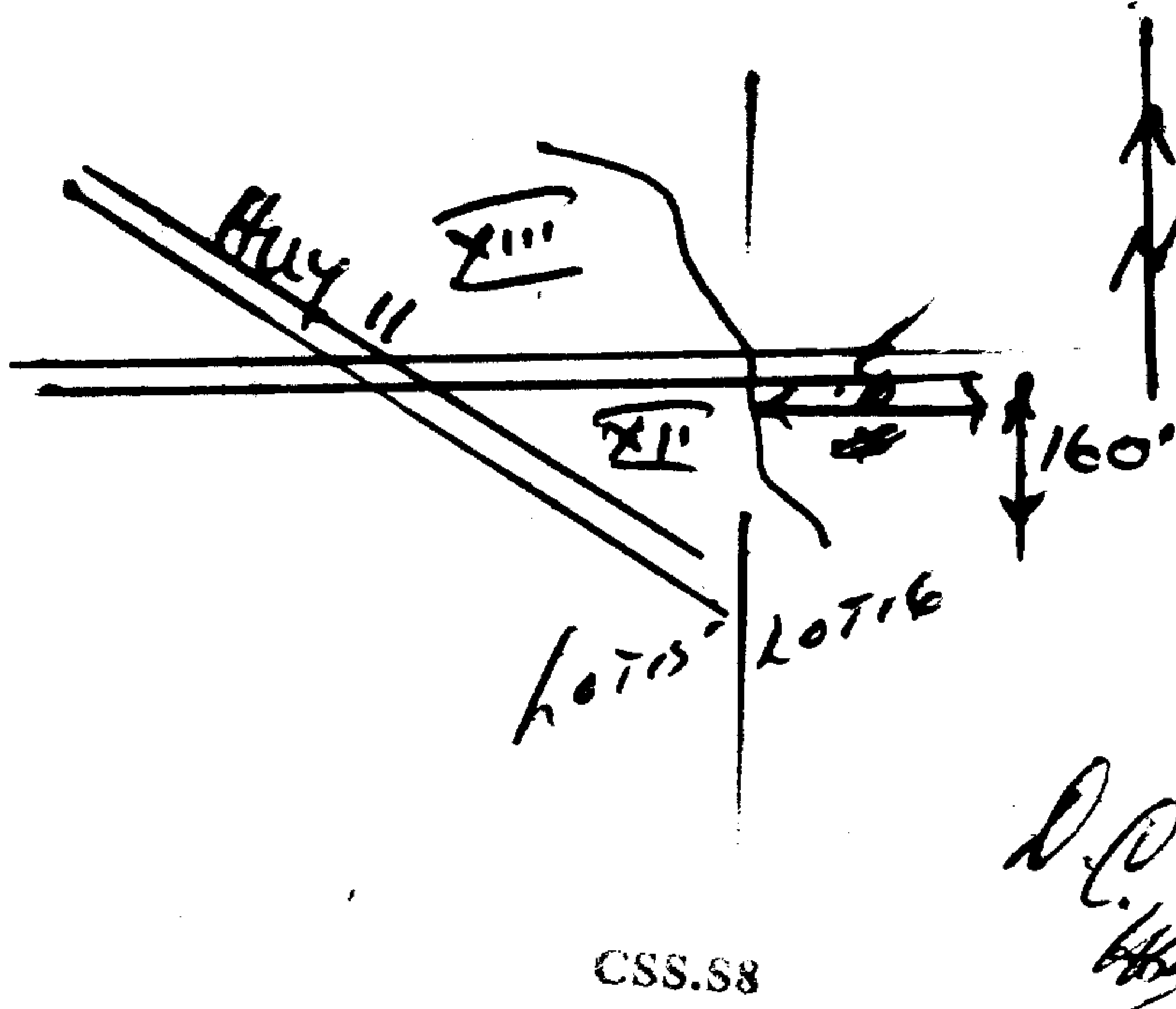
(Signature of Licensed Drilling or Boring Contractor)
Henry Hammers

Form 15M-60-4138

OWRC COPY

Location of Well

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



CSS.S8



WATER RESOURCES
DIVISION
57 No 1623
SEP 27 1965
ONTARIO WATER
RESOURCES COMMISSION

UTM 172609556E
CONV XIII
S R 49129.44N
Elev. S R 0875

The Ontario Water Resources Commission Act

WATER WELL RECORD

Basin 221
County or District Barrie
Con. 13
Lot part of 16
Township, Village, Town or City Innesfil
Date completed 9 7 65
(day month year)
Address R R #4, Barrie

Casing and Screen Record

Inside diameter of casing 6 1/4
Total length of casing 78 ft
Type of screen Johnson S.S. Slot 20
Length of screen 3 ft
Depth to top of screen 85
Diameter of finished hole 6 1/4

Pumping Test

Static level 47 ft
Test-pumping rate 10 G.P.M.
Pumping level 80 ft
Duration of test pumping 2 hrs
Water clear or cloudy at end of test Clear
Recommended pumping rate 7 G.P.M.
with pump setting of 73 feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Dug Well	0	50		
Dry Sand	50	80		
Coarse sand	80	88	80	fresh

For what purpose(s) is the water to be used? farm

Is well on upland, in valley, or on hillside? hillside

Drilling or Boring Firm Henry Hammers

Well Drilling Contractor

Address R R #3 Barrie, Ont.

Licence Number 1662

Name of Driller or Borer John Van Der Meulen

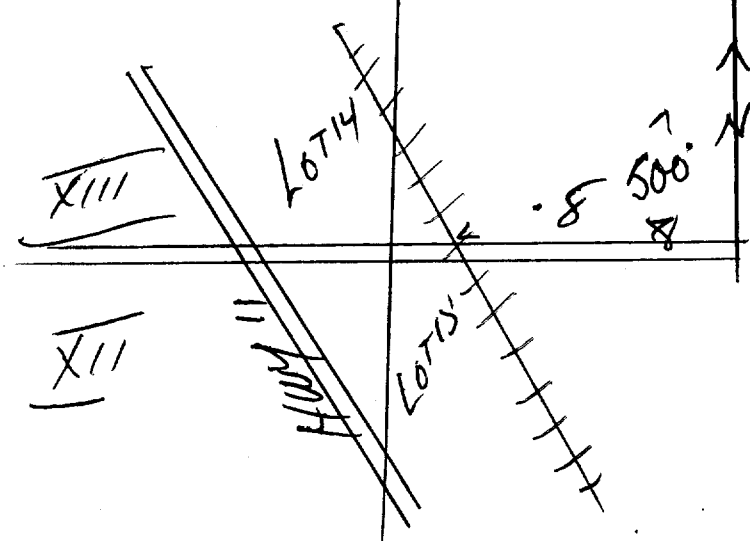
Address 119 Cumberland St. Barrie

Date July 9/65

(Signature of Licensed Drilling or Boring Contractor)

Location of Well

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





4912 963 N

Elev 190 68 65

Basin 12

RECEIVED

OCT 27 1947

GEOLOGICAL BRANCH
DEPARTMENT OF MINES

The Well Drillers Act

Department of Mines, Province of Ontario

Water Well Record

County or District Lincoln Tp. Innisfil Con 13 Lot 17 Pt. Lot 17 (approx)
Owner [redacted] Address Toronto Ont Acres —
Date Completed August 1 Cost of Well (not including pump) \$ 260

Pipe and Casing Record

Pumping Test

Casing diameter(s) <u>2"</u>	Date <u>—</u>
Length(s) of casing(s) <u>130' hole</u>	Developed Capacity <u>—</u>
Length of screen <u>None</u>	Duration of Test <u>—</u>
Type of screen <u>—</u>	Pumping Rate <u>—</u>
Type of pump <u>Unknown</u>	Drawdown <u>—</u>
Capacity of pump <u>Unknown</u>	Static level of completed well <u>—</u>
Depth of pump setting <u>—</u>	Is well a gravel-wall type? <u>—</u>

Water Record

Kind (fresh or mineral)	Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
<u>Fresh</u>			
Quality (hard, soft, contains iron, sulphur etc.) <u>Not known</u>			
Appearance (clear, cloudy, coloured) <u>Clear</u>			
For what purpose(s) is the water to be used? <u>Household</u>	<u>Flow</u>	<u>Pure</u>	<u>at least 140'</u>
How far is well from possible source of contamination? <u>Unknown</u>			
What is source of contamination? <u>—</u>			
Enclose a copy of any mineral analysis that has been made of water <u>—</u>			

Well Log

Drift and Bedrock Record

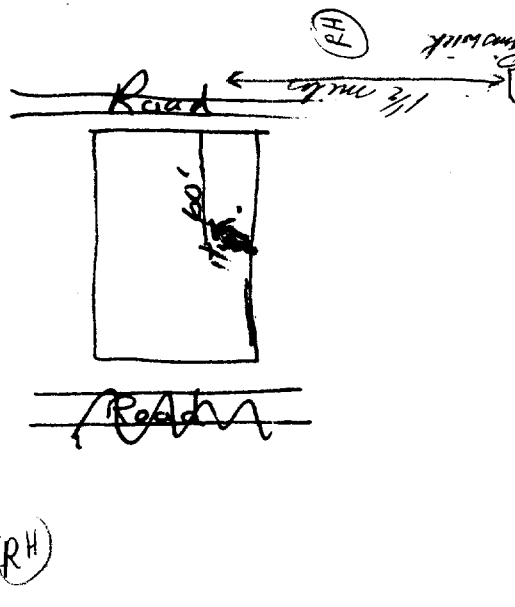
From To
0 ft.ft.

Sand
Clay

30 30
30 100
130

Location of Well

In diagram below show distances of well from road and lot line



Situation: Is well on upland, in valley, or on hillside? Upland
Drilling Firm E. R. Quantz
Address Belle Ewart, Ontario
Recorded by E. Quantz Address Belle Ewart
Date Sept 15/47 Licence Number 130

UTM 17 610487 E



WATER RESOURCES
DIVISION No. 1630
NOV 9 1964
ONTARIO WATER
RESOURCES COMMISSION

The Ontario Water Resources Commission Act

Elev. 105 R 184.60

WATER WELL RECORD

Basin 122 L Sparcoe

County or District XIII

Lot 18

Township, Village, Town or City INNISFIL

Date completed 27

(day)

OCT

month

1964

year)

Address R.R. 4 BARRIE

Casing and Screen Record

Inside diameter of casing 6 1/4
Total length of casing 50'
Type of screen JOHNSON SLOT 10 ST. ST.
Length of screen 3'
Depth to top of screen 61'
Diameter of finished hole 6 1/4

Pumping Test

Static level 26'
Test-pumping rate 4 1/2 G.P.M.
Pumping level 60'
Duration of test pumping 2 HRS.
Water clear or cloudy at end of test CLEAR
Recommended pumping rate 4 1/2 G.P.M.
with pump setting of 60' feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record

	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
DUG WELL	0	28		FRESH
BLUE CLAY WITH SAND	28	59		
FINE YELLOW SAND	59	64	59	

For what purpose(s) is the water to be used?

HOUSE

Is well on ☒ upland, ☐ in valley, or on hillside?

