WYCLIFFE THORNRIDGE SHARON CORNERS LIMITED

HYDROGEOLOGICAL EVALUATION SHARON CORNERS

APRIL 8, 2022

17M-00407-03

HYDROGEOLOGICAL EVALUATION - SHARON CORNERS

SHARON, ONTARIO

WYCLIFFE THORNRIDGE SHARON CORNERS LIMITED

OUR REF. NO. 17M-00407-03
DATE: APRIL 2022

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April 8, 2022

Wycliffe Thornridge Sharon Corners Limited
34 Doncaster Avenue, Suite 201
Thornhill, Ontario L3T 4S134

Attention: Mr. Gary Bensky

Dear Gary:

Subject: Hydrogeological Evaluation - Sharon Corners Development, Sharon, Ontario

WSP Canada Inc. (WSP) was retained by Wycliffe Thornridge Sharon Corners Limited (the "client") to prepare a hydrogeological investigation and annual water balance assessment for a proposed residential development, located northwest of the intersection of Leslie Street and Mount Albert Road in the community of Sharon, Ontario (the "Site").

The initial investigation and report was submitted in March 2019, which included all phases of development (the full site), with a revision of the water balance carried out on phase 2 in April 2021. The report was revised again in November 2021 to address comments received from the Town of East Gwillimbury, The Regional Municipality of York (York Region), and the Lake Simcoe Region Conservation Authority (LSRCA) regarding Phase 2 of the development (herein referred to as Sharon Corners). The primary focus of the November 2021 update was to address comments from Mr. Arif Khan of York Region in a letter dated June 24, 2021, which requested a dewatering assessment and management plan.

This submission of the report provides an update to the dewatering assessment for Townhouse Blocks 1 to 6, and Block 12 in response to a design change. This report revision additionally includes the results of groundwater monitoring carried out on December 22, 2021 and has made some editorial updates to address minor inconsistencies in the previously submitted report. As the design change in Townhouse Blocks 1 to 6 and Block 12 were related to proposed grade changes and not imperviousness changes, the water balance was not revised.

The water balance analysis concludes that the shallow water table and low permeability soils will present challenges for off-setting the potential infiltration deficit due to the development. The recommendation is to pay the compensation payment of $63,199 to LSRCA. WSP understands that this fee would be waived due to the value of the phosphorus offsetting fee of $211,715. The Owner is recommended to confirm this status with LSRCA.

The dewatering assessment has identified that low volumes for short-term construction dewatering of municipal service trenches and residential buildings will require an Environmental Activity Sector Registry (EASR), however the final grades of the proposed basements will not likely require long-term dewatering through the use of a foundation drain system.

Thank you for the opportunity to carry out this work on your behalf. Please contact us if you have any questions or concerns regarding the information presented in this report.

Leon Halwa, M.Sc., P.Geo.
Hydrogeologist
Earth and Environment

Phyllis McCrindle, M.Sc., P.Geo
Senior Hydrogeologist
Earth and Environment

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SIGNATURES

PREPARED BY

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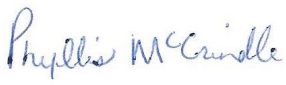
REVIEWED BY



Phyllis McCrindle, M.Sc., P.Geo.
Senior Hydrogeologist

This report has additionally been reviewed by:

Lloyd Lemon, M.Sc., P.Geo.
Senior Geoscientist

Andrew Kulin, M.A.S.c, P.Eng.
Senior Hydrogeologist

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FIGURES

APPENDICES

1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by Wycliffe Thornridge Sharon Corners Limited (the "client") to prepare a hydrogeological evaluation for their Sharon Corners project site located at the northwest corner of the intersection of Leslie Street and Mount Albert Road (the "site") in the community of Sharon, Ontario. The site location is shown on **Figure 1**.

The site is located within an area designated as WHPA-Q, which reflects the recharge area for The Regional Municipality of York (York Region) municipal wells and as such, an annual water balance calculation is required to assess potential changes to infiltration due to the proposed development and to identify measures that will mitigate predicted deficits. WSP's project scope for this assessment was to:

- Conduct background review of available geotechnical and hydrogeological reports for the site, along with published geological mapping and reports in the area;
- Discuss the requirements with the Lake Simcoe Region Conservation Authority (LSRCA) and obtain data of precipitation, evapotranspiration, runoff, and recharge mapping from LSRCA for use in the water balance;
- Carry out field investigations that include: a borehole drilling and monitoring well installation program; one (1) year of groundwater level monitoring on a quarterly basis; groundwater quality sampling at selected wells; hydraulic conductivity testing of the monitoring wells (slug tests); and infiltration testing (permeameter testing) of shallow soils;
- Prepare a site-specific annual water balance that assesses the pre-existing and post-development recharge (infiltration) at the site. The water balance will be prepared using the methodology outlined in the MOE Stormwater Management and Planning and Design Manual (2003). The water balance analysis from April 2021 was revised to address agency comments with regard to Phase 2 of the development;
- Identify appropriate mitigation measures (Low Impact Development (LID) approaches) for use at the site in order to maintain pre-development infiltration levels. This will include coordination with the planners and engineering design team to identify and allocate locations for the construction of the proposed LIDS. In lieu of on-site mitigation measures, compensation that is based on the magnitude of the infiltration reduction can be paid to LSRCA for use in constructing LIDS elsewhere in the subwatershed;
- Prepare a dewatering assessment and management plan on Phase 2 lands to estimate short-term construction dewatering requirements for installation of municipal services and residential basements. The dewatering assessment also includes an evaluation of long-term water management needs at the site for the permitting that may be required for dewatering; and,
- Prepare a technical report for submission to the Town of East Gwillimbury.

1.1 BACKGROUND

The 3.08 ha site is located at the northwest corner of the intersection of Leslie Street and Mount Albert Road in Sharon, Ontario. The pre-development condition of the site consisted of eight residential dwellings fronting the roads while the north, northwest and western limits were comprised of fallowed ground or disturbed soils from past construction of the Sharon Trunk Sewer. The lands gently slope to the west toward lower-lying ground which contains a tributary to Sharon Creek and wetland vegetation (cattails, etc.). Grades change from approximately 263 masl at the southeast corner of the property to about 256 masl at the western corner of the site. The residential lots were landscaped with lawn, gardens and occasional trees.

It is WSP's understanding that most of the original structures fronting along Mount Albert Road have been demolished and that the client proposes to redevelop their lands with eighty-six condominium townhouse units spread across twelve buildings, a seven-storey retirement residence (currently under construction), a seven-storey apartment building and a mixed-use building fronting along Leslie Street (see **Figure 2**). The site will be serviced with municipal water and sanitary sewers. Phase 1 of the development includes the Retirement Residence, the mixed-use buildings and the municipal servicing at the south end of the site. As the municipal servicing has been

installed in Phase 1 and the buildings are nearing completion, the dewatering assessment is focused on Phase 2 of the development, which includes the residential townhouses.

Approximately one half of the overall site area (1.54 ha) is located in lands previously approved as part of the Sharon West Master Environmental Servicing Plan (MESP) and identified as Area A on **Figure 2**. Area B on **Figure 2** represents the remainder of the site. Land use coverage for the entire site in its pre-development and proposed conditions is presented in **Table 1**.

Table 1: Existing and Proposed Land Use

CATEGORY	PRE-DEVELOPMENT		POST-DEVELOPMENT	
	Area	Percentage	Area	Percentage
Site Area	**30,771 m^2**	**100.0%**	**30,771 m^2**	**100.0%**
Building Footprints	1,299 m^2	4.22%	8,965 m^2	29.13%
Driveways/Parking/Sidewalks	1,239 m^2	4.02%	14,336 m^2	46.59%
Grassed Area/Landscaping	12,865 m^2	41.80%	7,470 m^2	24.28%
Pasture/Shrub (Low Area)	15,367 m^2	49.93%	0 m^2	0.0%
Total Impervious Area	2,539 m^2	8.25%	23,301 m^2	75.72%
Total Pervious Area	28,232 m^2	91.75%	7,470 m^2	24.28%
Total Area	**30,771 m^2**	**100.0%**	**30,771 m^2**	**100.0%**

J:\1442 Projects by Job Number\2017\17M-00407-00-HEV Sharon Corners\Mapping\MXD\Figure 1 Site Location.mxd

LEGEND

- Site Location
- Property Boundary

Client:	WYCLIFFE THORNRIDGE SHARON CORNERS LIMITED	
Title:	**SITE LOCATION**	
Prepared By:	WSP	
17M-00407-00	Scale as Shown	Review: ANK
Date: March 2022	**Figure: 1**	
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J:\1442 Projects by Job Number\2017\17M-00407-00-HEV Sharon Corners\Mapping\MXD\2021\Figure 2 Conceptual Development Plan.mxd

LEGEND

Property Boundary

- A - Pre-Approved Lands
- B - Remainder of Site

Proposed Development Plan

- Other Buildings
- Retirement Home
- Townhouses
- Roads, Sidewalk, Parking
- Road
- Landscaped / Pervious Areas

Notes:

Area A represents the area within the Sharon Village Compensation Strategy Plan (October 2008) for which compensation has been paid to the LSRCA. This area is identified as pre-approved lands. Area B represents the remainder of the area outside pre-approved lands for which compensation may need to be paid.

Client:	**WYCLIFFE THORNRIDGE SHARON CORNERS LIMITED**
Title:	**CONCEPTUAL DEVELOPMENT PLAN**
Prepared By:	WSP
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Date: March 2022	**Figure: 2**
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2 REGIONAL PHYSIOGRAPHY AND GEOLOGICAL SETTING

2.1 REGIONAL GEOLOGY AND HYDROSTRATIGRAPHY

2.1.1 PHYSIOGRAPHY

The site is principally located within or adjacent to two physiographic regions defined by Chapman and Putnam (1984). These regions are the Schomberg Clay Plains (within which the site is located), and the Simcoe Lowlands (mapped very close to the north of the site).

The Schomberg Clay Plains are deep water deposits of stratified clay and silt formed in ancestral lakes around Newmarket. These basin deposits are typically seen as varved clays composed of about 50% clay and 40% silt, behaving mostly as silt. The surface under the silty clay is that of a drumlinized till plain (Newmarket till). Some of the larger drumlins are exposed located through the clay. Since the rolling relief of the underlying till plain has not entirely been eliminated, these areas are not as flat as would be expected in many lake plains.

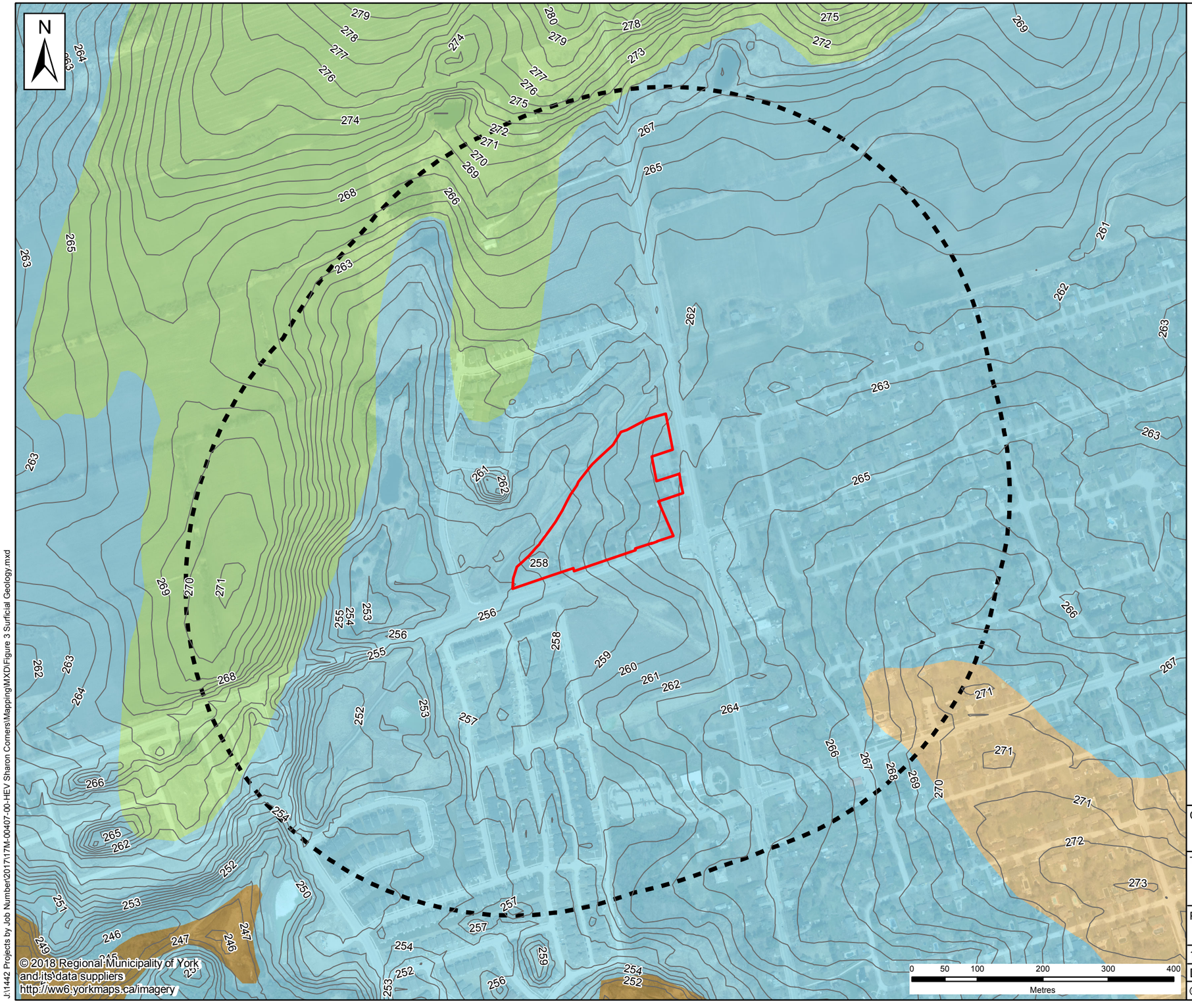
The Simcoe Lowlands include the lowland bordering Lake Simcoe and lie between 218 and 260 masl (elevation ranges from 228 to 272 masl nearby to Sharon). Cook's Bay occupies a broad valley that extend to the south-west from Lake Simcoe for about 25 km between high morainic hills. The East Holland River flows through this valley and discharges into Lake Simcoe.

2.1.2 GEOLOGY

The geology of the Greater Toronto Area (GTA), Oak Ridges Moraine and the surrounding areas has been investigated through numerous local and regional scale studies conducted over the past 70 years. These studies have been synthesized through the work of the Geological Survey of Canada (GSC) and consultant teams working for GTA Regions; York, Peel, and Durham, the City of Toronto and the Conservation Authorities Moraine Coalition (CAMC). The Conservation Authorities Moraine Coalition now operates as the Oak Ridges Moraine Groundwater Program.

The surficial geology of the study area is illustrated in **Figure 3,** which is based on the Ontario Geological Survey seamless digital Quaternary map of Southern Ontario (OGS 2003).

The conceptual geologic model developed for the overburden geology of the Oak Ridges Moraine and surrounding areas (Kassenaar and Wexler, 2006) identifies seven hydrostratigraphic layers overlying bedrock (**Table 2**) that correspond to the primary hydrostratigraphy used in conceptual geological and numerical groundwater flow models.



LEGEND

- Property Boundary
- Study Area - 500 m radius
- Topographic Contours (mASL)

Surficial Geology

- Sandy Silt to Silty Sand - Newmarket Till
- Silt and Clay
- Sand - Some Silt
- Modern

Client: **WYCLIFFE THORNRIDGE SHARON CORNERS LIMITED**

Title: **SURFICIAL GEOLOGY**

Prepared By: WSP

17M-00407-00	Scale as Shown	Review: ANK
Date: March 2022	**Figure: 3**	

J:\11442 Projects by Job Number\2017\17M-00407-00-HEV Sharon Corners\Mapping\MXD\Figure 3 Surficial Geology.mxd

Table 2: Conceptual Hydrostratigraphic System

MODEL LAYER	HYDROSTRATIGRAPHIC LAYER	GEOLOGIC LAYER
1	Aquifer/Aquitard	Surficial Deposits (incl. Algonquin deposits) and/or weathered surficial till and modern alluvium
2	Halton Aquitard	Halton / Kettleby Till
3	Oak Ridges Aquifer Complex (ORAC)	Oak Ridges Moraine Sediments
4	Newmarket Aquitard	Newmarket Till (and equivalents)
5	Thorncliffe Aquifer Complex	Thorncliffe Formation Sediments
6	Sunnybrook Aquitard	Sunnybrook Formation (Diamict)
7	Scarborough Aquifer Complex	Scarborough Formation Sediments
8	Basal Aquifer	Weathered Bedrock

Kassenaar and Wexler (2006) report provide the following descriptions of the hydrostratigraphic units and their significance:

Surficial Deposits (Aquifer/Aquitard)

Surficial deposits lying stratigraphically above the Newmarket Till are dominated by glacio-lacustrine and lacustrine deposits formed during and after the final retreat of the Wisconsinan ice sheet. These deposits range from massive to laminated clay and silt deposited in deep water low energy environments to sand and gravel deposited as terraces and along former shorelines (Lake Algonquin). In the Sharon area, glacio-lacustrine clay and silt of the Schomberg Clay Plains are mapped alongside Sharon Creek and, in conjunction with the underlying Newmarket Till, form the uppermost confining unit in the area.

Also present locally at surface are recent alluvial deposits of silt, sand and gravel in the low areas associated with Sharon Creek and its tributaries and East Holland River to the south. These deposits are generally fine grained but may form local aquifers of restricted extent which can be up to several metres thick. These deposits overlie the glacio-lacustrine deposits above.

Halton Aquitard

The Halton/Kettleby Till represents the final advance of ice southwards out of the Lake Simcoe basin at the end of the Wisconsinan glaciation approximately 13,000 years ago. In the Sharon area the Kettleby Till has a relatively fine-grained matrix (silty-clay), and is not widespread.

Oak Ridges Aquifer Complex (ORAC)

The ORAC consists of silts, sands and gravel of the Oak Ridges Moraine that reaches maximum thickness in excess of 95 m beneath the crest of the moraine but thin rapidly toward the margins to the north and south. The ORAC is not observed at surface in the immediate vicinity of Sharon, which lies north and west of the ORM.

Newmarket Aquitard

The Newmarket Aquitard is a regionally extensive unit, comprised of a thick sequence of dense, silt to silty clay till that separates the ORAC from the underlying Thorncliffe Aquifer Complex (Kassenaar and Wexler 2006).

In places where the ORAC is absent it may be difficult to distinguish Halton/Kettleby Till from Newmarket Till based on MECP water well records. The Newmarket Till is known to have been eroded in some areas by subglacial meltwater which formed a series of broad ‘tunnel channel’ valleys that were subsequently filled with thick deposits of fine sand to silty sediment. Kassenaar and Wexler (2006) have suggested that two such channels may be present running in a north-south direction roughly coinciding with the Black River and Mount Albert Creek valleys.

Thorncliffe Aquifer Complex

The Thorncliffe Aquifer Complex consists of glacio-fluvial to glacio-lacustrine deposits which extend under most of York Region to Lake Ontario. There is considerable variation in the type of sediments that comprise the Thorncliffe Formation, both locally and regionally. Locally, the Thorncliffe Aquifer Complex is a productive water supply aquifer.

Sunnybrook Aquitard

the Sunnybrook Formation (Diamict) is also considered to be a regionally extensive unit. The Sunnybrook is typically described as a clast-poor mud (silt and clay) deposited on the floor of a glacially dammed lake or formed by the overriding of pre-existing lake sediments by advancing ice.

Scarborough Aquifer Complex

The Scarborough Formation is interpreted as sediments deposited in fluvio-deltaic system fed by large, braided meltwater streams and rivers draining from an ice sheet. The Scarborough Aquifer is interpreted to underlie much of York Region, but is typically considered to be thin within the study area, possibly due to quantity of data. Appreciable thicknesses are observed in bedrock lows and valleys including the Laurentian valley and its tributaries.

Bedrock (Aquitard)

The underlying bedrock in the study area is mapped as black shale of the Georgian Bay Formation. The bedrock is interpreted to gently slope from the northeast to southwest (190 to 160 masl) although in the interpreted valley elevations are believed to range from 170 masl at the northeast to about 70 masl in the southwest.

2.1.3 WATER WELL RECORDS

Water well records for the study area were obtained from the Water Well Information System (WWIS) maintained by the Ministry of Environment, Conservation and Parks (MECP) and reviewed to assist in interpreting local subsurface conditions.

There are 107 well records located within about 500 m of the site as presented on **Figure 4**. A detailed listing of the MECP well records is presented in **Appendix A**. The well records indicate the following distribution of wells:

- Domestic Water Supply – 68 Records[1]
- Abandoned/Decommissioned – 23 Records
- Test Hole, Monitoring Wells, Observation Wells – 10 Records
- Not Used – 1 Record
- Unknown Use – 5 Records

Essentially all of the existing Sharon Community is serviced by the distribution system connected to the municipal water supply system from the Queensville wells operated by York Region. Many of the well records located in the community (generally to the east of Leslie Street) therefore correspond to properties that are now serviced by municipal water supply. A figure displaying properties that as of 2008 were connected to the Municipal water system is included with **Appendix A**.

Four domestic well records plot on the site fronting along Mount Albert Road. These records all reflect dug wells with depth ranging between 13.7 and 16.5 mbgs and water is obtained from clay or clay-medium sand deposits with reported depths to usable quantities of water being reported between 12.8 and 13.7 mbgs. Two of these records (69-00120 and 69-00121) are believed to be the concrete dug wells identified and monitored at 1432 and 1442 Mount Albert Road.

[1] One well record is misidentified as Municipal use.

2.1.4 MUNICIPAL WELLS

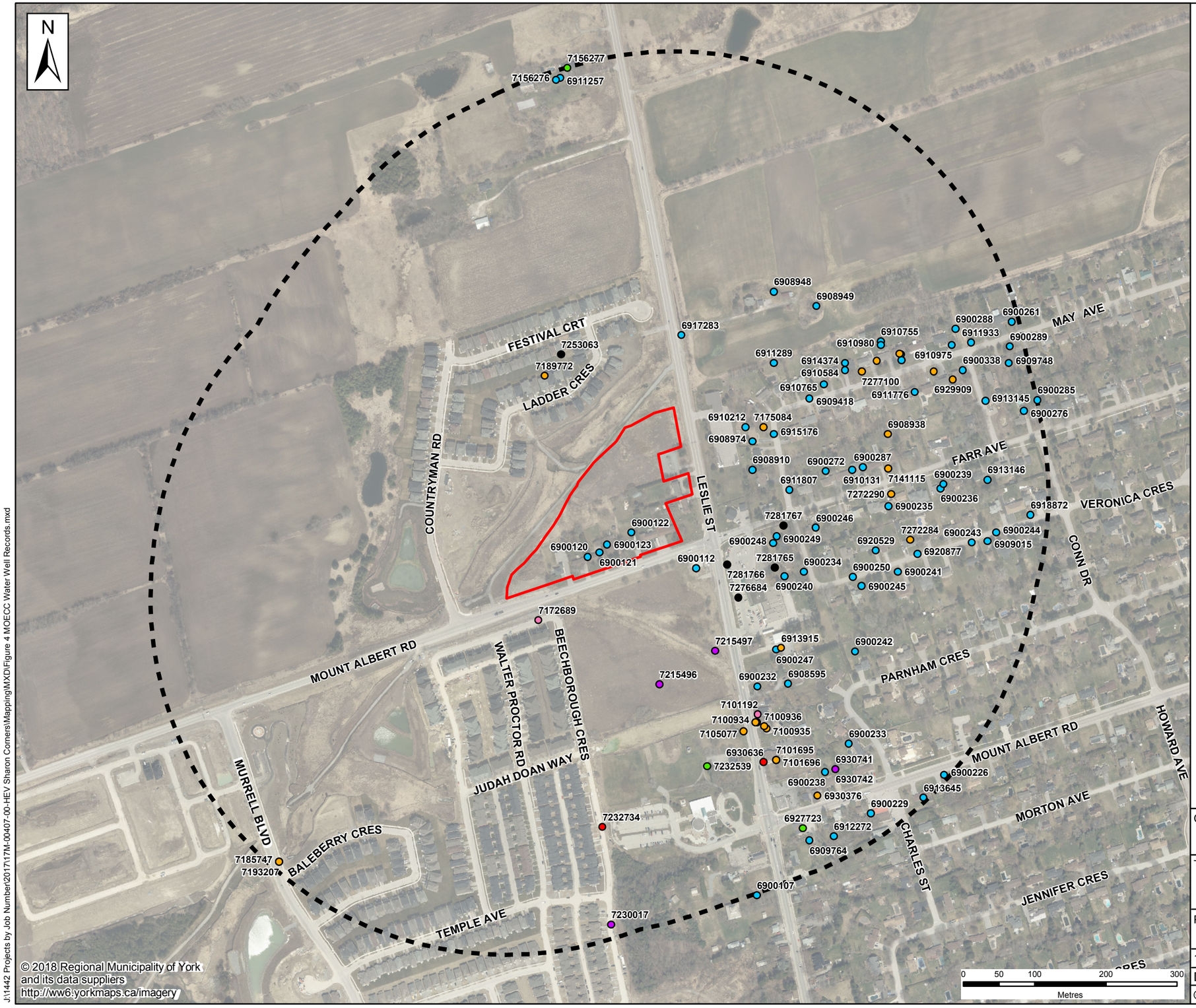
Two municipal well fields owned and operated by York Region are located near the site. Queensville Wells 3 and 4 are located approximately 1.7 km north of the site at Leslie Street and Doane Road while the Holland Landing Wells 1 and 2 are located about 2.4 km to the west of the site along Mount Albert Road, west of the 2nd Concession (see Figure 5). Review of the well logs for these four municipal wells indicate that they draw water from the deep Scarborough Aquifer Complex. As noted above, this aquifer complex is protected from surficial activities by between approximately 45 m to 80 m of overlying sediments, including higher elevation aquifers.

The site is located within wellhead protection area (WHPA) WHPA-D of the Queensville well field (**Figure 5**). WHPA-D reflects the zone where the estimated time-of-travel for groundwater to arrive at the well is greater than five (5) years and less than 25 years. The vulnerability score assigned to WHPA-D in the area of the site ranges between 2 and 4 and reflects a relatively low vulnerability. As the site is located within a wellhead protection area, a Source Water Impact Assessment and Management Plan (SWIAMP) was required in accordance with the Region of York policies and submitted under separate cover in March 2019.

2.2 TOPOGRAPHY AND DRAINAGE

The site is located within the Holland River watershed, and more specifically with the Sharon Creek subwatershed. Sharon Creek and its tributaries generally flow in a westerly to southerly direction toward the Holland River. The Holland River flows to the north and discharges to Lake Simcoe.

Topographically the lands surrounding the site generally decline from a high of about 290 masl to the northeast down to about 230 masl where Sharon Creek drains into the Holland River to the southwest. The topographic relief on the lands to the south of Mount Albert Road is much steeper sloped than the lands to the north of the road, including the site. As noted earlier the site is gently sloped in a westerly direction, declining from approximately 263 masl at the southeast corner of the property to about 256 masl at the western corner of the site.



LEGEND

- Property Boundary
- Study Area - 500m

MECP Water Well Records

- Abandoned
- Decommissioned
- Monitoring and Test Hole
- Observation Wells
- Test Hole
- Unknown
- Water Supply

Client:	**WYCLIFFE THORNRIDGE SHARON CORNERS LIMITED**
Title:	**MECP WELL RECORDS**
Prepared By:	wsp
17M-00407-00	Scale as Shown | Review: ANK
Date: March 2022	**Figure: 4**
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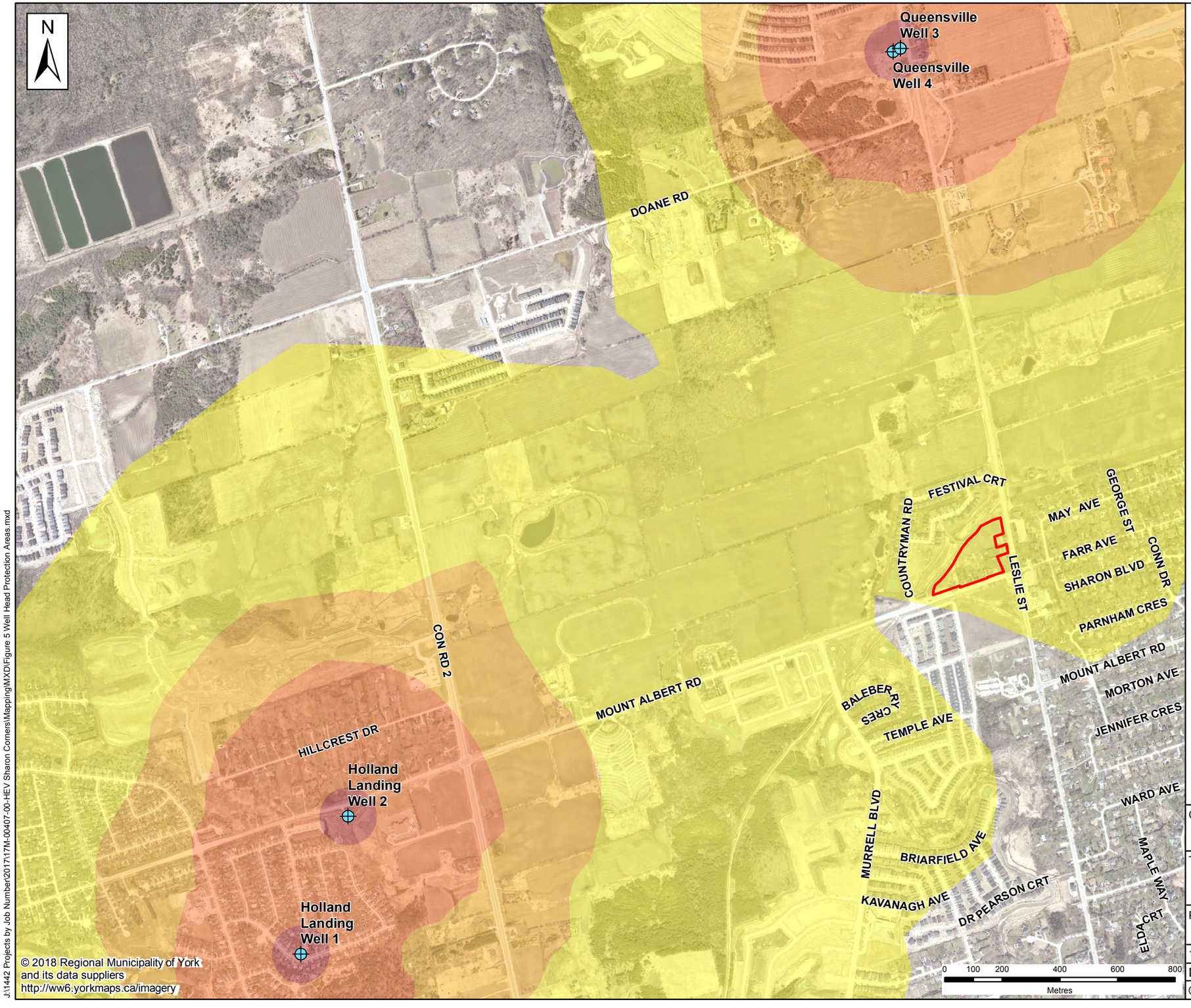
J:\17442 Projects by Job Number\2017\17M-00407-00-HEV Sharon Corners\Mapping\MXD\Figure 4 MOECC Water Well Records.mxd



LEGEND

- Property Boundary
- Municipal Well

Wellhead Protection Area

- 100 Day Zone
- 2 Year Zone
- 5 Year Zone
- 25 Year Zone

Client:	**WYCLIFFE THORNRIDGE SHARON CORNERS LIMITED**
Title:	**WELLHEAD PROTECTION AREAS**
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J:\17442 Projects by Job Number\2017\17M-00407-00-HEV Sharon Corners\Mapping\MXD\Figure 5 Well Head Protection Areas.mxd

3 HYDROGEOLOGICAL EVALUATION

3.1 ON-SITE AND OFF-SITE INVESTIGATIONS

Three geotechnical investigations have been carried out on the site since 2007 by Soil Engineers Ltd. Two boreholes (BH12 and BH13) were drilled at the site during the initial geotechnical investigation[2] to depths ranging from 6.6 metres below ground surface (mbgs) to 9.6 mbgs. A supplementary investigation was conducted in April 2008, where five additional boreholes (BH101 to BH105) were drilled to depths ranging from 6.6 mbgs to 21.8 mbgs. Only one of these boreholes was drilled on site (BH101 to 21.8 mbgs) while the remaining four boreholes were drilled west of the site along Countryman Road. A third geotechnical investigation took place in 2017 where ten additional boreholes (BH201 to BH210) were drilled across the site to depths ranging from 6.6 mbgs to 22.6 mbgs. No monitoring wells were installed onsite as part of the geotechnical investigations. A number of other off-site investigations have taken place on surrounding lands since 2006 in conjunction with works carried out for the Sharon West MESP studies. Information from investigation/monitoring locations located within 200 m of the site have been considered and incorporated into this investigation where applicable.

WSP's borehole drilling program took place on September 25 and 26, 2017, during which time three boreholes (MW-1 to MW-3) were drilled to depths ranging from 6.1 mbgs to 7.6 mbgs and were completed as 51 mm diameter monitoring wells. The boreholes were advanced using a track-mounted drill rig equipped with 250 mm diameter hollow stem augers and operated by a drilling sub-contractor working under the direction and supervision of WSP staff. Soil samples were retrieved at regular intervals with a 50 mm outer diameter split-barrel sampler driven into the undisturbed soil with a hammer deploying a force of 624 N and dropping 760 mm in accordance with the Standard Penetration Test (SPT) method. The soil samples were described in the field and brought to the laboratory of WSP for detailed examination. Borehole logs from this investigation and from the previous site investigation are found in **Appendix B**. The borehole and monitoring well locations on the site and the adjoining lands (from past MESP investigations) are presented on **Figure 6**. Hydrogeological cross-sections are shown on **Figure 7** and **Figure 8** for section lines A-A' and B-B' shown on **Figure 6**.

The monitoring wells were constructed with 51 mm diameter Schedule 40 PVC screen and riser, equipped with O-rings at the threaded joints. The well screens were 1.5 m in length and a sand pack was installed around the screen, extending 0.3 to 0.6 m above the top of the screen. A bentonite seal was placed from the top of the sand pack to approximately 0.3 m below grade. A protective lockable steel casing and 0.3 m of concrete at surface completed the installation.

[2] A total of 20 boreholes were drilled across the site and adjacent lands in the initial 2007-2008 investigation.

N

FESTIVAL CRT

LADDER CRES

COUNTRYMAN RD

MAY AVE

LESLIE ST

FARR AVE

SHARON BLVD

MOUNT ALBERT RD

BEECHBOROUGH CRES

WALTER PROCTOR RD

CU-1
CU-2
CU-5S
CU-MP3
CU-MP4
BH S1
BH S2
BH14
BH15
BH16
BH17
BH18
BH19
BH20
BH101
BH102
BH104
BH105
BH12
BH13
BH201
BH202
BH203
BH204
BH205
BH206
BH207
BH208
BH209
BH210
Perm-1
Perm-2
Perm-3
Perm-4
Perm-5
MW-1
MW-2
MW-3
MMM12-1
SWM-1
TR-BH101
TR-BH201-S
TR-BH201-D
TR-BH-10
COR-MP1
COR-MP2
COR-2
T4-8SW
T4-8B
T4-8A
8 May Ave.
1442 Mt. Albert Rd.
1432 Mt. Albert Rd.

A
A'
B
B'

255 256 257 258 259 260 261 262 263 264 265

0 25 50 100 150
Metres

J:\1442 Projects by Job Number\2017\17M-00407-00-HEV Sharon Corners\Mapping\MXD\Figure 6 Monitoring Locations.mxd

LEGEND

- Property Boundary
- Cross Sections
- Topographic Contours (mASL)
- Private Wells
- Permeameter Test Location
- Permeameter Test Location – Not Completed
- Borehole (Soil Eng)
- Monitoring Well (WSP)
- MESP Monitoring Well
- MESP Mini-Piezometers

Notes:
1. Borehole locations are approximate and were taken from Soil Eng's Borehole Location Plan. Monitoring well locations are based on GPS coordinates obtained by WSP using a hand-held GPS unit.

Client: **WYCLIFFE THORNRIDGE SHARON CORNERS LIMITED**

Title: **BOREHOLE AND MONITORING WELL LOCATION PLAN**

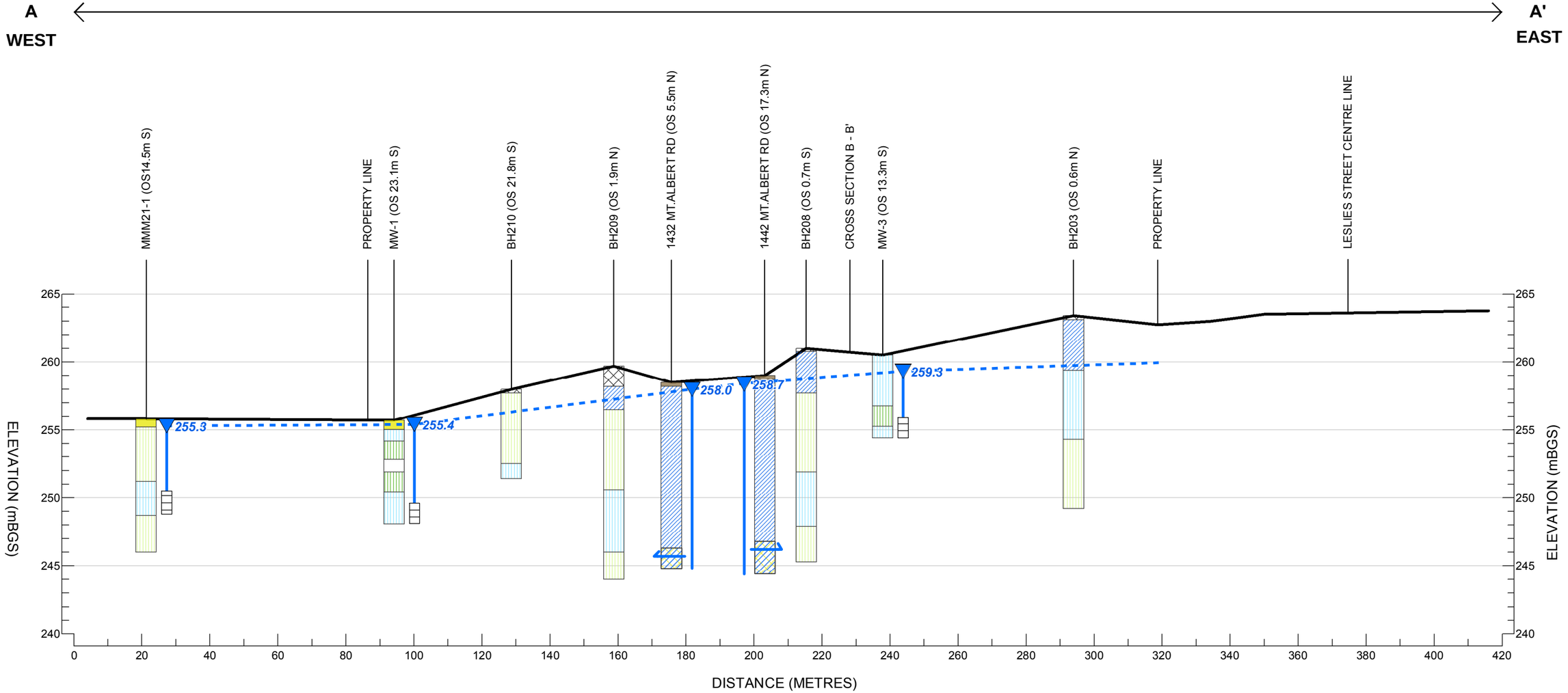
Prepared By: WSP

17M-00407-00	Scale as Shown	Review: ANK
Date: March 2022	**Figure: 6**	

LOOKING NORTH

A
WEST

A'
EAST



NOTES:
1. GROUND SURFACE ELEVATION GENERALIZED.
2. STATIC WATER LEVELS SHOWN ARE THE MAXIMUM RECORDED LEVEL UP TO MAY 8, 2018.
3. BOREHOLE LOCATIONS ARE APPROXIMATE AND WERE TAKEN FROM SOIL ENG'S BOREHOLE LOCATION PLAN. MONITORING WELL LOCATIONS ARE BASED ON GPS COORDINATES OBTAINED BY WSP USING A HAND-HELD GPS UNIT.

LEGEND

- GROUND SURFACE
- INTERPRETED GROUNDWATER ELEVATION
- DEPTH TO WATER FOUND
- GROUNDWATER LEVEL
- MONITORING WELL SCREEN
- NO DATA
- TOPSOIL
- FILL
- SILTY SAND TO SANDY SILT
- CLAY AND SAND
- SILT / CLAYEY SILT
- CLAY / SILTY CLAY
- SANDY SILT TO SILTY SAND TILL
- SILT / SILTY CLAY TILL

0 25 50 75 100 Meters

SCALE AS SHOWN
4X VERTICAL EXAGGERATION

WYCLIFFE THORNRIDGE
SHARON CORNERS LIMITED

HYDROGEOLOGICAL CROSS SECTION A - A'

DATE: March 2022

PROJECT: 17M-00407-00

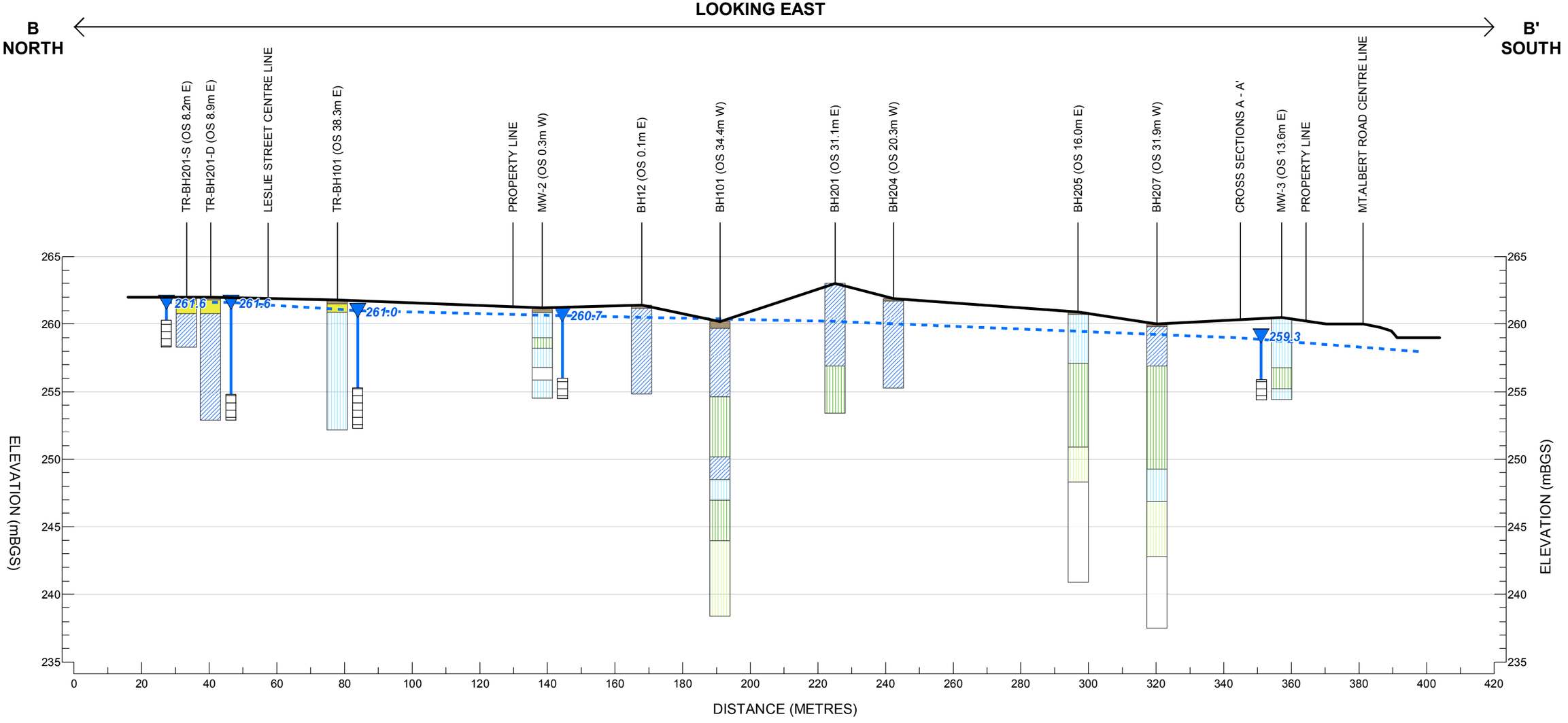
FIGURE 7

J:\1442 Projects by Job Number\2017\17M-00407-00-HEV Sharon Corners\Mapping\MXD\Figure 7 Cross Section A-A'.mxd

LOOKING EAST

B NORTH

B' SOUTH



NOTES:
1. GROUND SURFACE ELEVATION GENERALIZED.
2. STATIC WATER LEVELS SHOWN ARE THE MAXIMUM RECORDED LEVEL UP TO MAY 8, 2018.
3. BOREHOLE LOCATIONS ARE APPROXIMATE AND WERE TAKEN FROM SOIL ENG'S BOREHOLE LOCATION PLAN. MONITORING WELL LOCATIONS ARE BASED ON GPS COORDINATES OBTAINED BY WSP USING A HAND-HELD GPS UNIT.

LEGEND

- GROUND SURFACE
- INTERPRETED GROUNDWATER ELEVATION
- GROUNDWATER LEVEL
- MONITORING WELL SCREEN
- NO DATA
- TOPSOIL
- FILL
- SILTY SAND TO SANDY SILT
- CLAY AND
- SILT / CLAYEY SILT
- CLAY / SILTY CLAY
- SANDY SILT TO SILTY SAND TILL
- SILT / SILTY CLAY TILL

0 25 50 75 100 Meters

SCALE AS SHOWN
4X VERTICAL EXAGGERATION

WYCLIFFE THORNRIDGE
SHARON CORNERS LIMITED

HYDROGEOLOGICAL CROSS SECTION B - B'

DATE: March 2022

PROJECT: 17M-00407-00

FIGURE 8

J:\1442 Projects by Job Number\2017\17M-00407-00-HEV Sharon Corners\Mapping\MXD\Figure 8 Cross Section B-B'.mxd

3.2 SITE GEOLOGY

3.2.1 SITE STRATIGRAPHY

The borehole drilling completed by Soil Engineers Ltd. and WSP indicates that topsoil was observed at surface in 31 of the 38 boreholes, and ranged in thickness from 0.15 m to 0.51 m. In the remaining boreholes, asphalt and/or granular fill material was observed at surface, with a thickness ranging from 0.05 m to 1.5 m.

A fine-grained glacio-lacustrine deposit consisting of Silt/Silty Clay was observed to underly the surficial material at 28 of the 38 boreholes. This material extended to depths ranging from 1.5 mbgs to 14.2 mbgs, and has a thickness ranging from 1.0 m to 9.3 m. The glacio-lacustrine soils are typically more fine-grained at surface, and transition from Silty Clay to Silt at depth. The material is described as brown with trace amounts of sand and occasional wet seams of silt and sand. The upper 1.5 m of the deposit was observed to be weathered. In 18 boreholes, this deposit was underlain by Clayey Silt/Silty Clay Till.

The Clayey Silt/Silty Clay Till deposit was observed in 26 out of 38 boreholes at depths ranging from 1.5 mbgs to 10.7 mbgs, and ranged in thickness from 1.5 m to 7.6 m. This deposit is often found between the Silty Clay and Silt deposits, and is described as sandy with trace amounts of gravel, and wet sand and silt seams throughout the deposit. The soils are typically grey and stiff to very stiff.

A Sandy Silt Till deposit was observed in 16 out of 38 boreholes. This deposit varied in thickness from 1.0 m to 5.9 m. It was typically observed at shallow depth, ranging from 0.28 mbgs to 8.5 mbgs, however in seven of the boreholes, this deposit was observed at a depth ranging from 9.1 mbgs to 21.8 mbgs. This soil contains some clay and trace amounts of gravel. Wet sand and silt seams were observed occasionally in this deposit.

A thin Sand deposit was observed in two of the Soil Engineers Ltd. boreholes. This deposit was less than 2 m thick in both boreholes, and observed at 6.9 mbgs to 8.5 mbgs in borehole BH-1 and from between 2.1 mbgs to 4.0 mbgs at borehole BH-1. The deposit is described as Fine to Coarse Sand, with some silt and gravel and was overlain by Sandy Silt/Silty Clay Till and underlain by Silty Sand/Sandy Silt Till.

3.2.2 GRAIN SIZE DISTRIBUTION ANALYSIS

Soil Engineers Ltd. submitted five soil samples for grain size distribution analysis as part of their supplementary geotechnical investigation in April 2008 (BH101 to BH105). In addition, WSP submitted three soil samples for grain size distribution analysis in October 2017. The grain size distribution results were reviewed and used to estimate hydraulic conductivity and confirm soil classifications. This information was also used in the water balance analysis and the dewatering assessment. The grain size distribution curves are presented in **Appendix B**. The location and depth of soil samples that were tested for grain size distribution and the hydraulic conductivity estimates are presented on **Table 3**.

Hydraulic conductivity was estimated from the grain size distribution curves results using the Hazen approximation:

$$K = 0.01 \times C d_{10}^2 \text{ (m/sec)}$$

Where:

K = bulk hydraulic conductivity (m/sec);

d_{10} = grain size at which point 10% of the soil passes the sieve (mm); and

C = a constant generally set at 1 for these units.

Table 3: Hydraulic Conductivity Estimates based on the Hazen Approximation

BOREHOLE ID	DEPTH (MBGS)	SOIL DESCRIPTION	D10 (MM)	HYDRAULIC CONDUCTIVITY ESTIMATE (M/SEC)
BH 101	2.6	Silt, some clay	0.0025	6.3×10^{-8}
BH 101	12.5	Silt, some clay	0.0028	7.8×10^{-8}
BH 101	18.6	Silty Clay Till, sandy, trace gravel	0.0014	2.0×10^{-8}
BH 102	2.5	Silt, some clay	0.002	4.0×10^{-8}
BH 105	1.8	Silty Clay Till, sandy, trace gravel	0.0014	2.0×10^{-8}
MW1	0.9	Sandy Silt, some clay, trace gravel	***<0.001***	***<1.0 x 10^{-8}***
MW2	5.2	Clayey Silt, trace sand	***<0.001***	***<1.0 x 10^{-8}***
MW3	0.9	Clayey Silt, trace sand	***<0.001***	***<1.0 x 10^{-8}***

Notes:

*Grain size diameters and calculated hydraulic conductivities shown with **bold italics** are estimated as the observed grain size curve did not reach d_{10}*

The hydraulic conductivity of the Silt deposit is estimated to be between 4.0×10^{-8} m/sec and 7.8×10^{-8} m/sec based on the Hazen Approximation. The geometric mean hydraulic conductivity of the Silt soil is calculated at 5.8×10^{-8} m/sec. Both samples of Silty Clay Till had estimated hydraulic conductivities of 2.0×10^{-8} m/sec. Two samples submitted from the Clayey Silt and one sample submitted from the Sandy Silt were estimated to have hydraulic conductivities of less than 1.0×10^{-8} m/sec based on the grain size curve not reaching the d_{10} value. The observed hydraulic conductivities are within the expected range for the observed materials.

3.2.3 IN-SITU PERMEABILITY TESTING

In situ hydraulic conductivity testing was carried out by WSP staff at MW1, MW2, and MW3 on October 6, 2017 and October 10, 2017 to provide estimates of in situ hydraulic conductivity of the deposits at the Site. The hydraulic conductivity testing was generally carried out by rapidly inserting a slug with a known volume down the well to displace the water and to observe the rate of water level recovery (falling head test). After the water level stabilized, the slug was removed, and the rate of water level recovery was observed again (rising head test). The recovery of the water levels in the well was measured over time until they had recovered to the original water level. WSP's recovery data was analysed with Aquifer Test Pro software, using the Bouwer and Rice (1976) approach.

The hydraulic conductivity estimates from in situ testing are presented in **Appendix C** and summarized on **Table 4**. These values are considered to be representative of the horizontal hydraulic conductivity in the immediate vicinity of the well. Estimated hydraulic conductivity values by the slug testing program range between 1.4×10^{-8} m/sec and 8.9×10^{-8} m/sec with a geometric mean of 4.3×10^{-8} m/sec which is representative of the Clayey Silt/Silt material. These results are consistent with the estimates calculated using the Hazen approximation, and fall within the approximate hydraulic conductivity range for silt of 10^{-9} m/sec to 10^{-5} m/sec according to Freeze and Cherry (1979).

As excavations for residential basements and municipal servicing trenches are expected to be within the Silty Clay material, the dewatering assessment has used the geometric mean hydraulic conductivity of 4.3×10^{-8} m/sec to estimate pumping rates.

Table 4: Hydraulic Conductivity Estimates based on In SItu Testing

MONITORING WELL ID	SCREEN INTERVAL (MBGS)	SOIL DESCRIPTION	HYDRAULIC CONDUCTIVITY FALLING HEAD (M/SEC)	HYDRAULIC CONDUCTIVITY RISING HEAD (M/SEC)
MW1	6.1 – 7.6	Silt, trace to some clay, trace sand	8.9×10^{-8}	7.0×10^{-8}
MW2	5.2 – 6.7	Clayey Silt	6.6×10^{-8}	5.7×10^{-8}
MW3	5.6 – 6.1	Silt/Silt Till	2.0×10^{-8}	1.4×10^{-8}

3.2.4 PERMEAMETER TESTING

Four permeameter tests were performed to observe infiltration rates and to estimate the saturated hydraulic conductivity of near surface materials. The permeameter tests were carried out as a constant-head test in a shallow borehole using a Guelph Permeameter. The steady-state rate of water recharge into soil from a cylindrical well hole is used to estimate the saturated hydraulic conductivity using the Marriot Principle.

The permeameter tests were conducted at locations identified as Perm-1, Perm-3, Perm-4, and Perm-5 on October 4, 2017 and October 6, 2017 (see **Figure 6**). A test was attempted in a fifth hole (Perm-2) however there was no change in the water level in the hole after 15 minutes and the test was abandoned. WSP interprets that the water level in the hole for Perm-2 did not change due to the presence of a shallow water table at this location. The permeameter tests were performed close to existing monitoring wells as the stratigraphy was known from drilling and sampling of these boreholes.

The test holes were 60 mm in diameter and were hand augered to a minimum depth of 0.32 m into the material below the base of the overlying topsoil. Each hole was pre-soaked by filling it with water and allowing the water to infiltrate completely prior to the start of the test. If necessary following pre-soaking, silt and sediment were removed from the bottom and sides of the hole, and the hole was cleaned to its original depth. A rough brush was used to remove any smear layer present on the walls of the hand augered well hole as per the equipment manufacturer's instructions. A desired water height was established by raising the air inlet tip within the permeameter reservoir to create a partial vacuum with the reservoir tube and allow water to be released into the hole until the water head was a minimum of 0.10 m above the base of the hole. The water level was measured using the scale on the permeameter reservoir tube, and were recorded at consistent time intervals. The Single Head Method and combination of inner and outer reservoir tubes were used exclusively for both tests.

Table 5: Permeameter Test Results

PERMEAMETER TEST	MONITORING WELL LOCATION	SOIL DESCRIPTION	SATURATED HYDRAULIC CONDUCTIVITY (M/SEC)	SATURATED HYDRAULIC CONDUCTIVITY (MM/HR)
Perm-1	MW2	Silt, trace clay	8.7×10^{-7}	3.1
Perm-2	BH101	Silty Clay	N/A[1]	N/A
Perm-3	BH13	Silty Clay	5.4×10^{-7}	1.9
Perm-4	BH206	Silty Clay, trace sand	1.6×10^{-7}	0.6
Perm-5	MW1	Silt/Silty Sand	8.7×10^{-8}	0.3

Notes:
[1] *Test not completed due to interference from shallow groundwater*

Results were analysed using the methods established by Reynolds and Elrick (1986) in the Guelph Permeameter Quick Calculator provided by the equipment manufacturer and are presented on **Table 5**. Copies of the permeameter test results are presented in **Appendix C**.

The estimated saturated soil hydraulic conductivity of the Silty Clay from the permeameter testing ranged from 1.6×10^{-7} m/sec to 5.4×10^{-7} m/sec, alternatively expressed as rates of between 0.6 and 1.9 mm/hour. The saturated hydraulic conductivity rates of the Silt ranged between 8.7×10^{-8} m/sec and 8.7×10^{-7} m/sec, or 0.3 to 3.1 mm/hour. The average infiltration rate of the surficial soils at the site was calculated to be 1.5 mm/hour.

3.2.5 GROUNDWATER LEVEL MONITORING

Groundwater level monitoring has been carried out at available monitoring stations at the site and near to the site within the Sharon MESP lands on a quarterly basis (approximately in January, April, July, and October) between June 2006 and February 2019. The three monitoring wells installed on-site in September 2017 (MW-1, MW-2, and MW-3) were monitored on eleven occasions between September 26, 2017, and February 8, 2019, which included the quarterly monitoring events. A monitoring event was carried out on December 22, 2021 to measure water levels from remaining monitoring wells in the vicinity of the site. Two of the three monitoring wells installed in 2017 on-site are no longer operational, however MW-2, located at the northeast corner of the Site remains operational. The results of groundwater level monitoring at the site are tabulated on Table SWL-1 presented in **Appendix D**, which includes water levels from on-site and off-site monitoring locations.

In addition to the monitoring wells at and near to the site, a total of thirteen private water supply wells were monitored on a quarterly schedule between 2012 and August 2017. Results of private well monitoring has been included in Table SWL-1 in **Appendix D**.

Groundwater elevations from monitoring wells on-site were observed to range between 254.3 masl and 260.7 masl between September 2017 and December 2021). Groundwater elevations recorded during the December 2021 event were consistent with February 2019 measurements. **Figure 9** presents the interpreted seasonal high shallow groundwater elevation contours based on the highest recorded water level data obtained at each groundwater monitoring well located within 200 m of the Site between 2007 and 2018. The groundwater elevations have been interpreted to consider the potential influence of the topography in the water course for Sharon Creek that flows adjacent to the northern boundary of the site. The interpreted seasonally high groundwater elevations presented on Figure 9 have been used as inputs into the dewatering assessment. Groundwater is interpreted to flow from northeast to southwest at a horizontal gradient of approximately 0.0135 m/m.

Selected monitoring wells (four monitoring wells in the vicinity of the site and three private wells) were instrumented with dataloggers that recorded hourly water level measurements, which were downloaded during quarterly monitoring events. Groundwater elevations measured by the dataloggers have been used to produce continuous hydrograph plots of water levels with time, which have been provided in **Appendix D**. Two private wells with dataloggers were located on-site (located at 1432 Mount Albert Road and 1442 Mount Albert Road), while one location was off-site (located at 8 May Avenue). The data logger plot from 1432 Mount Albert Road shows the seasonal high water table ranging from 257.8 masl to 258.0 masl across a three-year monitoring period (2012 to 2015), which is within 0.5 m to 0.7 m of the approximated ground surface elevation of 258.5 masl. The data logger plot from 1442 Mount Albert Road shows the seasonal high water table across a four-year monitoring period (2012 to 2016) ranging from 258.5 masl to 258.7 masl, which is within 0.3 to 0.5 m of the approximated ground surface elevation of 259 masl. The seasonal variation between the maximum and minimum groundwater levels recorded at these two wells ranges from 2.3 m to 5.4 m from spring to fall. Data logger plots from off-site monitoring locations within 200 m of the Site show that the seasonal high water table ranges from 1.8 metres below ground surface to 0.2 metres above ground surface at locations where continuous monitoring data is available. The seasonal variation between the maximum and minimum groundwater levels recorded at off-site monitoring locations ranges from 1.0 m to 3.4 m from spring to fall.

N

FESTIVAL CRT
LADDER CRES
COUNTRYMAN RD
MOUNT ALBERT RD
BEECHBOROUGH CRES
WALTER PROCTOR RD
LESLIE ST
MAY AVE
FARR AVE
SHARON BLVD

CU-1 261.80
CU-2 259.6
BH S1 260.7
TR-BH201-S 261.6
TR-BH201-D 261.6
SWM-1 261.4
TR-BH101 261.0
TR-BH-10
8 May Ave. 260.9
Perm-1
MW-2 260.7
Perm-2
Perm-3
Perm-4
Perm-5
CU-MP4 258.2
BH S2 256.5
1442 Mt. Albert Rd. 258.7
1432 Mt. Albert Rd. 258.0
MW-3 259.3
CU-5S 256.4
CU-MP3 255.8
MMM12-1 255.3
MW-1 255.4
T4-8B 256.1
T4-8A 256.1
T4-8SW 256.1
COR-MP2
COR-2 256.8
COR-MP1

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0 25 50 100 150
Metres

J:\1442 Projects by Job Number\2017\17M-00407-00-HEV Sharon Corners\Mapping\MXD\Figure 9 Interpreted Seasonally High Groundwater Contours.mxd

LEGEND

- Property Boundary
- Topographic Contours (mASL)
- Interpreted Groundwater Contours (mASL)
- MESP Defined Wetland
- Newly Defined Wetland
- Private Wells
- Permeameter Test Location
- Permeameter Test Location – Not Completed
- Monitoring Well (WSP)
- MESP Monitoring Well
- MESP Mini-Piezometers

Notes:
1. Static water levels shown are the maximum recorded level up to May 8, 2018.

Client: **WYCLIFFE THORNRIDGE SHARON CORNERS LIMITED**

Title: **INTERPRETED SEASONALLY HIGH GROUNDWATER CONTOURS**

Prepared By: WSP

17M-00407-00	Scale as Shown	Review: ANK
Date: March 2022	**Figure: 9**	
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3.2.6 GROUNDWATER QUALITY

Groundwater samples were collected by WSP staff at MW1 and MW3 on October 11, 2017. The samples were analysed for general physical parameters, major ions, and dissolved metals. Dedicated polyethylene Waterra tubing was used for purging and sampling of the groundwater into laboratory prepared sample bottles. The samples were placed in a cooler with ice and transported to Maxxam Analytics under standard Chain of Custody procedures. Maxxam Analytics are a certified laboratory for examining water quality samples.

Water quality sample results are provided in Table WQ-1 in **Appendix D**. Water quality results were compared to the Ontario Drinking Water Quality Standards (ODWQS) and the Provincial Water Quality Objectives (PWQO)[3]. As shown in Table WQ-1, the concentrations of Total Dissolved Solids (TDS), hardness, sodium, and chloride in the sample collected from MW3 were greater than the aesthetic ODWQS standards for sodium. Exceedances to chloride was not detected at MW1, suggesting this exceedance in M3 may be related to road salting activities as the monitoring well is located adjacent to the road. Concentrations of all other parameters were less than the standards in the ODWQS and/or PWQO.

3.3 LOCAL HYDROGEOLOGICAL SETTING

The following discussion of the local hydrogeology is based on the information gathered during this investigation and from previous studies conducted on the property and elsewhere around the site.

The surficial fine-grained glacio-lacustrine deposits present at the site serve to limit infiltration to the groundwater system. Most of the infiltrating groundwater is anticipated to flow laterally through the upper fractured and weathered zones of the Till towards the watercourse to the west, and drain after the spring freshet. This enhanced permeability allows infiltrating groundwater to travel somewhat quickly through the shallow zone toward the watercourse.

The depth to groundwater at the site is considered to be shallow, particularly during the spring. Continuous water level data is available from two on-site private wells (1432 and 1442) Mount Albert Road with data collected between 2012 and 2016 shows groundwater typically ranging between about 0.3 and 2.5 m below grades. These data showed generally steady water level with declines observed in some years between July and late September down to about 3 to 5 m below grades (at 1442 and 1432 Mount Albert Road respectively). The large declines noted in 2016 were a result from the very dry conditions experienced in 2016.

The interpreted seasonally high groundwater elevation contours presented on **Figure 9** indicate that the water table may be found close to existing grade along the northwestern property line. The data suggests that the seasonally high water table at the southeast corner of the site by the intersection of Mount Albert Road and Leslie Street may be on the order of 2 m below existing and proposed grades. Across the majority of the site, the interpreted depth to the groundwater is less than 2 m. Whereas the depth to groundwater is interpreted to be greater at the southeast corner of the site, this area is also located immediately upgradient of the proposed retirement complex and as such water infiltrated through potential LID measures in that part of the site may potentially be intercepted by the basement sub-drainage systems under certain conditions.

[3] ODWQS are from Table 2 (Chemical Standards) and Table 4 (Chemical/Physical Objectives and Guidelines) of Technical Support Document for Ontario Drinking Water Quality Standards, Objectives and Guidelines (MOE), June 2003, revised June 2006.
PWQO are from Table 2 (Table of PWQOs and Interim PWQOs) of Water Management, Policies, Guidelines, Provincial Water Quality Objectives (MOE), July 1994, and revised February 1999.

4 WATER BALANCE

An annual water balance analysis was prepared for the property to examine the changes that would occur due to the proposed condominium development plan. The water balance was revised in April 2021 to account for changes to Phase 2 of the development (Townhouse and Urban Towns) in accordance with Design SP100, issued by RN Design Group on March 11, 2021. The water balance calculations include the revised Phase 2 development design and Phase 1 developments (Retirement Home). The water balance was carried out using precipitation and evapotranspiration data for the site provided by LSRCA for the East Holland River Subwatershed, in which the site is located (the LSRCA table is provided as an attachment in Appendix E). The site is located in an area of temperate climate mean annual precipitation of **878 mm/year** and actual evapotranspiration which varies depending on the ground cover between **594** and **606 mm/year**[4]. Across the pervious areas only under existing conditions, the water surplus is calculated at 277.5 mm/year.

The *MOE Stormwater Planning and Design Manual* (2003) offers a method to estimate the infiltration on the site, based on a local infiltration factor "i", which is applied to the available water surplus to determine the groundwater recharge for a given area with pervious cover. The methodology considers factors such as the soil type, topography, and vegetation to arrive at the infiltration factor that is then applied against the water surplus to provide an estimate of the amount of water infiltrating into the ground. The remaining water surplus is considered runoff.

