

GAMAN CONSULTANTS INC.

**WATER BALANCE EVALUATION
PHASE 2 LIMEN HEAD OFFICE
15123 WOODBINE AVENUE
TOWN OF WHITCHURCH-STOUFFVILLE
YORK REGION**

*Prepared for:
SCAL Properties Ltd.*

February 2023

File 21013.02

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GAMAN CONSULTANTS INC.

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February 28, 2023

SCAL Properties Ltd.
46 Lepage Court
Toronto, Ontario
M3J 1Z9

Attention: Mr. Amir Soleimani, Executive VP and COO

Re: Water Balance Evaluation
Phase 2 Limen Head Office 15123 Woodbine Avenue
Town of Whitchurch-Stouffville, York Region
File 21013.02

GAMAN Consultants Inc. is pleased to submit this updated hydrogeological report to address the Conservation Authority Hydrogeological Requirements for Water Balances. The evaluation documents the recharge rate needed to match pre-development recharge rates at the site. The Schaeffers's stormwater management plan will address the implementation of low impact development measures to enhance recharge at the site. If you have any questions or require further information, please contact us.

Yours truly,
GAMAN Consultants Inc.



Gary R. Hendy, P.Eng.
Consulting Engineer

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1.0 INTRODUCTION

1.1 BACKGROUND

GAMAN Consultants Inc. was retained by the SCAL Properties Ltd. to complete a water balance evaluation of the subject site to address the Lake Simcoe Region Conservation Authority Guidelines.

The proposed development is located east of Aurora between Woodbine Avenue and Fortecon Drive on a 4.02 ha parcel of land as shown on Figures 1 and 2. The site will be developed to support the Limen Head Office in Phase 2A and a future building in Phase 2B. It is proposed to service the sites with individual drilled wells for water supply, individual on-site subsurface sewage disposal systems and a stormwater pond. A stormwater management report and sewage system report will be prepared as part of separate investigations for the site by other consultants. This report was prepared to assess changes to the water budget and determine the need to mitigate groundwater recharge at the site in support of Site Plan Approval, a Zoning By-Law Amendment and an Official Plan Amendment to permit the contractor yard as shown on the Site Plan (Figure 1). Two office buildings are proposed, each building on lot areas of 1.48ha and 2.54ha with a contractor yard use on the easterly portion of the 2.54ha 2B office building site. Proposed zoning is from "Development Reserve" to "Village Commercial" and "Employment Heavy", to permit the office buildings and a contractor yard use. Concurrent applications for severance of the proposed 1.48ha and 2.54ha lots within Phase 2 lands are being submitted to the Town Committee of Adjustment.

1.2 STUDY OBJECTIVES & SCOPE

The Conservation Authorities Geoscience Group developed guidelines for hydrogeological assessment submissions related to water balances. The document provides information for

consultants to consider and address in technical submissions for a development site. The purpose of this evaluation was to assess the changes in recharge to the site for input into appropriate mitigation methods to be implemented to maintain groundwater recharge.

The tasks required to complete the work program included:

- Background review of the physical setting of the site including physiography, surficial geology, and groundwater.
- A site inspection of the site and surrounding area.
- Test pit excavations were completed to assess shallow soil and groundwater for the suitability of on-site sewage disposal systems as provided by other project team members and to provide data for the water budget evaluation.
- A review of local water well records and existing services around the site.
- Sample shallow groundwater to assess water quality from past land use.
- Groundwater level monitoring.
- Preparation of a hydrogeological report to address LSRCA Guideline for a water balance.

This report documents the study findings of these investigations.

2.0 PHYSICAL SETTING

2.1 PHYSIOGRAPHY, SURFICIAL GEOLOGY AND DRAINAGE

The site is situated just north of the Oak Ridges Moraine within the Schomberg Clay Plains Physiographic Region as described by Chapman and Putnam (1984). The clay plain in the vicinity of Newmarket is described as drumlinized till plain. The surficial geology illustrated in Figure 3 shows the presence of drumlins in the vicinity of the site. The site is

also located near the northern boundary of the Oak Ridges Moraine. The figure illustrates sandy surficial deposits extend onto the site. Site investigations described later in this report confirm these permeable deposits do not exist at the site.

Drainage is north to northwest through a tributary of the East Branch Holland River. The Holland River eventually discharges into Lake Simcoe at Cook's Bay.

2.2 HYDROGEOLOGY

Aquifers are sources of groundwater yielding enough water to supply a well. Aquifers are commonly derived from saturated sand and/or gravel deposits within overburden and from fractured bedrock. Aquitards are barriers to groundwater movement and can provide protection to aquifers from sources of contamination. Aquitards are commonly comprised of silt, clay, till or bedrock. Figure 4 is a stratigraphic cross section from west to east through the site. The section was created from the Oak Ridges Moraine Groundwater Program (ORMGP) site and extends from just west of Woodbine Avenue to Warden Avenue.

There are three hydrostratigraphic units of interest to this investigation.

- The Newmarket Aquitard
- The Oak Ridges Aquifer Complex
- The Thorncliffe Aquifer Complex

The Newmarket (Till) Aquitard is the uppermost stratigraphic unit beneath the site. This unit is expected to behave as an aquitard that protects or buffers deeper sources of groundwater from contamination.

The Oak Ridges Moraine is a source of groundwater for municipal, communal, and individual wells and is referred to as the Oak Ridges Aquifer Complex (ORAC). It is a major recharge area for deeper aquifers and a source of recharge for the headwaters to

many streams originating on or down hill of the Moraine. The ORAC is exposed at surface east of the site as shown in Figure 4.

The Thorncliffe Formation is an aquifer where its composition is comprised of coarser deposits of saturated sand and/or gravel. Locally, the Thorncliffe Aquifer Complex (TAC) is a source of groundwater to municipal, communal, and individual wells in the vicinity of Aurora, Newmarket and the Town of Whitchurch-Stouffville. The TAC is a proposed source of groundwater for this site.

The west to east Cross-Section shows deeper stratigraphic units comprised of other aquitards or aquifers. These deeper deposits are below the hydrostratigraphic units relevant to this water budget evaluation.

2.3 SHALLOW GROUNDWATER MOVEMENT

Shallow groundwater movement reflects local topography and drainage. The ORMGP is an interactive web-site analytical tool used to evaluate hydrogeological data at a high scale. Figure 5 is an interpretation of shallow groundwater movement based on shallow groundwater monitors and wells in the database. The overall direction of shallow groundwater movement is northward through the site at a regional scale. This is reasonably consistent with local topography and drainage at the site that is generally northward too.

2.4 LOCAL WATER SUPPLIES

Figure 6 illustrates the location of water wells in the vicinity of the site. Most wells extend into the TAC. The reported test rates of wells terminating in the TAC ranges from 9 to 273 L/min in this area. Most wells yield more than the reported test rates because the wells

were not tested to evaluate maximum yield. The average test rate of wells terminating in the TAC and appearing in Figure 6 is 68 L/min.

There is evidence of a few dug wells or a sand point terminating within perhaps sandy fractions of the Newmarket Aquitard. Some wells extract groundwater from a productive zone less than 30 metres below grade and we expect that these wells may be hydraulically connected with the TAC given the history of water takings in the Vandorf Area.

The water well for this site will be constructed in the future. The well at 28 Fortecon Drive, abutting the site to the east, was drilled and constructed by Wilson Water Wells and it provides an example of expected yields from wells terminating in the TAC as illustrated in Well Record A199020 (attached). This well was drilled to a depth of 60.35 metres below grade and terminates within the TAC. The total volume of water removed from the well was 2,720 litres in one hour. The well is overlain with a thick sequence of Newmarket Aquitard that behaves as a protective layer to buffer this water from sources of contamination. The well test provides evidence of a long-term sustainable yield of 45.5 L/min.

3.0 SITE INVESTIGATIONS

3.1 SHALLOW SUBSURFACE SOILS

Gunnell Engineering is responsible for the design of the subsurface sewage disposal system at this site. The firm completed a test excavation program at the site to document shallow soil and groundwater conditions within the proposed sewage bed area and at other locations on-site. We understand the proposed sewage bed is to be constructed near test pits TP7 and TP8 as shown in Figures 7. The soils in the Phase 2 Limen Head Office are documented as silty clay. Soil Engineers completed a geotechnical evaluation in 2022. Borehole logs are included in Appendix A and boreholes are shown on Figures C-1 and C-2. The soils in the borehole logs are consistent with soils documented in the test pit program. Groundwater was encountered within two metres of ground surface.

3.2 BACKGROUND WATER QUALITY

The site has been used for agricultural purposes. Two existing shallow groundwater monitors designated BH-4 and BH-8 are illustrated in Figure C-1, Appendix C. These existing shallow groundwater monitors were drilled and constructed for other investigations at the site. There are no borehole logs available. The monitors are constructed with 50-mm diameter pvc casing and protective steel casing. The monitor depths are shallow and documented in Table A-1.

Nitrates are an indicator parameter used to assess the effects of fertilizers on agricultural farmland. Samples of groundwater were collected from BH4 and BH8 to document background nitrate and nitrite concentrations in the shallow groundwater. The results are included in Appendix B and show background nitrates ranging from 0.5 to 1.0 mg/L. Nitrites were not detected in groundwater. The results of these indicator parameters show agricultural land use has not affected shallow groundwater quality.

4.0 WATER BUDGET

4.1 CLIMATIC DATA

As precipitation falls to the ground in the form of rainfall or snow, it is subject to components of the hydrological cycle. Water will generally runoff, infiltrate, evaporate or be subject to transpiration from plant uptake. Evaporation and transpiration are commonly grouped together as evapotranspiration while runoff and infiltration are grouped together as water surplus. The water budget is represented in a simple form as follows:

$$\begin{aligned} \text{Water In} &= \text{water Out} \\ P + EI &= ET + IR + RO + EO \end{aligned}$$

Where:

P = Precipitation

EI = External Inputs (Run-on, irrigation, and vertical/lateral transfers)

ET = Evapotranspiration from plant uptake and evaporation.

IR = Infiltration Recharge

RO = Run-off

EO = External Outputs (water taking and vertical/lateral transfers)

4.2 CLIMATIC STATION SELECTION

Precipitation data is available from the Environment Canada website for climatic stations across the country and is also compiled in the Oak Ridges Moraine Groundwater Program (ORMGP).

GAMAN examined the ORMGP interactive map for climatic stations to identify a station with suitable data for the water budget. Table C-1, Appendix C provides details about climatic stations surrounding this site as a screening tool to select an appropriate station. The table documents the station, years of data and total precipitation. Climatic stations located near a site with 30-years of continuous data and similar elevations are amongst the criteria used to evaluate a suitable station. Most of the stations shown in Table C-1 either have insufficient data or have ceased operation.

The King Smoke Tree Climatic Station provides climatic data, temperature and precipitation for the period 1981 to 2010. The station was chosen for the following reasons:

1. Located 10km west of the property, it is close to the site.
2. The climatic station has a recent 30-year dataset ending in 2010.
3. The annual precipitation is within the range of precipitation of other stations evaluated in Table C-1.

4. King Smoke Tree station is at an elevation of 352 masl compared with the site elevation of about 300 masl.
5. Buttonville A is another climatic station with 30 years of data, but it is further away and at a much lower elevation of 197 masl.

Thornthwaite (1948) developed a mathematical method for analyzing precipitation data and calculating evapotranspiration and water surplus. The method was modified by Thornthwaite-Mather in 1957 and was used to evaluate water surplus. Average monthly temperature and precipitation data were analyzed using this method and the results are presented in Table C-2. The 30-year normal annual precipitation is 857.7 mm/yr. with a resultant moisture surplus of 241.4 m/yr.

4.3 GROUNDWATER RECHARGE ESTIMATES

4.3.1 MECP Recharge Rates

The MOECC Hydrogeological Technical Information Requirements For Land Development Applications (1995) includes Table 2 derived from hydrologic analysis for assessing peak runoff for storm water management. The method considers topography, soil type and vegetation cover at a site. Table C-3(A) documents the infiltration factors for pre-development and post-development at the site.

Topography was evaluated from west to east and north to south and the resulting average slopes at the site ranged from 27 metres per kilometre. The site reflects steep slopes with a topographic factor of 0.1 for pre-development as shown in Table C-3(A). It is proposed to grade the site. Site grading usually makes the slopes gentler than the original topography. The gentler the slope, the higher the infiltration factor and higher the recharge rate.

The peer review comments from the LSRCA for the Phase 1 site to the east requested a rational for ignoring run-on from the lands to the south forming Catchment Area 301 shown

on Figure 9 prepared by Schaeffers Engineering. A site inspection of the Powell's property to the north shows an existing drainage course is oriented west to east across the north property boundary conveys runoff through the Powell site. Figure 9 Catchment Areas 302 and 103 drain into this drainage path and provide no additional infiltration from off-site sources.

Soils at the Phase 2 sites were confirmed to be comprised of silty clay as described in Section 3.1. The soils are associated with low permeability and reflect an infiltration factor of 0.2 as shown in Table C-3(A) for pre-development and post-development. It is assumed filled needed to raise the grades in Phase 2 will be similar in permeability.

Cover reflects the presence or absence of a canopy that can shade parts of the site and reduce evaporation. The site was open agricultural fields in its pre-development state and will remain open post-development, so the Cover Infiltration Factor was selected as 0.1 for both the pre-development and post-development scenarios.

The pre-development total infiltration factors presented in Table C-3(A) are 0.4 and 0.5 respectively. Pre-development recharge rate for the site is the product of the infiltration factor (0.4) times the moisture surplus (241.4 mm/year) and results in 97 mm/year of recharge (Table C-3(B)). This seems reasonable for a site comprised of silty/clayey deposits.

4.3.2 ORMGP Recharge Rates

The Oak Ridges Moraine Groundwater Program was used as a guide for evaluating recharge rates. We reviewed the recharge model for the area and presented the information in Figure 8. The recharge rates within various blocks (or cells) in the figure show wide ranging recharge rates. The high rates at the site and south of the site appear to be related to the surficial geological mapping of the area (Figure 3) showing sandy soils. These high recharge rates do not accurately reflect recharge in the area because the Gunnell Test Pit program revealed no coarse-grained sediments (sands and gravels) at the site. The test pits shown in Figure 8 were those excavated for the sewage system evaluation and all show soils at the site

to be comprised of silty-clayey deposits as documented in Figure 7. The recharge rates in Figure 8 commonly range from about 65 to 135 mm/yr. if we ignore the anomalies from the high recharge rates. We have also ignored the very low recharge rate of 14 mm/year. The site recharge rate presented in Section 4.3.1 was calculated at 97 mm/year and seems reasonable with the ORMGP if we ignore the high recharge rates that are not supported by the geology of the site.

In summary the pre-development recharge rate was calculated at 97 mm/year and this appears reasonable compared with the range of recharge rates documented in the ORMGP.

4.4 PRE-DEVELOPMENT & POST-DEVELOPMENT WATER BUDGETS

The existing lands were used for agricultural purposes. There are no impermeable surfaces at the site and the soils have been shown to be comprised of silty-clayey deposits. We have examined runoff and infiltration for the pre-development conditions of the site based on water budget information presented in previous sections. Table C-3(B) documents the runoff and recharge rates for the pre-development and post-development scenarios. The pre-development recharge rate for the undeveloped lands was calculated at 3,881 m³/year based on a recharge rate of 97 mm/year. Runoff is higher at 5,821 m³/year.

Sources of recharge for post-development include infiltration on the permeable areas of the site shown on Figure 2. The permeable areas of the site include:

- a) Landscaped areas
- b) The sewage bed areas excluding the volume of sewage.

The impermeable areas of the site include:

- a) The two office buildings.
- b) The lined stormwater pond.
- c) The parking lots.

The permeable areas of the site post-development total 2.8905 ha of the 4.02 ha parcel of land. Infiltration rates post-development are documented in Table C-3(B). The site will be raised with 1-2 metres of fill and graded gently eastward with mild slopes. The infiltration factor on landscaped areas of the site was increased slightly for the gentle slopes. The permeability of the storage areas is expected to be higher than the native soils with a resultant infiltration factor of 0.5. The total infiltration post-development is estimated at 1,363 m³/year.

Table C-3(B) documents a recharge deficit of 2,517 m³/year for the site equivalent to an 65% reduction in recharge.

4.5 MITIGATION

Low impact development (LID) systems are used to capture runoff and promote infiltration as a means of restoring recharge. LID provides a wide range of practices that off-set the negative impacts of urban stormwater runoff including the reduction of groundwater recharge. Geology and water levels are two of the most important factors used to assess the suitability of a site for LID measures. The LSRCA published a document entitled “***Shallow Subsurface Characterization to Support Placement for Infiltration Based Low Impact Development Practices***” dated March 2000. The document aimed to provide guidance on areas low, medium and high suitability for LID systems within the East Holland River Sub-watershed.

The site is overlain with fine-textured silty clay (till-like) soils that correspond with Medium Suitability for LID systems based on geology.

The LSRCA document references the 2012 TRCA Guideline Stormwater Management Criteria that notes a preference for at least 1 metre of separation between the seasonal high groundwater table and the base of an infiltration facility. Locations with less than 1 metre

separation are considered low suitability, moderate suitability for 1-2 metres of separation and high suitability for more than 2 metres of separation to the water table.

Groundwater levels are presented in Table A-1 show varying depths to groundwater. The area around BH22-8 was flooded due to a drainage obstruction at the north property boundary. Groundwater levels from late 2021 to the summer of 2022 show high water levels at or near ground surface. Efforts to remove the water and improve drainage occurred during the summer and fall of 2022 and water levels at monitor BH22-8 showed groundwater levels in November and December were 1 -2 metres below grade. Additional groundwater level monitoring is needed to re-establish the seasonal variations for the water table on this site. Despite the uncertainty, these groundwater levels provide evidence of medium to high suitability for LID measures subject to confirmation from additional monitoring.

The geology and groundwater information available to date suggests the site has medium to moderate suitability for LID measures where there may be more than 1 metre of separation to the water table. The volume of water to be made up from the recharge deficit is calculated at 2,518 m³/year.

The two office building areas are 4,924 m². From March to November, the total precipitation is 704 mm/year and provides up to 3,466 m³/year of water for infiltration. If 90% of this precipitation is captured and infiltrated through infiltration trenches for example, roof runoff could provide about 3,119 m³ of recharge to off-set the 2,518 m³ of deficit. Capturing roof runoff between March and November could off-set all of the recharge deficit and provide suitable mitigation.

5.0 **CONCLUSIONS AND RECOMMENDATIONS**

The conclusions and recommendations presented below are based upon the data collected and reviewed as part of these investigations:

- The study area and site are located within the Schomberg Clay Plain Physiographic Region. This physiographic region has a clayey-silty (till-like) soil matrix at the site.
- Drainage is north to northwest through a tributary of the East Branch Holland River. The Holland River eventually discharges into Lake Simcoe at Cook's Bay.
- The two common sources of groundwater within the study area include the Oak Ridges Aquifer and the Thorncliffe Aquifer.
- Test pit excavations for the proposed on-site sewage disposal system confirm shallows soils are comprised of silty, clayey (till-like) sediments.
- The depth to groundwater was affected by poor drainage and recent monitoring suggests groundwater may be 1-2 metres below grade. Additional groundwater monitoring is needed to re-establish and confirm seasonal variations in the water table.
- The west area of the site has medium or moderate suitability for Low Impact Development (LID) systems based on geology and groundwater data, subject to confirmation with groundwater level monitoring.
- An existing drainage course, oriented west to east across the north property boundary, conveys runoff through the Powell site north of this development. Runoff from Catchment Areas 103 and 302 (Figure 9) is directed towards this drainage path, provides no additional infiltration from off-site sources.

- The recharge rate for this site was estimated at 97 mm/year. This is consistent and within the range of values obtained from the Oak Ridges Moraine Groundwater Program.
- The recharge deficit for this site is calculated at 2,517 m³/year, equivalent to a 65% reduction in recharge. This volume of water requires the use of LID systems to be established during detailed design of the site to capture runoff from the two-storey office building. The volume of roof from the buildings alone could provide enough make-up water to off-set the recharge deficit.

Respectfully Submitted,
GAMAN CONSULTANTS INC.

The image shows a handwritten signature in cursive that reads "Gary R. Hendy". To the right of the signature is a circular professional engineer's stamp. The stamp contains the text "LICENSED PROFESSIONAL ENGINEER" at the top, "GARY R. HENDY" in the center, and "PROVINCE OF ONTARIO" at the bottom. The stamp is divided into two horizontal sections by a line passing through the name.

Gary R. Hendy, P.Eng.
Consulting Engineer

6.0 LIMITATIONS AND USE

This report has been prepared for the exclusive use of SCAL Properties Ltd. for the exclusive use in the evaluation of the area for the proposed development. GAMAN Consultants Inc. accepts no responsibility for any damages incurred by any third party because of decisions made, or actions taken based upon the information contained within this report.

All background information used in the preparation of this report has been relied upon in good faith, and GAMAN does not accept any responsibility for any misstatements, inaccuracies, or deficiencies contained in those documents or records. The information contained in this report should be evaluated, interpreted and implemented only in the context of the assignment.

The findings and conclusions included in this report reflect our best judgement in light of the information available at the time of report preparation and site inspection and are valid only at the date of issuance. If additional information is provided in the future, such as the results of additional site-specific assessments or monitoring, GAMAN will be pleased to re-evaluate our conclusions contained within this report, and issue amendments, as required.

7.0 REFERENCES

Chapman L.J. and Putnam, D.F., 1984

The Physiography of Southern Ontario, 3rd edition;
Ontario Geological Survey Special Volume 2; Ministry of Natural Resources.

Government of Canada

Canadian Climatic Normals 1981-2010

Lake Simcoe Region Conservation Authority, June 2013

Hydrogeological Assessment Submissions, Conservation Authority Guidelines for
Development Applications

Lake Simcoe Region Conservation Authority, March 2000

Shallow Subsurface Characterization to Support Placement for Infiltration Based Low
Impact Development Practices

Ministry of Environment Conservation & Parks

Water Well Records

Ministry of Environment Conservation & Parks

(Revision) Technical Support Document for Ontario Drinking Water Standards,
Objectives and Guidelines, 2006

Ministry of Environment Conservation & Parks, 2003

Ontario Water Resources Act (Regulation 903 Wells)

Ministry of Environment and Energy, 1995

MOEE Hydrogeological Technical Information Requirements for Land Development
Applications, ISBN 0-7778-4340-4, April, Queen's Printer.

Ministry of Environment and Energy, 1996

Procedure D-5-5 – Technical Guideline for Private Wells: Water Supply Assessment.

Oak Ridges Moraine Groundwater Program

FIGURES



NOTES

SITE LOCATION

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For SCAL Properties Ltd

Date: Feb-23 Scale: as shown

Project: 21013.02 Ref No:

GAMAN Consultants Inc.

Figure



SITE STATISTICS (PHASE 2 - 2A)

DESCRIPTION

BLOCK 19, REGISTERED PLAN 65M-2571
PART LOT 20, CONCESSION 4
TOWN OF WHITCHURCH-STOUFFVILLE
REGION OF YORK

RE ZONING REQUEST

'EBP' EMPLOYMENT BUSINESS PARK
SUBJECT LOT (2A) AREA = 1.52 HECTARES
/ 3.75 ACS

PROPOSED BUILDING AREA/GFA/INDOOR
STORAGE = 1456 S.M / 15672 S.F

PROPOSED LANDSCAPED AREA = 7034.6
S.M., 46.2% (10% REQ'D)

PARKING SPACES PROPOSED = 134
SPACES (INCL. 6 B/F SPACES)
PARKING SPACES REQUIRED = 148
SPACES (INCL. 6 B/F SPACES)

SITE STATISTICS (PHASE 2 - 2B)

DESCRIPTION

BLOCK 19, REGISTERED PLAN 65M-2571
PART LOT 20, CONCESSION 4
TOWN OF WHITCHURCH-STOUFFVILLE
REGION OF YORK

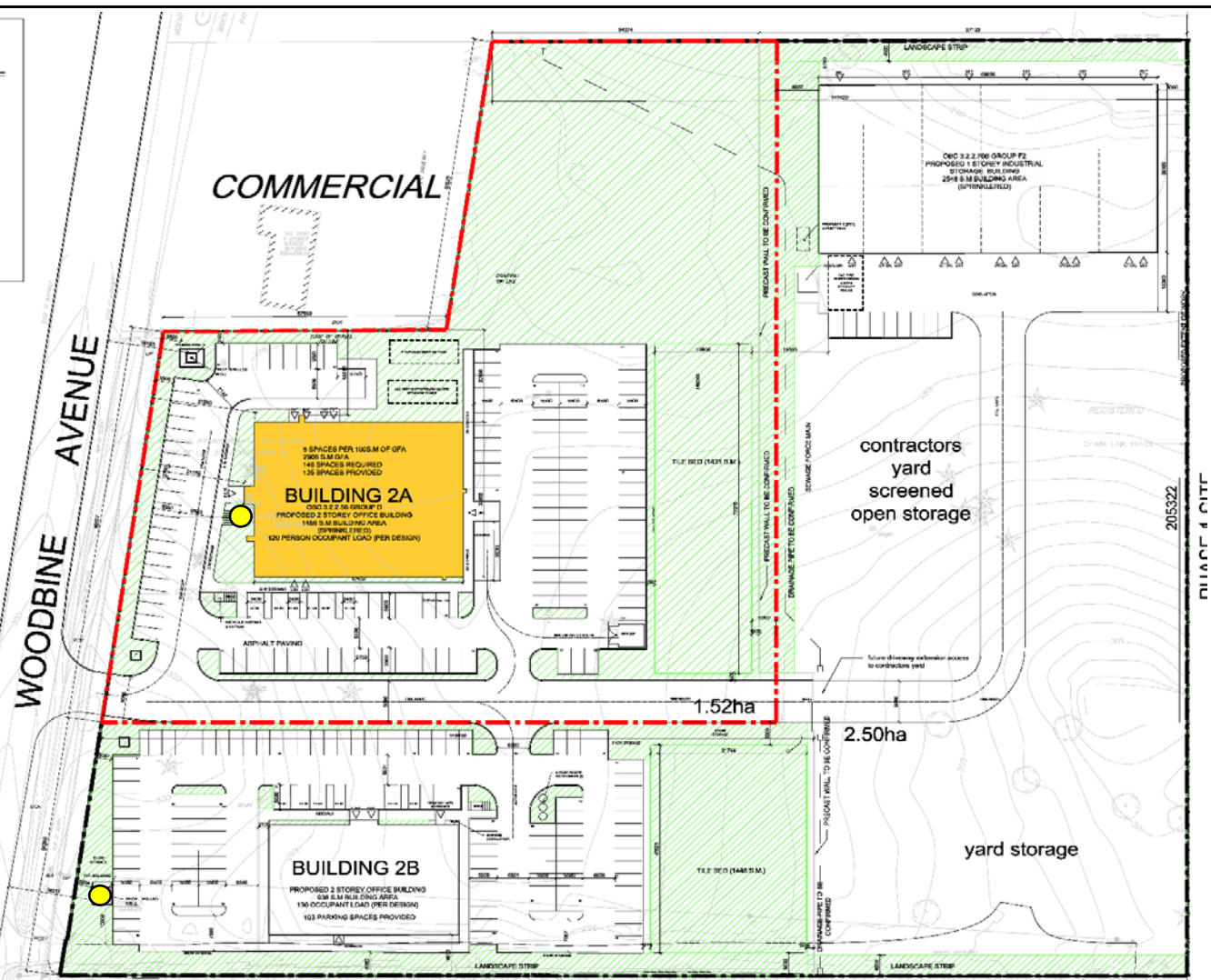
RE-ZONING REQUEST

'EBP' EMPLOYMENT BUSINESS PARK
SUBJECT LOT (2B) AREA = 2.50 HECTARES
/ 6.17 ACS

PROPOSED BUILDING AREA/GFA/INDOOR
STORAGE = 3486 S.M / 37523 S.F

PROPOSED LANDSCAPED AREA = 4260
S.M., 17.0% (10% REQ'D)

PARKING SPACES PROPOSED = 103
SPACES (INCL. 6 B/F SPACES)
PARKING SPACES REQUIRED = 96 SPACES
(INCL. 6 B/F SPACES)



NOTES



Future Drilled Well Locations



Areas where infiltration can occur.

Site Plan

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For Scal Properties Ltd

Date: Feb-23

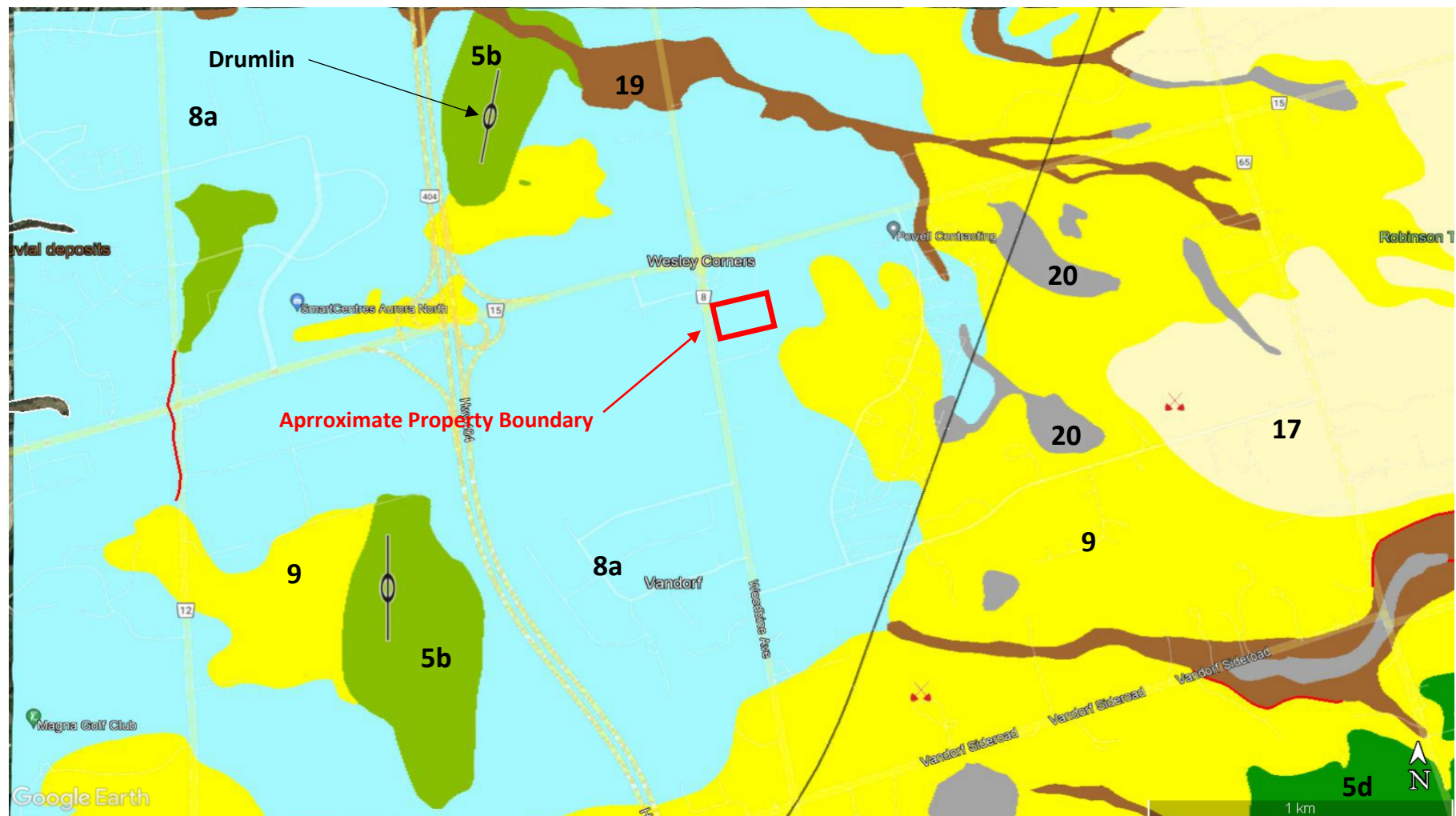
Scale: as shown

Project: 21013.02

Ref No:

GAMAN Consultants Inc.

Figure



NOTES

5b	Sandy silt to silty sand till
5d	Clay to silt textured till
8a	Fine Textured Glaciolacustrine Deposits (silt & clay, trace sand/gravel)
9	Coarse Textured Glaciolacustrine Deposits
17	Fine to very fine sand and silt
19	Modern Alluvial Deposits (gravel sand, silt, clay)
20	Organic Deposits (peat, muck marl)

Surficial Geology

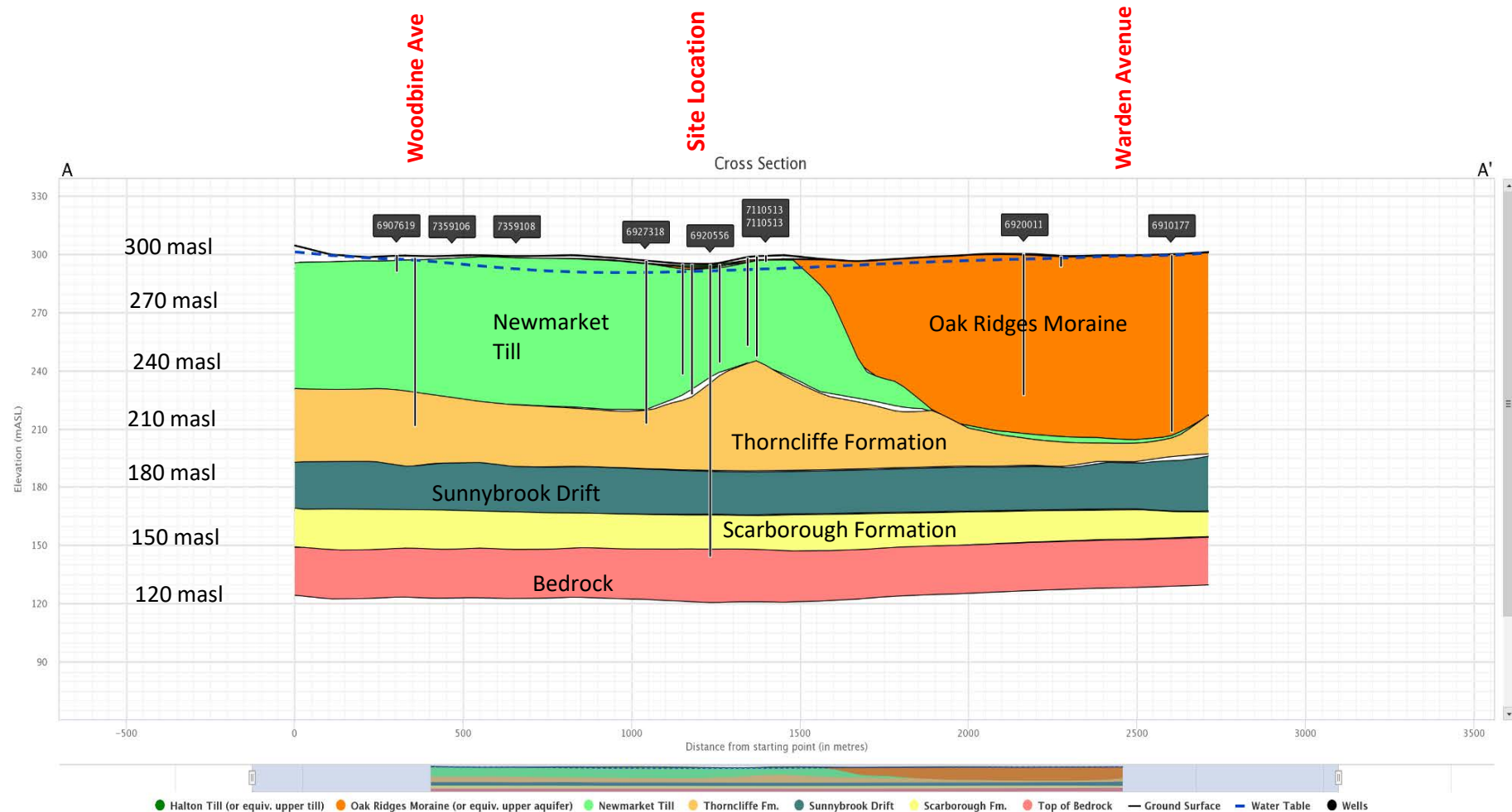
Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For Scal Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

GAMAN Consultants Inc.

Figure

3



NOTES

Source of Information: -Oak Ridges Moraine Groundwater Program



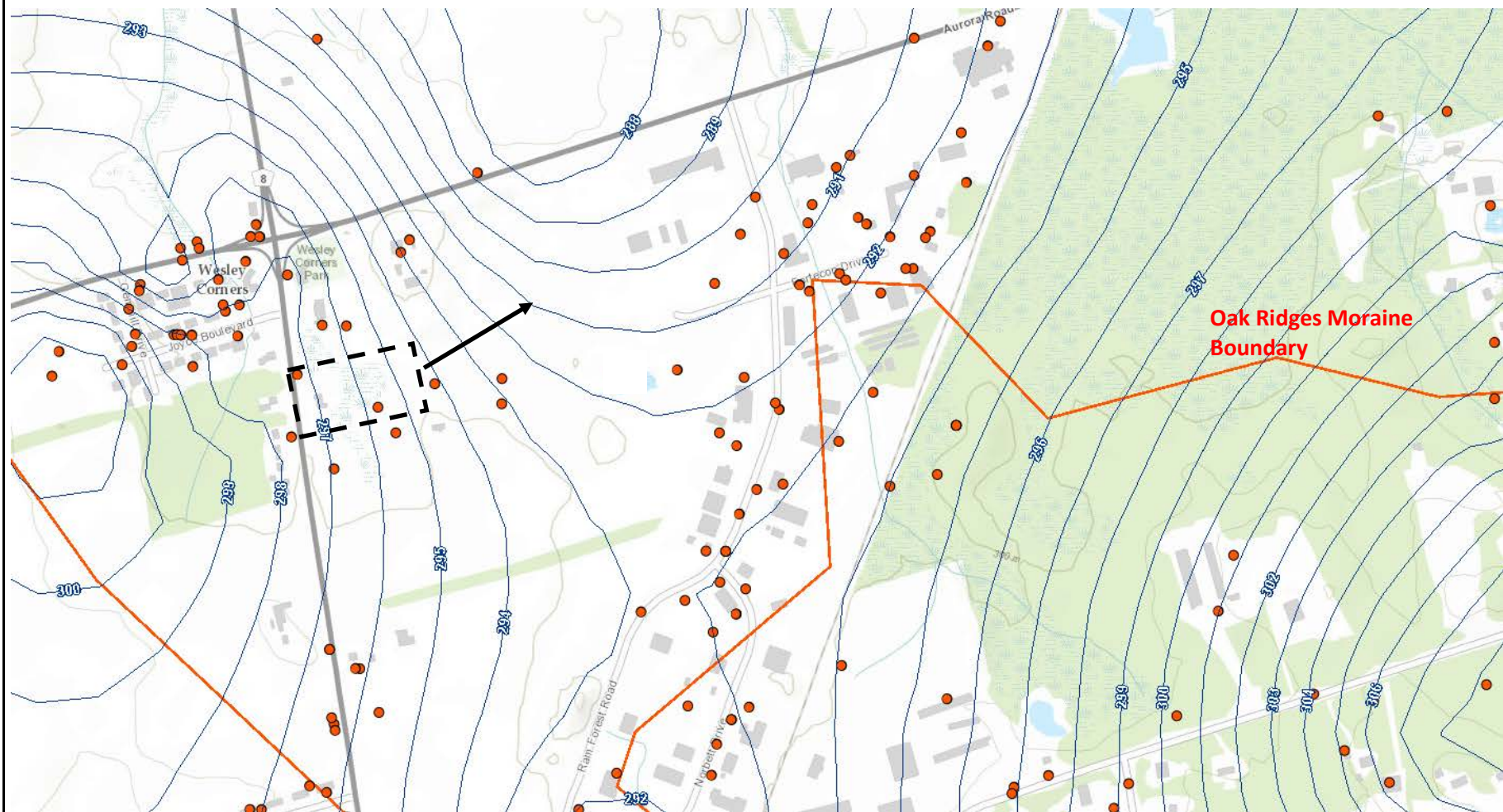
Stratigraphic Cross Section A-A'

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For Scal Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

GAMAN Consultants Inc.

Figure



NOTES

Groundwater Table Elevations -Oak Ridges Moraine Groundwater PGM



Approximate Site Boundary



Interpretation direction of shallow groundwater movement

Shallow Groundwater Movement

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For Scal Properties Ltd

Date: Feb-23

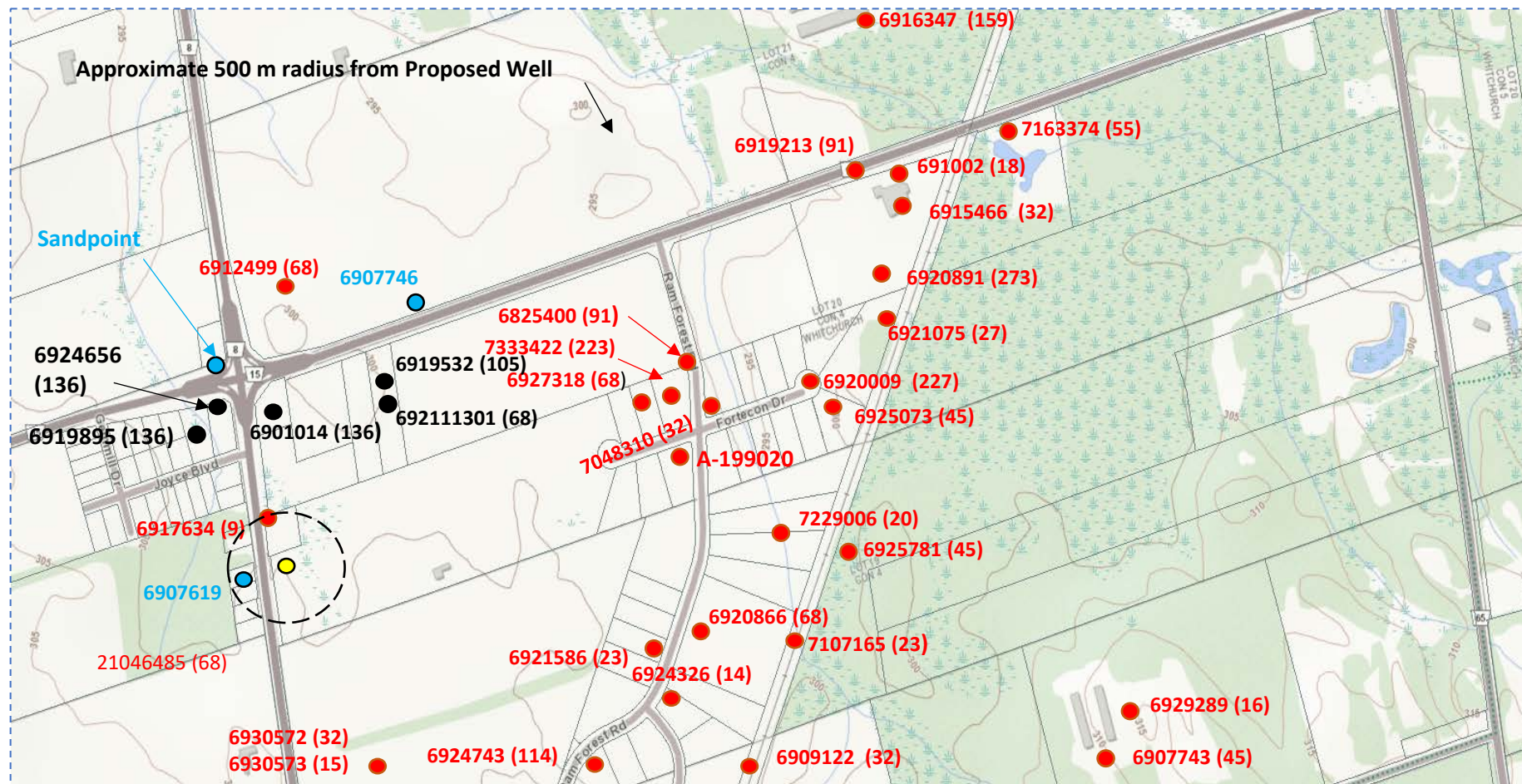
Scale: as shown

Project: 21013.02

Ref No:

GAMAN Consultants Inc.

Figure



NOTES

- Proposed Well Location (approximate)
- Wells terminating Thorncliffe Aquifer Complex (test rate L/min)
- Dug Well
- Drilled Wells Less Than 30m Deep (test rate L/min)

Predicted Zone of Influence to 0.3 metres of drawdown at 9,000 L/day Phase 2A

Water Well Location Map

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For Scal Properties Ltd

Date: Feb-23 Scale: as shown

Project: 21013.02 Ref No:

GAMAN Consultants Inc.

Figure

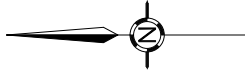
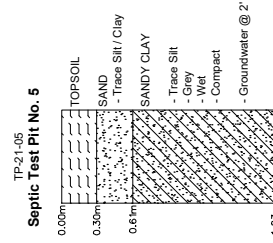
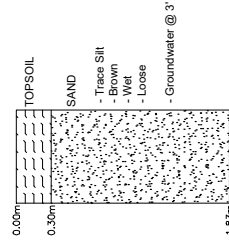
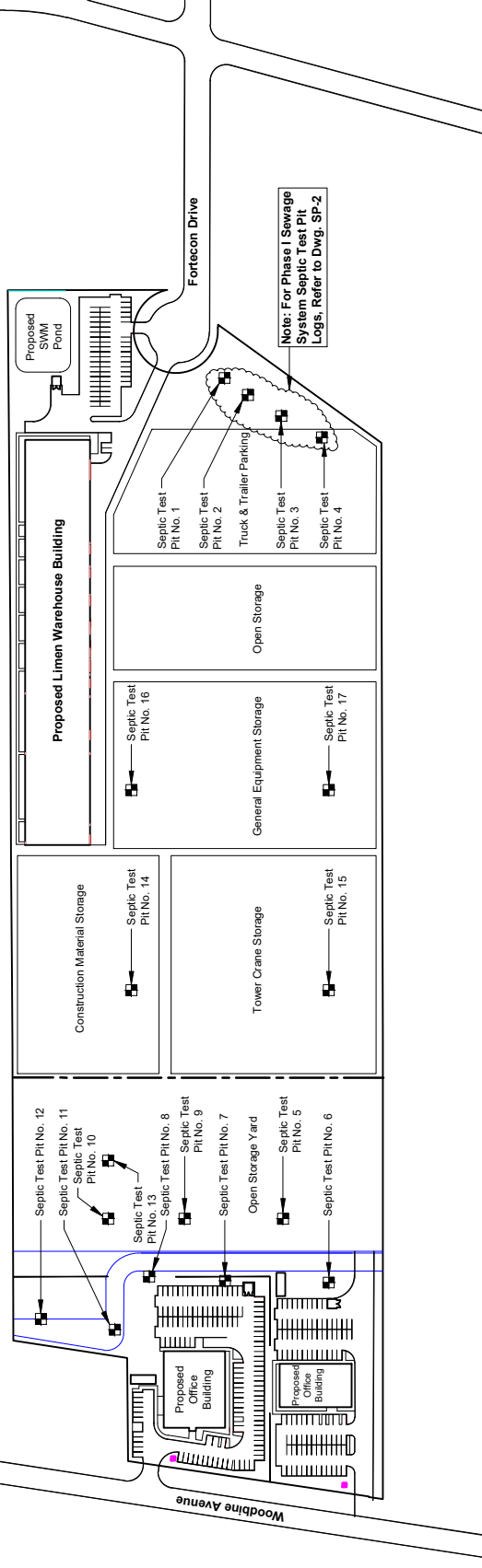
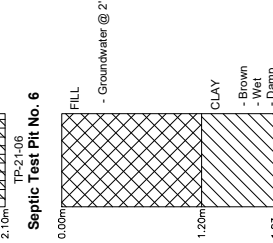
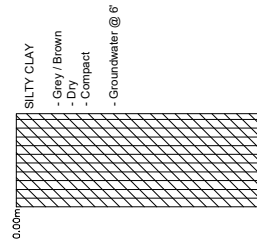


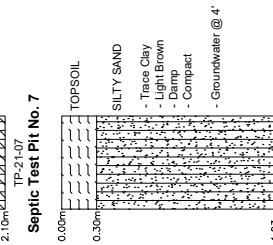
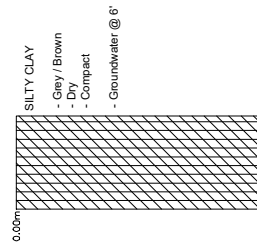
Figure 7: Test Pits



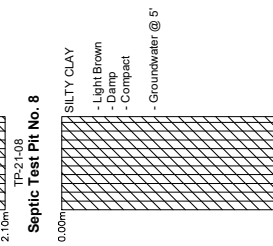
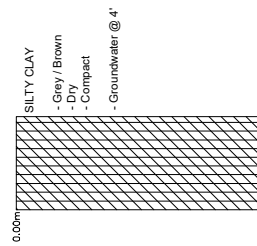
TP-21-11
Septic Test Pit No. 11



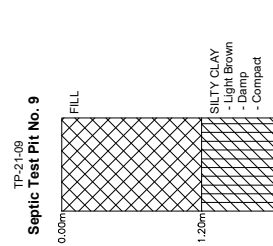
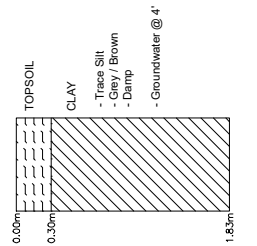
TP-21-12
Septic Test Pit No. 12



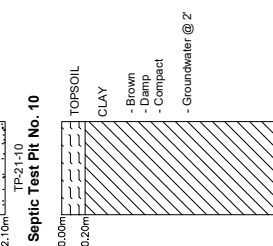
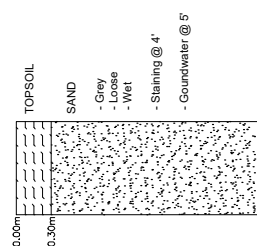
TP-21-13
Septic Test Pit No. 13



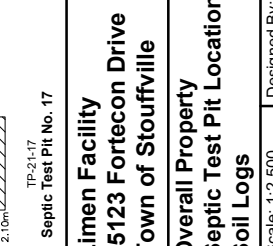
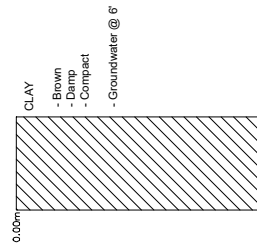
TP-21-14
Septic Test Pit No. 14



TP-21-15
Septic Test Pit No. 15

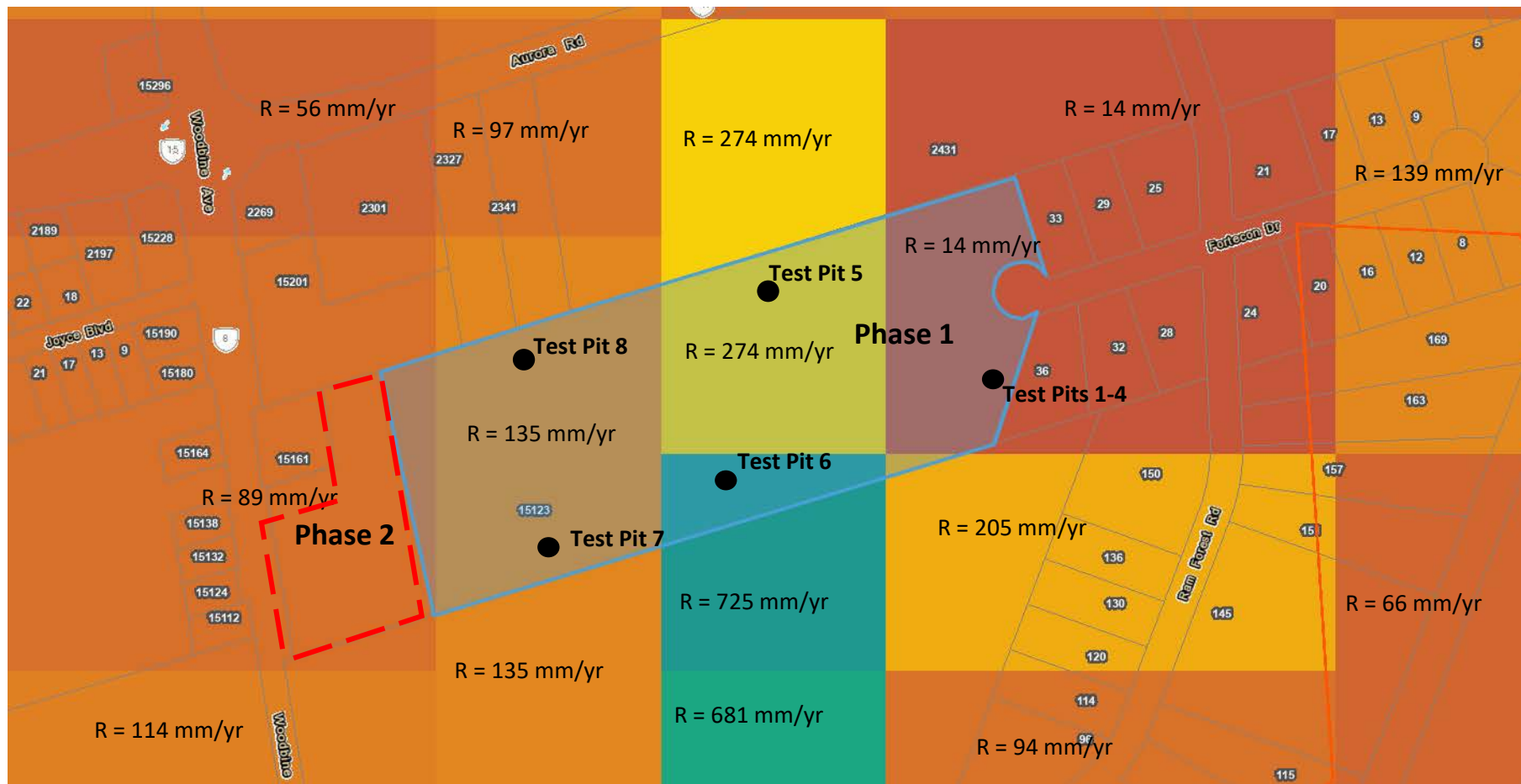


TP-21-16
Septic Test Pit No. 16



TP-21-17
Septic Test Pit No. 17

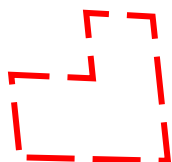
Limen Facility	
15123 Fortecon Drive	
Town of Stouffville	
Overall Property	
Septic Test Pit Locations	
Soil Logs	
Scale: 1:2 500	Designed By: --
Date: 22-NOV-2021	Drawn By: JK
Project No.:	Checked By: --
Drawing No.:	Drawn No.:
D3389	SP-1



NOTES

Source: Oak Ridges Moraine Groundwater Program (2021)

● Test Pit 8 Gunnell Engineering Test Pit Location and Number



Phase 2 Limen Head Office

Recharge Evaluation

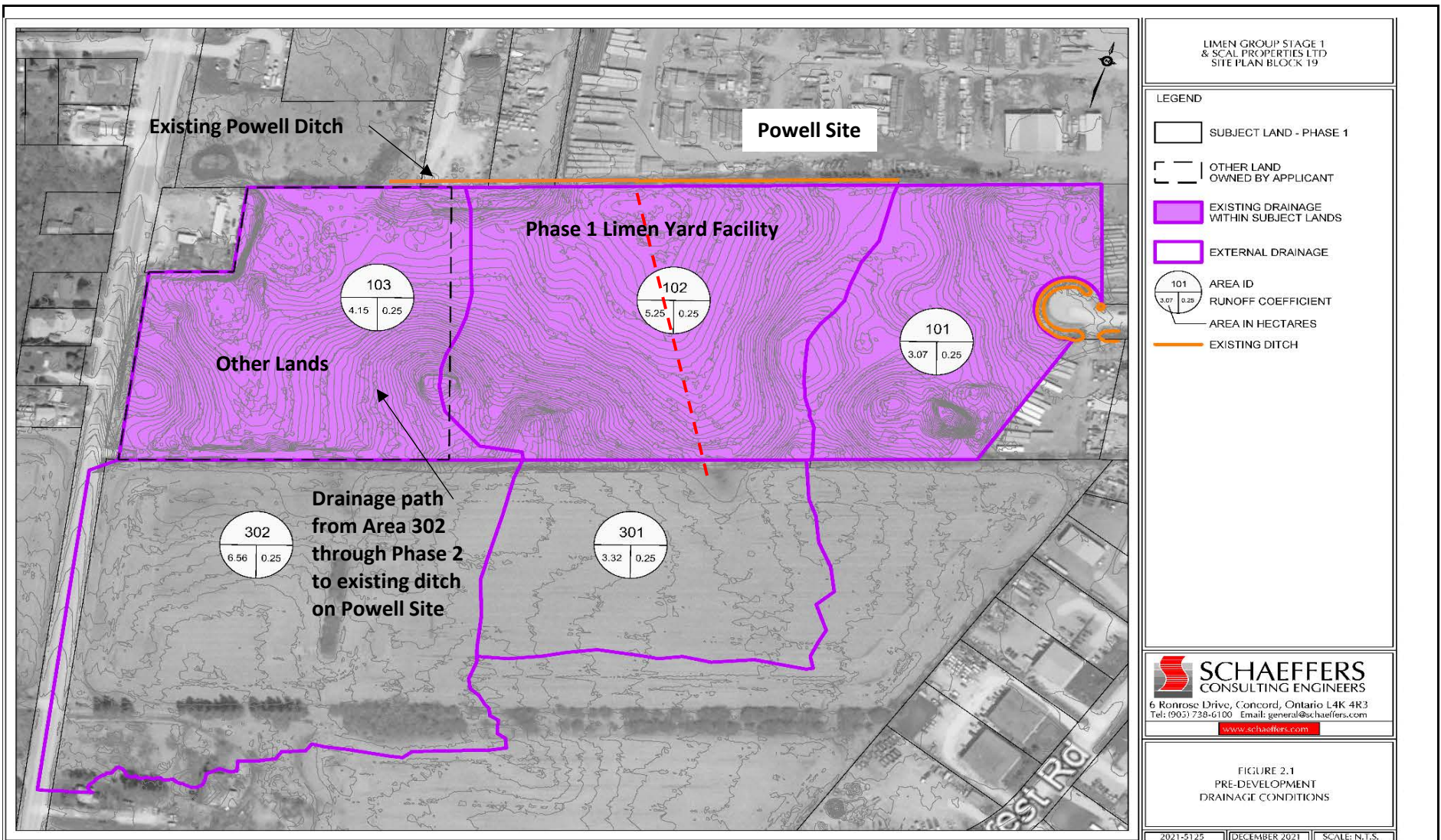
Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For Scal Properties Ltd

Date: Feb-23 Scale: as shown

Project: 21013.02 Ref No:

GAMAN Consultants Inc.

Figure



NOTES	Drainage Areas		
	Water Balance Evaluation, Phase 2 Limen Head Office, 15123 Woodbine Avenue For SCAL Properties Ltd		
	Date:	Feb-23	Scale: as shown
	Project:	21013.02	Ref No:
	GAMAN Consultants Inc.		Figure 9

APPENDICES

APPENDIX A

WELL RECORDS & MONITOR DETAILS

TABLE A-1 MONITOR DETAILS & GROUNDWATER LEVELS**Project: Water Balance Evaluation Limen Head Office****Fortecon Drive (21013.02)**

Monitor Details						15-Sep-21			21-Nov-21			12-Mar-22		
Monitor	Well Depth (mbtoc)	Casing Stickup (magl)	Casing Elev.	Ground Elev.	Depth (mbgl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)
BH1	4.52	0.67	299.34	298.67	3.85	3.28	2.61	296.07	destroyed			destroyed		
BH2	4.69	0.69	298.52	297.52	4.00	1.84	1.15	296.69	2.96	2.27	295.56	0.67	Frozen	
BH3	4.79	0.73	299.00	298.12	4.06	1.78	1.05	297.22	1.04	0.31	297.96	0.73	Frozen	
BH4	6.69	0.70	300.45	299.60	5.99	4.78	4.08	295.67	1.64	0.94	298.81	1.33	0.63	299.12
BH5	5.98	0.78	299.61	298.67	5.20	4.57	3.79	295.04	2.02	1.24	297.59	2.02	1.24	297.59
BH6	5.05	0.81	299.00	298.09	4.24	3.64	2.83	295.36	1.66	0.85	297.34	1.62	0.81	297.38
BH7	6.78	0.90	298.33	297.44	5.88	4.30	3.40	294.03	1.65	0.75	296.68	1.88	0.98	296.45
BH8	6.80	0.67	299.99	299.15	6.13	5.64	4.97	294.35	2.27	1.60	297.72	1.74	1.07	298.25
BH22-1	5.36	0.86	298.26	297.40	4.5							1.03	0.17	297.23
BH22-2	5.36	0.86	297.86	297.00	4.5							1.47	0.61	296.39
BH22-8	5.46	0.96	298.56	297.60	4.5							0.75	Frozen	297.81

Phase 2 Monitor Wells

mbtoc = metres below topp of casing

mbgl - metres below ground level

BH22-1, BH22-2, BH22-8 are Soil-Eng Borehole Monitors and
construction data are from the Draft Borehole Logs

TABLE A-1 MONITOR DETAILS & GROUNDWATER LEVELS**Project: Water Balance Evaluation Limen Head Office****Fortecon Drive (21013.02)**

Monitor Details						24-Apr-22			5-May-22			15-Jun-22		
Monitor	Well Depth (mbtoc)	Casing Stickup (magl)	Casing Elev.	Ground Elev.	Depth (mbgl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)
BH1	4.52	0.67	299.34	298.67	3.85	destroyed			destroyed			destroyed		
BH2	4.69	0.69	298.52	297.52	4.00	0.95	0.26	297.57	1.24	0.55	297.28	1.19	0.50	297.33
BH3	4.79	0.73	299.00	298.12	4.06	0.91	0.18	298.09	0.93	0.20	298.07	1.10	0.37	297.90
BH4	6.69	0.70	300.45	299.60	5.99	1.51	0.81	298.94	1.42	0.72	299.03	1.59	0.89	298.86
BH5	5.98	0.78	299.61	298.67	5.20	1.62	0.84	297.99	1.72	0.94	297.89	2.27	1.49	297.34
BH6	5.05	0.81	299.00	298.09	4.24	1.47	0.66	297.53	1.78	0.97	297.22	1.98	1.17	297.02
BH7	6.78	0.90	298.33	297.44	5.88	1.22	0.32	297.11	1.31	0.41	297.02	2.18	1.28	296.15
BH8	6.80	0.67	299.99	299.15	6.13	1.35	0.68	298.64	1.43	0.76	298.56	1.89	1.22	298.10
BH22-1	5.36	0.86	298.26	297.40	4.5	1.09	0.23	297.18	1.14	0.28	297.12	1.44	0.58	296.82
BH22-2	5.36	0.86	297.86	297.00	4.5	1.20	0.34	296.66	1.21	0.35	296.65	1.35	0.49	296.51
BH22-8	5.46	0.96	298.56	297.60	4.5	0.99	0.03	297.57	1.04	0.08	297.52	1.01	0.05	297.55

Phase 2 Monitor Wells

mbtoc = metres below topp of casing

mbgl - metres below ground level

BH22-1, BH22-2, BH22-8 are Soil-Eng Borehole Monitors and
construction data are from the Draft Borehole Logs

TABLE A-1 MONITOR DETAILS & GROUNDWATER LEVELS

Project: Water Balance Evaluation Limen Head Office
Fortecon Drive (21013.02)

Monitor Details						24-Oct-22			10-Dec-22		
Monitor	Well Depth (mbtoc)	Casing Stickup (magl)	Casing Elev.	Ground Elev.	Depth (mbgl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)
BH1	4.52	0.67	299.34	298.67	3.85	destroyed			destroyed		
BH2	4.69	0.69	298.52	297.52	4.00	3.09	2.40	295.43	2.36	1.67	296.16
BH3	4.79	0.73	299.00	298.12	4.06	3.33	2.60	295.67	2.47	1.74	296.53
BH4	6.69	0.70	300.45	299.60	5.99	dry	dry	dry	6.12	dry	dry
BH5	5.98	0.78	299.61	298.67	5.20	5.39	4.61	294.22	4.12	3.34	295.49
BH6	5.05	0.81	299.00	298.09	4.24	dry	dry	dry	na	na	na
BH7	6.78	0.90	298.33	297.44	5.88	dry	dry	dry	dry	dry	dry
BH8	6.80	0.67	299.99	299.15	6.13	dry	dry	dry	dry	dry	dry
BH22-1	5.36	0.86	298.26	297.40	4.5	3.72	2.86	294.54	4.12	3.26	294.14
BH22-2	5.36	0.86	297.86	297.00	4.5	5.11	4.25	292.75	2.96	2.10	294.90
BH22-8	5.46	0.96	298.56	297.60	4.5	2.95	1.99	295.61	2.02	1.06	296.54

Phase 2 Monitor Wells

mbtoc = metres below topp of casing

mbgl - metres below ground level

BH22-1, BH22-2, BH22-8 are Soil-Eng Borehole Monitors and construction data are from the Draft Borehole Logs

JOB NO.: 2109-S177

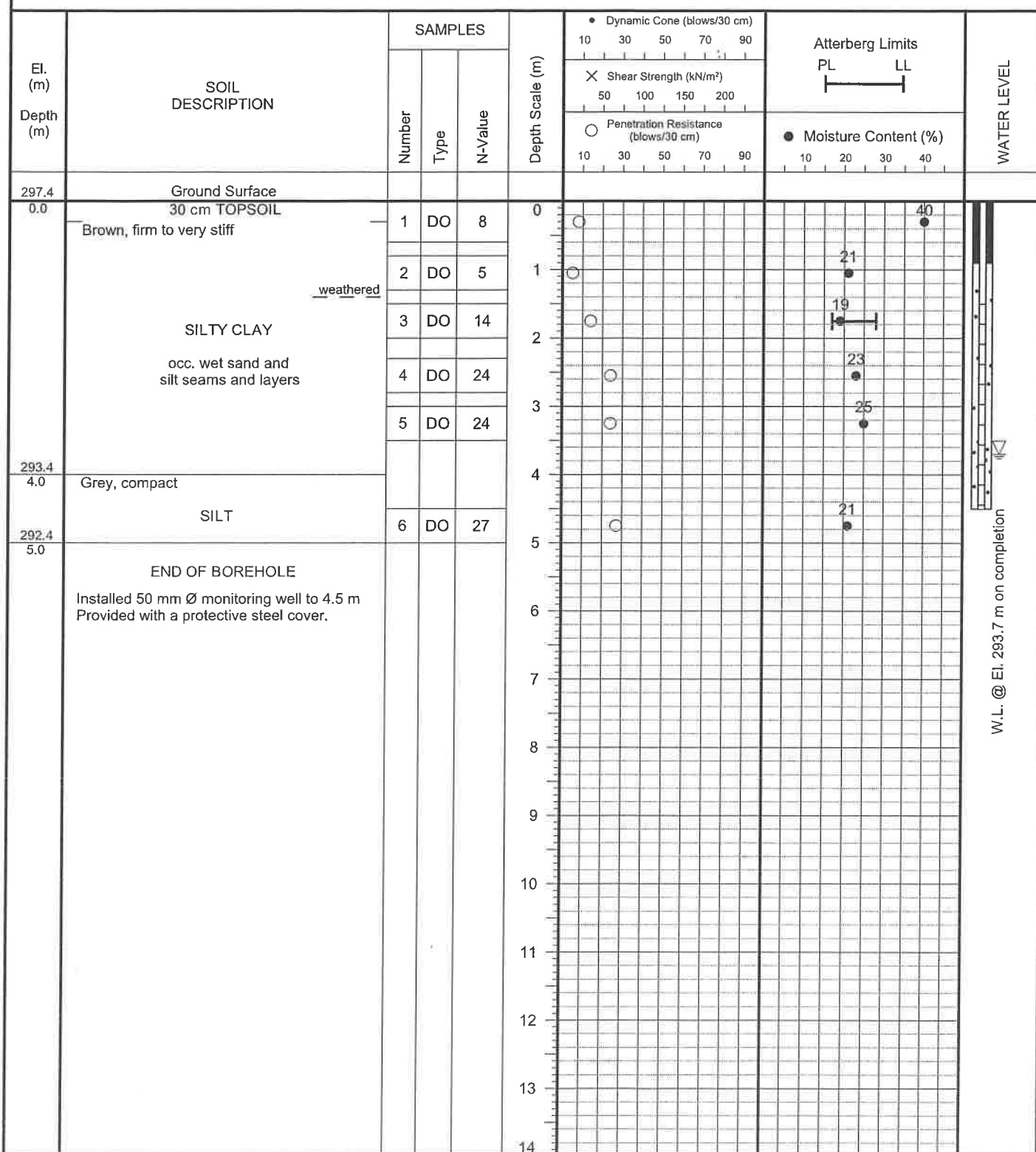
LOG OF BOREHOLE NO.: 1

FIGURE NO.: 1

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022

**Soil Engineers Ltd.**

JOB NO.: 2109-S177

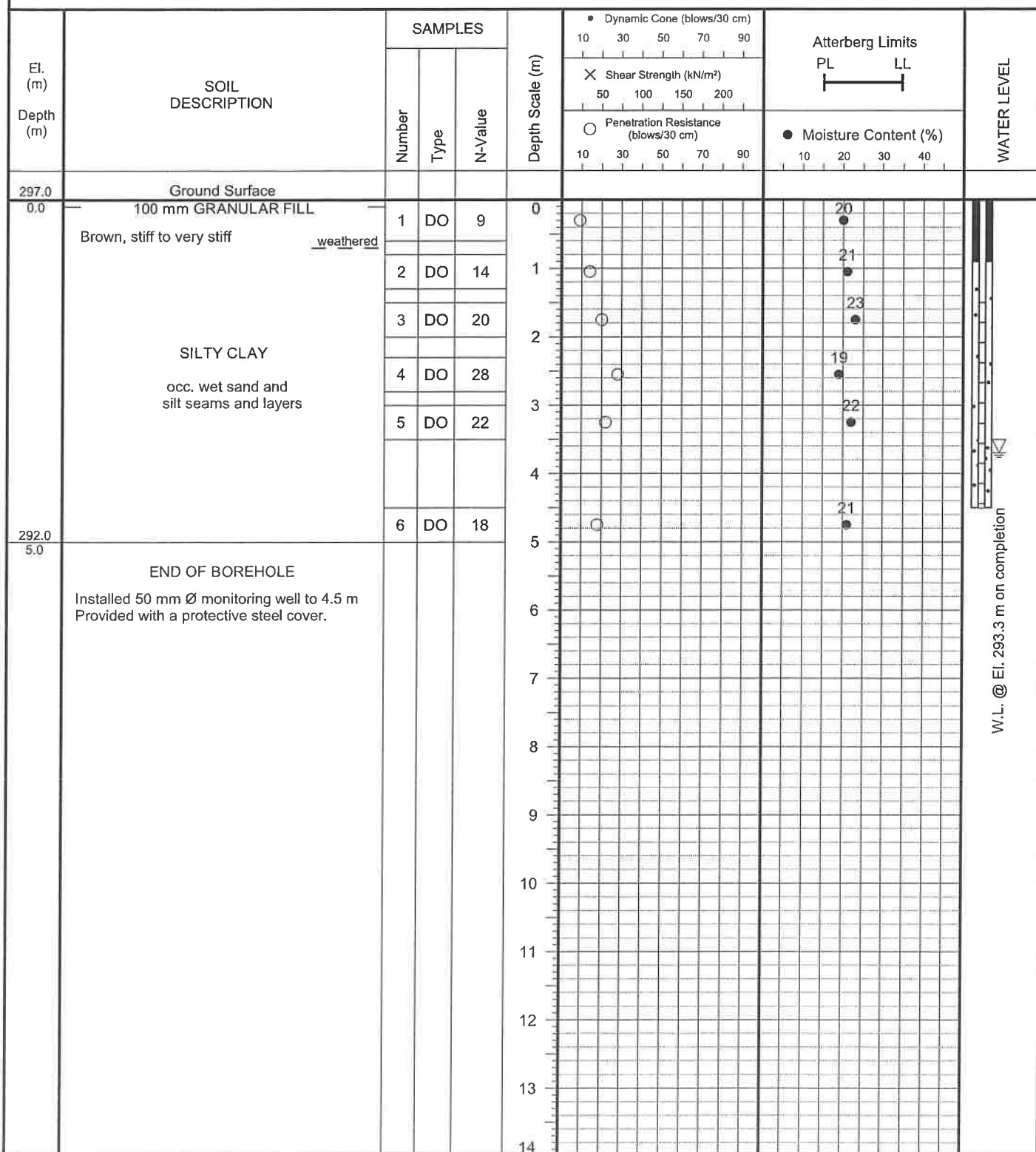
LOG OF BOREHOLE NO.: 2

FIGURE NO.: 2

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: December 10, 2021

**Soil Engineers Ltd.**

JOB NO.: 2109-S177

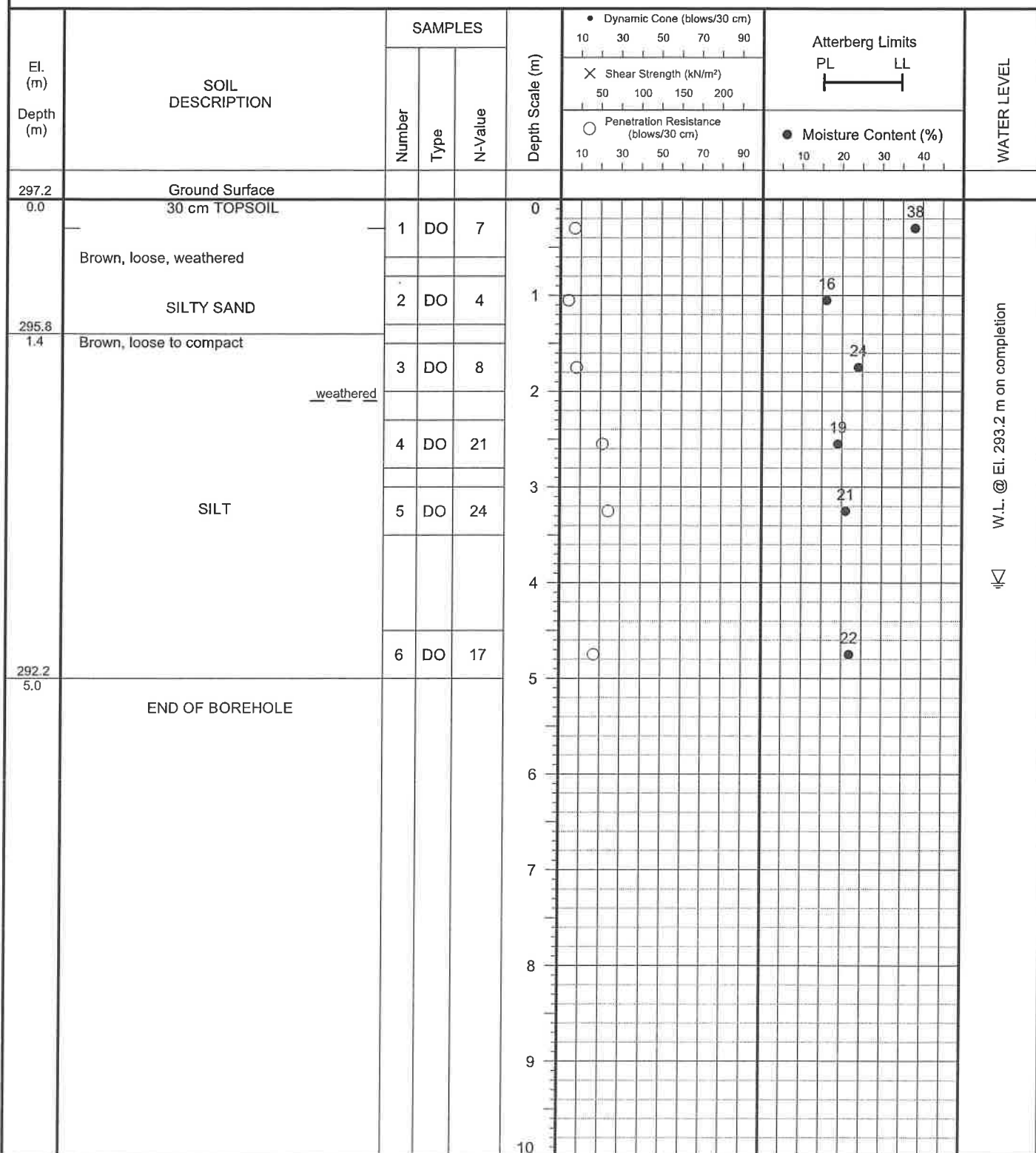
LOG OF BOREHOLE NO.: 3

FIGURE NO.: 3

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022

**Soil Engineers Ltd.**

JOB NO.: 2109-S177

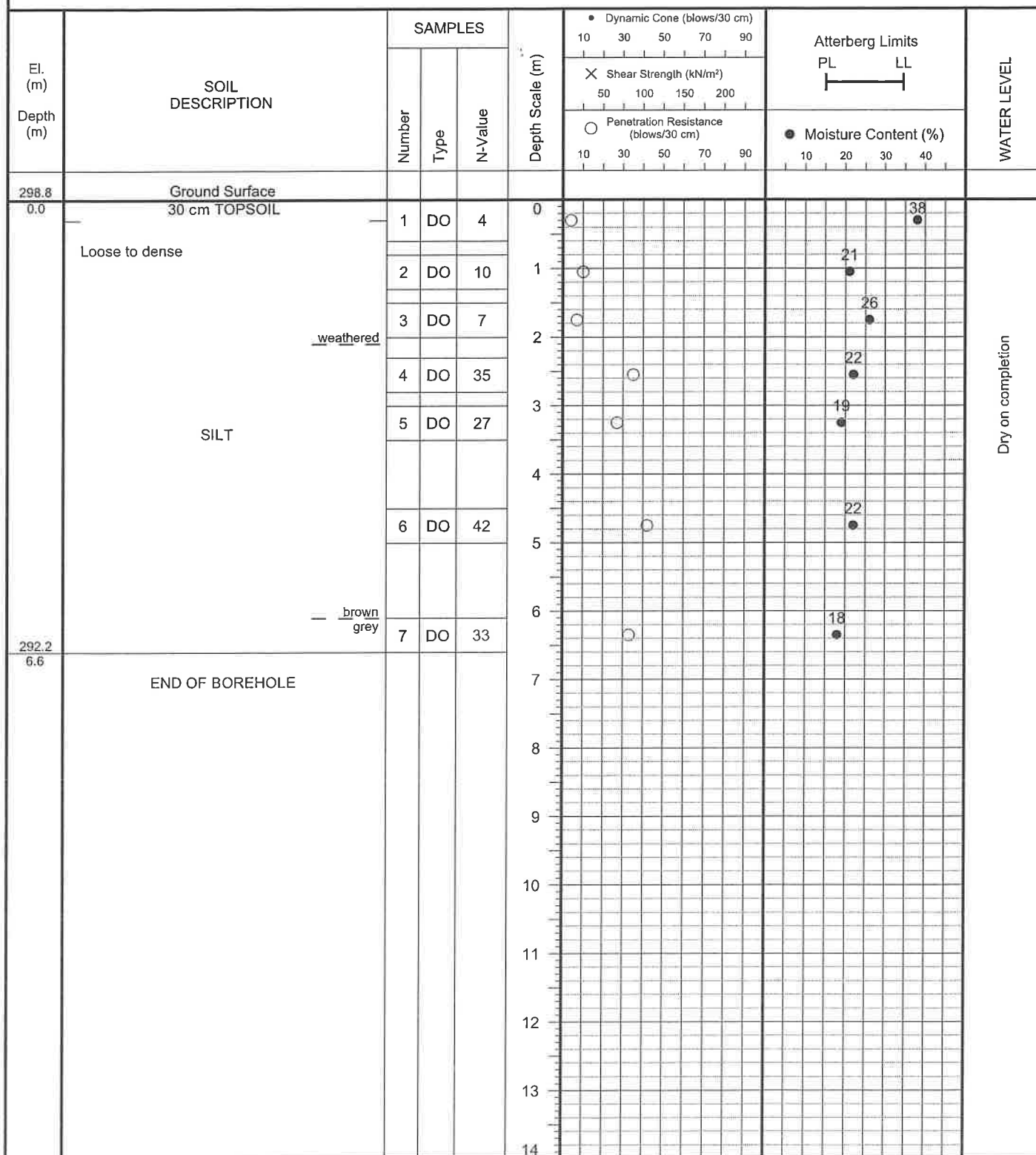
LOG OF BOREHOLE NO.: 4

FIGURE NO.: 4

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022



Soil Engineers Ltd.

JOB NO.: 2109-S177

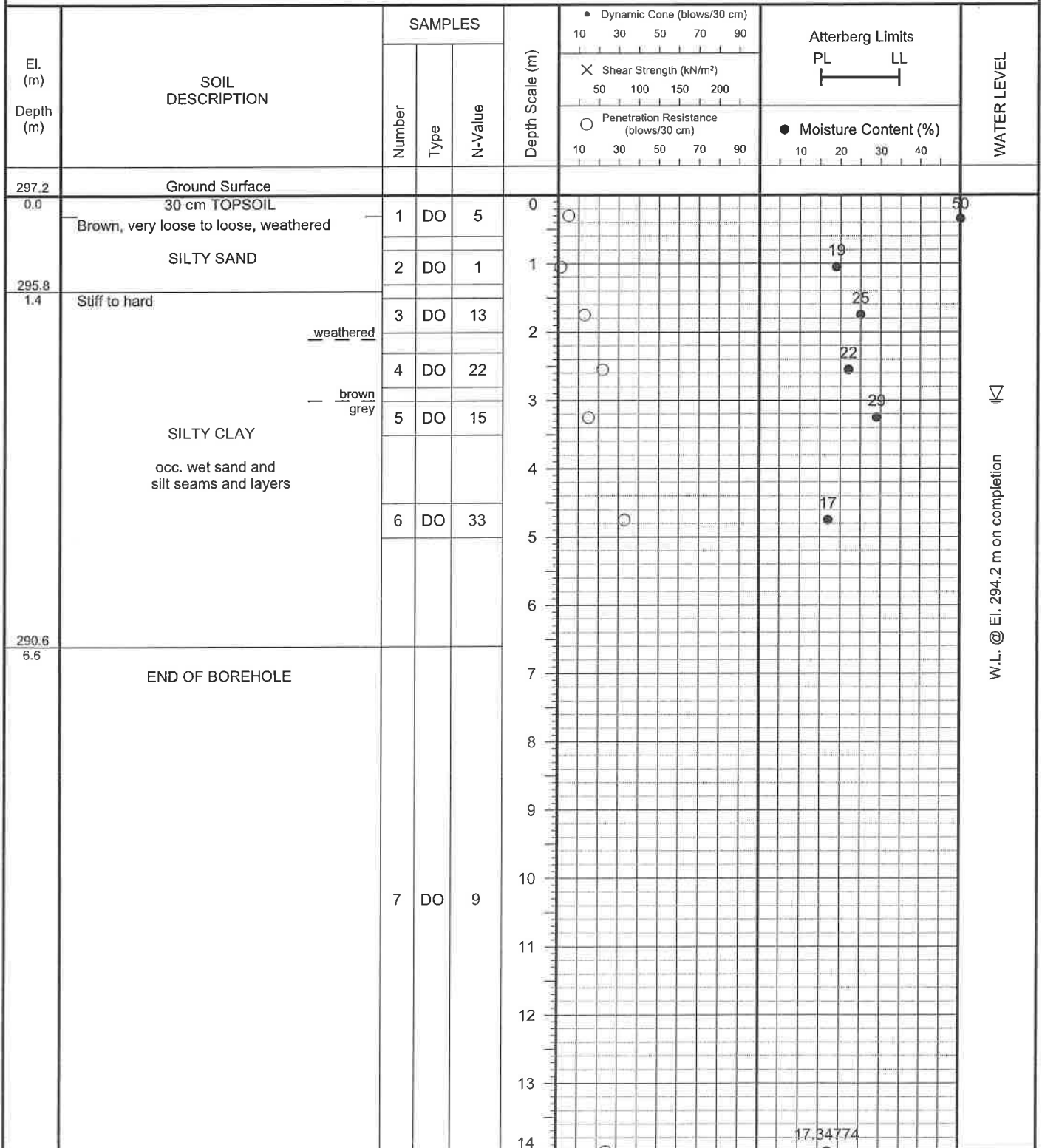
LOG OF BOREHOLE NO.: 5

FIGURE NO.: 5

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022

**Soil Engineers Ltd.**

JOB NO.: 2109-S177

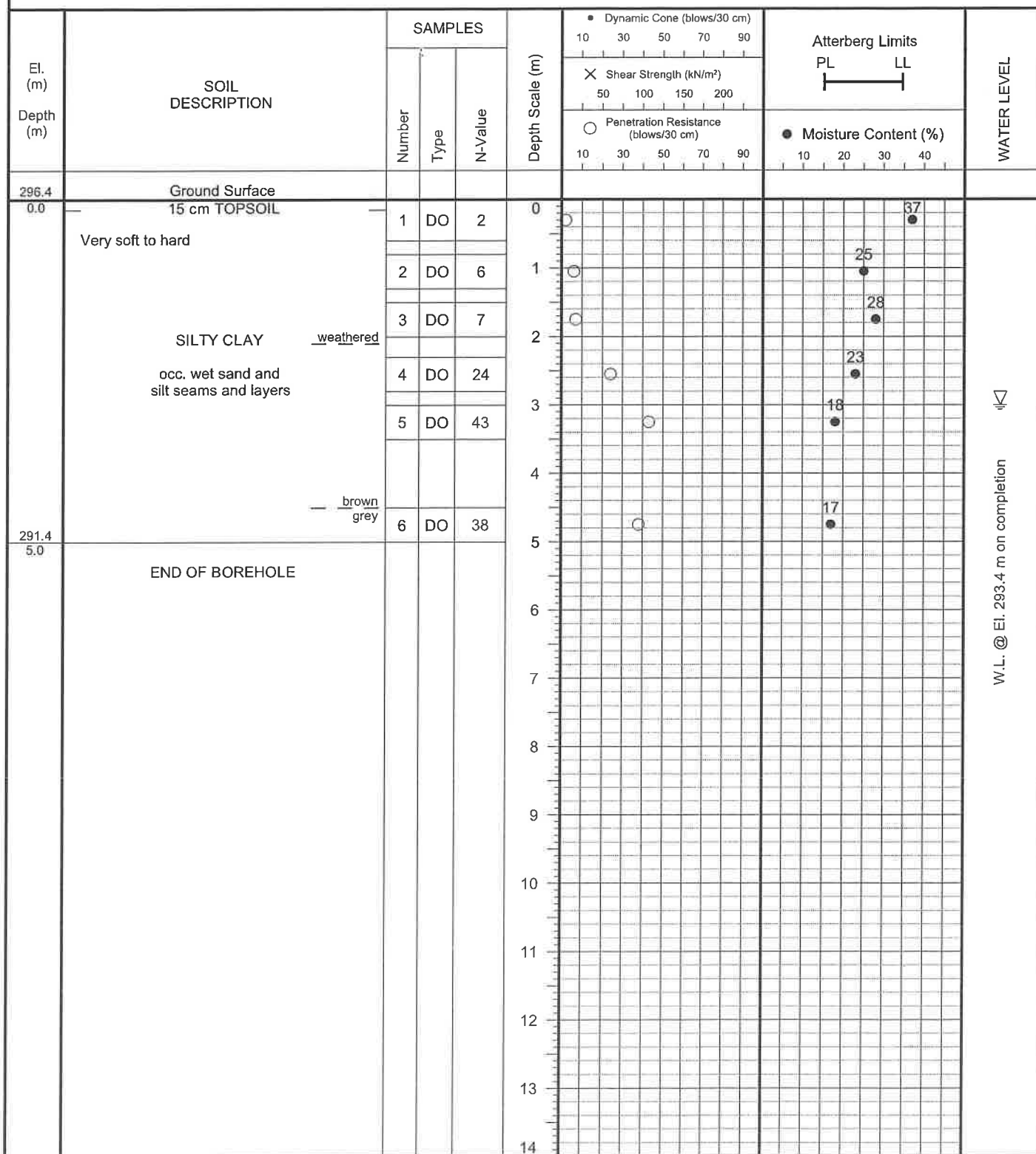
LOG OF BOREHOLE NO.: 6

FIGURE NO.: 6

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022

**Soil Engineers Ltd.**

JOB NO.: 2109-S177

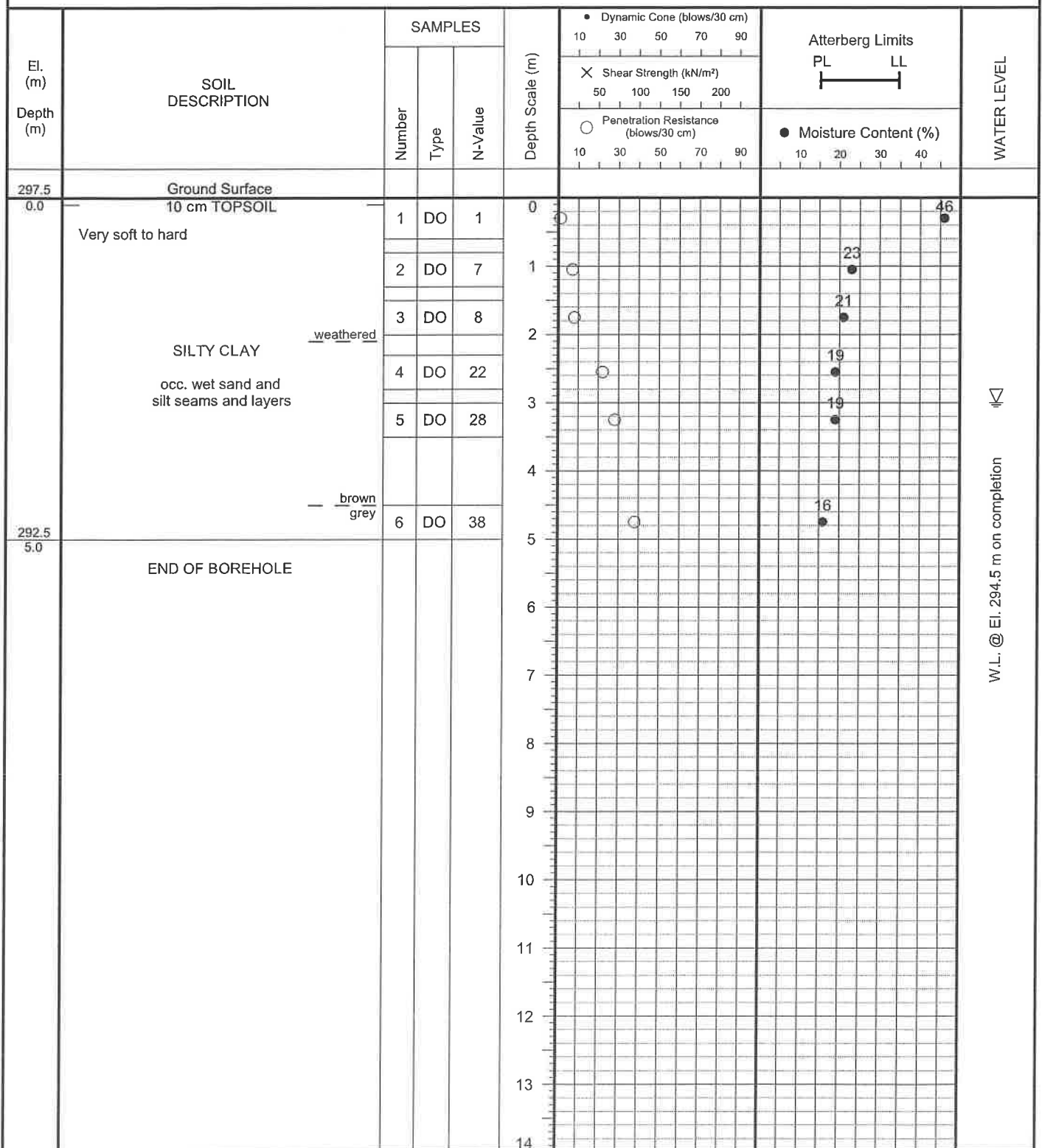
LOG OF BOREHOLE NO.: 7

FIGURE NO.: 7

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022

**Soil Engineers Ltd.**

JOB NO.: 2109-S177

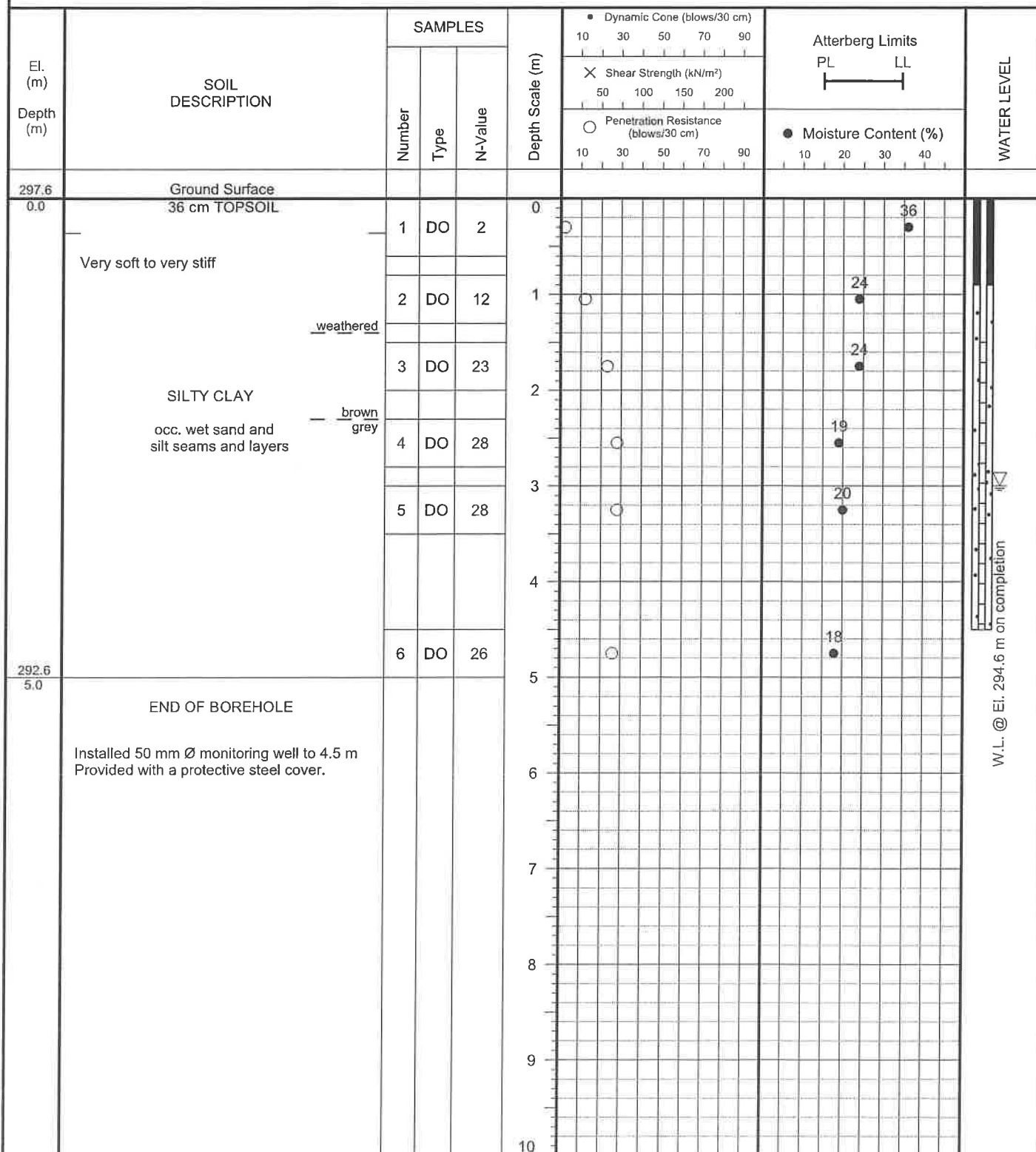
LOG OF BOREHOLE NO.: 8

FIGURE NO.: 8

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 2022

**Soil Engineers Ltd.**

JOB NO.: 2109-S177

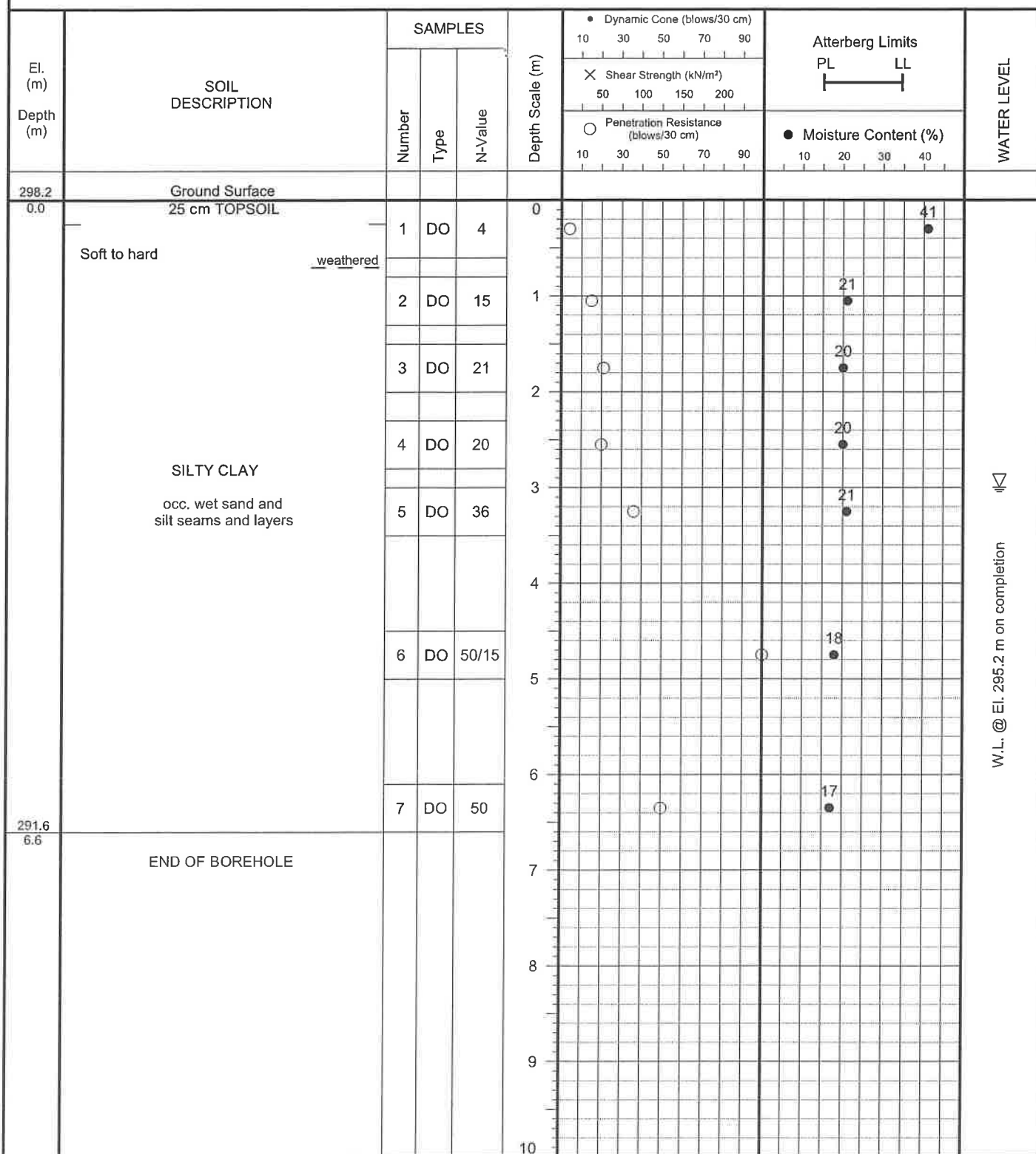
LOG OF BOREHOLE NO.: 9

FIGURE NO.: 9

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 2022

**Soil Engineers Ltd.**

JOB NO.: 2109-S177

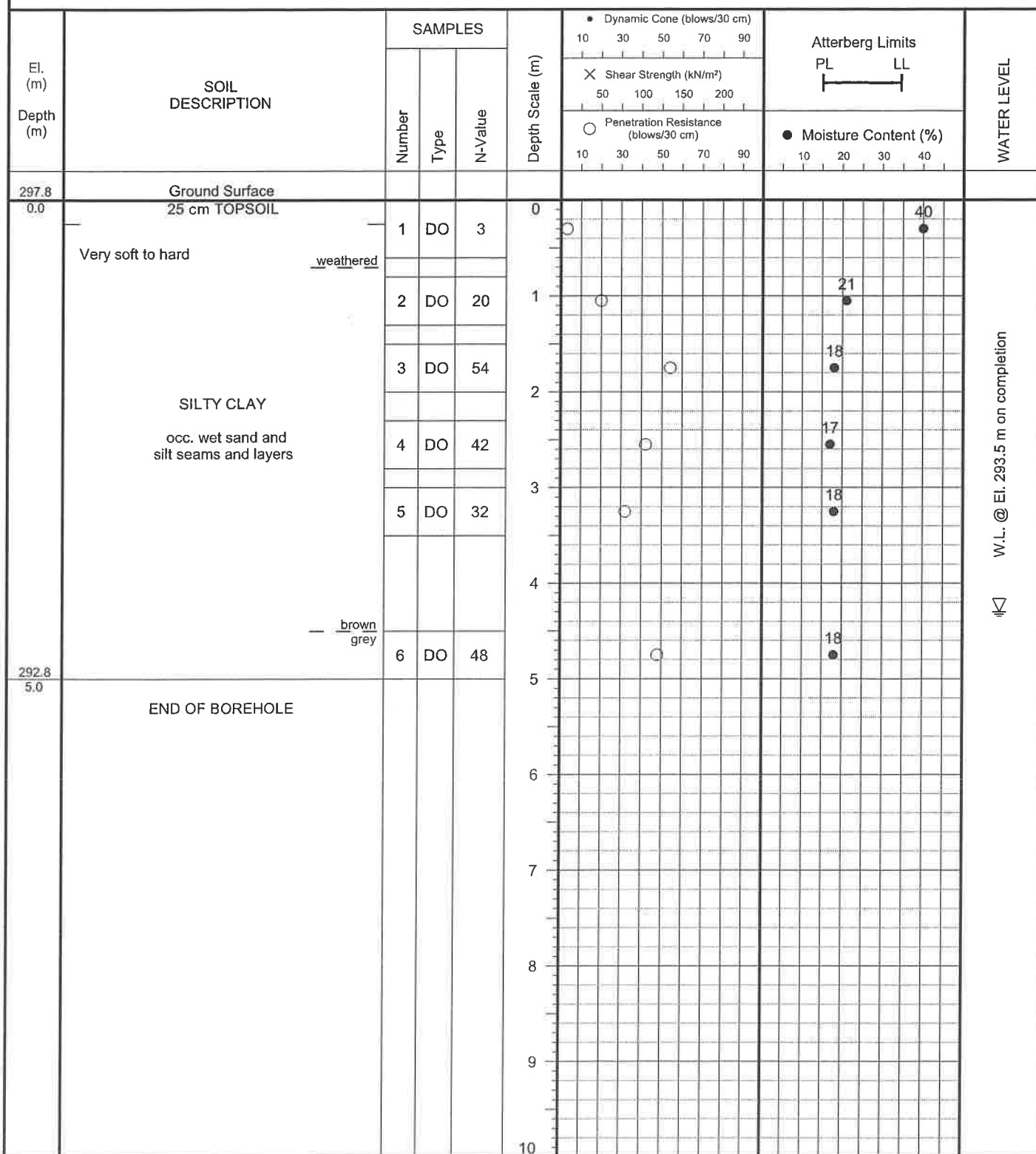
LOG OF BOREHOLE NO.: 10

FIGURE NO.: 10

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 2022

**Soil Engineers Ltd.**

JOB NO.: 2109-S177

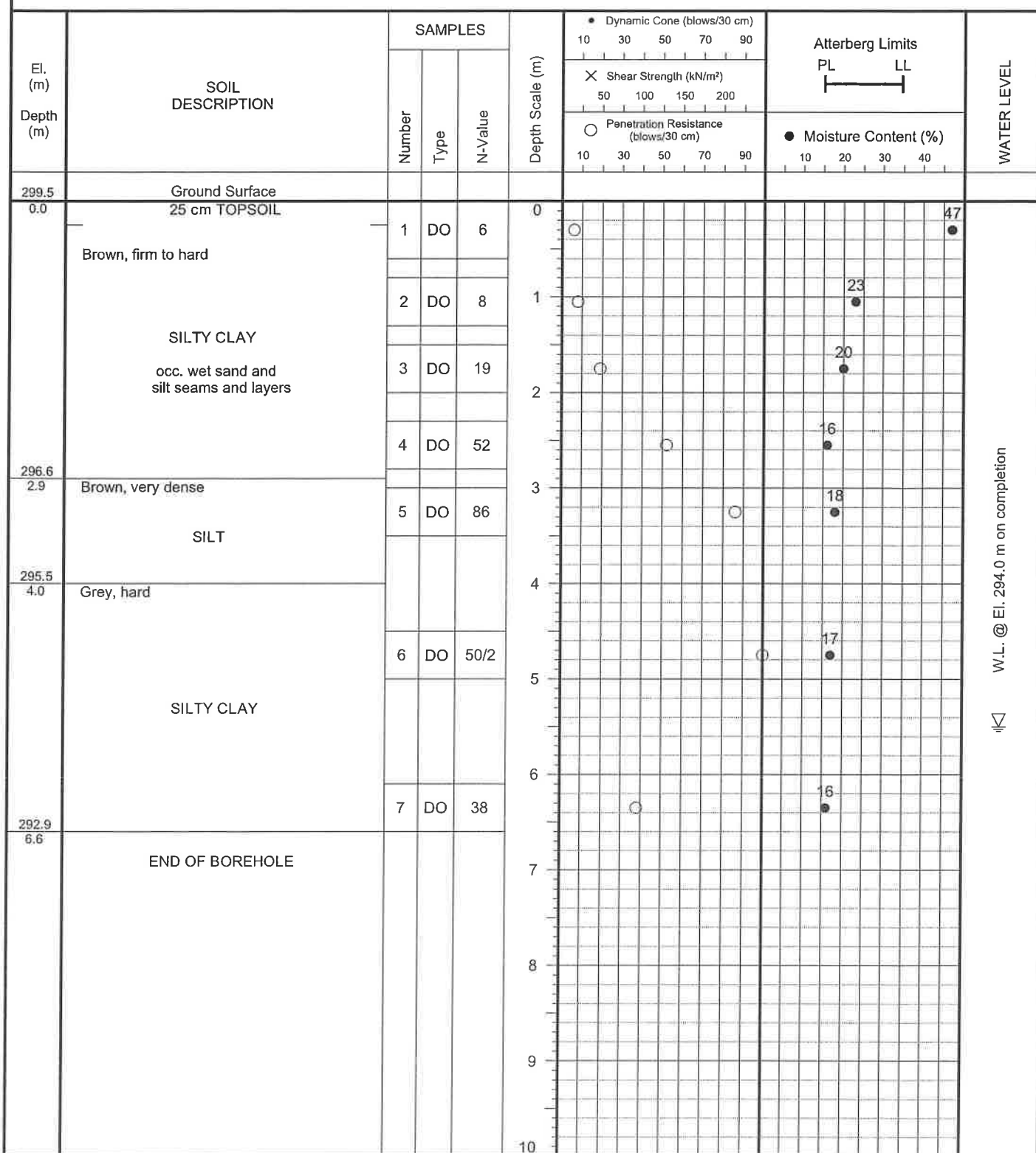
LOG OF BOREHOLE NO.: 11

FIGURE NO.: 11

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 2022

**Soil Engineers Ltd.**

JOB NO.: 2109-S177

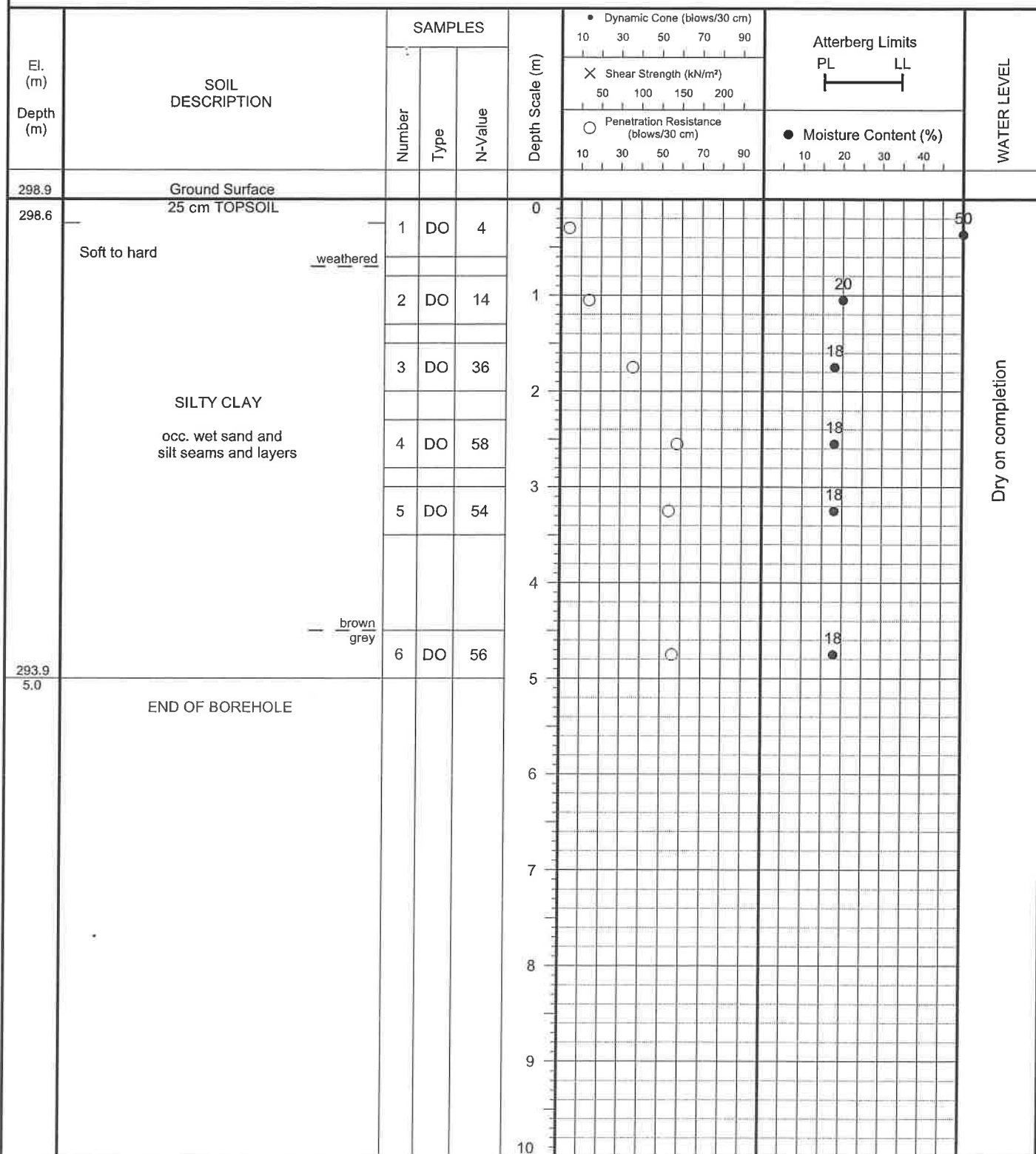
LOG OF BOREHOLE NO.: 12

FIGURE NO.: 12

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 2022

**Soil Engineers Ltd.**

JOB NO.: 2109-S177

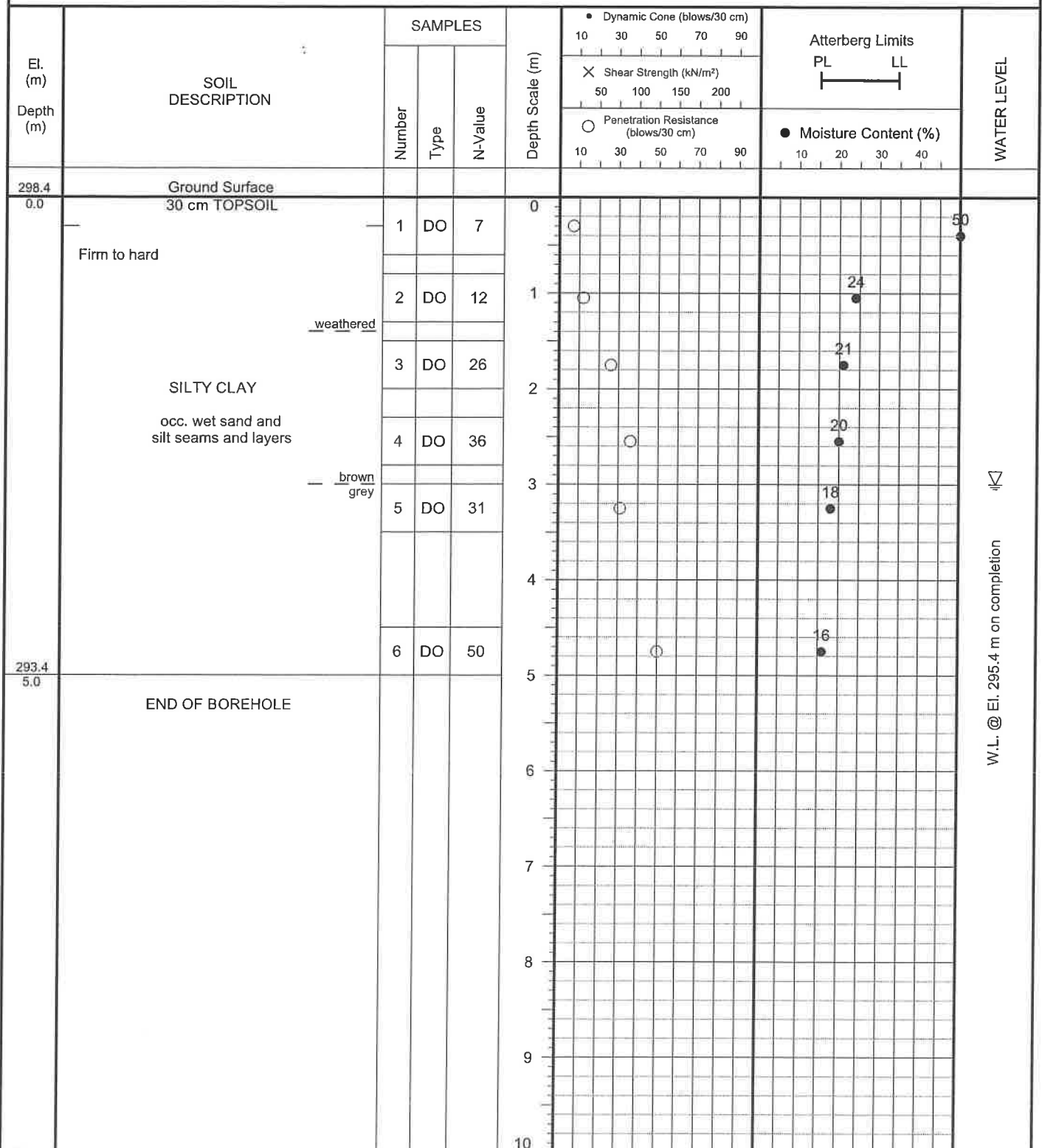
LOG OF BOREHOLE NO.: 13

FIGURE NO.: 13

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 2022

**Soil Engineers Ltd.**

Measurements recorded in: ☐ Metric ☒ Imperial

A199020

Page 1 of 1

Well Owner's Information

First Name Powell	Last Name/Organization Foundations	E-mail Address	☐ Well Constructed by Well Owner
Mailing Address (Street Number/Name) 28 Fortecon Dr.		Municipality Stouffville	Province ON
		Postal Code 44A2G8	Telephone No. (inc. area code)

Well Location

Address of Well Location (Street Number/Name) 28 Fortecon Dr		Township Whitchurch	Lot 19	Concession 4
County/District/Municipality York		City/Town/Village Whitchurch	Province Ontario	Postal Code
UTM Coordinates Zone 17	Easting 629379	Northing 4874748	Municipal Plan and Sublot Number	
NAD 83		Other		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m)	Depth (ft)
Grey	Fill		Packed	0	2
Brown	Clay	Stones	Hard	2	17
Grey	Clay	Silt	Soft, Layered	17	113
Grey	Clay	Stones	Hard, Packed	113	192
Grey	Medium Sand	Stones	Loose	192	198

Annular Space

Depth Set at (m)	From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³)
0	20		Bentonite Slurry	7.86

Results of Well Yield Testing

After test of well yield, water was:		Draw Down		Recovery	
☒ Clear and sand free	☐ Other, specify	Time (min)	Water Level (m)	Time (min)	Water Level (m)
If pumping discontinued, give reason:		Static Level	114.0		
Pump intake set at (m) 180		1	117.7	1	129.5
Pumping rate (l/min / GPM) 10		2	119.6	2	128.2
Duration of pumping 1 hrs + min		3	120.8	3	127.8
Final water level end of pumping (m) 130.6		4	121.6	4	126.1
If flowing give rate (l/min/GPM)		5	122.2	5	124.9
Recommended pump depth (m/ft) 185		10	124.2	10	117.6
Recommended pump rate (l/min/GPM) 10		15	125.5	15	114.0
Well production (l/min/GPM) 14		20	126.5	20	114.0
Disinfected? ☒ Yes ☐ No		25	127.3	25	114.0
		30	127.9	30	114.0
		40	129.0	40	11
		50	129.9	50	11
		60	130.6	60	11

Method of Construction

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

Well Use

Construction Record - Casing

Inside Diameter (cm)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm)	Depth (m)		Status of Well
			From	To	
6	Steel	1.88	0	192	☒ Water Supply
					☐ Replacement Well
					☐ Test Hole
					☐ Recharge Well
					☐ Dewatering Well
					☐ Observation and/or Monitoring Hole
					☐ Alteration (Construction)
					☐ Abandoned, Insufficient Supply
					☐ Abandoned, Poor Water Quality
					☐ Abandoned, other, specify
					☐ Other, specify

Construction Record - Screen

Outside Diameter (cm)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m)		Status of Well
			From	To	
5	Stainless Steel	10	192	198	☐ Other, specify

Water Details

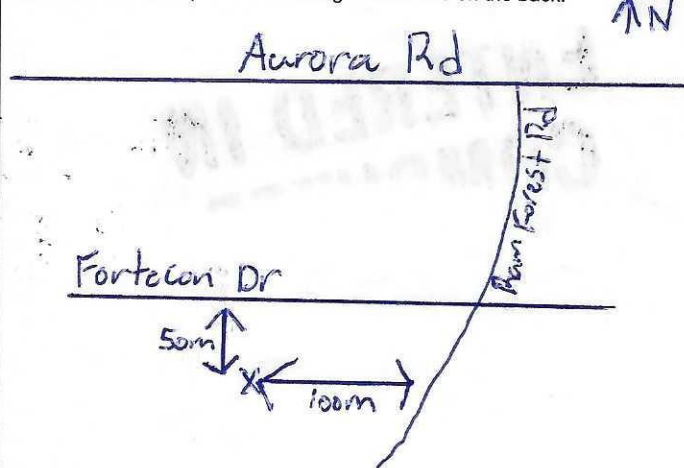
Water found at Depth (m)	Kind of Water:	Hole Diameter
192 (m)	☐ Fresh ☒ Untested	Depth (m) From To Diameter (cm)
	☐ Gas ☐ Other, specify	0 198 6
	☐ Gas ☐ Other, specify	0 20 10

Well Contractor and Well Technician Information

Business Name of Well Contractor Wilson's Water Wells LTD.		Well Contractor's Licence No. 5459
Business Address (Street Number/Name) 13787 Hwy 48		Municipality Stouffville
Province ON	Postal Code L4A3B3	Business E-mail Address
Bus. Telephone No. (inc. area code) 9056404369		Name of Well Technician (Last Name, First Name) Hinves, Jesse
Well Technician's Licence No. 3662	Signature of Technician and/or Contractor	Date Submitted 20210727

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

200 PPM 75 PPM residue 19 hrs

Well owner's information package delivered ☒ Yes ☐ No	Date Package Delivered 20210726	Ministry Use Only Audit No. 2353010 Received
	Date Work Completed 20210726	



Ministry
of the
Environment

Ontario

YORK

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

6918798

MUNICIP

CON.

COUNTY OR DISTRICT

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE

CON., BLOCK, TRACT, SURVEY, ETC.

LOT 25-27

YORK - WHITCHURCH

WHITCHURCH - STOUFFVILLE

CON 4.

20

2565 Aurora Rd.

DATE COMPLETED

DAY 11 MO 5 YR 87

74.757 ELEVATION 93.00

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	sand			0	11
Gray	clay	silt		11	22
Gray	sand	stones		22	33
Brown	sand	stones		33	56
Gray	clay	sandy stones		56	148
Gray	clay	silt		148	158
Gray	clay	stones & sand		158	221
Gray	clay	silt		221	238
Gray	clay	lap grey		238	249
Gray	sand	stones		249	251
Gray	clay	silt		251	261
Gray	sand	stones		261	267

31 32

41 WATER RECORD	
WATER FOUND AT - FEET	KIND OF WATER
261	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD			
INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
6 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	1/88	0 261
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE		
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE		

SCREEN	SIZE (S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
	20	6 INCHES	6 FEET
	MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN	
	55	261 FEET	

61 PLUGGING & SEALING RECORD	
DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
FROM TO	
10-13 14-17	
18-21 22-25	
26-29 30-33 80	

71 PUMPING TEST	PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
	1 ☐ PUMP 2 ☒ BAILER	25 GPM	3 HOURS
	STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
	84 FEET	261 FEET	15 MINUTES 261 FEET 30 MINUTES 261 FEET 45 MINUTES 261 FEET 60 MINUTES 261 FEET
	IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
		261 FEET	1 ☒ CLEAR 2 ☐ CLOUDY
	RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
	1 ☐ SHALLOW 2 ☒ DEEP	250 FEET	20 GPM

54 FINAL STATUS OF WELL	55-56 WATER USE
1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL	5 ☐ DOMESTIC 6 ☐ STOCK 7 ☒ IRRIGATION 8 ☒ INDUSTRIAL 9 ☐ OTHER
	10 ☐ ABANDONED, INSUFFICIENT SUPPLY 11 ☐ ABANDONED, POOR QUALITY 12 ☐ UNFINISHED
57 METHOD OF DRILLING	58-59
1 ☒ CABLE TOOL 2 ☒ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION	6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

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

CONTRACTOR	LICENCE NUMBER
Wilson Water Wells Ltd	5459
ADDRESS	
RR4 Stouffville Ont	
NAME OF OWNER	LICENCE NUMBER
J. Sadock	0234
SIGNATURE OF CONTRACTOR	SUBMISSION DATE
William Wilson	DAY NO. YR.

OFFICE USE ONLY	DATE RECEIVED
	JUL 21 1987
REMARKS	

1. PRINT ONLY IN SPACES PROVIDED

2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

6920866

MUNICIP 69009

CON. CON.

04

COUNTY OR DISTRICT: Simcoe TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Windsor CON. BLOCK, TRACT, SURVEY ETC: Con 4 LOT: 15

DATE COMPLETED: DAY 16 MO 02 YR 90

RC: 74.299 ELEVATION: 103.00 BASIN CODE: 11

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	Top Soil			0	2
Brown	Clay	Sandy		2	16
Grey	Clay	Silty	Soft	16	117
Grey	Clay	Stoney	Hard	117	178
Brown	Sand		Coarse	178	183

31 32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13	1 ☒ FRESH 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
15-18	1 ☐ FRESH 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
20-23	1 ☐ FRESH 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
25-28	1 ☐ FRESH 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
30-33	1 ☐ FRESH 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
10-11	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC		FROM TO
17-18	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC		FROM TO
24-25	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC		FROM TO

SCREEN SIZE(S) OF OPENING (SLOT NO 1) 14 DIAMETER 6 INCHES LENGTH 3 FEET

MATERIAL AND TYPE S.S DEPTH TO TOP OF SCREEN 180 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	(CEMENT GROUT, LEAD PACKER, ETC.)
10-13		
18-21		
26-29		

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER

PUMPING RATE: 15 GPM

DURATION OF PUMPING: 15-16 HOURS 17-18 MINS

STATIC LEVEL: 130 FEET

WATER LEVEL END OF PUMPING: 150 FEET

WATER LEVELS DURING: 15 MINUTES 150 FEET 30 MINUTES 150 FEET 45 MINUTES 150 FEET 60 MINUTES 150 FEET

IF FLOWING, GIVE RATE: 150 FEET

PUMP INTAKE SET AT: 170 FEET

WATER AT END OF TEST: 15 FEET

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP

RECOMMENDED PUMP SETTING: 170 FEET

RECOMMENDED PUMPING RATE: 15 GPM

FINAL STATUS OF WELL: 1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL

WATER USE: 1 ☐ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☒ INDUSTRIAL

METHOD OF CONSTRUCTION: 1 ☒ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.

Aurora Side Rd

Fortison Dr

Woodbine Av.

58477

CONTRACTOR: Wilson Water Well Ltd WELL CONTRACTOR'S LICENCE NUMBER: 5459

ADDRESS: R.R.#4 Stouffville Ont

NAME OF WELL TECHNICIAN: Pete Wilson WELL TECHNICIAN'S LICENCE NUMBER: 6

SIGNATURE OF TECHNICIAN/CONTRACTOR: Pete Wilson SUBMISSION DATE: DAY 16 MO 02 YR 90

OFFICE USE ONLY

DATA SOURCE: 5459 CONTRACTOR: 5459 DATE RECEIVED: FEB 28 1990

DATE OF INSPECTION: 16 MO 02 YR 90 INSPECTOR: 16 MO 02 YR 90

REMARKS:



The Ontario Water Resources Act

WATER WELL RECORD

Mark correct box with a checkmark, where applicable.

Municipality **69009** Con. **CON** **04**

County or District	Township/Borough/City/Town/Village	Con block	tract survey, etc.	Lot
	STAUFFVILLE	4		17
Address			Date completed	48-53
			06 03 98	day month year

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

[illegible]

41		WATER RECORD					
Water found at - feet		Kind of water					
10-13 <i>167</i>	1	☒ Fresh	3	☐ Sulphur	14		
	2	☐ Salty	6	☐ Minerals ☐ Gas			
15-18	1	☐ Fresh	3	☐ Sulphur	19		
	2	☐ Salty	6	☐ Minerals ☐ Gas			
20-23	1	☐ Fresh	3	☐ Sulphur	24		
	2	☐ Salty	6	☐ Minerals ☐ Gas			
25-28	1	☐ Fresh	3	☐ Sulphur	29		
	2	☐ Salty	6	☐ Minerals ☐ Gas			
30-33	1	☐ Fresh	3	☐ Sulphur	34		
	2	☐ Salty	6	☐ Minerals ☐ Gas			

CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
10-11	☒ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			
6 1/4		1/88	+2	1160
17-18	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			
24-25	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			

SCREEN	Sizes of opening (Slot No.)	31-33	Diameter	34-38	Length	39-40
	20		6	inches	4	feet
	Material and type	STAINLESS			Depth at top of screen	41-44
					163	feet

61	PLUGGING & SEALING RECORD			
☒ Annular space		☐ Abandonment		
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)		
From	To			
3 ¹³ 18-21	150 ¹⁴⁻¹⁷ 22-25	HOLE PLUG CUTTINGS		
26-29	30-33	80		

PUMPING TEST	Pumping test method <u>AIR</u> ☐ Pump ☐ Bailor		Pumping rate <u>3</u> GPM		Duration of pumping <u>8-16</u> ... Hours ... Mins	
	Static level 19-21 <u>136</u> feet		Water level end of pumping 22-24 <u>160</u> feet		Water levels during 1 ☒ Pumping 2 ☐ Recovery 15 minutes 26-28 <u>160</u> feet 30 minutes 29-31 <u>160</u> feet 45 minutes 32-34 <u>160</u> feet 60 minutes 35-37 <u>160</u> feet	
	If flowing give rate 38-41 GPM		Pump intake set at feet		Water at end of test 42 ☒ Clear ☐ Cloudy	
	Recommended pump type ☐ Shallow ☒ Deep		Recommended pump setting 43-45 <u>1100</u> feet		Recommended pump rate 46-49 <u>3</u> GPM	
	50-53					

FINAL STATUS OF WELL 54

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

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

METHOD OF CONSTRUCTION 57

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

LOCATION OF WELL

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

The diagram is a hand-drawn map showing the location of a well. At the top, a horizontal line is labeled "AURORA SIDEROAD". Below this line, there are two vertical lines. The left vertical line is labeled "DON MILLS ROAD." and the right vertical line is labeled "RAMBLERS ROAD.". A horizontal line runs below the vertical lines, representing a lot line. A well is located near the intersection of Don Mills Road and Ramblers Road. The well is represented by a circle with a dot in the center. The word "WELL" is written next to it. The number "187096" is written to the right of the well. Distances are marked with circles and 'X' marks. A north arrow points upwards.

Name of Well Contractor RABUKU DRILLING LTD	Well Contractor's Licence No. 4645
Address PO Box 320 BEETON, CNT LOGS AO	
Name of Well Technician ROBERT W. KWIALEKI	Well Technician's Licence No. T-2425
Signature of Technician/Contractor 	Submission date 09 day 03 mo 98 yr

MINISTRY USE ONLY	Data source	58	Contractor	59-62	Date received	63-68	69
			4645		APR 14 1998		
	Date of inspection	Inspector					
	Remarks						
							

Print only in spaces provided.

Mark correct box with a checkmark, where applicable.

11

6927318

Municipality

69009

Con.

CON

04

County or District YORK	Township/Borough/City/Town/Village WHITECHURCH STOUFFVILLE	Con block tract survey, etc. 4	Lot 20
	Address RICHMOND HILL	Date completed 27 day	02 month 03 year

21	Zone	Easting	Northing	RC	Elevation	RC	Basin Code		
	17	629346	4874845						

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
BROWN	CLAY	SILT	SAND	0	110
BROWN	SAND	GRAVEL & CLAY		110	121
BLUE	CLAY	SAND STONES		121	138
BROWN	SAND	GRAVEL	CEMENTED	138	158
GREY	MED SAND	GRAVEL		158	163
BLUE	CLAY	SAND GRAVEL	STREAKS	163	258
GREY	MED SAND	FINE SAND	DIRTY	258	264
BLUE	CLAY	GRAVEL		264	266
GREY	CMS SAND	GRAVEL		266	275
BLUE	CLAY			275	277

31

32

41		10		14		15		21		27		
WATER RECORD												
Water found at - feet				Kind of water								
266 ¹⁰⁻¹³				1	☒	Fresh	3	☐	Sulphur	14		
				2	☐	Salty	4	☐	Minerals			
				6	☐	Gas	6	☐	Gas			
15-18				1	☐	Fresh	3	☐	Sulphur	19		
				2	☐	Salty	4	☐	Minerals			
				6	☐	Gas	6	☐	Gas			
20-23				1	☐	Fresh	3	☐	Sulphur	24		
				2	☐	Salty	4	☐	Minerals			
				6	☐	Gas	6	☐	Gas			
25-28				1	☐	Fresh	3	☐	Sulphur	29		
				2	☐	Salty	4	☐	Minerals			
				6	☐	Gas	6	☐	Gas			
30-33				1	☐	Fresh	3	☐	Sulphur	34		
				2	☐	Salty	4	☐	Minerals			
				6	☐	Gas	6	☐	Gas			

51 CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
10-11 6 1/4	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	12 188	0	13-16 267
17-18	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	19		20-23
24-25	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	26		27-30

SCREEN	Sizes of opening (Slot No.)	31-33	Diameter	34-38	Length	39-40
	30 & 35		6	inches	7	feet
	Material and type	Depth at top of screen			30	
	SS TELESCOPE	267			feet	

61 PLUGGING & SEALING RECORD			
☒ Annular space		☐ Abandonment	
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
From	To		
0 ¹⁰⁻¹³	20 ¹⁴⁻¹⁷	BENTONITE GROUT	
18-21	22-25	K PACKER	
26-29	30-33	80	

PUMPING TEST	71 Pumping test method ¹⁰ 1 ☐ Pump 2 ☐ Bailer		Pumping rate ¹¹⁻¹⁴ 15.5 GPM		Duration of pumping ¹⁵⁻¹⁶ 1 Hours 0 Mins ¹⁷⁻¹⁸	
	25 Static level		Water level end of pumping		Water levels during 1 ☐ Pumping 2 ☐ Recovery	
	19-21 148.2 feet	22-24 149.2 feet	15 minutes ²⁶⁻²⁸ 149.1 feet	30 minutes ²⁹⁻³¹ 149.2 feet	45 minutes ³²⁻³⁴ 149.2 feet	60 minutes ³⁵⁻³⁷ 149.2 feet
	If flowing give rate ³⁸⁻⁴¹ _____ GPM		Pump intake set at _____ feet		Water at end of test ☒ Clear ☐ Cloudy	
	Recommended pump type ☐ Shallow ☒ Deep		Recommended pump setting ⁴³⁻⁴⁵ 180 feet		Recommended pump rate ⁴⁶⁻⁴⁹ 30 GPM	
	50-53					

FINAL STATUS OF WELL			54
1 ☒ Water supply	5 ☐ Abandoned, insufficient supply	9 ☐ Unfinished	
2 ☐ Observation well	6 ☐ Abandoned, poor quality	10 ☐ Replacement well	
3 ☐ Test hole	7 ☐ Abandoned (Other)		
4 ☐ Recharge well	8 ☐ Dewatering		
WATER USE			55-56
1 ☐ Domestic	5 ☐ Commercial	9 ☐ Not use	
2 ☐ Stock	6 ☐ Municipal	10 ☐ Other	
3 ☐ Irrigation	7 ☐ Public supply		
4 ☒ Industrial	8 ☐ Cooling & air conditioning		
METHOD OF CONSTRUCTION			57
1 ☐ Cable tool	5 ☐ Air percussion	9 ☐ Driving	
2 ☒ Rotary (conventional)	6 ☐ Boring	10 ☐ Digging	
3 ☐ Rotary (reverse)	7 ☐ Diamond	11 ☐ Other	
4 ☐ Rotary (air)	8 ☐ Jetting		

LOCATION OF WELL

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

Lot 21

AURORA ROAD

LOT 20
CON 4

200'

80'

RAM FOREST ROAD

253116

Name of Well Contractor FRED CUNSTABLE & SON LTD	Well Contractor's Licence No. 1663
Address 3519 5TH LINE BRADFORD	
Name of Well Technician STEVE THOMPSON	Well Technician's Licence No. T 2120
Signature of Technician/Contractor <i>Ken Constable</i>	Submission date day 13 mo 5 yr 03

MINISTRY USE ONLY	Data source	58 Contractor	59-62	Date received	63-68
		1663		OCT 22 2003	
	Date of inspection	Inspector			
	Remarks				

Instructions for Completing Form

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

Well Owner's Information and Location of Well Information

Ministry Use Only											
MUN				CON				LOT			

RR#/Street Number/Name 15451 Woodbine				City/Town/Village Whitchurch				Site/Compartment/Block/Tract etc. 224			
GPS Reading NAD 83		Zone 17		Easting 628233		Northing 4875365		Unit Make/Model PAGEIAN		Mode of Operation: ☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify	

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	IN FEET	
				Depth From	Metres To
GREY	CLAY		SOFT	0	20
GREY	SILTY SANDS		SOFT	20	100
GREY	CLAY		SOFT	100	150
GREY	SILTY SANDS	"MED SAND" "WATER"	SOFT	150	200
GREY	CLAY	SILT LAYERS	SOFT	200	245
GREY	GRAVEL	SANDS	LOOSE	245	251

Hole Diameter		
Depth	Metres	Diameter
From	To	Centimetres
0	251	6"
Water Record		
Water found at Metres / Kind of Water		
☒ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:		
☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:		
After test of well yield, water was		
☐ Clear and sediment free ☐ Other, specify CLOUDY		
Chlorinated ☒ Yes ☐ No		

Construction Record			
Inside diam	Material	Wall thickness	Depth
centimetres		centimetres	Metres
From			To
Casing			
6'	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	1.188	0 240
Screen			
Outside diam	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.	
6"		#10	240 251
No Casing or Screen			
☐ Open hole			

Test of Well Yield			
Pumping test method	Draw Down	Recovery	
	Time min	Water Level Metres	Time min
Pump intake set at - (metres) 0.00	Static Level	140.2	
Pumping rate - (litres/min) 15	1	141.6	1
Duration of pumping 1 hrs + 0 min	2	141.1	2
Final water level end of pumping 141.1 metres	3	141.1	3
Recommended pump type ☐ Shallow ☐ Deep	4	141.1	4
Recommended pump depth, metres	5	141.1	5
Recommended pump rate, (litres/min)	10	141.1	10
If flowing give rate - (litres/min)	15		15
	20		20
	25		25
If pumping discontinued, give reason.	30	141.1	30
	40	141.1	40
	50	141.1	50
	60	141.1	60

Plugging and Sealing Record			
Depth set at - Metres		Material and type (bentonite slurry, neat cement slurry) etc.	
From	To	Volume Placed (cubic metres)	
0	6M	BENTONITE BENSEAL	
Method of Construction			
☐ Cable-Tool ☒ Rotary (air) ☐ Diamond ☐ Digging ☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other ☐ Rotary (reverse) ☐ Boring ☐ Driving			
Water Use			
☒ Domestic ☐ Industrial ☐ Public Supply ☐ Other ☐ Stock ☐ Commercial ☐ Not used ☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning			
Final Status of Well			
☒ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other) ☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering ☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well			
Well Contractor/Technician Information			
Name of Well Contractor WILSON'S WATER WELLS		Well Contractor's Licence No. 5459	
Business Address (street name, number, city etc.) 1377 HWY 48 STOUFFVILLE			
Name of Well Technician (last name, first name) O'BRIEN MICHAEL		Well Technician's Licence No. T-2516	
Signature of Technician/Contractor x M.C. O'Brien		Date Submitted 2006 06 08	

Location of Well	
In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.	
Audit No. z 35896	Date Well Completed 2006 05 29
Was the well owner's information package delivered? ☐ Yes ☐ No	Date Delivered 2006 05 29
Ministry Use Only	
Data Source	Contractor 5459
Date Received JUN 15 2006	Date of Inspection 2006 06 08
Remarks	Well Record Number



Ontario

Ministry of
the Environment

Well 1

A 075482

(and/or Print Below)

Master Well Record for
Cluster Well Construction

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Address of Well Location (Street Number/Name, RR)

1 Fortecon Dr.

Township

Lot

Concession

County/District/Municipality

City/Town/Village

Province

Postal Code

Gormley

Ontario

UTM Coordinates

Zone

Easting

Northing

GPS Unit Make

Model

Mode of Operation:

☐ Undifferentiated☒ Averaged

NAD

8

3

176292874874714

Garmin

Etrex

☐ Differentiated, specify

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

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	Depth (Metres) To
Bnn	Gravel	Sand		0	.91
Bnn	fine sand	Silt	soft	.91	1.22
Bnn	fine sand	Silt	soft, wet	1.22	3.1
Gz	clay	Silt	soft, wet	3.1	3.66

Hole Details

Depth (Metres) From	Depth (Metres) To	Diameter (Centimetres)
0	3.66	10.92

Water Use

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

Method of Construction

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

Status of Well

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

No Casing and Screen Used

- Open Hole
☐ Yes ☐ No

Static Water Level Test

Metres

Screen

- ☐ Galvanized ☐ Steel ☐ Fibreglass ☐ Concrete ☒ Plastic

Outside Diameter (Centimetres)

6.03

Slot No.

10

Water Details

- Water found at Depth ☐ Metres ☐ Gas ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Water found at Depth ☐ Metres ☐ Gas ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Water found at Depth ☐ Metres ☐ Gas ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Disinfected ☐ Yes ☐ No If no, provide reason:

Date Master Well Completed

(yyyy/mm/dd)

2008/07/30

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

- Total Wells in Cluster 3
Please indicate Number of Cluster Well Information Log Sheets Submitted
Total Wells on this Property 2

Location of Well Cluster

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

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

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

Well Contractor and Well Technician Information

Business Name of Well Contractor: Shata Soil Sampling
Well Contractor's Licence No.: 7121411
Business Address (Street No./Name, number, RR): #2 147 West Beaver Creek Rd. Richmond Hill
Municipality: Richmond Hill
Province: ON
Postal Code: M4B1C6
Business E-mail Address: on 4B1C6
Bus. Telephone No. (inc. area code): (905) 764-9304
Name of Well Technician (Last Name, First Name): Mike Brown
Well Technician's Licence No.: 72977
Signature of Technician: [Signature]
Date Submitted (yyyy/mm/dd): 2008/07/31

Audit No.: M 01560
Well Contractor No.:
Date Received (yyyy/mm/dd): AUG 28 2008
Date of Inspection (yyyy/mm/dd):
Remarks: C 00479



Well T

A 075482

(ell Tag No.)

A 075482

Cluster Well Information for Cluster Well Construction

Regulation 903 Ontario Water Resources Act

4925

Page 2 of 2

Well Contractor and Well Technician Information				
Business Name of Well Contractor		Business Address (Street Number/Name, RR)		Municipality
Shata Soil Sampling		2-147 West Beaver Creek		Richmond Hill ON
Postal Code	Business Telephone No. (inc. area code)	Well Contractor's Licence No.	Business E-mail Address	
L4B 1G6	(905) 764-9304			
Name of Well Technician (First Name, Last Name)		Well Technician's Licence No.	Date Submitted (yyyy/mm/dd)	Signature of Technician
Mike		7-2977	2008/07/31	[Signature]

Date 1st Well in Cluster Constructed (yyyy/mm/dd) 2008/07/30	Date Last Well in Cluster Constructed (yyyy/mm/dd) 2008/07/30
Ministry Use Only	
Date Received (yyyy/mm/dd) AUG 28 2008	Date Inspected (yyyy/mm/dd)
Audit No. C 00479	Remarks M 01560

Measurements recorded in: ☒ Metric ☐ Imperial

Address of Well Location (Street Number/Name)

Township

Lot

Concession

County/District/Municipality

City/Town/Village

Province

Postal Code

UTM Coordinates

Zone

Easting

Northing

Municipal Plan and Sublot Number

Other

NAD 83 176296084874676

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
BLACK	TOPSOIL		SOFT	0	.3
GREY	CLAY		SOFT	.3	32
GREY	CLAY	STONES	MED.	32	50.2
BROWN	SAND	GRAVEL	PACKED	50.2	58.5

Annular Space			
Depth Set at (m/ft)		Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From	To		
0	6	BENTONITE SLURRY	.18

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

Construction Record - Casing					Status of Well
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		☒ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned,
			From	To	
15.4	STEEL	.477	1.7	37.7	
12.7	PLASTIC	.544	36.2	55.4	

Construction Record - Screen					Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify _____ ☐ Other, specify _____
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		
			From	To	
14.75	STAINLESS	12	55.4	56.9	
14.75	STAINLESS	14	56.9	58.5	

Water Details		Hole Diameter		
Water found at Depth <i>50</i> (m/ft) ☐ Gas	Kind of Water: ☒ Fresh ☐ Untested ☐ Other, specify _____	Depth (m/ft)		Diameter (cm/in)
		From	To	
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	<i>0</i>	<i>6</i>	<i>25.4</i>
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	<i>6</i>	<i>37.7</i>	<i>17.1</i>
		<i>37.7</i>	<i>58.5</i>	<i>15.34</i>

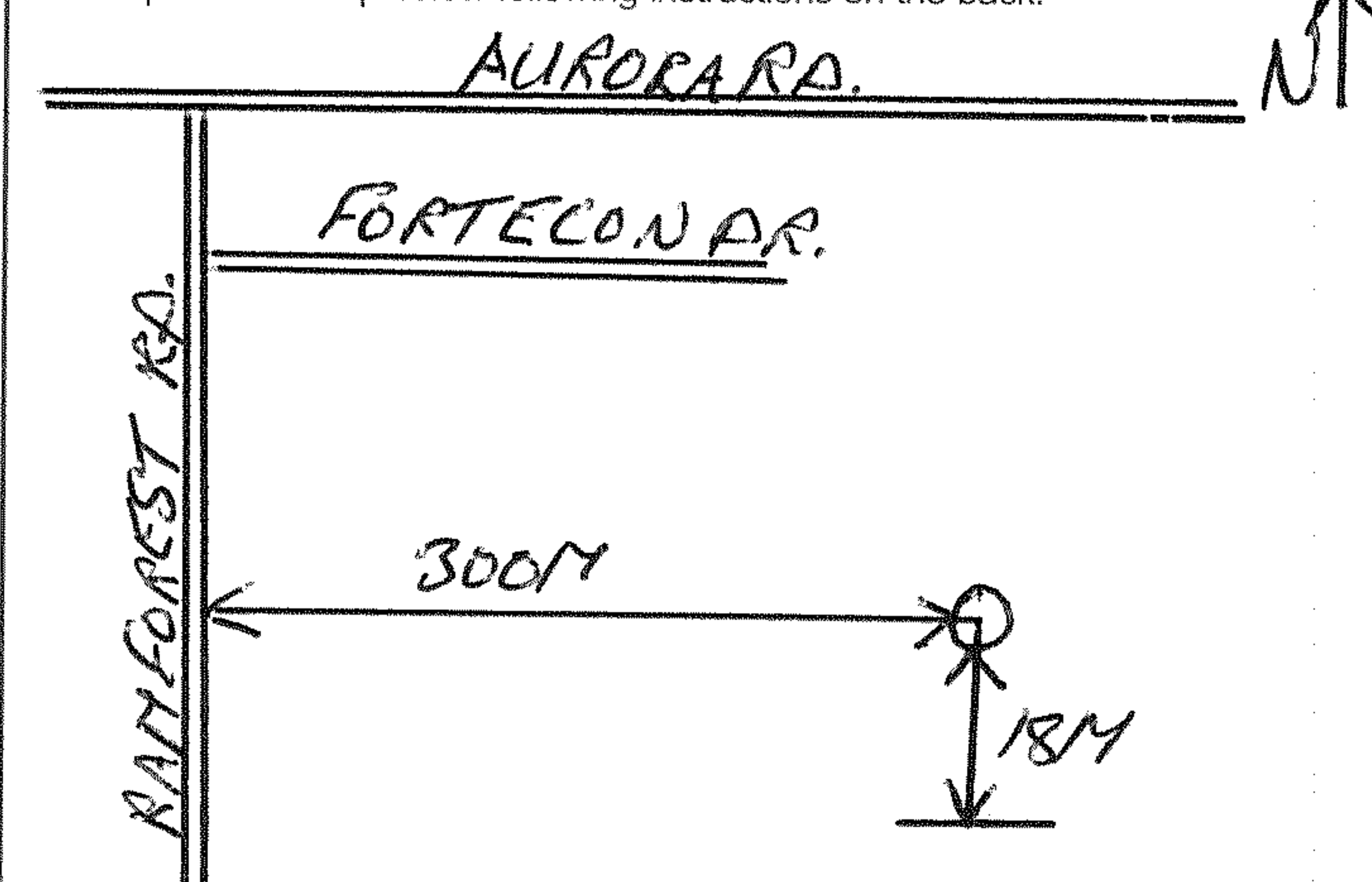
Well Contractor and Well Technician Information			
Business Name of Well Contractor		Well Contractor's Licence No.	
E.S. WELL DRILLING		7 1 0 8	
Business Address (Street Number/Name)		Municipality	
2 NORTHLINE RD. FENELON FALLS		KAWARTHA	
Province	Postal Code	Business E-mail Address	
ONT	K0M1N0		
Bus. Telephone No. (inc. area code)		Name of Well Technician (Last Name, First Name)	
705 454 2323		HOUSTON EARL	
Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted	
1554		20141007	

Results of Well Yield Testing

After test of well yield, water was:		Draw Down		Recovery	
☒ Clear and sand free ☐ Other, specify _____		Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:		Static Level	34.75		
Pump intake set at (m/ft)		1	36.54	1	45.87
Pumping rate (l/min / GPM)		2	38.15	2	44.76
Duration of pumping		3	39.55	3	43.76
1 hrs + 30 min		4	40.66	4	42.87
Final water level end of pumping (m/ft)		5	41.64	5	42.08
If flowing give rate (l/min / GPM)		10	44.72	10	39.14
Recommended pump depth (m/ft)		15	46.14	15	37.41
55		20	46.82	20	36.4
Recommended pump rate (l/min / GPM)		25	47.2	25	35.8
20		30	47.42	30	35.45
Well production (l/min / GPM)		40	47.63	40	35.17
20		50	47.73	50	35.03
Disinfected?		60	47.8	60	34.95
☒ Yes ☐ No					

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well owner's information package delivered

☒ Yes
☐ No

Date Package Delivered

20140926

Date Work Completed	
---------------------	--

20140926

Ministry Use Only

Audit No. **Z 185065**

OCT 08 2014

Discussion

APPENDIX B

GROUNDWATER QUALITY

C.O.C.: ---

REPORT No. B21-38777

Report To:

Gaman Consultants Inc

7 Pinsent Court,

Barrie ON L4N 6E3

Attention: Gary Hendy

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 25-Nov-21

JOB/PROJECT NO.: Limen Foretcon Drive

DATE REPORTED: 02-Dec-21

P.O. NUMBER: 21013.00

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.:		BH4	BH8	ODWS	
			Sample I.D.:		B21-38777-1	B21-38777-2	Objective	Type of Objective
			Date Collected:		24-Nov-21	24-Nov-21		
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Nitrite (N)	mg/L	0.1	SM4110C	01-Dec-21/O	< 0.1	< 0.1	1	MAC
Nitrate (N)	mg/L	0.1	SM4110C	01-Dec-21/O	0.5	1.0	10	MAC

ODWS - Ontario Drinking Water Standards

AO - Aesthetic Objectives

IMAC - Interim Maximum Acceptable Concentration

MAC - Maximum Acceptable Concentration

ODWO - D-5-5 Objective

OG - Operational Guidelines

WL - Warning Level - Sodium Restricted Diets

R.L. = Reporting Limit

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

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



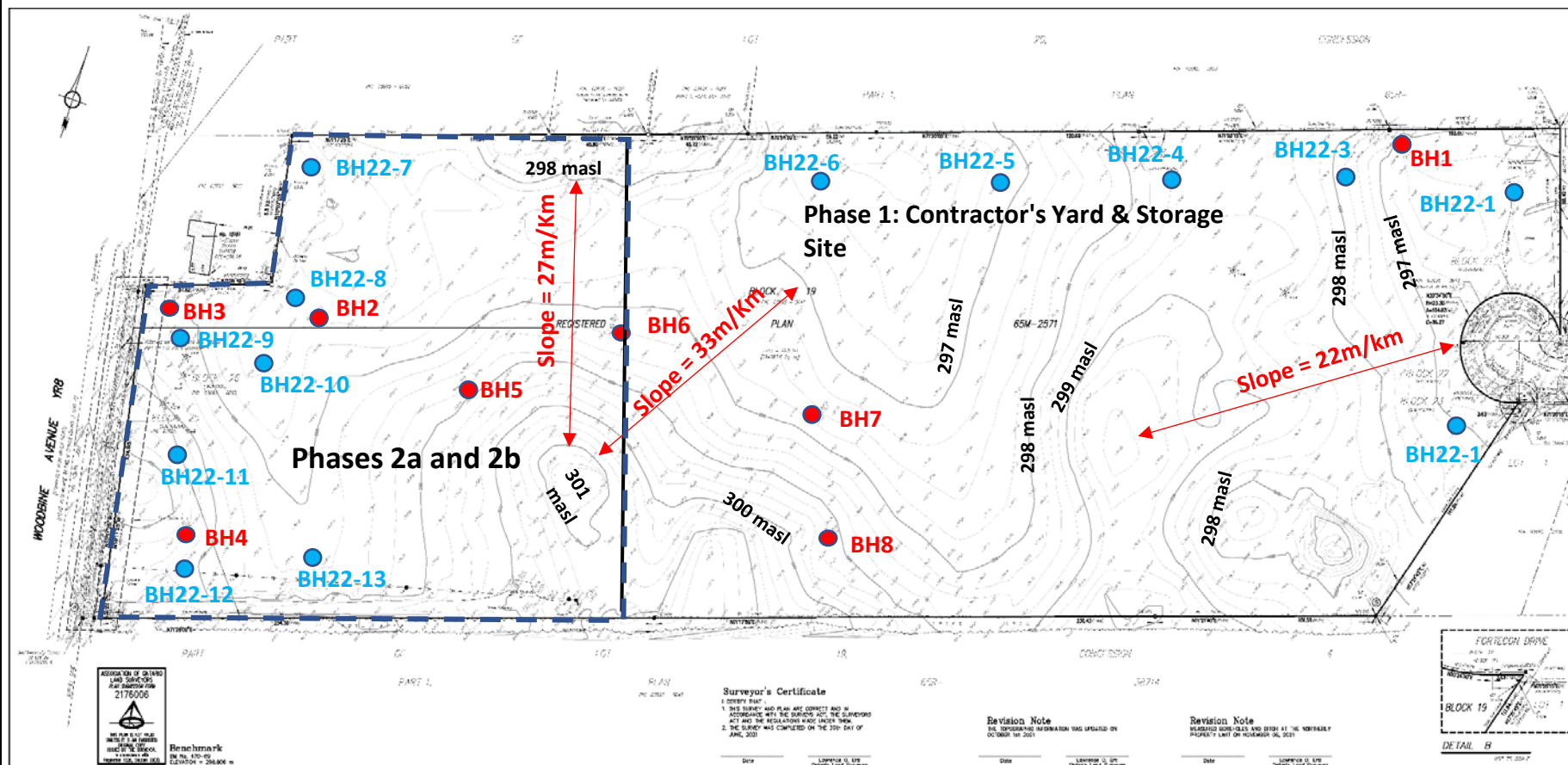
Christine Burke

Lab Manager

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

APPENDIX C

WATER BUDGET



NOTES

BH8 ● Borehole location and designation (BH Logs not available)

BH22-1 ● Soil-Eng Borehole Location & Designation

Borehole locations are approximate

300 masl topographic contour metres above sea level



Phase 2 Boundary (Approximate)

Existing Boreholes and Topography

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For SCAL Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

GAMAN Consultants Inc.

Figure C-1



NOTES

- **BH22-8** Soil-Eng Groundwater Monitor
- BH10 Soil-Eng borehole Location

Soil-Eng Borehole Map

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For SCAL Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

GAMAN Consultants Inc.

Figure

C-2

TABLE C-1 SUMMARY OF CLIMATIC STATIONS**Project: Water Balance Evaluation Phase 2 Limen Head Office 15123 Woodbine Ave (21013.02)**

Station Name	Station ID	years Monitored	Years	Total Precipitation	Distance from Site (km)
Aurora NE	6150398	2003-2009	6	892	4km NW
Newmarket 3	615N002	1996-2002	16	817	4.6km NW
Ballantrea	6150460	1979-1992	13	902	8 Km East
Bruce Mills		2002-2021	19	885	13 KM South
Stouffville WPCP		1971-1993	22	851	13 Km Southwest
Goodwood Pumping Stat	6158040	2004-2021	17	964	16 Km East
Uxbridge	HY031	1983-1992	9	809	24 Km East
King Smoke Tree	6154142	1981-2010	30	853	10 Km West
Sharon	6157685	1961-1999	38	779	10 Km North
Buttonville A	615HMAK	1981-2010	30	853	18 Km South
Average Precipitation				861	

TABLE C-2
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1981-2010 (King Smoke Tree ID6154142)
Potential Evapotranspiration
Project: Water Balance Evaluation Phase 2 Limen Head Office 15123 Woodbine Ave (21013.02)

#

Thornthwaite (1948)									Thornthwaite and Mather (1957)						
Month	Mean Temperature (°C)	Heat Index	Potential Evapo-transpiration (mm)	Daylight Correction Value	Adjusted Potential Evapo-transpiration (mm)	Total Precipitation (mm)	Surplus (mm)	Deficit (mm)	PPT - PET (mm)	Accumulated Potential Water Loss (mm)	Storage (mm) (ST)	Change in Soil Moisture (mm) (delta S)	Actual Evapo-transpiration (mm)	Moisture Deficit (mm)	Unadjusted Moisture Surplus (mm)
January	-7.4	0.0	0.0	0.81	0.0	51.7	51.7	0.0	51.7	0.0	250.0	0.0	0.0	0.0	51.7
February	-6.1	0.0	0.0	0.81	0.0	46.0	46.0	0.0	46.0	0.0	250.0	0.0	0.0	0.0	46.0
March	-1.5	0.0	0.0	1.02	0.0	51.2	51.2	0.0	51.2	0.0	250.0	0.0	0.0	0.0	51.2
April	6	1.3	27.6	1.12	30.9	64.9	34.0	0.0	34.0	0.0	250.0	0.0	30.9	0.0	34.0
May	12.5	4.0	60.5	1.27	76.8	87.1	10.3	0.0	10.3	0.0	250.0	0.0	76.8	0.0	10.3
June	17.7	6.8	87.7	1.29	113.1	84.8	0.0	28.3	-28.3	-28.3	197.0	-53.0	137.8	-24.7	0.0
July	20.5	8.5	102.6	1.30	133.4	86.4	0.0	47.0	-47.0	-75.3	170.0	-27.0	113.4	20.0	0.0
August	19.6	7.9	97.8	1.20	117.3	88.4	0.0	28.9	-28.9	-104.2	125.0	-45.0	133.4	-16.1	0.0
September	15.3	5.4	75.0	1.04	78.0	84.2	6.2	0.0	6.2	0.0	131.2	6.2	78.0	0.0	0.0
October	8.6	2.3	40.5	0.95	38.5	72.9	34.4	0.0	34.4	0.0	250.0	118.8	38.5	0.0	-84.4
November	2.2	0.3	9.4	0.80	7.5	84.6	77.1	0.0	77.1	0.0	250.0	0.0	7.5	0.0	77.1
December	-3.7	0.0	0.0	0.74	0.0	55.5	55.5	0.0	55.5	0.0	250.0	0.0	0.0	0.0	55.5
TOTALS		36.5			595.6	857.7	366.4	104.2	262.1	-207.8	2623.2	0.0	616.3	-20.8	241.4
TOTAL WATER SURPLUS									TOTAL MOISTURE SURPLUS						
262.1									241.4						
mm									mm						

NOTES:
1) Water budget adjusted for latitude and daylight.
2) (°C) - Represents calculated mean of daily temperatures for the month.
3) Precipitation and Temperature data from the King Smoke Tree Latitude 44°01'00.00" N, Longitude 79°31'00.00" W, elevation 352 masl
4) Total Water Surplus (Thornthwaite, 1948) is calculated as total precipitation minus adjusted potential evapotranspiration.

557.1

TABLE C-3(A): PRE-DEVELOPMENT AND POST-DEVELOPMENT INFILTRATION FACTORS

Project: Water Balance Evaluation Phase 2 Limen Head Office (21013.02)

MOECC 1995 Hydrogeological Technical Information Requirements (page 4-62)

Description of Area/Development Site		Pre-development		Post-development		
		Description	Factor	Description		Factor
TOPOGRAPHY	Factor					
Flat lying, average slope < 0.6m/km	0.3	Slopes = 27m/km	0.1	Between Flat and Rolling		0.2
Rolling land average slope of 2.8-3.8m	0.2					
Hilly land, average slopes of 28-47 metres	0.1					
SOILS						
Tight impervious Clay	0.1	Clay and loam	0.2	Clay and loam	0	0.2
Medium combinations of clay and loam	0.2					
open sandy loam	0.4					
COVER						
Cultivated land	0.1	Agricultural land	0.1	Open space		0.1
Woodland	0.2					
Total Infiltration factor for pervious areas with medium combinations of clay and loam pre-development and post-development.			0.4	Clay and Loam		0.5

TABLE C-3(B): PRE-DEVELOPMENT AND POST-DEVELOPMENT WATER BUDGETS

Project: Water Balance Evaluation Phase 2 Limen Head Office 15123 Woodbine Ave (21013.02)

PRE-DEVELOPMENT WATER BUDGET	
Water Surplus (mm/yr)	241.4
Infiltration Areas (ha)	4.02
Pre-Development Infiltration Factor	0.4
A Total Recharge m3/yr	3,881
Total Recharge mm/yr	97
Runoff m3/year	5,821

POST-DEVELOPMENT RECHARGE RATES	Landscape & sewage bed area	2-storey office bld	Parking Lot	Other impervious areas	Impervious Areas*	Totals
90% Total Precipitation (mm/yr)					772	
Water Surplus (mm/yr)	241.4	241.4	241.4	241.4		
Areas (ha)	1.130	0.4924	2.398	0.000		4.020
Infiltration Factor	0.5	0	0	0	0	
B Recharge from precipitation m3/yr	1,364	-	-	-	-	1,364
Runoff m3/year	1,364	1,188	5,788	-	-	8,340
C Recharge Deficit (A-B) m3/year						2,517

Assumptions: (1) stormwater pond is lined, (2) site grading changes topography to gentler slopes, fill soils similar in composition to native soils

***Impervious areas include: Building, parking areas, 90% total precipitation**