Drilling or Boring Firm

F. HAMMERS

Address R.R. 3 BARRIE

Licence Number 1330

Name of Driller or Borer A. HAMMERS

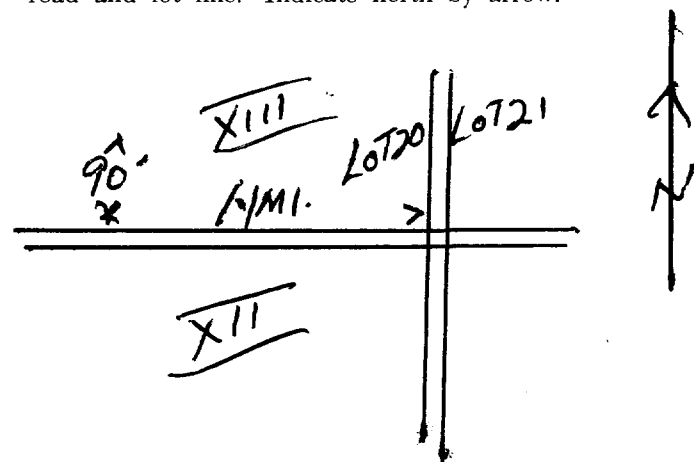
Address R.R. 5 BARRIE

Date NOV. 4/64

Henry Hammers
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

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



WATER RESOURCES
DIVISION57 No 1634
JUL 4 19667/5 SD
UMP 172 6104114 E
5 R 4913286 N
The Ontario Water Resources Commission Act

Elev. 5 R 0850

WATER WELL RECORD

Basin 172
County or District SIMCOE
Con 13 Lot 14 18 10 Township, Village, Town or City INNISFILL
Date completed 14 3 1966
58 Blake St. Barrie

Casing and Screen Record

Inside diameter of casing 5"
Total length of casing 120 FT
Type of screen JOHNSON SS. SLOT 6
Length of screen 3 FT
Depth to top of screen 120 FT
Diameter of finished hole 5"

Pumping Test

Static level 60 FT
Test-pumping rate 2 1/2 G.P.M.
Pumping level 110
Duration of test pumping 2 HRS
Water clear or cloudy at end of test CLEAR
Recommended pumping rate 2 1/2 G.P.M.
with pump setting of 115 feet below ground surface

Well Log

Overburden and Bedrock Record

~~Forest~~
DUG WELL
CLAY (BLUE)
SILT (GREY)
CLAY (GREY)
FINE SAND (GREY)From
ft.To
ft.Depth(s) at
which water(s)
foundKind of water
(fresh, salty,
sulphur)0 43
43 76
76 99
99 111
111 123

111-123 FRESH

For what purpose(s) is the water to be used? HOUSE

Is well on upland, in valley, or on hillside? UPLAND

Drilling or Boring Firm KNELSEN WATER WELLS
R.R. #1

Address BARRIE ONT

729 8218

Licence Number 2203

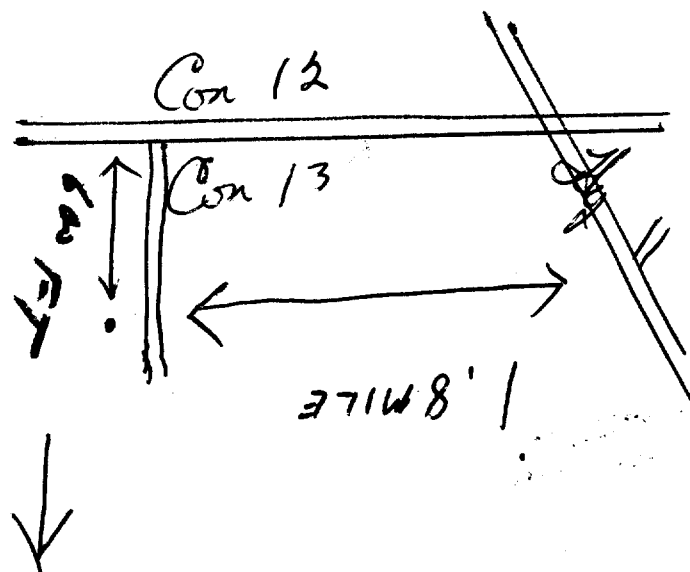
Name of Driller or Borer ANDREAS KNELSEN

Address SAME

Date Mar. 14 1966

G. R. Knudsen
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

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



The Ontario Water Resources Commission Act

WATER WELL RECORD

310/SE

Water management in Ontario 1. PRINT ONLY IN SPACES PROVIDED

2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

5708503

MUNICIP.

57005

CON.

C&N

12

COUNTY OR DISTRICT

Simcoe

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE

Ernis Fi 1

3

CON. BLOCK, TRACT, SURVEY, ETC.

12

LOT

25-27

217

DATE COMPLETED

48-53

DAY

MO.

YR.

21

12

71

4 BARRE

1289.0

14

0860

5

23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Block	Topsoil			0	1
Brown	Clay		Sandy	1	28
"	Sand		Dead	28	52
"	Sand		Wet	52	56

31

32

41

WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13	1 ☒ FRESH	3 ☐ SULPHUR	14	
	2 ☐ SALTY	4 ☐ MINERAL		
15-18	1 ☒ FRESH	3 ☐ SULPHUR	19	
	2 ☐ SALTY	4 ☐ MINERAL		
20-23	1 ☐ FRESH	3 ☐ SULPHUR	24	
	2 ☐ SALTY	4 ☐ MINERAL		
25-28	1 ☐ FRESH	3 ☐ SULPHUR	29	
	2 ☐ SALTY	4 ☐ MINERAL		
30-33	1 ☐ FRESH	3 ☐ SULPHUR	34	
	2 ☐ SALTY	4 ☐ MINERAL		

CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 ☒ STEEL	12		
	2 ☐ GALVANIZED			
	3 ☐ CONCRETE			
	4 ☐ OPEN HOLE			
17-18	1 ☐ STEEL	19		
	2 ☐ GALVANIZED			
	3 ☐ CONCRETE			
	4 ☐ OPEN HOLE			
24-25	1 ☐ STEEL	26		
	2 ☐ GALVANIZED			
	3 ☐ CONCRETE			
	4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
008	05.000	04
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN	
Johnson SS	0052	

PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)	
FROM	TO	
10-13	14-17	Putty Pack
18-21	22-25	
26-29	30-33	

PUMPING TEST	PUMPING TEST METHOD	10 PUMPING RATE	11-14 DURATION OF PUMPING			
	☐ PUMP	2 ☒ DRILLER	15-16 HOURS			
	STATIC LEVEL	WATER LEVEL END OF PUMPING	17-18 MINS.			
	025	044				
	IF FLOWING, GIVE RATE	WATER LEVELS DURING				
	19-21	22-24	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
	025	044	044	044	044	044
	38-41	PUMP INTAKE SET AT	WATER AT END OF TEST			
			1 ☒ CLEAR	2 ☐ CLOUDY		
	RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE			
	☐ SHALLOW	☒ DEEP	050	0004		
	50-53	000.2 GPM./FT. SPECIFIC CAPACITY				

FINAL STATUS OF WELL	1 ☒ WATER SUPPLY	5 ☐ ABANDONED, INSUFFICIENT SUPPLY
	2 ☐ OBSERVATION WELL	6 ☐ ABANDONED, POOR QUALITY
	3 ☐ TEST HOLE	7 ☐ UNFINISHED
WATER USE	1 ☒ DOMESTIC	5 ☐ COMMERCIAL
	2 ☐ STOCK	6 ☐ MUNICIPAL
	3 ☐ IRRIGATION	7 ☐ PUBLIC SUPPLY
METHOD OF DRILLING	4 ☐ INDUSTRIAL	8 ☐ COOLING OR AIR CONDITIONING
	1 ☒ CABLE TOOL	6 ☐ BORING
	2 ☐ ROTARY (CONVENTIONAL)	7 ☐ DIAMOND
	3 ☐ ROTARY (REVERSE)	8 ☐ JETTING
	4 ☐ ROTARY (AIR)	9 ☐ DRIVING
	5 ☐ AIR PERCUSSION	

LOCATION OF WELL	
IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.	
DRILLERS REMARKS:	
Con 12	

CONTRACTOR	NAME OF WELL CONTRACTOR	LICENCE NUMBER
	AMULSEN WATER WELLS	3203
	ADDRESS	
	RD 1 BARRE	ONT
	NAME OF DRILLER OR BORER	LICENCE NUMBER
	GORD KENT	
SIGNATURE OF CONTRACTOR	SUBMISSION DATE	
	23 MO. 12 YR.	

OFFICE USE ONLY	DATA SOURCE	58 CONTRACTOR	59-62 DATE RECEIVED	63-68
	1	3203	180172	
	DATE OF INSPECTION	INSPECTOR		
	REMARKS:			

OWRC COPY

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

5738384

Municipality **57005** Con **CCN** **16**

County or District SIMCOE	Township/Borough/City/Town/Village INNISFIL	Con Block tract survey, etc. 12	Lot 17	SW Q1
Owner's surname CIRSDAWN	First Name CONST INC	Address of Well Location 27 CLAPPERTON ST BARRIE	Date completed 23 day 11 month 03 year	

[illegible][illegible]

WATER RECORD			
Water found at - feet	Kind of water		
10-13	☐ Fresh ☐ Salty	☐ Sulphur ☐ Minerals ☐ Gas	
15-18	☐ Fresh ☐ Salty	☐ Sulphur ☐ Minerals ☐ Gas	
20-23	☐ Fresh ☐ Salty	☐ Sulphur ☐ Minerals ☐ Gas	
25-28	☐ Fresh ☐ Salty	☐ Sulphur ☐ Minerals ☐ Gas	
30-33	☐ Fresh ☐ Salty	☐ Sulphur ☐ Minerals ☐ Gas	

CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
10-11	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			13-16
17-18	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			20-23
24-25	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			27-30

SCREEN	SIZES OF OPENING (SLOT NO.)		
	Diameter	Length	Inches
	feet		
1	Material and type		Depth at top of screen
			feet

PLUGGING & SEALING RECORD			
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
From	To		
10-11	13-16	BENTONITE	
18-21	22-25		
26-29	30-33		

PUMPING TEST	71 Pumping test method ¹⁰ 1 ☐ Pump 2 ☐ Bailer		Pumping rate ¹¹⁻¹⁴ GPM		Duration of pumping ¹⁵⁻¹⁶ Hours ¹⁷⁻¹⁸ Mins	
	25 Static level Water level end of pumping		Water levels during 1 ☐ Pumping 2 ☐ Recovery			
	¹⁹⁻²¹ feet		²²⁻²⁴ feet		²⁵ feet	
	²⁶⁻²⁸ feet		²⁹⁻³¹ feet		³²⁻³⁴ feet	
	³⁵⁻³⁷ feet		³⁸⁻⁴¹ feet		⁴² feet	
	If flowing give rate GPM		Pump intake set at feet		Water at end of test ☐ Clear ☐ Cloudy	
Recommended pump type ☐ Shallow ☐ Deep		Recommended pump setting feet		Recommended pump rate GPM		

FINAL STATUS OF WELL			54
1 ☐ Water supply	5 ☐ Abandoned, insufficient supply	9 ☐ Unfinished	
2 ☐ Observation well	6 ☐ Abandoned, poor quality	10 ☐ Replacement well	
3 ☐ Test hole	7 ☒ Abandoned (Other)		
4 ☐ Recharge well	8 ☐ Dewatering		

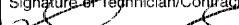
WATER USE			55-56
1 ☐ Domestic	5 ☐ Commercial	9 ☐ Not use	
2 ☐ Stock	6 ☐ Municipal	10 ☐ Other	
3 ☐ Irrigation	7 ☐ Public supply		
4 ☐ Industrial	8 ☐ Cooling & air conditioning		

METHOD OF CONSTRUCTION			57
1 ☐ Cable tool	5 ☐ Air percussion	9 ☐ Driving	
2 ☐ Rotary (conventional)	6 ☐ Boring	10 ☐ Digging	
3 ☐ Rotary (reverse)	7 ☐ Diamond	11 ☐ Other	
4 ☐ Rotary (air)	8 ☐ Jetting		

LOCATION OF WELL

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

265293

Name of Well Contractor Fenella Well Drilling	Well Contractor's Licence No. 6418
Address RR4 Roseneath, ON K0K 2X0	
Name of Well Technician Larry Callahan	Well Technician's Licence No. T1569
Signature of Technician/Contractor 	Submission date 28 11 07 day mo yr

MINISTRY USE ONLY	Data source	Contractor	Date received
	6418	DEC 29 2003	
	Date of inspection	Inspector	
	Remarks		

Instructions for Completing Form

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- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Management Coordinator at 416-235-6203.
- All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Well Owner's Information and Location of Well Information

Ministry Use Only													
MUN	5	7	0	0	5	CON	C	O	N	13	LOT	1	7

#1870 Big Bay Pt. Rd. Innisfil 17 13
RR#4. Innisfil Big Bay Pt. Ont
GPS Reading NAD Zone Easting Northing Unit Make/Model Mode of Operation: ☐ Undifferentiated ☐ Averaged
8.3 610622 4913404 Sportrak ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Metres To
Black	Top Soil			0'	1'
GREY	Clay	Stones		1'	23'
GREY	Sand	Clay		23'	80'
BROWN	Sand			80'	90'
GREY	Sand			90'	
Total DEPTH 90					