Table 6 presents the infiltration factors used for the water balance. Under the post-development conditions, the infiltration factor is recalculated to account for changes in soil types (no change), vegetation and topography after development, and the infiltration and runoff at the pervious land areas are recalculated. As the land after development will have impervious surfaces that prevent infiltration, such as larger building footprints, driveways and parking areas, the pervious area available for infiltration is reduced. Furthermore, there is limited opportunity for evapotranspiration on these impervious surfaces, other than evaporative losses from wetting and ponding of water in shallow depressions, and so total precipitation is applied to these surfaces instead of the water surplus**.**

Table 6: Infiltration Factors

INFILTRATION FACTOR	PRE-DEVELOPMENT			POST-DEVELOPMENT		
	Slope	**Area (m^2)**	**i- factor**	**Slope**	**Area (m^2)**	**i-factor**
Topography	Gentle Slopes (3.3%)	28,232	0.110	Gentle Slopes (2.0%)	7,470	0.120
	Weighted Average		0.110	Weighted Average		0.120
Soils	Clayey Silt (Silt Loam)	28,232	0.200	Clayey Silt (Silt Loam)	7,470	0.200
Cover	Pasture/Shrub	15,367	0.150	Pasture/Shrub	0	0.150
	Lawns	12,865	0.100	Lawns	7,470	0.100
	Weighted Average		0.127	Weighted Average		0.100
Weighted Average i-Factor			0.437			0.420

Notes:

Grades under the post-development condition will be flatter than the existing condition, therefore the weighted infiltration factor for slope (i_{slope}) is predicted to increase from 0.11 to 0.12.

[4] Precipitation and Actual Evapotranspiration is based on data for the site provided by LSRCA (East Holland River Subwatershed). For Silt Loam, the Actual Evapotranspiration rates for Urban Lawns (594 mm/year) and Pasture/Shrubs (606 mm/year) were used in the water balance and a pervious area-weighted average of 600.5 mm/year was calculated for the pre-development (existing) condition.

The annual pre-development and post-development water balances across the entire 3.08 ha site area are presented in **Table 7** and includes a comparison of the differences in water volumes under the post-development condition (post-development minus pre-development). The analysis suggests that the post-development infiltration across the entire site will be reduced by approximately **2,534 m^3/year** from the pre-development condition. This is equivalent to about 35.8% of the total predicted annual runoff from the proposed development roofing (7,084 m^3/year). The total unmitigated runoff is predicted to increase by 13,228 m^3/year.

Table 7: Water Balance

	PRE-DEVELOPMENT			POST-DEVELOPMENT			
	URBAN LAWNS	PASTURE/ SHRUBS	WEIGHTED	URBAN LAWNS	PASTURE/ SHRUBS	WEIGHTED	DELTA
Water Balance Statistics	**mm/year**	**mm/year**	**mm/year**	**mm/year**	**mm/year**	**mm/year**	**mm/year**
Pervious Area (m^2)	12,865	15,367	28,232	7,470	0	7,470	
Precipitation	878.0	878.0	878.0	878.0	878.0	878.0	0.0
Evapotranspiration	594.0	606.0	600.5	594.0	606.0	594.0	-6.5
Surplus	284.0	272.0	277.5	284.0	272.0	284.0	+6.5
Infiltration Factor (dimensionless)			0.437			0.420	-0.017
Infiltration	124.2	118.9	121.3	119.3	114.2	119.3	-2.0
Runoff (from pervious areas)	159.8	153.1	156.2	164.7	157.8	164.7	+8.6
Site Statistics	**m^2**	**m^2**	**m^2**	**m^2**	**m^2**	**m^2**	**m^2**
Impervious Area (Roofs)			1,299			8,965	+7,665
Impervious Area (Pavement, etc.)			1,239			14,336	+13,097
Total Impervious Area			2,539			23,301	+20,762
Pervious Area (m^2)	12,865	15,367	28,232	7,470	0	7,470	-20,762
Total Site Area (m^2)			**30,771**			**30,771**	**0**
Water Volumes			**m^3/year**			**m^3/year**	**m^3/year**
Precipitation (Entire Site Area)			27,017			27,017	0
Evapotranspiration (Pervious Area)	7,642	9,312	16,954	4,437	0	4,437	-12,517
Evaporation Impervious Surfaces			223			2,046	+1,823
Runoff (Roofs)			1,027			7,084	+6,057
Runoff (Pavement, etc.)			979			11,328	+10,349
Runoff (Pervious Surfaces)	2,056	2,352	4,409	1,230	0	1,230	-3,178
Infiltration	1,597	1,827	3,425	891	0	891	-2,534
Total			**27,017**			**27,017**	**0**

Mitigation of Infiltration Losses

The site is located within WHPA-D for the Queensville Wells (**Figure 4**). There are no policies that restrict the construction of LIDs to off-set infiltration deficits in WHPA-D. The calculated post-development infiltration loss for the entire site was calculated by the water balance at 2,534 m^3/year as shown on **Table 7**. Based on our past discussions with LSRCA, there are two ways available to address these losses: mitigation, or compensation, discussed below.

Mitigation

Mitigation measures would receive relatively clean roof runoff rather than pavement runoff. The water table across the site is observed to be quite shallow which would a create a significant challenge to effectively design an infiltration system that will maintain the mandated 1.0 m minimum separation from the base of the LID to the seasonally high water table. Furthermore, the infiltration rates for the soils were determined to be quite low, with an average rate of 1.5 mm/hour obtained at ground surface. If the predicted infiltration loss of 2,534 m^3/year is to be mitigated using infiltration trenches or soak-away pits, then as noted above, approximately 35.8% of the calculated roof runoff will be needed to make up for these predicted losses in infiltration. This would reduce the increase in post-development runoff to 10,694 m^3/year from 13,228 m^3/year in the unmitigated situation (existing condition runoff is calculated as 6,415 m^3/year). The potential sizing for an infiltration structure is calculated on Table 8 using the following parameters:

Annual Precipitation:	878.0 mm/year
Evaporative Losses on Roofs:	10%
Available Runoff from Roofs:	790.2 mm/year
Design Precipitation Event:	20 mm
Design Infiltration Rate of Soils:	0.6 mm/hour
Depth of Stone Reservoir:	$d_{r\,max} = i * t_s / V_r$

Where:

$d_{r\,max}$ = Maximum stone reservoir depth (mm)
i = Infiltration rate for native soils (mm/hour)
V_r = Void space ratio for aggregate used (typically 0.4 for 50 mm clear stone)
t_s = Time to drain (design for 48 hour time to drain is recommended)

Table 8: Infiltration Sizing

TOTAL ROOF AREA M^2	35.8% ROOF AREA M^2	VOLUME OF WATER M^3/YEAR	DESIGN RAINFALL 20 MM M^3	REQUIRED VOLUME POROSITY = 40% M^3	MAX. GRANULAR BED THICKNESS M	REQUIRED BED AREA M^2
8,965	3,227	2,550	51.00	127.51	0.07	1,770.9

Notes:

[1] *A soil infiltration rate of 1.5 mm/hour is assumed based on in situ hydraulic conductivity well testing carried out at the site.*

[2] *For design purposes the 1.5 mm/hour infiltration rate was divided by a safety factor of 2.5, which presumes that the infiltration rate of the soils located within 1.5 m depth below the proposed bottom elevation of any infiltration-based LIDs is the equal to or higher than 1.5 mm/hour determined through testing. This results in a design infiltration rate of 0.6 mm/hour. Soil infiltration capacity should be confirmed at detailed design.*

Compensation

In lieu of constructing LID devices on site to mitigate the calculated loss of infiltration, LSRCA will accept monetary compensation to be used to construct appropriate LID measures elsewhere in the watershed. Policy LUP-12 of the South Georgian Bay Lake Simcoe Source Protection Plan requires that new major development (where imperviousness increases by greater than 500 m^2) within a groundwater quality threat area (WHPA-Q) only be permitted where it can be demonstrated through a hydrogeological study that the existing water balance can be maintained using LIDs.

The site is located within the limits of the Sharon Village Compensation Strategy Plan from October 2008 and for which compensation had been paid to the LSRCA (April 5, 2016). We note that WSP had discussions with LSRCA staff between June and September 2018 regarding this and LSRCA staff acknowledged that no further compensation was required for the northern portion. This was confirmed during the water balance revision work in April 2021.

Tables E-1 to E-3 in **Appendix E** present the infiltration reductions separately across the pre-approved lands in the northern portion of the site (identified on drawings as Area A, Table E-1), the remainder of the site (Area B, Table E-2), and the total infiltration loss of the entire property (Table E-3). As the pre-approved lands found within the limits of Area A have already had compensation paid in 2016 and are within previously approved development limits, the compensation payment for this application will only consider the reduction in infiltration across Area B (Table E-2 in the Appendix), which is calculated as a loss of 1,249 m^3/year (see **Table 9** below). According to the 2021 LSRCA Recharge Compensation Cost Table, compensation may be paid in the amount of $50.60 for every cubic meter of lost infiltration. This is a one-time fee. Based on Table E-2, approximately $63,199 of compensation would be due for the calculated 1,249 m^3/year reduction in infiltration across Area B. The LSRCA has confirmed that if multiple offsetting compensation payments are assessed for the same development, only the larger of the two needs to be paid. As the development has paid a phosphorous offsetting fee of $211,715, it is our understanding that there will be no requirement to pay the additional water budget compensation fee.

Table 9: Infiltration Losses for Compensation

AREA	SITE AREA (HA)	CALCULATED INFILTRATION LOSS (M^3/YEAR)	NOTES
Area A (Table E-1)	1.54	1,285	This area is included in the 2008 Sharon Village Compensation Strategy Plan
Area B (Table E-2)	1.54	1,249	Compensation required for this area
Total Area (Table E-3)	**3.08**	**2,534**	

5 DEWATERING ASSESSMENT

A dewatering assessment has been conducted for Phase 2 of the proposed development, which includes municipal servicing and Townhouse Blocks 1 to 12, to assess the potential volumes and the quality of discharge water generated from short-term construction and in consideration of long-term water management. The dewatering assessment has not considered slab-on-grade structures or municipal services within Phase 1, as these elements have already been completed.

The dewatering assessment is intended to provide a recommendation for the type of permit that is likely required for dewatering and to provide recommendations for long-term water management if required.

5.1 APPROACH AND DEWATERING POTENTIAL

The approach taken to assess the potential dewatering requirements includes an analysis of the depths of excavations required, types of soils anticipated to be encountered at the excavation levels, and potential groundwater levels.

Based on designs provided by RN Designs Limited (Drawing SP100 Dated February 17, 2022), Townhouse Blocks 1 to 6, and Block 12 have walk-out basements, while Townhouse Blocks 7 to 11, the retirement home, and the mixed-use buildings are proposed as slab on grade. Designs provided by RN Designs identify the top of basement slab elevation and the underside of footing (USF) elevations for which an assessment of short-term and long-term dewatering is based.

Short-term construction dewatering estimates are based on the lowest USF elevation between the townhouse unit USF elevation provided on the designs and 1.22 m below the proposed grade at the rear of each unit. As basements in Blocks 1 to 6, and Block 12 are proposed as walk-out units, a USF elevation for each unit (referred to as the "unit USF") has been provided by RN Designs Ltd, which represents the USF elevation for the centre and front of the property. The USF elevation at the rear of the property is planned at 1.22 m below the proposed grade (referred to as the "rear USF"). The short-term dewatering assessment has used the lowest elevation between the unit USF and the rear USF with an additional 40 cm added for the placement of granular material (see Table 10). Townhouse Blocks 7 to 11, the retirement residence, and mixed-use buildings are proposed to be slab on grade and are assumed to have an excavation depth of 0.65 m below the proposed grade (0.15 m to footing elevations with an additional 0.5 m added for granular materials).

The development is proposing approximately 582 m of storm sewers, 218 m of sanitary sewers, and 304 m of watermains as shown on **Figure 10**. Utility trenches are proposed to have invert elevations that range between approximately 254.7 masl (cover of 4.4m) in the southwest of the site to about 261.6 masl (cover of 1.2 m) in the northeast of the site. Deeper excavations for municipal servicing are along the western side of the Site where the cover is typically shown to be greater than 4 m, however the western side of the site is also associated with deeper groundwater levels. Groundwater levels across the Site range between approximately 256.0 masl at the southwest corner to about 260.5 masl at the northeast corner (see **Figure 9**). Interpreted groundwater contouring across the Site have based on the maximum recorded water levels from monitoring wells at and near to the Site up to May 8, 2018. Water levels from groundwater monitoring in December 2021 showed consistent measurements with 2018 levels and did not exceed the maximum readings used to create the contours. As a result, the presented groundwater contours represent seasonally high levels that may be encountered during the spring freshet.

Basement excavations at Townhouse Blocks 1 to 6 and Block 12 are estimated to range between 257.3 masl and 260.5 masl (based upon RN designs) compared to seasonally high groundwater levels between about 257.4 masl and 260.4 masl (see Table 10). This suggests that short-term construction dewatering may be required if construction is carried out during times of seasonally high water levels. An assessment of short-term dewatering rates based on the seasonally high groundwater levels is summarized in Section 5.2. Basement slab elevations in Townhouse Blocks 1 to 6 and Block 12 are proposed to range between 258.2 masl and 261.2 masl, which have been assessed as remaining above seasonally high groundwater levels by between 0.5 m and 1.3 m (see **Figure 11**). This suggests that long-term dewatering through foundation drain systems will not likely be required at the development. Table 10 compares

the interpreted seasonally high groundwater levels, finished basement slab elevations, and the lowest USF elevation in order to identify dewatering potential in the development.

Table 10 - Basement and USF Elevations Relative to Groundwater

Sharon Corners

	Above Groundwater by more than 0.5 m
	Above Groundwater by less than 0.5 m
	Below Groundwater

Column	A	B	C	D	E	F	G	H	I	J	K
Building Lot ID	**Expected Seasonally High Water Level** *(based on highest level at location of rear of house)*	**Top of Basement Slab Elevation**	**Base Elevation of Basement Slab**	**Predicted distance between base of basement slab elevation and spring water levels**	**USF of House**	**Elevation at Rear of House**	**USFR (Elev at Rear of House-1.22)**	**Lowest USF between USF of house and USFR**	**Bottom of Excavation for Foundations**	**Predicted distance between lowest USF elevation and spring water levels**	**Predicted distance between Bottom of Excavation for foundations and spring water levels**
	masl	*masl*	*masl*	*m*	*masl*	*masl*	*masl*	*masl*	*masl*	*m*	*m*
East Lot	260.45	261.30	261.22	0.77	261.00	261.12	259.90	259.90	259.50	-0.55	-0.95
Block 1	260.40	261.30	261.22	0.82	261.00	261.10	259.88	259.88	259.48	-0.52	-0.92
	260.40	261.30	261.22	0.82	261.00	261.00	259.78	259.78	259.38	-0.62	-1.02
	260.30	261.10	261.02	0.72	260.80	260.90	259.68	259.68	259.28	-0.62	-1.02
West Lot	260.20	261.10	261.02	0.82	260.80	260.90	259.68	259.68	259.28	-0.52	-0.92
East Lot	260.10	260.90	260.82	0.72	260.60	260.75	259.53	259.53	259.13	-0.57	-0.97
Block 2	260.10	260.90	260.82	0.72	260.60	260.52	259.30	259.30	258.90	-0.80	-1.20
	260.00	260.90	260.82	0.82	260.60	260.52	259.30	259.30	258.90	-0.70	-1.10
	259.80	260.90	260.82	1.02	260.60	260.33	259.11	259.11	258.71	-0.69	-1.09
	259.70	260.90	260.82	1.12	260.60	260.33	259.11	259.11	258.71	-0.59	-0.99
West Lot	259.60	260.90	260.82	1.22	260.60	260.33	259.11	259.11	258.71	-0.49	-0.89
East Lot	259.60	260.80	260.72	1.12	260.50	260.61	259.39	259.39	258.99	-0.21	-0.61
Block 3	259.60	260.80	260.72	1.12	260.50	260.65	259.43	259.43	259.03	-0.17	-0.57
	259.50	260.80	260.72	1.22	260.50	260.61	259.39	259.39	258.99	-0.11	-0.51
	259.40	260.80	260.72	1.32	260.50	260.42	259.20	259.20	258.80	-0.20	-0.60
	259.30	260.60	260.52	1.22	260.30	260.42	259.20	259.20	258.80	-0.10	-0.50
West Lot	259.30	260.60	260.52	1.22	260.30	260.23	259.01	259.01	258.61	-0.29	-0.69
East Lot	259.20	260.15	260.07	0.87	259.85	260.00	258.78	258.78	258.38	-0.42	-0.82
Block 4	259.10	260.15	260.07	0.97	259.85	260.00	258.78	258.78	258.38	-0.32	-0.72
	259.00	260.15	260.07	1.07	259.85	260.00	258.78	258.78	258.38	-0.22	-0.62
	259.00	260.15	260.07	1.07	259.85	260.00	258.78	258.78	258.38	-0.22	-0.62
	258.90	260.15	260.07	1.17	259.85	260.00	258.78	258.78	258.38	-0.12	-0.52
West Lot	258.80	260.15	260.07	1.27	259.85	259.95	258.73	258.73	258.33	-0.07	-0.47
East Lot	258.70	259.40	259.32	0.62	259.10	259.70	258.48	258.48	258.08	-0.22	-0.62
Block 5	258.60	259.40	259.32	0.72	259.10	259.75	258.53	258.53	258.13	-0.07	-0.47
	258.50	259.10	259.02	0.52	258.80	259.90	258.68	258.68	258.28	0.18	-0.22
	258.50	259.10	259.02	0.52	258.80	260.00	258.78	258.78	258.38	0.28	-0.12
	258.40	259.10	259.02	0.62	258.80	260.15	258.93	258.80	258.40	0.40	0.00
West Lot	258.30	259.10	259.02	0.72	258.80	260.05	258.83	258.80	258.40	0.50	0.10
East Lot	258.30	258.90	258.82	0.52	258.60	259.80	258.58	258.58	258.18	0.28	-0.12
Block 6	258.20	258.80	258.72	0.52	258.50	259.70	258.48	258.48	258.08	0.28	-0.12
	258.00	258.60	258.52	0.52	258.30	259.80	258.58	258.30	257.90	0.30	-0.10
	258.00	258.60	258.52	0.52	258.30	259.65	258.43	258.30	257.90	0.30	-0.10
	257.80	258.60	258.52	0.72	258.30	259.60	258.38	258.30	257.90	0.50	0.10
	257.60	258.20	258.12	0.52	257.90	259.50	258.28	257.90	257.50	0.30	-0.10
	257.50	258.20	258.12	0.62	257.90	259.50	258.28	257.90	257.50	0.40	0.00
West Lot	257.40	258.00	257.92	0.52	257.70	259.45	258.23	257.70	257.30	0.30	-0.10
East Lot	260.40	261.20	261.12	0.72	260.90	262.90	261.68	260.90	260.50	0.50	0.10
Block 12	260.30	261.20	261.12	0.82	260.90	262.80	261.58	260.90	260.50	0.60	0.20
	260.30	261.20	261.12	0.82	260.90	262.70	261.48	260.90	260.50	0.60	0.20
	260.20	260.80	260.72	0.52	260.50	262.45	261.23	260.50	260.10	0.30	-0.10
West Lot	260.20	260.80	260.72	0.52	260.50	262.30	261.08	260.50	260.10	0.30	-0.10

Notes:

Elevations provided by RN Designs on February 17, 2022 - Site Plan Drawings SP100

Basement Slab Thickness confirmed by RN Design as 8 cm thickness

Lowest USF elevation is considered the lowest elevation between the House USF elevation and the Rear of the House Elevation minus 1.22 m

The Bottom of excavation has assumed 40 cm below the lowest USF elevation. This applies for short-term construction of the foundations

Column D represents how far above the basements will be above groundwater in metres

Column K represents how how much distance (in metres) between the base of excavation and groundwater, intended for short-term construction dewatering only

LEGEND

- PROPERTY BOUNDARY
- SITE PLAN (APPROXIMATE)
- SANITARY SEWER LINE
- STORM SEWER LINE
- WATERMAIN

Notes:
Municipal servicing based on servicing designs SS1 dated September 2021

N
W E
S

10 5 0 10 Metres

CLIENT:

WYCLIFFE THRONRIDGE SHARON CORNERS LIMITED

PROJECT:

Sharon Corners Development

PROJECT NO:	DATE:
17M-00407-03	OCTOBER 2021

DESIGNED BY:
-

DRAWN BY:
TP

CHECKED BY:
-

FIGURE NO:	SCALE:
10	1:1,250

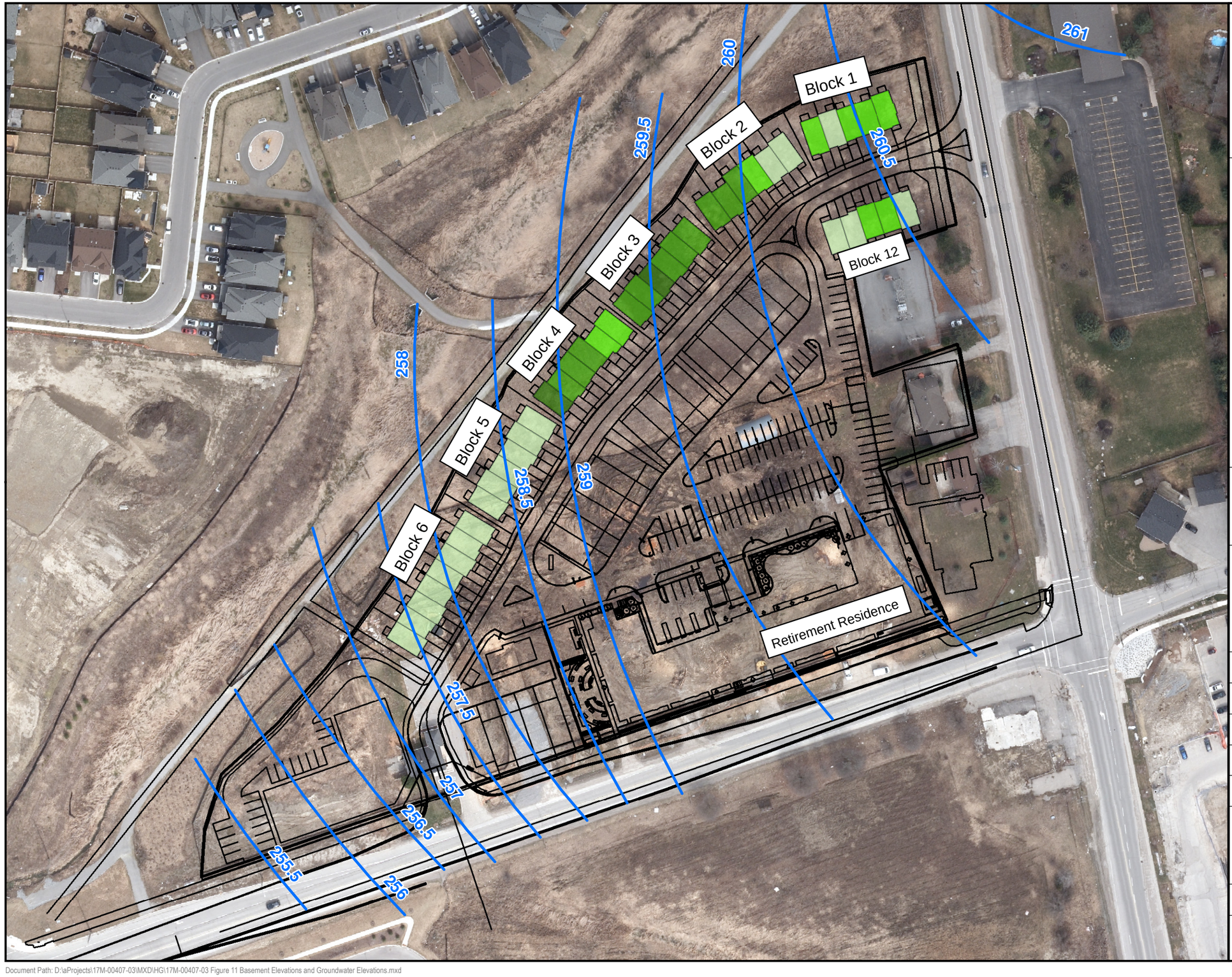
TITLE:

Municipal Servicing Plan

DISCIPLINE:
ENVIRONMENT

ISSUE:	REV.:
Figure 10	-

Document Path: D:\aProjects\17M-00407-03\MXD\17M-00407-03 Figure 1 Municipal Servicing.mxd



wsp

LEGEND

- PROPERTY BOUNDARY
- SITE PLAN (APPROXIMATE)
- 0.50 - 0.74 m ABOVE GROUNDWATER
- 0.75 - 0.99 m ABOVE GROUNDWATER
- 1.00 - 1.25 m ABOVE GROUNDWATER
- 1.25 - 1.32 m ABOVE GROUNDWATER
- INTERPRETED GROUNDWATER CONTOURS

Note:
Color Scale relates to the estimated distance between the base of the basement slab elevation to interpreted seasonally high groundwater elevations.
Groundwater contours are based on historical high water levels up to May 2018

N W E S

10 5 0 10 Metres

CLIENT:
WYCLIFFE THORNRIDGE
SHARON CORNERS LIMITED

PROJECT:
SHARON CORNERS
DEVELOPMENT

PROJECT NO:	DATE:
17M-00407-03	MARCH 2022

DESIGNED BY: -

DRAWN BY: TP

CHECKED BY: -

FIGURE NO:	SCALE:
11	1:1,250

TITLE:
BASEMENT ELEVATIONS
COMPARED TO
GROUNDWATER LEVELS

DISCIPLINE:
ENVIRONMENT

ISSUE:	REV.:
-	-

Document Path: D:\aProjects\17M-00407-03\MXD\HG\17M-00407-03 Figure 11 Basement Elevations and Groundwater Elevations.mxd

Excavations for residential basements and municipal servicing trenches have been interpreted as being contained within fine-grained deposits composed of Clay, Silty Clay and Silty Clay Till (Newmarket Till). Based on borehole logs generated by WSP (2017) and Soil Engineers Ltd. (2008), a fine-grained glacio-lacustrine deposit consisting of Clay to Silty Clay was found to extend to elevations ranging between approximately 246 masl and 258 masl (see Section 3.2.1) with deposits of glacial till (Sandy Silt Till to Silty Sand Till) contained within and underlying the glacio-lacustrine deposits, extending to elevations of approximately 239 masl (See **Figure 7** and **Figure 8**). Excavations of residential buildings have been proposed to range between 257.3 masl and 261.7 masl, therefore all excavations are expected to terminate within the Clay, Silty Clay, and Silty Clay Till.

Hydraulic conductivity inputs to the assessment are based on single well response testing by WSP in October 2017 from three monitoring wells across the site. All three monitoring wells are screened within fine-grained deposits (two of the monitoring wells are screened in a Silt to Clayey Silt, while one monitoring well is screened in a Silt Till), which is considered representative of soil conditions within the excavation footprint of the proposed development. Hydraulic conductivity for this material is estimated to have a geometric mean of 4.3×10^{-8} m/sec. The dewatering assessment has assumed an unconfined condition in the Newmarket Till with the base of the aquifer considered to be at 250 masl.

The dewatering assessment estimates pumping rates for construction of each Townhouse Block as a single unit. This method is conservative as it considers the lowest excavation elevation for that Block and the highest groundwater level at each Block. The dewatering assessment has been based on the construction dewatering methods by Powers (1992) in an unconfined condition. The assessment has considered only the horizontal flow though the glacio-lacustrine deposits at a hydraulic conductivity of 4.3×10^{-8} m/sec and has not factored in vertical flow. Vertical gradients calculated at Mini-piezometers south of the site show primarily downwards gradients and with the absence of confined aquifers, the influence of upwards flow is minimal and therefore upward flow was not included in the dewatering assessment calculations. While the short-term dewatering assessment has estimated pumping rates on a block basis, Table 10 provides further comparisons of excavation depths with groundwater levels on a unit basis. Blocks 1 to 6 and Block 12 show that excavations may be up to 1.3 m below groundwater. Basement excavations at Townhouse Blocks 1 to 4 show the largest distance between excavation and groundwater levels with a range between 0.5 m and 1.3 m within groundwater. Townhouse Blocks 5, 6 and 12 show excavation depths marginally below groundwater for some units ranging between 10 cm and 60 cm below groundwater. Three units at Block 12 and one unit each in Block 5 and Block 6 are identified as remaining above groundwater (**Figure 11**).

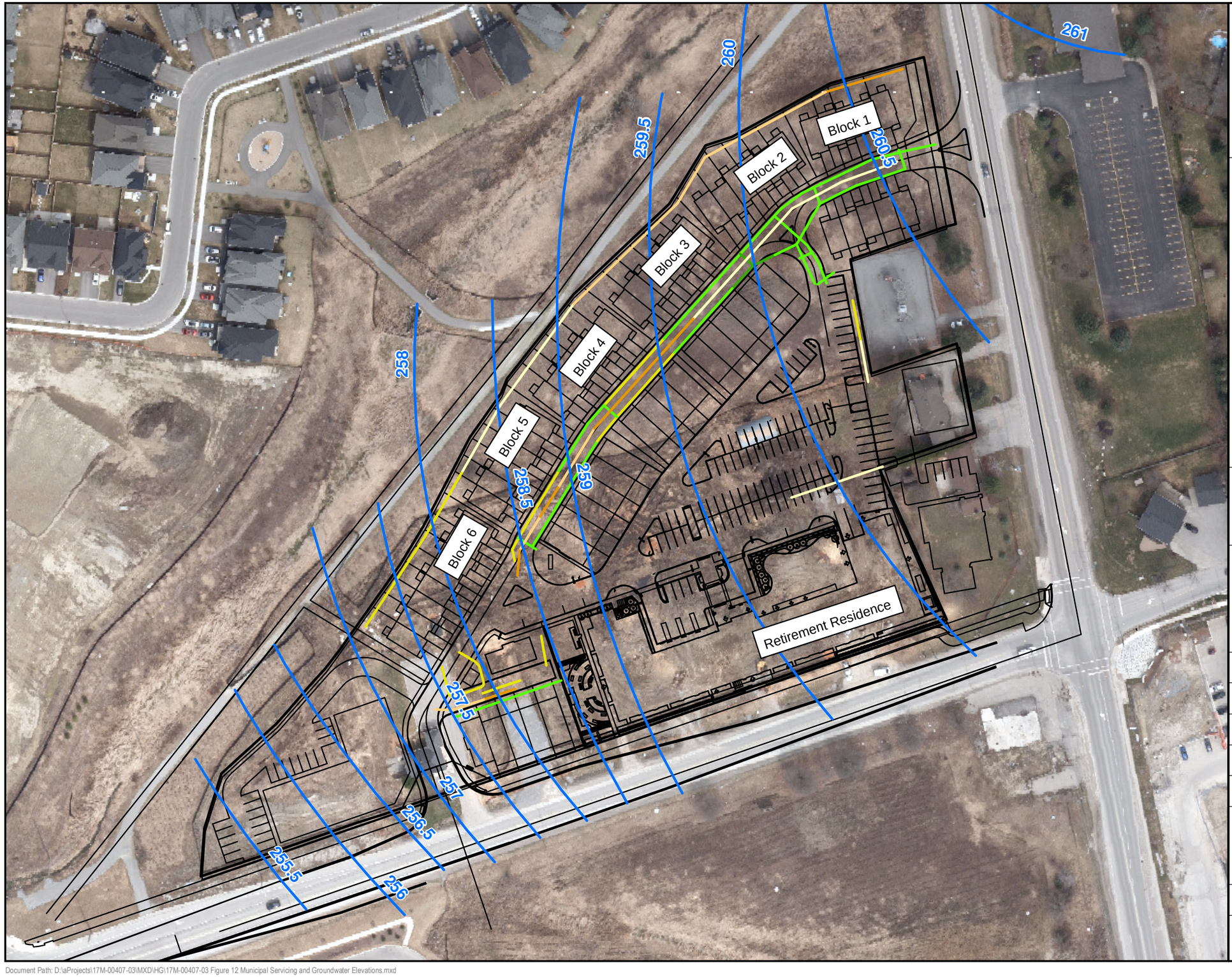
Figure 12 provides a comparison between utility trench excavations and seasonally high groundwater levels to identify the areas of the site where construction dewatering may be needed. The storm sewer along the north end of the property at the rear of Townhouse Blocks 1 to 6, as well as the Sanitary Sewer along the front of Townhouse Blocks 1 to 6 have been identified as likely requiring dewatering, with excavations potentially being below groundwater between 1 m and 3 m. Adjacent services along the fronts of Townhouse Blocks 1 to 6 are identified as remaining above groundwater and are not likely to need dewatering during construction. The dewatering assessment has considered a 50 metre section of utility servicing at the north end of the site along the rear of Townhouse Blocks 1 and 2 to estimate pumping rates. This is a conservative section, however in order to identify the appropriate type of dewatering permit, an assessment with the worst-case rates is recommended.

A conservative factor of safety (FoS) approach has been incorporated into the dewatering assessment by increasing the hydraulic conductivity of the soils by one order of magnitude. This FoS approach accounts for unforeseen groundwater and soil conditions, and allows for a temporary, higher volume pumping in cases where this may occur. Conservative rates are presented as a steady-state rate. While anticipated rates are based on site conditions, the conservative FoS rates are recommended for ensuring that the required permitting is obtained.

The dewatering assessment is intended to predict the type of permitting that may be required for the development. If dewatering rates exceed 50,000 litres/day, permitting will be required. Registration on the Environmental Activity and Sector Registry (EASR) is required if the combined rates are less than 400,000 litres/day. A Permit to Take Water (PTTW) would be required if the rates exceed 400,000 litres/day during construction, or higher than 50,000 Litres/day are actively pumped on a long-term basis. As the assessment has identified that long-term dewatering is not required because the basements are proposed to be constructed above the seasonally high groundwater table, a PTTW will not be required for long-term water management. EASR registration requires dewatering and discharge plans be prepared by qualified personnel and can be submitted prior to the start of dewatering without agency review.

The short term construction dewatering assessment has considered the following parameters and assumptions in the calculations:

- Each Townhouse Block has been assessed as a single unit, where inputs to the calculation have considered the highest groundwater level and lowest excavation elevation for each Townhouse Block:
- The assessment has assumed a total excavation elevation as the lower elevation between the unit USF and rear of the house USF (proposed grade minus 1.22 m) with an additional 40 cm of granular material added. This assumption has been employed for Townhouse Blocks 1 to 6, and Block 12. Excavations for slab on grade buildings (Townhouse Blocks 7 to 11) have been assessed as 0.65 m below the front of the house, which includes an assumption that the footings are 0.15 m below the proposed grade of the front of the unit with an additional 0.5 m added for the placement of granular material;
- A geometric mean of 4.3×10^{-8} m/sec has been used for hydraulic conductivity which is representative of soils across the site;
- Utility trench excavations are restricted to an open section of no more than 50 m in length and 2 metres in width at one time;
- Utility trench excavations for sanitary, storm and watermains have been assessed with a 50 m length and a 2 m width trench. The assessment has assumed that the estimated pumping rates for trench excavations apply to all types of municipal services. The 50 m section that was used in the dewatering assessment is along the northeast of the site within the area with the highest groundwater and deepest invert elevation of servicing, and therefore represents the worst-case scenario for utility trench dewatering;
- Factor of Safety (Conservative Rates) have been presented as both steady-state rates and initial pumping rates. Initial Factor of Safety Rates are used to identify appropriate permitting. The FOS is increasing the hydraulic conductivity by one order of magnitude;
- The base of the aquifer is assumed to be at 250 m for the purpose of this investigation. Although there is some supporting evidence to support the presence of fine-grained sediments extending deeper (approximately 239 masl), the Oak Ridge Moraine Groundwater Program (ORMGP) stratigraphic model places the base of the Newmarket Till in the vicinity of the site at 250 masl. This is consistent with several borehole logs from on-site drilling. The assumed bottom of the aquifer is below the planned depth of dewatering;
- The aquifer is assumed to be infinite in horizontal extent. In reality, the extent of the aquifer is limited by high horizontal variability of glacial deposits;
- It was assumed that dewatering occurs across the full vertical extent of the aquifer (i.e., assumes fully penetrating wells). In practice, dewatering will occur only a limited thickness within the upper portion of the aquifer; and,
- Based on the comparison between the finished basement elevations provided by RN Designs and interpreted seasonally high groundwater levels, long-term dewatering rates are not required as the basement slab elevation is proposed above the high water table and therefore have not been further discussed in this section.



LEGEND

- PROPERTY BOUNDARY
- SITE PLAN (APPROXIMATE)
- INTERPRETED GROUNDWATER CONTOURS
- 3.0 -3.99 m BELOW GROUNDWATER
- 2.0 -2.99 m BELOW GROUNDWATER
- 1.0 -1.99 m BELOW GROUNDWATER
- 0 - 0.99 m BELOW GROUNDWATER
- 0 - 0.99 m ABOVE GROUNDWATER
- 1 - 1.99 m ABOVE GROUNDWATER

N W E S

10 5 0 10 Metres

CLIENT:
WYCLIFFE THORNRIDGE
SHARON CORNERS LIMITED

PROJECT:
SHARON CORNERS
DEVELOPMENT

PROJECT NO:	DATE:
17M-00407-03	MARCH 2022

DESIGNED BY: -

DRAWN BY: TP

CHECKED BY: -

FIGURE NO:	SCALE:
12	1:1,250

TITLE:
MUNICIPAL TRENCH EXCAVATION ELEVATIONS
COMPARED TO
GROUNDWATER ELEVATIONS

DISCIPLINE:
ENVIRONMENT

ISSUE:	REV.:
-	-

Document Path: D:\aProjects\17M-00407-03\MXD\HG\17M-00407-03 Figure 12 Municipal Servicing and Groundwater Elevations.mxd

Table 11: Short-Term and Long-Term Dewatering Summary - Sharon Corners Development

		Residential Units with Basements							Residential Units Slab on Grade				
Reference Area	**Municipal Servicing**	**Townhouse Block 1**	**Townhouse Block 2**	**Townhouse Block 3**	**Townhouse Block 4**	**Townhouse Block 5**	**Townhouse Block 6**	**Townhouse Block 12**	**Townhouse Block 7**	**Townhouse Block 8**	**Townhouse Block 9**	**Townhouse Block 10**	**Townhouse Block 11**
Location	70 m Segment at STM CBMH38	Block 1 (5 Units)	Block 2 (6 Units)	Block 3 (6 Units)	Block 4 (6 Units)	Block 5 (6 Units)	Block 5 (8 Units)	Block 12 (5 Units)	Block 7 (5 Units)	Block 8 (5 Units)	Block 9 (12 Units)	Block 10 (8 Units)	Block 11 (12 Units)
Length *(m)*	70 m	31.1 m x 11 m	37 m x 11 m	37 m x 11 m	37 m x 12 m	37 m x 12 m	49.5 m x 12 m	31.1 m x 11 m	33.5 m x 15 m	7.4 m x 15.5 m	40.6 m x 15.2 m	26.6 m x 15.0 m	40.0 m x 15.0 m
Construction Element	Linear	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular
Soil	Expected to be within Silt, Silt Till and Clayey Silt material	Expected to be within Silt, Silt Till and Clayey Silt material	Expected to be within Silt, Silt Till and Clayey Silt material	Expected to be within Silt, Silt Till and Clayey Silt material	Expected to be within Silt, Silt Till and Clayey Silt material	Expected to be within Silt, and Silt Till. Thin layer of Silty Sand at surface	Expected to be within Silt, and Silt Till. Thin layer of Silty Sand at surface	Expected to be within Silt, and Silt Till. Thin layer of Silty Sand at surface	Expected to be within Silt, and Silt Till. Thin layer of Silty Sand at surface	Silt Till to Silt with surficial sands.	Silt Till to Silt with surficial sands.	Expected to be within Silt, Silt Till and Clayey Silt material	Expected to be within Silt, Silt Till and Clayey Silt material
Aquifer Type	Unconfined	Unconfined	Unconfined	Unconfined	Unconfined	Unconfined	Unconfined	Unconfined	Unconfined	Unconfined	Unconfined	Unconfined	Unconfined
Hydraulic Conductivity *(m/sec)*	4.3E-08	4.3E-08	4.3E-08	4.3E-08	4.3E-08	4.3E-08	4.3E-08	4.3E-08	4.3E-08	4.3E-08	4.3E-08	4.3E-08	4.3E-08
Excavation Elevation *(masl)*	256.9	259.3	258.7	258.6	258.3	258.1	257.3	260.1	259.1	259.0	259.85	260.95	261.65
Initial Groundwater Elevation *(masl)*	260.5	260.5	260.1	259.6	259.2	258.7	258.3	260.4	258.4	258.1	259.2	259.5	260
Aquifer Base *(masl)*	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250	250	250
ZOI *(m)*	7.9	11.2	12.2	12.5	12.4	12.1	14.4	10.6	NA	NA	NA	NA	NA
Short-Term Steady State Rate "Q" *(Anticipated Condition LPD)*	12,560	4,005	4,168	4,166	3,998	3,740	4,115	4,059	No Dewatering	No Dewatering	No Dewatering	No Dewatering	No Dewatering
Short-Term Initial Rate "Q" *(Anticipated Condition LPD)*	***18,839***	***6,008***	***6,251***	***6,249***	***5,997***	***5,610***	***6,172***	***6,089***	No Dewatering	No Dewatering	No Dewatering	No Dewatering	No Dewatering
Short-Term Steady-State Rate "Q" *(Factor of Safety Rate 10xK LPD)*	41,802	13,547	14,174	13,870	13,235	12,234	13,617	13,078	No Dewatering	No Dewatering	No Dewatering	No Dewatering	No Dewatering
Short-Term Initial Rate "Q" *(Factor of Safety Rate 10xK LPD)*	**62,703**	**20,321**	**21,260**	**20,804**	**19,852**	**18,350**	**20,425**	**19,617**	No Dewatering	No Dewatering	No Dewatering	No Dewatering	No Dewatering
Long-Term Rate "Q" *(LPD)*	-	No Dewatering	No Dewatering	No Dewatering	No Dewatering	No Dewatering	No Dewatering	No Dewatering	-	-	-	-	-

Notes:
Yellow highlighted rates represent worst-case scenario pumping rates for which permitting should be based upon

5.3 DISCHARGE MITIGATION AND MONITORING

Since the dewatering volumes are estimated to be relatively low, the discharge may be directed into the Town of East Gwillimbury's sewer system subject to a discharge approval permit issued by the Town. The discharge will need to be monitored for quality and shall comply to the standards set out by the Town and the York Region. While the Town of East Gwillimbury does not have a specific Sewer-Use Bylaw, standards for discharge water quality should be based on the York Regions Sewer-Use Bylaws and should be expected to be approved by the Town. Water quality sampling in October 2017 from two monitoring wells (MW1 and MW2) identified that concentrations of chloride, sodium, hardness and total dissolved solids (TDS) were greater than ODWQS values. Although total suspended solids (TSS) was not measured during water quality sampling in 2017, treatment of TSS is likely to be required prior to discharge. Filtering the discharge through a fine mesh filter bag is a typical option that can be employed to reduce TSS concentrations. Additional mitigation measures such as fractionation tanks or flocculants may be required if filtering alone does not lower the suspended solids to guideline levels. Although the 2017 sample has provided water quality results, a more recent groundwater sample should be collected to support the discharge permit. We recommend a groundwater sample be collected and analyzed against the York Regions Sewer-Use Bylaws within 9 months of applying for a discharge permit.

Chloride concentrations of 460 mg/L was measured in monitoring well MW3 along the southwest side of the site, which is greater than the ODWQS of 250 mg/L. As MW3 is located next to Mount Albert Road, the water quality may reflect local conditions and not the overall water quality of the Site. The Town of East Gwillimbury will be consulted to confirm if this water can be discharged to surface water or if it can be discharged to sanitary sewers.

5.4 PROPOSED DEWATERING MONITORING PLAN

Groundwater seepage into basement and utility trench excavations during the construction phase of the project is not anticipated to be significant and is expected to be within the limits of an EASR. While the sequence of construction and number of excavations open at any one point in time are unknown at this time, estimated rates suggest that an EASR will likely be required. A dewatering monitoring plan is recommended during dewatering operations to mitigate potential environmental impacts. The following monitoring components are recommended as part of the dewatering monitoring plan:

— Groundwater level monitoring

— Quantify dewatering volumes

— Groundwater quality monitoring

— Settlement analysis

— Environmental inspection

— Mitigation and adaptive management

These items are discussed in subsequent sections and summarized in **Table 12**.

5.4.1 GROUNDWATER LEVEL MONITORING

Groundwater level monitoring is recommended at available monitoring wells in the vicinity of the site prior to construction, during dewatering activities and post-construction in order to monitor fluctuations in groundwater elevations during dewatering with baseline conditions recorded prior to construction. Groundwater monitoring in December 2021 has identified that two of the three monitoring wells on-site are no longer operational, however a number of monitoring wells and mini-piezometer stations (MPs) installed between 2006 and 2008 as part of the MESP study in the wetland north of the site continue to be operational. A suggested groundwater level monitoring program is proposed as follows:

- Groundwater levels from available monitoring stations are recommended to be measured once before the start of construction, and monthly during construction unless dewatering volumes exceed 50,000 LPD, in which monitoring should be increased to a weekly schedule. Groundwater level monitoring should be conducted monthly upon completion of dewatering for a period of six months;
- If dewatering discharge is proposed to be discharged to any natural areas in the vicinity of the Site, appropriate authorization and permitting will be required; and,
- If monitoring wells are damaged or non-operational, they should be decommissioned in accordance with O.Reg. 903.

5.4.2 DEWATERING DISCHARGE

Dewatering volumes should be recorded on a daily basis during construction regardless of discharge volume. The values shall be submitted to MECP on an annual basis as part of the reporting requirements for the EASR.

5.4.3 GROUNDWATER AND SURFACE WATER QUALITY

Groundwater and/or surface water quality sampling during construction is recommended to ensure that the dewatering discharge meets The Regional Municipality of York's Sewer-Use Bylaw (Bylaw 2011-56) and/or the Provincial Water Quality Objectives depending on the receptor. If discharge is to be directed toward natural areas the intention of natural flow to the tributary, dewatering discharge quality must meet PWQO's. If dewatering discharge is proposed to be directed to the sewer system in the Community of Sharon, discharge quality will need to comply with York Region's sewer use bylaw. A suggested program for water quality monitoring is proposed as follows:

- One sample of dewatering volumes to be tested for parameters required by York Region's Sewer-Use Bylaws and PWQO prior to discharge to confirm compliance. Annual sampling with testing for parameters in York Regions Sewer-Use Bylaws and PWQO is to be undertaken to maintain ongoing compliance to the standards;
- Annual sampling of dewatering volumes to be tested for parameters required by York Region's Sewer-Use Bylaws and /or PWQO (depending on receptor) prior to discharge to confirm compliance;
- Weekly sampling of dewatering volumes to be tested for TSS, metals and parameters of concern identified in previous sampling events;
- Annual surface water quality sampling from the tributary of Sharon Creek if discharge is being directed to this tributary. Samples are to be taken upstream and downstream of the discharge point; and,
- Field testing of dewatering volumes on a daily basis during dewatering for conductivity, pH, temperature and turbidity to assess changes over time.

A sewer discharge agreement with York Region will be required prior to discharge to the sewer. A sampling port will need to be installed for collection of samples. Field testing shall be carried out on a daily basis for electrical conductivity, pH, and turbidity. **Table 12** summarizes the recommended monitoring program.

The program for surface water monitoring should be re-visited by a qualified hydrologist at the time of preparing a report to support an EASR application.

Table 12: Summary of Monitoring Program

	BASELINE	CONSTRUCTION		POST CONSTRUCTION
		< 50,000 L/DAY	> 50,000 L/DAY	
Groundwater Levels	At least once	Monthly	Weekly	Seasonally for six months
Dewatering Volumes	None	Daily	Daily	None
Water Quality (Sewer Use)	None	Once Prior to Discharge, monthly thereafter	Once Prior to Discharge, annually thereafter	None
Water Quality (Parameters of Concern)	None	Weekly for the first month, monthly thereafter	Weekly for the first month, monthly thereafter	None
Field Water Quality	None	Daily	Daily	None

5.4.4 SETTLEMENT ANALYSIS

A ground settlement analysis should be carried out as a part of an EASR application to identify impacts to surrounding structures within the potential groundwater Zone of Influence (ZOI) from temporary construction dewatering activities. The ZOI for each townhouse block dewatering was estimated to be between 10.6 m and 14.4 m from the centre of the Townhouse block, which may extend beneath the adjacent townhouse blocks. Settlement potential of townhouse blocks is recommended to be reviewed by a geotechnical engineer.

5.4.5 ENVIRONMENTAL SITE INSPECTION

An environmental site inspection will take place on a regular basis during construction dewatering periods. Onsite groundwater management will be inspected in terms of compliance with best practices. These will include the volumes and rates of groundwater taking and the quality of groundwater discharge. Effectiveness of erosion and sediment control measures shall also be inspected, where required.

5.4.6 MITIGATION

Water quality sampling in October 2017 identified that concentrations of chloride, hardness and dissolved sodium were greater than the Aesthetic Objectives of the ODWQS. Parameter concentrations were not greater than the PWQO's. Although the results of groundwater sampling were not compared to York Region's Sewer-Use Bylaws, a review of measured analytes relative to the Bylaw standards show that measured concentrations are less than the established standards. Based on this, dewatering discharge is expected to meet either the PWQO or Sewer-Use Bylaws criteria. Although no impacts are expected to occur to nearby receptors, recommendations for the following mitigation measures are as follows:

- Implementation of erosion and sediment control measures, including silt fencing, sediment bags, splash pads and other relevant measures are to be installed at the site;
- If discharge quality sampling identifies concentrations greater than the Sewer-Use Bylaws or PWQO criteria, the discharge location can be changed accordingly; and,
- Treatment options may be implemented if concentrations are observed to be greater than the Sewer-Us Bylaw or PWQO criteria and changing the discharge location does not change this result.

A more recent groundwater sample should be collected to confirm these results.

5.4.7 ADAPTIVE MANAGEMENT

The intent of the monitoring plan is to conduct a comprehensive program that will continually assess the effects of dewatering on nearby receptors. Minor adjustments to the monitoring and mitigation strategies will likely be required over time. The analysis of qualitative and quantitative data from the monitoring program will be used to adaptively adjust monitoring variables, frequency of sampling, operational rules and mitigation.

6 CONCLUSIONS AND RECOMMENDATIONS

A hydrogeological investigation, water balance and dewatering assessment was conducted for the proposed residential subdivision located at the intersection of Leslie Street and Mount Albert Road in the Community of Sharon, Ontario. The initial hydrogeological investigation and water balance was carried out in March 2019 and included Phase 1 (Retirement Residence and Mixed-use Buildings) and Phase 2 (Townhouse developments). The water balance was revised in November 2021 for Phase 2 due to design changes in the townhouses, and a dewatering assessment was carried out at the same time on Phase 2 of the development to estimate short-term pumping rates from utility trench and basement excavations. It is our understanding that an assessment of Phase 1 excavation dewatering was not included because they have been completed.

Results of this hydrogeological investigation has determined the following:

- Borehole drilling by Soil Engineers Limited and WSP has identified the primary soil composition to consist of a Silty Clay to Clay glaciolacustrine deposit that extends to between 246 masl and 258 masl. This Silty Clay deposit overlies the Newmarket Till, which is composed of a Sandy Silt Till to Silty Clay Till. Residential basements and utility trenches are proposed to be excavated to between 257 masl and 262 masl, dominantly terminated within the Silty Clay;
- Eight soil samples were collected during the borehole drilling program and were submitted for grain size distribution analysis, which were used to estimate hydraulic conductivity and to classify the soils as inputs into the water balance and dewatering assessment. Estimated hydraulic conductivities of the soil based on the Hazen approximation showed a range between 4.0×10^{-8} m/sec and 7.8×10^{-8} m/sec with a geometric mean of the Silty Clay deposit of 5.8×10^{-8} m/sec. Three single well response tests (falling and rising head tests) were carried out at on-site monitoring wells MW1, MW2, and MW3, which produced an estimated geometric mean hydraulic conductivity value of 4.3×10^{-8} m/sec. This value has been used as the input into the dewatering assessment;
- Groundwater levels at the site have been collected on a quarterly basis between 2006 and 2019, which have been used to produce interpreted seasonally high groundwater contours. One groundwater monitoring event was carried out in December 2021 to confirm that recent groundwater levels are consistent with previous readings. Groundwater elevations on-site are observed to range between about 256 masl in the southwest corner to about 261 masl at the northeast corner of the Site. Groundwater flow is interpreted to the southwest at a horizontal gradient of 0.0135 m/m. Based on mini-piezometer stations installed in the vicinity of the Site, downwards vertical gradients are observed at the south of the site, while upwards vertical gradients are observed during spring events within Sharon Creek north of the site. The dewatering assessment has not considered vertical flow to be a contributing factor in basement dewatering;
- Basement elevations of townhouses are proposed to be higher than an elevation of 257.9 masl, which is more than 0.5 m above the interpreted seasonally high groundwater levels. As a result, long-term dewatering at residential properties through the use of foundation drain collectors is not anticipated;
- The water balance has estimated an infiltration deficit of 2,534 m^3/year for the full 3.1 ha site, which represents a 74% decrease in infiltration compared to the pre-development condition. Given the site has a high water table with low hydraulic conductivity soils, mitigating infiltration losses through LIDs is not recommended. The LSRCA allows compensation to be paid in lieu of mitigation measures in accordance with the South Georgian Bay Lake Simcoe Source Protection Plan. As a portion of the Site resides within the Sharon Village Compensation Strategy Plan (Area A) for which compensation has already been paid, the remainder of the site (Area B) is the only portion for which compensation will be paid in lieu of infiltration losses. Infiltration losses in this area of the Site is estimated at 1,249 m^3/year, which equates to $63,199 in compensation liable. However, as the LSRCA has confirmed that if multiple offsetting compensation payments are assessed for the same development, only the larger of the two needs to be paid. As the development has paid a phosphorous offsetting fee of $211,715, it is our understanding that there will be no requirement to pay the additional water budget compensation fee; and,

- Initial and steady-state conservative (FoS) pumping rates for short-term construction of residential basements in Phase 2 are estimated to range between 18,350 litres/day and 21,260 LPD (initial rates) and between 12,234 LPD and 14,174 LPD (steady-state). Initial and steady-state conservative rates for a 50 m long utility trench excavation is estimated at 62,703 LPD and 41,802 LPD respectively. The assessment has identified that an EASR is likely to be required as conservative rates exceed 50,000 LPD. Given the exact excavation sequence is unknown it should be noted that if construction requires multiple excavations open at one time that cumulatively add up to exceed a 400,000 LPD then a short term construction PTTW would be required. The estimated rates in this assessment is based on the historically high groundwater levels observed up to 2018. If construction occurs in periods of lower groundwater levels, pumping rates may be lower than estimated.

Upon completion of the assessment, the following recommendations are presented:

- Infiltration-based LIDs are not recommended for this site because of the shallow water table and the low infiltration rate of the soils determined through permeameter testing. While there may be space to accommodate infiltration trenches or soak-away pits at select areas of the Site, any infiltration may result in an overall increase to the water table, which is not beneficial for the development;
- If LIDs are being proposed for stormwater management methods, the design should be carried out by a qualified stormwater engineer in consideration of shallow water tables observed in Phase 2 and low hydraulic conductivity of the soils;
- We recommend that water levels from operational monitoring stations at the site continue to be collected on a quarterly basis or in compliance with the recommended dewatering schedule. Recent groundwater monitoring data will be required to support an EASR application, and is likely to be required during construction. It is recommended to protect MW2 in the northeast of the site as long as possible, as it represents the remaining on-site monitoring station;
- An updated groundwater sample should be collected from the remaining monitoring wells (MW2) in support of an EASR application and a discharge permit, particularly before the monitoring well gets destroyed or decommissioned as part of construction. The groundwater sample should be analyzed for PWQO and Sewer-use bylaws in order to identify potential exceedances during the dewatering program; and,
- An EASR application should be procured to register temporary construction water management activities. Additional approvals will be required to discharge water to local sanitary or storm sewer systems. In discharge is being considered to any natural areas, additional authorization and permitting will be required. Groundwater and surface water monitoring as detailed in Sections 5.4.1 and 5.4.3 should be implemented as part of the dewatering program.

7 STANDARD LIMITATIONS

("WSP") prepared this report solely for the use of the intended recipient Wycliffe Thornridge Sharon Corners Limited, in accordance with the professional services agreement between the parties. In the event a contract has not been executed, the parties agree that the WSP General Terms for Consultant shall govern their business relationship which was provided to you prior to the preparation of this report.

The report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment.

The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

WSP disclaims any obligation to update this report if, after the date of this report, any conditions appear to differ significantly from those presented in this report; however, WSP reserves the right to amend or supplement this report based on additional information, documentation or evidence.

WSP makes no other representations whatsoever concerning the legal significance of its findings.

The intended recipient is solely responsible for the disclosure of any information contained in this report. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. WSP does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report.

WSP has provided services to the intended recipient in accordance with the professional services agreement between the parties and in a manner consistent with that degree of care, skill and diligence normally provided by members of the same profession performing the same or comparable services in respect of projects of a similar nature in similar circumstances. It is understood and agreed by WSP and the recipient of this report that WSP provides no warranty, express or implied, of any kind. Without limiting the generality of the foregoing, it is agreed and understood by WSP and the recipient of this report that WSP makes no representation or warranty whatsoever as to the sufficiency of its scope of work for the purpose sought by the recipient of this report.

In preparing this report, WSP has relied in good faith on information provided by others, as noted in the report. WSP has reasonably assumed that the information provided is correct and WSP is not responsible for the accuracy or completeness of such information.

Benchmark and elevations used in this report are primarily to establish relative elevation differences between the specific testing and/or sampling locations and should not be used for other purposes, such as grading, excavating, construction, planning, development, etc.

Design recommendations given in this report are applicable only to the project and areas as described in the text and then only if constructed in accordance with the details stated in this report. The comments made in this report on potential construction issues and possible methods are intended only for the guidance of the designer. The number of

testing and/or sampling locations may not be sufficient to determine all the factors that may affect construction methods and costs. We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

Overall conditions can only be extrapolated to an undefined limited area around these testing and sampling locations. The conditions that WSP interprets to exist between testing and sampling points may differ from those that actually exist. The accuracy of any extrapolation and interpretation beyond the sampling locations will depend on natural conditions, the history of Site development and changes through construction and other activities. In addition, analysis has been carried out for the identified chemical and physical parameters only, and it should not be inferred that other chemical species or physical conditions are not present. WSP cannot warrant against undiscovered environmental liabilities or adverse impacts off-Site.

8 REFERENCES

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APPENDIX

A MECP WATER WELL RECORDS

APPENDIX

A MECP WATER WELL RECORDS

MOECC Water Well Records

Well Record #

6900107 **Lot** 010 **Conc** 02 EAST GWILLIMBURY TOWNSHIP / YORK

Date 5/15/1948 **DD/MM/YYYY**

Elev 263.2 (masl) **Easting** 624741 **Northing** 4884326
/ Domestic Water Supply **UTM RC** 9 **unknown UTM**
Water Found 51.8 (mbgs) 211.4 (masl) FRESH
Casing Diameter 2 inch **Casing Material:** STEEL
Top of Screen 50.0 (mbgs) **Bottom of Screen** 52.4 (mbgs)
Screen Interva 2.4 (m)

Flowing? N
SWL 15.2 (mbgs) 248.0 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 27.3 (LPM) 5 / 0
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	263.2		
52.4	210.8		CLAY / /

6900112 **Lot** 011 **Conc** 02 EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/2/1950 **DD/MM/YYYY**

Elev 262.7 (masl) **Easting** 624656 **Northing** 4884785
/ Domestic Water Supply **UTM RC** 9 **unknown UTM**
Water Found 45.7 (mbgs) 217.0 (masl) FRESH
Casing Diameter 2 inch **Casing Material:** STEEL
Top of Screen 49.4 (mbgs) **Bottom of Screen** 50.3 (mbgs)
Screen Interva 0.9 (m)

Flowing? N
SWL 39.6 (mbgs) 223.1 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 4.5 (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	262.7		
15.2	247.5	WHITE	CLAY / /
22.9	239.8		MEDIUM SAND / GRAVEL /
45.7	217.0	BLUE	CLAY / /
50.3	212.4		COARSE SAND / /

6900120 **Lot** 012 **Conc** 02 EAST GWILLIMBURY TOWNSHIP / YORK

Date 12/2/1963 **DD/MM/YYYY**

Elev 259.5 (masl) **Easting** 624504 **Northing** 4884801
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 12.8 (mbgs) 246.7 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 7.0 (mbgs) 252.4 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 4.5 (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	259.5		
0.3	259.2		TOPSOIL / /
12.2	247.3	BLUE	CLAY / /
13.7	245.7		CLAY / MEDIUM SAND /

6900121 **Lot** 012 **Conc** 02 EAST GWILLIMBURY TOWNSHIP / YORK

Date 6/18/1965 **DD/MM/YYYY**

Elev 259.9 (masl) **Easting** 624520 **Northing** 4884807
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 12.8 (mbgs) 247.1 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 7.0 (mbgs) 252.9 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 4.5 (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	259.9		
0.3	259.6		TOPSOIL / /
12.2	247.7	BLUE	CLAY / /
14.6	245.2		CLAY / MEDIUM SAND /

Well Record #

6900122 — **Lot** 012 **Conc** 02 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 2/23/1966 **DD/MM/YYYY**

Elev 260.1 (masl) **Easting** 624565 **Northing** 4884835
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 12.8 (mbgs) 247.3 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 3.7 (mbgs) 256.5 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 4.5 (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	260.1		
0.6	259.5		TOPSOIL / /
7.9	252.2	BROWN	CLAY / /
16.2	244.0	BLUE	CLAY / /

6900123 — **Lot** 012 **Conc** 02 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/28/1966 **DD/MM/YYYY**

Elev 260.0 (masl) **Easting** 624531 **Northing** 4884818
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 13.7 (mbgs) 246.3 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 3.7 (mbgs) 256.4 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 4.5 (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	260.0		
0.6	259.4		TOPSOIL / /
4.9	255.2	BROWN	CLAY / /
16.5	243.6	BLUE	CLAY / /

6900226 — **Lot** 010 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 5/29/1957 **DD/MM/YYYY**

Elev 268.9 (masl) **Easting** 625004 **Northing** 4884495
/ Domestic Water Supply **UTM RC** 9 **unknown UTM**
Water Found 22.3 (mbgs) 246.7 (masl) FRESH
Casing Diameter 2 inch **Casing Material:** STEEL
Top of Screen 22.3 (mbgs) **Bottom of Screen** 23.5 (mbgs)
Screen Interva 1.2 (m)

Flowing? N
SWL 6.1 (mbgs) 262.8 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 27.3 (LPM) 2 / 0
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	268.9		
2.4	266.5	YELLOW	CLAY / /
12.2	256.7	BLUE	CLAY / /
19.8	249.1		CLAY / STONES / MEDIUM SAND
22.3	246.7		MEDIUM SAND / CLAY /
23.8	245.2		MEDIUM SAND / /

6900229 — **Lot** 010 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 4/9/1959 **DD/MM/YYYY**

Elev 266.2 (masl) **Easting** 624901 **Northing** 4884441
/ Municipal Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 105.8 (mbgs) 160.5 (masl) FRESH
Casing Diameter 7 inch **Casing Material:** STEEL
Top of Screen 105.8 (mbgs) **Bottom of Screen** 107.3 (mbgs)
Screen Interva 1.5 (m)

Flowing? N
SWL 17.7 (mbgs) 248.6 (masl)
Pumping WL 96.9 (mbgs) 169.3 (masl)
Pump Rate 90.9 (LPM) 24 / 0
Spec. Cap. 1.15 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	266.2		
18.3	248.0		PREV. DRILLED / /
25.3	240.9		FINE SAND / /
40.8	225.4		SILT / /
46.6	219.6	BLUE	CLAY / /
47.2	219.0		GRAVEL / /
50.0	216.3	GREEN	CLAY / /
55.8	210.5	BLUE	CLAY / STONES /

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61.3	205.0		SILT /		/	
71.3	194.9	BLUE	CLAY /		/	
86.3	180.0		SILT /		/	
106.1	160.2	GREY	CLAY /		/	
107.3	159.0		GRAVEL /		/	

6900232 — **Lot** 011 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 8/27/1958 **DD/MM/YYYY**

Elev 261.9 (masl) **Easting** 624742 **Northing** 4884619

/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**

Water Found 25.3 (mbgs) 236.6 (masl) FRESH

Casing Diameter 2 inch **Casing Material:** STEEL

Top of Screen 25.3 (mbgs) **Bottom of Screen** 26.8 (mbgs)

Screen Interva 1.5 (m)

Flowing? N

SWL 9.1 (mbgs) 252.7 (masl)

Pumping WL (mbgs) (masl)

Pump Rate 18.2 (LPM) 5 / 0

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions		
0.0	261.9				
20.1	241.7		CLAY /		/
25.3	236.6		CLAY /	STONES	/ MEDIUM SAND
26.8	235.0		MEDIUM SAND /		/

6900233 — **Lot** 011 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 12/22/1958 **DD/MM/YYYY**

Elev 265.1 (masl) **Easting** 624870 **Northing** 4884539

/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**

Water Found 9.1 (mbgs) 256.0 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL 6.7 (mbgs) 258.4 (masl)

Pumping WL (mbgs) (masl)

Pump Rate 9.1 (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions		
0.0	265.1				
9.1	256.0	BLUE	CLAY /		/
12.8	252.3		CLAY /	MEDIUM SAND	/

6900234 — **Lot** 011 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 11/21/1959 **DD/MM/YYYY**

Elev 265.6 (masl) **Easting** 624807 **Northing** 4884780

/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**

Water Found 50.3 (mbgs) 215.4 (masl) FRESH

Casing Diameter 2 inch **Casing Material:** STEEL

Top of Screen 49.4 (mbgs) **Bottom of Screen** 50.6 (mbgs)

Screen Interva 1.2 (m)

Flowing? N

SWL 12.2 (mbgs) 253.5 (masl)

Pumping WL 45.7 (mbgs) 219.9 (masl)

Pump Rate 27.3 (LPM) 3 / 0

Spec. Cap. 0.81 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions		
0.0	265.6				
50.3	215.4	GREY	CLAY /		/
51.8	213.8		MEDIUM SAND /		/

6900235 — **Lot** 011 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 5/18/1962 **DD/MM/YYYY**

Elev 266.1 (masl) **Easting** 624926 **Northing** 4884872

/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**

Water Found 6.1 (mbgs) 260.0 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL 3.0 (mbgs) 263.1 (masl)

Pumping WL (mbgs) (masl)

Pump Rate 18.2 (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions		
0.0	266.1				
6.1	260.0	BLUE	CLAY /		/
9.1	257.0		MEDIUM SAND /	STONES	/

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6900236

Lot 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 6/29/1962 **DD/MM/YYYY**

Elev 265.9 (masl) **Easting** 624999 **Northing** 4884897

/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**

Water Found 6.1 (mbgs) 259.8 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL	4.6	(mbgs)	261.3	(masl)
Pumping WL		(mbgs)		(masl)
Pump Rate	9.1	(LPM)		/
Spec. Cap.		(LPM/m)	Hour / Minute	

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.9		
6.1	259.8	BLUE	CLAY / /
9.1	256.7		MEDIUM SAND / /
10.7	255.2	BLUE	CLAY / /

6900238

Lot 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 12/12/1962 **DD/MM/YYYY**

Elev 265.8 (masl) **Easting** 624837 **Northing** 4884499

/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**

Water Found 6.1 (mbgs) 259.7 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL	6.1	(mbgs)	259.7	(masl)
Pumping WL		(mbgs)		(masl)
Pump Rate	9.1	(LPM)		/
Spec. Cap.		(LPM/m)	Hour / Minute	

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.8		
6.1	259.7	BLUE	CLAY / /
10.4	255.4	GREY	MEDIUM SAND / /

6900239

Lot 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 4/27/1963 **DD/MM/YYYY**

Elev 265.7 (masl) **Easting** 625003 **Northing** 4884903

/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**

Water Found 6.1 (mbgs) 259.6 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL	6.1	(mbgs)	259.6	(masl)
Pumping WL		(mbgs)		(masl)
Pump Rate	9.1	(LPM)		/
Spec. Cap.		(LPM/m)	Hour / Minute	

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.7		
4.6	261.2	BROWN	CLAY / /
6.1	259.6	BROWN	CLAY / GRAVEL /
9.8	256.0	BLUE	CLAY / /

6900240

Lot 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 5/24/1963 **DD/MM/YYYY**

Elev 265.1 (masl) **Easting** 624780 **Northing** 4884774

/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**

Water Found 4.6 (mbgs) 260.5 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL	2.1	(mbgs)	263.0	(masl)
Pumping WL		(mbgs)		(masl)
Pump Rate	4.5	(LPM)		/
Spec. Cap.		(LPM/m)	Hour / Minute	

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.1		
0.6	264.5		TOPSOIL / /
4.6	260.5		CLAY / /
9.1	256.0	BLUE	CLAY / /

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6900241 — **Lot** 011 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 7/20/1963 (DD/MM/YYYY)

Elev 267.6 (masl) **Easting** 624939 **Northing** 4884780

/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**

Water Found 9.8 (mbgs) 257.9 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL	4.9	(mbgs)	262.7	(masl)
Pumping WL		(mbgs)		(masl)
Pump Rate	4.5	(LPM)	/	
Spec. Cap.		(LPM/m)	Hour / Minute	

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	267.6		
0.6	267.0		TOPSOIL / /
12.2	255.4	BLUE	CLAY / /

6900242 — **Lot** 011 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/17/1962 (DD/MM/YYYY)

Elev 266.3 (masl) **Easting** 624879 **Northing** 4884668

/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**

Water Found 7.6 (mbgs) 258.7 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL	7.6	(mbgs)	258.7	(masl)
Pumping WL		(mbgs)		(masl)
Pump Rate	9.1	(LPM)	/	
Spec. Cap.		(LPM/m)	Hour / Minute	

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	266.3		
7.6	258.7	BLUE	CLAY / /
12.2	254.1		CLAY / MEDIUM SAND /

6900243 — **Lot** 011 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 3/2/1964 (DD/MM/YYYY)

Elev 267.7 (masl) **Easting** 625043 **Northing** 4884821

/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**

Water Found 7.3 (mbgs) 260.4 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL	1.5	(mbgs)	266.1	(masl)
Pumping WL		(mbgs)		(masl)
Pump Rate	18.2	(LPM)	/	
Spec. Cap.		(LPM/m)	Hour / Minute	

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	267.7		
1.2	266.5	BROWN	CLAY / /
7.3	260.4	BLUE	CLAY / /
7.9	259.7		COARSE SAND / /

6900244 — **Lot** 011 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 3/3/1964 (DD/MM/YYYY)

Elev 267.4 (masl) **Easting** 625077 **Northing** 4884835

/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**

Water Found 7.0 (mbgs) 260.4 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL	1.5	(mbgs)	265.9	(masl)
Pumping WL		(mbgs)		(masl)
Pump Rate	18.2	(LPM)	/	
Spec. Cap.		(LPM/m)	Hour / Minute	

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	267.4		
1.2	266.2	BROWN	CLAY / /
7.0	260.4	BLUE	CLAY / /
7.9	259.5		COARSE SAND / /

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6900245 — **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 7/27/1965 **DD/MM/YYYY**

Elev 267.0 (masl) **Easting** 624888 **Northing** 4884760
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 9.8 (mbgs) 257.2 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 3.4 (mbgs) 263.6 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 4.5 (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	267.0		
0.6	266.3		TOPSOIL / /
3.7	263.3	BROWN	CLAY / /
13.7	253.2	BLUE	CLAY / /

6900246 — **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/29/1965 **DD/MM/YYYY**

Elev 265.8 (masl) **Easting** 624824 **Northing** 4884842
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 6.1 (mbgs) 259.7 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 6.1 (mbgs) 259.7 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 18.2 (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.8		
1.5	264.3	BROWN	CLAY / /
6.1	259.7	BLUE	CLAY / /
12.2	253.6	BLUE	SILT / MEDIUM SAND /

6900247 — **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 3/9/1966 **DD/MM/YYYY**

Elev 264.1 (masl) **Easting** 624768 **Northing** 4884671
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 57.9 (mbgs) 206.2 (masl) FRESH
Casing Diameter 4 inch **Casing Material:**
Top of Screen 56.7 (mbgs) **Bottom of Screen** 58.8 (mbgs)
Screen Interva 2.1 (m)

Flowing? N
SWL 9.1 (mbgs) 255.0 (masl)
Pumping WL 42.7 (mbgs) 221.5 (masl)
Pump Rate 45.5 (LPM) 2 / 0
Spec. Cap. 1.36 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.1		
4.6	259.6	YELLOW	CLAY / /
16.8	247.4	BLUE	CLAY / /
36.6	227.6	BLUE	CLAY / STONES /
56.4	207.8	BLUE	CLAY / /
58.8	205.3		COARSE SAND / /

6900248 — **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 7/11/1966 **DD/MM/YYYY**

Elev 265.0 (masl) **Easting** 624764 **Northing** 4884820
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 13.7 (mbgs) 251.2 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 5.5 (mbgs) 259.5 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 9.1 (LPM) 1 / 0
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.0		
0.6	264.4		TOPSOIL / /
5.5	259.5	BROWN	CLAY / /
15.2	249.7	BLUE	CLAY / /

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6900249 — **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 7/14/1966 **DD/MM/YYYY**

Elev 265.1 (masl) **Easting** 624769 **Northing** 4884830
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 12.2 (mbgs) 252.9 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 4.6 (mbgs) 260.5 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 9.1 (LPM) 1 / 0
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.1		
0.6	264.4		TOPSOIL / /
5.5	259.6	BROWN	CLAY / /
14.6	250.4	BLUE	CLAY / /

6900250 — **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/14/1966 **DD/MM/YYYY**

Elev 266.8 (masl) **Easting** 624876 **Northing** 4884773
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 12.8 (mbgs) 254.0 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 5.5 (mbgs) 261.3 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 4.5 (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	266.8		
0.6	266.1		TOPSOIL / /
4.9	261.9	BROWN	CLAY / /
15.2	251.5	BLUE	CLAY / /

6900261 — **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 6/25/1959 **DD/MM/YYYY**

Elev 263.7 (masl) **Easting** 625099 **Northing** 4885131
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 4.6 (mbgs) 259.1 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 1.5 (mbgs) 262.1 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 4.5 (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	263.7		
4.6	259.1	BLUE	CLAY / /
6.1	257.6		CLAY / MEDIUM SAND /

6900272 — **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/12/1960 **DD/MM/YYYY**

Elev 264.9 (masl) **Easting** 624838 **Northing** 4884921
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 6.1 (mbgs) 258.8 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 3.0 (mbgs) 261.9 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 9.1 (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.9		
9.1	255.8	GREY	CLAY / MEDIUM SAND /

6900276 — **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 5/9/1963 **DD/MM/YYYY**

Elev 265.1 (masl) **Easting** 625116 **Northing** 4885006
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 5.5 (mbgs) 259.7 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 1.2 (mbgs) 263.9 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 13.6 (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.1		

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			0.9	264.2		TOPSOIL /	/
			5.5	259.7		CLAY / MEDIUM SAND	/
			10.1	255.1	BLUE	CLAY /	/

6900285 **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 3/29/1966 **DD/MM/YYYY**

Elev 265.1 (masl) **Easting** 625135 **Northing** 4885021 **UTM RC** 5 **margin of error : 100 m - 300 m**

/ Domestic Water Supply

Water Found 4.9 (mbgs) 260.2 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL 0.9 (mbgs) 264.2 (masl)

Pumping WL (mbgs) (masl)

Pump Rate 4.5 (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions	
0.0	265.1			
0.6	264.5		TOPSOIL /	/
4.6	260.5	BROWN	CLAY /	/
6.1	259.0	BLUE	CLAY /	/

6900287 **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 8/19/1966 **DD/MM/YYYY**

Elev 265.0 (masl) **Easting** 624890 **Northing** 4884927 **UTM RC** 5 **margin of error : 100 m - 300 m**

/ Domestic Water Supply

Water Found 7.6 (mbgs) 257.4 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL 8.2 (mbgs) 256.8 (masl)

Pumping WL (mbgs) (masl)

Pump Rate 4.5 (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions	
0.0	265.0			
0.6	264.4		TOPSOIL /	/
4.3	260.7	BROWN	CLAY /	/
9.8	255.2	BLUE	CLAY /	/

6900288 **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/14/1966 **DD/MM/YYYY**

Elev 264.3 (masl) **Easting** 625020 **Northing** 4885121 **UTM RC** 5 **margin of error : 100 m - 300 m**

/ Domestic Water Supply

Water Found 10.7 (mbgs) 253.7 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL 2.4 (mbgs) 261.9 (masl)

Pumping WL (mbgs) (masl)

Pump Rate 4.5 (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions	
0.0	264.3			
0.6	263.7		TOPSOIL /	/
12.8	251.5	BLUE	CLAY /	/

6900289 **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 5/18/1967 **DD/MM/YYYY**

Elev 264.1 (masl) **Easting** 625096 **Northing** 4885096 **UTM RC** 5 **margin of error : 100 m - 300 m**

/ Domestic Water Supply

Water Found 11.3 (mbgs) 252.8 (masl) FRESH

Casing Diameter 30 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N

SWL 1.8 (mbgs) 262.3 (masl)

Pumping WL (mbgs) (masl)

Pump Rate 4.5 (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions	
0.0	264.1			
0.6	263.5		TOPSOIL /	/
4.9	259.2	BROWN	CLAY /	/
12.8	251.3	BLUE	CLAY /	/

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6900338 — **Lot** 012 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 6/30/1966 **DD/MM/YYYY**

Elev 264.4 (masl) **Easting** 625030 **Northing** 4885063
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 7.6 (mbgs) 256.8 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 1.5 (mbgs) 262.9 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 4.5 (LPM) 1 / 0
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions	
0.0	264.4			
0.6	263.8		TOPSOIL /	/
4.3	260.1	BROWN	CLAY /	/
9.1	255.3	BLUE	CLAY /	/

6908595 — **Lot** 011 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/4/1968 **DD/MM/YYYY**

Elev 263.6 (masl) **Easting** 624785 **Northing** 4884623
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 57.9 (mbgs) 205.7 (masl) FRESH
Casing Diameter 4 inch **Casing Material:** STEEL
Top of Screen 57.0 (mbgs) **Bottom of Screen** 60.7 (mbgs)
Screen Interva 3.7 (m)

Flowing? N
SWL 18.3 (mbgs) 245.4 (masl)
Pumping WL 36.6 (mbgs) 227.1 (masl)
Pump Rate 31.8 (LPM) 3 / 0
Spec. Cap. 1.74 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions	
0.0	263.6			
0.3	263.3		TOPSOIL /	/
5.8	257.8	GREY	CLAY /	/
16.5	247.2	BLUE	CLAY /	/
30.5	233.2	GREY	CLAY / MEDIUM SAND	/
57.9	205.7	BLUE	CLAY / GRAVEL	/
60.7	203.0		MEDIUM SAND / GRAVEL	/

6908910 — **Lot** 012 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/1/1968 **DD/MM/YYYY**

Elev 264.4 (masl) **Easting** 624735 **Northing** 4884923
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 10.4 (mbgs) 254.0 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 4.9 (mbgs) 259.5 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions	
0.0	264.4			
0.6	263.8		TOPSOIL /	/
5.5	258.9	BROWN	CLAY /	/
14.0	250.4	BLUE	CLAY /	/

6908938 — **Lot** 012 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 8/30/1968 **DD/MM/YYYY**

Elev 264.8 (masl) **Easting** 624925 **Northing** 4884973
/ Abandoned-Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found (mbgs) (masl)
Casing Diameter 4 inch **Casing Material:** STEEL
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing?
SWL (mbgs) (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions	
0.0	264.8			
3.0	261.7		CLAY / MEDIUM SAND	/
18.3	246.5	GREY	SILT /	/
26.5	238.3	BLUE	CLAY /	/
55.8	209.0	BLUE	CLAY / GRAVEL	/
89.9	174.9		CLAY / BOULDERS	/
108.8	156.0		CLAY / GRAVEL	/

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								109.7	155.0	BLACK	SHALE /		/		
6908948	**Lot** 012	**Conc** 03	EAST GWILLIMBURY TOWNSHIP / YORK								**Flowing?** N				
Date 7/12/1968	**Elev** 262.8 (masl)	**Easting** 624765	**Northing** 4885173								**SWL** 3.0	(mbgs)	259.7	(masl)	
DD/MM/YYYY	/ Domestic	Water Supply	**UTM RC** 4	**margin of error : 30 m - 100 m**							**Pumping WL**	(mbgs)		(masl)	
	Water Found 6.1 (mbgs)	256.7 (masl)	FRESH								**Pump Rate** 0.0	(LPM)	/		
	Casing Diameter 30 inch	**Casing Material:**	CONCRETE				**Depth (m)**	**Elev (masl)**			**Spec. Cap.**	(LPM/m)	Hour / Minute		
	Top of Screen (mbgs)	**Bottom of Screen**	(mbgs)				0.0	262.8	**Color**		**Soil Descriptions**				
	Screen Interva (m)														
							0.3	262.5		TOPSOIL /		/			
							3.0	259.7	BROWN	CLAY /		/			
							6.1	256.7	BLUE	CLAY /		/			
							7.6	255.1	BLUE	CLAY /		/			
6908949	**Lot** 012	**Conc** 03	EAST GWILLIMBURY TOWNSHIP / YORK								**Flowing?** N				
Date 7/12/1968	**Elev** 264.4 (masl)	**Easting** 624825	**Northing** 4885153								**SWL** 3.0	(mbgs)	261.4	(masl)	
DD/MM/YYYY	/ Domestic	Water Supply	**UTM RC** 4	**margin of error : 30 m - 100 m**							**Pumping WL**	(mbgs)		(masl)	
	Water Found 5.2 (mbgs)	259.2 (masl)	FRESH								**Pump Rate** 0.0	(LPM)	/		
	Casing Diameter 30 inch	**Casing Material:**	CONCRETE				**Depth (m)**	**Elev (masl)**			**Spec. Cap.**	(LPM/m)	Hour / Minute		
	Top of Screen (mbgs)	**Bottom of Screen**	(mbgs)				0.0	264.4	**Color**		**Soil Descriptions**				
	Screen Interva (m)														
							0.3	264.1		TOPSOIL /		/			
							3.0	261.4	BROWN	CLAY /		/			
							7.6	256.8	BLUE	CLAY /		/			
6908974	**Lot** 012	**Conc** 03	EAST GWILLIMBURY TOWNSHIP / YORK								**Flowing?** N				
Date 4/3/1968	**Elev** 263.5 (masl)	**Easting** 624735	**Northing** 4884963								**SWL** 1.5	(mbgs)	262.0	(masl)	
DD/MM/YYYY	/ Domestic	Water Supply	**UTM RC** 4	**margin of error : 30 m - 100 m**							**Pumping WL** 6.7	(mbgs)	256.8	(masl)	
	Water Found 6.4 (mbgs)	257.1 (masl)	FRESH								**Pump Rate** 9.1	(LPM)	/		
	Casing Diameter 30 inch	**Casing Material:**	CONCRETE				**Depth (m)**	**Elev (masl)**			**Spec. Cap.** 1.75	(LPM/m)	Hour / Minute		
	Top of Screen (mbgs)	**Bottom of Screen**	(mbgs)				0.0	263.5	**Color**		**Soil Descriptions**				
	Screen Interva (m)														
							0.6	262.9		TOPSOIL /		/			
							1.8	261.7	BROWN	CLAY /		/			
							5.5	258.1	BLUE	CLAY /		/			
							6.1	257.4		MEDIUM SAND /		/			
							7.6	255.9	BLUE	CLAY /		/			
6909015	**Lot** 011	**Conc** 03	EAST GWILLIMBURY TOWNSHIP / YORK								**Flowing?** N				
Date 3/18/1968	**Elev** 267.6 (masl)	**Easting** 625065	**Northing** 4884823								**SWL** 2.4	(mbgs)	265.2	(masl)	
DD/MM/YYYY	/ Domestic	Water Supply	**UTM RC** 4	**margin of error : 30 m - 100 m**							**Pumping WL**	(mbgs)		(masl)	
	Water Found 7.6 (mbgs)	260.0 (masl)	FRESH								**Pump Rate**	(LPM)	/		
	Casing Diameter 30 inch	**Casing Material:**	CONCRETE				**Depth (m)**	**Elev (masl)**			**Spec. Cap.**	(LPM/m)	Hour / Minute		
	Top of Screen (mbgs)	**Bottom of Screen**	(mbgs)				0.0	267.6	**Color**		**Soil Descriptions**				
	Screen Interva (m)														
							0.6	267.0		TOPSOIL /		/			
							5.5	262.2	BROWN	CLAY /		/			
							8.5	259.1	BLUE	CLAY /		/			

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6909418 — **Lot** 012 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 7/12/1969 **DD/MM/YYYY**

Elev 264.6 (masl) **Easting** 624815 **Northing** 4885023
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 3.0 (mbgs) 261.6 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 6.1 (mbgs) 258.5 (masl)
Pumping WL 7.9 (mbgs) 256.7 (masl)
Pump Rate 68.2 (LPM) /
Spec. Cap. 37.29 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.6		
1.5	263.1	BROWN	CLAY / /
3.0	261.6	BROWN	CLAY / MEDIUM SAND /
6.1	258.5	BLUE	CLAY / MEDIUM SAND /
9.8	254.9	BLUE	CLAY / /

6909748 — **Lot** 012 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/7/1969 **DD/MM/YYYY**

Elev 264.4 (masl) **Easting** 625095 **Northing** 4885073
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 12.5 (mbgs) 251.9 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 4.9 (mbgs) 259.5 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.4		
0.6	263.8		TOPSOIL / /
4.6	259.8	BROWN	CLAY / /
15.2	249.1	BLUE	CLAY / SILT /

6909764 — **Lot** 010 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 12/9/1969 **DD/MM/YYYY**

Elev 264.0 (masl) **Easting** 624815 **Northing** 4884403
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 7.3 (mbgs) 256.7 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 2.1 (mbgs) 261.9 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.0		
0.6	263.4		TOPSOIL / /
5.8	258.2	BROWN	CLAY / /
9.1	254.9	BLUE	CLAY / MEDIUM SAND /

6910131 — **Lot** 012 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/16/1970 **DD/MM/YYYY**

Elev 264.9 (masl) **Easting** 624875 **Northing** 4884923
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 10.4 (mbgs) 254.6 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 5.5 (mbgs) 259.5 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.9		
0.6	264.3		TOPSOIL / /
5.5	259.5	BROWN	CLAY / /
12.2	252.8	BLUE	SILT / CLAY /

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6910212 — **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 11/21/1970 **DD/MM/YYYY**

Elev 263.2 (masl) **Easting** 624725 **Northing** 4884983
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 4.6 (mbgs) 258.7 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 3.0 (mbgs) 260.2 (masl)
Pumping WL 8.2 (mbgs) 255.0 (masl)
Pump Rate 9.1 (LPM) /
Spec. Cap. 1.75 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	263.2		
3.0	260.2	BROWN	CLAY / /
4.6	258.7	BLUE	CLAY / /
7.6	255.6	BLUE	CLAY / MEDIUM SAND /
8.5	254.7	BLUE	CLAY / /

6910584 — **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 11/11/1971 **DD/MM/YYYY**

Elev 264.9 (masl) **Easting** 624865 **Northing** 4885063
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found (mbgs) (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 4.9 (mbgs) 260.0 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.9		
3.0	261.9	BROWN	CLAY / /
4.6	260.4	BLUE	CLAY / /
7.6	257.3		MEDIUM SAND / CLAY /
9.1	255.8	BLUE	CLAY / /

6910755 — **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 11/3/1971 **DD/MM/YYYY**

Elev 264.9 (masl) **Easting** 624915 **Northing** 4885103
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 14.9 (mbgs) 250.0 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 6.4 (mbgs) 258.5 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.9		
0.6	264.3		TOPSOIL / /
5.5	259.4	BROWN	CLAY / /
14.9	250.0	BLUE	CLAY / /
16.5	248.4		GRAVEL / /

6910765 — **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/17/1971 **DD/MM/YYYY**

Elev 264.9 (masl) **Easting** 624835 **Northing** 4885043
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 9.1 (mbgs) 255.7 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 4.3 (mbgs) 260.6 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.9		
0.6	264.2		TOPSOIL / /
4.9	260.0	BROWN	CLAY / /
9.1	255.7	BLUE	CLAY / /
9.8	255.1		COARSE SAND / /

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6910975 — **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 7/19/1972 **DD/MM/YYYY**

Elev 264.4 (masl) **Easting** 625015 **Northing** 4885098
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 7.9 (mbgs) 256.4 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 3.4 (mbgs) 261.0 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.4		
0.6	263.8		TOPSOIL / /
4.9	259.5	BROWN	CLAY / /
8.8	255.5	BLUE	CLAY / SILT /

6910980 — **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 6/15/1972 **DD/MM/YYYY**

Elev 264.9 (masl) **Easting** 624915 **Northing** 4885098
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 9.4 (mbgs) 255.4 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 4.3 (mbgs) 260.6 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.9		
0.6	264.3		TOPSOIL / /
4.9	260.0	BROWN	CLAY / /
10.4	254.5	BLUE	CLAY / SILT /

6911257 — **Lot** 013 **Conc** 02 EAST GWILLIMBURY TOWNSHIP / YORK

Date 11/13/1972 **DD/MM/YYYY**

Elev 274.6 (masl) **Easting** 624465 **Northing** 4885473
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 11.9 (mbgs) 262.7 (masl) FRESH
Casing Diameter 4 inch **Casing Material:** STEEL
Top of Screen 12.5 (mbgs) **Bottom of Screen** 13.7 (mbgs)
Screen Interva 1.2 (m)

Flowing? N
SWL 9.1 (mbgs) 265.5 (masl)
Pumping WL 10.4 (mbgs) 264.2 (masl)
Pump Rate 27.3 (LPM) 1 / 0
Spec. Cap. 22.37 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	274.6		
11.9	262.7	GREY	CLAY / STONES /
13.7	260.9		COARSE SAND / /

6911289 — **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/7/1972 **DD/MM/YYYY**

Elev 264.9 (masl) **Easting** 624765 **Northing** 4885073
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 6.4 (mbgs) 258.5 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 1.2 (mbgs) 263.7 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.9		
0.6	264.3		TOPSOIL / /
6.4	258.5	BLUE	CLAY / SILT /
6.7	258.2		GRAVEL / /

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6911776 — **Lot** 012 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 6/4/1973 **DD/MM/YYYY**

Elev 264.6 (masl) **Easting** 624963 **Northing** 4885032
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 49.1 (mbgs) 215.5 (masl) FRESH
Casing Diameter 6 inch **Casing Material:** STEEL
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 25.9 (mbgs) 238.7 (masl)
Pumping WL 35.1 (mbgs) 229.6 (masl)
Pump Rate 68.2 (LPM) 4 / 0
Spec. Cap. 7.46 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.6		
17.4	247.2	GREY	CLAY / /
19.2	245.4	GREY	SILT / SAND /
49.1	215.5	GREY	CLAY / SILT /
49.4	215.2	GREY	GRAVEL / SAND /

6911807 — **Lot** 012 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/10/1973 **DD/MM/YYYY**

Elev 265.0 (masl) **Easting** 624787 **Northing** 4884895
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 48.8 (mbgs) 216.2 (masl) FRESH
Casing Diameter 4 inch **Casing Material:** STEEL
Top of Screen 47.5 (mbgs) **Bottom of Screen** 48.8 (mbgs)
Screen Interva 1.2 (m)

Flowing? N
SWL 24.4 (mbgs) 240.6 (masl)
Pumping WL 41.1 (mbgs) 223.8 (masl)
Pump Rate 36.4 (LPM) 1 / 0
Spec. Cap. 2.17 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.0		
4.9	260.1	GREY	CLAY / /
23.8	241.2	BLUE	CLAY / /
29.9	235.1	BLUE	CLAY / SAND /
48.8	216.2	BLUE	CLAY / /
49.7	215.3		COARSE SAND / /

6911933 — **Lot** 012 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 8/21/1973 **DD/MM/YYYY**

Elev 264.2 (masl) **Easting** 625042 **Northing** 4885102
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 7.6 (mbgs) 256.6 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 2.4 (mbgs) 261.7 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.2		
0.6	263.6		TOPSOIL / /
3.7	260.5	BROWN	CLAY / /
9.8	254.4	BLUE	CLAY / SILT /

6911945 — **Lot** 012 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/17/1973 **DD/MM/YYYY**

Elev 264.7 (masl) **Easting** 624943 **Northing** 4885085
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 12.5 (mbgs) 252.2 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 2.4 (mbgs) 262.3 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.7		
0.6	264.1		TOPSOIL / /
4.9	259.9	BROWN	CLAY / /
12.5	252.2	BLUE	CLAY / SILT /

Well Record #

6912272

Lot 010 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/18/1973 **DD/MM/YYYY**

Elev 264.7 (masl) **Easting** 624849 **Northing** 4884409
/ Domestic Water Supply **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found 10.7 (mbgs) 254.0 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 2.7 (mbgs) 261.9 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.7		
0.6	264.1		TOPSOIL / /
5.5	259.2	BROWN	CLAY / /
10.4	254.3	BLUE	CLAY / STONES /
12.5	252.2	BLUE	CLAY / SILT / SAND

6913057

Lot 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 7/26/1975 **DD/MM/YYYY**

Elev 264.7 (masl) **Easting** 624944 **Northing** 4885077
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 8.5 (mbgs) 256.2 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 2.4 (mbgs) 262.3 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.7		
0.6	264.1		TOPSOIL / /
6.7	258.0	BROWN	CLAY / /
8.5	256.2	BLUE	CLAY / STONES /
8.8	255.9		COARSE SAND / /
11.3	253.4	BLUE	CLAY / STONES /

6913145

Lot 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 11/4/1975 **DD/MM/YYYY**

Elev 264.8 (masl) **Easting** 625062 **Northing** 4885020
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 12.5 (mbgs) 252.3 (masl) SALTY
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 4.9 (mbgs) 259.9 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.8		
0.6	264.2		TOPSOIL / /
7.3	257.4	BROWN	CLAY / /
12.5	252.3	BLUE	CLAY / SILT /
14.3	250.4		SAND / SILT /

6913146

Lot 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 11/4/1975 **DD/MM/YYYY**

Elev 266.1 (masl) **Easting** 625065 **Northing** 4884909
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 8.5 (mbgs) 257.6 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 2.7 (mbgs) 263.4 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	266.1		
0.6	265.5		TOPSOIL / /
5.5	260.6	BROWN	CLAY / /
15.8	250.3	BLUE	CLAY / SILT /

Well Record #

6913645 — **Lot** 010 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 8/10/1976 **DD/MM/YYYY**

Elev 268.5 (masl) **Easting** 624975 **Northing** 4884463
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 25.9 (mbgs) 242.6 (masl) FRESH
Casing Diameter 6 inch **Casing Material:** STEEL
Top of Screen 26.5 (mbgs) **Bottom of Screen** 27.4 (mbgs)
Screen Interva 0.9 (m)

Flowing? N
SWL 5.5 (mbgs) 263.0 (masl)
Pumping WL 21.3 (mbgs) 247.1 (masl)
Pump Rate 45.5 (LPM) 10 / 0
Spec. Cap. 2.87 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	268.5		
14.0	254.4	GREY	CLAY / /
15.2	253.2	GREY	GRAVEL / CLAY /
24.1	244.4	GREY	CLAY / /
25.9	242.6	GREY	CLAY / GRAVEL /
27.4	241.0	GREY	GRAVEL / SAND /

6913915 — **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 3/17/1977 **DD/MM/YYYY**

Elev 264.5 (masl) **Easting** 624775 **Northing** 4884673
/ Abandoned-Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found (mbgs) (masl)
Casing Diameter **Casing Material:**
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing?
SWL (mbgs) (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.5		
5.2	259.3	GREY	CLAY / /
14.0	250.5	BLUE	CLAY / /
39.6	224.9	BLUE	CLAY / GRAVEL /
52.7	211.8	BLUE	CLAY / /
65.5	199.0	BLUE	CLAY / STONES / SAND

6914374 — **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/24/1977 **DD/MM/YYYY**

Elev 265.0 (masl) **Easting** 624865 **Northing** 4885073
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 6.1 (mbgs) 258.9 (masl) FRESH
Casing Diameter 30 inch **Casing Material:** CONCRETE
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL 2.1 (mbgs) 262.8 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.0		
0.6	264.3		TOPSOIL / /
5.2	259.8	BROWN	CLAY / SILTY /
10.7	254.3	BLUE	CLAY / SILTY /

6915176 — **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 8/10/1979 **DD/MM/YYYY**

Elev 263.9 (masl) **Easting** 624765 **Northing** 4884973
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 45.7 (mbgs) 218.1 (masl) Not stated
Casing Diameter 5 inch **Casing Material:** STEEL
Top of Screen 45.4 (mbgs) **Bottom of Screen** 46.6 (mbgs)
Screen Interva 1.2 (m)

Flowing? N
SWL 25.9 (mbgs) 238.0 (masl)
Pumping WL 29.0 (mbgs) 234.9 (masl)
Pump Rate 45.5 (LPM) 1 / 0
Spec. Cap. 14.91 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	263.9		
5.2	258.7		PREVIOUSLY DUG / /
30.5	233.4	BLUE	CLAY / /
45.7	218.1	BLUE	CLAY / STONES /
47.5	216.3	GREY	COARSE SAND / /

Well Record #

6917283 — **Lot** 012 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 11/27/1984 **DD/MM/YYYY**

Elev 261.0 (masl) **Easting** 624635 **Northing** 4885112
/ Domestic Water Supply **UTM RC** 3 **margin of error : 10 - 30 m**
Water Found 64.0 (mbgs) 197.0 (masl) FRESH
Casing Diameter 5 inch **Casing Material:** STEEL
Top of Screen 63.1 (mbgs) **Bottom of Screen** 64.0 (mbgs)
Screen Interva 0.9 (m)

Flowing? N
SWL 25.3 (mbgs) 235.7 (masl)
Pumping WL 27.4 (mbgs) 233.6 (masl)
Pump Rate 54.6 (LPM) 2 / 30
Spec. Cap. 25.57 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	261.0		
1.5	259.5	BROWN	SAND / CLAY / PACKED
5.5	255.5	BROWN	CLAY / DENSE /
20.4	240.6	BLUE	CLAY / STONES / HARD
25.3	235.7	GREY	SILT / SOFT /
53.6	207.4	GREY	CLAY / STONES / HARD
54.9	206.1	GREY	GRAVEL / SILT / LAYERED
61.3	199.7	GREY	CLAY / STONEY / HARD
64.0	197.0	GREY	GRAVEL / SAND / CLEAN

6918872 — **Lot** 006 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 2/20/1987 **DD/MM/YYYY**

Elev 266.5 (masl) **Easting** 625125 **Northing** 4884860
/ Domestic Water Supply **UTM RC** 2 **margin of error : 3 - 10 m**
Water Found 15.8 (mbgs) 250.7 (masl) Not stated
Casing Diameter 30 inch **Casing Material:** GALVANIZED
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing? N
SWL (mbgs) (masl)
Pumping WL 15.2 (mbgs) 251.3 (masl)
Pump Rate (LPM) 0 / 30
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	266.5		
0.3	266.2	BLACK	TOPSOIL / HARD /
6.1	260.5	BLACK	CLAY / HARD /
15.8	250.7	GREY	CLAY / PACKED /

6920529 — **Lot** 012 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 7/13/1989 **DD/MM/YYYY**

Elev 267.0 (masl) **Easting** 624908 **Northing** 4884810
/ Domestic Water Supply **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found 76.2 (mbgs) 190.8 (masl) FRESH
Casing Diameter 6 inch **Casing Material:** STEEL
Top of Screen 74.7 (mbgs) **Bottom of Screen** 76.2 (mbgs)
Screen Interva 1.5 (m)

Flowing? N
SWL 35.4 (mbgs) 231.6 (masl)
Pumping WL (mbgs) (masl)
Pump Rate 4.5 (LPM) 30 / 0
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	267.0		
5.5	261.5	BLUE	CLAY / /
24.7	242.3	GREY	SILT / GRAVEL /
25.9	241.1	GREY	TILL / /
29.3	237.7	GREY	SAND / SILTY / GRAVEL
53.6	213.3	GREY	TILL / /
57.3	209.7	GREY	SAND / SILTY /
70.1	196.9	GREY	TILL / /
76.2	190.8	GREY	SAND / GRAVEL /
97.5	169.5	GREY	TILL / /

Well Record #

6920877 **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 12/17/1989 **DD/MM/YYYY**

Elev 267.5 (masl) **Easting** 624966 **Northing** 4884805
/ Domestic Water Supply **UTM RC** 2 **margin of error : 3 - 10 m**
Water Found 26.5 (mbgs) 241.0 (masl) FRESH
Casing Diameter 6 inch **Casing Material:** STEEL
Top of Screen 26.5 (mbgs) **Bottom of Screen** 27.4 (mbgs)
Screen Interva 0.9 (m)

Flowing? N
SWL 3.7 (mbgs) 263.8 (masl)
Pumping WL 24.4 (mbgs) 243.1 (masl)
Pump Rate 31.8 (LPM) 8 / 0
Spec. Cap. 1.54 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	267.5		
1.5	266.0	BROWN	SAND / CLAY /
12.2	255.3	GREY	CLAY / /
18.9	248.6	GREY	GRAVEL / CLAY / VERY
26.2	241.3	GREY	CLAY / /
27.4	240.1	BROWN	SAND / GRAVEL /

6927723 **Lot** 010 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 4/4/2004 **DD/MM/YYYY**

Elev 264.1 (masl) **Easting** 624805 **Northing** 4884420
/ Not Used **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found (mbgs) (masl)
Casing Diameter **Casing Material:**
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing?
SWL (mbgs) (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.1		
			/ /

6929909 **Lot** 012 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 1/12/2006 **DD/MM/YYYY**

Elev 264.5 (masl) **Easting** 625016 **Northing** 4885050
/ Abandoned-Other **UTM RC** 3 **margin of error : 10 - 30 m**
Water Found (mbgs) (masl)
Casing Diameter **Casing Material:**
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing?
SWL 27.4 (mbgs) 237.1 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.5		
3.0	261.5		CLAY / FILL / CLEAN
3.7	260.8		/ /
41.5	223.0		/ /
42.7	221.8		/ /
45.7	218.8		STONES / /

6930376 **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 6/12/2006 **DD/MM/YYYY**

Elev 265.4 (masl) **Easting** 624826 **Northing** 4884466
/ Abandoned-Other **UTM RC** 3 **margin of error : 10 - 30 m**
Water Found (mbgs) (masl)
Casing Diameter **Casing Material:**
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing?
SWL (mbgs) (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.4		
			/ /

Well Record #

6930636 — **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 8/2/2006 **DD/MM/YYYY**

Elev 264.9 (masl) **Easting** 624750 **Northing** 4884513 **UTM RC** 3 **margin of error : 10 - 30 m**

/

Water Found (mbgs) (masl)

Casing Diameter 3 cm **Casing Material:** PLASTIC

Top of Screen 2.3 (mbgs) **Bottom of Screen** 3.8 (mbgs)

Screen Interva 1.5 (m)

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.9		
0.2	264.7	BLACK	TOPSOIL / /
3.8	261.1	BROWN	CLAY / SANDY /

6930741 — **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/20/2006 **DD/MM/YYYY**

Elev 265.8 (masl) **Easting** 624851 **Northing** 4884503 **UTM RC** 3 **margin of error : 10 - 30 m**

/ Not Used Observation Wells

Water Found 4.6 (mbgs) 261.2 (masl)

Casing Diameter 5 cm **Casing Material:** PLASTIC

Top of Screen 3.0 (mbgs) **Bottom of Screen** 5.5 (mbgs)

Screen Interva 2.5 (m)

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.8		
0.2	265.6	BLACK	TOPSOIL / /
4.0	261.8	BROWN	SILT / CLAY /
5.5	260.3	GREY	SILT / CLAY /

6930742 — **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/30/2006 **DD/MM/YYYY**

Elev 265.8 (masl) **Easting** 624851 **Northing** 4884503 **UTM RC** 3 **margin of error : 10 - 30 m**

/ Not Used Observation Wells

Water Found 7.6 (mbgs) 258.2 (masl)

Casing Diameter 5 cm **Casing Material:** PLASTIC

Top of Screen 4.6 (mbgs) **Bottom of Screen** 7.6 (mbgs)

Screen Interva 3.0 (m)

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.8		
0.2	265.6	BLACK	TOPSOIL / /
4.0	261.8	BROWN	CLAY / SILTY /
7.6	258.2	GREY	CLAY / SILTY /

7047523 — **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 6/20/2007 **DD/MM/YYYY**

Elev 264.5 (masl) **Easting** 624989 **Northing** 4885061 **UTM RC** 3 **margin of error : 10 - 30 m**

/ Abandoned-Other

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.5		
			/ /

7051928 — **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 4/25/2007 **DD/MM/YYYY**

Elev 264.7 (masl) **Easting** 624941 **Northing** 4885086 **UTM RC** 3 **margin of error : 10 - 30 m**

/ Abandoned-Other

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	264.7		

Well Record

Well	Lot	Conc	Location	Date	Elev (masl)	Use	Easting	Northing	UTM RC	Casing Diameter (cm)	Casing Material	Depth (m)	Elev (masl)	SWL (mbgs)	SWL (masl)
7100931	11	3	EAST GWILLIMBURY TOWNSHIP / YORK	10/19/2007	263.6	/ Not Used; Abandoned-Other	624741	4884569	3	3	PLASTIC	0.0	263.6		
7100934	11	3	EAST GWILLIMBURY TOWNSHIP / YORK	10/19/2007	263.6	/ Not Used; Abandoned-Other	624739	4884569	3	32	PLASTIC	0.0	263.6	6.8	256.8
7100935	11	3	EAST GWILLIMBURY TOWNSHIP / YORK	10/19/2007	264.2	Not Used /; Abandoned-Other	624754	4884560	3	76		0.0	264.2	4.6	259.6
7100936	11	3	EAST GWILLIMBURY TOWNSHIP / YORK	10/19/2007	264.0	/ Not Used; Abandoned-Other	624751	4884563	3	5	STEEL	0.0	264.0	5.0	259.0
7101192			EAST GWILLIMBURY TOWNSHIP / YORK	8/27/2007	263.1	/; Test Hole	624742	4884580	3	3	PLASTIC	0.0	263.1		

Each record also lists: Date DD/MM/YYYY; margin of error : 10 - 30 m; Water Found (mbgs) (masl); Top of Screen (mbgs); Bottom of Screen (mbgs); Screen Interva (m); Color; Soil Descriptions; Flowing?; Pumping WL (mbgs) (masl); Pump Rate (LPM) /; Spec. Cap. (LPM/m) Hour / Minute.

Well Record #

7101695 — **Lot** 011 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 12/12/2007 **DD/MM/YYYY**

Elev 265.2 (masl) / **Easting** 624768 **Northing** 4884516

Abandoned-Other **UTM RC** 3 **margin of error : 10 - 30 m**

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? Y

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.2		

/ /

7101696 — **Lot** 011 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 12/14/2007 **DD/MM/YYYY**

Elev 265.2 (masl) / **Easting** 624768 **Northing** 4884516

Abandoned-Other **UTM RC** 3 **margin of error : 10 - 30 m**

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? Y

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.2		

/ /

7105077 — **Lot** **Conc** — EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/4/2007 **DD/MM/YYYY**

Elev 263.9 (masl) / Monitoring **Easting** 624722 **Northing** 4884556

Abandoned-Other **UTM RC** 3 **margin of error : 10 - 30 m**

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	263.9		

/ /

7141115 — **Lot** 012 **Conc** 03 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 2/24/2010 **DD/MM/YYYY**

Elev 265.1 (masl) / **Easting** 624925 **Northing** 4884925

Abandoned-Other **UTM RC** 5 **margin of error : 100 m - 300 m**

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.1		

/ /

7156276 — **Lot** 013 **Conc** 02 — EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/25/2010 **DD/MM/YYYY**

Elev 274.4 (masl) / Domestic **Easting** 624459 **Northing** 4885470

Water Supply **UTM RC** 3 **margin of error : 10 - 30 m**

Water Found (mbgs) (masl)

Casing Diameter 6 inch **Casing Material:** STEEL

Top of Screen 11.3 (mbgs) **Bottom of Screen** 12.2 (mbgs)

Screen Interva 0.9 (m)

Flowing?

SWL 5.8 (mbgs) 268.6 (masl)

Pumping WL 10.7 (mbgs) 263.7 (masl)

Pump Rate 31.8 (LPM) 1 / 0

Spec. Cap. 6.53 (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	274.4		
5.8	268.6	BROWN	CLAY / STONES / HARD
12.2	262.2	BROWN	SAND / STONES / COARSE SAND

Well Record #

7156277 — **Lot** 013 **Conc** 02 EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/25/2010 **DD/MM/YYYY**

Elev 275.0 (masl) **Easting** 624475 **Northing** 4885487 **UTM RC** 3 **margin of error : 10 - 30 m**

/

Water Found (mbgs) (masl)

Casing Diameter 36 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing?
SWL (mbgs) (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	275.0		
6.4	268.6		/ /

7172689 — **Lot** **Conc** EAST GWILLIMBURY TOWNSHIP / YORK

Date 6/17/2011 **DD/MM/YYYY**

Elev 256.5 (masl) **Easting** 624434 **Northing** 4884712 **UTM RC** 3 **margin of error : 10 - 30 m**

/ Monitoring and Te Test Hole

Water Found (mbgs) (masl) Untested

Casing Diameter 2 inch **Casing Material:** PLASTIC

Top of Screen 3.0 (mbgs) **Bottom of Screen** 4.6 (mbgs)

Screen Interva 1.5 (m)

Flowing?
SWL (mbgs) (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	256.5		
0.3	256.2	BROWN	/ TOPSOIL / LOOSE
4.6	252.0	BROWN	CLAY / SILT / SOFT
5.2	251.4	GREY	CLAY / SILT /

7175084 — **Lot** 010 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/27/2011 **DD/MM/YYYY**

Elev 263.7 (masl) **Easting** 624750 **Northing** 4884983 **UTM RC** 4 **margin of error : 30 m - 100 m**

/ Abandoned-Other

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing?
SWL (mbgs) (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	263.7		
			/ /

7185747 — **Lot** 011 **Conc** 02 EAST GWILLIMBURY TOWNSHIP / YORK

Date 5/16/2012 **DD/MM/YYYY**

Elev 250.5 (masl) **Easting** 624070 **Northing** 4884373 **UTM RC** 4 **margin of error : 30 m - 100 m**

/ Monitoring Observation Wells

Water Found 0.4 (mbgs) 250.1 (masl)

Casing Diameter cm **Casing Material:** PLASTIC

Top of Screen 7.5 (mbgs) **Bottom of Screen** 9.3 (mbgs)

Screen Interva 1.8 (m)

Flowing?
SWL (mbgs) (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	250.5		
1.8	248.7	BROWN	SILT / SAND / GRAVEL
5.5	245.0	BROWN	SILT / FINE SAND / WATER-BEARING
8.5	242.0	GREY	SILT / CLAY / SAND
9.5	241.0	GREY	SAND / SILT / CLAY

7189772 — **Lot** 012 **Conc** 02 EAST GWILLIMBURY TOWNSHIP / YORK

Date 8/22/2012 **DD/MM/YYYY**

Elev 262.2 (masl) **Easting** 624443 **Northing** 4885055 **UTM RC** 3 **margin of error : 10 - 30 m**

/ Abandoned-Other

Water Found (mbgs) (masl)

Casing Diameter 36 inch **Casing Material:** CONCRETE

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing? N
SWL 2.4 (mbgs) 259.7 (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	262.2		

Well Record #

7193207 **Lot** **Conc** EAST GWILLIMBURY TOWNSHIP / YORK

Date **DD/MM/YYYY**

Elev 250.5 (masl) **Easting** 624070 **Northing** 4884373
/ Other Abandoned-Other **UTM RC** 5 **margin of error : 100 m - 300 m**
Water Found (mbgs) (masl)
Casing Diameter 5 cm **Casing Material:** PLASTIC
Top of Screen 7.5 (mbgs) **Bottom of Screen** 9.3 (mbgs)
Screen Interva 1.8 (m)

Flowing?
SWL (mbgs) (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	250.5		

/ /

7215496 **Lot** **Conc** EAST GWILLIMBURY TOWNSHIP / YORK

Date 1/9/2014 **DD/MM/YYYY**

Elev 260.7 (masl) **Easting** 624604 **Northing** 4884622
/ Observation Wells **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found (mbgs) (masl)
Casing Diameter 4 cm **Casing Material:** PLASTIC
Top of Screen 1.5 (mbgs) **Bottom of Screen** 4.5 (mbgs)
Screen Interva 3.0 (m)

Flowing?
SWL (mbgs) (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	260.7		
0.6	260.1	BROWN	TOPSOIL / / LOOSE
4.5	256.2	BROWN	SILT / CLAY / LOOSE

7215497 **Lot** **Conc** EAST GWILLIMBURY TOWNSHIP / YORK

Date 1/9/2014 **DD/MM/YYYY**

Elev 260.3 (masl) **Easting** 624682 **Northing** 4884669
/ Monitoring Observation Wells **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found (mbgs) (masl)
Casing Diameter 4 cm **Casing Material:** PLASTIC
Top of Screen 1.5 (mbgs) **Bottom of Screen** 4.5 (mbgs)
Screen Interva 3.0 (m)

Flowing?
SWL (mbgs) (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	260.3		
0.6	259.7	BROWN	TOPSOIL / / LOOSE
4.5	255.8	BROWN	SILT / CLAY / LOOSE

7230017 **Lot** 010 **Conc** 02 EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/12/2014 **DD/MM/YYYY**

Elev 260.5 (masl) **Easting** 624536 **Northing** 4884285
/ Monitoring and Te Observation Wells **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found (mbgs) (masl)
Casing Diameter 2 inch **Casing Material:** PLASTIC
Top of Screen 4.0 (mbgs) **Bottom of Screen** 7.0 (mbgs)
Screen Interva 3.0 (m)

Flowing?
SWL (mbgs) (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	260.5		
0.6	259.9	BROWN	SAND / /
4.6	255.9	BROWN	SILT / CLAY /
7.0	253.5	GREY	CLAY / /

7232539 **Lot** 008 **Conc** 02 EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/14/2014 **DD/MM/YYYY**

Elev 262.9 (masl) **Easting** 624671 **Northing** 4884507
/ **UTM RC** 4 **margin of error : 30 m - 100 m**
Water Found (mbgs) (masl)
Casing Diameter **Casing Material:**
Top of Screen (mbgs) **Bottom of Screen** (mbgs)
Screen Interva (m)

Flowing?
SWL (mbgs) (masl)
Pumping WL (mbgs) (masl)
Pump Rate (LPM) /
Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	262.9		

Well Record #

7232734 **Lot** 011 **Conc** 02 EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/9/2014 **DD/MM/YYYY**

Elev 258.2 (masl) **Easting** 624524 **Northing** 4884422

/ Monitoring and Te Monitoring and Test Hole **UTM RC** 3 **margin of error : 10 - 30 m**

Water Found 3.7 (mbgs) 254.5 (masl) Untested

Casing Diameter 2 inch **Casing Material:** PLASTIC

Top of Screen 3.0 (mbgs) **Bottom of Screen** 6.1 (mbgs)

Screen Interva 3.0 (m)

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	258.2		
6.1	252.1	BROWN	CLAY / TILL / WATER-BEARING

7253063 **Lot** **Conc** EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/19/2015 **DD/MM/YYYY**

Elev 262.9 (masl) **Easting** 624466 **Northing** 4885085

/ **UTM RC** 4 **margin of error : 30 m - 100 m**

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	262.9		

7272284 **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 9/13/2016 **DD/MM/YYYY**

Elev 267.1 (masl) **Easting** 624956 **Northing** 4884825

/ Abandoned-Other **UTM RC** 4 **margin of error : 30 m - 100 m**

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	267.1		

7272290 **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 8/30/2016 **DD/MM/YYYY**

Elev 265.8 (masl) **Easting** 624929 **Northing** 4884889

/ Abandoned-Other **UTM RC** 4 **margin of error : 30 m - 100 m**

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing?

SWL 0.6 (mbgs) 265.2 (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	265.8		

7276684 **Lot** **Conc** EAST GWILLIMBURY TOWNSHIP / YORK

Date 6/9/2016 **DD/MM/YYYY**

Elev 262.7 (masl) **Easting** 624715 **Northing** 4884744

/ **UTM RC** 4 **margin of error : 30 m - 100 m**

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

Depth (m)	Elev (masl)	Color	Soil Descriptions
0.0	262.7		

Well Record #

7277100 **Lot** 011 **Conc** 02 EAST GWILLIMBURY TOWNSHIP / YORK

Date 10/25/2016 **DD/MM/YYYY**

Elev 264.9 (masl) **Easting** 624888 **Northing** 4885061

/ Abandoned-Other **UTM RC** 4 **margin of error : 30 m - 100 m**

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

	Depth (m)	Elev (masl)
	0.0	264.9

Color **Soil Descriptions**

/ /

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

7277103 **Lot** 011 **Conc** 02 EAST GWILLIMBURY TOWNSHIP / YORK

Date 11/7/2016 **DD/MM/YYYY**

Elev 264.8 (masl) **Easting** 624909 **Northing** 4885076

/ Abandoned-Other **UTM RC** 4 **margin of error : 30 m - 100 m**

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

	Depth (m)	Elev (masl)
	0.0	264.8

Color **Soil Descriptions**

/ /

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

7281765 **Lot** 011 **Conc** 03 EAST GWILLIMBURY TOWNSHIP / YORK

Date 8/5/2016 **DD/MM/YYYY**

Elev 265.0 (masl) **Easting** 624766 **Northing** 4884786

/ **UTM RC** 4 **margin of error : 30 m - 100 m**

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

	Depth (m)	Elev (masl)
	0.0	265.0

Color **Soil Descriptions**

/ /

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

7281766 **Lot** **Conc** EAST GWILLIMBURY TOWNSHIP / YORK

Date 8/5/2016 **DD/MM/YYYY**

Elev 263.3 (masl) **Easting** 624699 **Northing** 4884790

/ **UTM RC** 4 **margin of error : 30 m - 100 m**

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

	Depth (m)	Elev (masl)
	0.0	263.3

Color **Soil Descriptions**

/ /

Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute

7281767 **Lot** **Conc** EAST GWILLIMBURY TOWNSHIP / YORK

Date 8/5/2016 **DD/MM/YYYY**

Elev 265.1 (masl) **Easting** 624778 **Northing** 4884845

/ **UTM RC** 4 **margin of error : 30 m - 100 m**

Water Found (mbgs) (masl)

Casing Diameter **Casing Material:**

Top of Screen (mbgs) **Bottom of Screen** (mbgs)

Screen Interva (m)

	Depth (m)	Elev (masl)
	0.0	265.1

Color **Soil Descriptions**

/ /

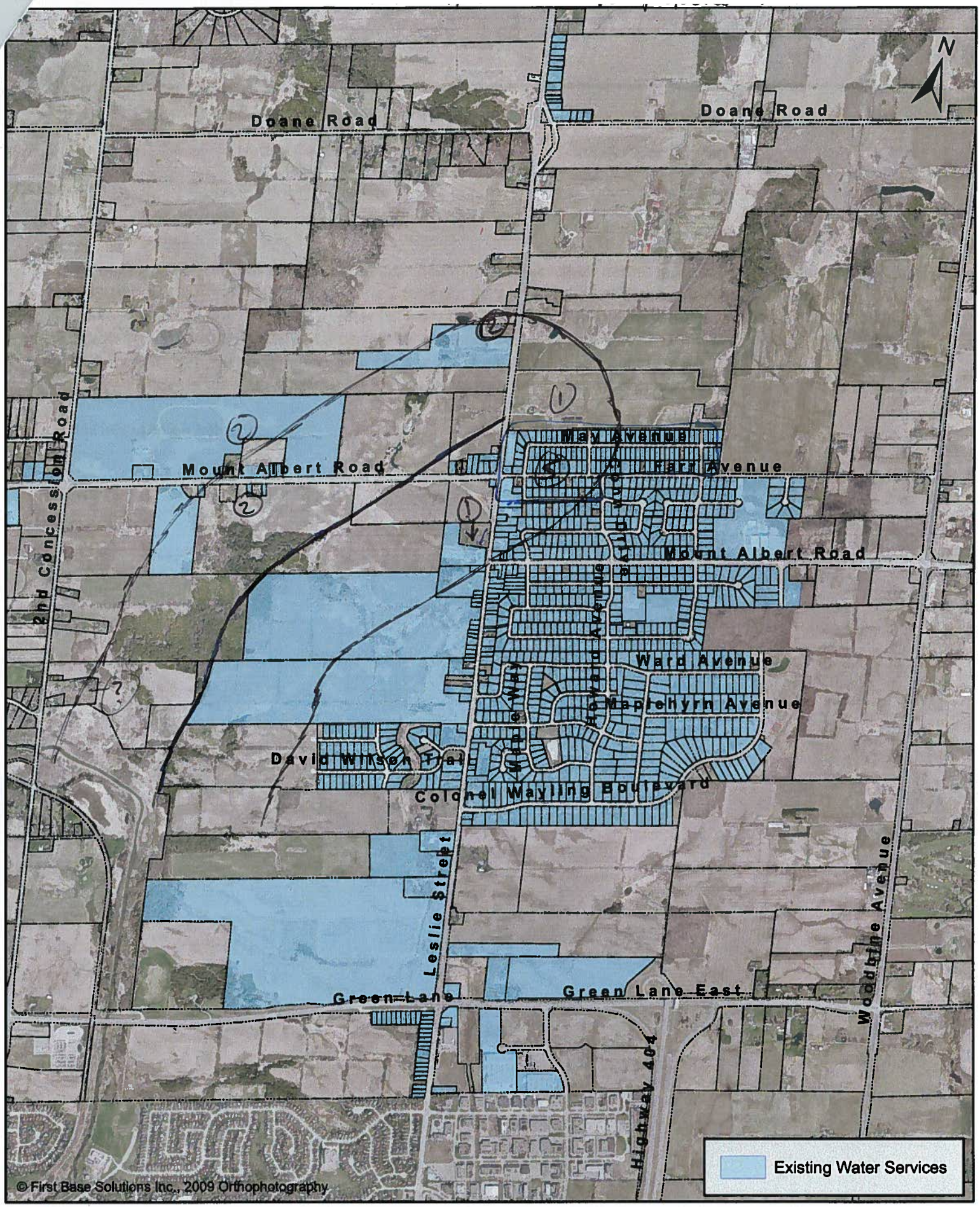
Flowing?

SWL (mbgs) (masl)

Pumping WL (mbgs) (masl)

Pump Rate (LPM) /

Spec. Cap. (LPM/m) Hour / Minute



Town of East Gwillimbury

Existing Water Services - Sharon

0 100 200 400 600 800 Meters

NOTE: INFORMATION DISPLAYED IS FOR REFERENCE PURPOSES ONLY. DOES NOT REPLACE ENGINEERING DRAWINGS OR LEGAL PLAN OF SURVEY

APPENDIX

B BOREHOLE LOGS AND GRAIN SIZE RESULTS

Figure No. _____

LOG OF MONITORING WELL MW1

Project No. 17M-00407-00-HEV
Project: Sharon Corners - Wycliffe Homes
Location: Sharon, Ontario
Co-ordinates: 624404E, 4884755N
Date Drilled: September 25, 2017
Datum: UTM NAD 83 Zone 17
Drill Type: B-45 HD
Logged By: D. N.
Drilling Contractor: Profile Drilling Inc.
Checked By: A. K.

DEPTH (mbgs)	DEPTH (masl)	LITHOLOGY	SOIL DESCRIPTION	WELL	INSTALLATION DETAILS	SAMPLE ID	RECOVERY (%)	SPT Value
	255.7							
			SILTY SAND, some clay, trace gravel - brown, some orange oxidation, compact, moist		Concrete Enviroplug Bentonite	SS1	100%	14
0.69	255.01							
			SILT, trace to some sand and clay - brown mottled, stiff, moist			SS2	100%	11
1.36	254.34							
1.52	254.18		**SILT TILL,** trace to some clay, trace sand and gravel - brown, compact, damp to moist			SS3	100%	7
						SS4	92%	20
2.90	252.8		- No sample due to rock in spoon tip					
						No Recovery	0%	30
3.81	251.89							
			SILT TILL, some clay, trace to some sand, trace gravel - brown, compact, damp to moist			SS5	92%	21
						SS6	100%	22
5.26	250.44							
			SILT, trace to some clay, trace sand - grey, stiff to very stiff, moist to wet			SS7	83%	20
			- clay content decreasing with depth		Sand #10 Slotted PVC Screen	SS8	100%	15
						SS9	67%	26
7.62	248.08							
			End of borehole at 7.62 mbgs		Water measured on Sept. 26, 2017 masl 1.36 mbgs Well Diameter: 50.8 mm Well Material: Schedule 40 PVC			

Figure No. _____

LOG OF MONITORING WELL MW2

Project No. 17M-00407-00-HEV
Project: Sharon Corners - Wycliffe Homes
Location: Sharon, Ontario
Co-ordinates: 624605E, 4844998N
Date Drilled: September 26, 2017
Datum: UTM NAD 83 Zone 17
Drill Type: B-45 HD
Logged By: D. N.
Drilling Contractor: Profile Drilling Inc.
Checked By: A. K.

DEPTH (mbgs)	DEPTH (masl)	LITHOLOGY	SOIL DESCRIPTION	WELL	INSTALLATION DETAILS	SAMPLE ID	RECOVERY (%)	SPT Value
	261.2							
0.33	260.87		**TOPSOIL**		Concrete			
			SILT, trace to some clay, trace sand - brown mottled, firm to stiff, moist		Enviroplug Bentonite	SS1	54%	6
						SS2	100%	5
						SS3	50%	13
2.21	258.99		**SILT TILL,** trace to some clay, trace gravel - brown mottled, stiff, moist - orange oxidation staining on fractures			SS4	100%	11
2.97	258.23		**CLAYEY SILT** - grey mottled, firm to stiff - some oxidation along fractures in upper part of the deposit			SS5	83%	11
						SS6	100%	6
4.42	256.78		- No sample due to rock in spoon tip		Sand			
						No Recovery	0%	19
5.33	255.87		**CLAYEY SILT** - grey, stiff, wet		#10 Slotted PVC Screen	SS7	100%	10
6.34	254.86					SS8	100%	9
6.71	254.49		End of borehole at 6.71 mbgs		Water measured on Sept. 26, 2017 masl 6.34 mbgs Well Diameter: 50.8 mm Well Material: Schedule 40 PVC			

WSP MW REPORT VER.3 BH LOGS - SHARON CORNERS.GPJ GINT STD CANADA LAB.GDT 11/10/17

Figure No. _____

LOG OF MONITORING WELL MW3

Project No. 17M-00407-00-HEV
Project: Sharon Corners - Wycliffe Homes
Location: Sharon, Ontario
Co-ordinates: 624545E, 4884792N
Date Drilled: September 26, 2017
Datum: UTM NAD 83 Zone 17
Drill Type: B-45 HD
Logged By: D. N.
Drilling Contractor: Profile Drilling Inc.
Checked By: A. K.