Hole Diameter			Construction Record					Test of Well Yield				
Depth From	Metres To	Diameter Centimetres	Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Metres To	Pumping test method	Draw Down Time min	Water Level Metres	Recovery Time min	Water Level Metres
0'	20'	8"						pump				
			Casing					Pump intake set at (metres)	Static Level			
			5"	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.188	0'	86'	40'	1	19'6"	1	33'10"
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				Pumping rate - (litres/min)	2	23'4"	2	25'11"
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				8gpm				
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				Duration of pumping	2	25'1"	2	22'6"
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				1 hrs + min				
			Screen					Final water level end of pumping	3	27'2"	3	30'3"
			5"	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized		86'	90'	33'10"				
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				Recommended pump type	4	31'1"	4	19'6"
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				Shallow ☐ Deep ☒				
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				Recommended pump depth	5	32'7"	5	
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				80' metres				
			No Casing or Screen					Recommended pump rate (litres/min)	10	33'10"	10	
				☐ Open hole				15gpm				
								If flowing give rate - (litres/min)	15		15	
									20		20	
									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' 18' 3/8 hole plug 9 bags

Method of Construction ☒ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging ☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other ☐ Rotary (reverse) ☐ Boring ☐ Driving
Water Use ☒ Domestic ☐ Industrial ☐ Public Supply ☐ Other ☐ Stock ☐ Commercial ☐ Not used ☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning
Final Status of Well ☒ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other) ☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering ☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Well Contractor/Technician Information
Name of Well Contractor Well Contractor's Licence No.
Buen Buker Drilling Ltd 1467
Business Address (street name, number, city etc.)
RR#1, Barrie Ontario L4M4Y8
Name of Well Technician (last name, first name) Well Technician's Licence No.
Brian Buker T226
Signature of Technician/Contractor Date Submitted
x Brian Buker 2004 12 10

Location of Well
In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.
N
road
well
15# V
BIG BAY PT RD
Audit No. 2 18452 Date Well Completed 2004 11 24
Was the well owner's information package delivered? ☐ Yes ☐ No Date Delivered

Ministry Use Only
Data Source Contractor 1467
Date Received DEC 16 2004 Date of Inspection
Remarks Well Record Number 5739403

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- All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Well Owner's Information and Location of Well Information

Ministry Use Only									
MUN						CON			LOT

RR#/Street Number/Name: **1490 Big Bay Point Rd.** City/Town/Village: **Thurso** Site/Compartment/Block/Tract etc.:

GPS Reading: NAD **83** Zone **17** Easting **610554** Northing **4913377** 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 - From	Depth To
BR	SAND	CLAY	SOFT	0	20
	GRAVEL	STONES, CLAY	HARD	20	27
BR	SAND	CLAY		27	48
BR	CLAY	STONE	DENSE	48	52
BR	SAND	E	FINE	52	54
BR	CLAY			54	73
BR	CLAY	SAND		73	102
GRAY	CLAY	STR OF SAND		102	155
BR	SAND		FINE	155	165

Hole Diameter

Depth	Metres	Diameter
From	To	Centimetres
0	6.4	22.86
6.4	50.29	16.82

Water Record

Water found at **4.7** 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

Construction Record

Inside diam	Material	Wall thickness	Depth	Metres
centimetres		centimetres	From	To
Casing				
	☒ Steel ☐ Fibreglass			
	☐ Plastic ☐ Concrete			
	☐ Galvanized			
15.87	☒ Steel ☐ Fibreglass	188"	1.45	49.07
	☐ Plastic ☐ Concrete			
	☐ Galvanized			
13.7	☒ Steel ☐ Fibreglass	188	48.46	49.07
	☐ Plastic ☐ Concrete			
	☐ Galvanized			
Screen				
Outside diam	☒ Steel ☐ Fibreglass	Slot No.		
	☐ Plastic ☐ Concrete			
	☐ Galvanized			
6"		6	49.07	50.29
No Casing or Screen				
☐ Open hole				

Test of Well Yield

Pumping test method	Draw Down		Recovery	
	Time min	Water Level Metres	Time min	Water Level Metres
Pump intake set at - (metres)	Static Level	179'		
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	
If pumping discontinued, give reason.	20		20	
	25		25	
	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record ☒ Annular space ☐ Abandonment

Depth set at - Metres	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
From	To	
0	6.5	BENTONITE GROUT 30 GALS

Method of Construction

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

Water Use

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

Final Status of Well

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

Location of Well

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

Audit No. **Z 36566** Date Well Completed **2006 02 26**

Was the well owner's information package delivered? ☐ Yes ☐ No Date Delivered **2006 02 26**

Well Contractor/Technician Information

Name of Well Contractor: **Canadian Soil Drilling** Well Contractor's Licence No.: **07075**

Business Address (street name, number, city etc.): **1243 HWY 27 N, THURSO, ONTARIO**

Name of Well Technician (last name, first name): **JENSEN DONALD** Well Technician's Licence No.: **70232**

Signature of Technician/Contractor: **[Signature]** Date Submitted: **2006 03 25**

Ministry Use Only

Data Source: Contractor: **7075**

Date Received: **APR 11 2006** Date of Inspection: **2006 02 26**

Remarks: Well Record Number:



A 131793

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Measurements recorded in: ☐ Metric ☐ Imperial

Well Owner's Information

First Name	Last Name / Organization	E-mail Address			☐ Well Constructed by Well Owner
Shoppers Realty Inc.					
Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)	
243 Consumers Road	Toronto	ON	M2J 4N4	416 493 1220	

Well Location

Address of Well Location (Street Number/Name)		Township	Lot	Concession	
CORNER OF PRINCEWILLIAM WAY & BIG BAY POINT RD					
County/District/Municipality		City/Town/Village	Province		Postal Code
		BARRIE	Ontario		L4N0M7

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	610194	4913100		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

[illegible]

Annular Space

Depth Set at (m) From To		Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
0	2.4	3/8 HOEPLUG	41
2.4	6.4	#2 INDUSTRIAL SAND	41

Method of Construction

- | | | | | |
|--|---|--|---|--|
| ☐ Cable Tool | ☐ Diamond | ☐ Public | ☐ Commercial | ☐ Not used |
| ☐ Rotary (Conventional) | ☐ Jetting | ☐ Domestic | ☐ Municipal | ☐ Dewatering |
| ☐ Rotary (Reverse) | ☒ Driving | ☐ Livestock | ☐ Test Hole | ☒ Monitoring |
| ☐ Boring | ☐ Digging | ☐ Irrigation | ☐ Cooling & Air Conditioning | |
| ☐ Air percussion | | ☐ Industrial | | |
| ☐ Other, <i>specify</i> _____ | | ☐ Other, <i>specify</i> _____ | | |

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☒ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply
			From	To	
3.8	PLASTIC		0	3.3	

Status of Well

- ☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☒ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify*
☐ Other, *specify*

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To
4.0	PLASTIC	10	3.3	6.4

☐ Damaged, but Water Quality
☐ Abandoned, other, *specify*
☐ Other, *specify*

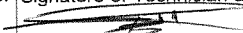
Water Details

Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	Depth (m/ft) From	To	Diameter (cm/in)
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	0	6.4	10
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____			

Hole Diameter

Depth (m)		Diameter (cm)
From	To	
0	6.4	10

Well Contractor and Well Technician Information

Business Name of Well Contractor		Well Contractor's Licence No.	
CMT ENGINEERING INC		7366	
Business Address (Street Number/Name)		Municipality	
1011 INDUSTRIAL CRES ST. CLEMENTS		WATERLOO	
Province	Postal Code	Business E-mail Address	
ON	N0B2M0	cmt@golden.net	
Bus. Telephone No. (inc. area code)		Name of Well Technician (Last Name, First Name)	
5196995775		DANIEL, BUD	
Well Technician's Licence No.	Signature of Technician and/or Contractor		Date Submitted
3458			20120530

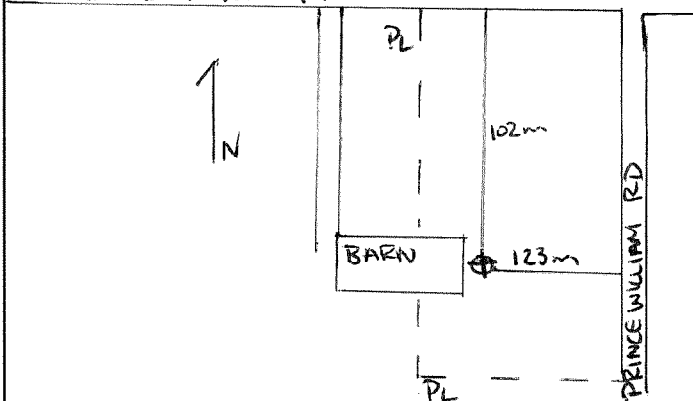
Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, <i>specify</i> _____	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:	Static Level			
	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
	4		4	
Duration of pumping _____ hrs + _____ min	5		5	
	10		10	
Final water level end of pumping (m/ft)	15		15	
	20		20	
If flowing give rate (l/min / GPM)	25		25	
	30		30	
Recommended pump depth (m/ft)	40		40	
	50		50	
Recommended pump rate (l/min / GPM)	60		60	
Well production (l/min / GPM)				
Disinfected? ☐ Yes ☐ No				

Map of Well Location

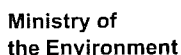
Please provide a map below following instructions on the back.

BIG BAY POINT RD



Comments:

Well owner's information package delivered ☐ Yes ☐ No	Date Package Delivered	Ministry Use Only Audit No. Z 146097 Received 06 2012
	Date Work Completed	
	Y Y Y Y M M D D 2 0 1 2 1 0 5 2 9	



A 131794

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Measurements recorded in: ☒ Metric ☐ Imperial

Well Owner's Information

First Name <i>Shoppers Realty Inc.</i>		Last Name / Organization		E-mail Address			☐ Well Constructed by Well Owner	
Mailing Address (Street Number/Name) <i>243 Consumers Road</i>			Municipality <i>Toronto</i>		Province <i>ON</i>	Postal Code <i>M2T 4W2</i>	Telephone No. (inc. area code) <i>416 493 1220</i>	

Well Location

Address of Well Location (Street Number/Name)		Township	Lot	Concession	
corner of Prince William Way & Big Bay Point Rd.					
County/District/Municipality		City/Town/Village		Province	Postal Code

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	610290	4913163		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m)	
				From	To
BROWN	FILL		LOOSE	0	1.2
GREY	SILT	CLAY SAND	DENSE	1.2	4.8
BROWN	SAND	SILT	DENSE	4.8	6.0

Annular Space			
Depth Set at (m/ft) From		Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
0	2.4	3/8 HOLEPLUG	LI
2.4	6.0	#2 INDUSTRIAL SAND	LI

Method of Construction		Well Use		
☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial	☐ Not used
☐ Rotary (Conventional)	☐ Jetting	☐ Domestic	☐ Municipal	☐ Dewatering
☐ Rotary (Reverse)	☒ Driving	☐ Livestock	☐ Test Hole	☒ Monitoring
☐ Boring	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning	
☐ Air percussion		☐ Industrial		
☐ Other, <i>specify</i> _____		☐ Other, <i>specify</i> _____		

Construction Record - Casing					Status of Well
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☒ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply
			From	To	
3.8	PLASTIC		0	3.0	

Construction Record - Screen				
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To
4.0	PLASTIC	10	3.0	6.0

☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify* _____
☐ Other, *specify* _____

Insufficient Supply

Water Details		Hole Diameter	
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	Depth (m/ft) From To	Diameter (cm/in)
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	0 6.0	10
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____		

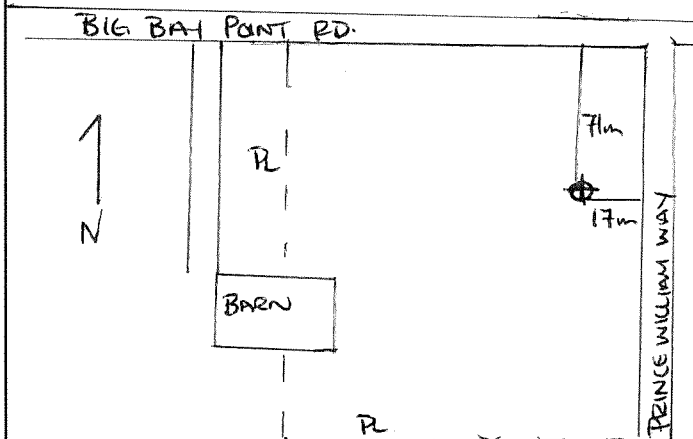
Well Contractor and Well Technician Information				
Business Name of Well Contractor			Well Contractor's Licence No.	
CMT ENGINEERING INC			7366	
Business Address (Street Number/Name)			Municipality	
1011 INDUSTRIAL CRES ST. CLEMENTS			WATERLOO	
Province	Postal Code	Business E-mail Address		
ON	N0B2M0	cmt@golden.net		
Bus. Telephone No. (inc. area code)		Name of Well Technician (Last Name, First Name)		
519/699/5775		DAVIES, BUI		
Well Technician's Licence No.	Signature of Technician and/or Contractor		Date Submitted	
3458			20120508	