DEPTH (mbgs)	(masl)	LITHOLOGY	SOIL DESCRIPTION	WELL	INSTALLATION DETAILS	SAMPLE ID	RECOVERY (%)	SPT Value
	260.5							
0.05	260.45		**SAND AND GRAVEL FILL** - brown, loose, moist		Concrete			
			SILT, trace to some clay, trace sand - brown, firm to stiff - some orange oxidation staining		Enviroplug Bentonite	SS1	25%	5
						SS2	83%	7
						SS3	88%	13
2.21	258.29		**SILT,** some sand, trace clay - brown, loose, wet			SS4	100%	5
2.74	257.76		**SILT,** trace to some clay, trace sand - brown, firm, wet - orange oxidation staining visible at fractures			SS5	83%	7
3.73	256.77		**SILT TILL,** some sand and clay, trace gravel - grey, stiff, wet			SS6	100%	9
					Sand #10 Slotted PVC Screen	SS7	100%	8
5.26	255.24		**SILT,** trace sand and clay - grey, very stiff, wet			SS8	100%	28
6.10	254.4		End of borehole at 6.10 mbgs Monitoring well was dry upon completion.		Water measured on Sept. 26, 2017 masl mbgs Well Diameter: 50.8 mm Well Material: Schedule 40 PVC			

WSP MW REPORT VER.3 BH LOGS - SHARON CORNERS.GPJ GINT STD CANADA LAB.GDT 11/10/17

LEGEND

- TOPSOIL
- SANDY SILT TILL
- FINE TO COARSE SAND
- SILTY SAND TILL
- SILTY CLAY
- SILTY CLAY TILL
- SILT
- FINE SAND
- WATER LEVEL
- CAVE-IN

BH.1
BH.2
BH.3
BH.4
BH.5
BH.6
BH.7
BH.8
BH.9
BH.10
BH.11
BH.12
BH.13
BH.14
BH.15
BH.16
BH.17
BH.18
BH.19
BH.20
CU1
CU2
CU3
CU4
CU5
S1
S2
S3
SWM
0.9 ha
Mount Albert Road
Leslie Street

BOREHOLE LOCATION PLAN AND SUBSURFACE PROFILE

Ref. No.: 0710-S131

Date: March 2008

Drawing No.: 1

Scale: Horiz.: 1:2500

SOIL ENGINEERS LTD.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 1

FIGURE NO.: 1

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: November 20, 2007

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
269.6	Ground Surface			
0.0	**28cm TOPSOIL**	1A	DO	-
	Brown, loose to very dense weathered	1B	DO	6
		2	DO	35
	SANDY SILT, Till	3	DO	100+
	some clay, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	4	DO	100+
		5	DO	100+
		6	DO	100+
		7	DO	100+
262.7				
6.9	Brown, very dense **FINE TO COARSE SAND** some silt and gravel	8	DO	100+
261.1				
8.5	Brown, very dense **SILTY SAND, Till** some clay, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	9	DO	100+
259.6				
10.0				

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

Shear Strength (kN/m2): × 50 100 150 200 ×

Penetration Resistance (blows/0.3m): ○ 10 30 50 70 90 ○

Atterberg Limits: W_P ⊢——⊣ W_L

Water Content (%): ● 5 15 25 35 45 ●

Water Content values: 16, 11, 3, 8, 8, 7, 6, 8, 10, 14

WATER LEVEL: Cave-In @ El. 262.3 m on completion

Cont'd on Fig.1A

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 1

FIGURE NO.: 1 A

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: November 20, 2007

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Shear Strength (kN/m2) 50 100 150 200 / Penetration Resistance (blows/0.3m) 10 30 50 70 90	Atterberg Limits W_p W_L / Water Content (%) 5 15 25 35 45	WATER LEVEL
259.6								
10.0 / 258.8	Brown, very dense **SILTY SAND, Till** some clay, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	10	DO	100+	11		13	
10.8	**END OF BOREHOLE**				12			
					13			
					14			
					15			
					16			
					17			
					18			
					19			
					20			

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 2

FIGURE NO.: 2

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: November 20, 2007

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
271.0 / 0.0	Ground Surface			
	30cm TOPSOIL	1A	DO	-
	Brown, stiff **SILTY CLAY** weathered	1B	DO	11
	a trace of sand occ. wet sand and silt seams and layers	2	DO	15
		3	DO	15
268.9 / 2.1	Brown, very dense **SANDY SILT, Till** some clay, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	4	DO	100+
		5	DO	100+
		6	DO	100+
265.4 / 5.6	Brown, hard **SILTY CLAY, Till** sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	7	DO	100+
264.7 / 6.3	**END OF BOREHOLE**			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

Shear Strength (kN/m2): 50 100 150 200

Penetration Resistance (blows/0.3m): 10 30 50 70 90

Atterberg Limits: W_P — W_L

Water Content (%): 5 15 25 35 45

Water Content values: 27, 21, 21, 21, 10, 7, 7, 10

WATER LEVEL: Dry on completion

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 3

FIGURE NO.: 3

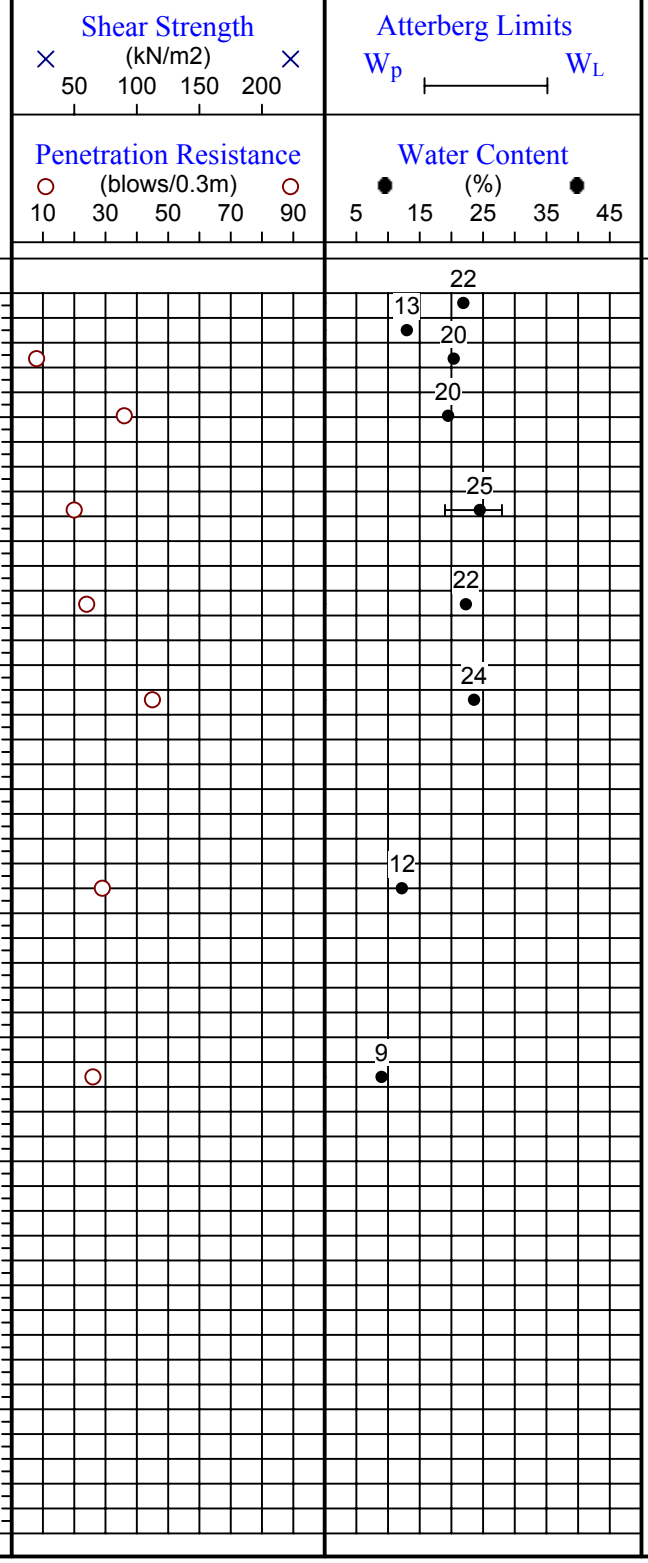
JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: November 20, 2007

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
268.9	Ground Surface			
0.0	**23cm TOPSOIL**	1A	DO	-
		1B	DO	-
	Brown, stiff to hard weathered	1C	DO	8
	SILTY CLAY	2	DO	36
	a trace of sand occ. wet sand and silt seams and layers	3	DO	20
		4	DO	24
265.9				
3.0	Brown, dense **SILT** a trace of some sand some clay, a trace of gravel occ. wet sand and clay seams and layers	5	DO	45
264.3				
4.6	Grey, very stiff **SILTY CLAY, Till** sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	6	DO	29
262.3		7	DO	26
6.6	**END OF BOREHOLE**			



WATER LEVEL

Cave-In @ El. 265.7 m on completion

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 4

FIGURE NO.: 4

JOB DESCRIPTION: Proposed Residential Subdivision

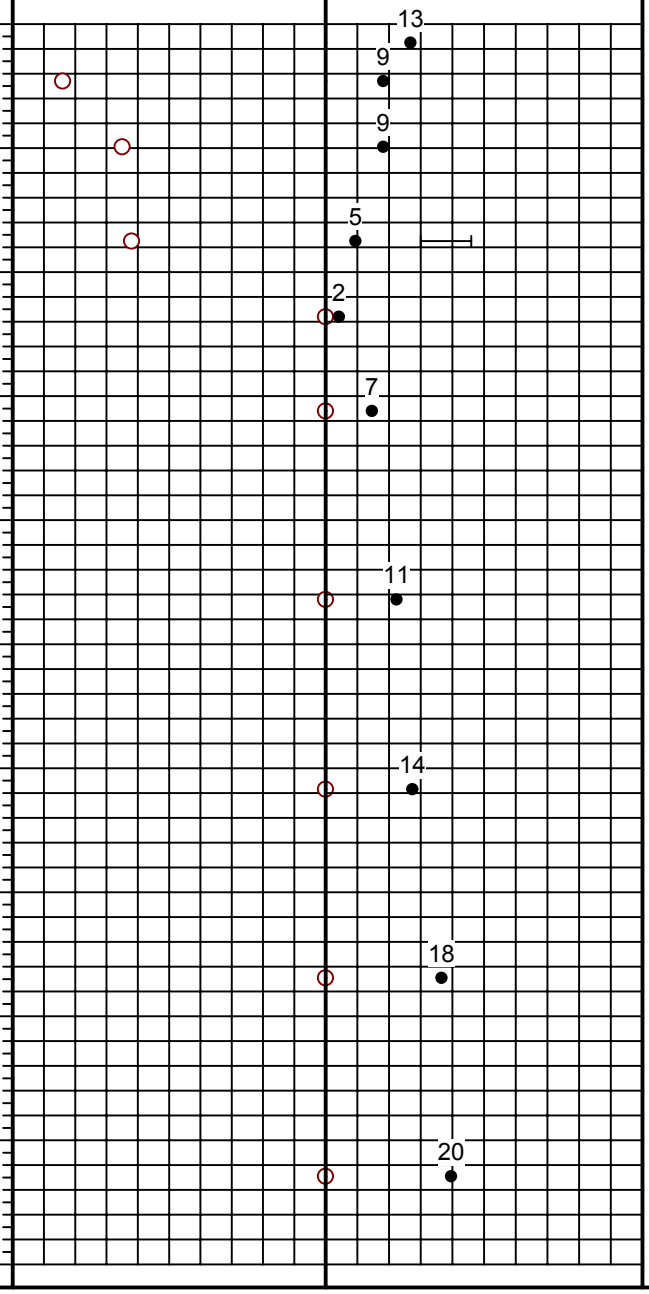
JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: November 20, 2007

Elev. / Depth (m)	SOIL DESCRIPTION	Number	Type	N-Value
270.8 / 0.0	Ground Surface			
	33cm TOPSOIL	1A	DO	-
	Brown, very stiff to hard (weathered)	1B	DO	16
	SILTY CLAY, Till	2	DO	35
	sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	3	DO	38
268.7 / 2.1	Brown, very dense	4	DO	100+
	FINE SAND			
	some silt	5	DO	100+
266.8 / 4.0	Very dense	6	DO	100+
	SANDY SILT, Till			
	some clay, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	7	DO	100+
	brown / grey	8	DO	100+
262.3 / 8.5	Grey, very dense			
	SILT a trace of some sand some clay, a trace of gravel occ. wet sand and clay seams and layers	9	DO	100+
261.3 / 9.5	**END OF BOREHOLE**			

Shear Strength (kN/m2): 50 100 150 200
Penetration Resistance (blows/0.3m): 10 30 50 70 90
Atterberg Limits: W_P — W_L
Water Content (%): 5 15 25 35 45
Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10



WATER LEVEL: Cave-In @ El. 261.5 m on completion

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 5

FIGURE NO.: 5

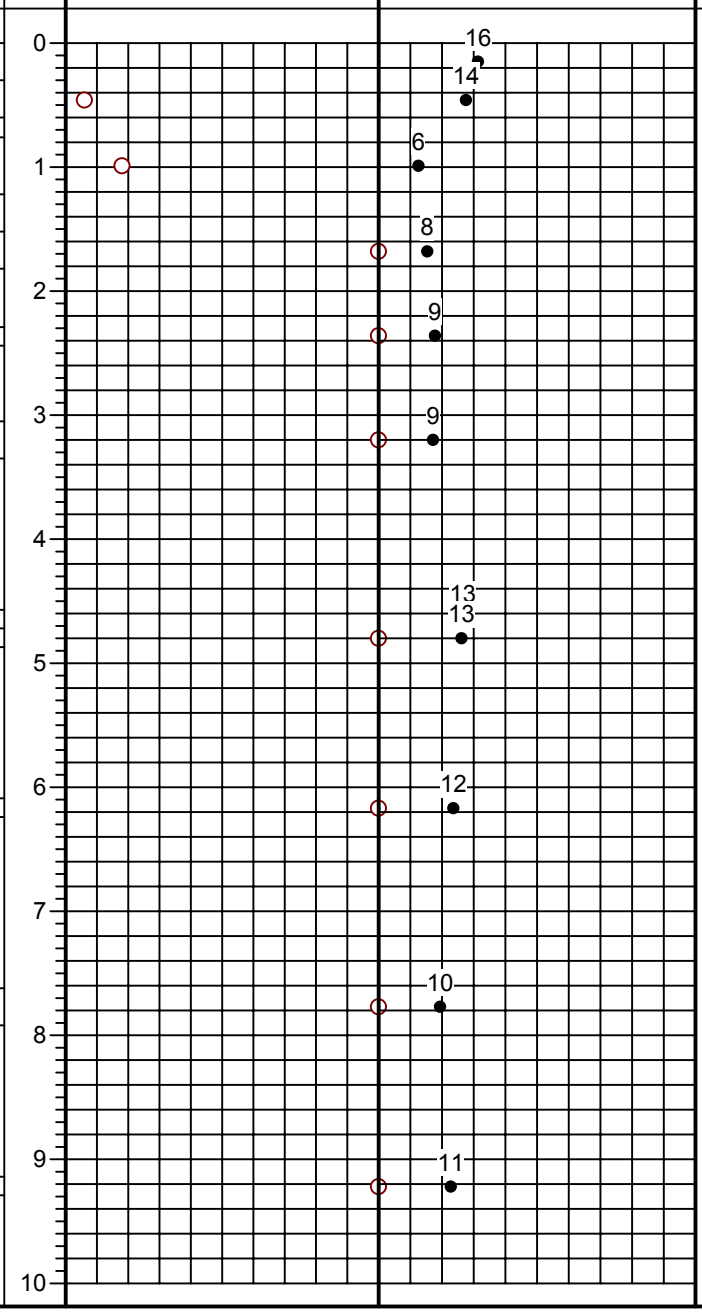
JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: November 20, 2007

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
270.1	Ground Surface			
0.0	**36cm TOPSOIL**	1A	DO	-
	Brown, loose **SILT** a trace of sand and clay	1B	DO	6
269.3				
0.8	Brown, compact weathered	2	DO	18
	SILTY SAND, Till some clay, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders			
268.6				
1.5		3	DO	100+
	Brown, very dense	4	DO	100+
	SANDY SILT, Till some clay, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	5	DO	100+
265.4		6A	DO	-
4.7	Hard	6B	DO	100+
	SILTY CLAY, Till brown / grey sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	7	DO	100+
		8	DO	100+
260.8		9	DO	100+
9.3	**END OF BOREHOLE**			



WATER LEVEL: Dry on completion

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 6

FIGURE NO.: 6

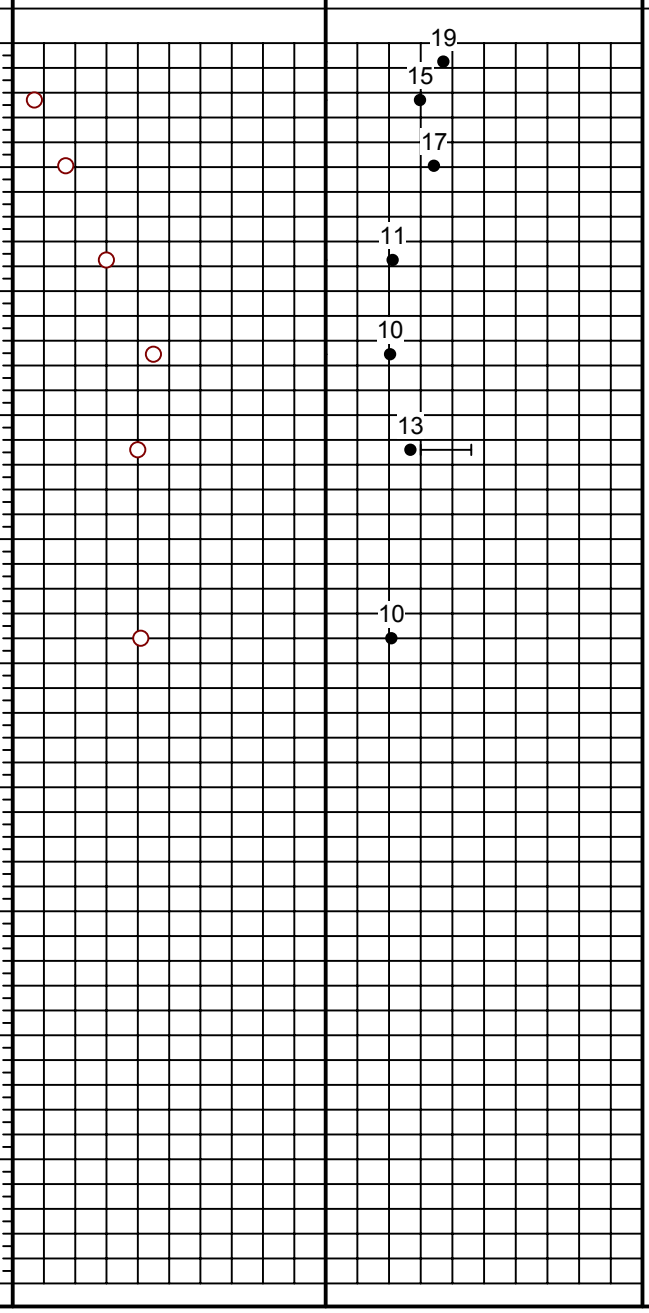
JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: November 20, 2007

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
266.1 / 0.0	Ground Surface			
	25cm TOPSOIL	1A	DO	-
	Brown, firm to very stiff **SILTY CLAY** weathered	1B	DO	7
	a trace of sand occ. wet sand and silt seams and layers	2	DO	17
264.6 / 1.5	Brown, very stiff to hard	3	DO	30
	SILTY CLAY, Till	4	DO	45
	sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	5	DO	40
262.1 / 4.0	Brown, dense **SANDY SILT, Till** some clay, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	6	DO	41
261.1 / 5.0	**END OF BOREHOLE**			



Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 7

FIGURE NO.: 7

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: November 20, 2007

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
261.4	Ground Surface			
0.0	**30cm TOPSOIL**	1A	DO	-
	Brown, stiff	1B	DO	10
	weathered			
	SILTY CLAY	2	DO	12
	a trace of sand			
	occ. wet sand and	3	DO	13
	silt seams and layers			
259.3				
2.1	Compact to dense	4	DO	27
	SANDY SILT, Till	5	DO	28
	brown / grey			
	some clay, a trace of gravel	6	DO	28
	occ. wet sand and silt seams and layers, cobbles and boulders			
254.8		7	DO	42
6.6	**END OF BOREHOLE**			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

Shear Strength (kN/m2): × 50 100 150 200 ×

Penetration Resistance (blows/0.3m): ○ 10 30 50 70 90 ○

Atterberg Limits: W_P ——— W_L

Water Content (%): ● 5 15 25 35 45 ●

Water Content values: 22, 20, 19, 16, 12, 11, 10, 9

WATER LEVEL: Dry on completion

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 8

FIGURE NO.: 8

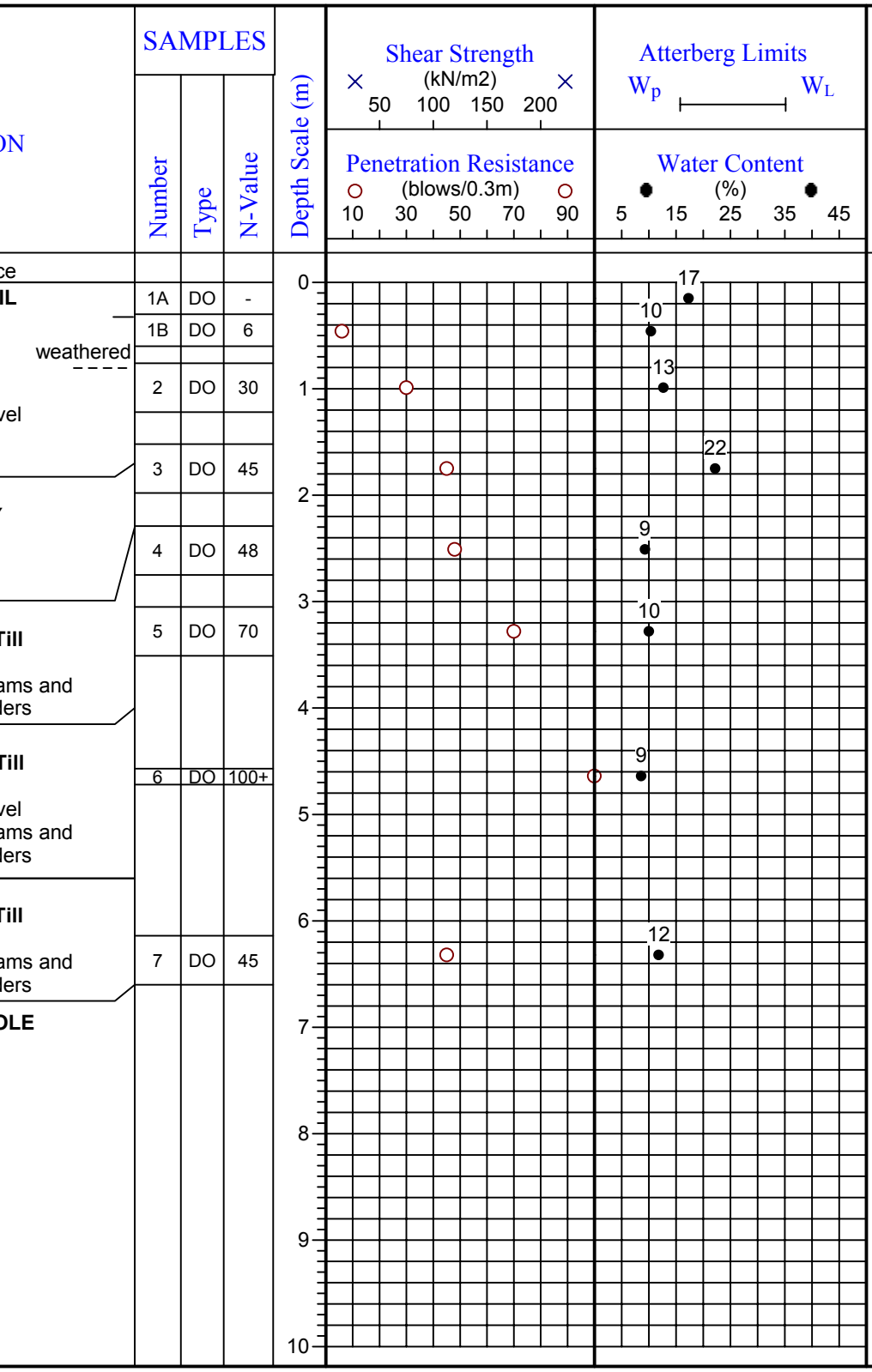
JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: November 20, 2007

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
265.5 / 0.0	Ground Surface			
	30cm TOPSOIL	1A	DO	-
	Brown, loose to compact **SILT** weathered a trace to some sand some clay, a trace of gravel occ. wet sand and clay seams and layers	1B	DO	6
		2	DO	30
263.8 / 1.7		3	DO	45
	Brown, hard **SILTY CLAY** a trace of sand occ. wet sand and silt seams and layers			
263.2 / 2.3		4	DO	48
	Brown, hard **SILTY CLAY, Till** sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	5	DO	70
261.5 / 4.0				
	Brown, very dense **SANDY SILT, Till** some clay, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	6	DO	100+
259.9 / 5.6				
	Brown, hard **SILTY CLAY, Till** sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	7	DO	45
258.9 / 6.6	**END OF BOREHOLE**			



Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 9

FIGURE NO.: 9

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: November 21, 2007

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
261.4 / 0.0	Ground Surface			
	30cm TOPSOIL	1A	DO	-
	Brown, stiff to hard weathered	1B	DO	13
	SILTY CLAY	2	DO	20
	a trace of sand occ. wet sand and silt seams and layers	3	DO	23
		4	DO	28
		5	DO	34
257.4 / 4.0	Brown, very dense **SILT** a trace to some sand some clay, a trace of gravel occ. wet sand and clay seams and layers	6	DO	55
256.4 / 5.0	**END OF BOREHOLE**			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

Shear Strength (kN/m2): × 50 100 150 200 ×

Penetration Resistance (blows/0.3m): ○ 10 30 50 70 90 ○

Atterberg Limits: W_P ⊢——⊣ W_L

Water Content (%): ● 5 15 25 35 45 ●

Water Content values: 19, 21, 22, 21, 20, 21, 22

WATER LEVEL: Cave-In @ El. 256.6 m on completion

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 10

FIGURE NO.: 10

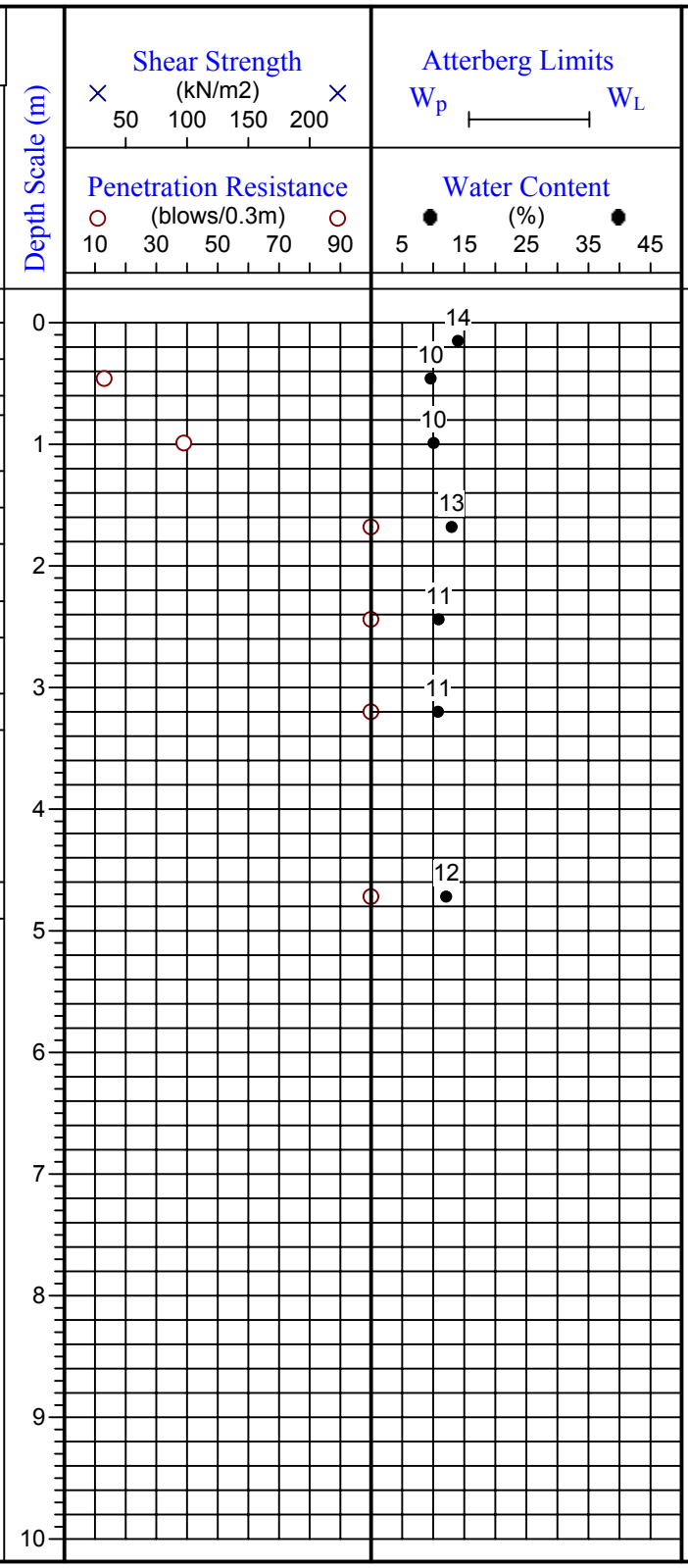
JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: November 21, 2007

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
263.3 / 0.0	Ground Surface			
	25cm TOPSOIL	1A	DO	-
	Brown, stiff to hard — weathered	1B	DO	13
	SILTY CLAY, Till	2	DO	39
	sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	3	DO	100+
		4	DO	100+
260.3 / 3.0	Brown, very dense **SANDY SILT, Till** some clay, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	5	DO	100+
259.3 / 4.0	Brown, hard **SILTY CLAY, Till** sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	6	DO	100+
258.4 / 4.9	**END OF BOREHOLE**			



WATER LEVEL: Dry on completion

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 11

FIGURE NO.: 11

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: November 21, 2007

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
258.1	Ground Surface			
0.0	**30cm TOPSOIL**	1A	DO	-
		1B	DO	10
	Brown, stiff to hard weathered	2	DO	21
	SILTY CLAY	3	DO	27
	a trace of sand occ. wet sand and silt seams and layers	4	DO	27
		5	DO	24
		6	DO	36
251.5		7	DO	38
6.6	**END OF BOREHOLE**			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

Shear Strength (kN/m2): × 50 100 150 200 ×

Penetration Resistance (blows/0.3m): ○ 10 30 50 70 90 ○

Atterberg Limits: W_P ⊢—⊣ W_L

Water Content (%): ● 5 15 25 35 45 ●

Water Content values: 17, 25, 22, 19, 22, 22, 21, 23

WATER LEVEL: Dry on completion

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 12

FIGURE NO.: 12

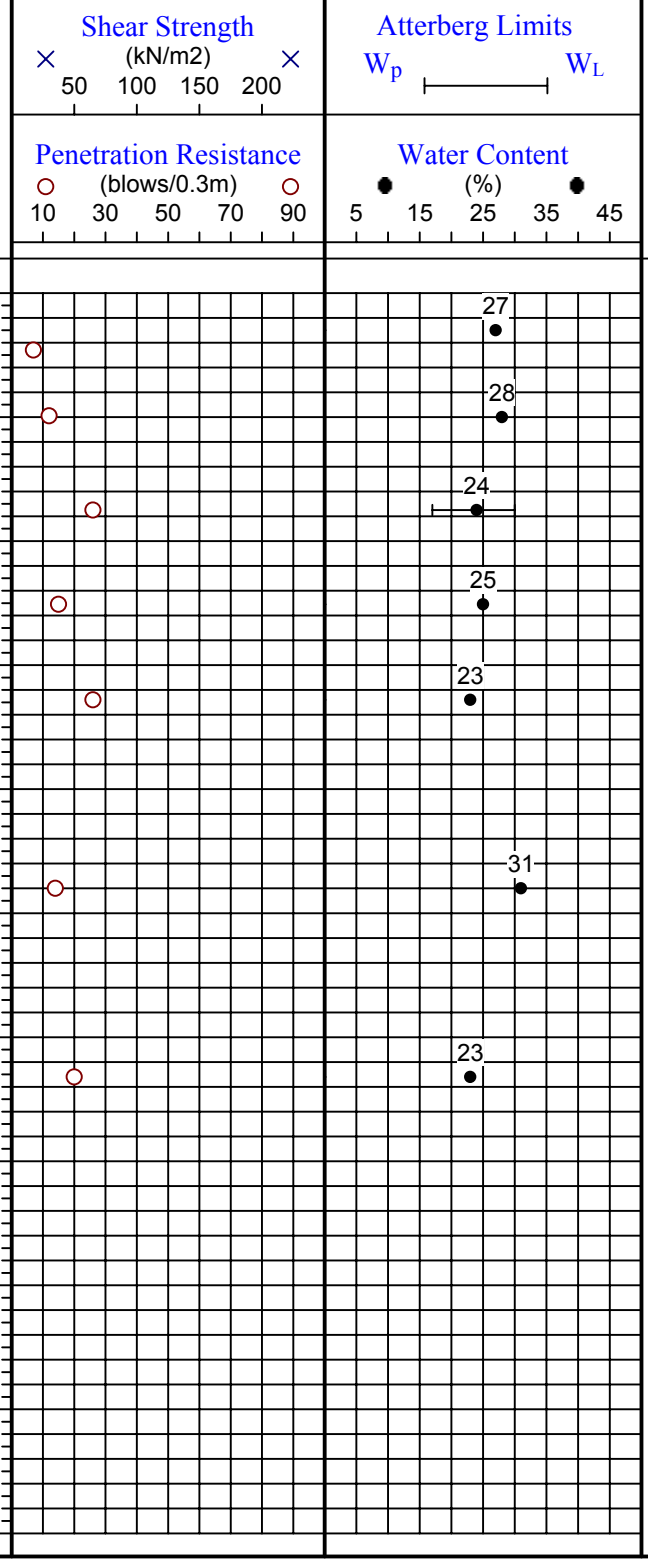
JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: January 24, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
261.4 / 0.0	Ground Surface			
	23cm TOPSOIL			
	Firm to very stiff — weathered	1	DO	7
		2	DO	12
	SILTY CLAY			
		3	DO	26
		4	DO	15
	a trace of sand occ. wet sand and silt seams and layers			
		5	DO	26
	brown grey			
		6	DO	14
254.8 / 6.6		7	DO	20
	END OF BOREHOLE			



WATER LEVEL

W.L. @ El. 256.8 m on completion

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 13

FIGURE NO.: 13

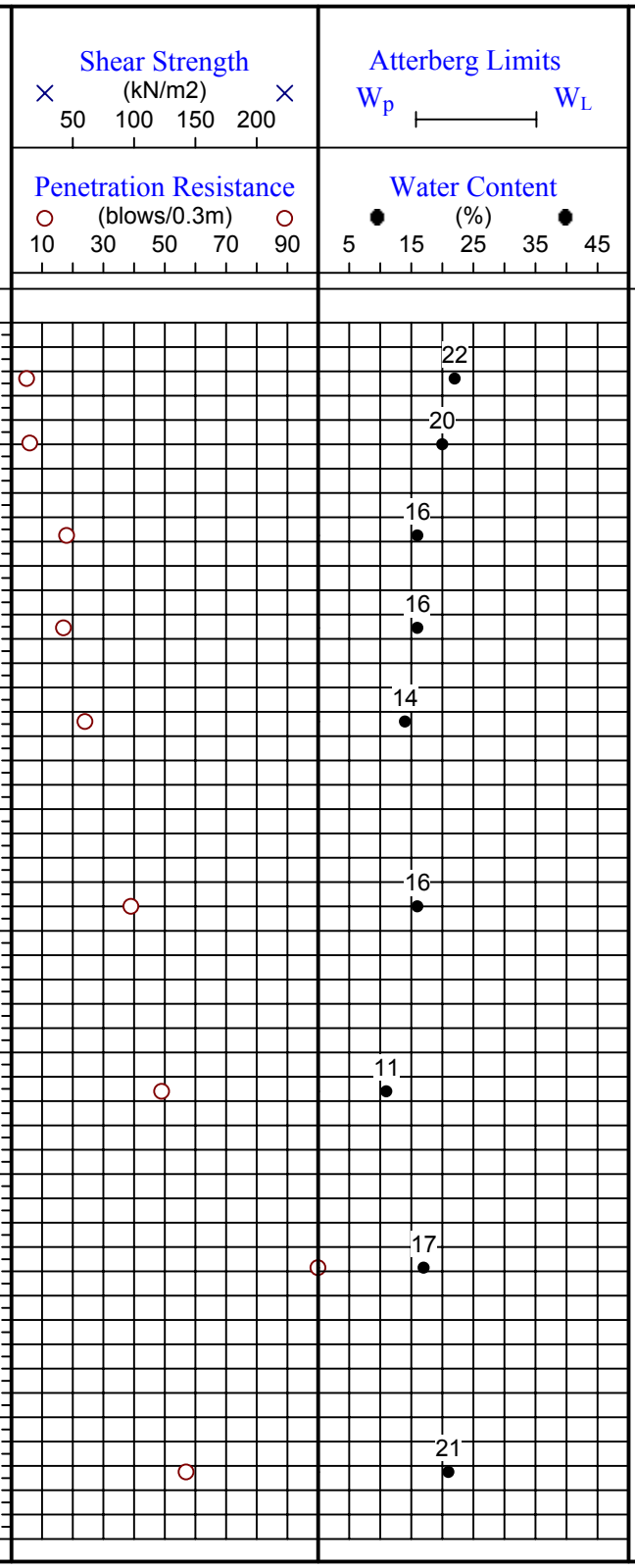
JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: January 24, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
257.9 / 0.0	Ground Surface			
	25cm TOPSOIL			
	Brown, firm to very stiff **SILTY CLAY** a trace of sand occ. wet sand and silt seams and layers	1	DO	5
		2	DO	6
	weathered			
		3	DO	18
255.8 / 2.1	Very stiff to hard brown grey	4	DO	17
		5	DO	24
	SILTY CLAY, Till sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	6	DO	39
		7	DO	49
		8	DO	100+
249.4 / 8.5	Grey, very dense **SILT** a trace to some sand some clay, a trace of gravel occ. wet sand and clay seams and layers	9	DO	57
248.3 / 9.6	**END OF BOREHOLE**			



Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 14

FIGURE NO.: 14

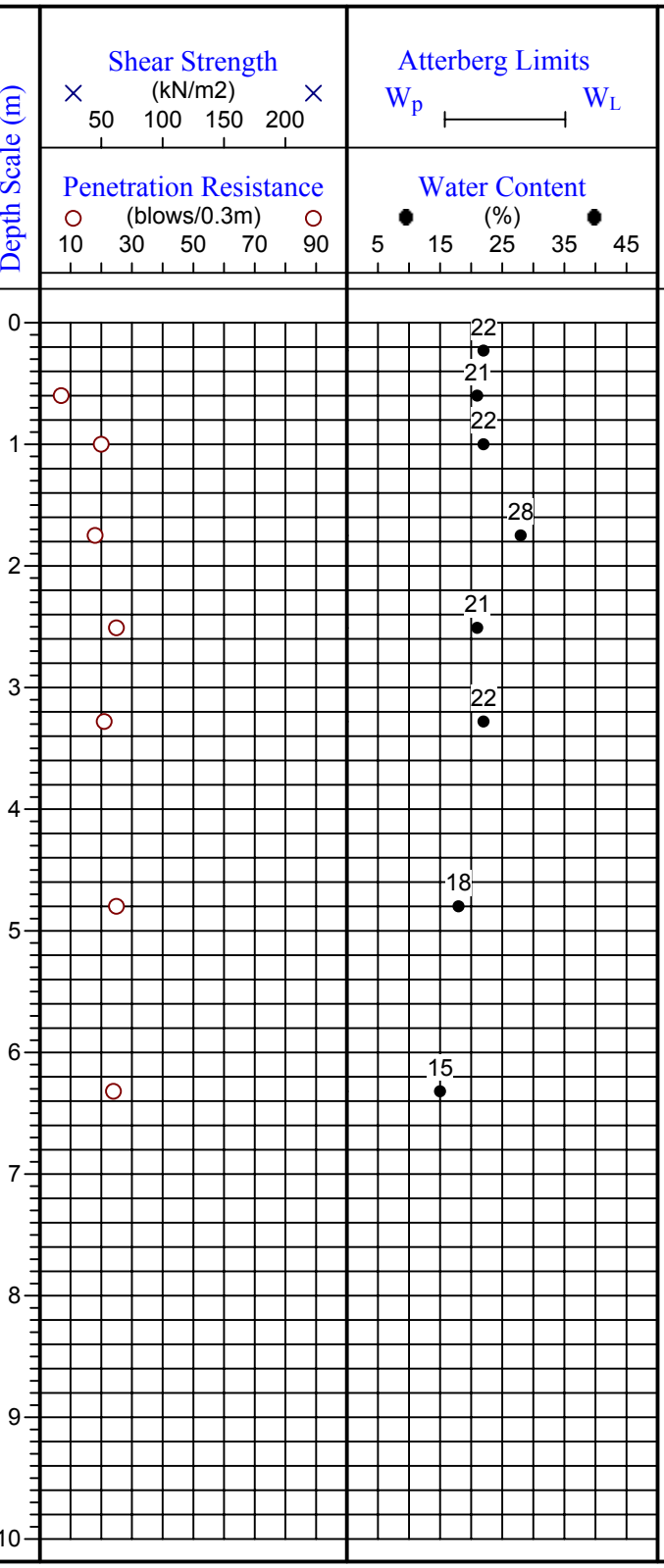
JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: January 24, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
260.0 / 0.0	Ground Surface			
	30cm TOPSOIL	1A	DO	-
	Brown, firm to very stiff — weathered	1B	DO	7
	SILTY CLAY	2	DO	20
	a trace of sand occ. wet sand and silt seams and layers	3	DO	18
257.9 / 2.1	Brown, compact	4	DO	25
	SILT	5	DO	21
	a trace to some sand some clay, a trace of gravel occ. wet sand and clay seams and layers — brown / grey	6	DO	25
254.4 / 5.6	Grey, very stiff **SILTY CLAY** a trace of sand occ. wet sand and silt seams and layers	7	DO	24
253.4 / 6.6	**END OF BOREHOLE**			



Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 15

FIGURE NO.: 15

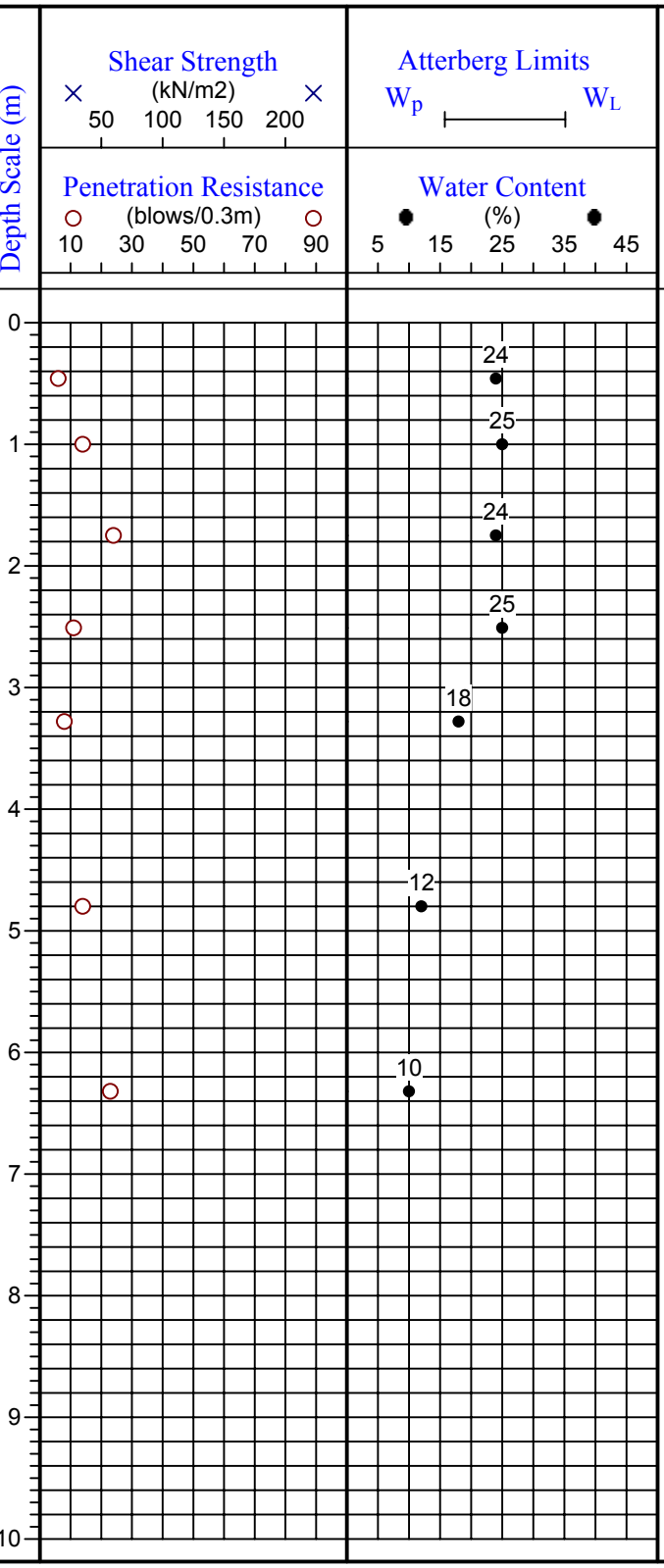
JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: January 24, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
260.4	Ground Surface			
0.0	**30cm TOPSOIL**			
	Brown, firm to stiff — weathered	1	DO	6
		2	DO	14
	SILTY CLAY — silt layer	3	DO	24
	a trace of sand occ. wet sand and silt seams and layers	4	DO	11
		5	DO	8
256.4				
4.0	Grey, stiff to very stiff			
	SILTY CLAY, Till	6	DO	14
	sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	7	DO	23
253.8				
6.6	**END OF BOREHOLE**			



Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 16

FIGURE NO.: 16

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: January 24, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
258.2 / 0.0	Ground Surface			
	25cm TOPSOIL			
	Brown, firm to stiff **SILTY CLAY** a trace of sand occ. wet sand and silt seams and layers	1	DO	7
		2	DO	7
	weathered			
		3	DO	9
256.1 / 2.1	Stiff to very stiff **SILTY CLAY, Till** brown grey sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	4	DO	23
		5	DO	22
		6	DO	16
		7	DO	24
251.1 / 7.1	Grey, dense **SILT** a trace to some sand some clay, a trace of gravel occ. wet sand and clay seams and layers	8	DO	33
249.6 / 8.6	Grey, stiff **SILTY CLAY** a trace of sand occ. wet sand and silt seams and layers	9	DO	14
248.6 / 9.6	**END OF BOREHOLE**			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

Shear Strength (kN/m2): × 50 100 150 200 ×

Penetration Resistance (blows/0.3m): ○ 10 30 50 70 90 ○

Atterberg Limits: W_P ⊢——⊣ W_L

Water Content (%): ● 5 15 25 35 45 ●

Water Content values: 16, 25, 12, 13, 13, 9, 13, 21, 22

WATER LEVEL: W.L. @ El. 250.6 m on completion

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 17

FIGURE NO.: 17

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: January 25, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
257.8 / 0.0	Ground Surface			
	25cm TOPSOIL			
	Brown, firm to stiff	1	DO	7
	SILTY CLAY weathered	2	DO	11
	a trace of sand occ. wet sand and silt seams and layers	3	DO	12
255.7 / 2.1	Brown, stiff to hard	4	DO	15
	SILTY CLAY, Till	5	DO	18
	brown / grey sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	6	DO	25
		7	DO	24
		8	DO	36
249.2 / 8.6	Grey, very stiff **SILTY CLAY** a trace of sand occ. wet sand and silt seams and layers	9	DO	24
248.2 / 9.6	**END OF BOREHOLE**			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

Shear Strength (kN/m2): × 50 100 150 200 ×

Penetration Resistance (blows/0.3m): ○ 10 30 50 70 90 ○

Atterberg Limits: W_P ——— W_L

Water Content (%): ● 5 15 25 35 45 ●

Water Content values: 21, 20, 17, 12, 12, 13, 10, 18, 21

WATER LEVEL: W.L. @ El. 251.7 m on completion

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 18

FIGURE NO.: 18

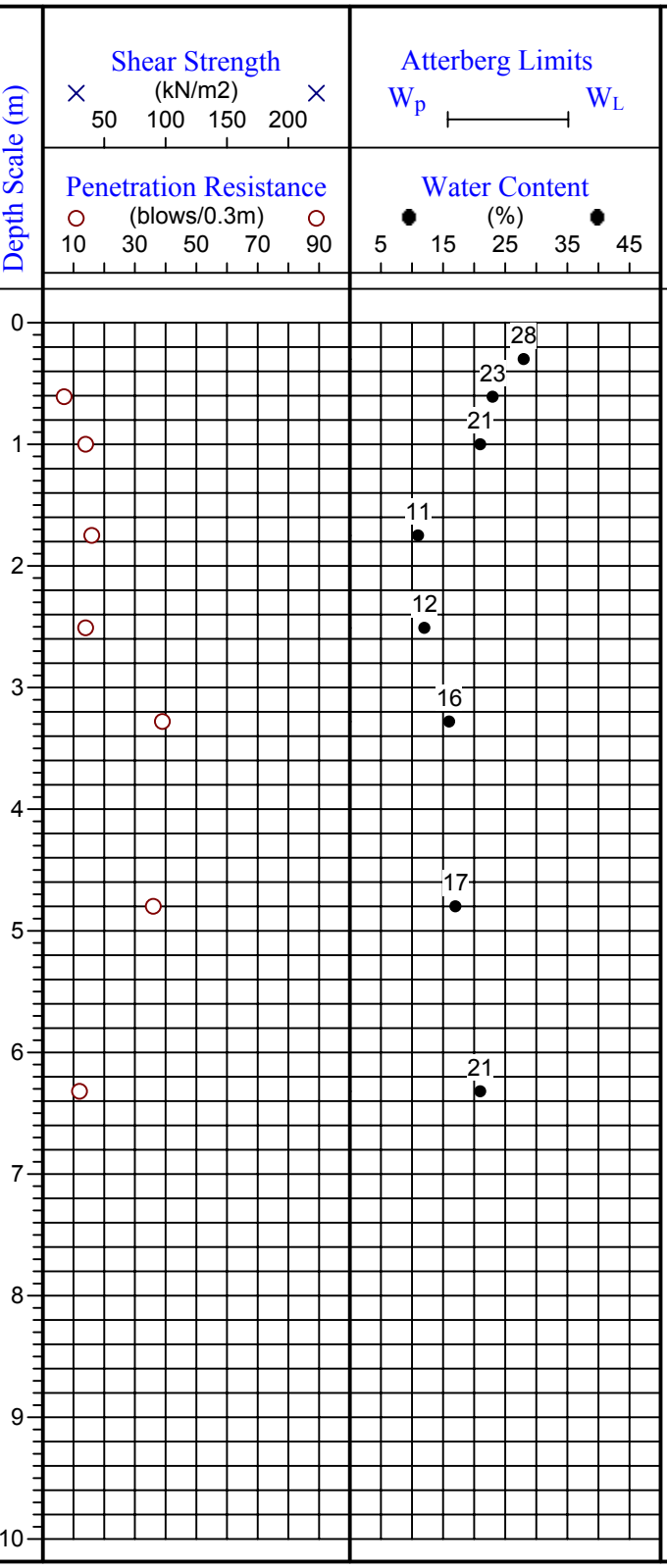
JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: January 25, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
256.4	Ground Surface			
0.0	**30cm TOPSOIL**			
	Brown, firm to stiff **SILTY CLAY** a trace of sand occ. wet sand and silt seams and layers (weathered)	1A	DO	-
		1B	DO	7
		2	DO	14
254.9				
1.5	Brown, stiff **SILTY CLAY, Till** sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	3	DO	16
		4	DO	14
253.4				
3.0	Dense **SILT** (brown / grey) a trace to some sand some clay, a trace of gravel occ. wet sand and clay seams and layers	5	DO	39
		6	DO	36
250.8				
5.6	Grey, stiff **SILTY CLAY** a trace of sand occ. wet sand and silt seams and layers	7	DO	12
249.8				
6.6	**END OF BOREHOLE**			



Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 19

FIGURE NO.: 19

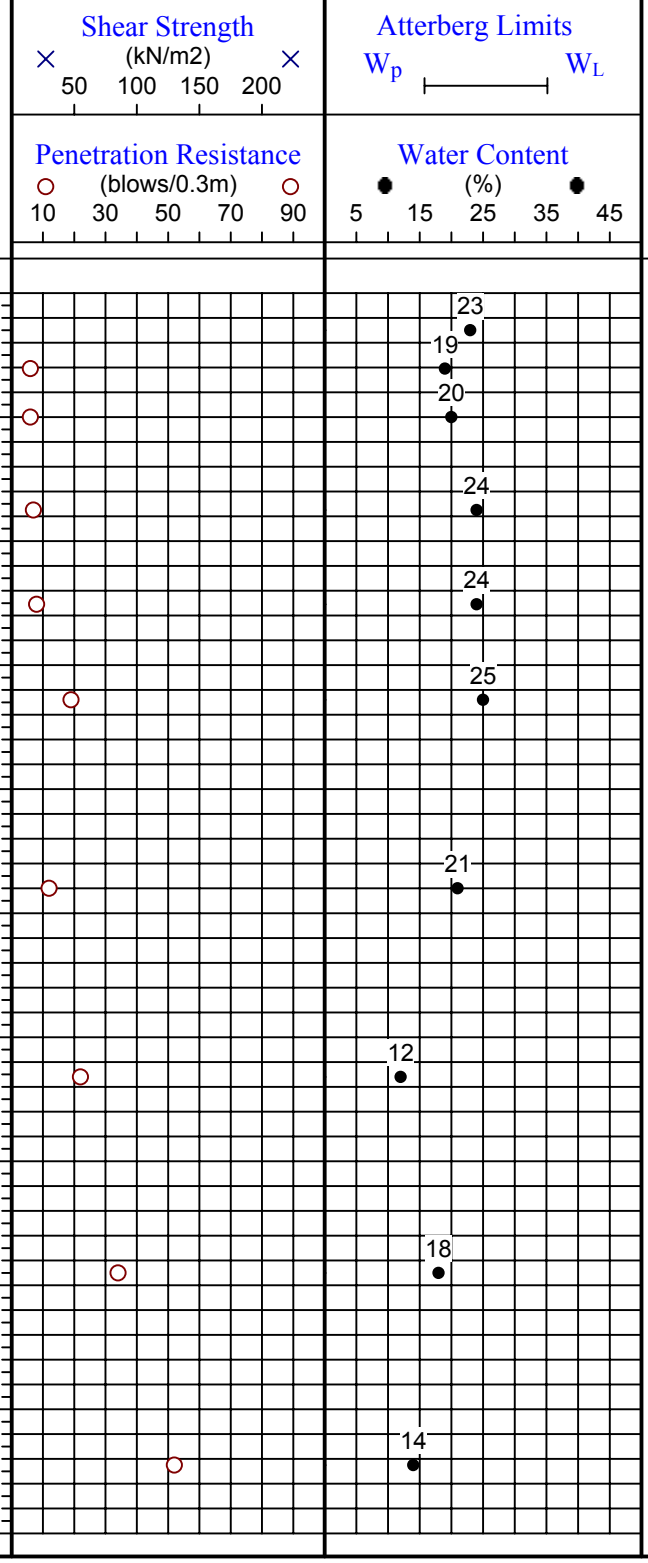
JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: January 25, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
257.8 / 0.0	Ground Surface			
	46cm TOPSOIL	1A	DO	-
	Firm to stiff	1B	DO	6
		2	DO	6
	weathered			
	SILTY CLAY			
		3	DO	7
		4	DO	8
	a trace of sand occ. wet sand and silt seams and layers	5	DO	19
	brown / grey	6	DO	12
252.2 / 5.6	Grey, very stiff **SILTY CLAY, Till** sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	7	DO	22
250.7 / 7.1	Grey, dense **SILT** a trace to some sand some clay, a trace of gravel occ. wet sand and clay seams and layers	8	DO	34
249.2 / 8.6	Grey, hard **SILTY CLAY** a trace of sand occ. wet sand and silt seams and layers	9	DO	52
248.2 / 9.6	**END OF BOREHOLE**			



Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 20

FIGURE NO.: 20

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: January 25, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
258.6 / 0.0	Ground Surface			
	28cm TOPSOIL			
	Firm to very stiff	1	DO	6
		2	DO	5
	weathered			
		3	DO	10
	SILTY CLAY			
		4	DO	18
		5	DO	16
	brown / grey			
	a trace of sand occ. wet sand and silt seams and layers	6	DO	6
		7	DO	6
		8	DO	9
		9	DO	13
249.0 / 9.6	**END OF BOREHOLE**			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

Shear Strength (kN/m2): × 50 100 150 200 ×

Penetration Resistance (blows/0.3m): ○ 10 30 50 70 90 ○

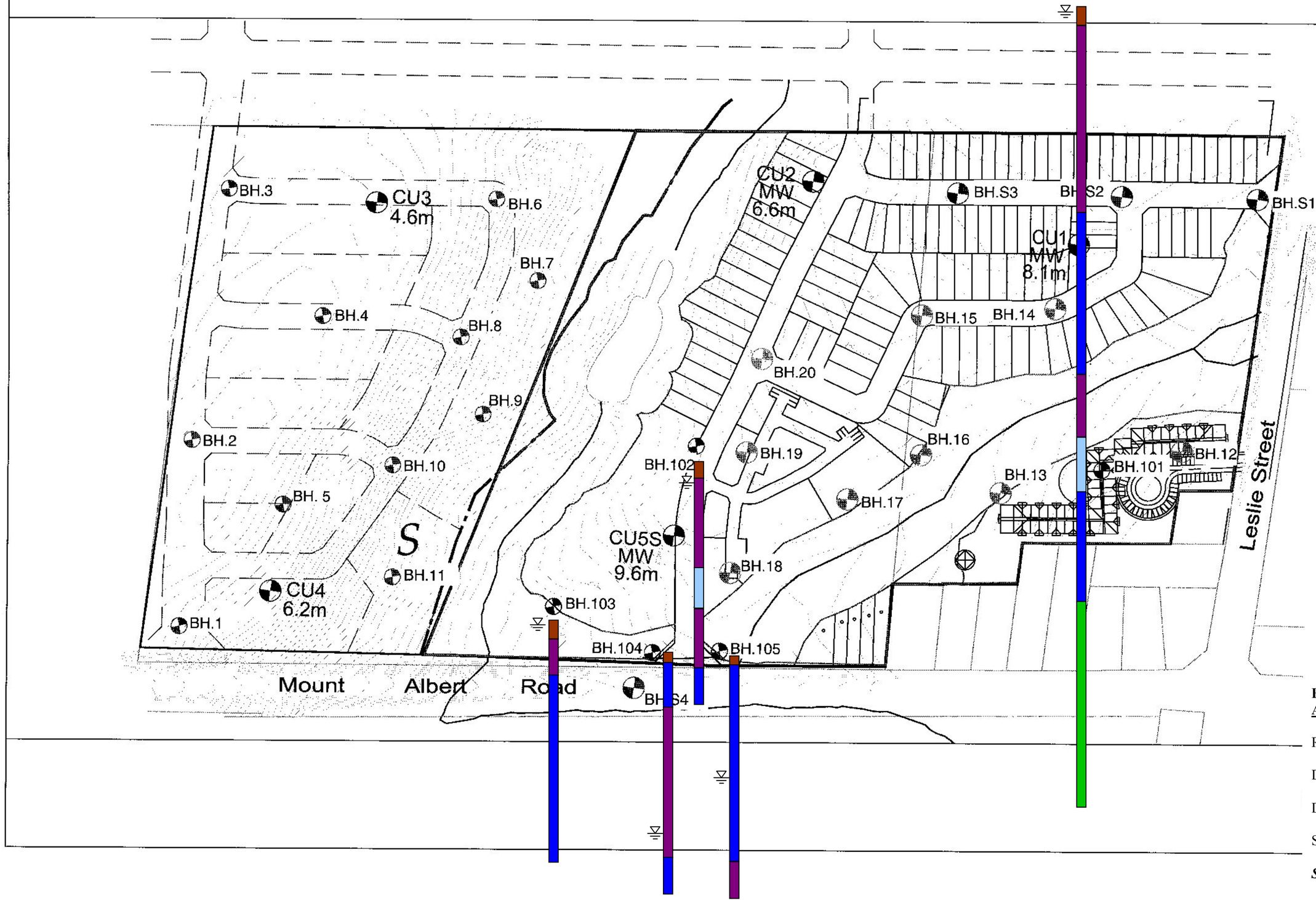
Atterberg Limits: W_P ⊢—⊣ W_L

Water Content (%): ● 5 15 25 35 45 ●

Water Content values: 17, 21, 22, 24, 26, 35, 25, 29, 23

WATER LEVEL: W.L. @ El. 251.6 m on completion

Soil Engineers Ltd.



LEGEND

- TOPSOIL
- SILTY CLAY
- SILTY CLAY TILL
- SILT
- SANDY SILT TILL
- WATER LEVEL

BOREHOLE LOCATION PLAN AND SUBSURFACE PROFILE

Ref. No.: 0710-S131

Date: April 2008

Drawing No.: 1

Scale: Horiz: 1:2500

SOIL ENGINEERS LTD.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 101

FIGURE NO.: 1

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: April 2, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
260.2 / 0.0	Ground Surface			
	51cm TOPSOIL			
	Firm to stiff	1A	DO	-
		1B	DO	4
	SILTY CLAY weathered	2	DO	6
	a trace of sand occ. wet sand and silt seams and layers (varved structure)	3	DO	10
	SILT LAYER brown grey	4	DO	11
		5	DO	14
		6	DO	13
254.6 / 5.6	Grey, stiff to very stiff			
	SILTY CLAY, Till	7	DO	15
	sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	8	DO	16
		9	DO	21
250.2 / 10.0	Cont'd on Fig.1A			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

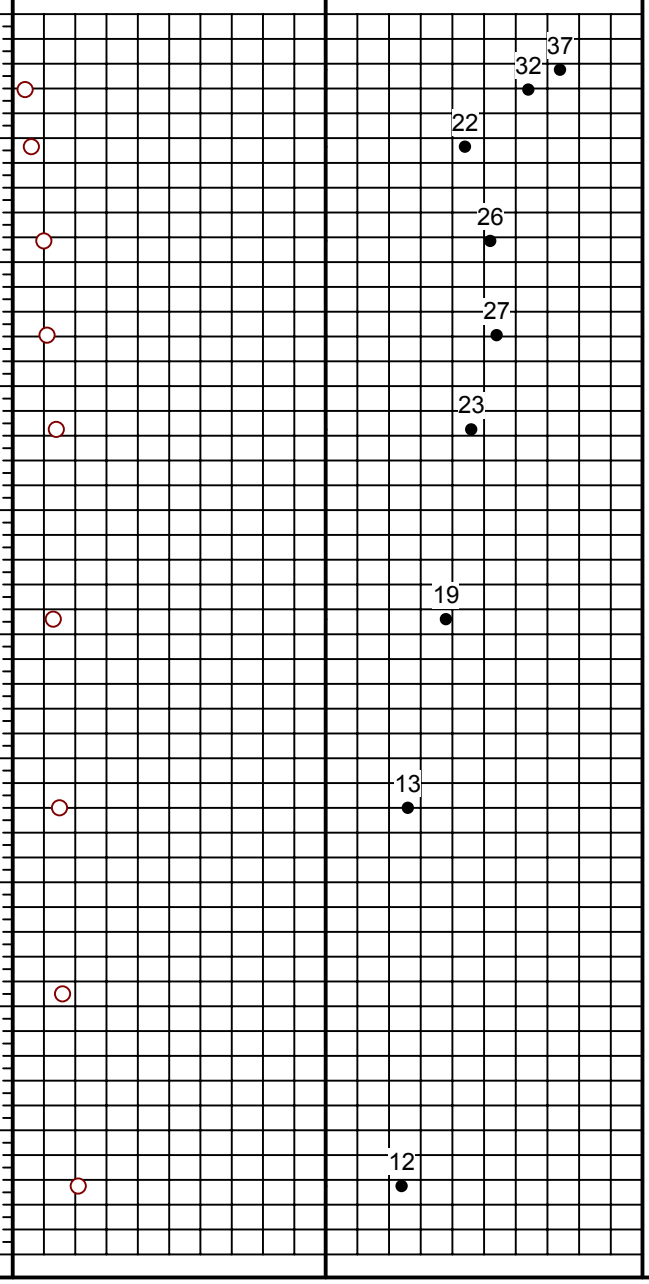
Shear Strength (kN/m2): × 50 100 150 200 ×

Penetration Resistance (blows/0.3m): ○ 10 30 50 70 90 ○

Atterberg Limits: W_P ⊢——⊣ W_L

Water Content (%): ● 5 15 25 35 45 ●

Water Level: Surface flooded



Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 101

FIGURE NO.: 1 A

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: April 2, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Shear Strength (kN/m2) 50 100 150 200 / Penetration Resistance (blows/0.3m) 10 30 50 70 90	Atterberg Limits W_P W_L / Water Content (%) 5 15 25 35 45	WATER LEVEL
250.2	Cont'd							
10.0	Grey, very stiff **SILTY CLAY** a trace of sand occ. wet sand and silt seams and layers (varved structure)	10	DO	21	11		20	
248.5								
11.7	Grey, compact **SILT** some clay, a trace of sand occ. silty clay layers	11	DO	19	12		20	
247.0								
13.2	Grey, very stiff **SILTY CLAY, Till** sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	12	DO	16	13 14		19	
244.0		13	DO	18	15		19	
16.2	Grey, compact to dense **SANDY SILT, Till** some clay, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	14	DO	11	16 17		12	
		15	DO	45	18		9	
240.2	Cont'd on Fig. 1B	16	DO	42	19 20		11	
20.0								

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 101

FIGURE NO.: 1 B

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: April 2, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Shear Strength (kN/m2) 50 100 150 200 / Penetration Resistance (blows/0.3m) 10 30 50 70 90	Atterberg Limits W_p W_L / Water Content (%) 5 15 25 35 45	WATER LEVEL
240.2	Cont'd							
20.0	Grey, dense **SANDY SILT, Till** some clay, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	17	DO	42	21			
238.4								
21.8	**END OF BOREHOLE**				22			
					23			
					24			
					25			
					26			
					27			
					28			
					29			
					30			

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 102

FIGURE NO.: 2

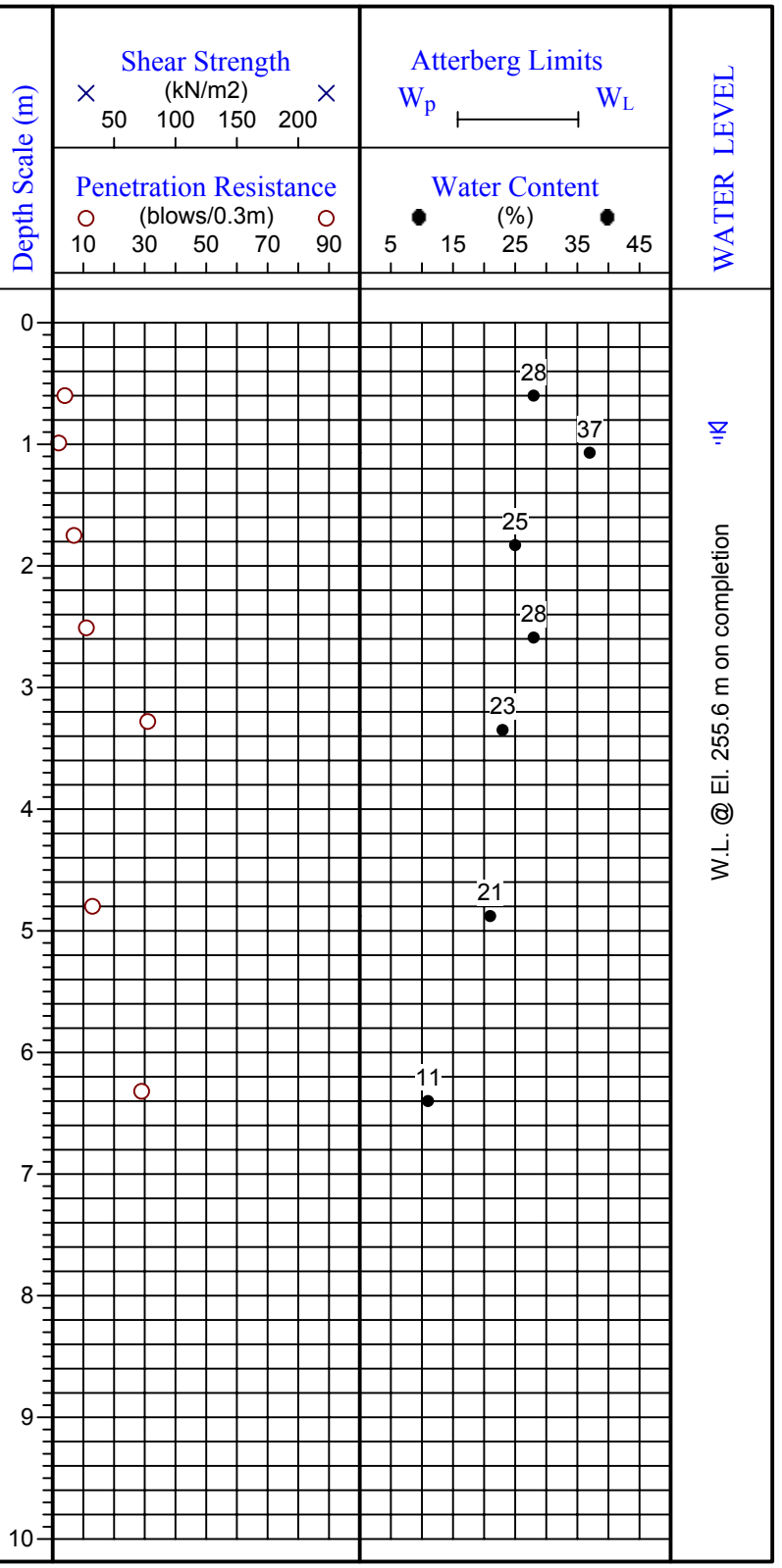
JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: April 2, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
256.5 / 0.0	Ground Surface			
	46cm TOPSOIL			
	Brown, soft to stiff	1	DO	4
	SILTY CLAY	2	DO	2
	weathered			
	a trace of sand occ. wet sand and silt seams and layers	3	DO	7
		4	DO	11
253.6 / 2.9	Brown, dense			
	SILT	5	DO	31
	some clay, a trace of sand occ. silty clay layers			
252.5 / 4.0	Grey, stiff			
	SILTY CLAY			
	a trace of sand occ. wet sand and silt seams and layers	6	DO	13
250.9 / 5.6	Grey, verystiff			
	SILTY CLAY, Till			
	sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	7	DO	29
249.9 / 6.6	**END OF BOREHOLE**			



Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 103

FIGURE NO.: 3

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: April 2, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
252.3 / 0.0	Ground Surface			
	51cm TOPSOIL			
	Brown, firm **SILTY CLAY** a trace of sand occ. wet sand and silt seams and layers	1A	DO	-
		1B	DO	5
		2	DO	6
250.8 / 1.5				
		3	DO	5
	weathered			
	Firm to very stiff			
		4	DO	8
	SILTY CLAY, Till brown			
	grey	5	DO	13
	sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders			
		6	DO	19
		7	DO	9
245.7 / 6.6	**END OF BOREHOLE**			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

Shear Strength (kN/m2): × 50 100 150 200 ×

Penetration Resistance (blows/0.3m): ○ 10 30 50 70 90 ○

Atterberg Limits: W_P ⊢——⊣ W_L

Water Content (%): ● 5 15 25 35 45 ●

Water content values: 41, 24, 31, 32, 12, 14, 12, 13

WATER LEVEL: W.L. @ El. 252.1 m on completion

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 104

FIGURE NO.: 4

JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: April 2, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
254.4 / 0.0	Ground Surface			
	28cm TOPSOIL			
	Brown, firm to stiff **SILTY CLAY, Till** weathered	1	DO	4
	sandy, a trace of gravel	2	DO	9
252.9 / 1.5	occ. wet sand and silt seams and layers, cobbles and boulders	3	DO	20
	Very stiff **SILTY CLAY**	4	DO	21
		5	DO	24
	a trace of sand occ. wet sand and silt seams and layers brown / grey	6	DO	26
248.8 / 5.6	Grey, very stiff **SILTY CLAY, Till**			
	sandy, a trace of gravel	7	DO	22
247.8 / 6.6	occ. wet sand and silt seams and layers, cobbles and boulders			
	END OF BOREHOLE			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

Shear Strength (kN/m2): × 50 100 150 200 ×

Penetration Resistance (blows/0.3m): ○ 10 30 50 70 90 ○

Atterberg Limits: W_P ⊢——⊣ W_L

Water Content (%): ● 5 15 25 35 45 ●

Water Content values: 14, 14, 19, 25, 21, 18, 10

WATER LEVEL: W.L. @ El. 249.2 m on completion

Soil Engineers Ltd.

JOB NO.: 0710-S131

LOG OF BOREHOLE NO.: 105

FIGURE NO.: 5

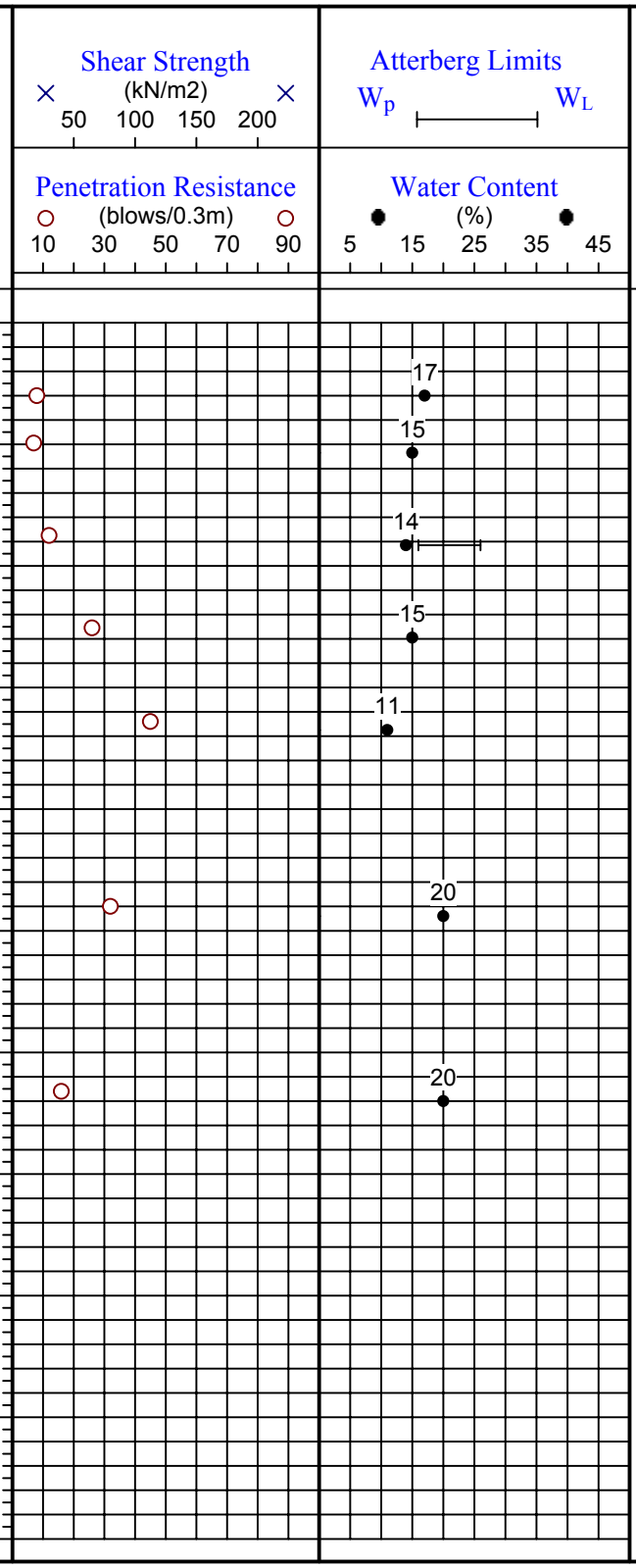
JOB DESCRIPTION: Proposed Residential Subdivision

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: April 2, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
255.4 / 0.0	Ground Surface			
	25cm TOPSOIL			
	Brown, firm to hard	1	DO	8
	weathered	2	DO	7
	SILTY CLAY, Till			
		3	DO	12
	sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders			
		4	DO	26
		5	DO	45
	brown / grey			
		6	DO	32
249.8 / 5.6	Grey, very stiff **SILTY CLAY** a trace of sand occ. wet sand and silt seams and layers	7	DO	16
248.8 / 6.6	**END OF BOREHOLE**			



Soil Engineers Ltd.

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 201

FIGURE NO.: 1

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 6, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
263.0	Ground Surface							
0.0	Firm to stiff **SILTY CLAY** a trace of sand	1	DO	4	0		23	
	weathered	2	DO	11	1		25	
		3	DO	13	2		22	
		4	DO	14			28	
		5	DO	16	3		26	
	brown grey	6	DO	6	4		20	
256.9					5			
6.1	Grey, stiff to very stiff **SILTY CLAY TILL** some sand to sandy a trace of gravel	7	DO	11	6		14	
		8	DO	14	7		13	
255.0					8			

W.L. @ El. 258.4 m upon completion
Cave-in @ El. 258.1 m upon completion

Soil Engineers Ltd.

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 201

FIGURE NO.: 1

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 6, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	SAMPLES Type	SAMPLES N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
8.0	Grey, stiff to very stiff **SILTY CLAY TILL** some sand to sandy a trace of gravel				8			
		9	DO	20	9	○	● 9	
253.4 9.6	**END OF BOREHOLE**				10			
					11			
					12			
					13			
					14			
					15			
					16			

Soil Engineers Ltd.

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 202

FIGURE NO.: 2

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street, Town of East Gwillimbury

DRILLING DATE: May 10, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m^2) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
262.2	Ground Surface							
0.0	**15cm TOPSOIL**				0			
	Brown, firm to stiff	1	DO	6			19	
	SILTY CLAY							
	a trace of sand weathered	2	DO	14	1		24	
		3	DO	11	2		20	
		4	DO	11			21	
		5	DO	8	3		25	
257.6					4			
4.6	Grey, stiff to very stiff	6	DO	13	5		13	
	SILTY CLAY TILL							
	some sand to sandy a trace of gravel	7	DO	15	6		14	
					7			
254.2		8	DO	18	8		18	

W.L. @ El. 260.4 m upon completion
Cave-In @ El. 260.1 m upon completion

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 202

FIGURE NO.: 2

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 10, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
8.0	Grey, stiff to very stiff **SILTY CLAY TILL** some sand to sandy a trace of gravel				8			
253.1					9			
9.1	Grey, compact to dense, wet **SILT** some clay to clayey occ. clay layers	9	DO	33			26	
		10	DO	10	10		27	
		11	DO	10	11		25	
		12	DO	18	12		17	
248.0					13			
14.2	**NO SAMPLING** **DYNAMIC CONE**				14			
246.2					15			
					16			

Soil Engineers Ltd.

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 202

FIGURE NO.: 2

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 10, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES: Number	SAMPLES: Type	SAMPLES: N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
16.0	**NO SAMPLING DYNAMIC CONE**				16			
					17			
					18			
244.0 18.2	**END OF BOREHOLE**							
					19			
					20			
					21			
					22			
					23			
					24			

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 203

FIGURE NO.: 3

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 8, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
263.4	Ground Surface							
0.0	**50 mm ASPHALTIC CONCRETE** **300 mm GRANULAR FILL**	1	DO	13	0		16	
	Brown, firm to stiff **SILTY CLAY** a trace of sand	2	DO	13	1		17	
		3	DO	7	2		27	
		4	DO	9			28	
		5	DO	11	3		25	
259.4								
4.0	Compact, wet **SILT** some clay a trace of sand	6	DO	18	4		30	
	brown / grey	7	DO	22	5		28	
					6			
					7			
255.4		8	DO	13	8		21	

W.L. @ El. 258.5 m upon completion
Cave-In @ El. 257.3 m upon completion

Soil Engineers Ltd.

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 203

FIGURE NO.: 3

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 8, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
8.0	Compact, wet				8			
	SILT							
	some clay a trace of sand							
254.3					9			
9.1	Grey, compact to dense							
	SANDY SILT TILL	9	DO	28		○	● 8	
	some clay a trace of gravel occ. cobbles				10			
		10	DO	22		○	● 14	
					11			
					12			
		11	DO	44		○	● 13	
					13			
		12	DO	25	14	○	● 13	
249.2								
14.2	**END OF BOREHOLE**				15			
					16			

Soil Engineers Ltd.

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 204

FIGURE NO.: 4

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 10, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
261.9	Ground Surface							
0.0	**18 cm TOPSOIL**				0			
	Firm to stiff	1	DO	6			26	
	SILTY CLAY							
	occ. silt layers							
	weathered	2	DO	9	1		26	
		3	DO	12	2		25	
		4	DO	20			21	
		5	DO	16	3		22	
	brown grey	6	DO	17	4		22	
		7	DO	22	5		16	
255.3					6			
6.6	**END OF BOREHOLE**				7			
					8			

W.L. @ El. 260.4 m upon completion

Cave-In @ El. 257.0 m upon completion

Soil Engineers Ltd.

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 205

FIGURE NO.: 5

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 19, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
260.9	Ground Surface							
0.0	**15cm TOPSOIL**				0			
	Very loose to compact, wet	1	DO	1			29	
	SILT							
	some clay							
	weathered	2	DO	8	1		21	
		3	DO	10			21	
					2			
		4	DO	10			22	
	brown grey	5	DO	9	3		20	
257.1								
3.8	Grey, stiff to very stiff	6	DO	10	4		13	
	SILTY CLAY TILL							
	some sand to sandy a trace of gravel	7	DO	11			12	
					5			
					6			
		8	DO	8			13	
					7			
252.9		9	DO	16	8		11	

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 205

FIGURE NO.: 5

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 19, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
8.0	Grey, stiff to very stiff **SILTY CLAY TILL** some sand to sandy a trace of gravel				8			
	wet silt layer	10	DO	9	9		24	
250.9					10			
10.0	Grey, compact **SANDY SILT TILL** some clay to clayey a trace of gravel	11	DO	12	11		11	
		12	DO	13	12			
248.3					13			
12.6	**NO SAMPLING** **DYNAMIC CONE**				14			
					15			
244.9					16			

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 205

FIGURE NO.: 5

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 19, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES: Number	SAMPLES: Type	SAMPLES: N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
16.0	**NO SAMPLING DYNAMIC CONE**				16			
					17			
					18			
					19			
240.9 / 20.0	**END OF BOREHOLE**				20			
					21			
					22			
					23			
					24			

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 206

FIGURE NO.: 6

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 12, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
259.0	Ground Surface							
0.0	**23 cm TOPSOIL**				0			
	Brown, firm	1	DO	5			18	
	SILTY CLAY							
	a trace of sand	2	DO	6	1		23	
257.5	weathered							
1.5	Stiff to hard							
	SILTY CLAY TILL	3	DO	14	2		14	
	sandy a trace of gravel occ. cobbles and boulders	4	DO	10			13	
					3			
		5	DO	16			17	
					4			
	brown grey	6	DO	17			12	
					5			
					6			
		7	DO	27			12	
					7			
	boulders and cobbles	8	DO	36	8		11	
251.0								

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 206

FIGURE NO.: 6

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 12, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
8.0	Stiff to hard				8			
	SILTY CLAY TILL							
	sandy a trace of gravel occ. cobbles and boulders							
249.9					9			
9.1	Grey, compact, wet	9	DO	28		○	18 ●	
	SILT							
	some clay				10			
		10	DO	13		○	19 ●	
					11			
					12			
		11	DO	12		○	22 ●	
245.9					13			
13.1	Grey, loose							
	SANDY SILT TILL							
	some clay to clayey a trace of gravel	12	DO	6	14	○	12 ●	
					15			
		13	DO	7		○	11 ●	
243.0					16			

Soil Engineers Ltd.

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 206

FIGURE NO.: 6

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 12, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES: Number	SAMPLES: Type	SAMPLES: N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
16.0	**NO SAMPLING DYNAMIC CONE**				16			
					17			
					18			
					19			
					20			
238.6								
20.4	**END OF BOREHOLE**				21			
					22			
					23			
					24			

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 207

FIGURE NO.: 7

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 16, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
260.0	Ground Surface							
0.0	**20 cm TOPSOIL**				0			
	Brown, soft to stiff	1	DO	5			29	
	SILTY CLAY							
	a trace of sand							
	weathered	2	DO	9	1		24	
		3	DO	2	2		31	
		4	DO	7			25	
256.9					3			
3.1	Stiff to very stiff	5	DO	10			10	
	SILTY CLAY TILL							
	sandy a trace of gravel occ. sand seams and layers				4			
	brown grey	6	DO	20	5		17	
		7	DO	20	6		12	
					7			
252.0		8	DO	23	8		12	

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 207

FIGURE NO.: 7

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 16, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
8.0	Stiff to very stiff **SILTY CLAY TILL** sandy a trace of gravel occ. sand seams and layers	9	DO	30	8 9 10	Penetration Resistance: 30	Moisture Content: 25	
249.3								
10.7	Grey, loose to compact, wet **SILT** some clay	10	DO	6	11	Penetration Resistance: 6	Moisture Content: 25	
		11	DO	15	12	Penetration Resistance: 15	Moisture Content: 19	
246.9					13			
13.1	Grey, very loose to compact **SANDY SILT TILL** some clay a trace of gravel	12	DO	13	14	Penetration Resistance: 13	Moisture Content: 10	
	wet silt layer	13	DO	2	15	Penetration Resistance: 2	Moisture Content: 13	W.L. @ El. 244.8 m upon completion
244.0					16			

Soil Engineers Ltd.

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 207

FIGURE NO.: 7

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 16, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
16.0	Grey, very loose to compact				16			
	SANDY SILT TILL							
	some clay a trace of gravel							
242.8		14	DO	7	17		12	
17.2	**NO SAMPLING DYNAMIC CONE**				18			
					19			
					20			
					21			
					22			
237.5								
22.5	**END OF BOREHOLE**				23			
					24			

Soil Engineers Ltd.

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 208

FIGURE NO.: 8

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street, Town of East Gwillimbury

DRILLING DATE: May 8, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
261.0	Ground Surface							
0.0	**80 mm ASPHALTIC CONCRETE** **250 mm GRANULAR FILL** Brown, firm to very stiff **SILTY CLAY** a trace of sand — weathered	1	DO	7	0		20	
		2	DO	11	1		21	
		3	DO	10	2		23	
		4	DO	22	3		22	
257.7		5	DO	18			20	
3.3	Compact to dense **SANDY SILT TILL** some clay a trace of gravel — brown grey	6	DO	15	4		13	
		7	DO	33	5		16	
253.0		8	DO	47	6 7 8		12	W.L. @ El. 256.4 m upon completion

Soil Engineers Ltd.

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 208

FIGURE NO.: 8

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 8, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
8.0	Compact to dense				8			
	SANDY SILT TILL							
	some clay a trace of gravel							
251.9					9			
9.1	Grey, loose to dense, wet	9	DO	32			15	
	SILT							
	some clay				10			
		10	DO	9			23	
					11			
					12			
		11	DO	7			25	
247.9					13			
13.1	Grey, loose to compact							
	SANDY SILT TILL							
	some clay a trace of gravel	12	DO	12	14		18	
					15			
		13	DO	8			12	
245.3								
15.7	**END OF BOREHOLE**				16			

Soil Engineers Ltd.

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 209

FIGURE NO.: 9

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 9, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
259.7 / 0.0	Ground Surface				
	50 mm ASPHALTIC CONCRETE **380 mm GRANULAR FILL**	1	DO	10	0
	EARTH FILL brown silty clay	2	DO	7	1
258.2 / 1.5	Brown, stiff **SILTY CLAY** (coarse sand layer) a trace of sand occ. gravel	3	DO	9	2
		4	DO	11	3
256.5 / 3.2	Grey, compact to dense (boulder) **SANDY SILT TILL** some clay a trace of gravel	5	DO	42	4
		6	DO	21	5
		7	DO	15	6
251.7		8	DO	26	8

Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40

Moisture values: 22, 21, 17, 24, 12, 10, 10

WATER LEVEL: W.L. @ El. 255.7 m upon completion

Soil Engineers Ltd.

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 209

FIGURE NO.: 9

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 9, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
8.0	Grey, compact to dense				8			
	SANDY SILT TILL							
	some clay a trace of gravel							
250.6					9			
9.1	Grey, compact to dense, wet	9	DO	32			19	
	SILT							
	some clay				10			
		10	DO	12			22	
					11			
					12			
		11	DO	21			18	
					13			
246.0								
13.7	Grey, loose to compact	12	DO	11	14		18	
	SANDY SILT TILL							
	some clay a trace of gravel				15			
		13	DO	9			12	
244.0								
15.7	**END OF BOREHOLE**				16			

JOB NO.: 1704-S065

LOG OF BOREHOLE NO.: 210

FIGURE NO.: 10

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight Auger

PROJECT LOCATION: Northwest Corner of Mount Albert Road and Leslie Street
Town of East Gwillimbury

DRILLING DATE: May 9, 2017

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
258.0	Ground Surface				
0.0	**EARTH FILL**				0
257.7 / 0.3	brown silty clay traces of sand and gravel Brown, loose to compact	1	DO	18	
	SANDY SILT TILL				
	some clay a trace of gravel	2	DO	10	1
		3	DO	8	
					2
		4	DO	13	
					3
		5	DO	18	
					4
		6	DO	31	
252.5 / 5.5	Grey, compact, wet				5
	SILT				
	some clay and sand	7	DO	25	6
251.4 / 6.6	**END OF BOREHOLE**				7
					8

Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40

Depth (m)	Moisture Content (%)
0.3	20
1.5	15
2.0	15
2.5	15
3.3	12
4.8	15
6.3	21

WATER LEVEL

W.L. @ El. 256.2 m upon completion

Soil Engineers Ltd.

JOB NO.: 0604-S043

LOG OF BOREHOLE NO.: CU1

FIGURE NO.: 1

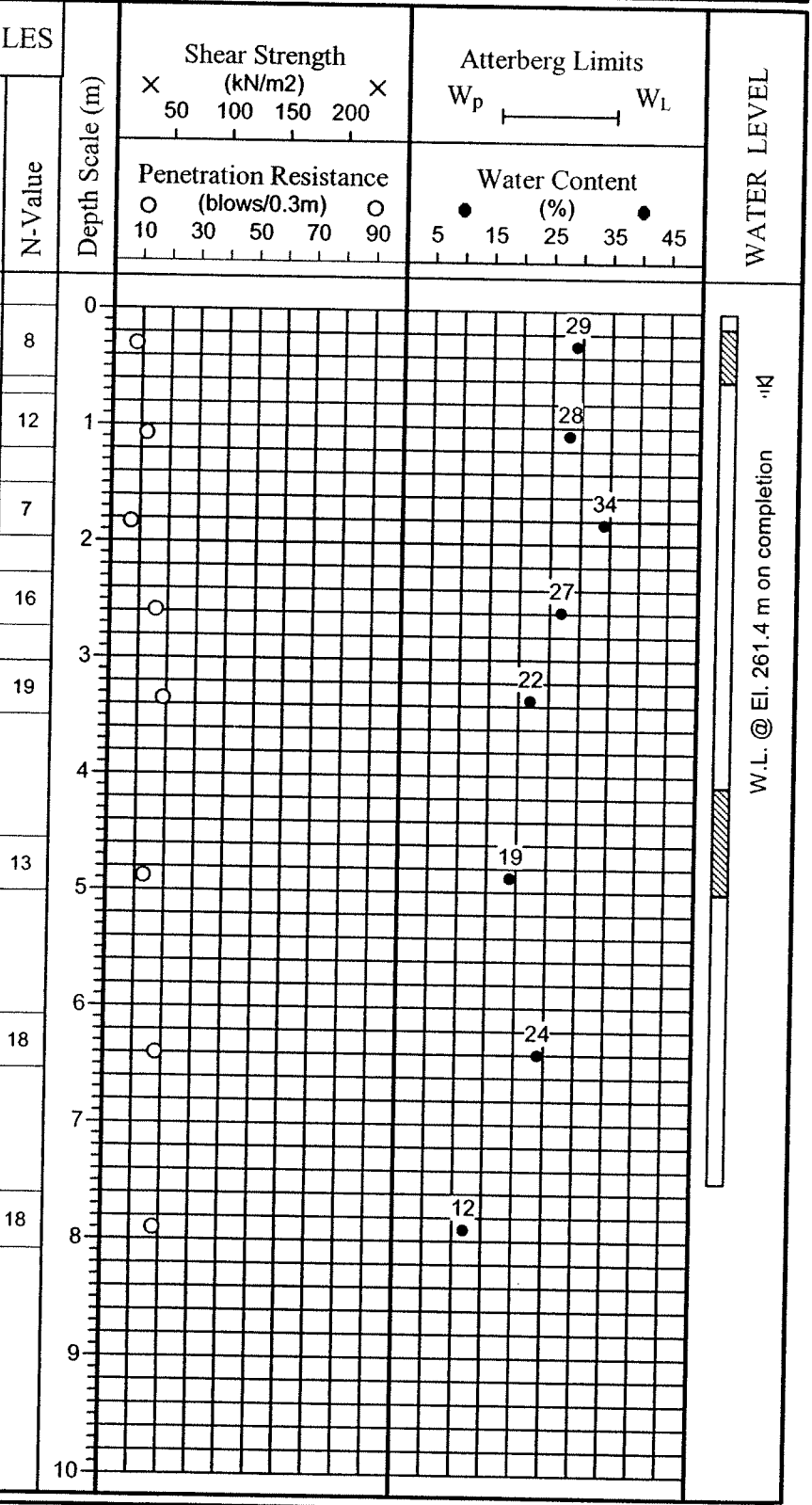
JOB DESCRIPTION: Proposed Master Environmental Servicing Plan

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: May 24, 2006

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
262.0 / 0.0	Ground Surface			
	25cm TOPSOIL	1	DO	8
	Loose to compact	2	DO	12
	weathered	3	DO	7
		4	DO	16
	SILT	5	DO	19
	brown / grey	6	DO	13
	a tr. of clay to clayey a tr. of sand occ. silty clay layers	7	DO	18
253.9 / 8.1		8	DO	18
	END OF BOREHOLE Installed 50mm ø standpipe to 7.5m. Sand backfill from 0.6 to 4.1m and from 5.0 to 7.5m. Bentonite seal from 0.15 to 0.6m and from 4.1 to 5.0m. Concrete from 0.0 to 0.15m mounted with a steel protector casing.			



Soil Engineers Ltd.

JOB NO.: 0604-S043

LOG OF BOREHOLE NO.:CU5-S

FIGURE NO.: 5

JOB DESCRIPTION: Proposed Master Environmental Servicing Plan

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: May 24, 2006

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
257.0 / 0.0	Ground Surface			
	20cm TOPSOIL	1	DO	12
	Loose to compact	2	DO	17
	weathered	3	DO	7
	SILT	4	DO	25
	a tr. of clay to clayey a tr. of sand occ. silty clay layers	5	DO	25
	brown / grey	6	DO	16
251.4 / 5.6	Grey, stiff			
	SILTY CLAY, Till	7	DO	8
	a tr. of sand to sandy a tr. of gravel occ. sand and silt seams and layers, cobbles and boulders	8	DO	15
248.4 / 8.6	Grey, dense			
	SILT a tr. of clay to clayey a tr. of sand	9	DO	33
247.4 / 9.6	occ. silty clay layers			
	END OF BOREHOLE Installed 50mm ø standpipe to 9.1m with steel protector casing.			

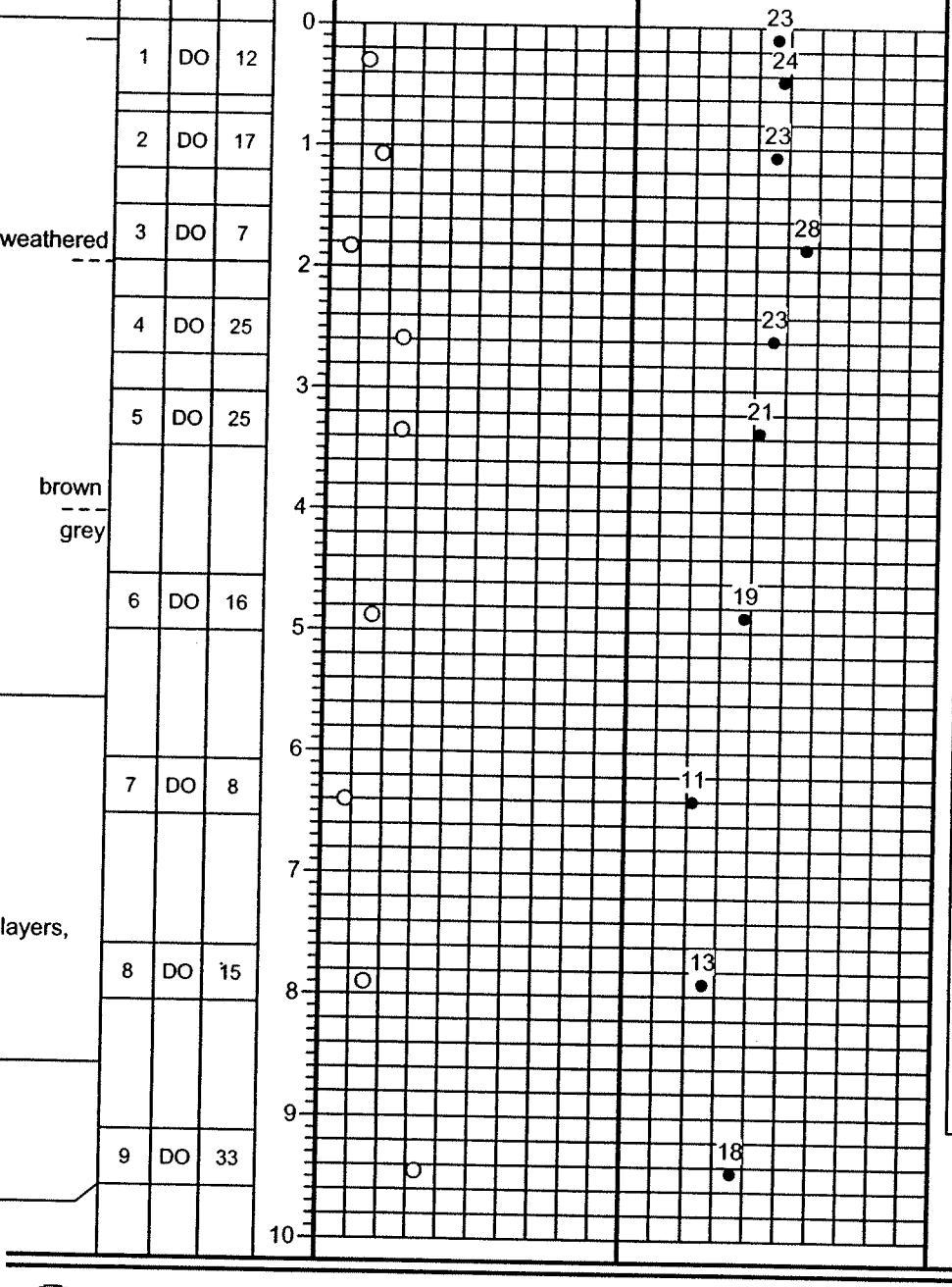
Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

Shear Strength (kN/m2): × 50 100 150 200 ×

Penetration Resistance (blows/0.3m): ○ 10 30 50 70 90 ○

Atterberg Limits: W_P ⊢—⊣ W_L

Water Content (%): ● 5 15 25 35 45 ●



WATER LEVEL

Cave-in @ El. 254.8 m on completion

Soil Engineers Ltd.

JOB NO.: 0604-S043

LOG OF BOREHOLE NO.:COR2

FIGURE NO.: 7

JOB DESCRIPTION: Proposed Master Environmental Servicing Plan

JOB LOCATION: Leslie St./Mount Albert Rd.
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: May 25, 2006

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
257.5 / 0.0	Ground Surface			
	36cm TOPSOIL			
	Brown, loose to compact	1	DO	6
	SANDY SILT, Till			
	a tr. of gravel			
	a tr. of clay to clayey	2	DO	14
256.1 / 1.4	occ. sand and silt seams and layers, cobbles and boulders			
	Brown, stiff to very stiff	3	DO	14
		4	DO	24
	SILTY CLAY, Till	5	DO	29
	brown / grey			
	a tr. of sand to sandy	6	DO	26
	a tr. of gravel			
	occ. sand and silt seams and layers, cobbles and boulders	7	DO	17
250.3 / 7.2	Grey, compact			
	SILT	8	DO	26
	a tr. of clay to clayey			
	a tr. of sand			
	occ. silty clay layers	9	DO	16
247.9 / 9.6	**END OF BOREHOLE**			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

Shear Strength (kN/m2) × 50 100 150 200 ×

Penetration Resistance O (blows/0.3m) O
10 30 50 70 90

Atterberg Limits W_p — W_L

Water Content ● (%) ●
5 15 25 35 45

Plotted values: 23, 18, 15, 15, 16, 14, 15, 19, 23

WATER LEVEL

Cave-in @ El 248.9 m on completion

Installed 50mm ø standpipe to 9.1m. Sand backfill from 0.3 to 6.1m and from 7.0 to 9.1m. Bentonite seal from 0.15 to 0.3m and from 6.1 to 7.0m. Concrete from 0.0 to 0.15m mounted with a steel protector casing.

Soil Engineers Ltd.

JOB NO.: 0805-S014

LOG OF BOREHOLE NO.: COR-2 *FIGURE NO.:* 1

JOB DESCRIPTION: Proposed Monitoring Well Installation

JOB LOCATION: Leslie Street and Mount Albert Road
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: May 27, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES: Number	SAMPLES: Type	SAMPLES: N-Value	Depth Scale (m)	Shear Strength (kN/m2) 50 100 150 200 / Penetration Resistance (blows/0.3m) 10 30 50 70 90	Atterberg Limits W_p W_L / Water Content (%) 5 15 25 35 45	WATER LEVEL
	Ground Surface							
0.0	Decomissioned previously installed, damaged well. Installed 50mm Ø standpipe to 9.1 m. Sand backfill from 1.2 to 4.3 m and from 5.2 to 9.1 m. Bentonite seal from 0.25 to 1.2 m and from 4.3 to 5.2 m. Concrete from 0.0 to 0.25 m mounted with steel protective casing.				0 1 2 3 4 5 6 7 8		Well ends at 9.1 m.	

Soil Engineers Ltd.

TR-

Log of Borehole BH101

Project No. SPN1127R

Drawing No. 2

Project: GEOTECHNICAL INVESTIGATION

Sheet No. 1 of 1

Location: 19219 Leslie Street, Sharon, Ontario

N 4885055 ; E 624664

Date Drilled: July 13, 2006

Drill Type: Rubber Wheel Mounted CME 75

Datum: Geodetic

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Combustible Vapour Reading
Natural Moisture
Plastic and Liquid Limit
Unconfined Strength at % Strain at Failure
Penetrometer

Soil Description	ELEV m	Depth m
300 mm - TOPSOIL	261.8	
	261.5	
SANDY SILT some clay, trace organics, brown, wet loose	261.3	
	261.0	
CLAYEY SILT trace sand brown, very moist, stiff		
grey, dilatent, very moist, stiff to very stiff		
	252.2	
END OF BOREHOLE - 50 mm piezometer installed		

N Value
20 40 60 80
Shear Strength kPa
0.1 0.2

Combustible Vapour Reading (ppm)
250 500 750
Natural Moisture Content % Atterberg Limits (% Dry Weight)
10 20 30

SAMPLES

Natural Unit Weight kN/m³

S&P Shaheen & Peaker Consulting Engineers

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	0.9	6.0
July 17, 2006	0.6	n/e
July 21, 06	0.5	n/e
July 15, 06	0.6	n/e

JACQUES WHITFORD LIMITED

BOREHOLE RECORD

TR-BH201D

CLIENT Tribute Communities — PROJECT No. 1026250.01

LOCATION Sharon, Ontario — DATUM Geodetic

DATES: BORING February 19, 2008 — WATER LEVEL March 28, 2008 — TPC ELEV. 262.84

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS ● %LEL ▲ ppm (● 20 40 60 80 / ▲ 100 200 300 400)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE	WELL CONSTRUCTION
0	262.0				0					
	261.8	TOPSOIL			1					Flushmount casing with concrete seal
		Brown, Silty SAND, trace clay, moist		▼	2					
1	260.8				3					
		Brown, Silty CLAY, trace sand, moist			4					
2					5					
					6					
					7					
					8					
3					9					
					10					50 mm ID solid PVC pipe with bentonite seal
					11					
					12					
4					13					
					14					
					15					
					16					
5					17					
					18					
					19					
6	255.9				20					
		Grey, Silty CLAY, wet			21					
					22					
7					23					
					24					
					25					
8					26					50 mm ID slotted PVC pipe with silica sand backfill
					27					
					28					
					29					
9	252.9				30					
		END OF BOREHOLE at a depth of approximate 9.1 m below grade.			31					
					32					
10										

LABORATORY ANALYSES:

Jacques Whitford

JACQUES WHITFORD LIMITED

BOREHOLE RECORD

TR-BH201D

CLIENT Tribute Communities — PROJECT No. 1026250.01

LOCATION Sharon, Ontario — DATUM Geodetic

DATES: BORING February 19, 2008 — WATER LEVEL March 28, 2008 — TPC ELEV. 262.84

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS ● %LEL ▲ ppm (● 20 40 60 80 / ▲ 100 200 300 400)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE	WELL CONSTRUCTION
0	262.0				0					
	261.8	TOPSOIL			1					Flushmount casing with concrete seal
		Brown, Silty SAND, trace clay, moist		▼	2					
1	260.8				3					
		Brown, Silty CLAY, trace sand, moist			4					
2					5					
					6					
					7					
					8					
3					9					
					10					50 mm ID solid PVC pipe with bentonite seal
					11					
					12					
4					13					
					14					
					15					
					16					
5					17					
					18					
					19					
6	255.9				20					
		Grey, Silty CLAY, wet			21					
					22					
7					23					
					24					
					25					50 mm ID slotted PVC pipe with silica sand backfill
8					26					
					27					
					28					
					29					
9	252.9				30					
		END OF BOREHOLE at a depth of approximate 9.1 m below grade.			31					
					32					
10										

LABORATORY ANALYSES:

Jacques Whitford

JACQUES WHITFORD LIMITED

BOREHOLE RECORD

TR- BH201S

CLIENT Tribute Communities — PROJECT No. 1026250.01

LOCATION Sharon, Ontario — DATUM Geodetic

DATES: BORING February 19, 2008 — WATER LEVEL March 28, 2008 — TPC ELEV. 262.83

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS ● %LEL ▲ ppm (● 20 40 60 80 ▲ 100 200 300 400)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE	WELL CONSTRUCTION
0	262.0				0					
	261.7	TOPSOIL								Flushmount casing with concrete seal
1		Brown, Silty SAND, trace clay, moist		▼	1–4					50mm ID solid PVC pipe with bentonite seal
	260.8									
2		Brown, Silty CLAY, trace sand, moist			5–10					50mm ID slotted PVC pipe with silica sand backfill
3	258.3				11					
		END OF BOREHOLE at a depth of approximate 3.7 m below grade.			12					
4					13–16					
5					17–20					
6					21–23					
7					24–26					
8					27–30					
9					31–32					
10										

LABORATORY ANALYSES:

Jacques Whitford

JOB NO.: 0804-S038

LOG OF BOREHOLE NO.: S1

FIGURE NO.: 1

JOB DESCRIPTION: Proposed Hydro Corridor Spine Services

JOB LOCATION: Leslie St. and Mount Albert Rd., Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: May 7, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
260.5 / 0.0	Ground Surface			
	60cm TOPSOIL	1	DO	1
	Stiff to very stiff — weathered	2	DO	15
		3	DO	18
		4	DO	22
	SILTY CLAY	5	DO	14
	brown / grey	6	DO	12
	a trace to some sand with wet sand and silt seams and layers	7	DO	20
		8	DO	26
251.9 / 8.6	Grey, very stiff **SILTY CLAY, Till** sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	9	DO	28
250.5 / 10.0	Cont'd on Fig. 1A			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

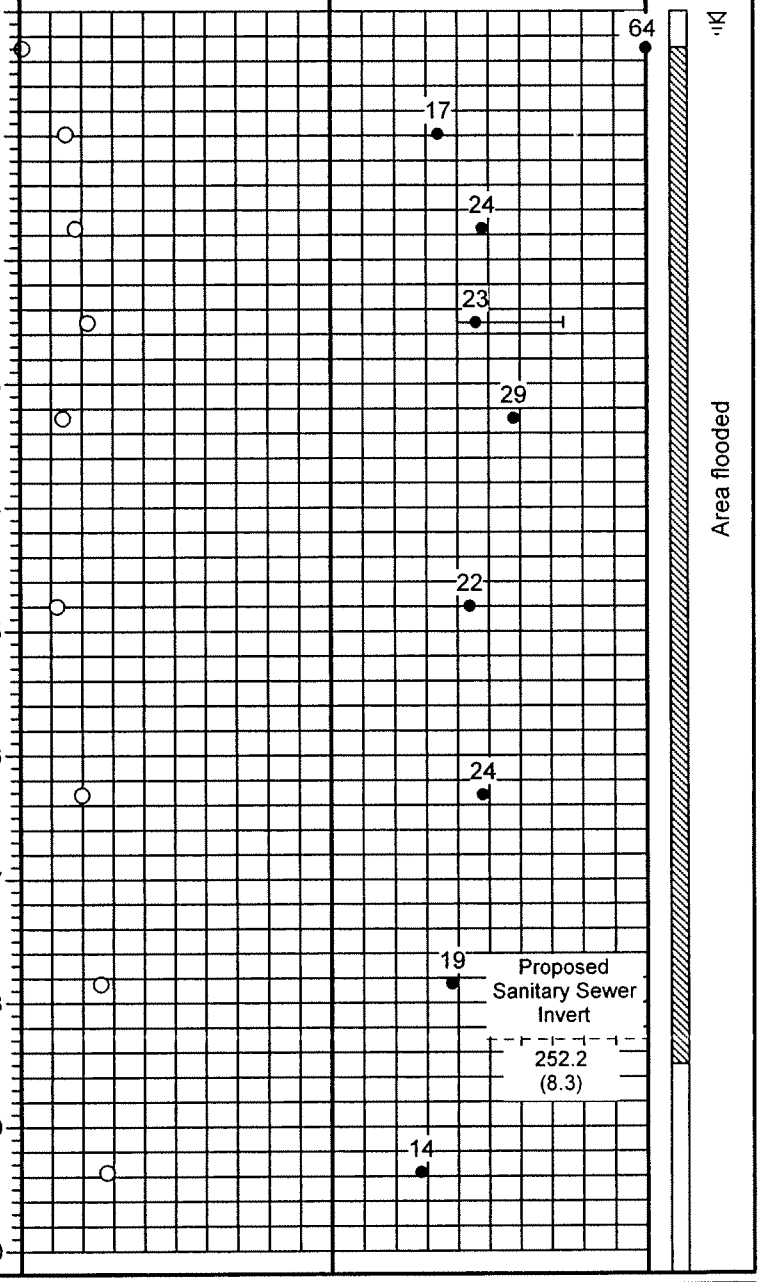
Shear Strength (kN/m2): × 50 100 150 200 ×

Penetration Resistance (blows/0.3m): ○ 10 30 50 70 90 ○

Atterberg Limits: W_p ⊢—⊣ W_L

Water Content (%): ● 5 15 25 35 45 ●

WATER LEVEL



Soil Engineers Ltd.

JOB NO.: 0804-S038

LOG OF BOREHOLE NO.: S1

FIGURE NO.: 1 A

JOB DESCRIPTION: Proposed Hydro Corridor Spine Services

JOB LOCATION: Leslie St. and Mount Albert Rd., Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: May 7, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
250.5				
10.0	Grey, very dense **SILT** a trace to some clay occ. sand and clay seams and layers	10	DO	75
249.4 / 11.1	**END OF BOREHOLE**			

Installed 50mm Ø monitoring well to 10.7 m.
Sand backfill from 8.5 to 10.7 m.
Bentonite seal from 0.3 to 8.5 m.
Concrete from 0.0 to 0.3 m.
Provided with a steel protective casing.

Depth Scale (m): 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

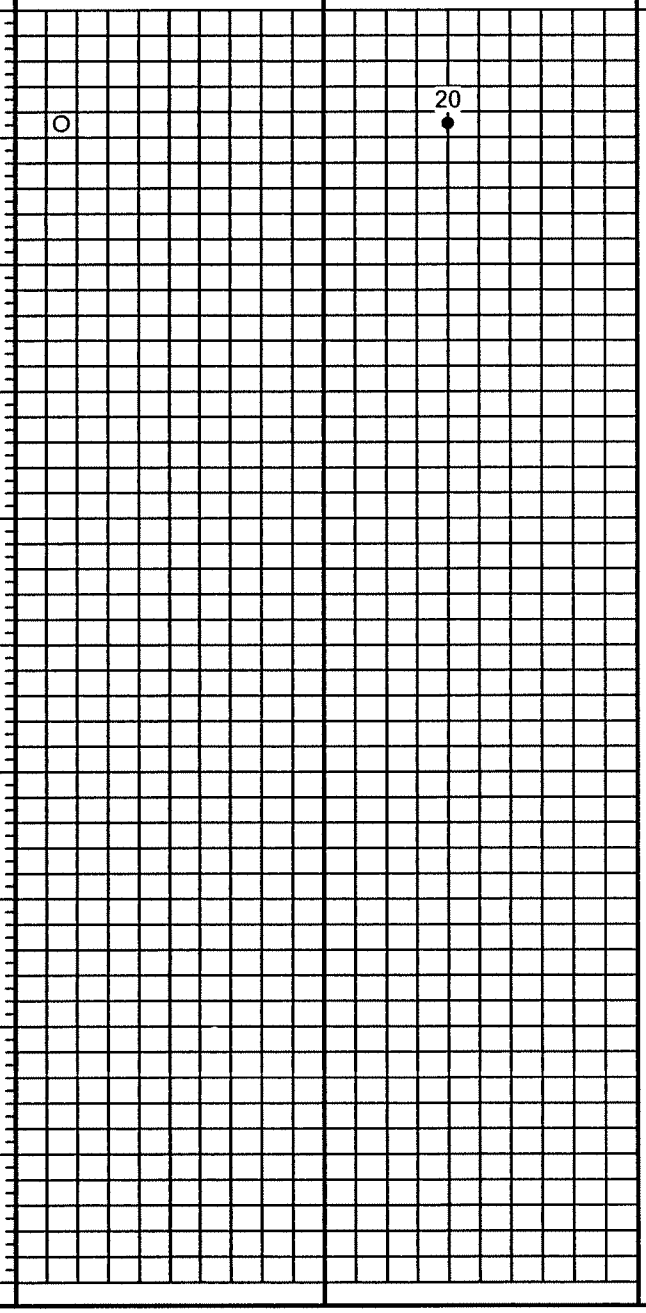
Shear Strength (kN/m2): × 50 100 150 200 ×

Penetration Resistance (blows/0.3m): O 10 30 50 70 90 O

Atterberg Limits: W_p ⊢—⊣ W_L

Water Content (%): ● 5 15 25 35 45 ●

WATER LEVEL



Soil Engineers Ltd.

JOB NO.: 0804-S038

LOG OF BOREHOLE NO.: S2

FIGURE NO.: 2

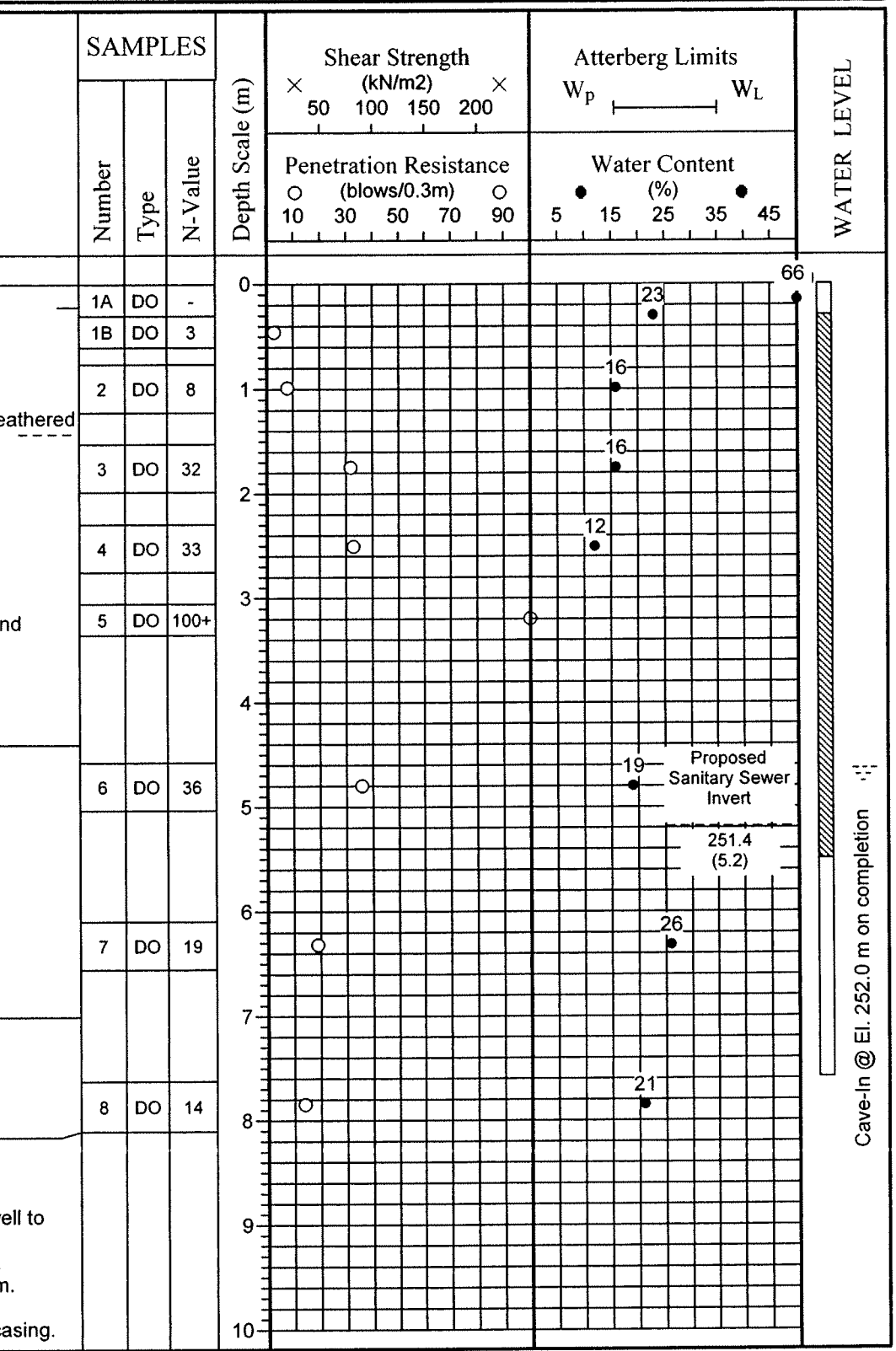
JOB DESCRIPTION: Proposed Hydro Corridor Spine Services

JOB LOCATION: Leslie St. and Mount Albert Rd., Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: May 7, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
256.6 / 0.0	Ground Surface			
	20cm TOPSOIL	1A	DO	-
	Brown, soft to hard	1B	DO	3
		2	DO	8
	weathered			
	SILTY CLAY, Till	3	DO	32
		4	DO	33
	sandy, a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	5	DO	100+
252.2 / 4.4	Grey, compact to dense	6	DO	36
	SILT			
	a trace to some clay occ. sand and clay seams and layers	7	DO	19
249.6 / 7.0	Grey, stiff			
	SILTY CLAY a trace to some sand with wet sand and silt seams and layers	8	DO	14
248.5 / 8.1	**END OF BOREHOLE**			
	Installed 50mm Ø monitoring well to 7.6 m. Sand backfill from 5.5 to 7.6 m. Bentonite seal from 0.3 to 5.5 m. Concrete from 0.0 to 0.3 m. Provided with steel protective casing.			



Soil Engineers Ltd.

JOB NO.: 0805-S014

LOG OF BOREHOLE NO.: T4-8SW *FIGURE NO.:* 15

JOB DESCRIPTION: Proposed Monitoring Well Installation

JOB LOCATION: Leslie Street and Mount Albert Road
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: May 29, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES: Number	SAMPLES: Type	SAMPLES: N-Value	Depth Scale (m)	Shear Strength (kN/m2) 50 100 150 200 / Penetration Resistance (blows/0.3m) 10 30 50 70 90	Atterberg Limits W_p W_L / Water Content (%) 5 15 25 35 45	WATER LEVEL
257.0 0.0	Ground Surface				0			
	Augered from 0.0 to 1.5 m to install piezometer with exposed screen for water infiltration monitoring. Bentonite seal from 0.25 to 1.5 m, concrete from 0.0 to 0.25 m.				1 2 3 4 5 6 7 8			

Soil Engineers Ltd.

JOB NO.: 0805-S014

LOG OF BOREHOLE NO.: T4-8A

FIGURE NO.: 16

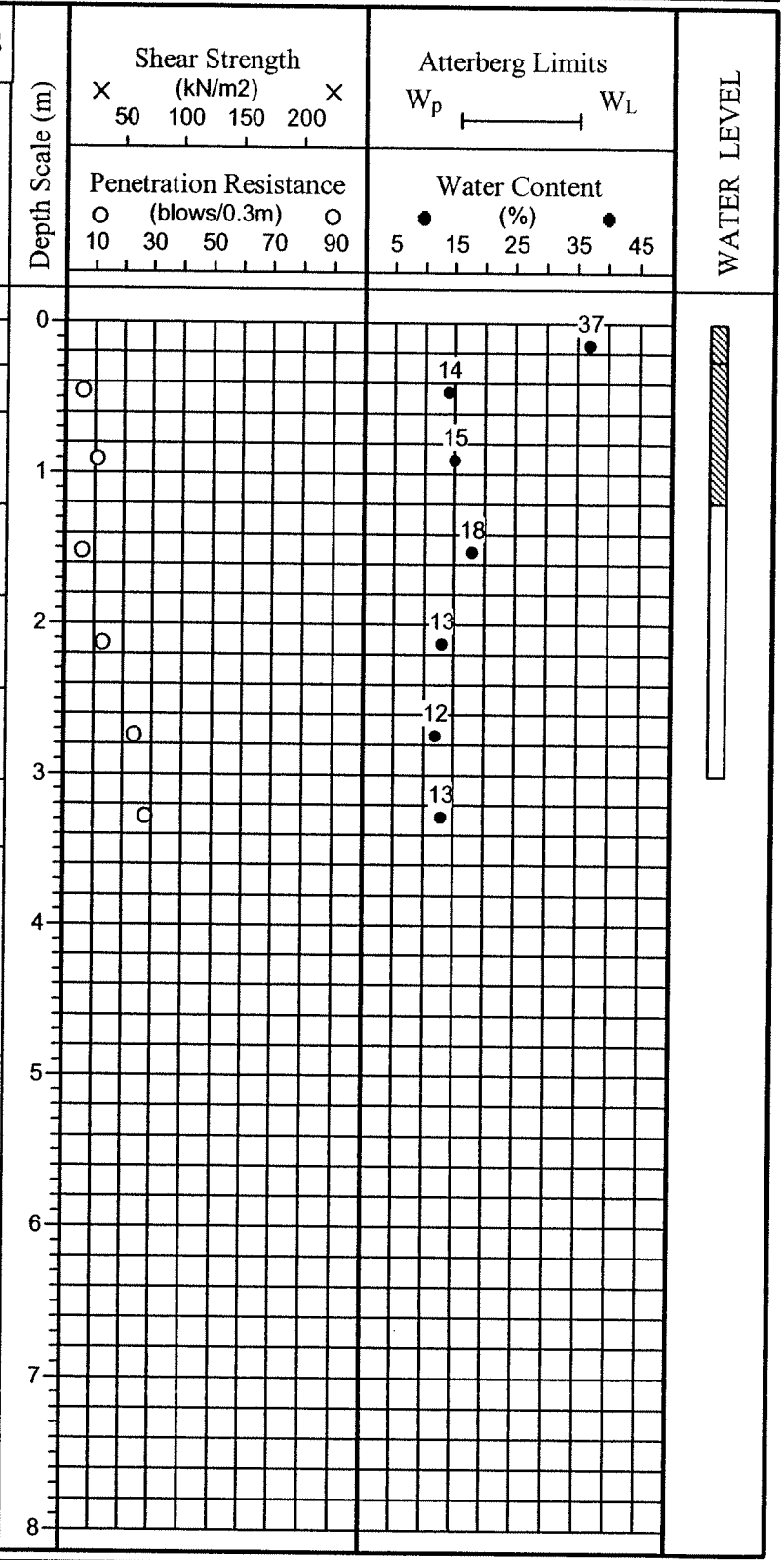
JOB DESCRIPTION: Proposed Monitoring Well Installation

JOB LOCATION: Leslie Street and Mount Albert Road
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: May 28, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
257.0 / 0.0	Ground Surface			
	30cm TOPSOIL	1A	DO	-
	Brown, firm to very stiff	1B	DO	6
		2	DO	11
	SILTY CLAY, Till	3	DO	6
		4	DO	13
	a trace of sand to sandy a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	5	DO	24
253.5 / 3.5		6	DO	28
	END OF BOREHOLE			
	Installed 50mm Ø monitoring well to 3.0 m. Sand backfill from 1.2 to 3.0 m. Bentonite seal from 0.25 to 1.2 m. Concrete from 0.0 to 0.25 m mounted with steel protective casing.			



Soil Engineers Ltd.

JOB NO.: 0805-S014

LOG OF BOREHOLE NO.: T4-8B

FIGURE NO.: 17

JOB DESCRIPTION: Proposed Monitoring Well Installation

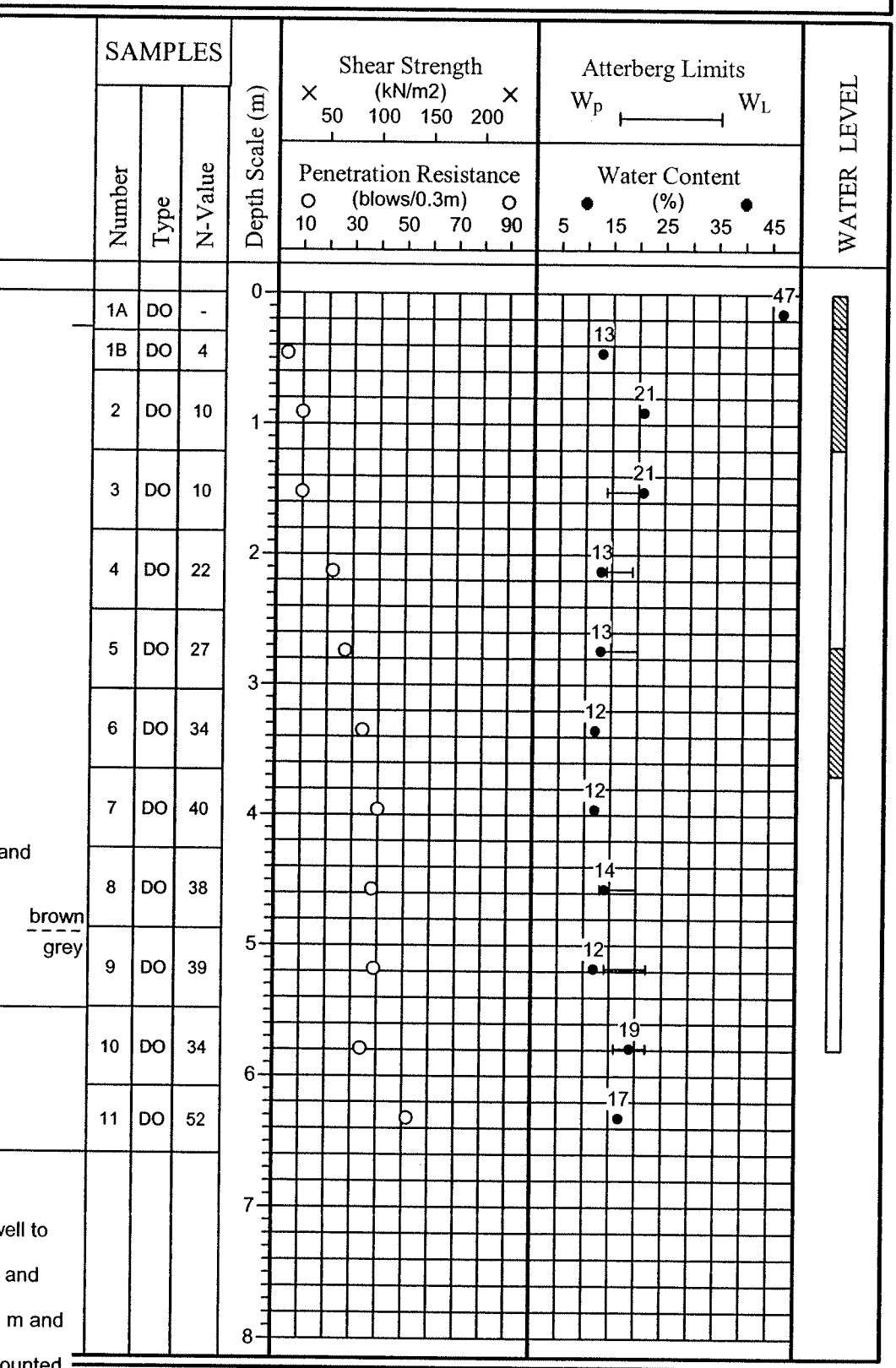
JOB LOCATION: Leslie Street and Mount Albert Road
Town of East Gwillimbury

METHOD OF BORING: Flight-Auger

DATE: May 28, 2008

Elev. / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
257.0 / 0.0	Ground Surface			
	28cm TOPSOIL	1A	DO	-
	Firm to hard	1B	DO	4
		2	DO	10
		3	DO	10
	SILTY CLAY, Till	4	DO	22
		5	DO	27
		6	DO	34
	a trace of sand to sandy a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders	7	DO	40
		8	DO	38
	brown / grey	9	DO	39
251.5 / 5.5	Grey, compact to dense	10	DO	34
	SILT some clay to clayey a trace of sand occ. silty clay layers	11	DO	52
250.4 / 6.6	**END OF BOREHOLE**			

Installed 50mm Ø monitoring well to 5.8 m.
Sand backfill from 1.2 to 2.7 m and from 3.7 to 5.8 m.
Bentonite seal from 0.25 to 1.2 m and from 2.7 to 3.7 m.
Concrete from 0.0 to 0.25 m mounted with steel protective casing.



Soil Engineers Ltd.

Log of Borehole MMM12-1

Project No: 32-11108-000-483-493
Project: Hydrogeological Investigation
Client: Regional Municipality of York
Location: Sharon, Ontario

Easting: 624333 **Zone** 17T
Northing: 4884751 **Datum:** NAD 83

MOE ID#: A119949

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Description	Depth/Elev	Type	Sample Number	Recovery (%)	N-Value / Moisture Content	Remarks
		Ground Surface	255.8					
0	0	***SILTY SAND (TOPSOIL)*** Dark brown, loose, moist	0.0	SS	1	92	11	
1			255.3					
2		***SILTY SAND*** Brown, trace clay and gravel, compact, moist-wet	0.6					
3	1	***SANDY SILT (TILL)*** Brown, trace to some clay and gravel, dense to compact, moist to wet		SS	2	100	11	
4								
5				SS	3	92	23	
6	2							
7				SS	4	75	34	
8								
9								
10	3		252.6					
11		Very dense	3.2	SS	5	25	55	
12			252.0					
13	4	Grey in colour, wet	3.8	SS	6	100	49	
14								
15			251.2					
16	5	***SILT*** Grey, trace sand and clay, dense to compact, saturated	4.6	SS	7	88	42	
17								
18				SS	8	75	27	
19								
20	6			SS	9	75	17	
21								
22								
23	7		248.7					
24		***SANDY SILT to SILTY SAND (TILL)*** Grey, some clay and gravel, compact, wet	7.1	SS	10	96	21	
25								
26	8			SS	11	100	20	

N-Value: 10 30 50 70 90
Moisture Content (%): 10 20 30 40

Water level on April 17, 2012 was 0.74 mbgs.