Results of Well Yield Testing

After test of well yield, water was:	Draw Down		Recovery	
☐ Clear and sand free	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
☐ Other, <i>specify</i> _____	Static Level			
If pumping discontinued, give reason:	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
	4		4	
Duration of pumping _____ hrs + _____ min	5		5	
Final water level end of pumping (m/ft)	10		10	
	15		15	
If flowing give rate (l/min / GPM)	20		20	
Recommended pump depth (m/ft)	25		25	
	30		30	
Recommended pump rate (l/min / GPM)	40		40	
	50		50	
Well production (l/min / GPM)	60		60	
Disinfected?				
☐ Yes ☐ No				

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well owner's information package delivered	Date Package Delivered	Ministry Use Only Audit No. Z 146103
	Y Y Y Y M M D D Date Work Completed 20120529	
☐ Yes ☐ No	Received	062212

Ministry of
the Environment

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

A 131794

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☒ Metric ☐ Imperial

Page of

Well Owner's Information

First Name Shannon		Last Name / Organization 2144764 ONT INC WELFOLDS LLP.		E-mail Address		☐ Well Constructed by Well Owner	
Mailing Address (Street Number/Name) 516 Wellington Road			Municipality Dundas		Province ON		Postal Code M5K 1B7
Well Location 60 WELLINGTON ST. W SUIT 4100 P.O. BOX 35			Township Dundas		Lot 416		Concession 365
Address of Well Location (Street Number/Name) Corner of Prince William Way & Big Bay Point Rd			City/Town/Village Dundas		Province Ontario		Postal Code L4H 1G1
County/District/Municipality			Municipal Plan and Sublot Number			Other	
UTM Coordinates Zone Easting NAD 83 17 6110290		Northing 4911311613					

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

[illegible]

Annular Space

Depth Set at (m//ft)		Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From	To		
0	24	3/8 HOUSPLUM	21
24	100	M2 INDUSTRIAL SAND	61

Method of Construction

- | | | | | |
|--|----------------------------------|--|---|-------------------------------------|
| ☐ Cable Tool | ☐ Diamond | ☐ Public | ☐ Commercial | ☐ Not used |
| ☐ Rotary (Conventional) | ☐ Jetting | ☐ Domestic | ☐ Municipal | ☐ Dewatering |
| ☐ Rotary (Reverse) | ☐ Driving | ☐ Livestock | ☐ Test Hole | ☐ Monitoring |
| ☐ Boring | ☐ Digging | ☐ Irrigation | ☐ Cooling & Air Conditioning | |
| ☐ Air percussion | | ☐ Industrial | | |
| ☐ Other, <i>specify</i> _____ | | ☐ Other, <i>specify</i> _____ | | |

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		
			From	To	
30	PLASTIC		0	30	☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☒ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned

Status of Well

- ☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☒ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify* _____
☐ Other, *specify* _____

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (mm/in)	
			From	To
40	Plastic	10	30	60

☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify _____
☐ Other, specify _____

Water Details

Water found at Depth (m/ft) ☐ Gas ☐ Other, specify _____	Kind of Water: ☐ Fresh ☐ Untested	Depth (m/ft) From To	Diameter (cm/in)
Water found at Depth (m/ft) ☐ Gas ☐ Other, specify _____	Kind of Water: ☐ Fresh ☐ Untested	0 20	10
Water found at Depth (m/ft) ☐ Gas ☐ Other, specify _____	Kind of Water: ☐ Fresh ☐ Untested		

Hole Diameter

Depth (m/ft)		Diameter (cm/in)
From	To	
0	60	10

Well Contractor and Well Technician Information

Business Name of Well Contractor		Well Contractor's Licence No.
CMT ENGINEERING INC		713 10 16
Business Address (Street Number/Name)		Municipality
1011 HURON ST. W. ST. CLEMENTS		WATERBURY
Province	Postal Code	Business E-mail Address
ON	N9B 1E1	CMT@CMTINC.COM
Bus. Telephone No. (inc. area code)		Name of Well Technician (Last Name, First Name)
519 699 1577		DAVID B. D.
Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
12 14 15	[Signature]	6-15-15

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify _____	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:	Static Level			
	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
Duration of pumping ____ hrs + ____ min	4		4	
Final water level end of pumping (m/ft)	5		5	
If flowing give rate (l/min / GPM)	10		10	
	15		15	
Recommended pump depth (m/ft)	20		20	
	25		25	
Recommended pump rate (l/min / GPM)	30		30	
	40		40	
Well production (l/min / GPM)	50		50	
	60		60	
Disinfected? ☐ Yes ☐ No				

Map of Well Location

Please provide a map below following instructions on the back.

A hand-drawn map of a rectangular area, possibly a field or plot. The map is oriented with North (N) at the top, indicated by an arrow. The bottom edge is labeled 'TL' (Top Left). The right edge is labeled 'TL' (Top Right). The left edge is labeled 'TL' (Bottom Left). The right edge is labeled 'TL' (Bottom Right). The center of the map is labeled 'Pond'.

Comments:

Well owner's information package delivered	Date Package Delivered	Ministry Use Only Audit No. Z146103
	Date Work Completed 6/11/12 6/5/12	

0506E (2007/12) © Queen's Printer for Ontario, 2007

Contractor's Copy

Measurements recorded in: ☒ Metric ☐ Imperial

A131795

Page 1 of 1

Well Owner's Information

First Name <i>Shoppers Realty Inc</i>		Last Name / Organization		E-mail Address		☐ Well Constructed by Well Owner	
Mailing Address (Street Number/Name) <i>293 Consumers Road</i>		Municipality <i>Toronto</i>		Province <i>ON</i>	Postal Code <i>M2J4W4</i>	Telephone No. (inc. area code) <i>416 4931280</i>	

Well Location

Address of Well Location (Street Number/Name) <i>Corner of Prince William Way & Big Bay Point Rd.</i>			Township <i>Barrie</i>		Lot	Concession
County/District/Municipality			City/Town/Village		Province Ontario	Postal Code <i>L4N0M7</i>
UTM Coordinates NAD <i>83</i>	Zone <i>17</i>	Easting <i>610203</i>	Northing <i>4913193</i>		Municipal Plan and Sublot Number	
					Other	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Brown	FILL		Loose	0	1.2
Grey	Silt	Clay, Sand	Dense	1.2	4.8
Brown	Sand	Silt	Dense	4.8	6.0

Annular Space			
Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
0	2.4	3/8 Holeplug	41
2.4	6.0	#2 Industrial Sand	41

Method of Construction	Well Use
☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☐ Air percussion ☐ Other, specify _____	☐ Public ☐ Domestic ☐ Livestock ☐ Irrigation ☐ Industrial ☐ Other, specify _____
☐ Diamond ☐ Jetting ☒ Driving ☐ Digging	☐ Commercial ☐ Municipal ☐ Test Hole ☐ Cooling & Air Conditioning ☒ Monitoring

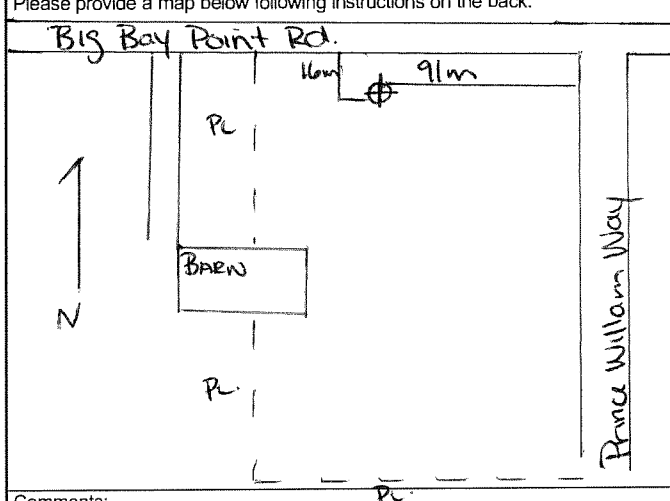
Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To	☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☒ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify _____ ☐ Other, specify _____
3.8	Plastic		0	3.0	

Construction Record - Screen				
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
4.0	Plastic	10	3.0	6.0

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify _____	Depth (m/ft) From	To
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify _____	0	6.0
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify _____		

Well Contractor and Well Technician Information			
Business Name of Well Contractor <i>CNT Engineering Inc.</i>		Well Contractor's Licence No. <i>7366</i>	
Business Address (Street Number/Name) <i>101 Industrial Cres. St. Clements</i>		Municipality <i>Waterloo</i>	
Province <i>ON</i>	Postal Code <i>N0B2M0</i>	Business E-mail Address <i>cmt@golden.net</i>	
Bus. Telephone No. (inc. area code) <i>519 699 5775</i>		Name of Well Technician (Last Name, First Name) <i>Davies, Bud</i>	
Well Technician's Licence No. <i>3458</i>		Signature of Technician and/or Contractor <i>[Signature]</i>	
		Date Submitted <i>20120530</i>	

Results of Well Yield Testing			
After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify _____	Draw Down		Recovery
	Time (min)	Water Level (m/ft)	Time (min)
If pumping discontinued, give reason:	Static Level		
	1		1
Pump intake set at (m/ft)	2		2
Pumping rate (l/min / GPM)	3		3
Duration of pumping hrs + min	4		4
Final water level end of pumping (m/ft)	5		5
If flowing give rate (l/min / GPM)	10		10
Recommended pump depth (m/ft)	15		15
Recommended pump rate (l/min / GPM)	20		20
Well production (l/min / GPM)	25		25
Disinfected? ☐ Yes ☐ No	30		30
	40		40
	50		50
	60		60

Map of Well Location	
Please provide a map below following instructions on the back.	
	

Well owner's information package delivered ☐ Yes ☐ No	Date Package Delivered Y Y Y Y M M D D <i>20120529</i>	Ministry Use Only Audit No. <i>2146102</i> Received <i>06 2012</i>
Date Work Completed <i>20120529</i>		



Ontario

Ministry of
the Environment

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

A 131795

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Measurements recorded in: ☒ Metric ☐ Imperial

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
214704	ONT. INC. WEL FOLD LLP.		
Mailing Address (Street Number/Name)	Municipality	Province	Postal Code
214704	214704	ON	M5K 1B7
Well Location	Address of Well Location (Street Number/Name)	Township	Lot
66	WELLINGTON ST. W SUIT 400 P.O. Box 35	214704	3651876
County/District/Municipality	City/Town/Village	Province	Postal Code
	Born	Ontario	L1H 1C1
UTM Coordinates	Zone	Easting	Northing
NAD 83	17	61021034	491131193
Municipal Plan and Sublot Number			
Other			

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
Brown	Fill		Loose	0
Grey	Silt	Clay, Sand	Dense	12
Brown	Sand	Silt	Dense	48
				60

Annular Space		
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
0	3/8 Hoop Plus	21
24	#2 Industrial Sand	21

Method of Construction		Well Use	
☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial
☐ Rotary (Conventional)	☐ Jetting	☐ Domestic	☐ Municipal
☐ Rotary (Reverse)	☐ Driving	☐ Livestock	☐ Test Hole
☐ Boring	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning
☐ Air percussion		☐ Industrial	
☐ Other, specify		☐ Other, specify	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	From	To
38	Plastic		0	30	

Construction Record - Screen				Status of Well	
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	From	To
40	Plastic	10	30	60	

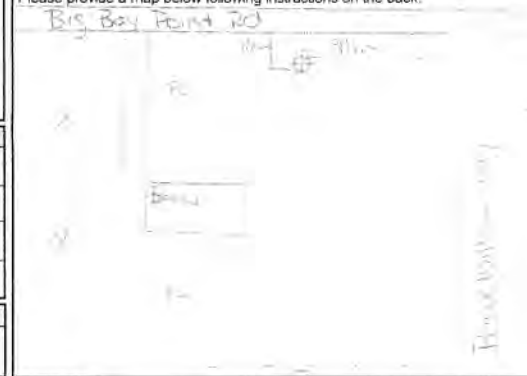
Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify	Depth (m/ft)	Diameter (cm/in)
0		0	60
60		10	

Well Contractor and Well Technician Information			
Business Name of Well Contractor		Well Contractor's Licence No.	
CNT Engineering Inc		7131010	
Business Address (Street Number/Name)		Municipality	
101 Industrial Cres St. Catharines		Waterloo	
Province	Postal Code	Business E-mail Address	
ON	N1P 2M1	cnt@cnteng.com	
Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)		
519 309 5949	Dennis Bul		
Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted	
3141518		21/12/2012	

Results of Well Yield Testing					
After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify		Draw Down		Recovery	
		Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:		Static Level			
		1		1	
Pump intake set at (m/ft)		2		2	
Pumping rate (l/min / GPM)		3		3	
Duration of pumping		4		4	
hrs + min		5		5	
Final water level end of pumping (m/ft)		10		10	
If flowing give rate (l/min / GPM)		15		15	
Recommended pump depth (m/ft)		20		20	
		25		25	
Recommended pump rate (l/min / GPM)		30		30	
Well production (l/min / GPM)		40		40	
		50		50	
Disinfected?		60		60	
☐ Yes ☐ No					

Map of Well Location

Please provide a map below following instructions on the back.



Comments:	
Well owner's information package delivered	Date Package Delivered
☐ Yes ☐ No	21/12/2012
Date Work Completed	21/12/2012
Ministry Use Only	
Audit No.	
2146102	
MAR 06 2013	
Recorded	

Ministry of
the Environment

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

Now it will fly down

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

Measurements recorded in: ☐ Metric ☐ Imperial

Well Owner's Information

First Name SHOHEEN REALTY INC		Last Name / Organization 214764 ONT. INC. WELLFUND LP		E-mail Address		☐ Well Constructed by Well Owner	
Mailing Address (Street Number/Name) 273 Consumers Rd		Municipality TORONTO		Province ON		Postal Code M2B 1K6S	
Well Location 66 WELLINGTON ST. W SUIT 4100 PO BOX 35		Township		Telephone No. (inc. area code) 416 493 1826		Lot M5K 1B7	
Address of Well Location (Street Number/Name) CORNER OF PRINCE WILLIAM WAY & BIG BAIL POW RD		City/Town/Village BARRIE		Province Ontario		Concession 11111	
County/District/Municipality		Municipal Plan and Sublot Number		Other			
UTM Coordinates NAD 83 17 4110203 491131913							

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

[illegible]

Annular Space

Depth Set at		Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
From	To		
0	6	3/4 ACPLUG	<1

Results of Well Yield Testing

Results of Well Field Testing				
After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify _____	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:	Static Level			
	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
Duration of pumping _____ hrs + _____ min	4		4	
Final water level end of pumping (m/ft)	5		5	
	10		10	
If flowing give rate (l/min / GPM)	15		15	
Recommended pump depth (m/ft)	20		20	
	25		25	
Recommended pump rate (l/min / GPM)	30		30	
Well production (l/min / GPM)	40		40	
	50		50	
Disinfected? ☐ Yes ☐ No	60		60	

Method of Construction

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

Well Use

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

Construction Record - Casing

[illegible]

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or
Monitoring Hole
☐ Alteration
(Construction)
☐ Abandoned,
Insufficient Supply
☐ Abandoned, Poor
Water Quality
☒ Abandoned, other,
specify
Construction
☐ Other, specify

Construction Record - Screen

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

Water Details

Water found at Depth (mft) ☐ Gas ☐ Other, specify _____	Kind of Water: ☐ Fresh ☐ Untested
Water found at Depth (mft) ☐ Gas ☐ Other, specify _____	Kind of Water: ☐ Fresh ☐ Untested
Water found at Depth (mft) ☐ Gas ☐ Other, specify _____	Kind of Water: ☐ Fresh ☐ Untested

Hole Diameter

Hole Diameter		
Depth (m/ft)		Diameter (cm/in)
From	To	
0	6	70

Well Contractor and Well Technician Information

Business Name of Well Contractor CMT ENCL INC		Well Contractor's Licence No. 713616	
Business Address (Street Number/Name) 101 INDUSTRIAL CRTS UNIT 1		Municipality WATERLOO	
Province ON	Postal Code N6B1B1	Business E-mail Address CMT@CMTINC.COM	
Bus. Telephone No. (inc. area code) 519 995 5775	Name of Well Technician (Last Name, First Name) DAVIS, Bria		
Well Technician's Licence No. 3458	Signature of Technician and/or Contractor 		Date Submitted Dec 13 2011

Map of Well Location

Please provide a map below following instructions on the back.

ECU BALANCE POINT LHS
 16m 17m
 17m

17m

Comments:

Well owner's information package delivered

☐ Yes

☐ No

Date Package Delivered
11/13/10

Date Work Completed
7/13/10

Ministry Use Only	
Audit No.	
Z 161299	
MAR 06 2001	

Z 161299
MAR 06 2011

Contractor's Copy



MONITORING WELL ABANDONMENT

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☐ Imperial

Page of

Well Owner's Information

First Name SHOPPERS		Last Name / Organization REALTY INC		E-mail Address			☐ Well Constructed by Well Owner	
Mailing Address (Street Number/Name) 243 CONSUMERS RD			Municipality TORONTO	Province	Postal Code	Telephone No. (inc. area code)		

Well Location

Address of Well Location (Street Number/Name) CORNER OF PRINCE WILLIAM WAY & BIG BAY POINT RD				Township		Lot		Concession	
County/District/Municipality				City/Town/Village BARRIE		Province Ontario		Postal Code 	
UTM Coordinates		Zone	Easting	Northings	Municipal Plan and Sublot Number			Other	
NAD 83		17	610194	4913100					

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

[illegible]

Annular Space

Depth Set at (m)		Type of Sealant Used	Volume Placed
From	To	(Material and Type)	(m ³)
0	6.4	3/8 HLEPLUG	21

Method of Construction

- | | | | | |
|--|----------------------------------|--|---|-------------------------------------|
| ☐ Cable Tool | ☐ Diamond | ☐ Public | ☐ Commercial | ☐ Not used |
| ☐ Rotary (Conventional) | ☐ Jetting | ☐ Domestic | ☐ Municipal | ☐ Dewatering |
| ☐ Rotary (Reverse) | ☐ Driving | ☐ Livestock | ☐ Test Hole | ☐ Monitoring |
| ☐ Boring | ☐ Digging | ☐ Irrigation | ☐ Cooling & Air Conditioning | |
| ☐ Air percussion | | ☐ Industrial | | |
| ☐ Other, <i>specify</i> _____ | | ☐ Other, <i>specify</i> _____ | | |

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	
			From	To

Status of Well

- ☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☒ Abandoned, other, *specify*
CONSTRUCTION
☐ Other, *specify*

Construction Record - Screen

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

Water Details

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

Hole Diameter

Depth (m/ft)		Diameter (cm/in)
From	To	
0	6-4	10

Well Contractor and Well Technician Information

Business Name of Well Contractor CMT ENCY INC		Well Contractor's Licence No. 7360	
Business Address (Street Number/Name) 1011 INDUSTRIAL CRES UNIT 1		Municipality WATERLOO	
Province ON	Postal Code N0B2M0	Business E-mail Address CMT@GOLDEN.NET	
Bus. Telephone No. (inc. area code) 519 699 5775		Name of Well Technician (Last Name, First Name) DAVIES BUD	
Well Technician's Licence No. 3458	Signature of Technician and/or Contractor 		Date Submitted 20130118

Results of Well Yield Testing

After test of well yield, water was:	Draw Down		Recovery	
☐ Clear and sand free	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
☐ Other, <i>specify</i> _____				
If pumping discontinued, give reason:	Static Level			
	1		1	
Pump intake set at (m/ft)	2		2	
	3		3	
Pumping rate (l/min / GPM)	4		4	
	5		5	
Duration of pumping _____ hrs + _____ min	10		10	
Final water level end of pumping (m/ft)	15		15	
If flowing give rate (l/min / GPM)	20		20	
	25		25	
Recommended pump depth (m/ft)	30		30	
	40		40	
Recommended pump rate (l/min / GPM)	50		50	
Well production (l/min / GPM)	60		60	
Disinfected?				
☐ Yes ☐ No				

Map of Well Location

Please provide a map below following instructions on the back.

Big Bay Point

BAW

Diagram showing a rectangular area with dimensions 10m and 12m. A circle is drawn at the bottom-left corner, tangent to both sides. The radius is labeled 12m.

Comments:

Well owner's information package delivered	Date Package Delivered Y Y Y Y M M D D
☐ Yes ☐ No	Date Work Completed 20130103

Ministry Use Only

Audit No. **Z 161301**
Received **JAN 23 2013**

Ministry's Copy



Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the [Open Data catalogue](#).

[Go Back to Map](#)

Well ID

Well ID Number: 7244354

Well Audit Number: Z103032

Well Tag Number: A087697

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	801 BIG BAY POINT RD
Township	INNISFIL TOWNSHIP
Lot	
Concession	
County/District/Municipality	SIMCOE
City/Town/Village	Barrie
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 609946.00 Northing: 4913078.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
BRWN	LOAM			0 m	.12 m
BRWN	SAND	SILT	FILL	.12 m	2.1 m
BRWN	SAND	SILT		2.1 m	5 m

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 m	2.4 m	3/8 BENTONITE	

Method of Construction & Well Use

Method of Construction	Well Use
Boring	Monitoring

Status of Well

Observation Wells

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
	PLASTIC	0 m	3 m

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
1 inch	PLASTIC	3 m	4.6 m

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7314

Results of Well Yield Testing

After test of well yield, water was

If pumping discontinued, give reason

Pump intake set at

Pumping Rate

Duration of Pumping

Final water level

If flowing give rate

Recommended pump depth

Recommended pump rate**Well Production****Disinfected?****Draw Down & Recovery**

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind
----------------------	------

Hole Diameter

Depth From	Depth To	Diameter
------------	----------	----------

Audit Number: Z103032**Date Well Completed:**

Date Well Record Received by MOE: July 10, 2015

Updated: January 24, 2020



Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the [Open Data catalogue](#).

[Go Back to Map](#)

Well ID

Well ID Number: 7286077

Well Audit Number: Z255333

Well Tag Number: A216581

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	875 BIG BAY POINT RD
Township	INNISFIL TOWNSHIP
Lot	
Concession	
County/District/Municipality	SIMCOE
City/Town/Village	Barrie
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 610547.00 Northing: 4913304.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
BRWN	CLAY	SILT	DRY	0 ft	10 ft
BRWN	SILT	CLAY	SAND	10 ft	15 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	9 ft	BENTONITE	
9 ft	15 ft	SAND	

Method of Construction & Well Use

Method of Construction	Well Use
Rotary (Convent.)	Monitoring

Status of Well

Observation Wells

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
1.25 inch	PLASTIC	-3 ft	10 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
1.25 inch	PLASTIC	10 ft	15 ft

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7190

Results of Well Yield Testing

After test of well yield, water was
If pumping discontinued, give reason
Pump intake set at
Pumping Rate
Duration of Pumping
Final water level
If flowing give rate
Recommended pump depth
Recommended pump rate

Well Production

Disinfected?	N
---------------------	---

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL	12.5 ft		
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind
12 ft	Untested

Hole Diameter

Depth From	Depth To	Diameter
0 ft	15 ft	6.5 inch

Audit Number: Z255333**Date Well Completed:** March 14, 2017

Date Well Record Received by MOE: May 08, 2017

Updated: January 24, 2020



Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the [Open Data catalogue](#).

[Go Back to Map](#)

Well ID

Well ID Number: 7286078

Well Audit Number: Z255331

Well Tag Number: A216600

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	875 BIG BAY POINT RD
Township	INNISFIL TOWNSHIP
Lot	
Concession	
County/District/Municipality	SIMCOE
City/Town/Village	Barrie
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 610556.00 Northing: 4913229.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
BRWN	CLAY	SILT	DRY	0 ft	10 ft
BRWN	SILT	CLAY	SAND	10 ft	15 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	9 ft	BENTONITE	
9 ft	15 ft	SAND	

Method of Construction & Well Use

Method of Construction	Well Use
Rotary (Convent.)	Monitoring

Status of Well

Observation Wells

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
1.75 inch	PLASTIC	-3 ft	10 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
1.75 inch	PLASTIC	10 ft	15 ft

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7190

Results of Well Yield Testing

After test of well yield, water was
If pumping discontinued, give reason
Pump intake set at
Pumping Rate
Duration of Pumping
Final water level
If flowing give rate
Recommended pump depth
Recommended pump rate

Well Production

Disinfected?	N
---------------------	---

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL	12 ft		
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind
12 ft	Untested

Hole Diameter

Depth From	Depth To	Diameter
0 ft	15 ft	6.5 inch

Audit Number: Z255331**Date Well Completed:** March 14, 2017

Date Well Record Received by MOE: May 08, 2017

Updated: January 24, 2020

Well Owner's Information

First Name FANDOR HOMES (HAMPTONS) INC.		Last Name / Organization		E-mail Address		☐ Well Constructed by Well Owner	
Mailing Address (Street Number/Name) 108 ROMANA DRIVE			Municipality VAUGHAN		Province ON	Postal Code L4K4K7	Telephone No. (inc. area code) 905-895-8222

Well Location

Address of Well Location (Street Number/Name) 875 BIG BAY POINT RD		Township	Lot	Concession	
County/District/Municipality SIMCOE COUNTY		City/Town/Village BARRIE	Province Ontario		Postal Code
UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	
NAD 83	18N	541449	13304	Other	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

[illegible]

Annular Space

Depth Set at (m/ft)		Annular Space	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
From	To			
	15		Pentoni H	

Method of Construction

☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial	☐ Not used
☐ Rotary (Conventional)	☐ Jetting	☐ Domestic	☐ Municipal	☐ Dewatering
☐ Rotary (Reverse)	☐ Driving	☐ Livestock	☐ Test Hole	☐ Monitoring
☐ Boring	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning	
☐ Air percussion		☐ Industrial		
☐ Other, <i>specify</i> _____		☐ Other, <i>specify</i> _____		

Construction Record - Casing

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		
			From	To	
					☐ Water Supply
					☐ Replacement Well
					☐ Test Hole
					☐ Recharge Well
					☐ Dewatering Well
					☐ Observation and/or Monitoring Hole
					☐ Alteration (Construction)
					☐ Abandoned, (Fill or Seal)

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		☐ Abandoned, Poor Water Quality ☒ Abandoned, other, specify <i>Decommissioned</i> ☐ Other, specify
			From	To	

Water Details

Water found at Depth		Depth (m/ft)		Diameter (cm/in)
(m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify _____	From	To	
Water found at Depth	Kind of Water: ☐ Fresh ☐ Untested			
(m/ft) ☐ Gas ☐ Other, specify _____				
Water found at Depth	Kind of Water: ☐ Fresh ☐ Untested			
(m/ft) ☐ Gas ☐ Other, specify _____				
Water found at Depth	Kind of Water: ☐ Fresh ☐ Untested			
(m/ft) ☐ Gas ☐ Other, specify _____				

Well Contractor and Well Technician Information

Business Name of Well Contractor LONDON SOIL TEST LTD		Well Contractor's Licence No. 7190
Business Address (Street Number/Name) BR6		Municipality DUNDAS
Province ON	Postal Code N6C1B0	Business E-mail Address info@londonsoil.com
Bus. Telephone No. (inc. area code) 5194555777	Name of Well Technician (Last Name, First Name) LIVINGSTON, MARK	
Well Technician's Licence No. 3577	Signature of Technician and/or Contractor 	Date Submitted 2017/1/16

Results of Well Yield Testing

After test of well yield, water was:	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
☐ Clear and sand free ☐ Other, <i>specify</i> _____	Static Level			
If pumping discontinued, give reason:	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
	4		4	
Duration of pumping _____ hrs + _____ min	5		5	
Final water level end of pumping (m/ft)	10		10	
If flowing give rate (l/min / GPM)	15		15	
	20		20	
Recommended pump depth (m/ft)	25		25	
Recommended pump rate (l/min / GPM)	30		30	
	40		40	
Well production (l/min / GPM)	50		50	
Disinfected?	60		60	
☐ Yes ☒ No				

Map of Well Location

Please provide a map below following instructions on the back.

A hand-drawn map showing a road intersection. At the top, a horizontal line is labeled "BIG BAY POINT RD.". Below this line, a road runs vertically. To the left of the vertical road, there is a shaded area with dashed lines and the word "Houses" written inside. To the right of the vertical road, there is another shaded area with dashed lines and the word "Houses" written inside. Below the right-hand shaded area, the word "Westminster" is written. At the intersection of the vertical road and the horizontal line, there is a circled "X" and the number "1500" written above it.

Comments:

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
	Date Work Completed	Audit No. Z 215575
☐ Yes ☐ No	30/7/109	DEC 14 2017 Received

Measurements recorded in: ☐ Metric ☒ Imperial

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

A 216600

Well Owner's Information

First Name FANDOR	Last Name / Organization HOMES (HAMPTON) INC.	E-mail Address 	☐ Well Constructed by Well Owner
Mailing Address (Street Number/Name) 608 ROMANA DRIVE	Municipality VAUGHAN	Province ON	Postal Code L4K 4K7
		Telephone No. (inc. area code) 905 669 5826	

Well Location

Address of Well Location (Street Number/Name) 815 BIG BAY POINT RD.		Township	Lot	Concession	
County/District/Municipality SIMCOE COUNTY		City/Town/Village BARRIE		Province Ontario	Postal Code
UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	
NAD	8	3	17	610551	4913229
				Other	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

[illegible]

2" PVC removed and backfilled
with bentonite chips

Annular Space

Depth Set at (m/ft)		Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From	To		
	15	Bentonite	

Method of Construction

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

Well Use

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

Construction Record - Casino

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	
			From	To

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☒ Abandoned, other, specify
☐ Other, specify

Construction Record - Screen

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

Water Details

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

Hole Diameter

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

Well Contractor and Well Technician Information

Business Name of Well Contractor LONDON SOIL TEST LTD		Well Contractor's Licence No. 7190
Business Address (Street Number/Name) BRLE		Municipality DUNDACK
Province ON	Postal Code N6C1B0	Business E-mail Address info@londonsoil.com
Bus. Telephone No. (inc. area code) 519 436 5777		Name of Well Technician (Last Name, First Name) LIVINGSTON, MARK
Well Technician's Licence No. 35977	Signature of Technician and/or Contractor 	Date Submitted 2017 11 15

Results of Well Yield Testing

After test of well yield, water was:		Draw Down		Recovery	
☐ Clear and sand free ☐ Other, <i>specify</i> _____		Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:		Static Level			
Pump intake set at (m/ft)		1		1	
Pumping rate (l/min / GPM)		2		2	
Duration of pumping _____ hrs + _____ min		3		3	
Final water level end of pumping (m/ft)		4		4	
If flowing give rate (l/min / GPM)		5		5	
Recommended pump depth (m/ft)		10		10	
Recommended pump rate (l/min / GPM)		15		15	
Well production (l/min / GPM)		20		20	
Disinfected?		25		25	
☐ Yes ☐ No		30		30	
		40		40	
		50		50	
		60		60	

Map of Well Location

Please provide a map below following instructions on the back.

Big Bay Point Rd.

Houses

Houses

Westminster

Houses

300

70

Comments:

Well owner information package delivered

Date Package Delivered									
7	8	9	0	1	2	3	4	5	6

Ministry Use Only

Audit No. **Z 215576**

REC-100
Received

Measurements recorded in: ☐ Metric ☒ Imperial

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

A216610

Well Owner's Information

First Name <i>PANDOR</i>	Last Name / Organization <i>HOMES (HAMPTON) INC.</i>	E-mail Address	☐ Well Constructed by Well Owner
Mailing Address (Street Number/Name) <i>608 ROMANA DRIVE</i>	Municipality <i>LAUGHTON</i>	Province <i>ON</i>	Postal Code <i>L4K4K7</i>
		Telephone No. (inc. area code) <i>905-669-5820</i>	

Well Location

Address of Well Location (Street Number/Name) 875 BIG BAY POINT ROAD			Township		Lot	Concession	
County/District/Municipality SIMCOE COUNTY			City/Town/Village BARRIE		Province Ontario		Postal Code
UTM Coordinates		Zone	Easting	Northing		Municipal Plan and Sublot Number	
NAD 83		17	491531	4913265		Other	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

[illegible]

Annular Space

Depth Set at (mm) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
	15	Bentonite	

Results of Well Yield Testing

After test of well yield, water was:	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
☐ Clear and sand free ☐ Other, specify _____	Static Level			
If pumping discontinued, give reason:	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
	4		4	
Duration of pumping _____ hrs + _____ min	5		5	
Final water level end of pumping (m/ft)	10		10	
	15		15	
If flowing give rate (l/min / GPM)	20		20	
Recommended pump depth (m/ft)	25		25	
Recommended pump rate (l/min / GPM)	30		30	
	40		40	
Well production (l/min / GPM)	50		50	
Disinfected?	60		60	
☐ Yes ☒ No				

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned
			From	To	

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☒ Abandoned, other, specify
 COMMISSION
☐ Other, specify

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		☐ Abandoned, Food Water Quality ☒ Abandoned, other, specify ☐ Other, specify
			From	To	
					decommission

Water Details

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

Hole Diameter

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

Well Contractor and Well Technician Information

Business Name of Well Contractor LONDON SOIL TEST LTD		Well Contractor's Licence No. 7190
Business Address (Street Number/Name) BBLE		Municipality DUNDARK
Province ON	Postal Code N0C1B0	Business E-mail address info@londonsoil.com
Bus. Telephone No. (inc. area code) 5194555777	Name of Well Technician (Last Name, First Name) LIVINGSTON MARK	
Well Technician's Licence No. 3577	Signature of Technician and/or Contractor	Date Submitted 20/7/14

Map of Well Location

Please provide a map below following instructions on the back.

A hand-drawn sketch map showing a road layout. At the top, a horizontal line is labeled "BIG BAY POINT ROAD". Below this, a vertical road runs downwards. To the left of this vertical road is a large area labeled "Houses". To the right of the vertical road, there is a horizontal road labeled "Westminster". Above the Westminster road, there is another area labeled "Houses". A point on the vertical road is marked with an arrow pointing up and labeled "A) 150'". Another point on the vertical road is marked with an arrow pointing right and labeled "150'".

Comments:

Well owner's information package delivered

☐ Yes

Date Package Delivered											
Y	Y	Y	Y	MM	MM	DD					
Date Work Completed											
Y	Y	Y	Y	MM	MM	DD					

Ministry Use Only
Audit No. **Z 215577**
DEC 14 2017
Received



Tag#: A204980

A204980

Measurements recorded in: ☐ Metric ☐ Imperial

Well Owner's Information

First Name	Last Name / Organization Simcoe County Christian Services Home	E-mail Address	☐ Well Constructed by Well Owner
Mailing Address (Street Number/Name) 274 Hurst Dr.	Municipality Barrie	Province ON	Postal Code L4N0Z3
Telephone No. (inc. area code) 7057220469			

Well Location

Address of Well Location (Street Number/Name) 1902 Big Bay Point Rd	Township	Lot	Concession
County/District/Municipality Simcoe	City/Town/Village Barrie	Province Ontario	Postal Code
UTM Coordinates Zone NAD 83	Easting 17660505	Northing 4913446	Municipal Plan and Sublot Number
			Other

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m)	From	To
Brown	Silt	Clay		0	6'	
Brown	Silt Clay	Till		6'	16'	
Brown	Tru	Sandy silt		16'	20'	

Annular Space		
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From To		
0 8'	Bentonite chips	
8 20'	Well Gravel	

Method of Construction		Well Use	
☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial
☐ Rotary (Conventional)	☐ Jetting	☐ Domestic	☐ Municipal
☐ Rotary (Reverse)	☐ Driving	☐ Livestock	☐ Test Hole
☒ Boring	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning
☐ Air percussion		☐ Industrial	
☐ Other, specify		☐ Other, specify	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	From	To
2	Plastic	SCH 40	0	10	

☐ Water Supply	☐ Replacement Well
☐ Test Hole	☐ Recharge Well
☐ Dewatering Well	☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)	☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality	☐ Abandoned, other, specify
☐ Other, specify	

Construction Record - Screen			
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)
2	Plastic	.010	10 20

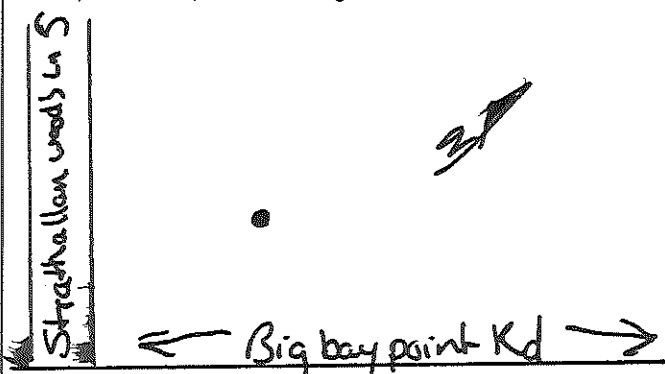
Water Details		Hole Diameter	
Water found at Depth (m/ft) ☐ Gas ☐ Other, specify	Kind of Water: ☐ Fresh ☐ Untested	Depth (m/ft) From To	Diameter (cm/in)
Water found at Depth (m/ft) ☐ Gas ☐ Other, specify	Kind of Water: ☐ Fresh ☐ Untested		
Water found at Depth (m/ft) ☐ Gas ☐ Other, specify	Kind of Water: ☐ Fresh ☐ Untested		

Business Name of Well Contractor Walker Drilling Ltd		Well Contractor's Licence No. 7201	
Business Address (Street Number/Name) 8866 County Road 56		Municipality ESSA	
Province ON	Postal Code L0M1T0	Business E-mail Address info@walkerdrilling.com	
Bus. Telephone No. (inc. area code) 7054243423	Name of Well Technician (Last Name, First Name) Laranger Pierre		
Well Technician's Licence No. 3470	Signature of Technician and/or Contractor Pierre Laranger		
Date Submitted 20180228			

Results of Well Yield Testing				
After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify _____	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:	Static Level			
	1		1	
Pump intake set at (m/ft)	2		2	
	3		3	
Pumping rate (l/min / GPM)	4		4	
	5		5	
Duration of pumping _____ hrs + _____ min	10		10	
	15		15	
Final water level end of pumping (m/ft)	20		20	
	25		25	
If flowing give rate (l/min / GPM)	30		30	
	40		40	
Recommended pump depth (m/ft)	50		50	
	60		60	
Recommended pump rate (l/min / GPM)				
Well production (l/min / GPM)				
Disinfected? ☐ Yes ☐ No				

Map of Well Location

Please provide a map below following instructions on the back.



Comments:	
Well owner's information package delivered ☐ Yes ☐ No	Date Package Delivered Y Y Y Y M M D D Date Work Completed 20180227
Ministry Use Only Audit No. 2251478 MAY 11 2018 Received	



Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the [Open Data catalogue](#).

[Go Back to Map](#)

Well ID

Well ID Number: 7330260

Well Audit Number: Z301458

Well Tag Number: A260397

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	825-83 Big Bay Point Road
Township	INNISFIL TOWNSHIP
Lot	017
Concession	CON 12
County/District/Municipality	SIMCOE
City/Town/Village	Barrie
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 610248.00 Northing: 4913120.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
BRWN	SAND			0 ft	21.5 ft
BRWN	SAND		WBRG	21.5 ft	30 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	1 ft	FLUSHMOUNT	
1 ft	18.5 ft	BENTONITE	
18.5 ft	30 ft	WELL SAND	

Method of Construction & Well Use

Method of Construction	Well Use
Boring	Monitoring and Test Hole

Status of Well

Monitoring and Test Hole

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
2 Inch	PLASTIC	0 ft	20 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
2.375 Inch	PLASTIC	20 ft	30 ft

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7644

Results of Well Yield Testing

After test of well yield, water was
If pumping discontinued, give reason
Pump intake set at
Pumping Rate
Duration of Pumping
Final water level
If flowing give rate
Recommended pump depth

Recommended pump rate**Well Production****Disinfected?****Draw Down & Recovery**

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind
21.5 ft	

Hole Diameter

Depth From	Depth To	Diameter
0 ft	30 ft	6 Inch

Audit Number: Z301458**Date Well Completed:** March 04, 2019

Date Well Record Received by MOE: March 27, 2019

Updated: January 24, 2020



Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the [Open Data catalogue](#).

[Go Back to Map](#)

Well ID

Well ID Number: 7330261

Well Audit Number: Z301457

Well Tag Number: A260401

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	825-83 Big Bay Point Road
Township	INNISFIL TOWNSHIP
Lot	017
Concession	CON 12
County/District/Municipality	SIMCOE
City/Town/Village	Barrie
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 610228.00 Northing: 4913106.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
BRWN	SAND			0 ft	21.5 ft
BRWN	SAND		WBRG	21.5 ft	30 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	1 ft	FLUSHMOUNT	
1 ft	18.5 ft	BENTONITE	
18.5 ft	30 ft	WELL SAND	

Method of Construction & Well Use

Method of Construction	Well Use
Boring	Monitoring and Test Hole

Status of Well

Monitoring and Test Hole

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
2 Inch	PLASTIC	0 ft	20 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
2.375 Inch	PLASTIC	20 ft	30 ft

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7644

Results of Well Yield Testing

After test of well yield, water was
If pumping discontinued, give reason
Pump intake set at
Pumping Rate
Duration of Pumping
Final water level
If flowing give rate
Recommended pump depth

Recommended pump rate**Well Production****Disinfected?****Draw Down & Recovery**

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind
21.5 ft	

Hole Diameter

Depth From	Depth To	Diameter
0 ft	30 ft	6 Inch

Audit Number: Z301457**Date Well Completed:** March 04, 2019

Date Well Record Received by MOE: March 27, 2019

Updated: January 24, 2020



Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the [Open Data catalogue](#).

[Go Back to Map](#)

Well ID

Well ID Number: 7330262

Well Audit Number: Z301449

Well Tag Number: A260398

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	825-831 BIG BAY POINT RD
Township	INNISFIL TOWNSHIP
Lot	017
Concession	CON 12
County/District/Municipality	SIMCOE
City/Town/Village	BARRIE
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 610206.00 Northing: 4913106.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
BRWN	SAND	SLTY		0 ft	5 ft
GREY	SAND	TILL		5 ft	8 ft
BRWN	SAND		WBRG	8 ft	28.5 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	1 ft		
1 ft	17 ft		
17 ft	28.5 ft		

Method of Construction & Well Use

Method of Construction	Well Use
Boring	Monitoring Test Hole

Status of Well

Observation Wells

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
2 inch	PLASTIC	18.5 ft	0 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
2.375 inch	PLASTIC	28.5 ft	18.5 ft

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7644

Results of Well Yield Testing

After test of well yield, water was
If pumping discontinued, give reason
Pump intake set at
Pumping Rate
Duration of Pumping
Final water level

If flowing give rate

Recommended pump depth

Recommended pump rate

Well Production

Disinfected? Y

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind
21.5 ft	

Hole Diameter

Depth From	Depth To	Diameter
0 ft	28.5 ft	6 inch

Audit Number: Z301449

Date Well Completed: March 04, 2019

Date Well Record Received by MOE: May 07, 2019

Updated: January 24, 2020

Appendix F –
GROUNDWATER CHEMISTRY CERTIFICATE OF ANALYSIS

C.O.C.: ---

REPORT No. B20-31512 (i)

Report To:

Central Earth Engineering Inc
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada

Attention: Alex Winkelmann

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 13-Oct-20

JOB/PROJECT NO.: 821 Big Bay Point Rd., Barrie

DATE REPORTED: 19-Oct-20

P.O. NUMBER: 20-1199A

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Cyanide	1	Kingston	US	15-Oct-20	A-CN-001 (k)	SM 4500CN
Conductivity	1	Holly Lane	SYL	15-Oct-20	A-COND-02 (o)	SM 2510B
Anions	1	Holly Lane	VK	16-Oct-20	A-IC-01 (o)	SM4110C
pH	1	Holly Lane	SYL	15-Oct-20	A-PH-01 (o)	SM 4500H
Chromium (VI)	2	Holly Lane	LMG	19-Oct-20	D-CRVI-01 (o)	MOE E3056
Mercury	2	Holly Lane	PBK	19-Oct-20	D-HG-02 (o)	SM 3112 B
Metals - ICP-OES	1	Holly Lane	AHM	14-Oct-20	D-ICP-01 (o)	SM 3120
Metals - ICP-MS	2	Holly Lane	TPR	15-Oct-20	D-ICPMS-01 (o)	EPA 200.8

PWQO - Provincial Water Quality Objectives
Interim PWQO - Interim PWQO
PWQO - Provincial Water Quality Objectives



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke
Lab Manager

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C.O.C.: ---

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Barrie ON L4N 0B7 Canada

Attention: Alex Winkelmann

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 13-Oct-20

JOB/PROJECT NO.: 821 Big Bay Point Rd., Barrie

DATE REPORTED: 19-Oct-20

P.O. NUMBER: 20-1199A

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH3 B20-31512-1 13-Oct-20	BH3 (Filter) B20-31512-2 13-Oct-20			PWQO	
	Units	R.L.					Interim PWQO	PWQO
pH @25°C	pH Units		8.07					8.5
Conductivity @25°C	mS/cm	0.001	0.494					
Chloride	µg/L	500	19400					
Cyanide (Free)	µg/L	5	< 5					5
Sodium	µg/L	200	12000					
Antimony	µg/L	0.1	0.1	0.3				20
Arsenic	µg/L	0.1	0.3	0.3			100	5
Barium	µg/L	1	64	82				
Beryllium	µg/L	0.1	< 0.1	< 0.1				11
Boron	µg/L	5	33	29			200	
Cadmium	µg/L	0.015	0.025	< 0.015			0.1	0.2
Chromium	µg/L	1	2	< 1				
Chromium (VI)	µg/L	1	< 1	< 1 ¹				1
Cobalt	µg/L	0.1	0.3	< 0.1				0.9
Copper	µg/L	2	< 2	< 2				5
Lead	µg/L	0.02	0.30	< 0.02			1	5
Mercury	µg/L	0.02	< 0.02	< 0.02				0.2
Molybdenum	µg/L	0.1	6.6	5.6				40
Nickel	µg/L	0.2	1.8	0.6				25
Selenium	µg/L	1	< 1	< 1				100
Silver	µg/L	0.1	< 0.1	< 0.1				0.1
Thallium	µg/L	0.05	< 0.05	< 0.05				0.3
Uranium	µg/L	0.05	0.32	0.40				5
Vanadium	µg/L	0.1	1.4	0.9				6

PWQO - Provincial Water Quality Objectives

Interim PWQO - Interim PWQO

PWQO - Provincial Water Quality Objectives



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke

Lab Manager

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C.O.C.: ---

REPORT No. B20-31512 (i)

Report To:

Central Earth Engineering Inc
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada

Attention: Alex Winkelmann

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 13-Oct-20

JOB/PROJECT NO.: 821 Big Bay Point Rd., Barrie

DATE REPORTED: 19-Oct-20

P.O. NUMBER: 20-1199A

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH3 B20-31512-1 13-Oct-20	BH3 (Filter) B20-31512-2 13-Oct-20			PWQO	
	Units	R.L.					Interim PWQO	PWQO
Zinc	µg/L	5	10	< 5			20	30

1. Chromium (VI) result is based on total chromium

PWQO - Provincial Water Quality Objectives
Interim PWQO - Interim PWQO
PWQO - Provincial Water Quality Objectives



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke
Lab Manager

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647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada

Attention: Alex Winkelmann

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 13-Oct-20
DATE REPORTED: 19-Oct-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 821 Big Bay Point Rd., Barrie
P.O. NUMBER: 20-1199A
WATERWORKS NO.

Summary of Exceedances

PWQO - Provincial Water Quality Objectives
Interim PWQO - Interim PWQO
PWQO - Provincial Water Quality Objectives

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie



Christine Burke
Lab Manager

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C.O.C.: ---

REPORT No. B20-31512 (ii)

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Barrie ON L4N 0B7 Canada

Attention: Alex Winkelmann

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 13-Oct-20

JOB/PROJECT NO.: 821 Big Bay Point Rd., Barrie

DATE REPORTED: 19-Oct-20

P.O. NUMBER: 20-1199A

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
PHC(F2-F4)	1	Kingston	KPR	15-Oct-20	C-PHC-W-001 (k)	MOE E3421
VOC's	1	Richmond Hill	JE	16-Oct-20	C-VOC-02 (rh)	EPA 8260
PHC(F1)	1	Richmond Hill	JE	16-Oct-20	C-VPHW-01 (rh)	MOE E3421

PWQO - Provincial Water Quality Objectives
Interim PWQO - Interim PWQO
PWQO - Provincial Water Quality Objectives



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke
Lab Manager

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C.O.C.: ---

REPORT No. B20-31512 (ii)

Report To:

Central Earth Engineering Inc
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Alex Winkelmann

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 13-Oct-20

JOB/PROJECT NO.: 821 Big Bay Point Rd., Barrie

DATE REPORTED: 19-Oct-20

P.O. NUMBER: 20-1199A

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH3 B20-31512-1 13-Oct-20				PWQO	
	Units	R.L.					Interim PWQO	PWQO
Acetone	µg/L	30	< 30					
Benzene	µg/L	0.5	< 0.5				100	100
Bromodichloromethane	µg/L	2	< 2				200	
Bromoform	µg/L	5	< 5				60	60
Bromomethane	µg/L	0.5	< 0.5				0.9	0.9
Carbon Tetrachloride	µg/L	0.2	< 0.2					
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	< 0.5					15
Chloroform	µg/L	1	< 1					
Dibromochloromethane	µg/L	2	< 2					
Dichlorobenzene,1,2-	µg/L	0.5	< 0.5					2.5
Dichlorobenzene,1,3-	µg/L	0.5	< 0.5					2.5
Dichlorobenzene,1,4-	µg/L	0.5	< 0.5					4
Dichlorodifluoromethane	µg/L	2	< 2					
Dichloroethane,1,1-	µg/L	0.5	< 0.5					200
Dichloroethane,1,2-	µg/L	0.5	< 0.5					100
Dichloroethylene,1,1-	µg/L	0.5	< 0.5					40
Dichloroethene, cis-1,2-	µg/L	0.5	< 0.5					200
Dichloroethene, trans-1,2-	µg/L	0.5	< 0.5					200
Dichloropropane,1,2-	µg/L	0.5	< 0.5					0.7
Dichloropropene, cis-1,3-	µg/L	0.5	< 0.5					
Dichloropropene, trans-1,3-	µg/L	0.5	< 0.5					7

PWQO - Provincial Water Quality Objectives

Interim PWQO - Interim PWQO

PWQO - Provincial Water Quality Objectives



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke

Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: ---

REPORT No. B20-31512 (ii)

Report To:

Central Earth Engineering Inc
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Alex Winkelmann

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 13-Oct-20
DATE REPORTED: 19-Oct-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 821 Big Bay Point Rd., Barrie
P.O. NUMBER: 20-1199A
WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH3 B20-31512-1 13-Oct-20				PWQO	
	Units	R.L.					Interim PWQO	PWQO
Dichloropropene 1,3-cis+trans	µg/L	0.5	< 0.5					
Ethylbenzene	µg/L	0.5	< 0.5					8
Dibromoethane,1,2-(Ethylene Dibromide)	µg/L	0.2	< 0.2					5
Hexane	µg/L	5	< 5					
Methyl Ethyl Ketone	µg/L	20	< 20					400
Methyl Isobutyl Ketone	µg/L	20	< 20					
Methyl-t-butyl Ether	µg/L	2	< 2					200
Dichloromethane (Methylene Chloride)	µg/L	5	< 5					100
Styrene	µg/L	0.5	< 0.5					4
Tetrachloroethane,1,1,1,2-	µg/L	0.5	< 0.5					20
Tetrachloroethane,1,1,2,2-	µg/L	0.5	< 0.5					70
Tetrachloroethylene	µg/L	0.5	< 0.5					50
Toluene	µg/L	0.5	< 0.5					0.8
Trichloroethane,1,1,1-	µg/L	0.5	< 0.5					10
Trichloroethane,1,1,2-	µg/L	0.5	< 0.5					800
Trichloroethylene	µg/L	0.5	< 0.5					20
Trichlorofluoromethane	µg/L	5	< 5					
Vinyl Chloride	µg/L	0.2	< 0.2					600
Xylene, m,p-	µg/L	1.0	< 1.0					
Xylene, o-	µg/L	0.5	< 0.5					40

PWQO - Provincial Water Quality Objectives
Interim PWQO - Interim PWQO
PWQO - Provincial Water Quality Objectives



Christine Burke
Lab Manager

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Barrie ON L4N 0B7 Canada

Attention: Alex Winkelmann

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 13-Oct-20

JOB/PROJECT NO.: 821 Big Bay Point Rd., Barrie

DATE REPORTED: 19-Oct-20

P.O. NUMBER: 20-1199A

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH3 B20-31512-1 13-Oct-20				PWQO	
	Units	R.L.					Interim PWQO	PWQO
Xylene, m,p,o-	µg/L	1.1	< 1.1					
PHC F1 (C6-C10)	µg/L	50	< 50					
PHC F2 (>C10-C16)	µg/L	50	< 50					
PHC F3 (>C16-C34)	µg/L	400	< 400					
PHC F4 (>C34-C50)	µg/L	400	< 400					

PWQO - Provincial Water Quality Objectives

Interim PWQO - Interim PWQO

PWQO - Provincial Water Quality Objectives



Christine Burke
Lab Manager

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada

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Tel: 705-252-5743
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DATE RECEIVED: 13-Oct-20
DATE REPORTED: 19-Oct-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 821 Big Bay Point Rd., Barrie
P.O. NUMBER: 20-1199A
WATERWORKS NO.

Summary of Exceedances

PWQO - Provincial Water Quality Objectives
Interim PWQO - Interim PWQO
PWQO - Provincial Water Quality Objectives

R.L. = Reporting Limit

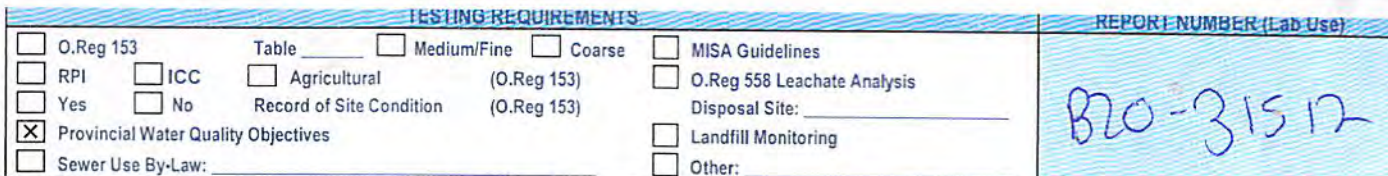
Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie



Christine Burke
Lab Manager

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Are any samples to be submitted intended for Human Consumption under any Drinking Water Regulations? ☐ Yes ☒ No (If yes, submit all Drinking Water Samples on a Drinking Water Chain of Custody)

Indicate Laboratory Samples are submitted to: ☐ Kingston ☐ Ottawa ☐ Richmond Hill ☐ Windsor ☒ Barrie ☐ London

ANALYSES REQUESTED (Print Test in Boxes)

TURNAROUND SERVICE
REQUESTED (see back page)

☐	Platinum	200% Surcharge
☐	Gold	100% Surcharge
☐	Silver	50% Surcharge
☐	Bronze	25% Surcharge
☒	Standard	5-7 days

☐ Specific Date:

Sample Matrix Legend: WW=Waste Water, SW=Surface Water, GW=Groundwater, LS=Liquid Sludge, SS=Solid Sludge, S=Soil, Sed=Sediment, PC=Paint Chips, F=Filter, Oil = Oil

[illegible]

SAMPLE SUBMISSION INFORMATION			SHIPPING INFORMATION		REPORTING / INVOICING	SAMPLE RECEIVING INFORMATION (LABORATORY USE ONLY)	
	Sampled by:	Submitted by:	Client's Courier ☐	Invoice ☐	Report by Fax ☐	Received By (print):	Signature:
Print:	Bo Hwang	Bo Hwang	Caduceon's Courier ☐		Report by Email ☒	Date Received (yy-mm-dd):	Time Received:
Sign:	<i>Bo Hwang</i>	<i>Bo Hwang</i>	Drop Off ☒	# of Pieces	Invoice by Email ☒	Laboratory Prepared Bottles: ☐ Yes ☐ No	
	20-10-13	20-10-13	Caduceon (Pick-up) ☐	8	Invoice by Mail ☐	Sample Temperature °C:	Labeled by:
Date (yy-mm-dd)/Time:			Date (yy-mm-dd)/Time:				
Comments:						Page 1 of 1	
						G	

Appendix G – **WATER BALANCE CALCULATIONS**

Water Balance - 821 Big Bay Point Road, Barrie

MONTHLY AND YEARLY WATER BALANCE COMPONENTS														
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Potential Evapotranspiration and Precipitation Calculations	Average Temperature: T (°C)	-7.7	-6.6	-2.1	5.6	12.3	17.9	20.8	19.7	15.3	8.7	2.7	-3.5	6.9
	Heat Index: $i=(T/5)^{1.514}$	0.00	0.00	0.00	1.19	3.91	6.90	8.66	7.97	5.44	2.31	0.39	0.00	36.8
	Unadjusted Daily Potential Evapotranspiration: U (mm)	0.0	0.0	0.0	25.2	59.0	88.5	104.1	98.1	74.7	40.6	11.5	0.0	501.7
	Adjusting Factor for U (Latitude 44°)	0.81	0.81	1.02	1.13	1.27	1.28	1.30	1.20	1.04	0.94	0.80	0.76	-
	Adjusted Potential Evapotranspiration - PET (mm)	0.0	0.0	0.0	28.5	74.9	113.3	135.3	117.8	77.7	38.1	9.2	0.0	594.8
	Precipitation: P (mm)	82.5	61.8	58.1	62.2	82.4	84.8	77.2	89.9	94.0	77.5	88.9	73.6	932.9
	P - PET	82.5	61.8	58.1	33.7	7.5	-28.5	-58.1	-27.9	16.3	39.4	79.7	73.6	338.1
Pervious Components with 0.8 Infiltration Factor	Change in Soil Moisture Storage (mm)	0.0	0.0	0.0	0.0	0.0	-28.5	-46.5	0.0	16.3	39.4	19.3	0.0	-
	Water Holding Capacity (max. 75 mm)	75.0	75.0	75.0	75.0	75.0	46.5	0.0	0.0	16.3	55.7	75.0	75.0	-
	Water Surplus Available for Infiltration or Runoff	82.5	61.8	58.1	33.7	7.5	0.0	0.0	0.0	0.0	0.0	60.4	73.6	377.6
	Potential Infiltration based on MOECC Infiltration Factor (mm)	66.0	49.4	46.5	27.0	6.0	0.0	0.0	0.0	0.0	0.0	48.3	58.9	302.1
	Potential Surface Water Runoff (mm)	16.5	12.4	11.6	6.7	1.5	0.0	0.0	0.0	0.0	0.0	12.1	14.7	75.5
Impervious Components	Precipitation: P (mm)	-												932.9
	Potential Evaporation: PE (mm), Assume 15%	-												139.9
	Potential Surface Water Runoff: P - PE (mm)	-												793.0

PRE- AND POST-DEVELOPMENT WATER BALANCE (WITHOUT INFILTRATION BASED LOW IMPACT DEVELOPMENT MEASURES IN PLACE)							
		Total Land Area (m ²)	Est. Fraction of Land	Est. Land Area (m ²)	Runoff (m ³ /annum)	Infiltration (m ³ /annum)	Runoff Increase Pre to Post
Existing Land Use (Pre-Development)	Pervious Area	7500.0	71%	5325.0	402.1	1608.5	76%
	Impervious Area		29%	2175.0	1724.7	0.0	Infiltration Decrease Pre to Post
	TOTAL	-	100%	7500.0	2126.8	1608.5	-42%
Proposed Land Use (Post-Development)	Pervious Area	7500.0	41%	3075.0	232.2	928.9	Infiltration Required to Meet Pre-Development Conditions (m ³)
	Impervious Area (Est. from "Preliminary Concept 3")		59%	4425.0	3508.9	0.0	
	TOTAL	-	100%	7500.0	3741.1	928.9	680

Notes

1. Both potential infiltration and surface water runoff are independent of temperature
2. Assumption is in January maximum soil moisture storage value is present
3. Water Holding Capacity & Infiltration Factors taken from Table 3.1 of MOE SWMPDM, 2003
4. Average Temp. and Precip. taken from Environment Canada station Barrie WPCC between 1981 and 2010
5. Adjusting Factor for U based on Lorente, 1961

Infiltration Criteria

Topography

Soils

Cover

Site Description - Pre-Development

Flat Land - Average Slope Less Than 0.6 m/km

Open Sandy Loam

Cultivated Land

Infiltration Factor

0.3

0.4

0.1

Sum of Infiltration Factors

0.8