Drilled By: Lantech Drilling Services
Drill Method: Hollow Stem Auger
Drill Date: April 4, 2012

MMM Group Limited
100 Commerce Valley Drive West
Thornhill, Ontario L3T 0A1

Borehole Log is for Environmental Purposes Only

Logged By: DN
Checked By: AK
Hole Size: 203.2 mm
Sheet: 1 of 2

Log of Borehole MMM12-1

Project No: 32-11108-000-483-493

Project: Hydrogeological Investigation

Client: Regional Municipality of York

Location: Sharon, Ontario

Easting: 624333 **Zone** 17T

Northing: 4884751 **Datum:** NAD 83

MOE ID#: A119949

Depth	Symbol	Description	Depth/Elev	Well Data	Type	Sample Number	Recovery (%)	N-Value / Moisture Content	Remarks
27 28 29					SS	12	100	12	
30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52		End of Borehole	246.8 9.0						Well Construction - Well constructed with 51 mm Schedule 40 PVC riser and screen - Holeplug from 0.3 m to 4.88 m - #0 sand pack from 4.88 m to 7.01 m - #10 slot screen from 5.33 m to 6.86 m - Borehole was backfilled with holeplug from 7.01 m to 9.0 m - Monitoring well dry upon completion

N-Value: 10 30 50 70 90

Moisture Content %: × 10 20 30 40 ×

9 10 11 12 13 14 15 16

Drilled By: Lantech Drilling Services

Drill Method: Hollow Stem Auger

Drill Date: April 4, 2012

MMM Group Limited
100 Commerce Valley Drive West
Thornhill, Ontario L3T 0A1

Borehole Log is for Environmental Purposes Only

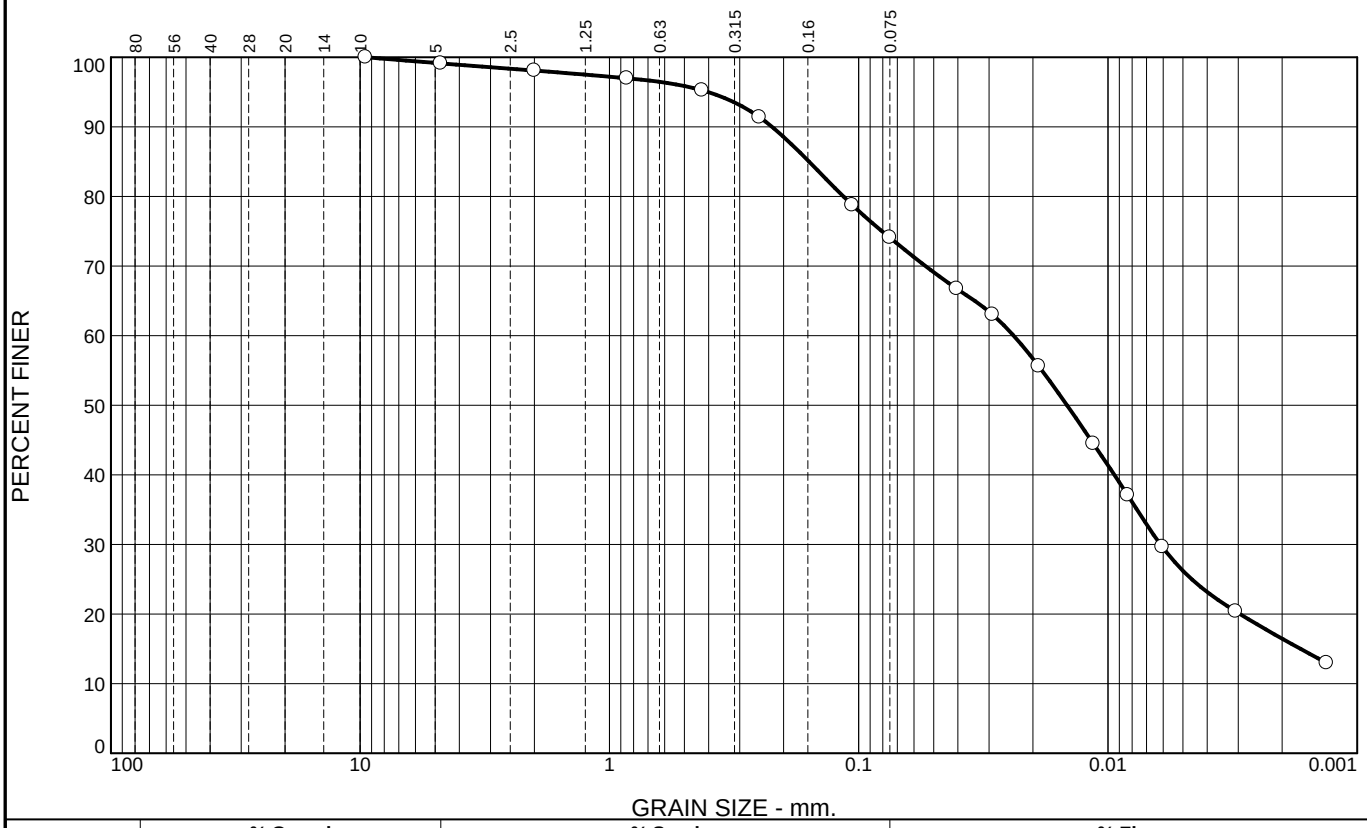
Logged By: DN

Checked By: AK

Hole Size: 203.2 mm

Sheet: 2 of 2

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.9	1.0	2.8	21.2	57.6	16.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
9.5mm	100.0		
4.75mm	99.1		
2mm	98.1		
0.850mm	97.0		
0.425mm	95.3		
0.250mm	91.4		
0.106mm	78.8		
0.075mm	74.1		
0.0404 mm.	66.7		
0.0290 mm.	63.0		
0.0190 mm.	55.6		
0.0114 mm.	44.5		
0.0083 mm.	37.1		
0.0061 mm.	29.7		
0.0031 mm.	20.4		
0.0013 mm.	13.0		

* (no specification provided)

Soil Description

Sandy silt, some clay, trace gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.2226 D_{85}= 0.1581 D_{60}= 0.0239
D_{50}= 0.0146 D_{30}= 0.0062 D_{15}= 0.0017
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

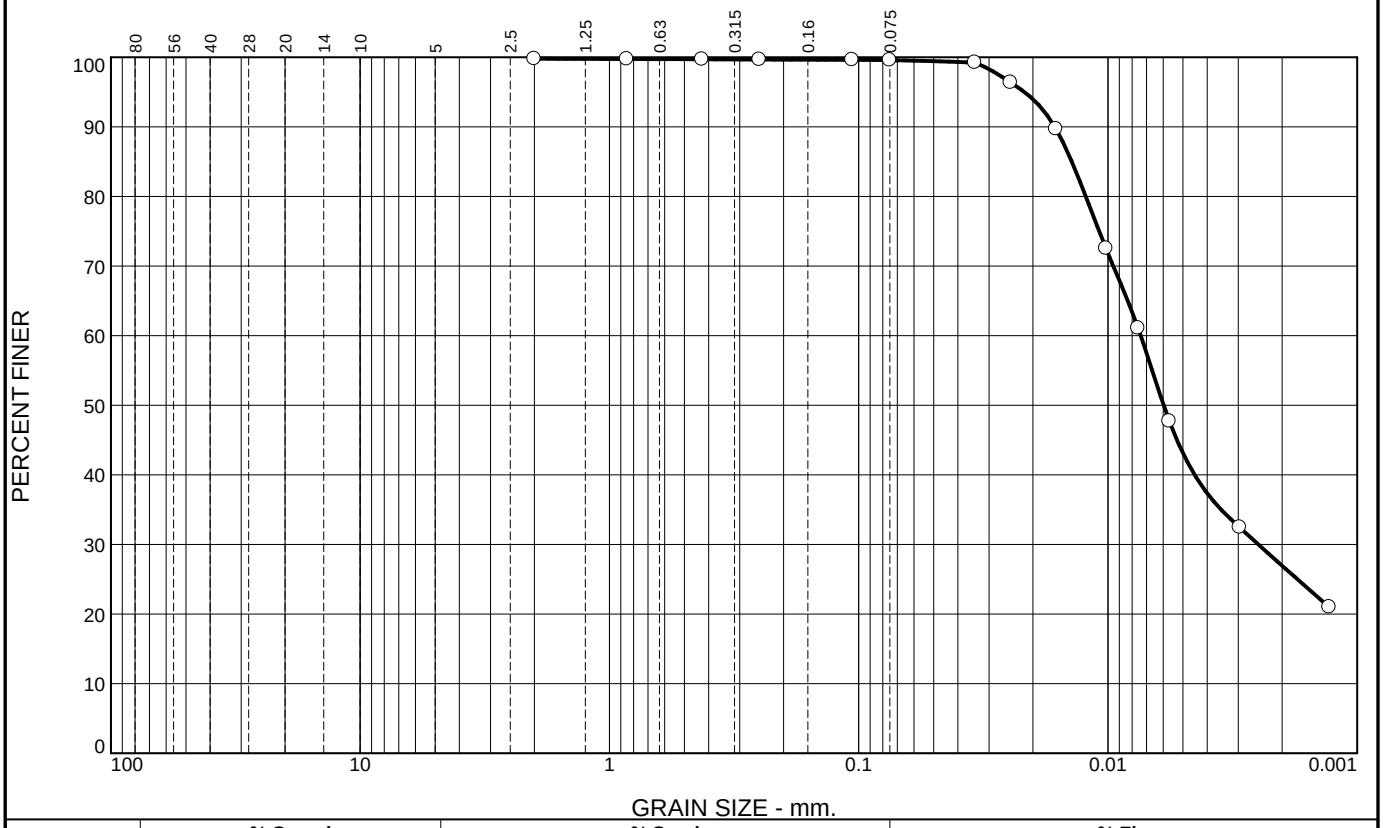
Sampled on Sep.25, 2017
F.M.=0.31

Location: MW1 SS2A
Sample Number: MM-5026 **Depth:** 2.5-3.5 ft **Date:** Oct.05, 2017

Client: Wycliffe Thornridge Sharon Limited
Project: Sharon Corners

Project No: 17M-00407-00-HEV **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
				0.1	0.1	72.7	26.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2mm	99.8		
0.850mm	99.7		
0.425mm	99.7		
0.250mm	99.7		
0.106mm	99.6		
0.075mm	99.6		
0.0341 mm.	99.2		
0.0246 mm.	96.4		
0.0162 mm.	89.7		
0.0102 mm.	72.5		
0.0076 mm.	61.1		
0.0057 mm.	47.7		
0.0030 mm.	32.4		
0.0013 mm.	21.0		

* (no specification provided)

Soil Description

Clayey silt, trace sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.0163 D_{85}= 0.0140 D_{60}= 0.0074
D_{50}= 0.0060 D_{30}= 0.0025 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sampled on Sep.26, 2017
F.M.=0.01

Location: MW2 SS6
Sample Number: MM-5027 **Depth:** 17.5-19.5 ft **Date:** Oct.05, 2017

Client: Wycliffe Thornridge Sharon Limited
Project: Sharon Corners

Project No: 17M-00407-00-HEV **Figure**

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.1	1.3	77.5	21.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4.75mm	100.0		
2mm	99.9		
0.850mm	99.8		
0.425mm	99.8		
0.250mm	99.7		
0.106mm	99.5		
0.075mm	98.5		
0.0347 mm.	94.2		
0.0251 mm.	90.3		
0.0165 mm.	82.6		
0.0105 mm.	61.5		
0.0079 mm.	48.0		
0.0058 mm.	36.5		
0.0030 mm.	25.0		
0.0013 mm.	17.3		

* (no specification provided)

Soil Description

Clayey silt, trace sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.0244 D_{85}= 0.0179 D_{60}= 0.0102
D_{50}= 0.0082 D_{30}= 0.0045 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sampled on Sep.26, 2017
F.M.=0.01

Location: MW3 SS2
Sample Number: MM-5028 **Depth:** 2.5-4.5 ft **Date:** Oct.05, 2017

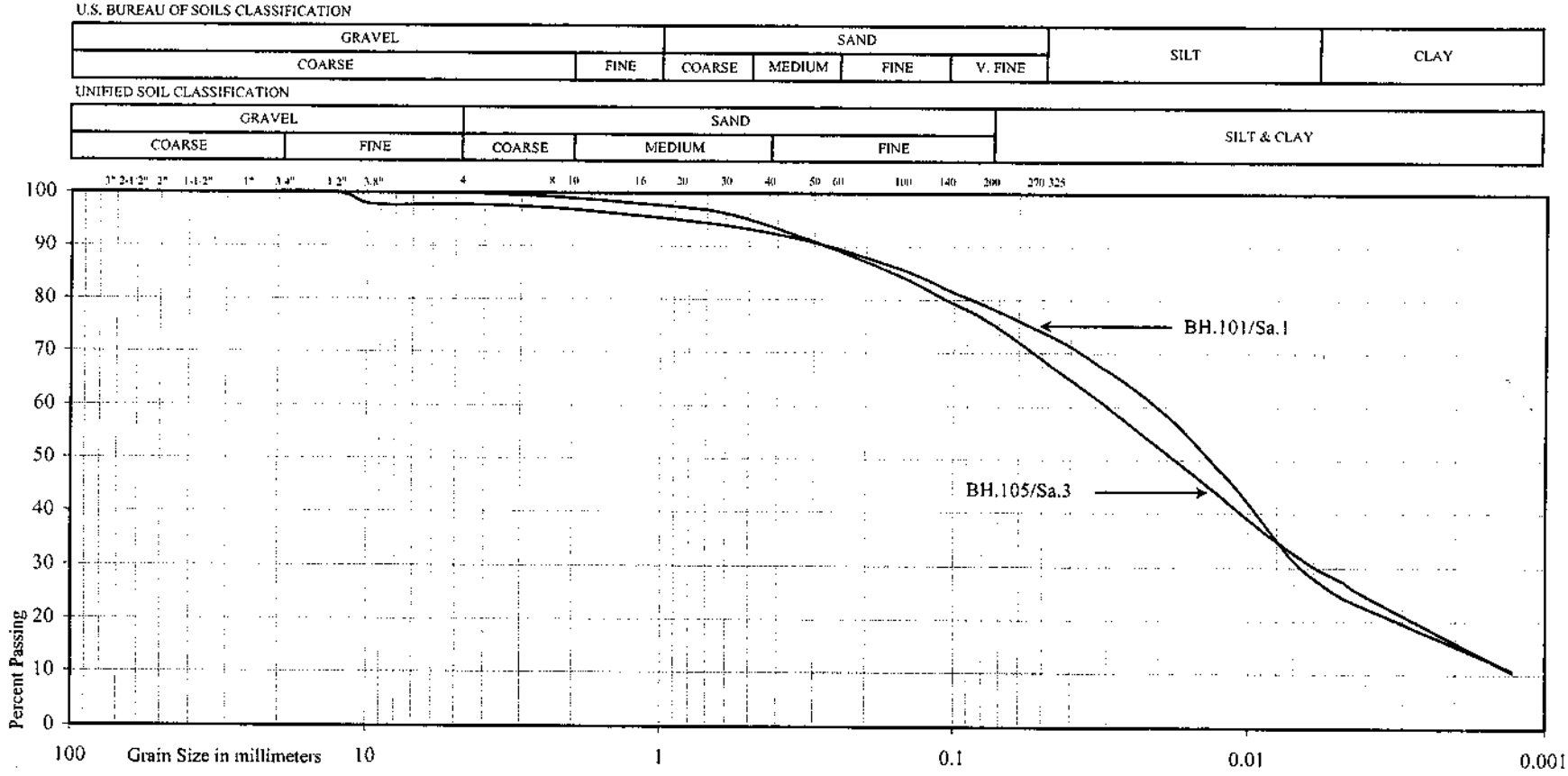
Client: Wycliffe Thornridge Sharon Limited
Project: Sharon Corners

Project No: 17M-00407-00-HEV **Figure**

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

Reference No: 0710-S131



Project: Proposed Residential Subdivision

Location: Leslie St./Mount Albert Rd., Town of East Gwillimbury

Borehole No:	101	105
Sample No:	15	3
Depth (m):	18.6	1.8
Elevation (m):	241.6	253.6

BH./Sa.	101/15	105/3
Liquid Limit (%) =	24	26
Plastic Limit (%) =	16	16
Plasticity Index (%) =	8	10
Moisture Content (%) =	9	14
Estimated Permeability (cm./sec.) =	10^{-6}	10^{-6}

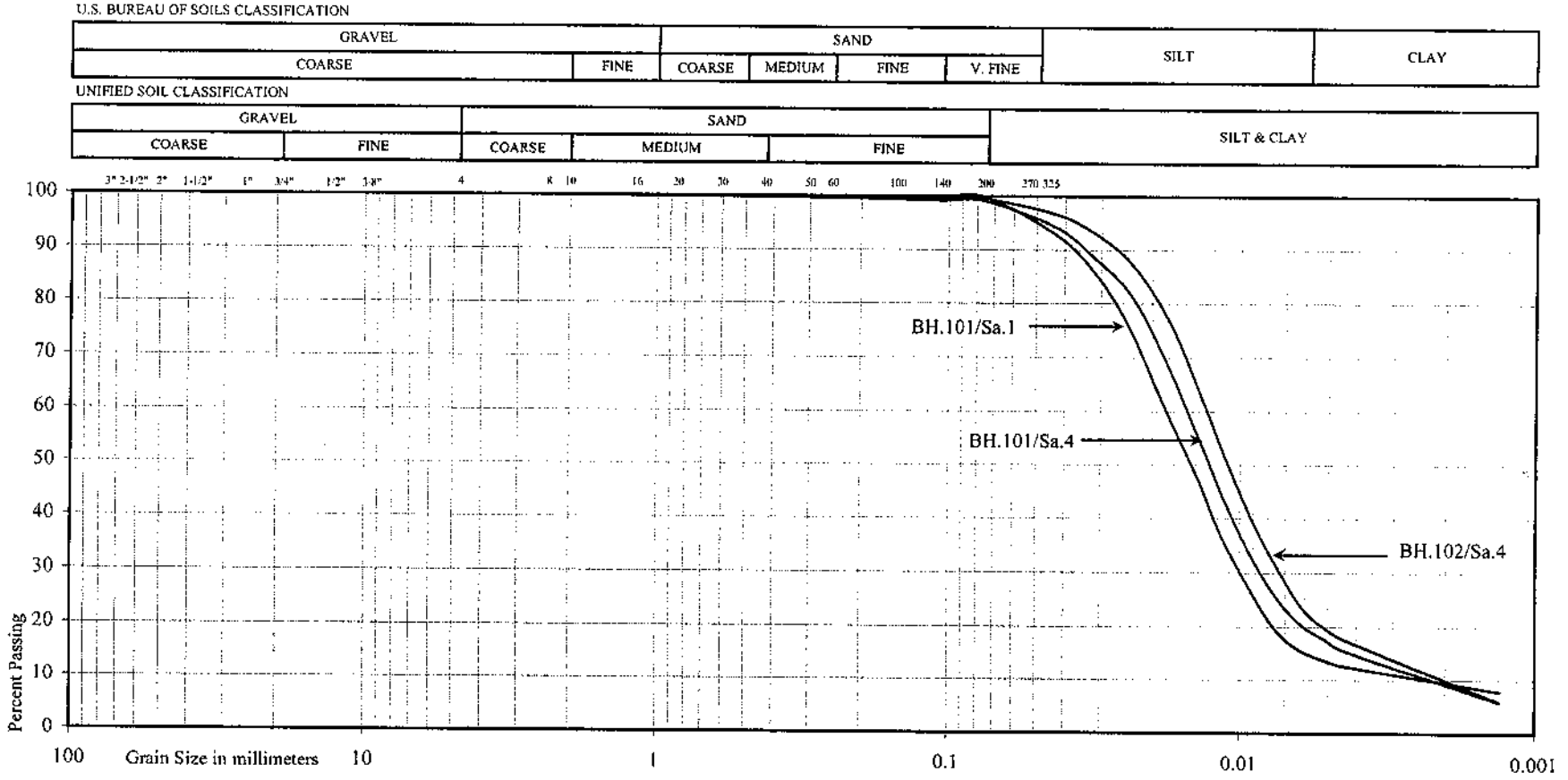
Classification of Sample [& Group Symbol]: SILTY CLAY, Till
sandy, a trace of gravel

Figure: 6

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

Reference No: 0710-S131



Project: Proposed Residential Subdivision

Location: Leslie St./Mount Albert Rd., Town of East Gwillimbury

Borehole No:	101	101	102
Sample No:	4	11	4
Depth (m):	2.6	12.5	2.5
Elevation (m):	257.6	247.7	254.0

BH./Sa.	101/4	101/11	102/4
Liquid Limit (%) =	-	-	-
Plastic Limit (%) =	-	-	-
Plasticity Index (%) =	-	-	-
Moisture Content (%) =	27	20	28
Estimated Permeability (cm./sec.) =	10^{-6}	10^{-6}	10^{-6}

Classification of Sample [& Group Symbol]: SILT

some clay

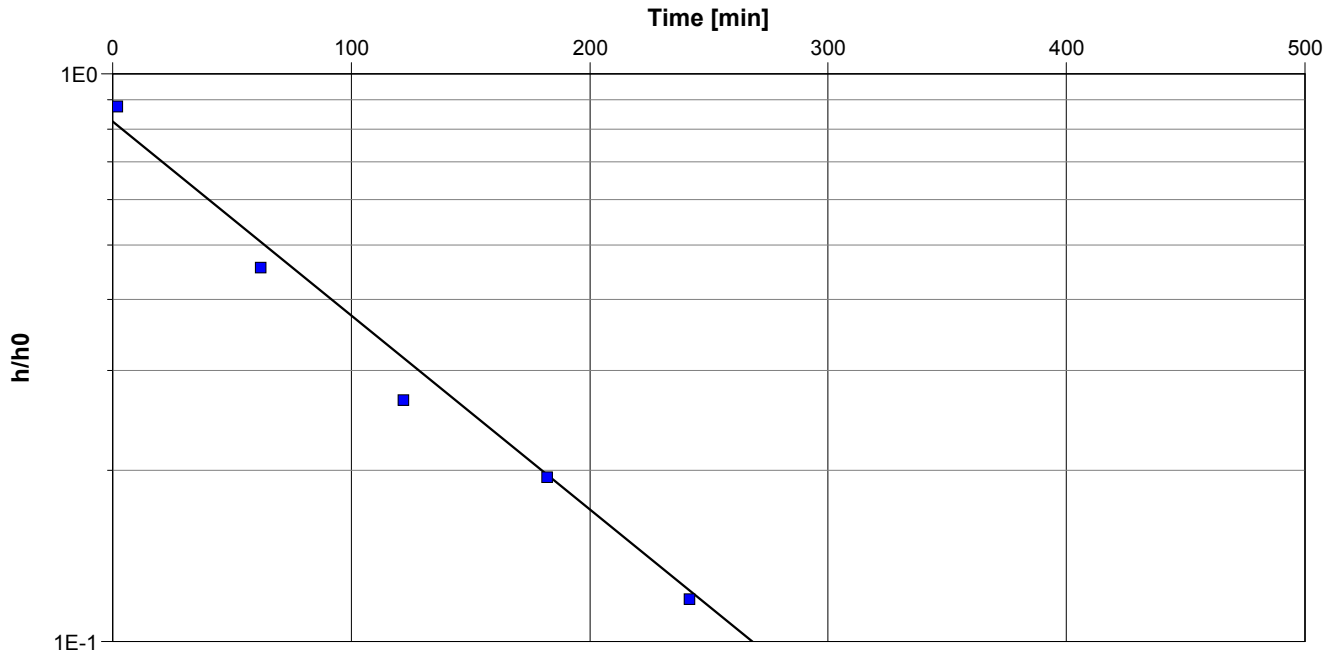
Figure: 7

APPENDIX

C HYDRAULIC CONDUCTIVITY TEST RESULTS

	Slug Test Analysis Report
	Project: Sharon Corners
	Number: 17M-00407-00-HEV
	Client: Wycliffe Thornridge Sharon Limited

Location: Mount Albert, Ontario	Slug Test: MW1 Falling Head Test	Test Well: MW1
Test Conducted by: D. Neerhof		Test Date: 06/10/2017
Analysis Performed by: A. Read	MW1 Falling Head Test	Analysis Date: 13/10/2017
Aquifer Thickness: 6.26 m		



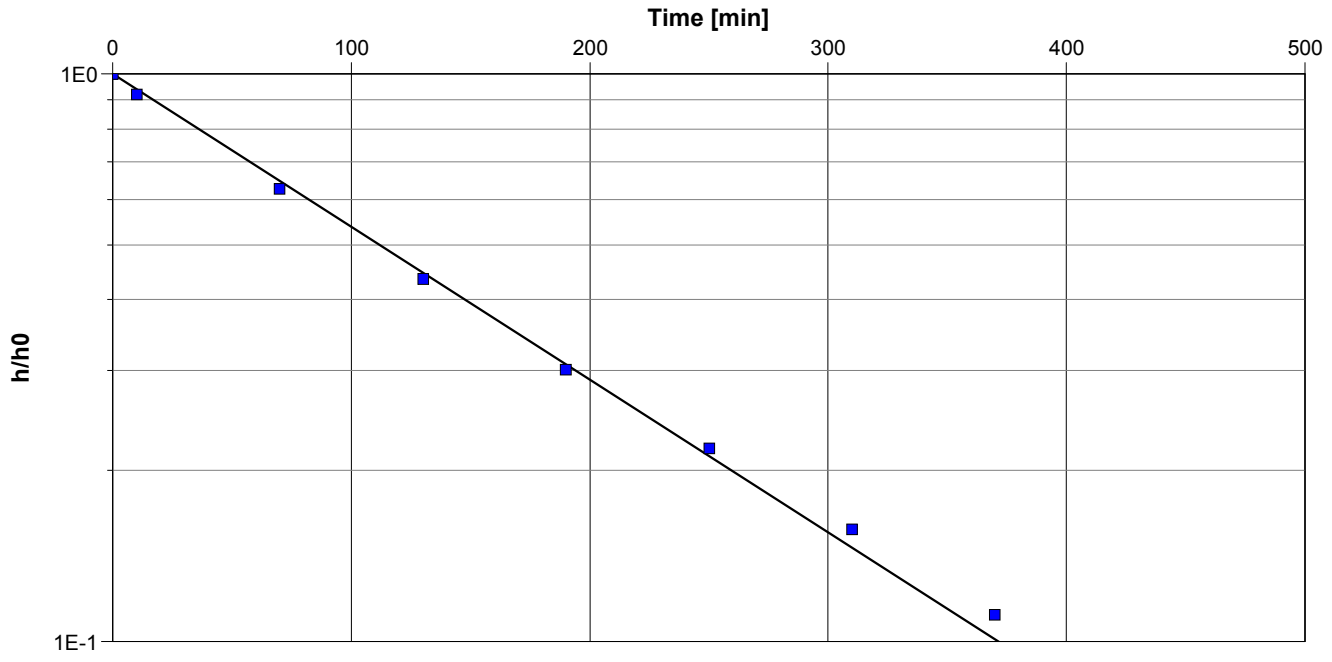
Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW1	8.86×10^{-8}	

Screened in Silt, trace to some clay, trace sand

	Slug Test Analysis Report
	Project: Sharon Corners
	Number: 17M-00407-00-HEV
	Client: Wycliffe Thornridge Sharon Limited

Location: Mount Albert, Ontario	Slug Test: MW1 Rising Head Test	Test Well: MW1
Test Conducted by: D. Neerhof		Test Date: 10/10/2017
Analysis Performed by: A. Read	MW1 Rising Head Test	Analysis Date: 16/10/2017
Aquifer Thickness: 6.26 m		



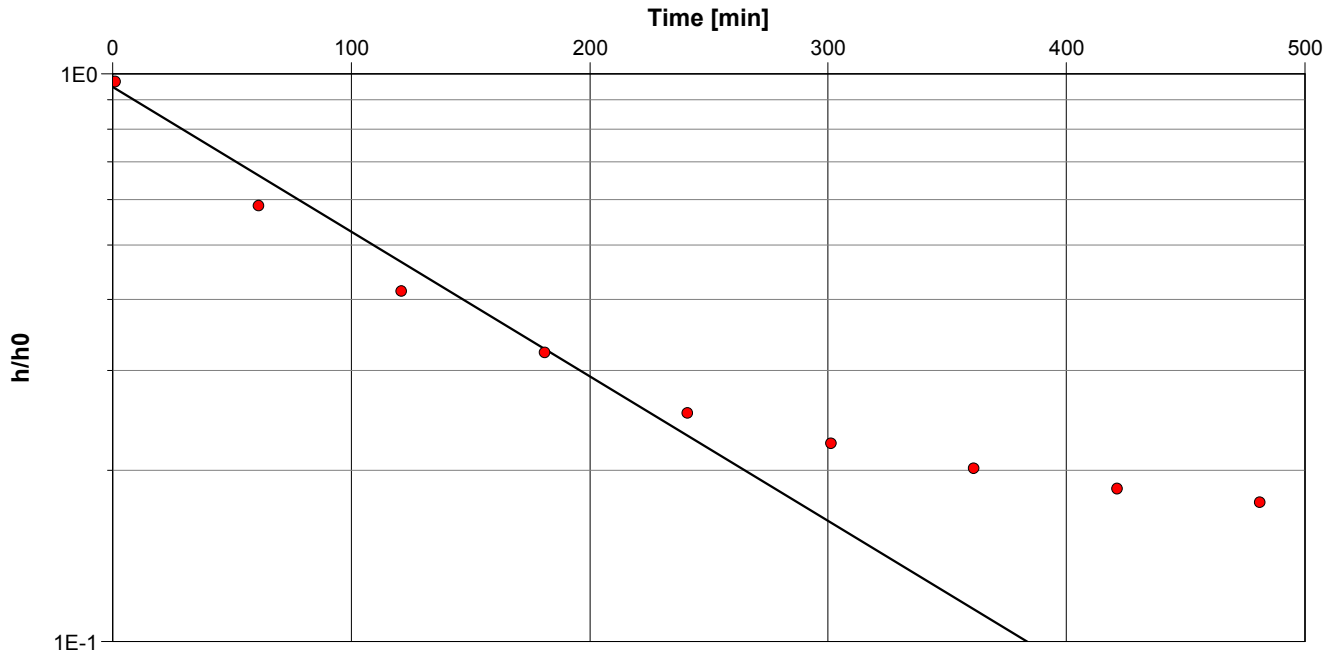
Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW1	6.99×10^{-8}	

Screened in Silt, trace to some clay, trace sand

	Slug Test Analysis Report
	Project: Sharon Corners
	Number: 17M-00407-00-HEV
	Client: Wycliffe Thornridge Sharon Limited

Location: Mount Albert, Ontario	Slug Test: MW2 Falling Head Test	Test Well: MW2
Test Conducted by: D. Neerhof		Test Date: 06/10/2017
Analysis Performed by: A. Read	MW2 Falling Head Test	Analysis Date: 16/10/2017
Aquifer Thickness: 4.85 m		



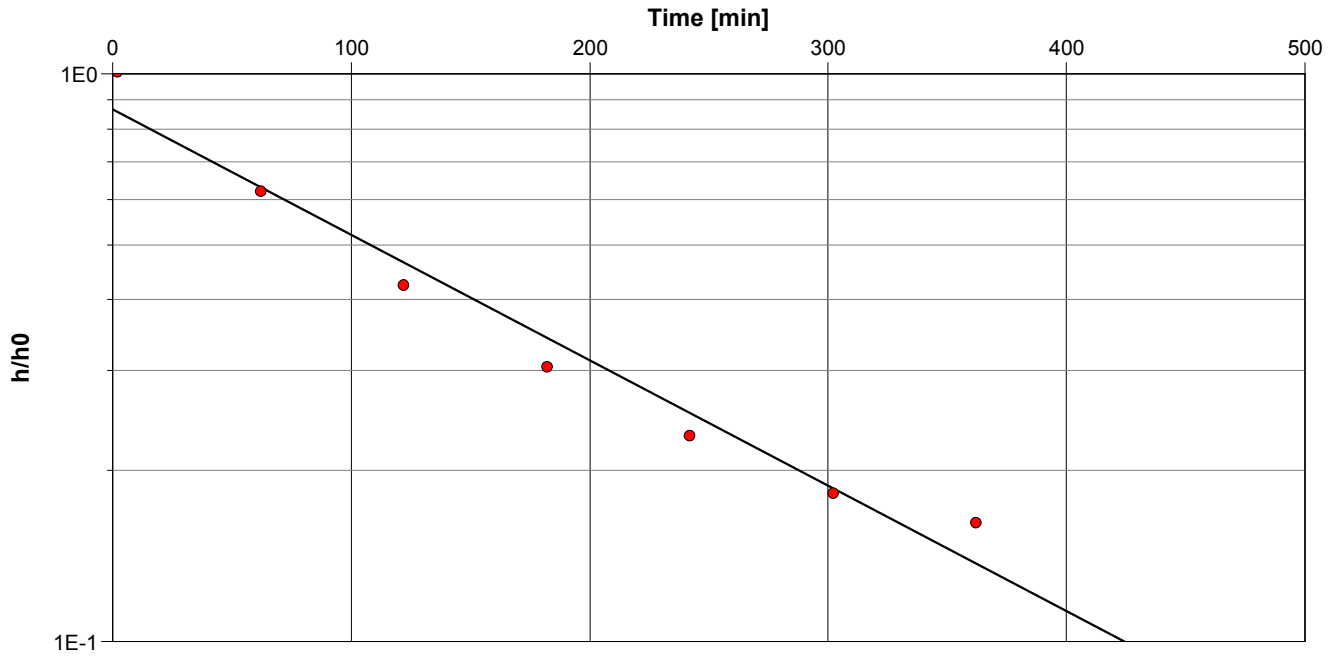
Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW2	6.62×10^{-8}	

Screened in Clayey Silt

	Slug Test Analysis Report
	Project: Sharon Corners
	Number: 17M-00407-00-HEV
	Client: Wycliffe Thornridge Sharon Limited

Location: Mount Albert, Ontario	Slug Test: MW2 Rising Head Test	Test Well: MW2
Test Conducted by: D. Neerhof		Test Date: 10/10/2017
Analysis Performed by: A. Read	MW2 Rising Head Test	Analysis Date: 16/10/2017
Aquifer Thickness: 4.85 m		



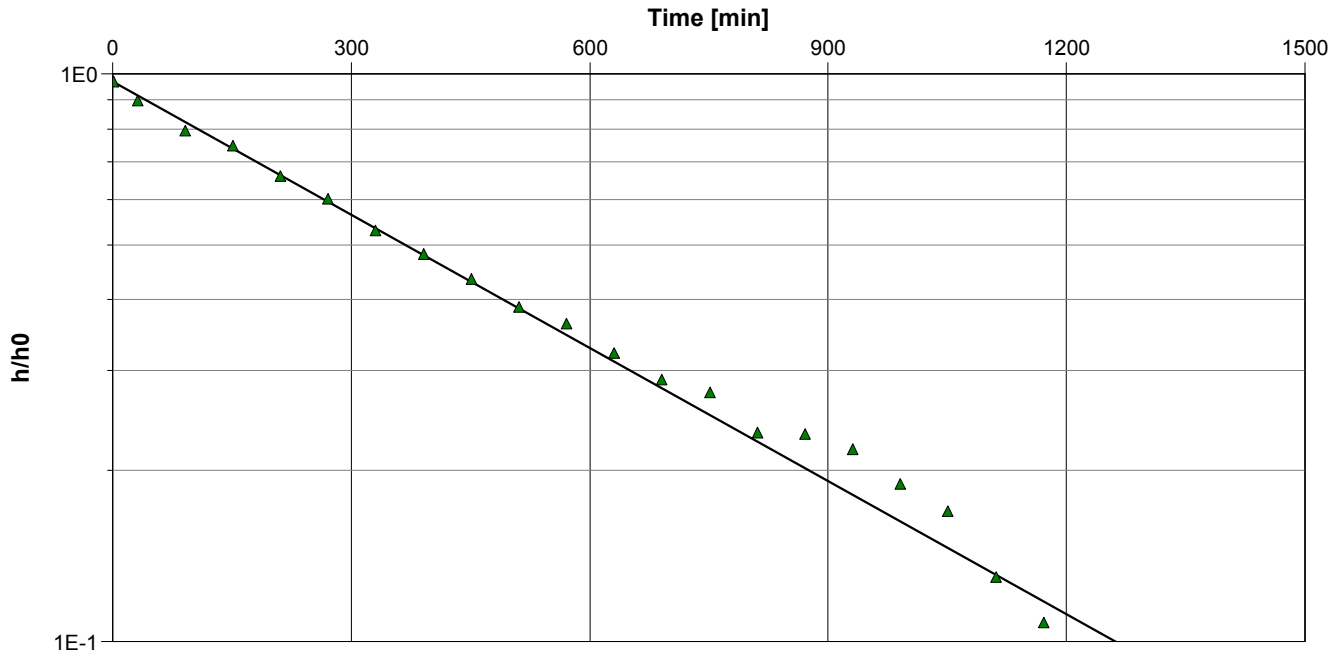
Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW2	5.74×10^{-8}	

Screenedin Clayey Silt

	Slug Test Analysis Report
	Project: Sharon Corners
	Number: 17M-00407-00-HEV
	Client: Wycliffe Thornridge Sharon Limited

Location: Mount Albert, Ontario	Slug Test: MW3 Falling Head Test	Test Well: MW3
Test Conducted by: D. Neerhof		Test Date: 06/10/2017
Analysis Performed by: A. Read	MW3 Falling Head Test	Analysis Date: 17/10/2017
Aquifer Thickness: 2.46 m		



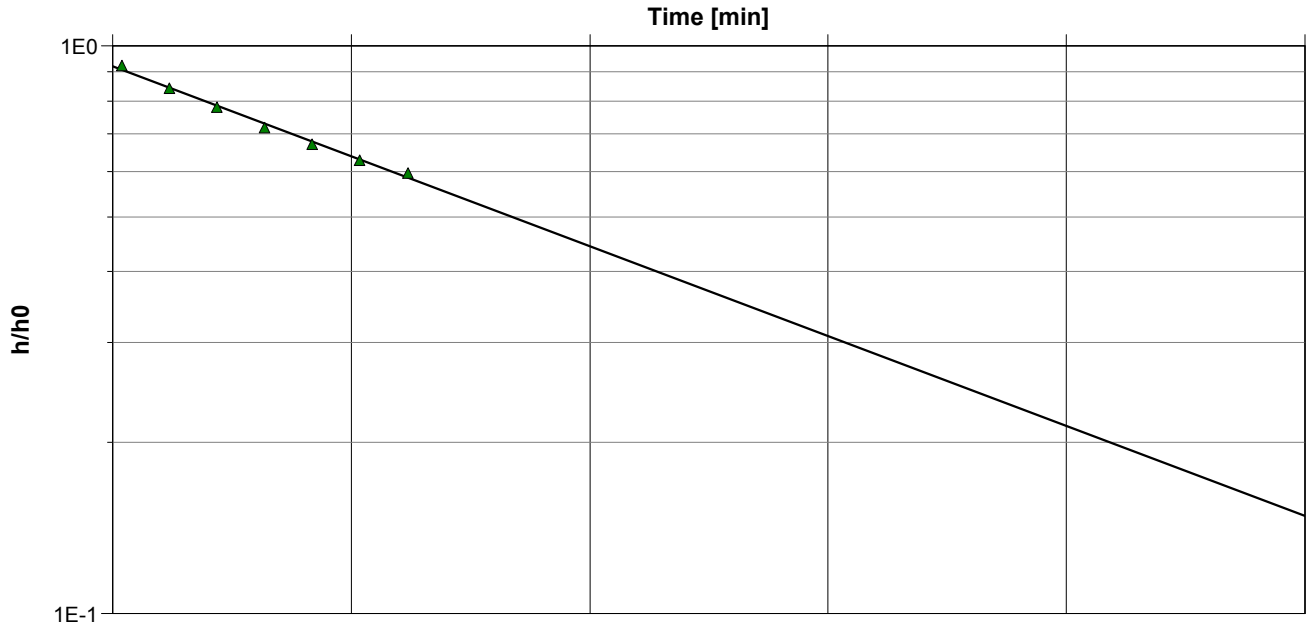
Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW3	2.03×10^{-8}	

Screened in Silt / Silt Till

wsp	**Slug Test Analysis Report**
	Project: Sharon Corners
	Number: 17M-00407-00-HEV
	Client: Wycliffe Thornridge Sharon Limited

Location: Mount Albert, Ontario	Slug Test: MW3 Rising Head Test	Test Well: MW3
Test Conducted by: D. Neerhof		Test Date: 10/10/2017
Analysis Performed by: A. Read	MW3 Rising Head Test	Analysis Date: 17/10/2017
Aquifer Thickness: 2.46 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW3	1.37×10^{-8}	

Screened in Silt / Silt Till

Guelph Permeameter

Input

Result

Single Head Method (1)

Reservoir Cross-sectional area in cm^2	
(enter "35.22" for Combined and "2.16" for Inner reservoir):	35.22
Enter water Head Height ("H" in cm):	15
Enter the Borehole Radius ("a" in cm):	3
Enter the soil texture-structure category (enter one of the below numbers):	3

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): 0.2000

Res Type	35.22
H	15
a	3
H/a	5
a*	0.12
C0.01	1.518
C0.04	1.629
C0.12	1.667
C0.36	1.667
C	1.667
R	0.200
Q	0.117
pi	3.142

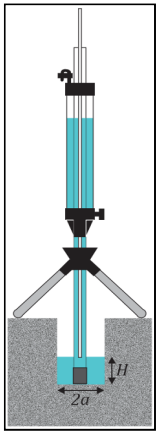
α^*= 0.12 cm^{-1}

C = 1.666893

Q = 0.1174

K_{fs} = 8.71E-05 *cm/sec*
5.23E-03 *cm/min*
8.71E-07 *m/sec*
2.06E-03 *inch/min*
3.43E-05 *inch/sec*

Φ_m = 7.26E-04 cm^2 /min



Calculation formulas related to shape factor (C). Where H_1 is the first water head height (cm), H_2 is the second water head height (cm), a is borehole radius (cm) and α^* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C_1 needs to be calculated while for two-head method, C_1 and C_2 are calculated (Zang et al., 1998).

Soil Texture-Structure Category	$\alpha^*(cm^{-1})$	Shape Factor
Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01	$C_1 = \left(\frac{H_2/a}{2.081 + 0.121\left(H_2/a\right)}\right)^{0.672}$
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04	$C_1 = \left(\frac{H_1/a}{1.992 + 0.091\left(H_1/a\right)}\right)^{0.683}$ $C_2 = \left(\frac{H_2/a}{1.992 + 0.091\left(H_2/a\right)}\right)^{0.683}$
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$
Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc.	0.36	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$

Calculation formulas related to one-head and two-head methods. Where R is steady-state rate of fall of water in reservoir (cm/s), K_{fs} is Soil saturated hydraulic conductivity (cm/s), Φ_m is Soil matric flux potential (cm^2/s), a^* is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), H_1 is the first head of water established in borehole (cm) , H_2 is the second head of water established in borehole (cm) and C is Shape factor (from Table 2).

One Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$	$K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{a^*}\right)}$ $\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)a^* + 2\pi H_1}$
One Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$	
Two Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$ $Q_2 = \bar{R}_2 \times 35.22$	$G_1 = \frac{H_2 C_1}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_2 = \frac{H_1 C_2}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $K_{fs} = G_2Q_2 - G_1Q_1$ $G_3 = \frac{(2H_2^2 + a^2C_2)C_1}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_4 = \frac{(2H_1^2 + a^2C_1)C_2}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $\Phi_m = G_3Q_1 - G_4Q_2$
Two Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$ $Q_2 = \bar{R}_2 \times 2.16$	

Guelph Permeameter

Input

Result

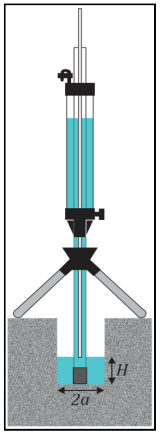
Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	35.22
Enter water Head Height ("H" in cm):	18
Enter the Borehole Radius ("a" in cm):	3
Enter the soil texture-structure category (enter one of the below numbers):	3

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): 0.1500

Res Type	35.22	
H	18	
a	3	
H/a	6	
a*	0.12	
C0.01	1.666	
C0.04	1.8	
C0.12	1.861	
C0.36	1.861	
C	1.861	
R	0.150	
Q	0.088	
pi	3.142	
α*=	0.12	cm^{-1}
C =	1.86136	
Q =	0.08805	
K_{fs} =	5.41E-05	cm/sec
	3.24E-03	cm/min
	5.41E-07	m/sec
	1.28E-03	inch/min
	2.13E-05	inch/sec
Φ_m =	4.51E-04	cm^2/min



Calculation formulas related to shape factor (C). Where H_1 is the first water head height (cm), H_2 is the second water head height (cm), a is borehole radius (cm) and α^* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C_1 needs to be calculated while for two-head method, C_1 and C_2 are calculated (Zang et al., 1998).

Soil Texture-Structure Category	$\alpha^*(cm^{-1})$	Shape Factor
Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01	$C_1 = \left(\frac{H_2/a}{2.081 + 0.121\left(H_2/a\right)}\right)^{0.672}$
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04	$C_1 = \left(\frac{H_1/a}{1.992 + 0.091\left(H_1/a\right)}\right)^{0.683}$ $C_2 = \left(\frac{H_2/a}{1.992 + 0.091\left(H_2/a\right)}\right)^{0.683}$
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$
Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc.	0.36	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$

Calculation formulas related to one-head and two-head methods. Where R is steady-state rate of fall of water in reservoir (cm/s), K_{fs} is Soil saturated hydraulic conductivity (cm/s), Φ_m is Soil matric flux potential (cm^2/s), α^* is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), H_1 is the first head of water established in borehole (cm) , H_2 is the second head of water established in borehole (cm) and C is Shape factor (from Table 2).

One Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$	$K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{\alpha^*}\right)}$ $\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)\alpha^* + 2\pi H_1}$
One Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$	
Two Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$ $Q_2 = \bar{R}_2 \times 35.22$	$G_1 = \frac{H_2 C_1}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_2 = \frac{H_1 C_2}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $K_{fs} = G_2Q_2 - G_1Q_1$
Two Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$ $Q_2 = \bar{R}_2 \times 2.16$	$G_3 = \frac{(2H_2^2 + a^2C_2)C_1}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_4 = \frac{(2H_1^2 + a^2C_1)C_2}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $\Phi_m = G_3Q_1 - G_4Q_2$

Guelph Permeameter

Input

Result

Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	35.22
Enter water Head Height ("H" in cm):	16
Enter the Borehole Radius ("a" in cm):	3
Enter the soil texture-structure category (enter one of the below numbers):	3

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): 0.0400

Res Type	35.22
H	16
a	3
H/a	5.333
a*	0.12
C0.01	1.57
C0.04	1.688
C0.12	1.734
C0.36	1.734
C	1.734
R	0.040
Q	0.023
pi	3.142

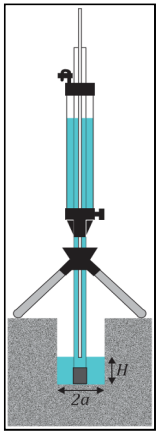
α^* = 0.12 cm^{-1}

C = 1.734073

Q = 0.02348

K_{fs} = 1.63E-05 cm/sec
9.79E-04 cm/min
1.63E-07 m/sec
3.85E-04 inch/min
6.42E-06 inch/sec

Φ_m = 1.36E-04 cm^2/min



Calculation formulas related to shape factor (C). Where H_1 is the first water head height (cm), H_2 is the second water head height (cm), a is borehole radius (cm) and α^* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C_1 needs to be calculated while for two-head method, C_1 and C_2 are calculated (Zang et al., 1998).

Soil Texture-Structure Category	α^*(cm^{-1})	Shape Factor
Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01	$C_1 = \left(\frac{H_2/a}{2.081 + 0.121\left(H_2/a\right)}\right)^{0.672}$
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04	$C_1 = \left(\frac{H_1/a}{1.992 + 0.091\left(H_1/a\right)}\right)^{0.683}$ $C_2 = \left(\frac{H_2/a}{1.992 + 0.091\left(H_2/a\right)}\right)^{0.683}$
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$
Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc.	0.36	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$

Calculation formulas related to one-head and two-head methods. Where R is steady-state rate of fall of water in reservoir (cm/s), K_{fs} is Soil saturated hydraulic conductivity (cm/s), Φ_m is Soil matric flux potential (cm^2/s), α^* is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), H_1 is the first head of water established in borehole (cm) , H_2 is the second head of water established in borehole (cm) and C is Shape factor (from Table 2).

One Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$	$K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{\alpha^*}\right)}$ $\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)\alpha^* + 2\pi H_1}$
One Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$	
Two Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$ $Q_2 = \bar{R}_2 \times 35.22$	$G_1 = \frac{H_2 C_1}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_2 = \frac{H_1 C_2}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $K_{fs} = G_2Q_2 - G_1Q_1$
Two Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$ $Q_2 = \bar{R}_2 \times 2.16$	$G_3 = \frac{(2H_2^2 + a^2C_2)C_1}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_4 = \frac{(2H_1^2 + a^2C_1)C_2}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $\Phi_m = G_3Q_1 - G_4Q_2$

Guelph Permeameter

Input

Result

Single Head Method (1)

Reservoir Cross-sectional area in cm^2

(enter "35.22" for Combined and "2.16" for Inner reservoir): **35.22**

Enter water Head Height ("H" in cm): **15**

Enter the Borehole Radius ("a" in cm): **3**

Enter the soil texture-structure category (enter one of the below numbers): **3**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.0200**

Res Type	35.22
H	15
a	3
H/a	5
a*	0.12
C0.01	1.518
C0.04	1.629
C0.12	1.667
C0.36	1.667
C	1.667
R	0.020
Q	0.012
pi	3.142

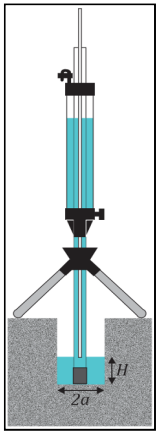
α^*= **0.12** cm^{-1}

C = **1.666893**

Q = **0.01174**

K_{fs} = **8.71E-06** *cm/sec*
5.23E-04 *cm/min*
8.71E-08 *m/sec*
2.06E-04 *inch/min*
3.43E-06 *inch/sec*

Φ_m = **7.26E-05** cm^2 */min*



Calculation formulas related to shape factor (C). Where H_1 is the first water head height (cm), H_2 is the second water head height (cm), a is borehole radius (cm) and α^* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C_1 needs to be calculated while for two-head method, C_1 and C_2 are calculated (Zang et al., 1998).

Soil Texture-Structure Category	$\alpha^*(cm^{-1})$	Shape Factor
Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01	$C_1 = \left(\frac{H_2/a}{2.081 + 0.121\left(H_2/a\right)}\right)^{0.672}$
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04	$C_1 = \left(\frac{H_1/a}{1.992 + 0.091\left(H_1/a\right)}\right)^{0.683}$ $C_2 = \left(\frac{H_2/a}{1.992 + 0.091\left(H_2/a\right)}\right)^{0.683}$
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$
Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc.	0.36	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$

Calculation formulas related to one-head and two-head methods. Where R is steady-state rate of fall of water in reservoir (cm/s), K_{fs} is Soil saturated hydraulic conductivity (cm/s), Φ_m is Soil matric flux potential (cm^2/s), a^* is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), H_1 is the first head of water established in borehole (cm) , H_2 is the second head of water established in borehole (cm) and C is Shape factor (from Table 2).

One Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$	$K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{a^*}\right)}$ $\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)a^* + 2\pi H_1}$
One Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$	
Two Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$ $Q_2 = \bar{R}_2 \times 35.22$	$G_1 = \frac{H_2 C_1}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_2 = \frac{H_1 C_2}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $K_{fs} = G_2Q_2 - G_1Q_1$
Two Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$ $Q_2 = \bar{R}_2 \times 2.16$	$G_3 = \frac{(2H_2^2 + a^2C_2)C_1}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_4 = \frac{(2H_1^2 + a^2C_1)C_2}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $\Phi_m = G_3Q_1 - G_4Q_2$

APPENDIX

D WATER LEVEL AND WATER QUALITY DATA

Table SWL-1: Groundwater Level Monitoring

Well ID	Location Easting m	Location Northing m	Ground Elevation masl	Stick-up mag	Top of Pipe Elevation masl	Screen Bottom mbg	Screen Top mbg	Screen m	Installation Date	Water Level 23-May-06 mbtop	Water Level 23-May-06 masl	Water Level 19-Jun-06 mbtop	Water Level 19-Jun-06 masl	Water Level 20-Jun-06 mbtop	Water Level 20-Jun-06 masl	Water Level 21-Jun-06 mbtop	Water Level 21-Jun-06 masl	Water Level 23-Jun-06 mbtop	Water Level 23-Jun-06 masl	Water Level 20-Aug-07 mbtop	Water Level 20-Aug-07 masl	Water Level 21-Aug-07 mbtop	Water Level 21-Aug-07 masl	Water Level 22-Aug-07 mbtop	Water Level 22-Aug-07 masl	Water Level 23-Aug-07 mbtop	Water Level 23-Aug-07 masl	Water Level 2-Oct-07 mbtop	Water Level 2-Oct-07 masl	Water Level 5-Oct-07 mbtop	Water Level 5-Oct-07 masl	Water Level 21-Nov-07 mbtop	Water Level 21-Nov-07 masl	Water Level 21-Dec-07 mbtop	Water Level 21-Dec-07 masl	Water Level 8-Jan-08 mbtop	Water Level 8-Jan-08 masl	Water Level 5-Feb-08 mbtop	Water Level 5-Feb-08 masl	Water Level 8-Feb-08 mbtop	Water Level 8-Feb-08 masl	Water Level 14-Feb-08 mbtop	Water Level 14-Feb-08 masl	Water Level 28-Mar-08 mbtop	Water Level 28-Mar-08 masl
P-1: CU																																												
CU-1	624479	4885085	262.0	0.94	262.94	7.5	6.0	1.5	24-May-06					1.81	261.13					6.92																									
CU-2	624289	4885066	260.25	0.97	261.22	6.1	4.6	1.5	24-May-06					2.94	258.28					4.33																									
CU-5S	624279	4884798	257.0	1.03	258.03	9.1	7.6	1.5	24-May-06					2.86	255.17					6.13												7.26	250.78									3.29	254.74				
MW-1	624404	4884755	255.7	0.92	256.62	7.5	6.0	1.5	25-Sep-17																																				
MW-2	624605	4884998	261.2	0.67	261.87	7.1	5.6	1.5	26-Sep-17																																				
MW-3	624545	4884792	260.5	0.88	261.38	6.1	4.6	1.5	26-Sep-17																																				
DO-4 (new stick-up)	624043	4884380	250.12	1.02	251.14	9.1	7.6	1.5	26-May-06																																				
COR-1	624686	4884636	261.0	0.89	261.89	4.6	3.1	1.5	25-May-06			1.46	260.43							3.08	258.81									2.40	259.49			1.58	260.32	0.88	261.01								
COR-2 - old	624464	4884690	257.5	0.92	258.42	9.1	7.6	1.5	25-May-06			2.87	255.55													Obstructed @1.25m																				
COR-2	624464	4884690	257.5	0.95	258.45	9.1	7.6	1.5	27-May-08			2.90	255.55													Obstructed @1.25m																				
COR-3	624414	4884519	256.8	0.97	257.72	7.6	6.1	1.5	25-May-06			2.15	255.57													8.01	249.71																				
COR-4	624245	4884552	254.0	0.90	254.90	6.1	4.6	1.5	26-May-06			3.51	251.39													6.50																				
CO-1	624219	4882835	247.5	0.99	248.49	9.1	7.6	1.5	12-Jun-06					1.16	247.33											CNL																				
CO-2	624271	4882535	244.5	1.00	245.50	6.1	4.6	1.5	12-Jun-06					2.94	242.56											CNL																				
CO-3	624325	4882414					0.0																																				
CO-4	624406	4882218					0.0																																				
N 1	623823	4882598	231.75	0.90	232.65	6.1	4.6	1.5	10-Oct-07																													3.00	229.65						
N 2	624833	4882900	264.0	1.06	265.06	6.1	4.6	1.5	10-Oct-07																													3.03	262.03						
M1-S (NO CASING)	624341	4882521	247.0	1.10	248.10	8.4	8.4																																				
M 1-D	624324	4882487	248.6	1.17	249.77	30.5	27.5	3.0	5-Nov-07																													1.98	247.79						
M 2	624866	4882708	262.9	1.02	263.92	6.1	4.6	1.5	9-Oct-07																													2.55	261.37						
M 3	625112	4882557	262.5	1.04	263.54	6.1	4.6	1.5	9-Oct-07																													1.09	262.45						
M 4	624835	4882494	261.3	0.97	262.27	6.1	4.6	1.5	9-Oct-07																													3.31	258.96						
M 5	624474	4882178	251.0	0.88	251.88	9.1	6.1	3.0	1-Nov-07																													5.07	246.81						
M 6	623898	4882394	240.0	1.07	241.07	9.1	7.6	1.5	10-Oct-07																													5.65	235.42						
M 7	624381	4882422	246.0	1.01	247.01	6.1	4.6	1.5	10-Oct-07																													1.11	245.90						
SW 1	624187	4882291	241.0	1.07	242.07	9.1	7.6	1.5	10-Oct-07																													4.91	237.16						
TR-BH101	624664	4885055	261.80	0.70	262.50	6.1	4.6	1.5	13-Jul-06											1.94	260.56	1.91	260.59							1.67	260.83			1.34	261.16	1.34	261.16							1.15	261.35		
TR-BH201-S	624649	4885097	261.97	0.86	262.83	3.6	1.8	1.8	19-Feb-08																																			1.66	261.17
TR-BH201-D	624649	4885095	262.0	0.83	262.86	9.1	7.3	1.8	19-Feb-08																																			1.53	261.33
Tributaries 3 and 4																																													
T3-7SW	624116	4884470	249.97	1.47	251.43	1.50	0.00	1.5	29-May-08																																				
T3-7A (shallow)	624117	4884467	250.52	0.91	251.43	3.11	1.61	1.5	29-May-08																																				
T3-7B (deep)	624115	4884464	250.56	0.94	251.50	6.29	4.79	1.5	28-May-08																																				
T4-8SW	624475	4884726	255.99	1.43	257.42	1.38	0.00	1.4	29-May-08																																				
T4-8A	624484	4884727	256.22	0.77	256.99	2.99	1.49	1.5	28-May-08																																				
T4-8B	624479	4884727	256.09	0.93	257.02	5.81	4.31	1.5	28-May-08																																				
Spine Services																																												
BH S1	624580	4885065	260.5	0.85	261.35	10.7	9.2	1.5	7-May-08																																				
BH-S2	624401	4884833	256.6	0.73	257.33	7.6	6.1	1.5	7-May-08																																				
DO-BH24 (S4)	624127	4884489	251.47	0.88	252.35	6.1	4.6	1.5	6-May-08																																				
DO-BH27 (S5)	623907	4884227	247.09	0.87	247.96	6.1	4.6	1.5	6-May-08																																				
DO-BH25 (S7)	623724	4883965	244.59	0.51	245.10	6.1	4.6	1.5	6-May-08																																				
Wetland/Watercourse Monitors																																												
MMM11-1	624097	4884391	250.46	0.87	251.33	5.9	4.4	1.5	6-Dec-11																																				
MMM11-2A	624178	4884124	248.5	0.80	249.30	5.9	4.4	1.5	6-Dec-11																																				
MMM11-2B	624172	4884030	250.0	0.78	250.78	5.9	4.4	1.5	14-Dec-11																																				
MMM11-3A	624704	4883739	257.6	0.88	258.48	5.9	4.4	1.5	8-Dec-11																																				
MMM11-3B	624867	4883756	257.7	0.77	258.47	5.9	4.4	1.5	14-Dec-11																																				
MMM11-4	623862	4883157	243.4	0.91	244.31	6.7	5.2	1.5	13-Dec-11																																				
MMM11-5A	624690	4883207	259.3	0.78	260.05	5.9	4.4	1.5	12-Dec-11																																				
MMM11-5B	624801	4883230	263.9	0.88	264.77	5.9	4.4	1.5	12-Dec-11																																				
MMM11-6	624612	4884066	255.4	0.75	256.15	9.0	7.5	1.5	7-Dec-11																																				
MMM12-1	624332.5	4884749.2	255.75	0.97	256.72	6.9	5.3	1.5	4-Apr-12																																				
MMM12-2	623700.2	4883879.7	243.18	0.88	244.06	5.9	4.4	1.5	5-Jul-12																																				
MMM12-3	623677.8	4883747.0	243.14	1.08	244.22	5.8	4.3	1.5	4-Jul-12																																				
MMM12-4S	623669.3	4883503.8	241.41	0.89	242.30	5.0	3.5	1.5	3-Apr-12																																				
MMM12-4D	623667.9	4883497.0	241.46	0.78	242.24	10.5	9.0	1.5	3-Apr-12																																				
MMM12-5	623649.6	4883281.6	238.60	0.86	239.46	7.5	5.9	1.5	3-Apr-12																																				
MMM12-6	623608.8	4883117.8	234.53	0.93	235.46	2.1	1.2	0.9	2-Apr-12																																				
BH-651	623587.2	4883126.0	233.06	0.89	233.95	13.7	10.7	3.0	28-Jan-08																																				
Surface Water Monitors							0.00																																				
SWM-1	624647	4885063	261.1	0.90	261.98	259.6	259.6		20-Nov-07																							0.83	261.15	0.89	261.09							0.79	261.19		
SWM-2	625147	4882591	260.2	1.02	261.21	258.8	258.8		20-Nov-07																							0.75	260.46												
SWM-3	623898	4884212	243.5	1.30	244.80																																							
SWM -3 Revised	623899.8	4884210.6	244.74	1.48	246.22				9-Oct-14																																				
Private Wells	Ground elevations for private wells obtained from contour mapping and are therefore estimates																																										
1442 Mt. Albert Rd.	624511	4884816	259.0	0.17	259.17	14.02																																						
1432 Mt. Albert Rd.	624484	4884799	258.5	0.48	258.98	11.64																																						
1037 Mt. Albert Rd.	623606	4884399	260.0	-0.3	259.70																																							
1029 Mt. Albert Rd.	623589	4884386	259.0	0.25	259.25	10.89																																						
1008 Mt. Albert Rd.	623488	4884466	258.0	0.28	258.28	> 50																																						
19384 Leslie St.	624456	4885478	275.0	0.71	275.71																																						
18846 Leslie St.	624836	4883986	259.0	0.12	259.12																																						
14 Sharon Blvd.	624858	4884790	266.0	0.06	266.06																																						
28 Sharon Blvd.	625067	4884855	267.0	0.08	267.08																																						
30 Sharon Blvd.	625110	4884862	267.0	0.4	267.40																																						
34 Farr Ave.	625163	4884999	264.0	0.14	264.14																																						
8 May Ave.	624738	4884996	263.0	0.11	263.11	7.86																																						
28 May Ave.	624957	4885087	263.0	0.25	263.25																																						

Notes:

CNL = Could not Locate

CNO = Could not Open

SWL is within 0.3 m of ground surface

SWL is above ground surface

Monitor is frozen - value indicates depth to ice

Indicates the monitor is lost, destroyed or decommissioned

Table SWL-1: Groundwater Level Monitoring

Well ID	Location Easting m	Location Northing m	Ground Elevation masl	Water Level 30-Apr-08 mbtop	30-Apr-08 masl	Water Level 5-May-08 mbtop	5-May-08 masl	Water Level 6-May-08 mbtop	6-May-08 masl	Water Level 7-May-08 mbtop	7-May-08 masl	Water Level 20-May-08 mbtop	20-May-08 masl	Water Level 16-Jul-08 mbtop	16-Jul-08 masl	Water Level 17-Jul-08 mbtop	17-Jul-08 masl	Water Level 18-Jul-08 mbtop	18-Jul-08 masl	Water Level 25-Jul-08 mbtop	25-Jul-08 masl	Water Level 1-Aug-08 mbtop	1-Aug-08 masl	Water Level 13-Aug-08 mbtop	13-Aug-08 masl	Water Level 18-Aug-08 mbtop	18-Aug-08 masl	Water Level 19-Aug-08 mbtop	19-Aug-08 masl	Water Level 20-Aug-08 mbtop	20-Aug-08 masl	Water Level 21-Aug-08 mbtop	21-Aug-08 masl	Water Level 13-Jan-09 mbtop	13-Jan-09 masl	Water Level 16-Jan-09 mbtop	16-Jan-09 masl	Water Level 20-Jan-09 mbtop	20-Jan-09 masl	Water Level 21-Jan-09 mbtop	21-Jan-09 masl	Water Level 26-Jan-09 mbtop	26-Jan-09 masl	Water Level 13-Apr-09 mbtop	13-Apr-09 masl
P-1: CU																																													
CU-1	624479	4885085	262.0					1.28	261.66																	3.21	259.73							1.35	261.59										
CU-2	624289	4885066	260.25					2.35	258.87																	4.04	257.18							2.07	259.15										
CU-5S	624279	4884798	257.0					2.18	255.85																	4.48	253.55							2.17	255.86										
MW-1	624404	4884755	255.7																																										
MW-2	624605	4884998	261.2																																										
MW-3	624545	4884792	260.5																																										
DO-4 (new stick-up)	624043	4884380	250.12																															Frozen										
COR-1	624686	4884636	261.0	1.04	260.85											6.01	255.88					1.25	260.64	1.15	260.74					1.30	260.59			1.01	260.88										
COR-2 - old	624464	4884690	257.5	DAMAGED										REPLACED																															
COR-2	624464	4884690	257.5	DAMAGED								REPLACED		3.01	255.44			3.05	255.40	2.94	255.51	2.82	255.63	2.87	255.58					3.06	255.39			2.07	256.38										
COR-3	624414	4884519	256.8	1.27	256.45	1.02	256.70																									3.21	254.51	1.26	256.46							0.98	256.74
COR-4	624245	4884552	254.0	2.13	252.77									3.41	251.49															3.70	251.20			2.03	252.87										
CO-1	624219	4882835	247.5			0.05	248.44																							1.97	246.52							0.28	248.21						
CO-2	624271	4882535	244.5																									2.96	242.54													1.78	243.72	1.08	244.42
CO-3	624325	4882414																																										
CO-4	624406	4882218																																										
N 1	623823	4882598	231.75																									4.00	228.65											2.52				1.86	230.79
N 2	624833	4882900	264.0																									3.49	261.57													2.29	262.77	1.20	263.86
M1-S (NO CASING)	624341	4882521	247.0																																										
M 1-D	624324	4882487	248.6																																								0.56	249.21	0.00	249.77
M 2	624866	4882708	262.9																									3.85	260.07													1.90	262.02	1.44	262.48
M 3	625112	4882557	262.5																									1.81	261.73													1.68	261.87	1.56	261.98
M 4	624835	4882494	261.3																									5.80	256.47													2.73	259.54	1.54	260.73
M 5	624474	4882178	251.0																									6.52	245.36													4.66	247.22	2.47	249.41
M 6	623898	4882394	240.0																									8.20	232.87													4.46	236.61	2.86	238.21
M 7	624381	4882422	246.0																									2.00	245.01													1.45	245.56	0.80	246.21
SW 1	624187	4882291	241.0																									4.99	237.08													2.74	239.34	2.05	240.02
TR-BH101	624664	4885055	261.80							1.17	261.33	1.33	261.16													1.41	261.09							1.21	261.29										
TR-BH201-S	624649	4885097	261.97									1.70	261.14													1.63	261.20							1.60	261.23										
TR-BH201-D	624649	4885095	262.0									1.63	261.23													1.72	261.14							1.54	261.32										
Tributaries 3 and 4																																													
T3-7SW	624116	4884470	249.97													1.48	249.95	1.49	249.94	1.45	249.98			1.45	249.98					1.47	249.96			1.39	250.04										
T3-7A (shallow)	624117	4884467	250.52													1.34	250.09	1.38	250.05	1.30	250.14	1.30	250.13	1.30	250.13					1.35	250.08			1.25	250.18										
T3-7B (deep)	624115	4884464	250.56													0.95	250.56	0.96	250.54	0.75	250.76	0.78	250.72	0.78	250.72					0.87	250.63			0.37	251.13										
T4-8SW	624475	4884726	255.99											1.50	255.92	1.52	255.90	1.58	255.84	1.41	256.01	1.41	256.01	1.40	256.02					1.44	255.98			1.36	256.06										
T4-8A	624484	4884727	256.22											1.39	255.60	1.43	255.56	1.48	255.51	0.98	256.01	0.96	256.03	0.89	256.10					1.08	255.91			0.88	256.11										
T4-8B	624479	4884727	256.09											1.40	255.62	1.45	255.57	1.51	255.51	1.00	256.02	1.02	256.00	1.01	256.01					1.11	255.91			0.93	256.09										
Spine Services																																													
BH S1	624580	4885065	260.5																															0.71	260.64										
BH-S2	624401	4884833	256.6																							1.05	256.28							0.63	256.70										
DO-BH24 (S4)	624127	4884489	251.47					1.76	250.59					1.31	251.04															1.83	250.52			1.41	250.94	1.47	250.88										
DO-BH27 (S5)	623907	4884227	247.09					4.62																						2.28	245.68			2.07	245.89	2.11	245.85										
DO-BH25 (S7)	623724	4883965	244.59					3.26	241.84																					4.27	240.83			3.66	241.44										
Wetland/Watercourse Monitors																																													
MMM11-1	624097	4884391	250.46																																										
MMM11-2A	624178	4884124	248.5																																										
MMM11-2B	624172	4884030	250.0																																										
MMM11-3A	624704	4883739	257.6																																										
MMM11-3B	624867	4883756	257.7																																										
MMM11-4	623862	4883157	243.4																																										
MMM11-5A	624690	4883207	259.3																																										
MMM11-5B	624801	4883230	263.9																																										
MMM11-6	624612	4884066	255.4																																										
MMM12-1	624332.5	4884749.2	255.75																																										
MMM12-2	623700.2	4883879.7	243.18																																										
MMM12-3	623677.8	4883747.0	243.14																																										
MMM12-4S	623669.3	4883503.8	241.41																																										
MMM12-4D	623667.9	4883497.0	241.46																																										
MMM12-5	623649.6	4883281.6	238.60																																										
MMM12-6	623608.8	4883117.8	234.53																																										
BH-651	623587.2	4883126.0	233.06																																										
Surface Water Monitors																																													
SWM-1	624647	4885063	261.1																							0.81	261.17																		
SWM-2	625147	4882591	260.2																							0.84	260.37																		
SWM-3	623898	4884212	243.5																																										
SWM -3 Revised	623899.8	4884210.6	244.74																																										
Private Wells	Ground elevations for private wells obtain																																												
1442 Mt. Albert Rd.	624511	4884816	259.0																																										
1432 Mt. Albert Rd.	624484	4884799	258.5																																										
1037 Mt. Albert Rd.	623606	4884399	260.0																																										
1029 Mt. Albert Rd.	623589	4884386	259.0																																										
1008 Mt. Albert Rd.	623488	4884466	258.0																																										
19384 Leslie St.	624456	4885478	275.0																																										
18846 Leslie St.	624836	4883986	259.0																																										
14 Sharon Blvd.	624858	4884790	266.0																																										
28 Sharon Blvd.	625067	4884855	267.0																																										
30 Sharon Blvd.	625110	4884862	267.0																																										
34 Farr Ave.	625163	4884999	264.0																																										
8 May Ave.	624738	4884996	263.0																																										
28 May Ave.	624957	4885087	263.0																																										

Notes:

CNL = Could not Locate

CNO = Could not Open

SWL is within 0.3 m of ground surface

SWL is above ground surface

Monitor is frozen - value indicates depth to ice

Indicates the monitor is lost, destroyed or decommissioned

Table SWL-1: Groundwater Level Monitoring

Well ID	Location Easting m	Location Northing m	Ground Elevation masl	Water Level 14-Apr-09 mbtop	14-Apr-09 masl	Water Level 16-Apr-09 mbtop	16-Apr-09 masl	Water Level 18-Aug-09 mbtop	18-Aug-09 masl	Water Level 19-Aug-09 mbtop	19-Aug-09 masl	Water Level 20-Aug-09 mbtop	20-Aug-09 masl	Water Level 21-Aug-09 mbtop	21-Aug-09 masl	Water Level 28-Oct-09 mbtop	28-Oct-09 masl	Water Level 22-Apr-10 mbtop	22-Apr-10 masl	Water Level 26-Apr-10 mbtop	26-Apr-10 masl	Water Level 19-Oct-12 mbtop	19-Oct-12 masl	Water Level 26-Oct-10 mbtop	26-Oct-10 masl	Water Level 27-Oct-10 mbtop	27-Oct-10 masl	Water Level 28-Oct-11 mbtop	28-Oct-11 masl	Water Level 1-Nov-11 mbtop	1-Nov-11 masl	Water Level 16-Nov-11 mbtop	16-Nov-11 masl	Water Level 29-Nov-11 mbtop	29-Nov-11 masl	Water Level 3-Dec-11 mbtop	3-Dec-11 masl	Water Level 7-Dec-11 mbtop	7-Dec-11 masl	Water Level 9-Dec-11 mbtop	9-Dec-11 masl
P-1: CU																																										
CU-1	624479	4885085	262.0	1.14	261.80									1.60	261.34																												
CU-2	624289	4885066	260.25	1.58	259.64									2.95	258.27																												
CU-5S	624279	4884798	257.0	1.68	256.35									CNL				2.19	255.85					4.25	253.78			1.88	256.15														
MW-1	624404	4884755	255.7																																								
MW-2	624605	4884998	261.2																																								
MW-3	624545	4884792	260.5																																								
DO-4 (new stick-up)	624043	4884380	250.12	0.00	251.14							0.06	251.08							-0.02	251.16			0.36	250.78			0.03	251.11														
COR-1	624686	4884636	261.0	1.04	260.85									1.04	260.85			1.07	260.82					1.25	260.64			1.11	260.78											1.08	260.82		
COR-2 - old	624464	4884690	257.5																																								
COR-2	624464	4884690	257.5	1.69	256.76									2.33	256.12			2.25	256.20					3.14	255.31																		
COR-3	624414	4884519	256.8									1.90	255.82											5.35	252.37																		
COR-4	624245	4884552	254.0	1.56	253.34							2.70	252.20					2.29	252.61					4.94	249.96																		
CO-1	624219	4882835	247.5			0.00	248.49																			2.63	245.86																
CO-2	624271	4882535	244.5											1.38	244.12																												
CO-3	624325	4882414																																									
CO-4	624406	4882218																																									
N 1	623823	4882598	231.75											1.90	230.75																												
N 2	624833	4882900	264.0											1.97	263.09																												
M1-S (NO CASING)	624341	4882521	247.0																																								
M 1-D	624324	4882487	248.6											0.00	249.77																												
M 2	624866	4882708	262.9											1.78	262.14																												
M 3	625112	4882557	262.5							1.65	261.89																																
M 4	624835	4882494	261.3											2.35	259.92																												
M 5	624474	4882178	251.0											3.56	248.32																												
M 6	623898	4882394	240.0											4.28	236.79																												
M 7	624381	4882422	246.0											1.26	245.75																												
SW 1	624187	4882291	241.0											2.49	239.58																												
TR-BH101	624664	4885055	261.80	1.09	261.41			1.35	261.15									1.33	261.17					1.41	261.08			1.37	261.13														
TR-BH201-S	624649	4885097	261.97	1.56	261.27			1.57	261.26															1.56	261.27			1.53	261.30														
TR-BH201-D	624649	4885095	262.0	1.42	261.44			1.60	261.27															1.61	261.25			1.46	261.40														
Tributaries 3 and 4																																											
T3-7SW	624116	4884470	249.97	1.36	250.07							1.48	249.95					1.45	249.98					1.48	249.96			1.43	250.00														
T3-7A (shallow)	624117	4884467	250.52	1.18	250.25							1.36	250.07					1.29	250.15					1.32	250.12			1.24	250.19														
T3-7B (deep)	624115	4884464	250.56	0.29	251.21							0.74	250.76					0.56	250.94					0.86	250.64			0.55	250.95														
T4-8SW	624475	4884726	255.99	1.37	256.05									1.37	256.05			1.36	256.06					1.41	256.01																		
T4-8A	624484	4884727	256.22	0.88	256.11									0.87	256.12			1.91	255.08					0.93	256.06																		
T4-8B	624479	4884727	256.09	0.91	256.11									0.91	256.11			0.94	256.08					0.97	256.05																		
Spine Services																																											
BH S1	624580	4885065	260.5	0.71	260.64									0.89	260.46																												
BH-S2	624401	4884833	256.6	0.59	256.74									0.77	256.56			0.72	256.61					0.81	256.52																		
DO-BH24 (S4)	624127	4884489	251.47	1.48	250.87							1.68	250.67					1.54	250.82					1.57	250.78			1.54	250.82														
DO-BH27 (S5)	623907	4884227	247.09	1.72	246.24							2.14	245.82					2.08	245.88					2.20	245.77			1.99	245.97														
DO-BH25 (S7)	623724	4883965	244.59	3.16	241.94							3.67	241.43					3.56	241.54					4.39	240.71			3.97	241.13														
Wetland/Watercourse Monitors																																											
MMM11-1	624097	4884391	250.46																																								
MMM11-2A	624178	4884124	248.5																																								
MMM11-2B	624172	4884030	250.0																																								
MMM11-3A	624704	4883739	257.6																																							1.61	256.87
MMM11-3B	624867	4883756	257.7																																								
MMM11-4	623862	4883157	243.4																																								
MMM11-5A	624690	4883207	259.3																																								
MMM11-5B	624801	4883230	263.9																																								
MMM11-6	624612	4884066	255.4																																								
MMM12-1	624332.5	4884749.2	255.75																																								
MMM12-2	623700.2	4883879.7	243.18																																								
MMM12-3	623677.8	4883747.0	243.14																																								
MMM12-4S	623669.3	4883503.8	241.41																																								
MMM12-4D	623667.9	4883497.0	241.46																																								
MMM12-5	623649.6	4883281.6	238.60																																								
MMM12-6	623608.8	4883117.8	234.53																																								
BH-651	623587.2	4883126.0	233.06																																								
Surface Water Monitors																																											
SWM-1	624647	4885063	261.1																																								
SWM-2	625147	4882591	260.2																																								
SWM-3	623898	4884212	243.5																																								
SWM -3 Revised	623899.8	4884210.6	244.74																																								
Private Wells	Ground elevations for private wells obtain																																										
1442 Mt. Albert Rd.	624511	4884816	259.0																																								
1432 Mt. Albert Rd.	624484	4884799	258.5																											1.49	257.49												
1037 Mt. Albert Rd.	623606	4884399	260.0																																								
1029 Mt. Albert Rd.	623589	4884386	259.0																																								
1008 Mt. Albert Rd.	623488	4884466	258.0																													45.26	213.02										
19384 Leslie St.	624456	4885478	275.0																																								
18846 Leslie St.	624836	4883986	259.0																																					2.13	256.99		
14 Sharon Blvd.	624858	4884790	266.0																																								
28 Sharon Blvd.	625067	4884855	267.0																																								
30 Sharon Blvd.	625110	4884862	267.0																																								
34 Farr Ave.	625163	4884999	264.0																																								
8 May Ave.	624738	4884996	263.0																																								
28 May Ave.	624957	4885087	263.0																																								

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Indicates the monitor is lost, destroyed or decommissioned

Table SWL-1: Groundwater Level Monitoring

Well ID	Location Easting m	Location Northing m	Ground Elevation masl	Water Level 13-Dec-11 mbtop	13-Dec-11 masl	Water Level 14-Dec-11 mbtop	14-Dec-11 masl	Water Level 15-Dec-11 mbtop	15-Dec-11 masl	Water Level 18-Jan-12 mbtop	18-Jan-12 masl	Water Level 22-Mar-12 mbtop	22-Mar-12 masl	Water Level 2-Apr-12 mbtop	2-Apr-12 masl	Water Level 3-Apr-12 mbtop	3-Apr-12 masl	Water Level 4-Apr-12 mbtop	4-Apr-12 masl	Water Level 5-Apr-12 mbtop	5-Apr-12 masl	Water Level 9-Apr-12 mbtop	9-Apr-12 masl	Water Level 17-Apr-12 mbtop	17-Apr-12 masl	Water Level 18-Apr-12 mbtop	18-Apr-12 masl	Water Level 19-Apr-12 mbtop	19-Apr-12 masl	Water Level 20-Apr-12 mbtop	20-Apr-12 masl	Water Level 3-May-12 mbtop	3-May-12 masl	Water Level 10-May-12 mbtop	10-May-12 masl	Water Level 11-May-12 mbtop	11-May-12 masl	Water Level 15-May-12 mbtop	15-May-12 masl	Water Level 23-May-12 mbtop	23-May-12 masl
P-1: CU																																								
CU-1	624479	4885085	262.0																			1.47	261.47																		
CU-2	624289	4885066	260.25																																						
CU-5S	624279	4884798	257.0																			2.53	255.50	2.74	255.29																
MW-1	624404	4884755	255.7																																						
MW-2	624605	4884998	261.2																																						
MW-3	624545	4884792	260.5																																						
DO-4 (new stick-up)	624043	4884380	250.12									0.03	251.11					0.02	251.12			0.03	251.11																		
COR-1	624686	4884636	261.0																																						
COR-2 - old	624464	4884690	257.5																																						
COR-2	624464	4884690	257.5																																						
COR-3	624414	4884519	256.8																																						
COR-4	624245	4884552	254.0																																						
CO-1	624219	4882835	247.5																																						
CO-2	624271	4882535	244.5																																						
CO-3	624325	4882414																																						
CO-4	624406	4882218																																						
N 1	623823	4882598	231.75																																						
N 2	624833	4882900	264.0																																						
M1-S (NO CASING)	624341	4882521	247.0																																						
M 1-D	624324	4882487	248.6																																						
M 2	624866	4882708	262.9																																						
M 3	625112	4882557	262.5																																						
M 4	624835	4882494	261.3																																						
M 5	624474	4882178	251.0																																						
M 6	623898	4882394	240.0																																						
M 7	624381	4882422	246.0																																						
SW 1	624187	4882291	241.0																																						
TR-BH101	624664	4885055	261.80																			1.43	261.07	1.43	261.07															1.60	260.90
TR-BH201-S	624649	4885097	261.97																			1.63	261.20																		
TR-BH201-D	624649	4885095	262.0																			1.59	261.28																		
Tributaries 3 and 4																																									
T3-7SW	624116	4884470	249.97																																						
T3-7A (shallow)	624117	4884467	250.52									1.25	250.18																					1.25	250.18						
T3-7B (deep)	624115	4884464	250.56									0.50	251.00																					0.50	251.00						
T4-8SW	624475	4884726	255.99									1.44	255.98																												
T4-8A	624484	4884727	256.22																																						
T4-8B	624479	4884727	256.09																																						
Spine Services																																								
BH S1	624580	4885065	260.5																			0.92	260.43	1.00	260.35																
BH-S2	624401	4884833	256.6																			0.72	256.61	0.79	256.54																
DO-BH24 (S4)	624127	4884489	251.47									1.52	250.83											1.59	250.76									1.52	250.83					1.74	250.61
DO-BH27 (S5)	623907	4884227	247.09									1.94	246.02											2.12	245.84									1.96	246.00					2.19	245.77
DO-BH25 (S7)	623724	4883965	244.59									3.25	241.85											3.66	241.44									3.35	241.75					3.73	241.37
Wetland/Watercourse Monitors																																								
MMM11-1	624097	4884391	250.46					0.96	250.38	1.27	250.06																							1.08	250.25					1.46	249.87
MMM11-2A	624178	4884124	248.5					0.88	248.42	1.12	248.18											1.19	248.11																	1.48	247.82
MMM11-2B	624172	4884030	250.0			2.07	248.71			1.99	248.79											2.16	248.62																	2.59	248.20
MMM11-3A	624704	4883739	257.6							2.03	256.45											2.26	256.22																	2.63	255.85
MMM11-3B	624867	4883756	257.7			2.77	255.70			4.08	254.39											4.14	254.33																	4.20	254.27
MMM11-4	623862	4883157	243.4	1.34	242.97																	1.82	242.49											1.78	242.53						
MMM11-5A	624690	4883207	259.3	1.02	259.03					0.91	259.14											1.26	258.79																		
MMM11-5B	624801	4883230	263.9			3.99	260.78			3.30	261.47											3.04	261.73																		
MMM11-6	624612	4884066	255.4					2.73	253.42													3.36	252.79																	3.46	252.69
MMM12-1	624332.5	4884749.2	255.75																					1.65	255.07																
MMM12-2	623700.2	4883879.7	243.18																																						
MMM12-3	623677.8	4883747.0	243.14																																						
MMM12-4S	623669.3	4883503.8	241.41															1.61	240.69					1.73	240.57	1.73	240.57							1.57	240.73						
MMM12-4D	623667.9	4883497.0	241.46															2.17	240.07							2.44	239.80							2.27	239.97						
MMM12-5	623649.6	4883281.6	238.60													1.14	238.32									1.91	237.55							1.81	237.66						
MMM12-6	623608.8	4883117.8	234.53											2.04	233.42											2.18	233.28			2.19	233.27			2.03	233.43						
BH-651	623587.2	4883126.0	233.06									1.40	232.55	1.43	232.52																			1.43	232.53						
Surface Water Monitors																																								
SWM-1	624647	4885063	261.1																			0.79	261.19																		
SWM-2	625147	4882591	260.2																																						
SWM-3	623898	4884212	243.5																																						
SWM -3 Revised	623899.8	4884210.6	244.74																																						
Private Wells	Ground elevations for private wells obtain																																								
1442 Mt. Albert Rd.	624511	4884816	259.0																																						
1432 Mt. Albert Rd.	624484	4884799	258.5																							2.49	256.49														
1037 Mt. Albert Rd.	623606	4884399	260.0																	3.36	256.34																				
1029 Mt. Albert Rd.	623589	4884386	259.0																																					3.70	255.55
1008 Mt. Albert Rd.	623488	4884466	258.0																																			42.76	215.52		
19384 Leslie St.	624456	4885478	275.0																																						
18846 Leslie St.	624836	4883986	259.0																																						
14 Sharon Blvd.	624858	4884790	266.0																																			1.38	264.68		
28 Sharon Blvd.	625067	4884855	267.0																																						
30 Sharon Blvd.	625110	4884862	267.0																													3.06	264.34								
34 Farr Ave.	625163	4884999	264.0																							2.13	262.01														
8 May Ave.	624738	4884996	263.0																									2.46	260.65												
28 May Ave.	624957	4885087	263.0																															1.79	261.46						

Notes:

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Table SWL-1: Groundwater Level Monitoring

Well ID	Location Easting m	Location Northing m	Ground Elevation masl	Water Level 24-May-12 mbtop	Water Level 24-May-12 masl	Water Level 30-May-12 mbtop	Water Level 30-May-12 masl	Water Level 25-Jun-12 mbtop	Water Level 25-Jun-12 masl	Water Level 26-Jun-12 mbtop	Water Level 26-Jun-12 masl	Water Level 4-Jul-12 mbtop	Water Level 4-Jul-12 masl	Water Level 5-Jul-12 mbtop	Water Level 5-Jul-12 masl	Water Level 16-Aug-12 mbtop	Water Level 16-Aug-12 masl	Water Level 22-Oct-12 mbtop	Water Level 22-Oct-12 masl	Water Level 24-Oct-12 mbtop	Water Level 24-Oct-12 masl	Water Level 16-Jan-13 mbtop	Water Level 16-Jan-13 masl	Water Level 18-Jan-13 mbtop	Water Level 18-Jan-13 masl	Water Level 11-Feb-13 mbtop	Water Level 11-Feb-13 masl	Water Level 15-Apr-13 mbtop	Water Level 15-Apr-13 masl	Water Level 16-Apr-13 mbtop	Water Level 16-Apr-13 masl	Water Level 15-Jul-13 mbtop	Water Level 15-Jul-13 masl	Water Level 16-Jul-13 mbtop	Water Level 16-Jul-13 masl	Water Level 22-Jul-13 mbtop	Water Level 22-Jul-13 masl	Water Level 23-Jul-13 mbtop	Water Level 23-Jul-13 masl	Water Level 26-Jul-13 mbtop	Water Level 26-Jul-13 masl
P-1: CU																																								
CU-1	624479	4885085	262.0																																						
CU-2	624289	4885066	260.25																																						
CU-5S	624279	4884798	257.0															3.46	254.57													2.36	255.67								
MW-1	624404	4884755	255.7																																						
MW-2	624605	4884998	261.2																																						
MW-3	624545	4884792	260.5																																						
DO-4 (new stick-up)	624043	4884380	250.12											0.42	250.72	0.55	250.59	0.23	250.91			0.28	250.86									0.00	251.19			0.03	251.16				
COR-1	624686	4884636	261.0															1.13	260.76																						
COR-2 - old	624464	4884690	257.5																																						
COR-2	624464	4884690	257.5											2.25	256.20			3.01	255.44			1.62	256.83																		
COR-3	624414	4884519	256.8															3.64	254.08																						
COR-4	624245	4884552	254.0											3.94	250.96			4.51	250.39			1.54	253.36									1.55	253.35								
CO-1	624219	4882835	247.5																																						
CO-2	624271	4882535	244.5																																						
CO-3	624325	4882414																																						
CO-4	624406	4882218																																						
N 1	623823	4882598	231.75																																						
N 2	624833	4882900	264.0																																						
M1-S (NO CASING)	624341	4882521	247.0																																						
M 1-D	624324	4882487	248.6																																						
M 2	624866	4882708	262.9																																						
M 3	625112	4882557	262.5																																						
M 4	624835	4882494	261.3																																						
M 5	624474	4882178	251.0																																						
M 6	623898	4882394	240.0																																						
M 7	624381	4882422	246.0																																						
SW 1	624187	4882291	241.0																																						
TR-BH101	624664	4885055	261.80											1.89	260.61			1.36	261.14			1.14	261.36									1.09	261.41	1.43	261.07						
TR-BH201-S	624649	4885097	261.97											1.96	260.87			1.23	261.60			1.19	261.64									1.23	261.60	1.53	261.30						
TR-BH201-D	624649	4885095	262.0											1.87	260.99			1.47	261.39			1.17	261.69									1.18	261.68	1.44	261.42						
Tributaries 3 and 4																																									
T3-7SW	624116	4884470	249.97											1.52	249.91							1.40	250.03					1.38	250.05							1.49	249.94				
T3-7A (shallow)	624117	4884467	250.52											1.57	249.86	1.34	250.09	1.31	250.12			1.24	250.19					1.25	250.18							1.40	250.03				
T3-7B (deep)	624115	4884464	250.56											1.14	250.36	0.97	250.53	0.85	250.65			Frozen at 0.26						0.42	251.08							0.76	250.74				
T4-8SW	624475	4884726	255.99											2.07	255.35																										
T4-8A	624484	4884727	256.22											2.74	254.25																										
T4-8B	624479	4884727	256.09											3.24	253.78																										
Spine Services																																									
BH S1	624580	4885065	260.5											1.58	259.77			0.91	260.44			Frozen at 0.57										0.67	260.68	CNL							
BH-S2	624401	4884833	256.6											1.57	255.76			0.75	256.58			0.57	256.76									0.57	256.76								
DO-BH24 (S4)	624127	4884489	251.47	1.72	250.63									2.18	250.17	1.72	250.63	1.61	250.74			1.52	250.83									1.50	250.85			1.79	250.56				
DO-BH27 (S5)	623907	4884227	247.09											2.46	245.50			3.26	244.70			1.82	246.14									1.82	246.14			2.11	245.85				
DO-BH25 (S7)	623724	4883965	244.59	3.75	241.35									4.30	240.80			5.43	239.67			3.24	241.86					3.15	241.95							3.61	241.49				
Wetland/Watercourse Monitors																																									
MMM11-1	624097	4884391	250.46											2.02	249.31	1.96	249.37	1.71	249.62			1.04	250.29									1.03	250.30								
MMM11-2A	624178	4884124	248.5													1.64	247.66	1.61	247.69							1.55	247.75	Well lost to construction activity												
MMM11-2B	624172	4884030	250.0													2.50	248.28	2.49	248.29							2.67	248.11	Well lost to construction activity												
MMM11-3A	624704	4883739	257.6															4.23	254.25							2.34	256.14									3.05	255.43				
MMM11-3B	624867	4883756	257.7															4.73	253.74					3.64	254.83	4.00	254.47									4.00	254.47				
MMM11-4	623862	4883157	243.4	2.06	242.25											2.88	241.43	2.49	241.82							2.38	241.93									2.29	242.02				
MMM11-5A	624690	4883207	259.3	1.57	258.48											2.39	257.66	1.69	258.36							1.73	258.32									1.32	258.73				
MMM11-5B	624801	4883230	263.9	3.34	261.43											4.67	260.11	4.31	260.46					3.27	261.50	3.57	261.20									3.73	261.04				
MMM11-6	624612	4884066	255.4															3.82	252.33					2.74	253.41											3.25	252.90				
MMM12-1	624332.5	4884749.2	255.75											2.33	254.39			1.42	255.30			1.07	255.65									1.03	255.69	1.55	255.17						
MMM12-2	623700.2	4883879.7	243.18											Y to 6.91 mbtop				4.35	239.71			2.99	241.07					2.98	241.08							3.14	240.92				
MMM12-3	623677.8	4883747.0	243.14											4.32			238.33	5.89	238.33			3.85	240.37					3.25	240.97							3.28	240.94				
MMM12-4S	623669.3	4883503.8	241.41									3.01	239.29					3.56	238.74			1.25	241.05					1.24	241.06												
MMM12-4D	623667.9	4883497.0	241.46									3.42	238.82					4.66	237.58			1.95	240.29					1.76	240.48												
MMM12-5	623649.6	4883281.6	238.60									3.24	236.22					4.51	234.95			1.75	237.71					1.72	237.74							2.23	237.23				
MMM12-6	623608.8	4883117.8	234.53									DRY to 2.96 mbtop						y to 2.90 mbtop				1.47	233.99					1.57	233.89							2.30	233.16				
BH-651	623587.2	4883126.0	233.06									3.38	230.57					3.40	230.55			1.30	232.65					1.27	232.68							1.91	232.04				
Surface Water Monitors																																									
SWM-1	624647	4885063	261.1															0.78	261.20													0.74	261.24	0.81	261.17						
SWM-2	625147	4882591	260.2															0.92	260.29																	0.94	260.27				
SWM-3	623898	4884212	243.5																													1.06	243.74			1.16	243.64				
SWM -3 Revised	623899.8	4884210.6	244.74																																						
Private Wells	Ground elevations for private wells obtain																																								
1442 Mt. Albert Rd.	624511	4884816	259.0			2.20	256.97	2.24	256.93					2.73	256.44	2.41	256.76			1.83	257.34			1.38	257.79							1.33	257.84					2.21	256.96				
1432 Mt. Albert Rd.	624484	4884799	258.5											3.60	255.38	4.80	254.18			3.02	255.96			CNO								1.69	257.29					2.72	256.26				
1037 Mt. Albert Rd.	623606	4884399	260.0																					No access																	
1029 Mt. Albert Rd.	623589	4884386	259.0					3.31	255.94					3.81	255.44	4.48	254.77			4.81	254.44			CNO								1.57	257.68							2.59	256.66		
1008 Mt. Albert Rd.	623488	4884466	258.0	46.75	211.53									47.58	210.70	48.56	209.72			43.74	214.54			32.02	226.26							30.41	227.87					30.68	227.60				
19384 Leslie St.	624456	4885478	275.0	5.57	270.14									5.91	269.80	6.11	269.60			6.20	269.51			5.44	270.27							5.21	270.50					5.79	269.92				
18846 Leslie St.	624836	4883986	259.0											3.70	255.42	4.88	254.24																								
14 Sharon Blvd.	624858	4884790	266.0											1.84	264.22	1.52	264.54			1.36	264.7			1.18	264.88							1.07	264.99					1.72	264.34				
28 Sharon Blvd.	625067	4884855	267.0			3.53	263.55							4.3	262.78	4.71	262.37			4.29	262.79			2.48	264.6							2.08	265					2.33	264.75				
30 Sharon Blvd.	625110	4884862	267.0											5.41	261.99	4.97	262.43			4.27	263.13			2.46	264.94							2.21	265.19					2.41	264.99				
34 Farr Ave.	625163	4884999	264.0											2.78	261.36	3.09	261.05			2.60	261.54			1.29	262.85							1.17	262.97					1.68	262.46				
8 May Ave.	624738	4884996	263.0							2.55	260.56			2.63	260.48	2.61	260.5			2.54	260.57			2.36	260.75							2.28	260.83					2.54	260.57				
28 May Ave.	624957	4885087	263.0											2.18	261.07	2.03	261.22			1.68	261.57			CNO								1.73	261.52					1.92	261.33				

Notes:

CNL = Could not Locate

CNO = Could not Open

SWL is within 0.3 m of ground surface

SWL is above ground surface

Monitor is frozen - value indicates depth to ice

Indicates the monitor is lost, destroyed or decommissioned

Table SWL-1: Groundwater Level Monitoring

Well ID	Location Easting m	Location Northing m	Ground Elevation masl	Water Level 16-Oct-13 mbtop	16-Oct-13 masl	Water Level 17-Oct-13 mbtop	17-Oct-13 masl	Water Level 10-Feb-14 mbtop	10-Feb-14 masl	Water Level 11-Feb-14 mbtop	11-Feb-14 masl	Water Level 12-Feb-14 mbtop	12-Feb-14 masl	Water Level 13-Mar-14 mbtop	13-Mar-14 masl	Water Level 17-Jun-14 mbtop	17-Jun-14 masl	Water Level 27-Jun-14 mbtop	27-Jun-14 masl	Water Level 4-Jul-14 mbtop	4-Jul-14 masl	Water Level 16-Jul-14 mbtop	16-Jul-14 masl	Water Level 19-Sep-14 mbtop	19-Sep-14 masl	Water Level 7-Oct-14 mbtop	7-Oct-14 masl	Water Level 8-Oct-14 mbtop	8-Oct-14 masl	Water Level 9-Oct-14 mbtop	9-Oct-14 masl	Water Level 12-Mar-15 mbtop	12-Mar-15 masl	Water Level 23-Jun-15 mbtop	23-Jun-15 masl	Water Level 24-Jun-15 mbtop	24-Jun-15 masl	Water Level 8-Oct-15 mbtop	8-Oct-15 masl	Water Level 9-Oct-15 mbtop	9-Oct-15 masl
P-1: CU																																								
CU-1	624479	4885085	262.0							Decomissioned																															
CU-2	624289	4885066	260.25							Decomissioned																															
CU-5S	624279	4884798	257.0	2.95	255.08			3.11	254.92	Decomissioned																															
MW-1	624404	4884755	255.7																																						
MW-2	624605	4884998	261.2																																						
MW-3	624545	4884792	260.5																																						
DO-4 (new stick-up)	624043	4884380	250.12			0.02	251.17			CNO								0.03	251.16			0.15	251.04	Decomissioned																	
COR-1	624686	4884636	261.0													Well ID'd for Decom																									
COR-2 - old	624464	4884690	257.5																																						
COR-2	624464	4884690	257.5							2.57	255.88					Well ID'd for Decom																									
COR-3	624414	4884519	256.8													Well ID'd for Decom																									
COR-4	624245	4884552	254.0							3.44	251.46					Well ID'd for Decom																									
CO-1	624219	4882835	247.5																																						
CO-2	624271	4882535	244.5																																						
CO-3	624325	4882414																																							
CO-4	624406	4882218																																							
N 1	623823	4882598	231.75																																						
N 2	624833	4882900	264.0																																						
M1-S (NO CASING)	624341	4882521	247.0																																						
M 1-D	624324	4882487	248.6																																						
M 2	624866	4882708	262.9																																						
M 3	625112	4882557	262.5																																						
M 4	624835	4882494	261.3																																						
M 5	624474	4882178	251.0																																						
M 6	623898	4882394	240.0																																						
M 7	624381	4882422	246.0																																						
SW 1	624187	4882291	241.0																																						
TR-BH101	624664	4885055	261.80	1.34	261.16			1.56	260.94											1.66	260.84	1.62	260.88	1.52	260.98	1.44	261.06	1.44	261.06			1.39	261.11	1.38	261.12						
TR-BH201-S	624649	4885097	261.97	1.25	261.58			1.48	261.35															1.46	261.37	1.34	261.49							1.55	261.28					1.66	261.17
TR-BH201-D	624649	4885095	262.0	1.26	261.60			1.53	261.33															1.66	261.20	1.42	261.44							1.48	261.38					1.77	261.09
Tributaries 3 and 4																																									
T3-7SW	624116	4884470	249.97							frozen														1.43	250.00			1.41	250.02					1.31	250.12			1.50	249.93		
T3-7A (shallow)	624117	4884467	250.52			1.32	250.11			1.35	250.08													1.43	250.00			1.41	250.02					1.25	250.18			1.60	249.83		
T3-7B (deep)	624115	4884464	250.56			0.70	250.80			frozen														0.90	250.60			0.82	250.68					0.82	250.68			1.45	250.05		
T4-8SW	624475	4884726	255.99																																						
T4-8A	624484	4884727	256.22																																						
T4-8B	624479	4884727	256.09																																						
Spine Services																																								
BH S1	624580	4885065	260.5	0.78	-0.78			CNO						CNO						1.15	260.20	1.08	260.27	0.92	260.43	0.81	260.54							0.82	260.53			1.27	260.08		
BH-S2	624401	4884833	256.6	0.68	-0.68			CNO						CNO						0.90	256.43	0.88	256.45	0.80	256.53	0.73	256.60							0.68	256.65			0.93	256.40		
DO-BH24 (S4)	624127	4884489	251.47			1.56	250.79			1.58	250.77			1.31	251.04			1.65	250.70					1.60	250.75			1.55	250.80	1.55	250.80			1.47	250.88			1.63	250.72		
DO-BH27 (S5)	623907	4884227	247.09			1.85	246.11			2.02	245.94							2.23	245.73			2.29	245.67	2.23	245.73			2.16	245.80			Destroyed									
DO-BH25 (S7)	623724	4883965	244.59			3.90	241.20			4.03	241.07							3.64	241.46			3.94	241.16	3.89	241.21			3.76	241.34					3.31	241.79			4.50	240.60		
Wetland/Watercourse Monitors																																								
MMM11-1	624097	4884391	250.46			1.38	249.95			1.71	249.62											1.52	249.81					1.56	249.77			1.37	249.96	1.00	250.33			1.85	249.48		
MMM11-2A	624178	4884124	248.5																																						
MMM11-2B	624172	4884030	250.0																																						
MMM11-3A	624704	4883739	257.6	3.35	255.13							Well lost to construction activity																													
MMM11-3B	624867	4883756	257.7	4.16	254.31							4.25	254.22																	4.07	254.40	4.21	254.26	Destroyed					
MMM11-4	623862	4883157	243.4			2.12	242.19			2.55	241.76							2.60	241.71									2.50	241.81			2.76	241.55	2.89	241.42			3.18	241.13		
MMM11-5A	624690	4883207	259.3			1.19	258.86					1.80	258.25	0.98	259.07			1.54	258.51			to be decommissioned								1.67	258.38	2.23	257.82	1.00	259.05			2.00	258.05		
MMM11-5B	624801	4883230	263.9			4.20	260.57							3.92	260.85			3.67	261.10			3.92	260.85							3.86	260.91	4.45	260.32			3.86	260.91	5.09	259.68
MMM11-6	624612	4884066	255.4	3.28	252.87							3.66	252.49									to be decommissioned										Destroyed									
MMM12-1	624332.5	4884749.2	255.75	1.25	255.47			1.37	255.35									1.49	255.23			1.79	254.93	1.88	254.84	1.70	255.02							1.38	255.34			2.12	254.60		
MMM12-2	623700.2	4883879.7	243.18			3.05	241.01			3.18	240.88							3.14	240.92			3.35	240.71	3.18	240.88			3.17	240.89			Destroyed									
MMM12-3	623677.8	4883747.0	243.14			4.15	240.07			4.41	239.81							3.57	240.65			3.91	240.31	4.43	239.79			4.54	239.68			Destroyed									
MMM12-4S	623669.3	4883503.8	241.41			1.82	240.48			2.01	240.29							2.17	240.13			2.63	239.67	2.51	239.79			2.56	239.74					Destroyed							
MMM12-4D	623667.9	4883497.0	241.46			2.63	239.61			2.80	239.44							2.83	239.41			3.23	239.01	3.13	239.11			3.13	239.11					Destroyed							
MMM12-5	623649.6	4883281.6	238.60			2.21	237.25			2.12	237.34							2.53	236.93					NM				3.24	236.22			Destroyed									
MMM12-6	623608.8	4883117.8	234.53			2.03	233.43			2.61	232.85							2.30	233.16					dry				dry						Destroyed							
BH-651	623587.2	4883126.0	233.06			1.79	232.16																	2.74	231.21			2.98	230.97					Destroyed							
Surface Water Monitors																																								
SWM-1	624647	4885063	261.1	0.79	261.19			0.82	261.16											0.82	261.16			0.80	261.18	0.78	261.20					0.59	261.39	0.72	261.26					0.91	261.07
SWM-2	625147	4882591	260.2			0.90	260.31															0.92	260.29					0.89	260.32			0.48	260.73	1.09	260.12			1.02	260.19		
SWM-3	623898	4884212	243.5							CNL												1.02	243.78																		
SWM -3 Revised	623899.8	4884210.6	244.74																											0.95	245.27	NM		NM				NM			
Private Wells	Ground elevations for private wells obtain																																								
1442 Mt. Albert Rd.	624511	4884816	259.0	1.61	257.56									1.77	257.40					2.28	256.89									1.69	257.48					1.35	257.82			3.25	255.92
1432 Mt. Albert Rd.	624484	4884799	258.5	2.35	256.63							No access		2.15	256.83					2.77	256.21									2.17	256.81					1.78	257.20			5.55	253.43
1037 Mt. Albert Rd.	623606	4884399	260.0																																			NM					
1029 Mt. Albert Rd.	623589	4884386	259.0	2.62	256.63							CNO		CNO						4.14	255.11							3.04	256.21									2.24	257.01			NM	
1008 Mt. Albert Rd.	623488	4884466	258.0	35.37	222.91							CNO										> 50 m	< 208 masl		< 208 masl		< 208 masl		< 208 masl									NM				NM	
19384 Leslie St.	624456	4885478	275.0	5.60	270.11							5.53	270.18									5.42	270.29							5.39	270.32							5.46	270.25			5.60	270.11
18846 Leslie St.	624836	4883986	259.0																																								
14 Sharon Blvd.	624858	4884790	266.0	1.29	264.77							CNO										1.49	264.57																	1.74	264.32			1.57	264.49
28 Sharon Blvd.	625067	4884855	267.0	2.93	264.15							CNO										3.33	263.75																	2.36	264.72			4.06	263.02
30 Sharon Blvd.	625110	4884862	267.0	3	264.40							2.37	265.03									3.58	263.82																	2.51	264.89			4.19	263.21
34 Farr Ave.	625163	4884999	264.0	2.32	261.82							1.42	262.72									2.45	261.69																	1.37	262.77			3.07	261.07
8 May Ave.	624738	4884996	263.0	2.47	260.64									CNO						2.55	260.56																	2.36	260.75			2.7	260.41
28 May Ave.	624957	4885087	263.0									CNO										1.84	261.41																	NM				NM	

Notes:

CNL = Could not Locate

CNO = Could not Open

SWL is within 0.3 m of ground surface

SWL is above ground surface

Monitor is frozen - value indicates depth to ice

Indicates the monitor is lost, destroyed or decommissioned

Table SWL-1: Groundwater Level Monitoring

Well ID	Location		Ground	Water Level		Water Level		Water Level		Water Level		Water Level		Water Level		Water Level		Water Level		Water Level		Water Level		Water Level		Water Level		Water Level		Water Level		Water Level	
	Easting	Northing	Elevation	12-Apr-16		13-Apr-16		14-Apr-16		19-May-16		23-Aug-16		27-Oct-16		31-Oct-16		16-Feb-17		10-Apr-17		18-Apr-17		2-Aug-17		25-Sep-17		26-Sep-17		2-Oct-17		6-Oct-17		10-Oct-17		11-Oct-17		31-Oct-17	
	m	m	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl
P-1: CU																																					
CU-1	624479	4885085	262.0																																		
CU-2	624289	4885066	260.25																																		
CU-5S	624279	4884798	257.0																																		
MW-1	624404	4884755	255.7																							2.28	254.34	2.37	254.25	2.33	254.29	2.26	254.36	2.32	254.30	1.77	254.85
MW-2	624605	4884998	261.2																							7.01	254.86	1.77	260.10	1.72	260.15	1.57	260.30	1.59	260.28	1.41	260.46
MW-3	624545	4884792	260.5																							dry		4.47	256.91	4.47	256.91	3.50	257.88	3.80	257.58	3.15	258.23
DO-4 (new stick-up)	624043	4884380	250.12																																		
COR-1	624686	4884636	261.0																																		
COR-2 - old	624464	4884690	257.5																																		
COR-2	624464	4884690	257.5																																		
COR-3	624414	4884519	256.8																																		
COR-4	624245	4884552	254.0																																		
CO-1	624219	4882835	247.5																																		
CO-2	624271	4882535	244.5																																		
CO-3	624325	4882414																																			
CO-4	624406	4882218																																			
N 1	623823	4882598	231.75																																		
N 2	624833	4882900	264.0																																		
M1-S (NO CASING)	624341	4882521	247.0																																		
M 1-D	624324	4882487	248.6																																		
M 2	624866	4882708	262.9																																		
M 3	625112	4882557	262.5																																		
M 4	624835	4882494	261.3																																		
M 5	624474	4882178	251.0																																		
M 6	623898	4882394	240.0																																		
M 7	624381	4882422	246.0																																		
SW 1	624187	4882291	241.0																																		
TR-BH101	624664	4885055	261.80			1.56	260.94			1.69	260.81	1.96	260.54	1.82	260.68			FROZEN		1.31	261.19			1.77	260.73	1.78	260.72										
TR-BH201-S	624649	4885097	261.97			1.61	261.22					1.66	261.17	1.61	261.22			1.40	261.43	1.11	261.72			1.48	261.35	1.46	261.37										
TR-BH201-D	624649	4885095	262.0			1.47	261.39					1.93	260.93	1.92	260.94			1.48	261.38	1.15	261.71			1.60	261.26	1.62	261.24										
Tributaries 3 and 4																																					
T3-7SW	624116	4884470	249.97			1.33	250.10					destroyed																									
T3-7A (shallow)	624117	4884467	250.52			1.35	250.08					1.37	250.06	1.15	250.28			FROZEN		1.14	250.29			1.30	250.13												
T3-7B (deep)	624115	4884464	250.56			0.72	250.78					1.04	250.46	0.99	250.51			FROZEN		0.69	250.81			0.93	250.57												
T4-8SW	624475	4884726	255.99																																		
T4-8A	624484	4884727	256.22																																		
T4-8B	624479	4884727	256.09																																		
Spine Services																																					
BH S1	624580	4885065	260.5			NM				0.89	260.46	1.56	259.79	CNL				FROZEN		0.63	260.72			0.86	260.49	1.35	260.00										
BH-S2	624401	4884833	256.6			0.64	256.69			0.73	256.60	CNL		1.45	255.88			CNL		0.70	256.63			CNL		CNL											
DO-BH24 (S4)	624127	4884489	251.47			1.48	250.87			1.53	250.82	1.60	250.75	1.55	250.80			1.52	250.83	1.46	250.89			1.57	250.78												
DO-BH27 (S5)	623907	4884227	247.09																																		
DO-BH25 (S7)	623724	4883965	244.59			3.20	241.90			3.47	241.63	4.42	240.68	4.57	240.53			4.00	241.10	3.14	241.96			3.73	241.37												
Wetland/Watercourse Monitors																																					
MMM11-1	624097	4884391	250.46			1.35	249.98					1.41	249.92	1.61	249.72			1.39	249.94	1.16	250.17			1.37	249.96												
MMM11-2A	624178	4884124	248.5																																		
MMM11-2B	624172	4884030	250.0																																		
MMM11-3A	624704	4883739	257.6																																		
MMM11-3B	624867	4883756	257.7																																		
MMM11-4	623862	4883157	243.4			2.02	242.29					6.07	238.24	3.14	241.17			2.19	242.12	1.51	242.80			2.06	242.25												
MMM11-5A	624690	4883207	259.3			1.07	258.98							2.19	257.86			1.60	258.45	0.94	259.11																
MMM11-5B	624801	4883230	263.9					3.36	261.41							6.00	258.77	4.56	260.21	3.51	261.26																
MMM11-6	624612	4884066	255.4																																		
MMM12-1	624332.5	4884749.2	255.75			1.39	255.33			1.64	255.08	3.25	253.47	2.82	253.90			1.69	255.03	1.29	255.43			2.04	254.68	2.24	254.48										
MMM12-2	623700.2	4883879.7	243.18																																		
MMM12-3	623677.8	4883747.0	243.14																																		
MMM12-4S	623669.3	4883503.8	241.41																																		
MMM12-4D	623667.9	4883497.0	241.46																																		
MMM12-5	623649.6	4883281.6	238.60																																		
MMM12-6	623608.8	4883117.8	234.53																																		
BH-651	623587.2	4883126.0	233.06																																		
Surface Water Monitors																																					
SWM-1	624647	4885063	261.1			0.92	261.06					CNL		0.98	261.00			0.93	261.05	0.89	261.09																
SWM-2	625147	4882591	260.2			0.96	260.25					DRY		1.01	260.20			FROZEN		0.91	260.30																
SWM-3	623898	4884212	243.5																																		
SWM -3 Revised	623899.8	4884210.6	244.74			NM						0.83	245.39	0.78	245.44			FROZEN		0.54	245.68																
Private Wells	Ground elevations for private wells obtain																																				
1442 Mt. Albert Rd.	624511	4884816	259.0			1.39	257.78					NM				5.02	254.15	4.89	254.28			1.33	257.84	3.68	255.49												
1432 Mt. Albert Rd.	624484	4884799	258.5			1.80	257.18					NM				7.40	251.58	NM				1.81	257.17	4.30	254.68										
1037 Mt. Albert Rd.	623606	4884399	260.0																																		
1029 Mt. Albert Rd.	623589	4884386	259.0			1.68	257.57									6.55	252.70					NM		NM													
1008 Mt. Albert Rd.	623488	4884466	258.0	NM								NM						NM				NM		NM													
19384 Leslie St.	624456	4885478	275.0			4.84	270.87					5.01	270.70			6.36	269.35	5.82	269.89			NM		5.32	270.39												
18846 Leslie St.	624836	4883986	259.0	NM														NM																			
14 Sharon Blvd.	624858	4884790	266.0	1.42	264.64							1.58	264.48			2.35	263.71	NM				1.13	264.93	1.88	264.18												
28 Sharon Blvd.	625067	4884855	267.0	3.89	263.19							4.16	262.92			5.77	261.31	NM				2.01	265.07	3.45	263.63												
30 Sharon Blvd.	625110	4884862	267.0	3.72	263.68							3.84	263.56			5.89	261.51	5.41	261.99			2.11	265.29	4.24	263.16												
34 Farr Ave.	625163	4884999	264.0	2.83	261.31							2.96	261.18			4.69	259.45	4.32	259.82			1.27	262.87	1.99	262.15												
8 May Ave.	624738	4884996	263.0			2.32	260.79					NM				4.33	258.78	4.24	258.87			2.17	260.94	3.54	259.57												
28 May Ave.	624957	4885087	263.0	NM								NM																									

Notes:

CNL = Could not Locate

CNO = Could not Open

SWL is within 0.3 m of ground surface

SWL is above ground surface

Monitor is frozen - value indicates depth to ice

Indicates the monitor is lost, destroyed or decommissioned

Table SWL-1: Groundwater Level Monitoring

Well ID	Location		Ground	Water Level		Water Level		Water Level		Water Level		Water Level		Water Level	
	Easting	Northing	Elevation	14-Feb-18		8-May-18		20-Jun-18		9-Nov-18		8-Feb-19		22-Dec-21	
	m	m	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl
P-1: CU															
CU-1	624479	4885085	262.0												
CU-2	624289	4885066	260.25												
CU-5S	624279	4884798	257.0												
MW-1	624404	4884755	255.7	1.46	255.16	1.27	255.35	1.92	254.70	1.43	255.19	1.56	255.06	Damaged	
MW-2	624605	4884998	261.2	1.39	260.48	1.21	260.66	1.71	260.16	1.19	260.68	1.55	260.32	1.44	260.43
MW-3	624545	4884792	260.5	2.68	258.70	2.05	259.33	3.26	258.12	2.37	259.01	2.75	258.63	CNL	
DO-4 (new stick-up)	624043	4884380	250.12												
COR-1	624686	4884636	261.0												
COR-2 - old	624464	4884690	257.5												
COR-2	624464	4884690	257.5												
COR-3	624414	4884519	256.8												
COR-4	624245	4884552	254.0												
CO-1	624219	4882835	247.5												
CO-2	624271	4882535	244.5												
CO-3	624325	4882414													
CO-4	624406	4882218													
N 1	623823	4882598	231.75												
N 2	624833	4882900	264.0												
M1-S (NO CASING)	624341	4882521	247.0												
M 1-D	624324	4882487	248.6												
M 2	624866	4882708	262.9												
M 3	625112	4882557	262.5												
M 4	624835	4882494	261.3												
M 5	624474	4882178	251.0												
M 6	623898	4882394	240.0												
M 7	624381	4882422	246.0												
SW 1	624187	4882291	241.0												
TR-BH101	624664	4885055	261.80	0.99	261.51	1.54	260.96	1.76	260.74	1.42	261.08	1.57	260.93	1.54	260.96
TR-BH201-S	624649	4885097	261.97	1.32	261.51	1.28	261.55	1.43	261.40	1.20	261.63	1.12	261.71	CNL	
TR-BH201-D	624649	4885095	262.0	1.42	261.44	1.31	261.55	1.59	261.27	1.26	261.60	1.30	261.56	CNL	
Tributaries 3 and 4															
T3-7SW	624116	4884470	249.97												
T3-7A (shallow)	624117	4884467	250.52	0.90	250.53										
T3-7B (deep)	624115	4884464	250.56	0.72	250.78										
T4-8SW	624475	4884726	255.99												
T4-8A	624484	4884727	256.22												
T4-8B	624479	4884727	256.09												
Spine Services															
BH S1	624580	4885065	260.5	0.99	260.36	0.67	260.68	1.22	260.13	CNL		CNL		CNL	
BH-S2	624401	4884833	256.6			0.81	256.52			0.80	256.53	1.07	256.26	1.70	255.63
DO-BH24 (S4)	624127	4884489	251.47	1.53	250.82										
DO-BH27 (S5)	623907	4884227	247.09												
DO-BH25 (S7)	623724	4883965	244.59												
Wetland/Watercourse Monitors															
MMM11-1	624097	4884391	250.46	1.38	249.95										
MMM11-2A	624178	4884124	248.5												
MMM11-2B	624172	4884030	250.0												
MMM11-3A	624704	4883739	257.6												
MMM11-3B	624867	4883756	257.7												
MMM11-4	623862	4883157	243.4												
MMM11-5A	624690	4883207	259.3												
MMM11-5B	624801	4883230	263.9												
MMM11-6	624612	4884066	255.4												
MMM12-1	624332.5	4884749.2	255.75	1.61	255.11	1.43	255.29	1.94	254.78	NM		1.78	254.94	1.39	255.33
MMM12-2	623700.2	4883879.7	243.18												
MMM12-3	623677.8	4883747.0	243.14												
MMM12-4S	623669.3	4883503.8	241.41												
MMM12-4D	623667.9	4883497.0	241.46												
MMM12-5	623649.6	4883281.6	238.60												
MMM12-6	623608.8	4883117.8	234.53												
BH-651	623587.2	4883126.0	233.06												
Surface Water Monitors															
SWM-1	624647	4885063	261.1					0.83	261.15					0.78	261.20
SWM-2	625147	4882591	260.2												
SWM-3	623898	4884212	243.5												
SWM -3 Revised	623899.8	4884210.6	244.74												
Private Wells	Ground elevations for private wells obtain														
1442 Mt. Albert Rd.	624511	4884816	259.0												
1432 Mt. Albert Rd.	624484	4884799	258.5												
1037 Mt. Albert Rd.	623606	4884399	260.0												
1029 Mt. Albert Rd.	623589	4884386	259.0												
1008 Mt. Albert Rd.	623488	4884466	258.0												
19384 Leslie St.	624456	4885478	275.0												
18846 Leslie St.	624836	4883986	259.0												
14 Sharon Blvd.	624858	4884790	266.0												
28 Sharon Blvd.	625067	4884855	267.0												
30 Sharon Blvd.	625110	4884862	267.0												
34 Farr Ave.	625163	4884999	264.0												
8 May Ave.	624738	4884996	263.0												
28 May Ave.	624957	4885087	263.0												

Notes:

CNL = Could not Locate

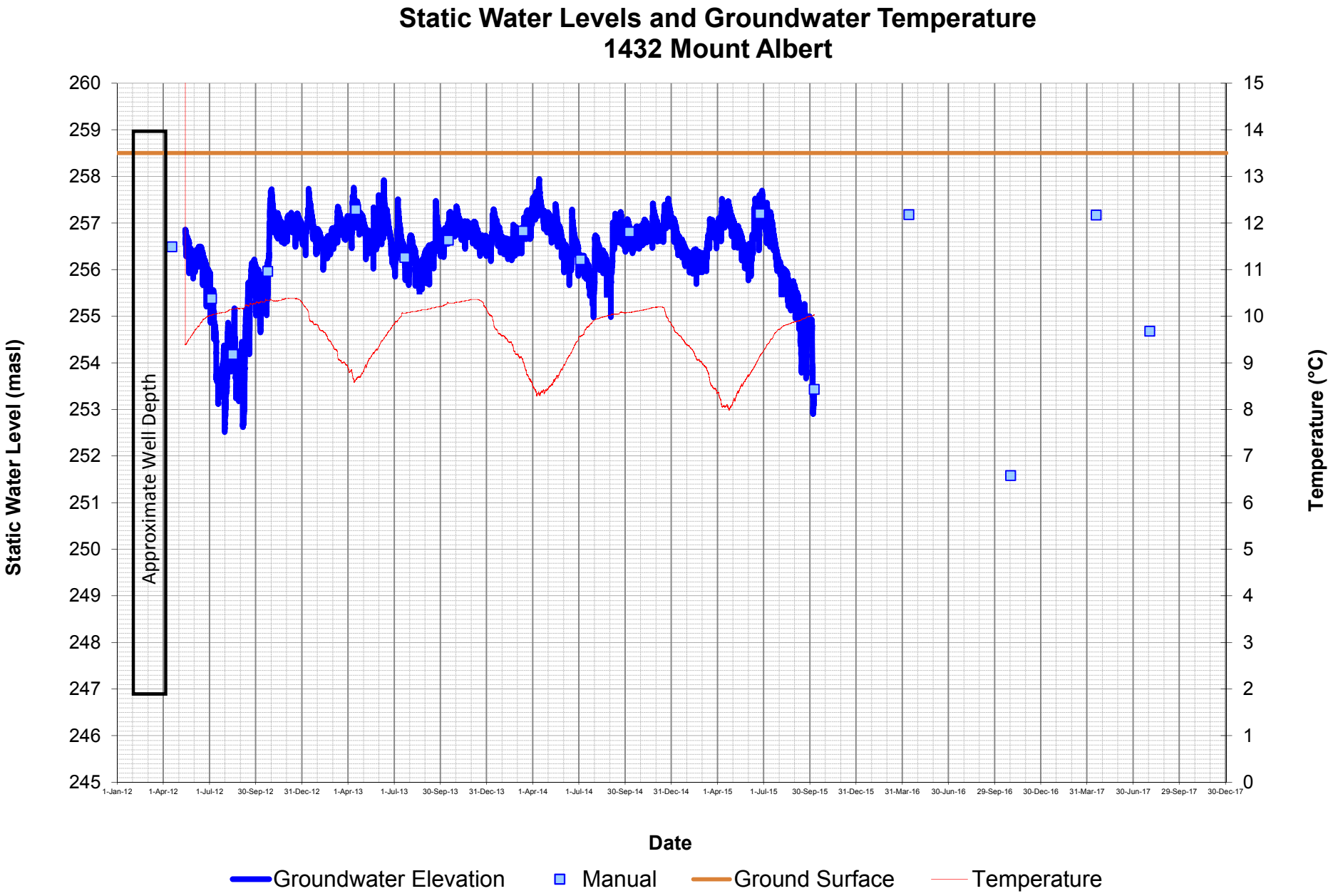
CNO = Could not Open

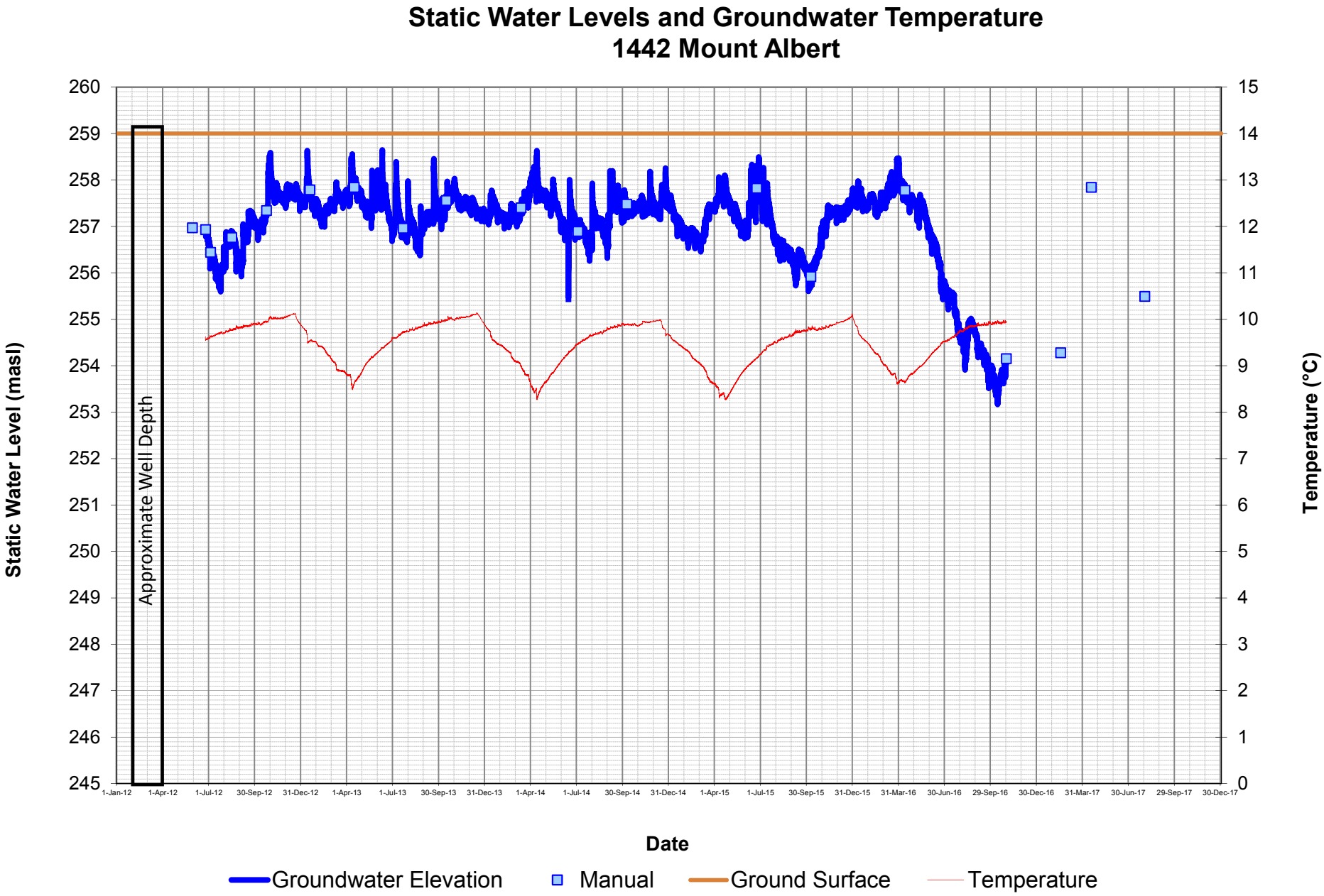
SWL is within 0.3 m of ground surface

SWL is above ground surface

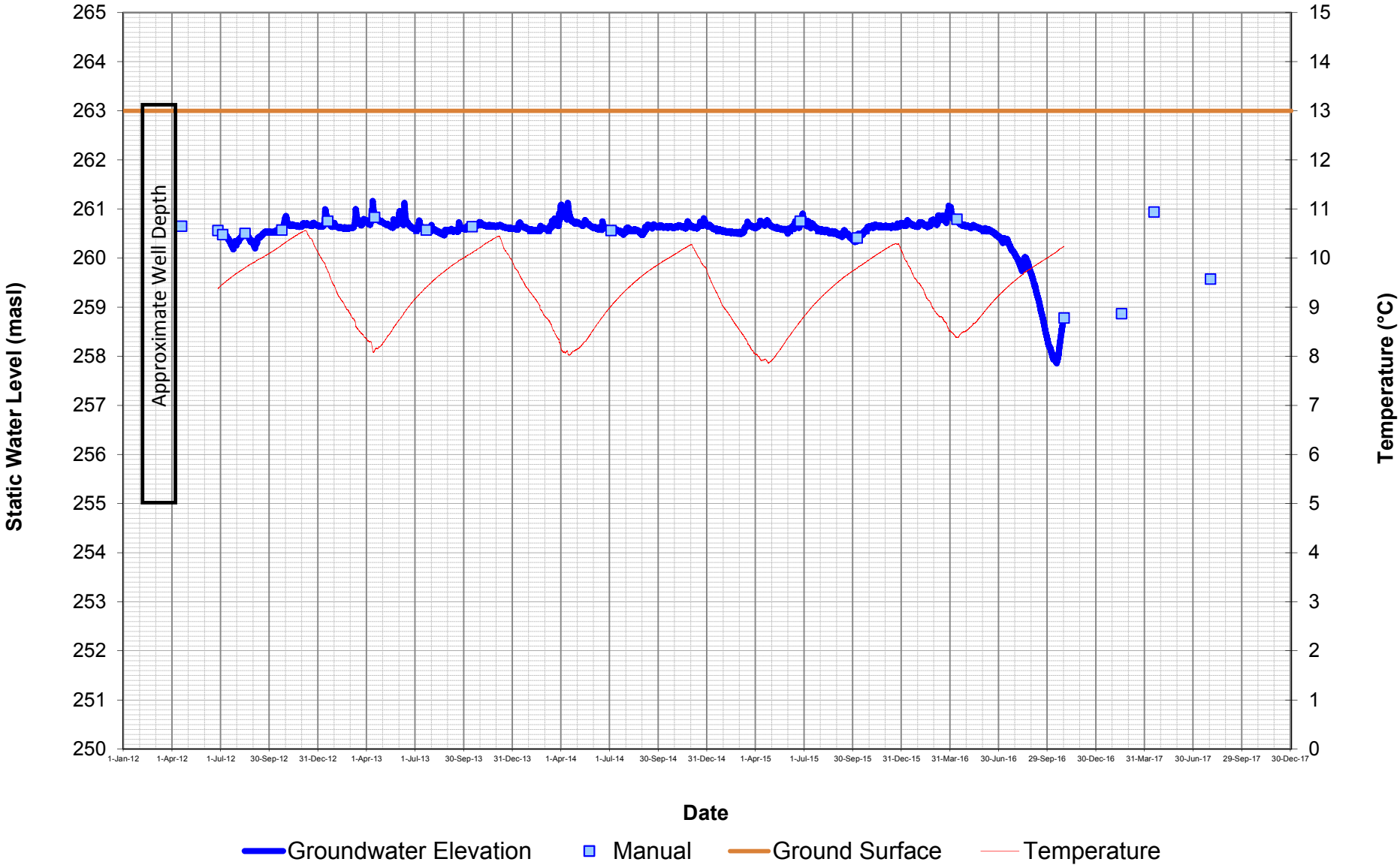
Monitor is frozen - value indicates depth to ice

Indicates the monitor is lost, destroyed or decommissioned

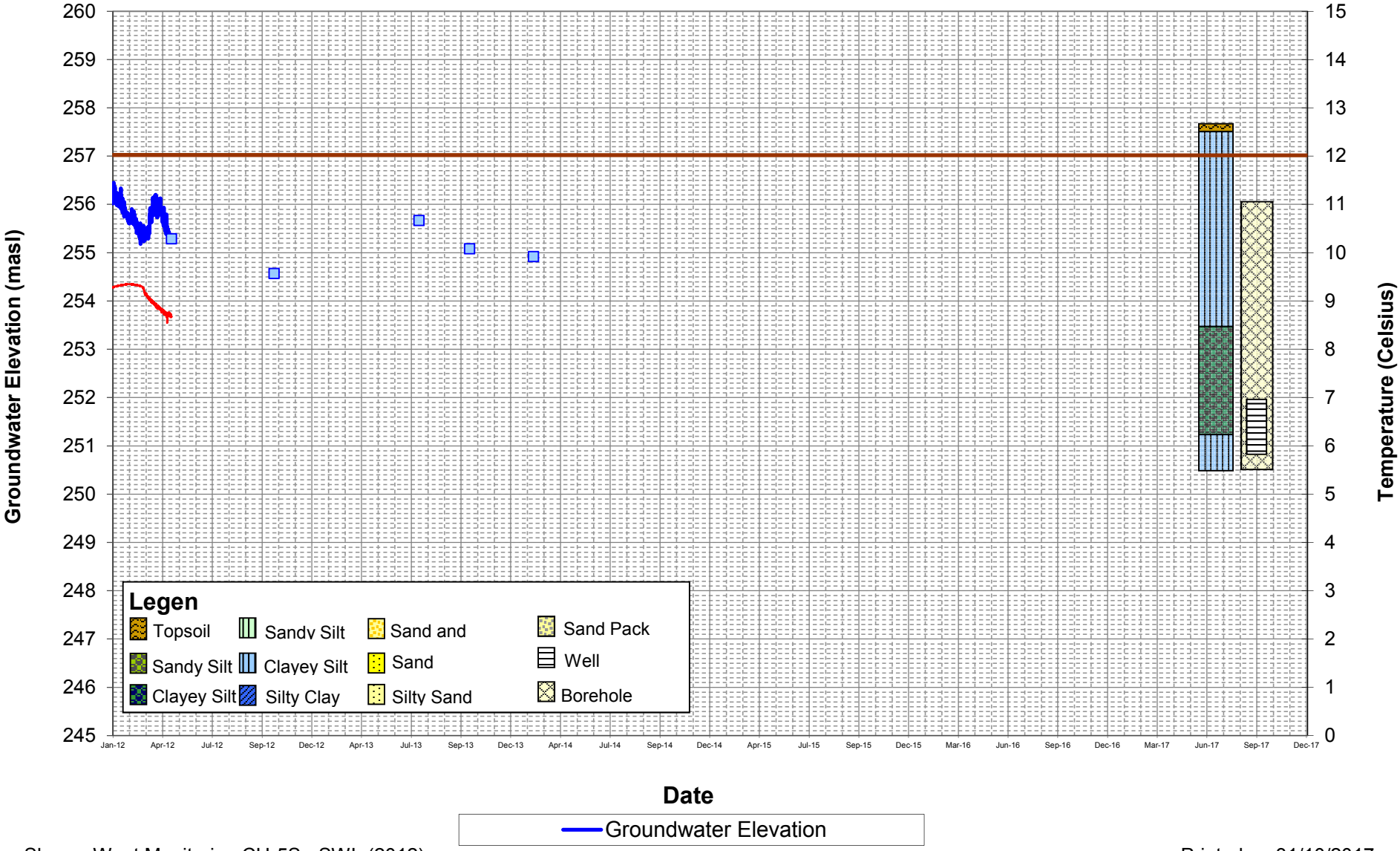

Static Water Levels and Groundwater Temperature
1432 Mount Albert
Static Water Level (masl)
Temperature (°C)
Approximate Well Depth
260
259
258
257
256
255
254
253
252
251
250
249
248
247
246
245
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1-Jan-12
1-Apr-12
1-Jul-12
30-Sep-12
31-Dec-12
1-Apr-13
1-Jul-13
30-Sep-13
31-Dec-13
1-Apr-14
1-Jul-14
30-Sep-14
31-Dec-14
1-Apr-15
1-Jul-15
30-Sep-15
31-Dec-15
31-Mar-16
30-Jun-16
29-Sep-16
30-Dec-16
31-Mar-17
30-Jun-17
29-Sep-17
30-Dec-17
Date
Groundwater Elevation
Manual
Ground Surface
Temperature


Static Water Levels and Groundwater Temperature
1442 Mount Albert
Static Water Level (masl)
Temperature (°C)
Approximate Well Depth
260
259
258
257
256
255
254
253
252
251
250
249
248
247
246
245
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1-Jan-12
1-Apr-12
1-Jul-12
30-Sep-12
31-Dec-12
1-Apr-13
1-Jul-13
30-Sep-13
31-Dec-13
1-Apr-14
1-Jul-14
30-Sep-14
31-Dec-14
1-Apr-15
1-Jul-15
30-Sep-15
31-Dec-15
31-Mar-16
30-Jun-16
29-Sep-16
30-Dec-16
31-Mar-17
30-Jun-17
29-Sep-17
30-Dec-17
Date
Groundwater Elevation
Manual
Ground Surface
Temperature

Static Water Levels and Groundwater Temperature
8 May Avenue



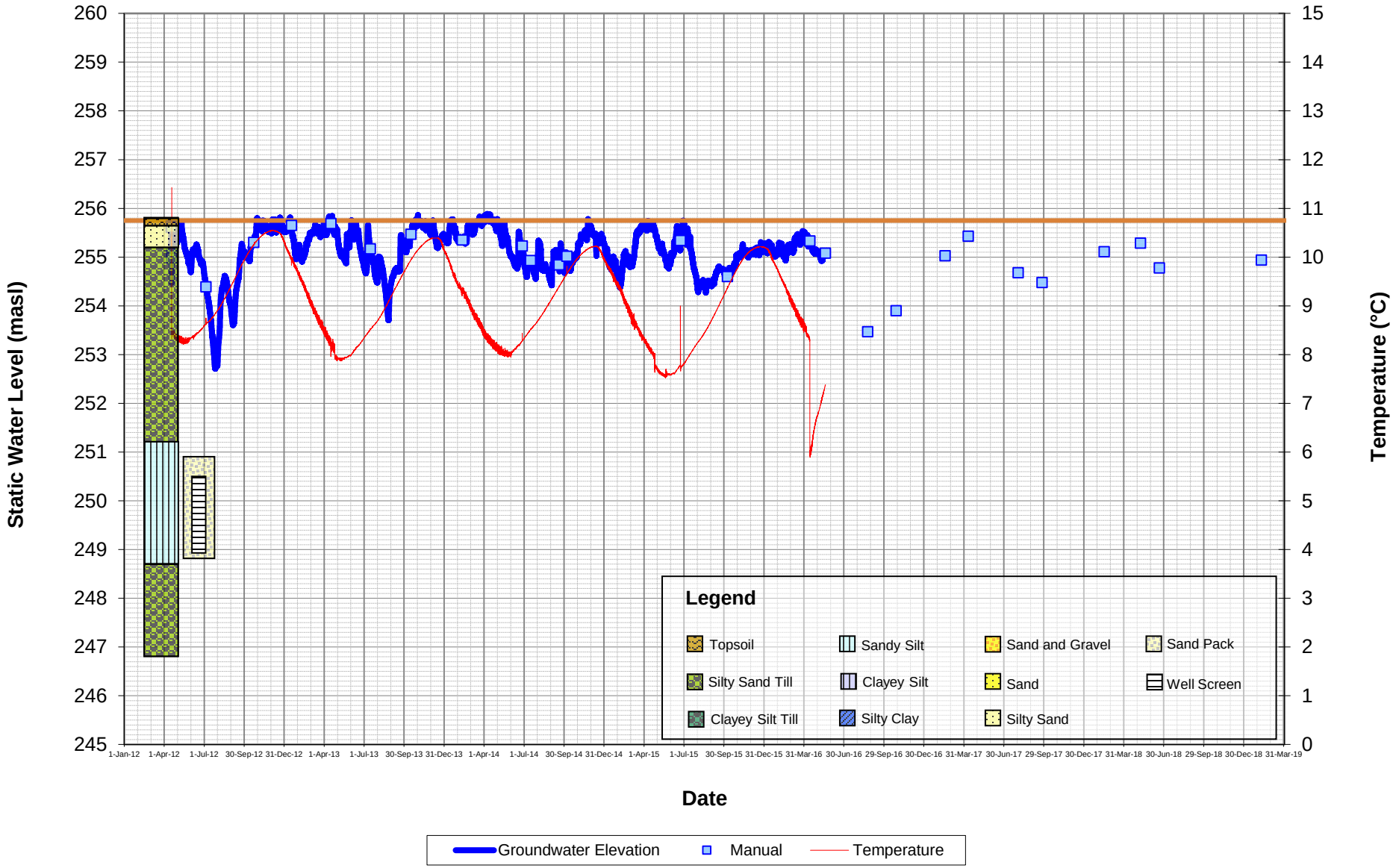
Groundwater Elevations and Temperature
CU-5S



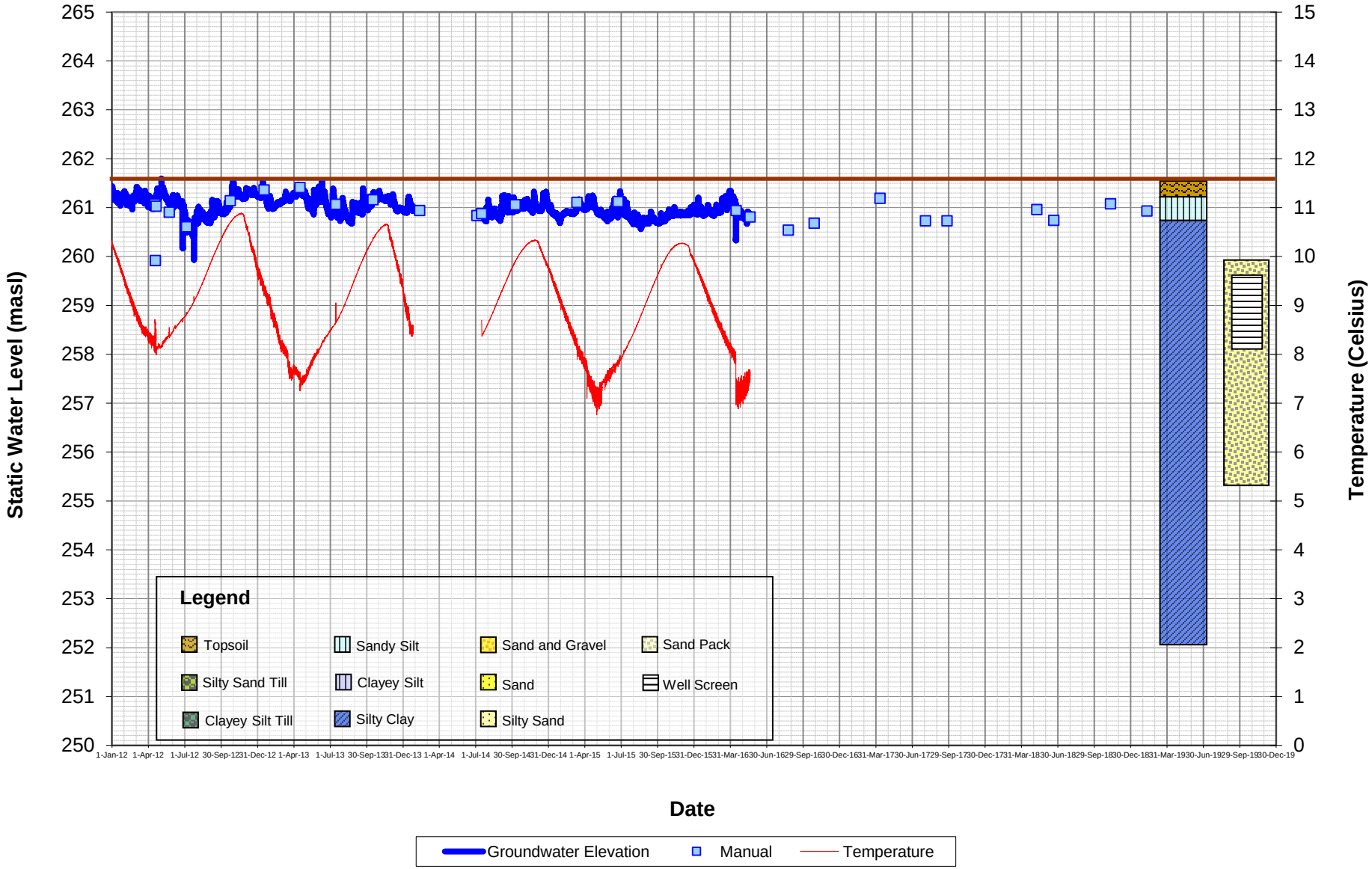
Sharon West Monitoring CU-5S - SWL (2012)

Printed on 31/10/2017

Static Water Levels and Groundwater Temperature
MMM12-01



Static Water Levels and Groundwater Temperature
TR-BH-101



Surface Water Elevations and Temperature
SWM-1

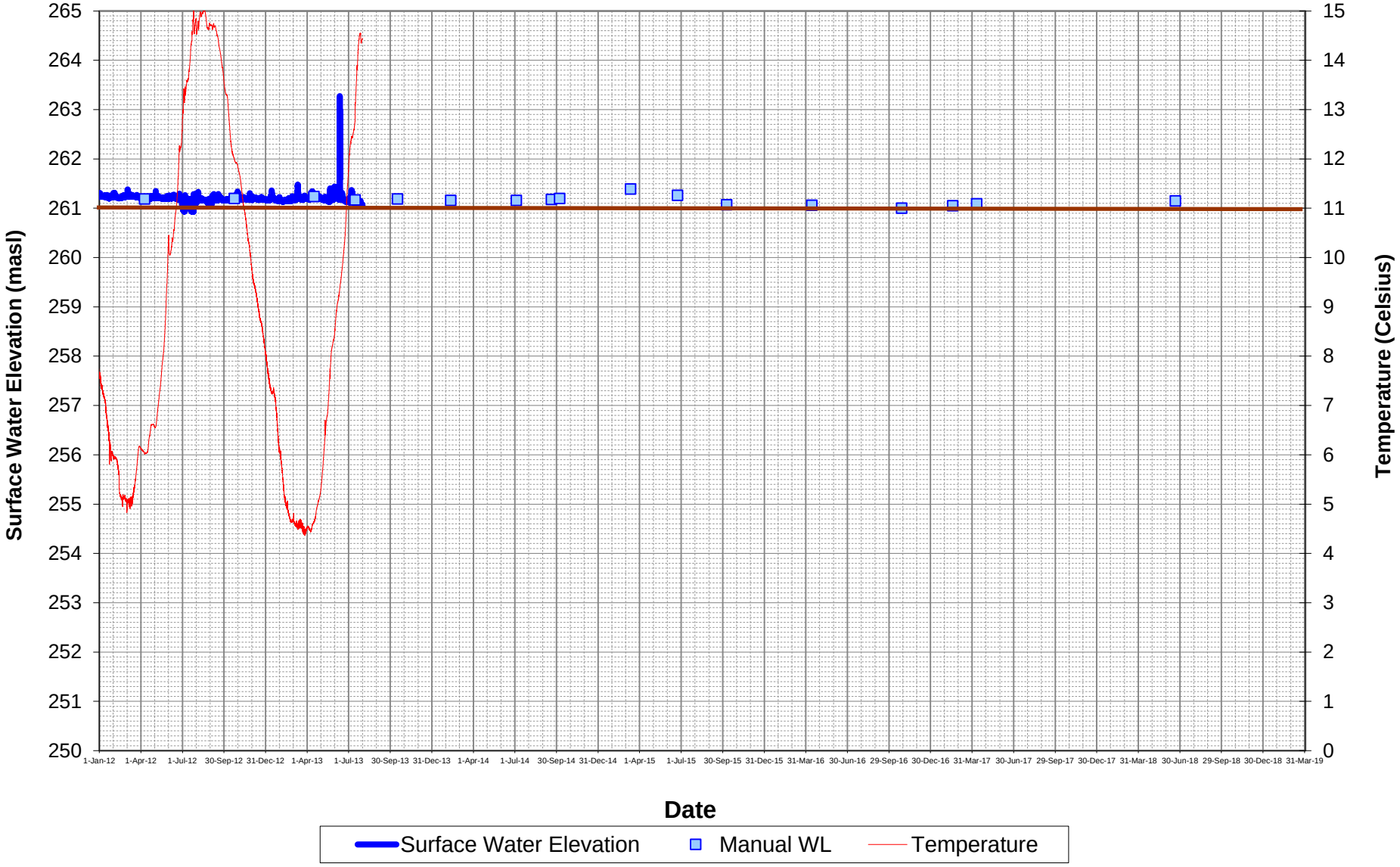


Table WQ-1
Water Quality Results
Sharon Corners
Northwest Corner of Mount Albert Road and Leslie Street,
East Gwillimbury, Ontario

Sample ID							MW1	MW3
Sampling Date			PWQO	Ontario Drinking Water Standards			11-Oct-17	11-Oct-17
Maxxam Sample ID				Health Related		non Health	FIA480	FIA479
	RDL	Units	Criteria	MAC	IMC	A/O		
Calculated Parameters								
Conductivity	1	umhos/cm	-	-	-	-	290	2100
pH	0.1	pH units	8.5	-	-	8.5	8.16	7.89
Alkalinity, Bicarbonate (as CaCO3)	1	mg/L	-	-	-	-	140	340
Alkalinity, Carbonate (as CaCO3)	1	mg/L	-	-	-	-	2.0	2.5
Alkalinity, Total (as CaCO3)	1	mg/L	-	-	-	-	150	340
Ammonia, Total (as N)	0.05	mg/L	-	-	-	-	0.15	0.35
Chloride (Cl) - Dissolved	1	mg/L	-	-	-	250	17	**460**
Hardness (as CaCO3)	n/a	mg/L	-	-	-	80:100	82	**600**
Ion Balance	n/a	%	-	-	-	-	5.89	3.30
Langelier Index (@ 4C)	n/a	-	-	-	-	-	-0.103	0.594
Langelier Index (@ 20C)	n/a	-	-	-	-	-	8.01	7.05
Nitrate and Nitrite as N	0.1	mg/L	-	10	-	-	<0.10	<0.10
Nitrate (as N)	0.1	mg/L	-	10	-	-	<0.10	<0.10
Nitrite (as N)	0.01	mg/L	-	1	-	-	0.037	<0.010
Saturation pH (@ 4C)	n/a	pH	-	-	-	-	8.26	7.3
Saturation pH (@ 20C)	n/a	pH	-	-	-	-	8.01	7.05
Phosphate-P (ortho)	0.01	mg/L	-	-	-	-	0.011	<0.010
TDS (Calculated)	1	mg/L	-	-	-	500	190	**1200**
Sulfate (SO4) - Dissolved	1	mg/L	-	-	-	500	5.5	84
Anion Sum	n/a	me/L	-	-	-	-	3.49	21.5
Cation Sum	n/a	me/L	-	-	-	-	3.1	23
Cation - Anion Balance	n/a	%	-	-	-	-	5.89	3.3
Dissolved Organic Carbon	0.2	mg/L	-	-	-	5	1.3	2.1
Aluminum (Al)-Dissolved	0.005	mg/L	0.075	-	-	0.1	<0.005	0.0055
Antimony (Sb)-Dissolved	0.0005	mg/L	0.02	-	0.006	-	<0.0005	<0.0005
Arsenic (As)-Dissolved	0.001	mg/L	0.005	-	0.025	-	0.0018	0.0028
Barium (Ba)-Dissolved	0.002	mg/L	-	1	-	-	0.058	0.23
Beryllium (Be)-Dissolved	0.0005	mg/L	0.011	-	-	-	<0.0005	<0.0005
Boron (B)-Dissolved	0.01	mg/L	0.2	-	5	-	0.1	0.072
Cadmium (Cd)-Dissolved	0.00001	mg/L	0.0001	0.005	-	-	<0.0001	<0.0001
Calcium (Ca)-Dissolved	0.2	mg/L	-	-	-	-	16	98
Chromium (Cr)-Dissolved	0.005	mg/L	-	0.05	-	-	<0.005	<0.005
Cobalt (Co)-Dissolved	0.0005	mg/L	0.0009	-	-	-	<0.0005	<0.0005
Copper (Cu)-Dissolved	0.001	mg/L	0.001	-	-	1	<0.001	<0.001
Iron (Fe)-Dissolved	0.1	mg/L	0.3	-	-	0.3	<0.1	<0.1
Lead (Pb)-Dissolved	0.0005	mg/L	0.001	0.01	-	-	<0.0005	<0.0005
Magnesium (Mg)-Dissolved	0.05	mg/L	-	-	-	-	10	87
Manganese (Mn)-Dissolved	0.002	mg/L	-	-	-	0.05	0.0083	0.041
Molybdenum (Mo)-Dissolved	0.0005	mg/L	0.04	-	-	-	0.0084	0.0076
Nickel (Ni)-Dissolved	0.001	mg/L	0.025	-	-	-	<0.001	0.0019
Phosphorus (P)-Dissolved	0.1	mg/L	-	-	-	-	<0.1	<0.1
Potassium (K)-Dissolved	0.05	mg/L	-	-	-	-	1.3	8.2
Selenium (Se)-Dissolved	0.002	mg/L	0.1	0.01	-	-	<0.002	<0.002
Silicon (Si)-Dissolved	0.05	mg/L	-	-	-	-	8.3	6.4
Silver (Ag)-Dissolved	0.0001	mg/L	0.0001	-	-	-	<0.0001	<0.0001
Sodium (Na)-Dissolved	0.5	mg/L	-	20	-	200	**33**	**250**
Strontium (Sr)-Dissolved	0.001	mg/L	-	-	-	-	0.19	1
Thallium (Tl)-Dissolved	0.00005	mg/L	0.0003	-	-	-	<0.00005	<0.00005
Titanium (Ti)-Dissolved	0.005	mg/L	-	-	-	-	<0.005	<0.005
Uranium (U)-Dissolved	0.0001	mg/L	0.005	0.02	-	-	0.00034	0.0033
Vanadium (V)-Dissolved	0.0005	mg/L	0.006	-	-	-	0.00083	0.0014
Zinc (Zn)-Dissolved	0.005	mg/L	0.02	-	-	5	<0.005	0.02

Notes:

RDL = Reportable Detection Limit

Criteria: Surface Water Provincial Water Quality Objectives (PWQO), July 1994 and Ontario Drinking Water Quality Standards (ODWS), June 2003

MAC,IMC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002, S.O. 2002, c. 32)

100	Exceeds PWQO
100	Exceeds ODWS
100	Exceeds PWQO and ODWS
100	Detection Limit exceeds PWQO

APPENDIX

E WATER BALANCE

East Holland Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	10.04	878	579	299
Fine Sandy Loam	B		878	638	240
Silt Loam	C		878	594	283
Clay	D		878	613	265
Forest					
Fine Sand	A	39.28	878	608	270
Fine Sandy Loam	B		878	624	253
Silt Loam	C		878	600	278
Clay	D		878	618	260
Pasture & Shrubs					
Fine Sand	A	11.08	878	601	276
Fine Sandy Loam	B		878	621	256
Silt Loam	C		878	606	272
Clay	D		878	594	283
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	24.28	878	622	256
Fine Sandy Loam	B		878	649	229
Silt Loam	C		878	632	246
Clay	D		878	619	259
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	48.80	878	601	276
Fine Sandy Loam	B		878	646	231
Silt Loam	C		878	648	230
Clay	D		878	647	231
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	24.28	878	508	371
Fine Sandy Loam	B		878	532	346
Silt Loam	C		878	462	417
Clay	D		-	-	-
Mean Annual			**878**	**567**	**311**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Table E-1: Water Balance - Pre-Approved Lands - Area A (1.54 ha)

	Pre-Development			Post-Development			Difference	Difference
Water Balance Statistics	**Urban Lawns mm/year**	**Pasture/Shrubs mm/year**	**weighted mm/year**	**Urban Lawns mm/year**	**Pasture/Shrubs mm/year**	**weighted mm/year**	**mm/year**	**%**
Pervious Area (m^2)	0	15,367	15,367	4,548	0	4,548		
Precipitation	878.0	878.0	878.0	878.0	878.0	878.0	0.0	0.0%
Evapotranspiration	594.0	606.0	606.0	594.0	606.0	594.0	-12.0	-2.0%
Surplus	284.0	272.0	272.0	284.0	272.0	284.0	12.0	4.4%
Infiltration Factor (dimensionless)			0.4			0.4	-0.02	
Infiltration	124.2	118.9	118.9	119.3	114.2	119.3	0.4	0.3%
Runoff (from pervious areas)	159.8	153.1	153.1	164.7	157.8	164.7	11.6	7.6%
Site Statistics	**m^2**	**m^2**	**m^2**	**m^2**	**m^2**	**m^2**	**m^2**	**%**
Impervious Area (Roofs)			0			4,684	4,684	NA
Impervious Area (Roads, Parking, Pavement)			0			6,135	6,135	NA
Total Impervious Area			**0**			**10,819**	10,819	NA
Pervious Area (m^2)	0	15,367	**15,367**	4,548	0	**4,548**	-10,819	-70.4%
Total Site Area (m^2)			**15,367**			**15,367**	0	0.0%
Water Volumes			**m^3/year**			**m^3/year**	**m^3/year**	**%**
Precipitation (Entire Site Area)			13,492			13,492	0	0.0%
Evapotranspiration (Pervious Area)	0	9,312	9,312	2,701	0	2,701	-6,611	-71.0%
Evaporation Impervious Surfaces			0			950	950	NA
Runoff (Roofs)			0			3,701	3,701	NA
Runoff (Pavement, etc.)			0			4,848	4,848	NA
Runoff (Pervious Surfaces)	0	2,352	2,352	749	0	749	-1,603	-68.2%
Infiltration	0	1,827	1,827	542	0	542	-1,285	-70.3%
Total ETR, Runoff, Infiltration			**13,492**			**13,492**	**0**	0.0%

Notes:
Assumes 10% evaporation off impervious surfaces.

Table E-2: Water Balance - Remainder of Site - Area B (1.54 ha)

	Pre-Development			Post-Development			Difference	Difference
Water Balance Statistics	**Urban Lawns mm/year**	**Pasture/Shrubs mm/year**	**weighted mm/year**	**Urban Lawns mm/year**	**Pasture/Shrubs mm/year**	**weighted mm/year**	**mm/year**	**%**
Pervious Area (m^2)	12,865	0	12,865	2,922	0	2,922		
Precipitation	878.0	878.0	878.0	878.0	878.0	878.0	0.0	0.0%
Evapotranspiration	594.0	606.0	594.0	594.0	606.0	594.0	0.0	0.0%
Surplus	284.0	272.0	284.0	284.0	272.0	284.0	0.0	0.0%
Infiltration Factor (dimensionless)			0.4			0.4	-0.02	-3.9%
Infiltration	124.2	118.9	124.2	119.3	114.2	119.3	-4.9	-3.9%
Runoff (from pervious areas)	159.8	153.1	159.8	164.7	157.8	164.7	4.9	3.1%
Site Statistics	**m^2**	**m^2**	**m^2**	**m^2**	**m^2**	**m^2**	**m^2**	**%**
Impervious Area (Roofs)			1,299			4,281	2,981	229.5%
Impervious Area (Roads, Sidewalks, Parking)			1,239			8,201	6,962	561.7%
Total Impervious Area			**2,539**			**12,481**	**9,943**	391.7%
Pervious Area (m^2)	12,865	0	**12,865**	2,922	0	**2,922**	**-9,943**	-77.3%
Total Site Area (m^2)			**15,404**			**15,404**	**0.0**	0.0%
Water Volumes			**m^3/year**			**m^3/year**	**m^3/year**	**%**
Precipitation (Entire Site Area)			13,524			13,524	0	0.0%
Evapotranspiration (Pervious Area)	7,642	0	7,642	1,736	0	1,736	-5,906	-77.3%
Evaporation Impervious Surfaces			223			1,096	873	391.7%
Runoff (Roofs)			1,027			3,383	2,356	229.5%
Runoff (Pavement, etc.)			979			6,480	5,501	561.7%
Runoff (Pervious Surfaces)	2,056	0	2,056	481	0	481	-1,575	-76.6%
Infiltration	1,597	0	1,597	349	0	349	-1,249	-78.2%
Total ETR, Runoff, Infiltration			**13,524**			**13,524**	**0**	0.0%

Notes:
Assumes 10% evaporation off impervious surfaces.

Table E-3: Water Balance - All Lands Combined (3.08 ha)

Water Balance Statistics	Pre-Development Urban Lawns mm/year	Pre-Development Pasture/Shrubs mm/year	Pre-Development weighted mm/year	Post-Development Urban Lawns mm/year	Post-Development Pasture/Shrubs mm/year	Post-Development weighted mm/year	Difference mm/year	Difference %
Pervious Area (m^2)	12,865	15,367	28,232	7,470	0	7,470		
Precipitation	878.0	878.0	878.0	878.0	878.0	878.0	**0.0**	**0.0%**
Evapotranspiration	594.0	606.0	600.5	594.0	606.0	594.0	**-6.5**	**-1.1%**
Surplus	284.0	272.0	277.5	284.0	272.0	284.0	**6.5**	**2.4%**
Infiltration Factor (dimensionless)			0.4			0.4	**-0.02**	**-3.9%**
Infiltration	124.2	118.9	121.3	119.3	114.2	119.3	**-2.0**	**-1.7%**
Runoff (from pervious areas)	159.8	153.1	156.2	164.7	157.8	164.7	**8.6**	**5.5%**
Site Statistics	**m^2**	**m^2**	**m^2**	**m^2**	**m^2**	**m^2**	**m^2**	**%**
Impervious Area (Roofs)			1,299			8,965	**7,665**	**590.0%**
Impervious Area (Pavement, etc.)			1,239			14,336	**13,097**	**1056.8%**
Total Impervious Area			**2,539**			**23,301**	**20,762**	**817.9%**
Pervious Area (m^2)	12,865	15,367	**28,232**	7,470	0	**7,470**	**-20,762**	**-73.5%**
Total Site Area (m^2)			**30,771**			**30,771**	**0**	**0.0%**
Water Volumes	**m^3/year**	**m^3/year**	**m^3/year**	**m^3/year**	**m^3/year**	**m^3/year**	**m^3/year**	**%**
Precipitation (Entire Site Area)			27,017			27,017	**0**	**0.0%**
Evapotranspiration (Pervious Area)	7,642	9,312	16,954	4,437	0	4,437	**-12,517**	**-73.8%**
Evaporation Impervious Surfaces			223			2,046	**1,823**	**817.9%**
Runoff (Roofs)			1,027			7,084	**6,057**	**590.0%**
Runoff (Pavement, etc.)			979			11,328	**10,349**	**1056.8%**
Runoff (Pervious Surfaces)	2,056	2,352	4,409	1,230	0	1,230	**-3,178**	**-72.1%**
Infiltration	1,597	1,827	3,425	891	0	891	**-2,534**	**-74.0%**
Total ETR, Runoff, Infiltration			**27,017**			**27,017**	**0**	**0.0%**

Notes:
Assumes 10% evaporation off impervious surfaces.

APPENDIX

F DEWATERING ASSESSMENT

Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 1 (5 Units) - Anticipated Hydraulic Conductivity

Short-Term Construction Dewatering Assessment

Site Sharon Corners

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	260.5	masl	10.5	m
Final Elevation of Water Table (m)	h	259.3	masl	9.3	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-08	m/s	4.3E-08	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-03	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	31.3	m	31.3	m
Width of Excavation (m)	b	11.0	m	11.0	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	0.4	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N) Y	a/b			0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI

$R_o = C \times (H - h) \times \sqrt{K}$ (eq. 6.14, p. 104)

$R_o + R_s$	11.2	
R_o	0.7	m

Equivalent Radius of Well (m)

R_s	10.5	m

$R_s = \sqrt{(a \times b)/ pi}$ (eq. 6.10, p. 102)

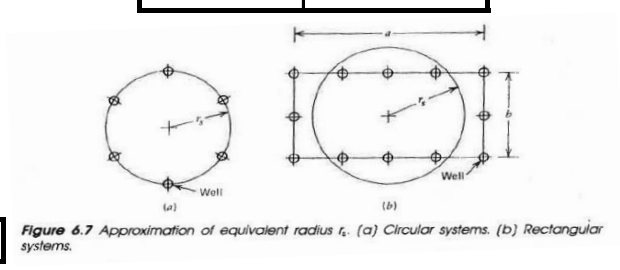


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day)

$Q = (\pi \times K \times (H^2 - h^2)) / \ln (R_o / R_s)$ (Eq. 6.3, p. 99)

Q	4.0	m^3/day
Q	4,005	L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day)

$Q = K \times X \times (H^2 - h^2) / L + \pi \times K \times (H^2 - h^2) / \ln(R_o/R_s)$ (eq. 6.8, p. 101)

Q	N/A	m^3/day
Q	N/A	L/day

Drainage Trench from a Line Source (m^3/day)

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102)

Q	N/A	m^3/day
Q	N/A	L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

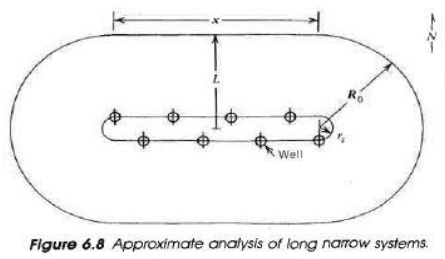
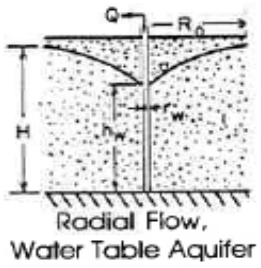
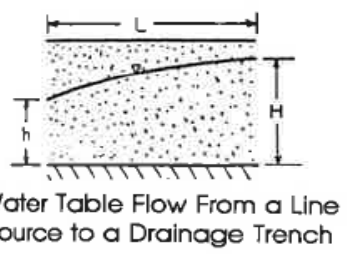


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 1 (5 Units) - Factor of Safety 10 x Hydraulic Conductivity

Short-Term Construction Dewatering Assessment

Site Sharon Corners

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	260.5	masl	10.5	m
Final Elevation of Water Table (m)	h	259.3	masl	9.3	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-07	m/s	4.3E-07	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-02	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	31.3	m	31.3	m
Width of Excavation (m)	b	11.0	m	11.0	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	1.2	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N)	Y	a/b		0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI $R_o + R_s$ 12.8

$R_o = C \times (H - h) \times \sqrt{K}$ (eq. 6.14, p. 104) R_o 2.3 m

Equivalent Radius of Well (m) R_s 10.5 m

$R_s = \sqrt{((a \times b)/ \pi)}$ (eq. 6.10, p. 102)

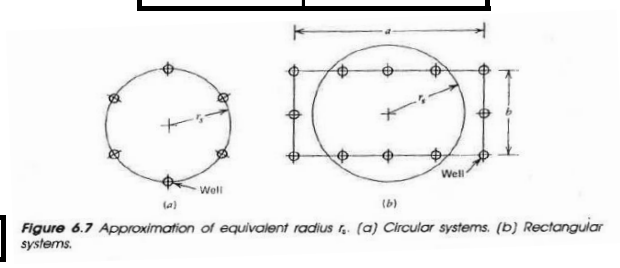


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day) Q 13.5 m^3/day

$Q = (\pi \times K \times (H^2 - h^2)) / \ln (R_o / R_s)$ (Eq. 6.3, p. 99) Q 13,547 L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day) Q N/A m^3/day

$Q = K \times X \times (H^2 - h^2) / L + \pi \times K \times (H^2 - h^2) / \ln(R_o/R_s)$ (eq. 6.8, p. 101) Q N/A L/day

Drainage Trench from a Line Source (m^3/day) Q N/A m^3/day

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102) Q N/A L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

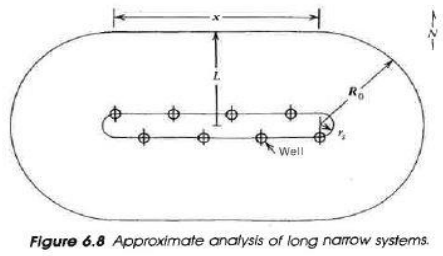
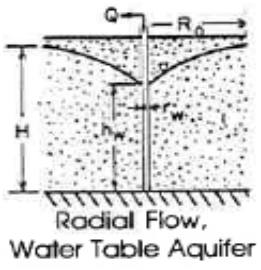
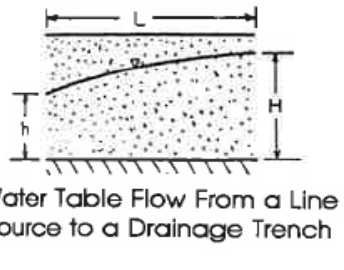


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 2 (6 Units) - Anticipated Hydraulic Conductivity

Short-Term Constuction Dewatering Assessment

Site Sharon Corners

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	260.1	masl	10.1	m
Final Elevation of Water Table (m)	h	258.7	masl	8.7	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-08	m/s	4.3E-08	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-03	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	37.0	m	37.0	m
Width of Excavation (m)	b	11.0	m	11.0	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	0.4	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N)	Y	a/b		0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI

$R_o = C \times (H - h) \times \sqrt{K}$ (eq. 6.14, p. 104)

$R_o + R_s$	12.2	
R_o	0.9	m

Equivalent Radius of Well (m)

$R_s = \sqrt{((a \times b)/ \pi)}$ (eq. 6.10, p. 102)

R_s	11.4	m

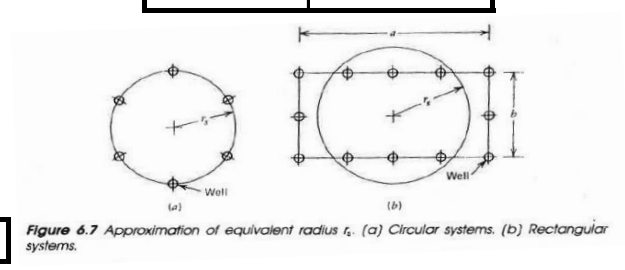


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day)

$Q = (\pi \times K \times (H^2 - h^2)) / \ln (R_o / R_s)$ (Eq. 6.3, p. 99)

Q	4.2	m^3/day
Q	4,168	L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day)

$Q = K \times X \times (H^2 - h^2) / L + \pi \times K \times (H^2 - h^2) / \ln(R_o/R_s)$ (eq. 6.8, p. 101)

Q	N/A	m^3/day
Q	N/A	L/day

Drainage Trench from a Line Source (m^3/day)

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102)

Q	N/A	m^3/day
Q	N/A	L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

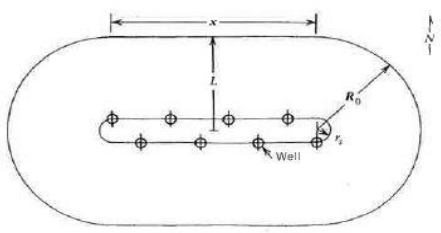
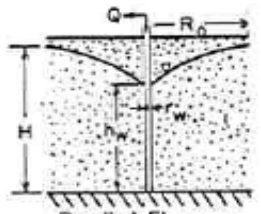
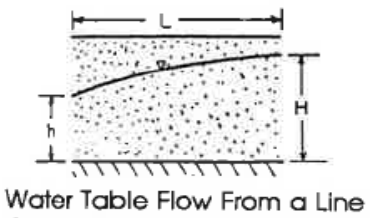


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 2 (6 Units) - Factor of Safety 10 x Hydraulic Conductivity

Short-Term Construction Dewatering Assessment

Site **Sharon Corners**

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	260.1	masl	10.1	m
Final Elevation of Water Table (m)	h	258.7	masl	8.7	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-07	m/s	4.3E-07	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-02	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	37.0	m	37.0	m
Width of Excavation (m)	b	11.0	m	11.0	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	1.4	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N)	Y	a/b		0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI $R_o + R_s$ 14.1

$R_o = C \times (H - h) \times \sqrt{K}$ (eq. 6.14, p. 104) R_o 2.7 m

Equivalent Radius of Well (m) R_s 11.4 m

$R_s = \sqrt{((a \times b)/ pi)}$ (eq. 6.10, p. 102)

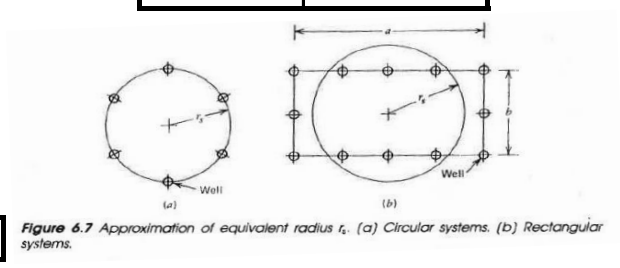


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day) Q 14.2 m^3/day

$Q = (\pi \times K \times (H^2 - h^2)) / \ln (R_o / R_s)$ (Eq. 6.3, p. 99) Q 14,174 L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day) Q N/A m^3/day

$Q = K \times X \times (H^2 - h^2) / L + \pi \times K \times (H^2 - h^2) / \ln(R_o/R_s)$ (eq. 6.8, p. 101) Q N/A L/day

Drainage Trench from a Line Source (m^3/day) Q N/A m^3/day

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102) Q N/A L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

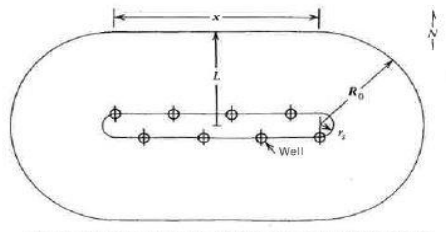
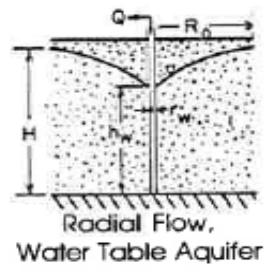
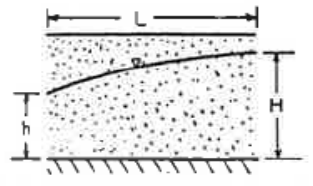


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 3 (6 Units) - Anticipated Hydraulic Conductivity

Short-Term Construction Dewatering Assessment

Site Sharon Corners

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	259.6	masl	9.6	m
Final Elevation of Water Table (m)	h	258.6	masl	8.6	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-08	m/s	4.3E-08	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-03	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	37.0	m	37.0	m
Width of Excavation (m)	b	12.0	m	12.0	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	0.3	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N)	Y	a/b		0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI $R_o + R_s$ 12.5

$R_o = C \times (H - h) \times \sqrt{K}$ (eq. 6.14, p. 104) R_o 0.6 m

Equivalent Radius of Well (m) R_s 11.9 m

$R_s = \sqrt{((a \times b)/ pi)}$ (eq. 6.10, p. 102)

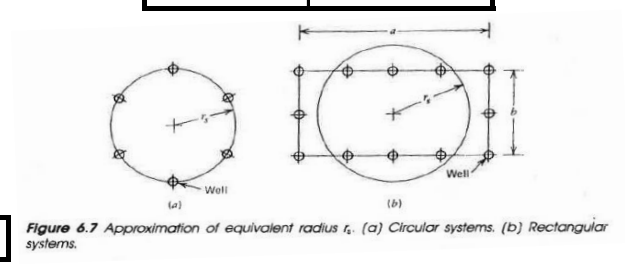


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day) Q 4.2 m^3/day

$Q = (\pi \times K \times (H^2 - h^2)) / \ln (R_o / R_s)$ (Eq. 6.3, p. 99) Q 4,166 L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day) Q N/A m^3/day

$Q = K \times X \times (H^2 - h^2) / L + \pi \times K \times (H^2 - h^2) / \ln(R_o/R_s)$ (eq. 6.8, p. 101) Q N/A L/day

Drainage Trench from a Line Source (m^3/day) Q N/A m^3/day

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102) Q N/A L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

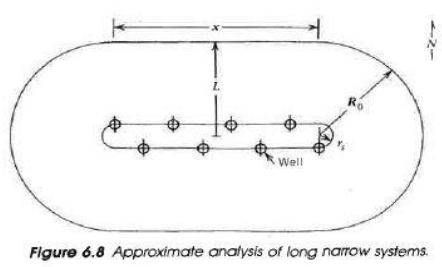
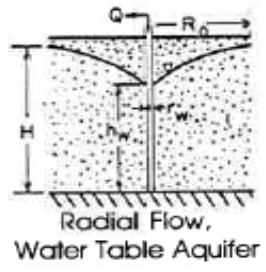
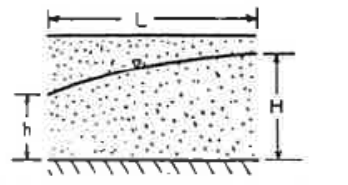


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 3 (6 Units) - Factor of Safety 10 x Hydraulic Conductivity

Short-Term Construction Dewatering Assessment

Site Sharon Corners

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	259.6	masl	9.6	m
Final Elevation of Water Table (m)	h	258.6	masl	8.6	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-07	m/s	4.3E-07	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-02	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	37.0	m	37.0	m
Width of Excavation (m)	b	12.0	m	12.0	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	1.0	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N)	Y	a/b		0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI

$R_o = C \times (H - h) \times \sqrt{K}$ (eq. 6.14, p. 104)

$R_o + R_s$	13.8	
R_o	1.9	m

Equivalent Radius of Well (m)

R_s	11.9	m

$R_s = \sqrt{(a \times b)/ pi}$ (eq. 6.10, p. 102)

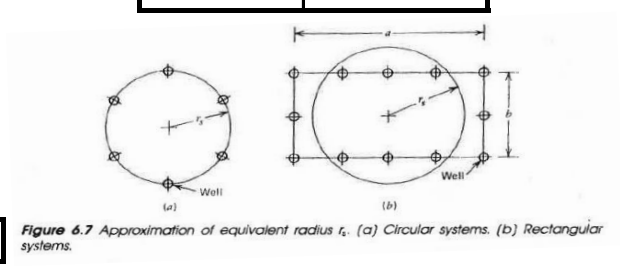


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day)

$Q = (\pi \times K \times (H^2 - h^2)) / \ln (R_o / R_s)$ (Eq. 6.3, p. 99)

Q	13.9	m^3/day
Q	13,870	L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day)

$Q = K \times X \times (H^2 - h^2) / L + \pi \times K \times (H^2 - h^2) / \ln(R_o/R_s)$ (eq. 6.8, p. 101)

Q	N/A	m^3/day
Q	N/A	L/day

Drainage Trench from a Line Source (m^3/day)

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102)

Q	N/A	m^3/day
Q	N/A	L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

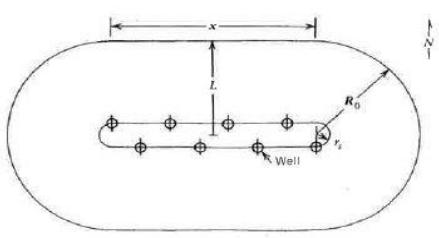
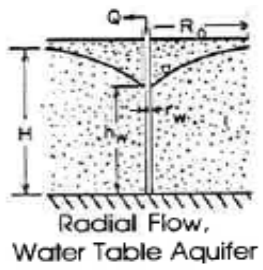
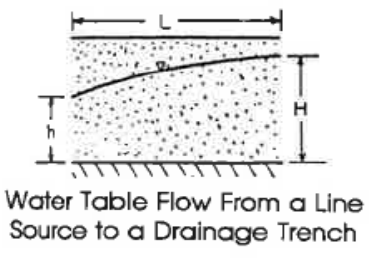


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 4 (6 Units) - Anticipated Hydraulic Conductivity

Short-Term Construction Dewatering Assessment

Site Sharon Corners

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	259.2	masl	9.2	m
Final Elevation of Water Table (m)	h	258.3	masl	8.3	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-08	m/s	4.3E-08	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-03	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	37.0	m	37.0	m
Width of Excavation (m)	b	12.0	m	12.0	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	0.3	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N) Y	a/b			0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI

$R_o = C \times (H - h) \times \sqrt{K}$ (eq. 6.14, p. 104)

$R_o + R_s$	12.4	
R_o	0.5	m

Equivalent Radius of Well (m)

R_s	11.9	m

$R_s = \sqrt{((a \times b)/ pi)}$ (eq. 6.10, p. 102)

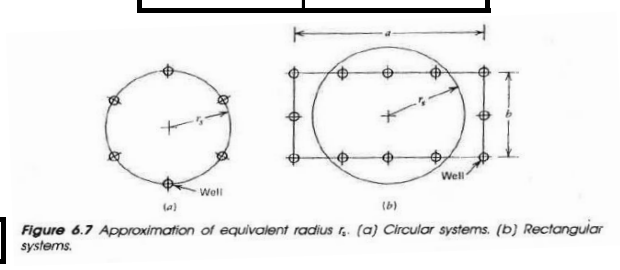


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day)

$Q = (\pi \times K \times (H^2 - h^2)) / \ln (R_o / R_s)$ (Eq. 6.3, p. 99)

Q	4.0	m^3/day
Q	3,998	L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day)

$Q = K \times X \times (H^2 - h^2) / L + \pi \times K \times (H^2 - h^2) / \ln(R_o/R_s)$ (eq. 6.8, p. 101)

Q	N/A	m^3/day
Q	N/A	L/day

Drainage Trench from a Line Source (m^3/day)

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102)

Q	N/A	m^3/day
Q	N/A	L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

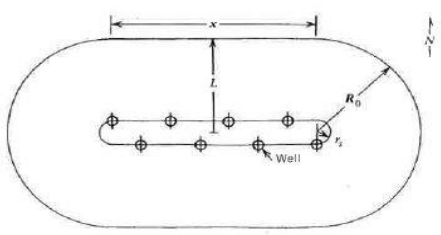
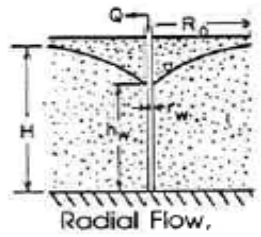
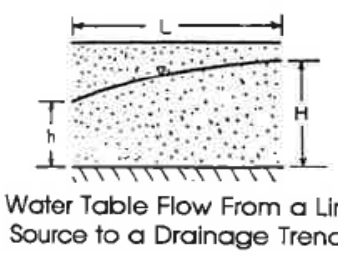


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 4 (6 Units) - Factor of Safety 10 x Hydraulic Conductivity

Short-Term Construction Dewatering Assessment

Site Sharon Corners

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	259.2	masl	9.2	m
Final Elevation of Water Table (m)	h	258.3	masl	8.3	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-07	m/s	4.3E-07	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-02	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	37.0	m	37.0	m
Width of Excavation (m)	b	12.0	m	12.0	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	0.9	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N)	Y	a/b		0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI

$R_o = C \times (H - h) \times \sqrt{K}$ (eq. 6.14, p. 104)

$R_o + R_s$	13.6	
R_o	1.7	m

Equivalent Radius of Well (m)

R_s	11.9	m

$R_s = \sqrt{((a \times b)/ \pi)}$ (eq. 6.10, p. 102)

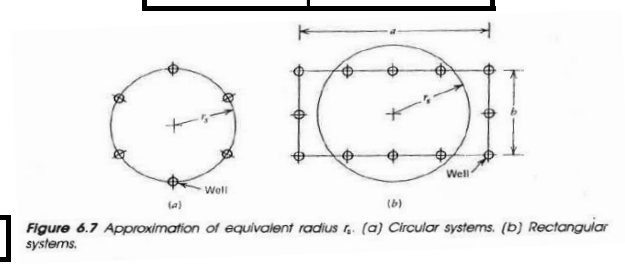


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day)

$Q = (\pi \times K \times (H^2 - h^2)) / \ln (R_o / R_s)$ (Eq. 6.3, p. 99)

Q	13.2	m^3/day
Q	13,235	L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day)

$Q = K \times X \times (H^2 - h^2) / L + \pi \times K \times (H^2 - h^2) / \ln(R_o/R_s)$ (eq. 6.8, p. 101)

Q	N/A	m^3/day
Q	N/A	L/day

Drainage Trench from a Line Source (m^3/day)

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102)

Q	N/A	m^3/day
Q	N/A	L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

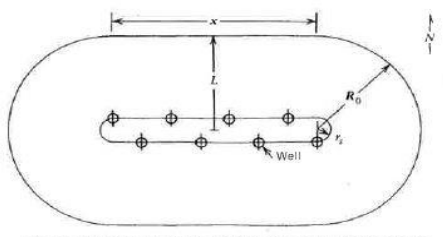
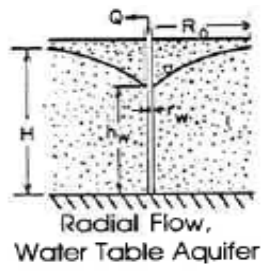
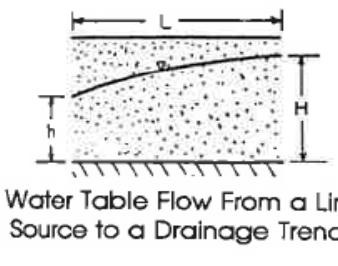


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 5 (6 Units) - Anticipated Hydraulic Conductivity

Short-Term Construction Dewatering Assessment

Site Sharon Corners

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	258.7	masl	8.7	m
Final Elevation of Water Table (m)	h	258.1	masl	8.1	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-08	m/s	4.3E-08	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-03	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	37.0	m	37.0	m
Width of Excavation (m)	b	11.6	m	11.6	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	0.2	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N)	Y	a/b		0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI $R_o + R_s$ 12.1

$R_o = C \times (H - h) \times \sqrt{K}$ (eq. 6.14, p. 104) R_o 0.4 m

Equivalent Radius of Well (m) R_s 11.7 m

$R_s = \sqrt{((a \times b)/ \pi)}$ (eq. 6.10, p. 102)

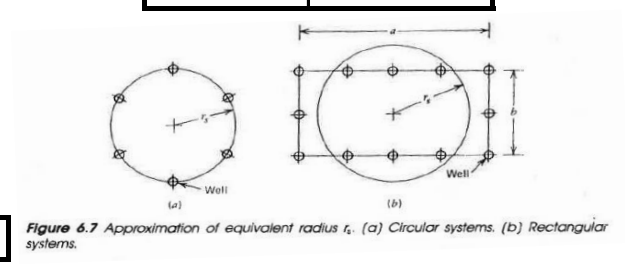


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day) Q 3.7 m^3/day

$Q = (\pi \times K \times (H^2 - h^2)) / \ln (R_o / R_s)$ (Eq. 6.3, p. 99) Q 3,740 L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day) Q N/A m^3/day

$Q = K \times X \times (H^2 - h^2) / L + \pi \times K \times (H^2 - h^2) / \ln(R_o/R_s)$ (eq. 6.8, p. 101) Q N/A L/day

Drainage Trench from a Line Source (m^3/day) Q N/A m^3/day

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102) Q N/A L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

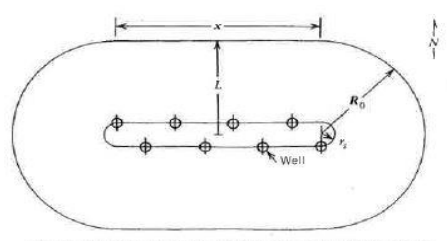
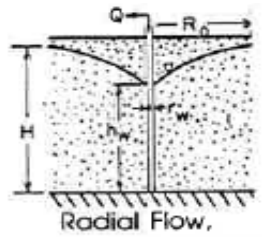
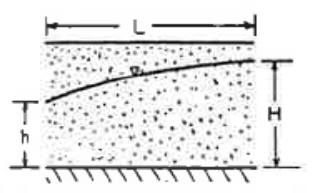


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 5 (6 Units) - Conservative 10 x Hydraulic Conductivity

Short-Term Construction Dewatering Assessment

Site Sharon Corners

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	258.7	masl	8.7	m
Final Elevation of Water Table (m)	h	258.1	masl	8.1	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-07	m/s	4.3E-07	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-02	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	37.0	m	37.0	m
Width of Excavation (m)	b	11.6	m	11.6	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	0.6	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N)	Y	a/b		0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI

R_o = C x (H - h) x sqrt (K) (eq. 6.14, p. 104)

$R_o + R_s$	12.9	
R_o	1.2	m

Equivalent Radius of Well (m)

R_s	11.7	m

R_s = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

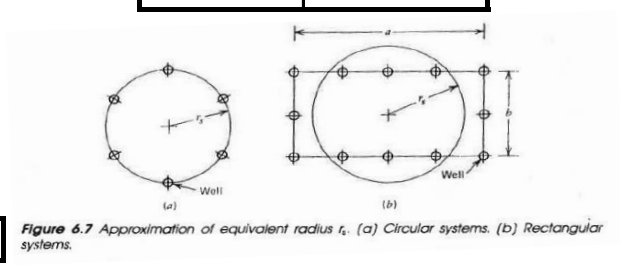


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day)

Q = (π x K x (H^2 - h^2)) / ln (R_o / R_s) (Eq. 6.3, p. 99)

Q	12.2	m^3/day
Q	12,234	L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day)

Q = K x X x (H^2 - h^2) / L + π x K x (H^2 - h^2) / ln(R_o/R_s) (eq. 6.8, p. 101)

Q	N/A	m^3/day
Q	N/A	L/day

Drainage Trench from a Line Source (m^3/day)

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102)

Q	N/A	m^3/day
Q	N/A	L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

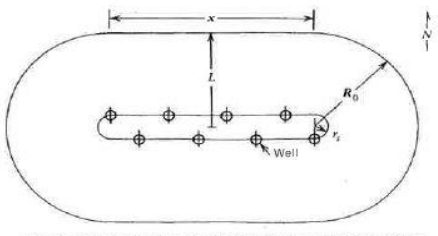
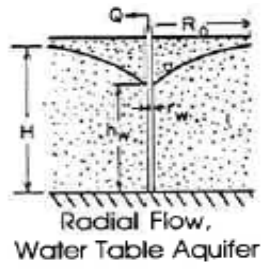
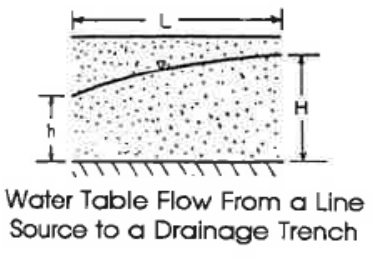


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 6 (6 Units) - Anticipated Hydraulic Conductivity

Short-Term Construction Dewatering Assessment

Site Sharon Corners

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	258.3	masl	8.3	m
Final Elevation of Water Table (m)	h	257.3	masl	7.3	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-08	m/s	4.3E-08	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-03	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	49.5	m	49.5	m
Width of Excavation (m)	b	12.0	m	12.0	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	0.3	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N)	Y	a/b		0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI

$R_o = C \times (H - h) \times \sqrt{K}$ (eq. 6.14, p. 104)

$R_o + R_s$	14.4	
R_o	0.6	m

Equivalent Radius of Well (m)

R_s	13.8	m

$R_s = \sqrt{((a \times b)/ \pi)}$ (eq. 6.10, p. 102)

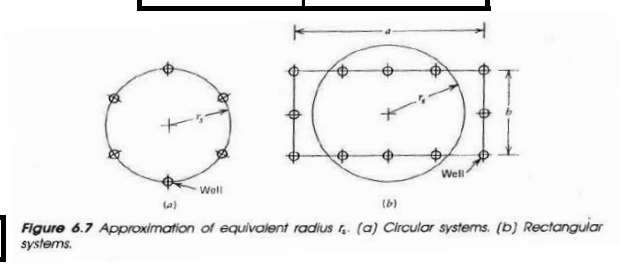


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day)

$Q = (\pi \times K \times (H^2 - h^2)) / \ln (R_o / R_s)$ (Eq. 6.3, p. 99)

Q	4.1	m^3/day
Q	4,115	L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day)

$Q = K \times X \times (H^2 - h^2) / L + \pi \times K \times (H^2 - h^2) / \ln(R_o/R_s)$ (eq. 6.8, p. 101)

Q	N/A	m^3/day
Q	N/A	L/day

Drainage Trench from a Line Source (m^3/day)

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102)

Q	N/A	m^3/day
Q	N/A	L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

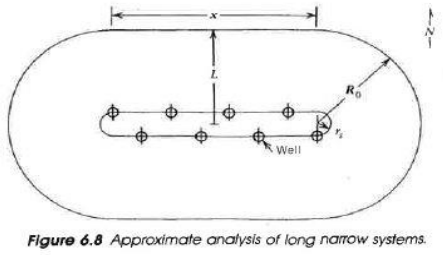
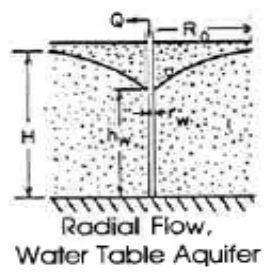
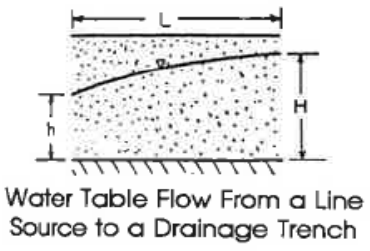


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 6 (6 Units) - Factor of Safety 10 x Hydraulic Conductivity

Short-Term Construction Dewatering Assessment

Site Sharon Corners

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	258.3	masl	8.3	m
Final Elevation of Water Table (m)	h	257.3	masl	7.3	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-07	m/s	4.3E-07	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-02	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	49.5	m	49.5	m
Width of Excavation (m)	b	12.0	m	12.0	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	1.0	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N) Y	a/b			0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI

R_o = C x (H - h) x sqrt (K) (eq. 6.14, p. 104)

$R_o + R_s$	15.7	
R_o	2.0	m

Equivalent Radius of Well (m)

R_s	13.8	m

R_s = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

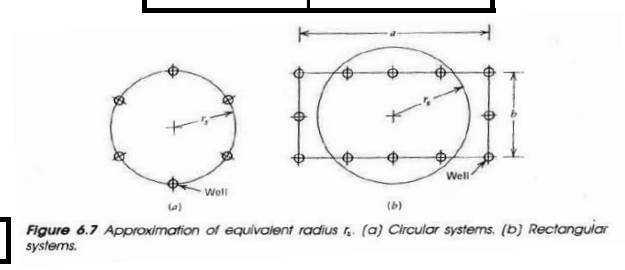


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day)

Q = (π x K x (H^2 - h^2)) / ln (R_o / R_s) (Eq. 6.3, p. 99)

Q	13.6	m^3/day
Q	13,617	L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day)

Q = K x X x (H^2 - h^2) / L + π x K x (H^2 - h^2) / ln(R_o/R_s) (eq. 6.8, p. 101)

Q	N/A	m^3/day
Q	N/A	L/day

Drainage Trench from a Line Source (m^3/day)

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102)

Q	N/A	m^3/day
Q	N/A	L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

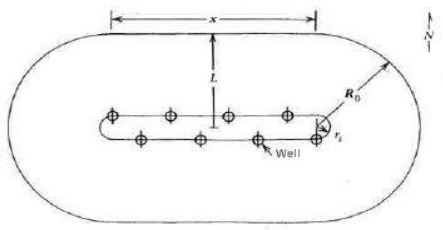
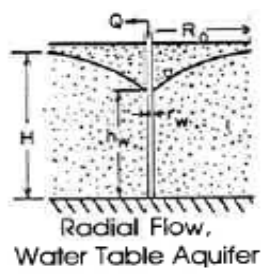
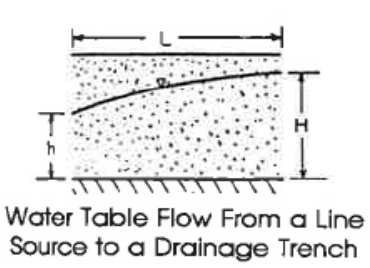


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 12 (5 Units) - Anticipated Hydraulic Conductivity

Short-Term Construction Dewatering Assessment

Site Sharon Corners

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	260.4	masl	10.4	m
Final Elevation of Water Table (m)	h	260.1	masl	10.1	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-08	m/s	4.3E-08	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-03	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	31.3	m	31.3	m
Width of Excavation (m)	b	11.0	m	11.0	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	0.1	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N)	Y	a/b		0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI

$R_o = C \times (H - h) \times \sqrt{K}$ (eq. 6.14, p. 104)

$R_o + R_s$	10.6	
R_o	0.2	m

Equivalent Radius of Well (m)

R_s	10.5	m

$R_s = \sqrt{(a \times b)/ \pi}$ (eq. 6.10, p. 102)

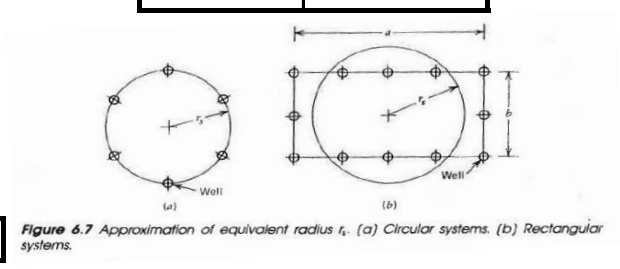


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day)

$Q = (\pi \times K \times (H^2 - h^2)) / \ln (R_o / R_s)$ (Eq. 6.3, p. 99)

Q	4.1	m^3/day
Q	4,059	L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day)

$Q = K \times X \times (H^2 - h^2) / L + \pi \times K \times (H^2 - h^2) / \ln(R_o/R_s)$ (eq. 6.8, p. 101)

Q	N/A	m^3/day
Q	N/A	L/day

Drainage Trench from a Line Source (m^3/day)

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102)

Q	N/A	m^3/day
Q	N/A	L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

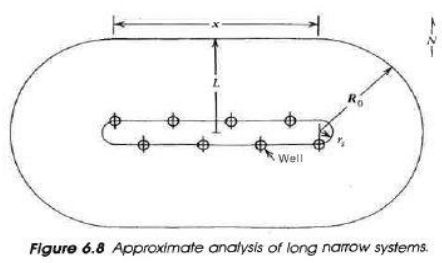
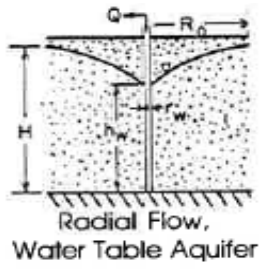
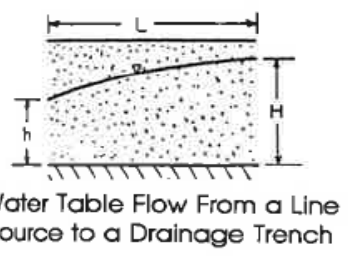


Figure 6.8 Approximate analysis of long narrow systems.





Construction Dewatering Assessment- Unconfined Conditions

from Powers, 1992

Townhouse Block 12 (5 Units) - Factor of Safety 10 x Hydraulic Conductivity

Site Sharon Corners

Input Parameters		**User Entry**		**Calc'd**	
Initial Elevation of Water Table (m)	H	260.4	masl	10.4	m
Final Elevation of Water Table (m)	h	260.1	masl	10.1	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-07	m/s	4.3E-07	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-02	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	31.3	m	31.3	m
Width of Excavation (m)	b	11.0	m	11.0	m
Length of Dewatering - Trench Length (m)	X		m	0.0	m
Linear System Zone of Influence (m)	L		m	0.3	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N) Y	a/b			0.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m) Well radius + ZOI

R_o = C x (H - h) x sqrt (K) (eq. 6.14, p. 104)

$R_o + R_s$	11.1	
R_o	0.6	m

Equivalent Radius of Well (m)

R_s	10.5	m

R_s = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

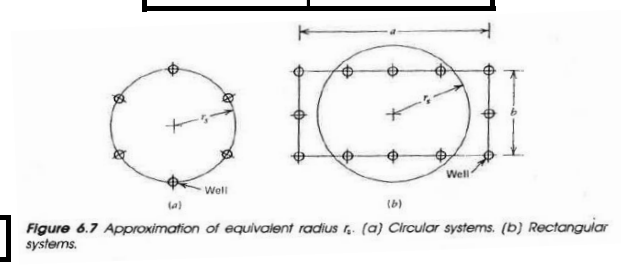


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) TRUE

Shaft Calculation (m^3/day)	Q	13.1	m^3/day
Q = (π x K x (H^2 - h^2)) / ln (R_o / R_s) (Eq. 6.3, p. 99)	Q	13,078	L/day

Long Narrow System - Trench (a/b > 1.5) FALSE

Trench Calculation with Radial Flow at Ends (m^3/day)	Q	N/A	m^3/day
Q = K x X x (H^2 - h^2) / L + π x K x (H^2 - h^2) / ln(R_o/R_s) (eq. 6.8, p. 101)	Q	N/A	L/day

Drainage Trench from a Line Source (m^3/day)	Q	N/A	m^3/day
Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102)	Q	N/A	L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

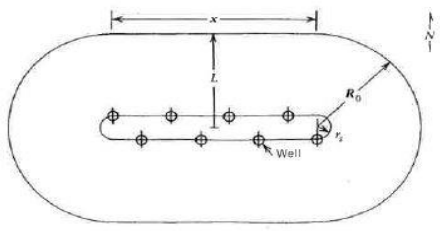
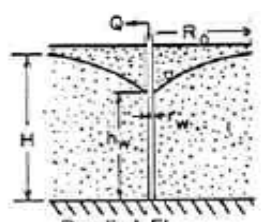
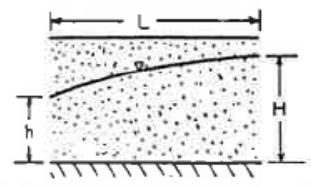


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment - Unconfined Conditions

from Powers, 1992

Municipal Servicing (50 m Section) - Anticipated Hydraulic Conductivity

Site Sharon Corners

Input Parameters		User Entry		Calc'd	
Initial Elevation of Water Table (m)	H	260.5	masl	10.5	m
Final Elevation of Water Table (m)	h	256.9	masl	6.9	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-08	m/s	4.3E-08	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-03	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	50.0	m	50.0	m
Width of Excavation (m)	b	2.0	m	2.0	m
Length of Dewatering - Trench Length (m)	X	50.0	m	50.0	m
Linear System Zone of Influence (m)	L		m	1.1	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b Override a/b? (Y/N) N	a/b			25.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

$R_o = C \times (H - h) \times \sqrt{K}$ (eq. 6.14, p. 104)

Well radius + ZOI	$R_o + R_s$	7.9
	R_o	2.3 m

Equivalent Radius of Well (m)

	R_s	5.6 m

$R_s = \sqrt{((a \times b)/ pi)}$ (eq. 6.10, p. 102)

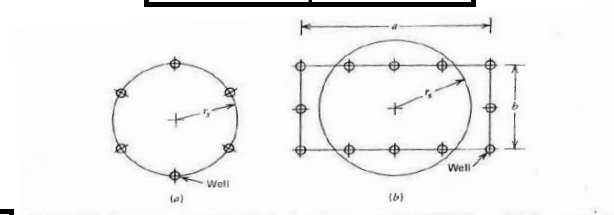


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) FALSE

Shaft Calculation (m^3/day)

$Q = (\pi \times K \times (H^2 - h^2)) / \ln (R_o / R_s)$ (Eq. 6.3, p. 99)

Q	N/A	m^3/day
Q	N/A	L/day

Long Narrow System - Trench (a/b > 1.5) TRUE

Trench Calculation with Radial Flow at Ends (m^3/day)

$Q = K \times X \times (H^2 - h^2) / L + \pi \times K \times (H^2 - h^2) / \ln(R_o/R_s)$ (eq. 6.8, p. 101)

Q	12.6	m^3/day
Q	12,560	L/day

Drainage Trench from a Line Source (m^3/day)

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102)

Q	0.0	m^3/day
Q	0	L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

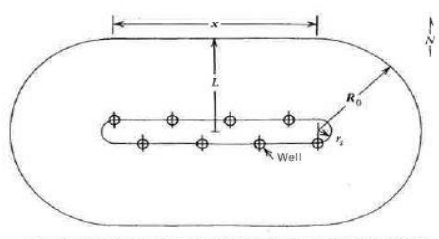
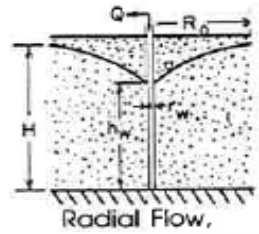
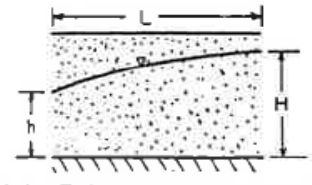


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Assessment - Unconfined Conditions

from Powers, 1992

Municipal Servicing (50 m Section) - Factor of Safety 10 x Hydraulic Conductivity

Site Sharon Corners

Input Parameters		User Entry		Calc'd	
Initial Elevation of Water Table (m)	H	260.5	masl	10.5	m
Final Elevation of Water Table (m)	h	256.9	masl	6.9	m
Base of Aquifer/Datum		250.0	masl	0.0	m
Hydraulic Conductivity (m/s)	K	4.3E-07	m/s	4.3E-07	m/s
Hydraulic Conductivity (m/d)	K		m/d	3.7E-02	m/d
Aquifer Thickness if Confined (m)	B		m	0.0	m
Length of Excavation (m)	a	50.0	m	50.0	m
Width of Excavation (m)	b	2.0	m	2.0	m
Length of Dewatering - Trench Length (m)	X	50.0	m	50.0	m
Linear System Zone of Influence (m)	L		m	3.6	m
Sichardt Constant (well = 3, wellpoint = 1.5 or 2)	C	3.0		3.0	
Ratio a/b — Override a/b? (Y/N) N	a/b			25.0	

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

$R_o = C \times (H - h) \times \sqrt{K}$ (eq. 6.14, p. 104)

Well radius + ZOI			
	$R_o + R_s$	12.8	
	R_o	7.1	m

Equivalent Radius of Well (m)

	R_s	5.6	m

$R_s = \sqrt{((a \times b)/ pi)}$ (eq. 6.10, p. 102)

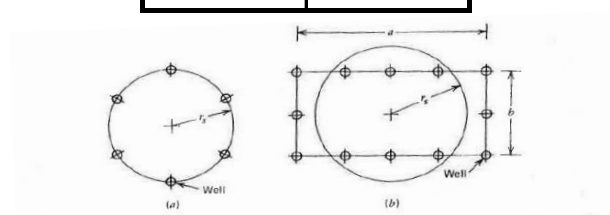


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b <= 1.5) FALSE

Shaft Calculation (m^3/day)

$Q = (\pi \times K \times (H^2 - h^2)) / \ln (R_o / R_s)$ (Eq. 6.3, p. 99)

	Q	N/A	m^3/day
	Q	N/A	L/day

Long Narrow System - Trench (a/b > 1.5) TRUE

Trench Calculation with Radial Flow at Ends (m^3/day)

$Q = K \times X \times (H^2 - h^2) / L + \pi \times K \times (H^2 - h^2) / \ln(R_o/R_s)$ (eq. 6.8, p. 101)

	Q	41.8	m^3/day
	Q	41,802	L/day

Drainage Trench from a Line Source (m^3/day)

Q = K x X x (H^2 - h^2) / L (eq. 6.9, p. 102)

	Q	0.0	m^3/day
	Q	0	L/day

Number of Trench Wall Sides with Flow (1 or 2) <-- This is used only in the equation above

Specify 2 walls if an actual trench, specify 1 wall if modelling a wall of a building - equations shown above based on 2 walls

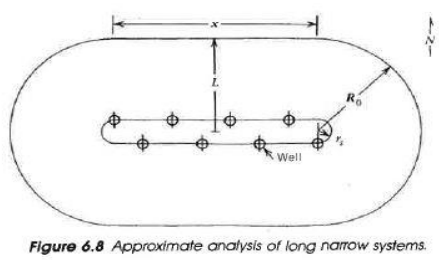
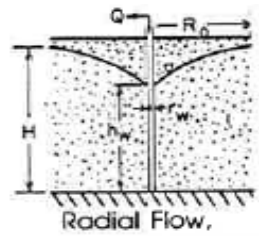
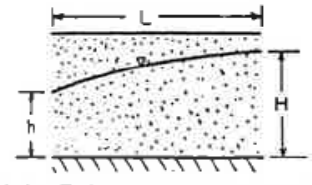


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench