



Hydrogeological Assessment Report - 245 Church Street, Penetanguishene, ON

November 15, 2022

Prepared for:
Koenig Developments Ltd.

Cambium Reference: 13237-001

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1.0 Introduction

Cambium Inc. (Cambium) was retained by Koenig Developments Ltd. (the client) to complete a hydrogeological assessment of the property located at 245 Church Street, Town of Penetanguishene, Ontario (herein referred to as Site).

The Site is approximately 5.30 hectares (2.13 acres) in size and is currently a vacant land covered with trees and bushes. Cambium understands that the hydrogeological investigation is required in support of the proposed residential development at the Site.

It is noted that this scale of development meets the definition of “Major Development” per the Lake Simcoe Protection Plan (LSPP), and the South Georgian Bay Lake Simcoe Source Protection Plan (SGBSPP).

1.1 Scope of Work

This hydrogeological investigation was conducted with the following tasks:

- **Review of available background information:** a review of available geological and hydrogeological information for the site and surrounding areas and the previous investigation reports completed for the Site, was conducted to provide background information to allow for characterization of the Site’s soil and groundwater conditions.
- **Detailed site inspection:** an inspection of the Site was completed to review existing site conditions including identification of any hydrogeological features such as significant areas of potential groundwater recharge or areas of groundwater discharge.
- **Measurement of groundwater levels:** groundwater levels were measured in the existing monitoring wells to establish and/or confirm the general groundwater flow condition and elevations.
- **Physical Laboratory Soil Testing:** results of soil sample testing completed will be utilized to characterize the infiltration rate of the shallow surficial soils (i.e., within approximately 0.5 mbgs). This will help with the design and placement of Low Impact Development (LID) measures, if any across the Site.



- **Water Balance (Preliminary):** a preliminary water balance study was completed for the pre-development and the proposed post-development using the Thornthwaite-Mather approach and utilizing the climatic data obtained from Environment Canada.
- **Report Preparation:** a hydrogeological report was prepared presenting the results, findings, and recommendations of this investigation.

It should be noted that Cambium was also retained for a geotechnical investigation (Cambium, 2022a). The data or information obtained in the current and former investigations has been incorporated into this hydrogeological investigation report.

1.2 Site Description and Site Development

The total area of the property is approximately 5.30 hectares (2.13 acres) in size and the Site is bound to the west by Church Street, Oxley Drive to the east, residential development to the north and scattered residential dwellings to the south. It is proposed that the Site is to be developed into a residential complex consisting of single detached dwellings, row house dwellings, and double duplex dwellings totalling to 32 units along with driveways, parking areas and roadways. Water and wastewater services are being provided by the Town.

The regional location of the Site is outlined on Figure 1, the property and surrounding areas outlined on Figure 2, and the proposed development plan is included in Appendix A.



2.0 Environmental Features

To assess environmental features, databases maintained by the Ministry of Natural Resources and Forestry (MNRF), the Ministry of Environment, Conservation and Parks (MECP), and Nottawasaga Valley Conservation Authority (NVCA) were reviewed.

A review of background information indicates the Site is situated within the South Georgian Bay-Lake Simcoe (SGBLS) Source Protection Region, under Severn Sound Source Protection Authority. The Property is designated as Neighborhood Area on Schedule A Land Use Structure per Town of Penetanguishene Official Plan and is within a Significant Groundwater Recharge Area (SGRA) and a Wellhead Protection Area Q1 and Q2 related to groundwater recharge management (Appendix A).

The Site is not situated in NVCA regulated areas per Ont. Reg. 172/06. Therefore, development restrictions do not apply to the proposed development Site, in its entirety.

Available mapping indicates no significant wetlands or woodlands are situated on the Site and a review of the Ministry of Natural Resources and Forestry's (MNRF) Natural Heritage System database further indicates the Site does not have any Areas of Environmental Significance or Areas of Natural and Scientific Interests (ANSI).



3.0 Physical Setting

3.1 Topography and Drainage

The Site is located on a peninsula within Severn Sound, in the southeastern portion of Georgian Bay. Shoreline is situated approximately 850 m to the west (Penetang Harbour). Based on the topographic survey completed by RS Surveying Limited, dated October 7, 2022 (Appendix A) of the Site, the property has a topographic high of approximately 228.42 m above sea level (masl) in the west portion of the Site sloping to the lowest elevation of approximately 222.51 masl in the mid-central part of the Site.

3.2 Physiography

The Site is located in the physiographic region known as Simcoe Uplands. The uplands are comprised of a series of broad, rolling, till plains separated by steep-sided flat-floored valleys. Boulder pavement, sand, and silt appear at surface in the Penetang Peninsula as it was at one time submerged by the glacial Lake Algonquin. Till in the area consists of gritty loam derived from Pre-Cambrian rock. (Chapman & Putnam, 1984).

3.3 Overburden Geology

According to Miscellaneous Release – Data 128 from the Ontario Geological Survey (Ontario Geological Survey, 2010), the Site is underlain primarily by till (stone-poor, sandy silt to silty sand textured till). Coarse-textured glaciolacustrine deposits (sand, gravel, minor silt, and clay), are identified in the majority of the property area.

3.4 Bedrock Geology

According to Miscellaneous Release – Data 219 from the Ontario Geological Survey (Armstrong, D.K. and Dodge, J.E.P., 2007), the Site is underlain by limestone bedrock of the Gull River Formation (Middle Ordovician Simcoe Group rocks). This formation is subdivided into three members. The lower member is characterized by grey to greenish grey fine-crystalline dolomitic limestones and calcareous dolostones up to 15 m thick. Light grey to white microcrystalline limestone up to 9m thick comprises the middle member, and the upper



member is identified as grey, micro- to fine-crystalline limestone up to 3 m thick. (Ontario Geological Survey, 1989).



4.0 MECP Well Records Assessment

Cambium accessed the Ministry of the Environment Conservation and Parks (MECP) Water Well Information System (WWIS) to review water well records within 500 m of the Site.

There were sixteen (16) water well records found within approximately 500 m of the Site. Of the well records, one drilled well was installed in bedrock (Well Record#5716422) has encountered a bedrock at a depth of about 71 m, which was installed as a test hole by the MECP. Rest of the wells were all overburden wells installed from 9.1 mbgs to 87.2 mbgs. The boreholes were installed between the years 1965 and 1996. Deepest borehole (Well#5732671) drilled to a depth of 87.2 mbgs, did not encounter any bedrock. A summary of the depths, static water levels, and pumping rate are shown in Table 1 and the well records have been included as Appendix B.

Table 1 Summary of Surrounding Water Well Record Information

Well Type		Depth (mbgs)	Static Water Level (mbgs)	Recommended Pumping Rate (L/min)
Bedrock Count = 1	Maximum	71.0	38.1	12
Overburden Count =15	Maximum	9.1	6.3	4
	Minimum	87.2	3.0	18
	Average	41.5	15.8	8

A summary of the information outlined in the well records is provided below:

- Of the records analyzed, all the wells encountered fresh groundwater.
- Overburden was reported as a layer of predominantly sand with some gravel and silt overlying the bedrock (limestone).
- Based on well yields, it is indicated the presence of productive wells in the area.



5.0 Borehole Drilling and Monitoring Well Installation

5.1 Borehole Investigation

Cambium completed a geotechnical investigation at the Site on July 21, 2021, to assess the subsurface conditions. A total of four boreholes, designated as BH101-21 through BH104-21, were advanced to a depth of 6.6 m below ground surface (mbgs). Borehole locations are appended as Figure 4. Borehole logs are included in Appendix C.

During the site investigation, three monitoring well was installed in boreholes BH102-21, BH103-21 and BH104-21 and the groundwater level was measured on a subsequent groundwater monitoring trips starting from August 3, 2022 to July 6, 2022.

A summary of lithological details is presented below.

Topsoil

A layer of black topsoil with some organics including sand and some silt was observed at the surface of all boreholes throughout the Site. The thickness of the topsoil ranged between 0.01 m and 0.40 m

Sand

Beneath the topsoil in boreholes BH101-21, BH102-21 and BH104-21, a layer of sand with varying amounts of gravel, silt and clay was encountered. The material was brown to grey in colour and extended to 1.5 mbgs in BH101-21, 4.6 mbgs in BH102-21 and the termination depth of 6.6 mbgs in BH104-21.

Silty Sand and Sandy Silt

Beneath the sand material found in boreholes BH101-21 and BH102-21, a silty sand material was encountered and extended to the termination depth of 6.6 mbgs. The material was grey in colour and contained varying amounts of gravel and trace amounts of clay.



Sand and Silt

Below the surficial topsoil layer in borehole BH103-21, a layer of sand and silt material was encountered and extended to the termination depth of 6.6 mbgs. The sand and silt material were brown to grey in colour and contained trace amounts of gravel.

Bedrock

Bedrock was not encountered during this geotechnical investigation. Drilling was terminated at depths of 6.6 mbgs, in native soils.

5.2 Monitoring Well Installation Details

Table 2 below provides all the construction details of monitoring well installation in three of the boreholes.

Table 2 Monitoring Well Installation Details

Monitoring Well	Termination Depth (mbgs)	Ground Elevation (masl)	Screen Details	
			Screen Top (masl)	Screen Bottom (masl)
BH102-21	6.6	224.67	221.57	218.57
BH103-21	6.6	223.86	220.76	217.76
BH104-21	6.6	222.65	219.55	216.55

5.3 Long-Term Groundwater Monitoring

As part of hydrogeological investigation, long-term stabilized water level monitoring was completed for 12 months. Groundwater levels were measured between August of 2021 and July of 2022.

Groundwater levels for the entire monitoring period are presented in Table 3 below.



Table 3 Measured Groundwater Levels

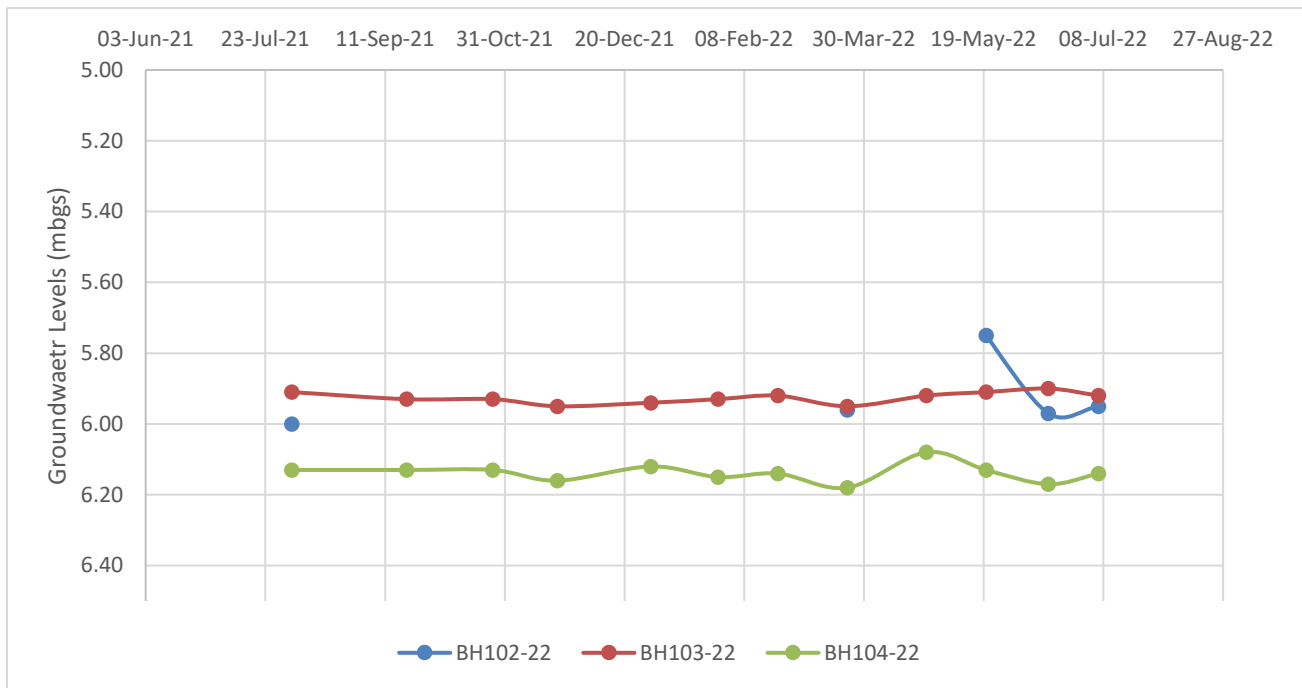
Date	Borehole	Ground Elevation (masl)	Water Level Depth (mbgs)	Water Level Elevation (masl)
August 3, 2021	BH102-21	224.67	6.0	218.67
	BH103-21	223.86	5.91	217.95
	BH104-21	222.65	6.13	216.52
September 20, 2021	BH102-21	224.67	Dry	-
	BH103-21	223.86	5.93	217.93
	BH104-21	222.65	6.13	216.52
October 26, 2021	BH102-21	224.67	Dry	-
	BH103-21	223.86	5.93	2
	BH104-21	222.65	6.13	216.52
November 22, 2021	BH102-21	224.67	Dry	-
	BH103-21	223.86	5.94	217.92
	BH104-21	222.65	6.16	216.49
December 21, 2021	BH102-21	224.67	Dry	-
	BH103-21	223.86	5.94	217.92
	BH104-21	222.65	5.92	216.73
January 28, 2022	BH102-21	224.67	Dry	-
	BH103-21	223.86	5.93	217.93
	BH104-21	222.65	6.15	216.50
February 22, 2022	BH102-21	224.67	Dry	-
	BH103-21	223.86	5.92	217.93
	BH104-21	222.65	6.14	216.51
March 23, 2022	BH102-21	224.67	5.96	218.71
	BH103-21	223.86	5.95	217.91
	BH104-21	222.65	6.18	216.47
April 25, 2022	BH102-21	224.67	Dry	-
	BH103-21	223.86	5.92	217.94
	BH104-21	222.65	6.08	216.57
May 20, 2022	BH102-21	224.67	5.75	218.92
	BH103-21	223.86	5.91	217.95
	BH104-21	222.65	6.13	216.52
June 15, 2022	BH102-21	224.67	5.97	218.70
	BH103-21	223.86	5.9	217.96



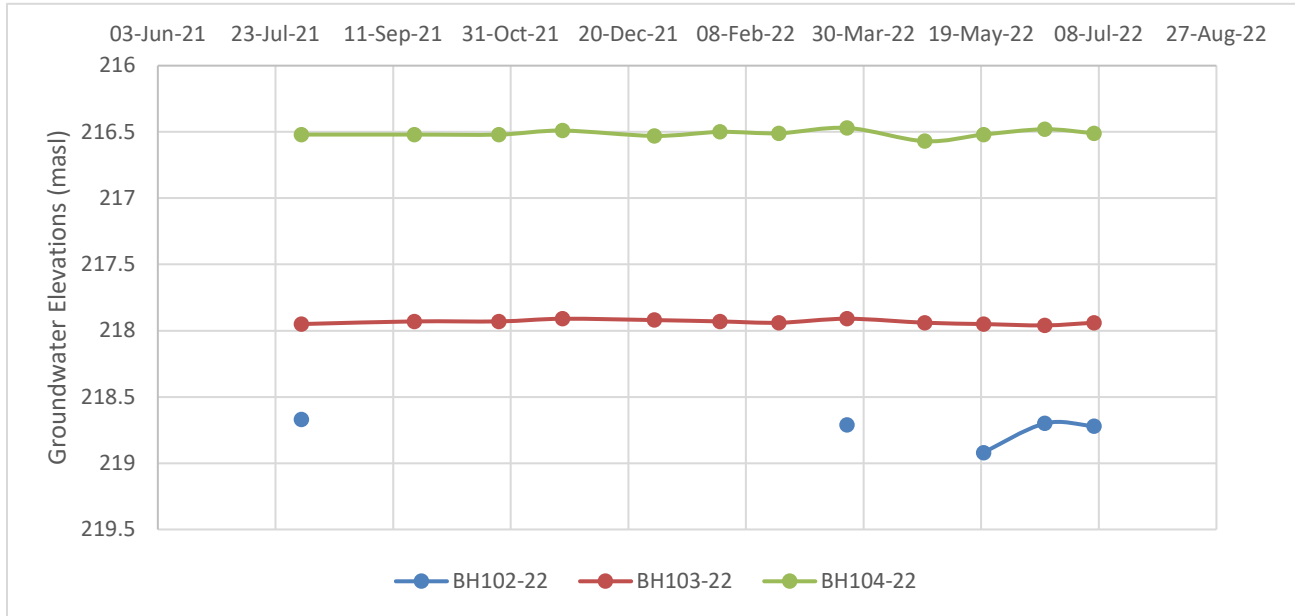
Date	Borehole	Ground Elevation (masl)	Water Level Depth (mbgs)	Water Level Elevation (masl)
	BH104-21	222.65	6.17	216.48
June 15, 2022	BH102-21	224.67	5.95	218.72
	BH103-21	223.86	5.92	217.94
	BH104-21	222.65	6.14	216.51

All the groundwater monitoring data is presented below in Embedded Figure 1 and Embedded Figure 2.

Embedded Figure 1 Depth to Groundwater Levels (mbgs)



Embedded Figure 2 Water Table Elevations (masl)



As presented above, the spring measured groundwater levels in the monitoring wells ranged in depth from 5.75 mbgs to 6.18 mbgs, and the elevations ranged from 216.47 masl to 218.92 masl. As per the long-term water level monitoring, BH102-21, has witnessed water levels only in the spring and was dry rest of the year. The seasonal high-water level of 5.75 mbgs was recorded in the month of May 2022 with the corresponding highest water table elevation at 218.92 masl.

5.4 Groundwater Flow Direction

Based on the groundwater elevation data obtained from the monitoring event (May 20, 2022), a site-specific groundwater elevation contour map was prepared to present the groundwater flow direction across the Site. As shown in Figure 5, the groundwater flow direction was found to be east and southeast following the local surficial drainage.

5.5 Physical Laboratory Testing

Physical laboratory testing, including five (5) sieve and hydrometer analyses (LS-702, 705) was completed on selected soil samples (BH101-21, BH102-21, BH103-21 and BH104-21) to

confirm textural classification and to estimate percolation rates of the native soils. Results are presented in Appendix D and details of the grain-size analysis are presented in Table 4 below.

Based on sieve analysis data, the shallow soil samples (0.6 to 2.0 mbgs) mostly consist of silty sand with trace to some clay and gravel, while the deeper (2.3 to 5.0 mbgs) native soils were predominantly sandy with trace silt and gravel.

Table 4 Particle Size Distribution

BH	Depth (mbgs)	Description	% Gravel	% Sand	% Silt	% Clay	Percolation Times (min/cm)
BH101-21 SS3	1.5 – 2.0 m	Silty Sand, some Clay, trace Gravel	7	68	25		14
BH102-21 SS2	0.6 - 1.2 m	Silty Sand trace Clay and Gravel	4	80	15	4	12
BH102-21 SS6	4.6 – 5.0 m	Silty Sand, some Gravel, trace Clay	11	62	24	3	14
BH103-21 SS2	0.6 – 1.2 m	Silty Sand, trace Gravel	3	62	35		20
BH104-21 SS4	2.3 – 2.7 m	Sand, trace Silt and Gravel	4	87	9		6

The soil percolation rates ranged between as low as 20 min/cm and as high as 6 min/cm. The geometric mean of the percolation rate was estimated at about 12 min/cm, indicating the presence of relatively high transmissive soils with good drainage capacity.

5.6 In-Situ Hydraulic Conductivity Tests

The in-situ hydraulic conductivity tests could not be conducted as the wells were either dry or have insufficient water column to conduct either a falling head test or rising head tests. Therefore, the hydraulic conductivity (k-value) of the native soils could not be estimated.



6.0 Construction Dewatering Assessment

Construction dewatering is intended to lower the groundwater levels in the excavation area in order to ensure a dry working condition for the construction operations at the Site.

The requirements for construction dewatering generally depend on the Site's soil and groundwater conditions including soil type, soil permeability or hydraulic conductivity, local groundwater levels, and the design of the proposed works, such as the foundation and/or basement elevation, as well as the size of proposed structure / excavation.

The proposed residential development could possibly include a basement under the proposed single detached dwellings, row house dwellings, and double duplex dwellings and accordingly, the basement might extend to a depth of about 3.5 m (10.5 ft.) below the existing grade. At the time of this report, no details regarding the finished floor elevation (FFE) or grade elevations were available.

Based on the groundwater monitoring data , the spring measured groundwater levels in the monitoring wells ranged in depth from 5.75 mbgs to 6.18 mbgs, and the elevations ranged from 216.47 masl to 218.92 masl. Since, the depth to water level is more than 2 m below the bottom elevations of the likely basements, no dewatering either short or long term would be required for the proposed development under the existing ground conditions.



7.0 Water Balance Assessment

Based on the Thornthwaite and Mather methodology (Thornthwaite & Mather, 1957), the water balance is an accounting of water in the hydrologic cycle. Precipitation (P) falls as rain and snow. It can run off towards lakes and streams (R), infiltrate to the groundwater table (I), or evaporate from ground or evapotranspiration by vegetation (ET). When long-term average values of P, R, I, and ET are used, there is minimal or no net change to groundwater storage (ΔS).

The annual water budget can be expressed as:

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

Where:

P = Precipitation (mm/year)

ET = Evapotranspiration (mm/year)

R = Run-off (mm/year)

I = Infiltration (mm/year)

ΔS = Change in groundwater storage (taken as zero) (mm/year)

It is noted that the water balance described herein does not account for catchment areas that extend off-site. The calculations compare the pre- and post-development water balance changes within the Site boundaries.

The pre-development portion of the Site is mainly a vacant land.

It is understood that the proposed development consists of single detached dwellings, row house dwellings, and double duplex dwellings totalling to 32 units along with driveways, parking areas and roadways.

Based on the available design information, the development area at the Site can be generally categorized into three (3) types as paved area, roof area, and landscape areas. Based on the development concept plan (Appendix A) the roof, landscape and paved were estimated and a summary of the surface areas of the development is listed in Table 5.



Table 5 Pre- and Post-Development Site Statistics

Type of Land Coverage	Pre-Development Areas (m ²)	Post-Development Areas (m ²)
Paved Area	-	10,600
Building Roof Area	-	9,525
Landscape/Vegetated Area	53,000	32,875
Total (m ²)	53,000	53,000

Supporting information referenced herein (including detailed water balance calculations) is attached in Appendix E.

7.1 Water Surplus

Water surplus is calculated by determining the difference between precipitation and evapotranspiration (changes in soil water storage was assumed to be negligible over the course of a year). The volume of water surplus is further sub-divided into portions that infiltrate the on-site soils and that are directed off-site as runoff.

The climatic data including monthly average temperature and precipitation were obtained from Environment Canada, for Midland weather station (Climate Identifier: 6115127) located about 6 km distance from the Site. Data was available for a period of 29 years from 1981 to 2010. Accordingly, the average annual evapotranspiration was estimated to be about 547 mm/annum using the USGS Thornthwaite Monthly Water Balance methodology (Appendix E), and the average annual precipitation was recorded to be 1,041 mm/annum. The water surplus of the Site was calculated to be 494 mm/year.

Evapotranspiration does not occur from structures, paved areas, or hard gravel surfaces. It was assumed that 10% of precipitation falling on these surfaces is lost directly to evaporation. The remaining depth (i.e., 90% of precipitation) was considered surplus and converted to infiltration and/or runoff.

7.2 Infiltration Rates

The volume of surplus water that infiltrates through pervious surfaces on-site was determined by applying an infiltration factor to the surplus depth. The surplus water that does not infiltrate



into pervious surfaces will leave the Site as surface water runoff. The infiltration factor varies from 0 to 1 and is estimated based on topography, soils, and vegetation cover as per the *Stormwater Management Planning and Design Manual* (Ministry of the Environment, 2003).

The rate of infiltration at a site is expected to vary, based on a number of factors to be considered in any infiltration model. To partition the available water surpluses into infiltration and surface run-off, the Ministry of Environment, Conservation and Parks (MECP) infiltration factor was used. The MECP Storm Water Management Planning and Design Manual (2003) methodology for calculating total infiltration based on topography, soil type and land cover was used, and a corresponding run-off component was calculated for the soil moisture storage conditions.

The Site is relatively a gently undulating to sloping topography, and based on the results of the borehole investigation, the subsurface conditions at the Site predominantly consist of sand with silt and gravel extending to a depth of approximately 6.0 mbgs.

The calculation of infiltration and runoff in the stages of pre-development and post-development is provided in Appendix E, and are presented in Table 6 through Table 9 below.

7.3 Pre-Development Water Balance

The water balance for the existing conditions of the Site is summarized in Table 6. The pre-development infiltration rate was calculated to be 18,327 m³/yr and the runoff rate was 7,855 m³/yr.

Table 6 Pre-Development Water Balance

Land Use		Area (m ²)	Precipitation (m ³)	Evapotranspiration (m ³)	Infiltration (m ³)	Run-off (m ³)
Impervious Areas	Paved Area	-	-	-	-	-
	Roof Area	-	-	-	-	-
Pervious Areas	Landscape Area	53,000	55,173	28,991	18,327	7,855
		53,000	55,173	28,991	18,327	7,855

Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.



7.4 Post-Development Water Balance

The post-development water balance is summarized in Table 7. The post-development infiltration rate was estimated at 11,368 m³/yr and the runoff rate was at 23,727 m³/yr.

Table 7 Post-Development Water Balance

Land Use		Area (m ²)	Precipitation (m ³)	Evapotranspiration (m ³)	Infiltration (m ³)	Run-off (m ³)
Impervious Areas	Paved Area	10,600	11,035	1,103	-	9,931
	Roof Area	9,525	9,916	992	-	8,924
Pervious Areas	Landscape Area	32,875	34,223	17,983	11,368	4,872
		53,000	55,173	20,078	11,368	23,727

Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.

7.5 Water Balance Comparison

The water balances of the pre-development and post-development scenarios are summarized below in Table 8.

Table 8 Water Balance Comparison

	Precipitation (m ³)	Evapotranspiration (m ³)	Infiltration (m ³)	Run-off (m ³)
Pre-Development	55,173	28,991	18,327	7,855
Post-Development	55,173	20,078	11,368	23,727
Change in Volume	-	-8,913	-6,959	15,873
Change in %	-	-31	-38	202

Based on the above, there is an infiltration deficit of about 6,959 m³/year compared to the pre-development infiltration. The runoff rate upon development of the Site was increased by about 15,873 m³/year.



Table 9 Requirement of Infiltration from Roof Run-off

Volume of Pre-Development Infiltration (m ³ /annum)	18,327
Volume of Post-Development Infiltration (m ³ /annum)	11,368
Deficit from Pre to Post Development Infiltration (m ³ /annum)	6,959
% of Roof Runoff required to match the pre-development Infiltration	78

Based on the above calculations, a summary of the water balance could be provided as follows:

1. There is a net increase in run-off at the Site of about 15,873 m³/annum, from 7,585 m³/annum to 23,727 m³/annum. This increase is a result of the development of the Site with more impervious areas such as roof and paved areas and decrease in pervious areas.
2. Post-development landscape area was decreased by about 20,125 m², when compared to the pre-development landscape, causing less infiltration and more run-off across the Site.
3. Without implementing any mitigation measures, there is a net deficit of about 6,959 m³/annum in the post-development infiltration on a yearly basis.
4. Based on the estimation, considering the diversion of about 78% of the general roof water for infiltration, the proposed development would maintain the pre-development infiltration after the development. Therefore, Cambium would recommend the design and implementation of Low Impact Development (LID) measures at the Site.

7.6 Discussions on LID Measures

It is known that low impact development (LID) practices have received increasing attention as these strategies attempt to capture the runoff and mimic the natural hydrologic cycle.

In general, there are two primary categories of LIDs. The first promotes the infiltration of Stormwater close to the source. These infiltration type LIDs are preferred when hydrogeological and physical conditions are optimal and allow for their emplacement. The proposed development does not include a stormwater management pond to improve water quality and enhance the lost infiltration due to the Site development with paved and roof areas. Therefore, the second option which captures and slowly releases the water to the ground



water system through the process of storage and filtration by infiltration LIDs should be considered.

Roof downspout disconnection is an option available for the Site. Considering a conservative run-off capture rate estimate of 25%, the total volume of roof run-off water available for infiltration is approximately 2,230 m³/yr, leaving approximately 4,725 m³/yr still to be compensated at the Site. Roof downspouts should only be disconnected where the minimum depth to the seasonally high water table is at least 1 m below the surface. As relatively deep water table conditions are present at the Site, this LID measurement will be feasible. Additional LID measures, such as infiltration trenches, infiltration galleries, soak-away pits etc., can be utilized to enhance infiltration in addition to roof downspout disconnects.

As there is an infiltration deficit in the post-development scenario, Cambium does recommend implementing any suitable LID measures, along with Best Management Practices (BMPs) to enhance and compensate the infiltration deficit. However, Cambium is not providing any design of LID facilities, it would be beneficial to consult with design engineers for the LID design recommendations.



8.0 Source Water Protection And Risk Management

As per the MECP Source Protection Information Atlas (SPIA) and SBLP Source Protection Plan (SPP), the western half of the Subject Site is located within a Significant Groundwater Recharge Area (SGRA) and the entire Site is within a Wellhead Protection Area Q1 and Q2 related groundwater recharge management (Appendix A).

- **SGRA**

SGRAs exist in areas where water from surface more easily infiltrates the ground to recharge an aquifer that is used for municipal or other drinking water supplies. Under the Clean Water Act, 2006, a SGRA helps maintain the water level in an aquifer that supplies drinking water (including to private wells) and has higher than average recharge comparatively across the Source Protection Area.

In the present development scenario, as the development will create more impervious areas across the Site causing a reduction in infiltration, we recommend implementing the LID measures where practicable. The proposed development does not involve any long-term dewatering and therefore, a potential reduction to ground water supplies was not expected.

- **WHPA Q1/Q2**

As per Section 58 of the SBLP SPP, a risk management plan should ensure that the threat to drinking water ceases to be significant. A climate based water balance assessment was completed for the pre- and post-development scenarios for the Site as described in Section 7. A climate based water balance assessment is the first step to identify the post-development infiltration deficit and then utilize the Best Management Practices (BMPs) to minimize any infiltration deficit.

Accordingly, as per the water balance assessment completed above, it was estimated that there is a net infiltration deficit between the pre- and development scenarios in the order of 6,959 m³/annum.

The preferred solution for recharge management is always for the post-development infiltration deficit to be mitigated during the development process. In the present scenario, due to deep



water table conditions and the presence highly permeable sandy soils at the Site, we recommend exploring all the LID measures such as infiltration trenches, infiltration galleries or other suitable measures to encourage the roof water run-off infiltration in order to mitigate the estimated infiltration deficit.

The Site will be under municipal sewage and water services and as such the proposed development is not expected to cause any groundwater contamination by nitrates.



9.0 Assessment of Potential Impacts

Based on the information available, the residential development at the Site may likely have one-level basement and based on water levels there is no construction dewatering, either short-term or long-term was anticipated at the Site. The potential impacts due to the Site development were assessed as below.

9.1 Natural Features

As discussed, no natural features such as wetlands, woodlands or creeks are located on the Site and therefore, there should be no impacts on the local natural features, due to the Site development. Also, the Site is not located in NVCA regulation areas and as per the O. Reg. 172/06, regulation limits prescribed by the Conservation Authority are not applicable to the Site development.

9.2 Water Supply Wells near the Site

Given that no dewatering will be required for completion of the proposed development, impacts on the local water wells (private or public), if any will not be anticipated to be associated with the dewatering activity.

9.3 Considerations on Drinking Water Vulnerability

Based on the MECP Source Protection Information Atlas, the Site is situated partly within SGRA and entirely in WHPA Q1/Q2 and therefore, best management practices and other measures described in Section 8 should be followed in order to reduce the qualitative and quantitative impacts on the local groundwater regime.



10.0 Conclusions and Recommendations

Cambium Inc. (Cambium) was retained by Koenig Developments Ltd. (the Client) to complete a hydrogeological assessment of the property located at 245 Church Street, Town of Penetanguishene, ON (the Site).

Subject Property is situated within the Severn Sound watershed under the jurisdiction of the NVCA Source Protection Area and no wetlands or woodlands or creeks are situated on the Site.

The measured groundwater levels in the monitoring wells ranged in depth from 5.75 mbgs to 6.18 mbgs, and the elevations ranged from 216.47 masl to 218.92 masl.

As per the long-term water level monitoring, the spring seasonal high water level of 5.75 mbgs was recorded in the month of May 2022 and water table elevation was at 218.92 masl.

Groundwater flow direction was found to be east and southeast following the local surficial drainage.

Based on the water table elevations and excavation depths for the likely one level basement, temporary short-term groundwater control (construction dewatering) will not be required. Also, the one level basement slab elevation would be well above the water table elevation and therefore, long-term sub-drain drainage was not expected at the Site.

The conceptual water balance indicates that there will be an infiltration deficit of 6,959 m³ /annum upon the development of the Site. About 78% of the runoff generated from roof surfaces can account for the infiltration deficit if it is captured and re-infiltrated.

The Site will be under municipal sewage and water services and as such the proposed development is not expected to cause any groundwater contamination by nitrates.

As the Site is situated within a SGRA and WHPA Q1/Q2, the preferred solution for recharge management is always for the post-development infiltration deficit to be mitigated during the development process. In the present scenario, due to deep water table conditions and the presence of highly permeable sandy soils at the Site, we recommend exploring all the possible



LID measures and adhering to the best management practices in order to protect the local groundwater supplies.

Respectfully submitted,

Cambium Inc.

Nicole Heikoop, M.Sc., GIT
Technologist

Sudhakar Kurli, M.Sc., P.Geo.
Project Manager/Hydrogeologist

NMH/SK

P:\13200 to 13299\13237-001 Schuren Sriskandarajah - Water Balance and Hydrogeological Assessment - 245 Church St\



11.0 References

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12.0 Standard Limitations

Limited Warranty

In performing work on behalf of a client, Cambium relies on its client to provide instructions on the scope of its retainer and, on that basis, Cambium determines the precise nature of the work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards. Unless required under local laws, other than as expressly stated herein, no other warranties or conditions, either expressed or implied, are made regarding the services, work or reports provided.

Reliance on Materials and Information

The findings and results presented in reports prepared by Cambium are based on the materials and information provided by the client to Cambium and on the facts, conditions and circumstances encountered by Cambium during the performance of the work requested by the client. In formulating its findings and results into a report, Cambium assumes that the information and materials provided by the client or obtained by Cambium from the client or otherwise are factual, accurate and represent a true depiction of the circumstances that exist. Cambium relies on its client to inform Cambium if there are changes to any such information and materials. Cambium does not review, analyze or attempt to verify the accuracy or completeness of the information or materials provided, or circumstances encountered, other than in accordance with applicable accepted industry practice. Cambium will not be responsible for matters arising from incomplete, incorrect or misleading information or from facts or circumstances that are not fully disclosed to or that are concealed from Cambium during the provision of services, work or reports.

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Site Assessments

A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

Only conditions at the site and locations chosen for study by the client are evaluated; no adjacent or other properties are evaluated unless specifically requested by the client. Any physical or other aspects of the site chosen for study by the client, or any other matter not specifically addressed in a report prepared by Cambium, are beyond the scope of the work performed by Cambium and such matters have not been investigated or addressed.

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Potential liability to the client arising out of the report is limited to the amount of Cambium's professional liability insurance coverage. Cambium shall only be liable for direct damages to the extent caused by Cambium's negligence and/or breach of contract. Cambium shall not be liable for consequential damages.

Personal Liability

The client expressly agrees that Cambium employees shall have no personal liability to the client with respect to a claim, whether in contract, tort and/or other cause of action in law. Furthermore, the client agrees that it will bring no proceedings nor take any action in any court of law against Cambium employees in their personal capacity.



Appended Figures

O:\GIS\MXD\112000-1329\13237-001 Schuren Sieslandagah - Water Balance and Hydrogeological Assessment - 245 Church St\2022-02-01 FIG 1 - Regional Location Plan.mxd



HYDROGEOLOGICAL ASSESSMENT
 KOENIG DEVELOPMENTS LTD.
 245 Church Street
 Penetanguishene, Ontario

LEGEND

- Highway
- Major Road
- Minor Road
- Watercourse
- Water Area
- Provincial Park
- Federal Protected Area
- Wooded Area
- Built Up Area

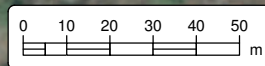
Notes:
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 - Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
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REGIONAL LOCATION PLAN

Project No.:	13237-001	Date:	May 2022
Scale:	1:100,000	Projection:	NAD 1983 UTM Zone 17N
Created by:	MAT	Checked by:	SK
			1



**HYDROGEOLOGICAL
ASSESSMENT**
KOENIG DEVELOPMENTS
LTD.
245 Church Street
Penetanguishene, Ontario

LEGEND

Site (approximate)

Notes:
 - Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).
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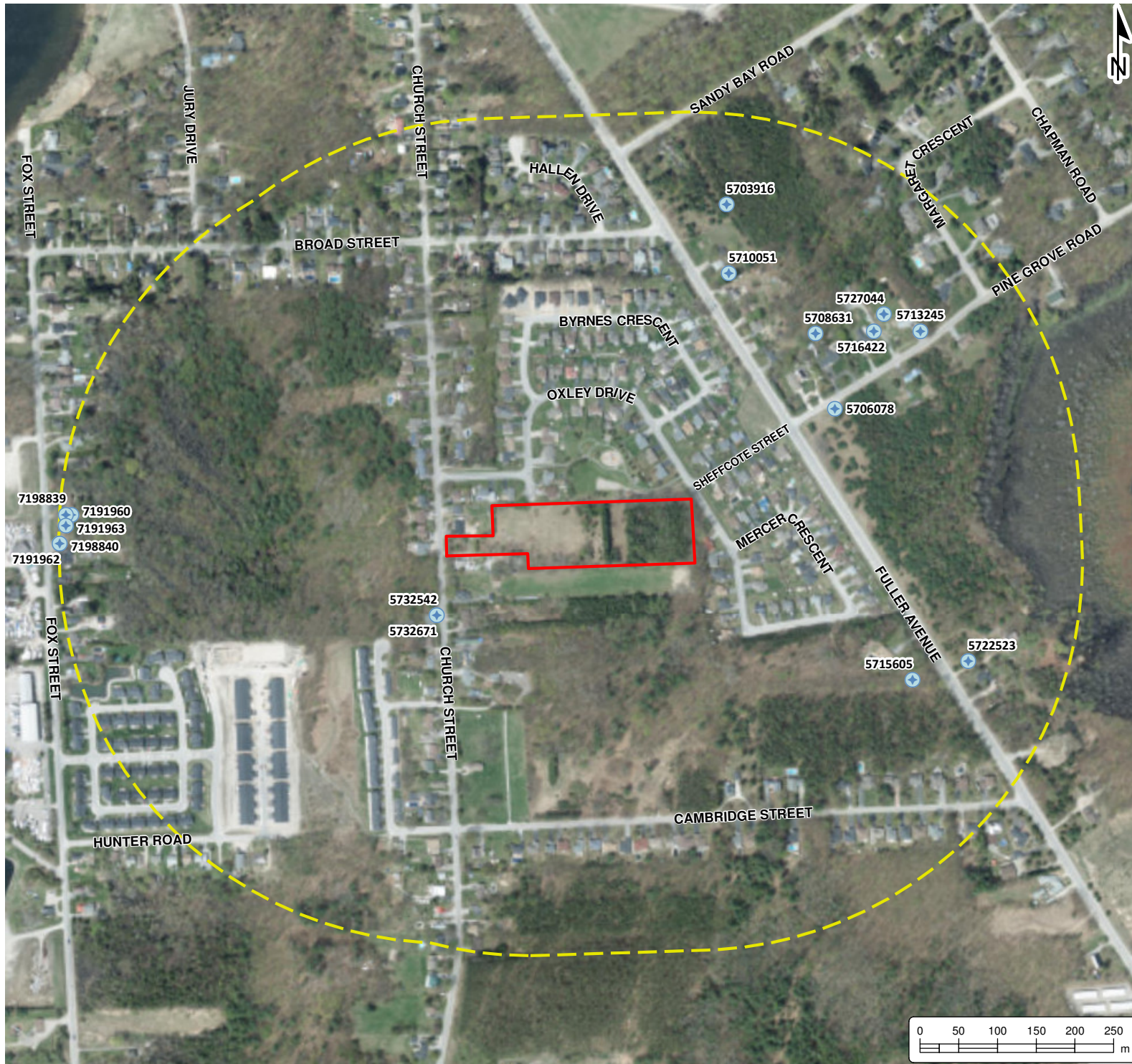


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SITE LOCATION PLAN

Project No.:	13237-001	Date:	May 2022
Scale:	1:1,750	Rev.:	
Created by:	MAT	Checked by:	SK
		Figure:	2
		Projection: NAD 1983 UTM Zone 17N	




O:\GIS\MXD\13200-13299\13237-001 Schuren Siekandarijeh - Water Balance and Hydrogeological Assessment - 245 Church St\2022-02-01 FIG 3 - MECF Well Record Map.mxd



HYDROGEOLOGICAL ASSESSMENT

KOENIG DEVELOPMENTS LTD.
245 Church Street
Penetanguishene, Ontario

LEGEND

-  MECF Well Record
-  500m Study Area
-  Site (approximate)

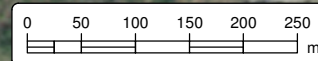
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MECF WELL RECORDS MAP

Project No.:	13237-001	Date:	May 2022
Scale:	1:7,000	Rev.:	
Created by:	MAT	Projection:	NAD 1983 UTM Zone 17N
Checked by:	SK	Figure:	3






O:\GIS\MD\13200-13299\13237-001 Schuren Snelandaregion - Water Balance and Hydrogeological Assessment - 245 Church St\2022-02-01 FIG 4 - Borehole Location Plan.mxd



HYDROGEOLOGICAL ASSESSMENT
 KOENIG DEVELOPMENTS LTD.
 245 Church Street
 Penetanguishene, Ontario

LEGEND

-  Borehole
-  Monitoring Well
-  Site (approximate)

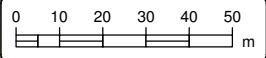
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BOREHOLE LOCATION PLAN

Project No.:	13237-001	Date:	May 2022
Scale:	1:1,750	Rev.:	
Created by:	MAT	Checked by:	SK
Figure:	4		









O:\GIS\MXD\13200-13299\13237-001 Schuren Sieslandarajah - Water Balance and Hydrogeological Assessment - 245 Church St\2022-02-01 FIG 5 - Groundwater Configuration Map.mxd



HYDROGEOLOGICAL ASSESSMENT
 KOENIG DEVELOPMENTS LTD.
 245 Church Street
 Penetanguishene, Ontario

LEGEND

-  Borehole
-  Monitoring Well
-  Groundwater Contour (0.5m intervals)
-  Site (approximate)
-  **(218.92)** Groundwater Elevation (masl) (May 20, 2022)
-  Groundwater Flow Direction

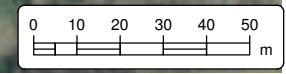
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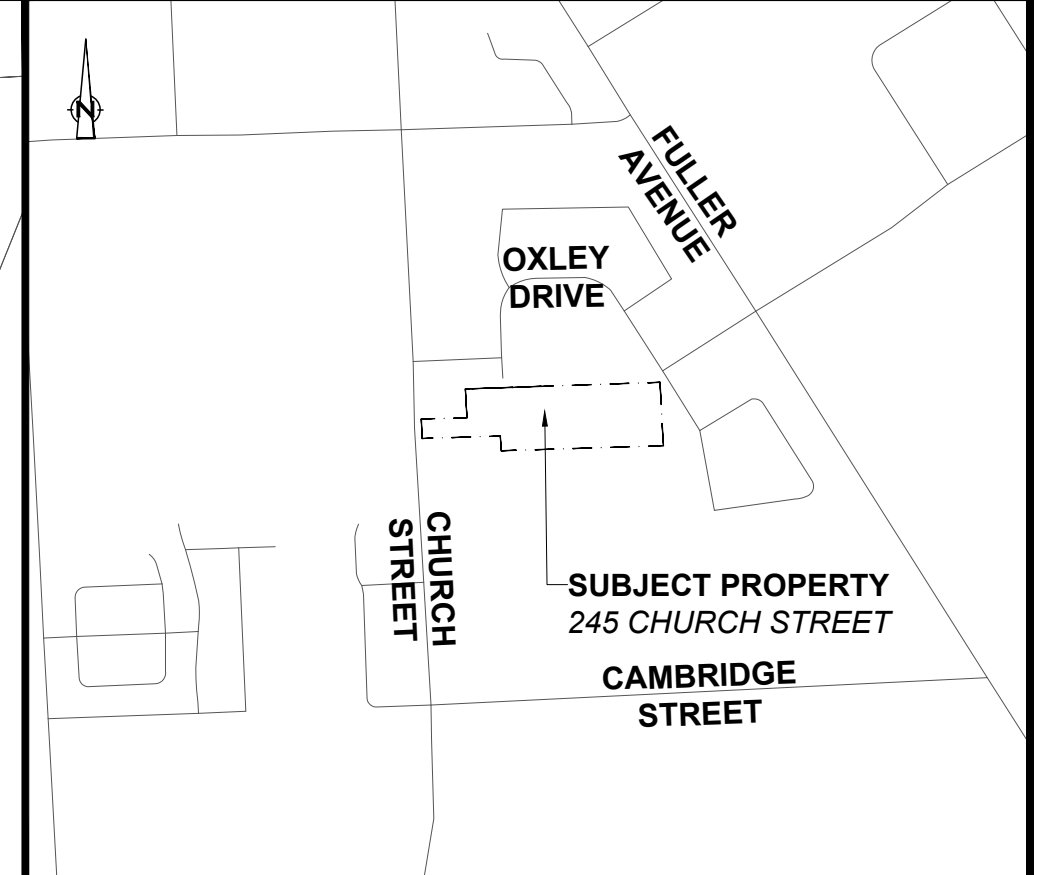
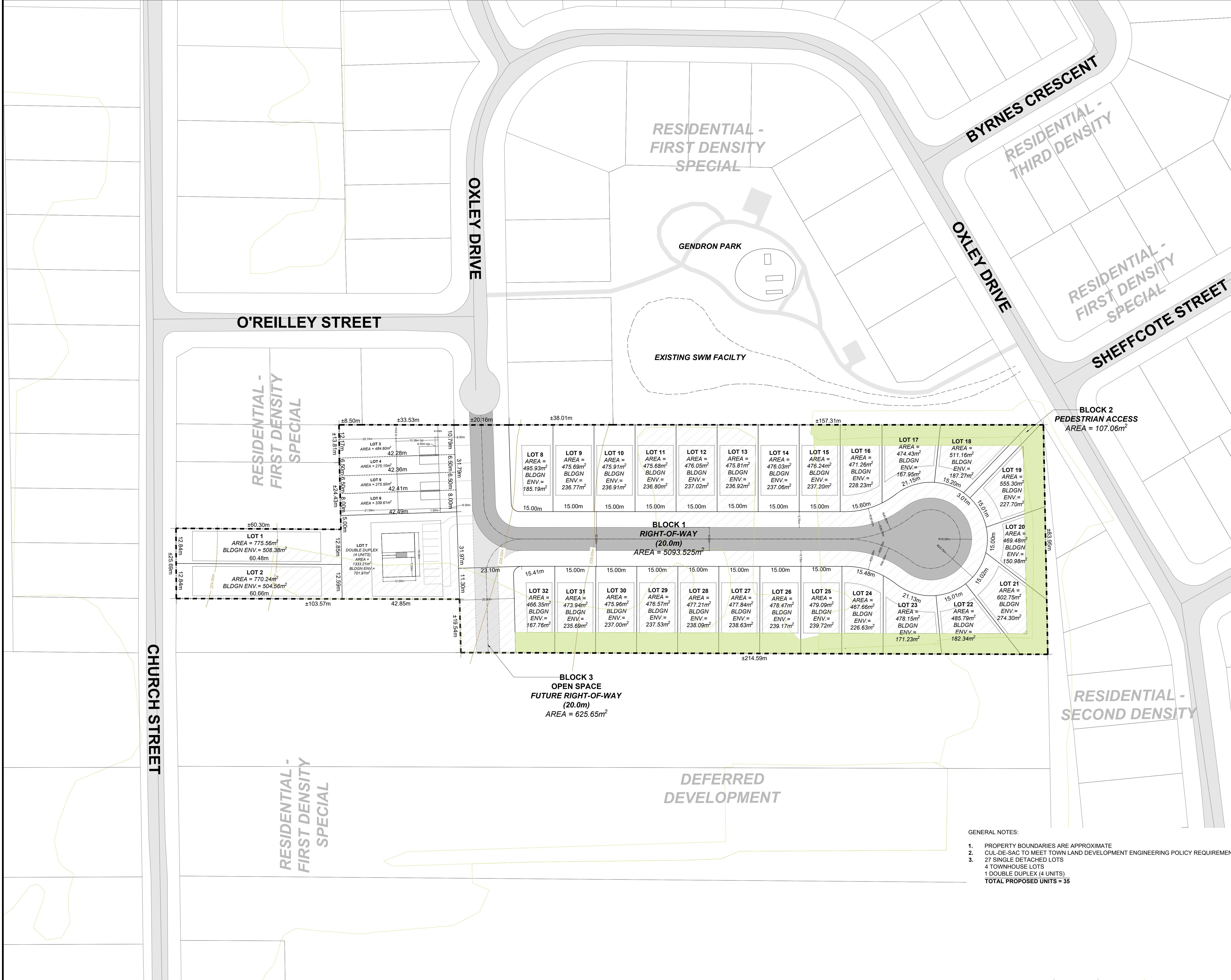
GROUNDWATER CONFIGURATION MAP

Project No.: 13237-001		Date: May 2022	
Scale: 1:1,750		Projection: NAD 1983 UTM Zone 17N	
Created by: MAT	Checked by: SK	Figure:	5





Appendix A
Site Development Plans



Key Map
1:10,000

- SUBJECT BOUNDARY
- EX. PARCEL
- EX. BUILDING
- EX. CONTOUR ELEVATION (2.0m INTERVAL)
(Retrieved from County GIS)
- EX. WOODLAND TO REMAIN
- EX. WOODLAND TO BE REMOVED
- PR. LOT/BLOCK LINE
- PR. BUILDING ENVELOPE
- POTENTIAL BLDGN FOOTPRINT
- PR. RIGHT-OF-WAY CENTRELINE (MIN. CL TURNING RADIUS = R12.0m)

CONCEPT ZONING STATISTICS		
R3 - ZONE REGULATIONS - SINGLE DETACHED DWELLINGS	REQUIRED	PROPOSED
MIN. LOT FRONTAGE	15m	12.84m
MIN. LOT AREA	511 sq.m	MIN. 474.58 sq.m
MAX. LOT COVERAGE	35%	<35%
MIN. FRONT YARD SETBACK	6m	6.0m
MIN. SIDE YARD SETBACK	1m (w/ attached garage)	1.0m
MIN. EXT. SIDE YARD SETBACK	4.5m	4.5m
MIN. REAR YARD	7.5m	7.5m
MIN. GROUND FLOOR AREA	74 sq.m	>74 sq.m
MAX. HEIGHT	11m	<11.0m
MAX. ACC. BUILDING HEIGHT	4m	<4.0m
R3 - ZONE REGULATIONS - MAISONNETTE AND ROW HOUSING DWELLINGS	REQUIRED	PROPOSED
MIN. LOT FRONTAGE	30m	31.79m
MIN. LOT AREA	230 sq.m/unit	333.30 sq.m/unit
MAX. LOT COVERAGE	35%	36.3%
MIN. FRONT YARD SETBACK	6m	6m
MIN. SIDE YARD SETBACK	2m plus 1m for each storey above the ground/floor on one side, and 6m on the other side.	1.5m on one side, 3.74m on the other
MIN. EXT. SIDE YARD SETBACK	4.5m	N/A
MIN. REAR YARD	7.5m	20.74m
MIN. GROSS FLOOR AREA PER DWELLING UNIT - 2 BEDROOM	65 sq.m	>65 sq.m
MAX. HEIGHT	11m	<11.0m
MAX. ACC. BUILDING HEIGHT	4m	<4.0m
R3 - ZONE REGULATIONS - DOUBLE DUPLEX DWELLINGS	REQUIRED	PROPOSED
MIN. LOT FRONTAGE	21m	31.97m
MIN. LOT AREA	230 sq.m/unit	333.30 sq.m/unit
MAX. LOT COVERAGE	35%	14.33%
MIN. FRONT YARD SETBACK	6m	>6m
MIN. SIDE YARD SETBACK	1.0m on one side and 3.0m on the other	>1.0m on one side and >3.0m on the other
MIN. EXT. SIDE YARD SETBACK	4.5m	N/A
MIN. REAR YARD	11.0m	>11.0m
MIN. GROSS FLOOR AREA PER DWELLING UNIT - 2 BEDROOM	65 sq.m	>65 sq.m
MAX. HEIGHT	11m	<11.0m
MAX. ACC. BUILDING HEIGHT	4m	<4.0m

LOT	AREA	BLDGN	ENV.
LOT 1	775.56m ²	508.38m ²	60.48m
LOT 2	770.24m ²	504.56m ²	60.66m
LOT 3	454.60m ²		42.28m
LOT 4	275.10m ²		42.36m
LOT 5	275.50m ²		42.41m
LOT 6	339.61m ²		42.39m
LOT 7	1333.21m ²	701.97m ²	
LOT 8	495.93m ²	185.19m ²	
LOT 9	475.69m ²	236.77m ²	
LOT 10	475.91m ²	236.91m ²	
LOT 11	475.68m ²	236.80m ²	
LOT 12	476.05m ²	237.02m ²	
LOT 13	475.81m ²	236.92m ²	
LOT 14	476.03m ²	237.06m ²	
LOT 15	476.24m ²	237.20m ²	
LOT 16	471.26m ²	228.23m ²	
LOT 17	474.43m ²	167.95m ²	
LOT 18	511.16m ²	187.27m ²	
LOT 19	555.30m ²	227.70m ²	
LOT 20	469.48m ²	150.98m ²	
LOT 21	602.75m ²	274.30m ²	
LOT 22	485.79m ²	182.34m ²	
LOT 23	478.15m ²	171.23m ²	
LOT 24	467.66m ²	226.63m ²	
LOT 25	479.09m ²	239.72m ²	
LOT 26	478.47m ²	239.17m ²	
LOT 27	477.84m ²	238.63m ²	
LOT 28	477.21m ²	238.09m ²	
LOT 29	476.57m ²	237.53m ²	
LOT 30	475.96m ²	237.00m ²	
LOT 31	473.94m ²	235.69m ²	
LOT 32	466.35m ²	167.76m ²	

**BLOCK 3
OPEN SPACE
FUTURE RIGHT-OF-WAY
(20.0m)
AREA = 625.65m²**

**BLOCK 1
RIGHT-OF-WAY
(20.0m)
AREA = 5093.525m²**

**BLOCK 2
PEDESTRIAN ACCESS
AREA = 107.06m²**

**DEFERRED
DEVELOPMENT**

- GENERAL NOTES:
- PROPERTY BOUNDARIES ARE APPROXIMATE
 - CUL-DE-SAC TO MEET TOWN LAND DEVELOPMENT ENGINEERING POLICY REQUIREMENTS.
 - 27 SINGLE DETACHED LOTS
4 TOWNHOUSE LOTS
1 DOUBLE DUPLEX (4 UNITS)
TOTAL PROPOSED UNITS = 35

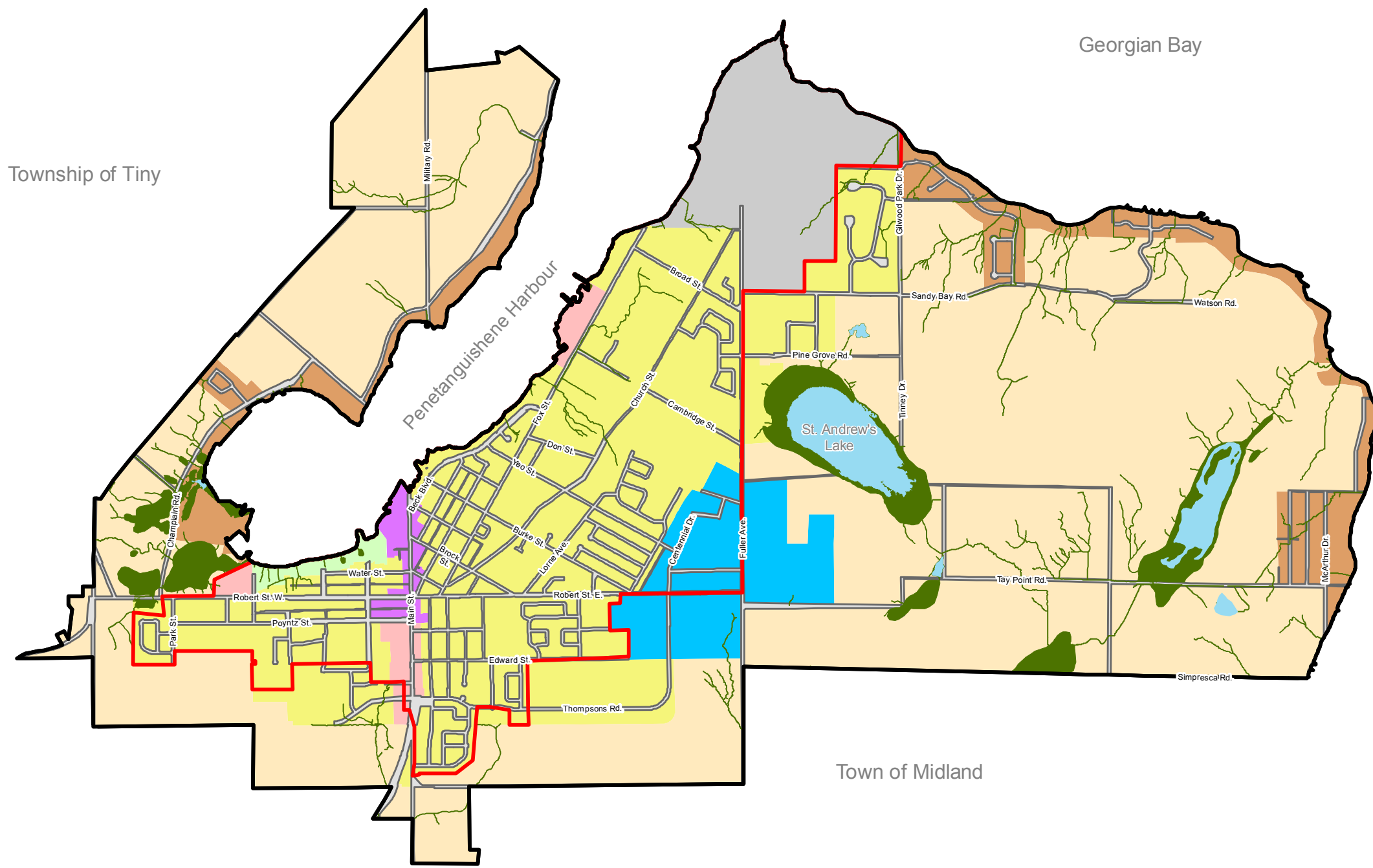
EcoVue Consulting Services Inc.
311 George St. N., Suite 200
Peterborough ON K9J 3H3
Tel: 705-876-8340 Fax: 705-742-8343
www.ecovueconsulting.com

DRAWN BY:	PROJECT No.:
MC	21-2132
APPROVED BY:	HORIZ. SCALE:
	1:600
REVISION DATE:	PLOT DATE:
AUGUST 12 2021	AUGUST 12 2021
CHURCH STREET SUBDIVISION	
KOENIG DEVELOPMENTS LTD.	
245 CHURCH STREET, TOWN OF PENETANGUISHENE, ON	
CONCEPT PLAN	CP1

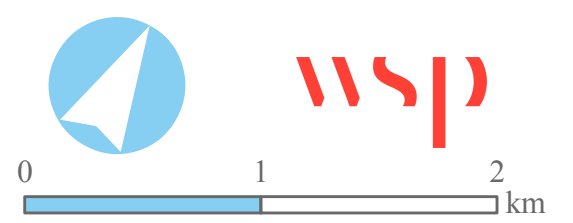


OFFICIAL PLAN
Schedule A: Land Use Structure

- Neighbourhood Area
- Downtown and Waterfront Area
- Mixed-Use and Commercial Area
- Employment Area
- Major Open Space Area
- Shoreline Area
- Rural Area
- Provincial Institution Area
- Environmental Protection Area (EP)
- Delineated Built Boundary











Interpretation Note:
 This Schedule shall be read and interpreted
 in conjunction with the Official Plan.

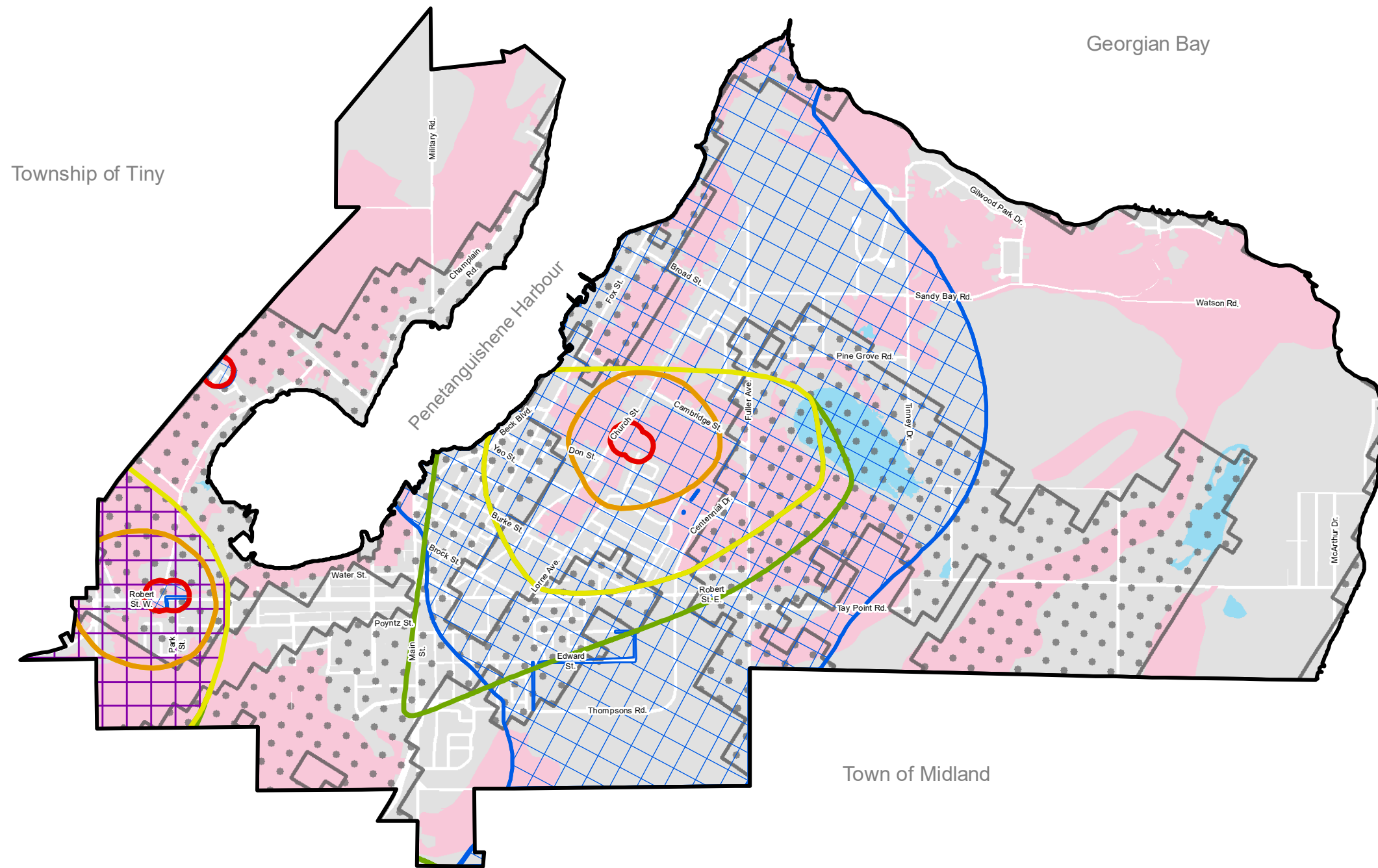




OFFICIAL PLAN
Schedule B2: Source Protection
Policy Overlays

-  WHPA-A
-  WHPA-B
-  WHPA-C1
-  WHPA-D
-  WHPA Q1 & WHPA Q2
-  Significant Groundwater Recharge Areas
-  Highly Vulnerable Aquifer
-  Robert Street Issues Contributed Area

Interpretation Note:
 This Schedule shall be read and interpreted
 in conjunction with the Official Plan.



SURVEYOR'S REAL PROPERTY REPORT

PART 1 : PLAN OF SURVEY
SHOWING TOPOGRAPHIC DETAIL OF
PART OF LOTS 142 AND 143
EAST SIDE OF CHURCH STREET
REGISTERED PLAN 70
TOWN OF PENETANGUISHENE
COUNTY OF SIMCOE

SCALE 1 : 500
 10m 0 10 20 30m

SHAJEESHANE RAJAKULENDRAN, O.L.S./O.L.I.P

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PART 2: REPORT
 THIS PLAN HAS TO BE READ IN CONJUNCTION WITH ACCOMPANYING WRITTEN REPORT.

NOTE
 THIS PLAN AND REPORT WAS PREPARED FOR THE CLIENT AND THE UNDERSIGNED ACCEPTS NO RESPONSIBILITY FOR USE BY OTHER PARTIES.

METRIC
 DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

BEARING NOTE:
 BEARINGS SHOWN HEREON ARE UTM GRID BEARINGS DERIVED FROM HORIZONTAL CONTROL MONUMENTS No. 00820038042 AND No. 00820038043 AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°00' WEST LONGITUDE. 6° UTM COORDINATE SYSTEM, ZONE 17, NAD 83 (CSRS02X010).

DISTANCES SHOWN HERE ARE GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.99988495.

INTEGRATION DATA

OBSERVED REFERENCE POINTS COORDINATES ARE REFERRED TO UTM ZONE 17 (NAD 83) (CSRS02X010)

THE UTM COORDINATES LISTED BELOW ARE TO URBAN ACCURACY AND COMPLY WITH SUBSECTION 14(2) OF ONTARIO REGULATION 216/10 FILED UNDER THE SURVEYORS ACT.

SPECIFIED CONTROL POINTS					
MONUMENT ID.	NORTHING	EASTING			
HCM 00820038042	4 954 255.350	590 465.059			
HCM 00820038043	4 954 178.389	591 968.246			
REFERENCE POINTS					
①	②	③	④	⑤	⑥
4 960 133.38	4 960 159.07	4 960 198.96	4 960 207.70	4 960 124.89	4 960 116.06
584 913.38	584 913.08	584 971.38	584 229.06	584 233.46	585 013.98

COORDINATES CAN NOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

NOTE:
 FOR BEARING COMPARISONS THE FOLLOWING ROTATIONS HAS TO BE APPLY.
 RP - 00°50'25" (COUNTERCLOCKWISE)
 P1 - 00°57'35" (COUNTERCLOCKWISE)
 P2 - 00°54'35" (COUNTERCLOCKWISE)
 P3 - 00°54'35" (COUNTERCLOCKWISE)
 P4 - 00°54'35" (COUNTERCLOCKWISE)
 P5 - 00°54'35" (COUNTERCLOCKWISE)
 P6 - 00°50'25" (COUNTERCLOCKWISE)

ELEVATION NOTE:
 ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO BENCH MARK No.0011928U136R, HAVING AN ELEVATION OF 198.925 METRES.
 LOCATION: TOWNSHIP - PENETANG CARNegie LIBRARY, TABLET IN WEST STONE FOUNDATION WALL, 61cm FROM NORTHWEST CORNER AND 1.4m BELOW BRICKWORK.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
 1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
 2. THE SURVEY WAS COMPLETED ON OCT 06, 2022.

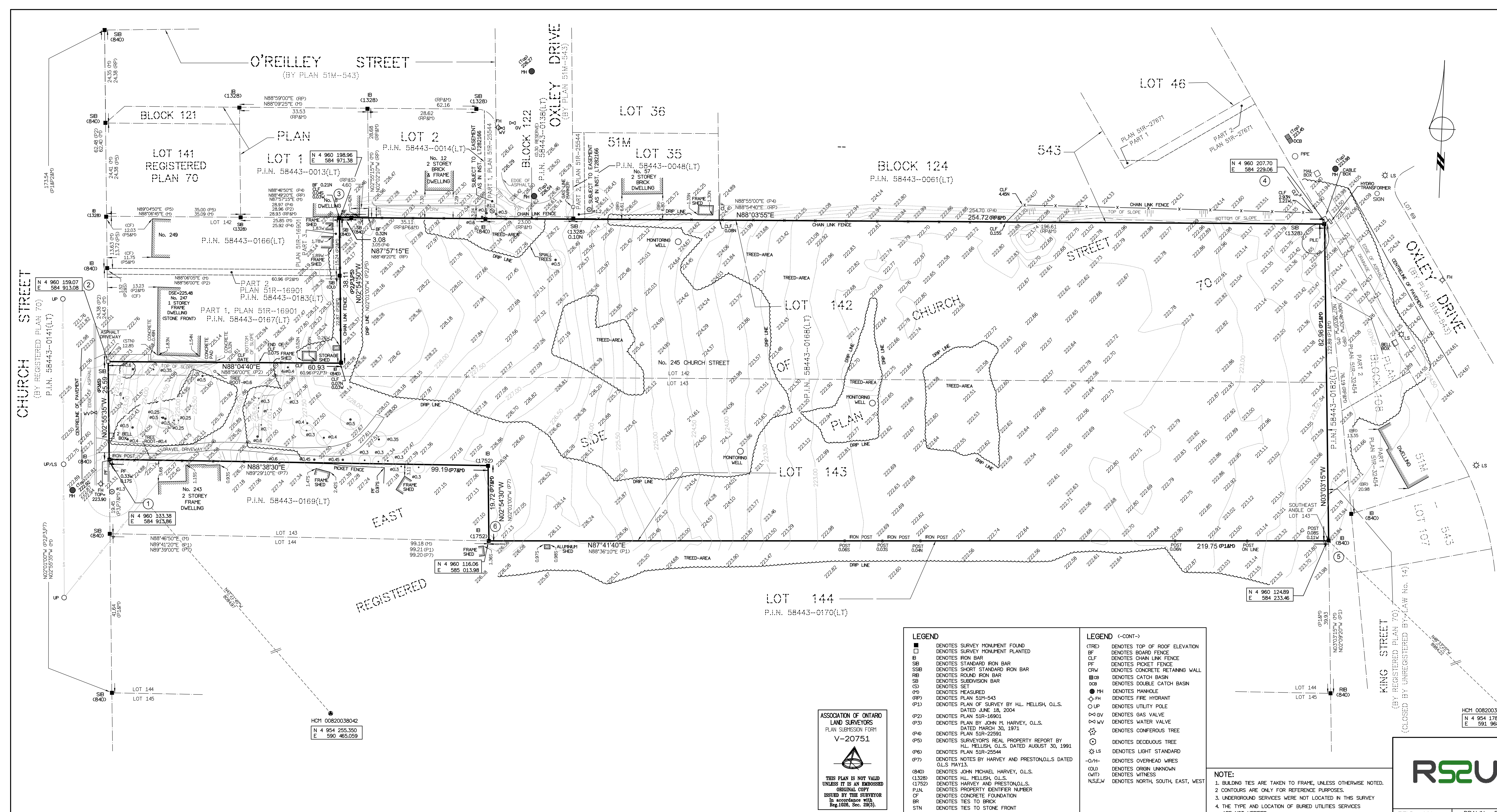
DATE: 07-OCT 2022
 SHAJEESHANE RAJAKULENDRAN
 ONTARIO LAND SURVEYOR

RS SURVEYING LIMITED.
ONTARIO LAND SURVEYORS

117 RINGWOOD DRIVE, UNIT 9
 STOUFFVILLE (ONT), L4A 8C1
 Ph. 905-554-1021, Cell 416-708-0545
 Web: www.rssurveyinglimited.ca, Email: shane@rssurveyinglimited.ca



FIELD : MM DRAWN : BL CHECKED : RS PROJECT : RSSU-2022-243-SRTP



LEGEND		LEGEND (-CONT-)	
■	DENOTES SURVEY MONUMENT FOUND	(T)	DENOTES TOP OF ROOF ELEVATION
□	DENOTES SURVEY MONUMENT PLANTED	BF	DENOTES BOARD FENCE
▣	DENOTES IRON BAR	CLF	DENOTES CHAIN LINK FENCE
SB	DENOTES STANDARD IRON BAR	PF	DENOTES PICKET FENCE
SSB	DENOTES SHORT STANDARD IRON BAR	CRW	DENOTES CONCRETE RETAINING WALL
RB	DENOTES ROUND IRON BAR	CB	DENOTES CATCH BASIN
SB	DENOTES SUBDIVISION BAR	DCB	DENOTES DOUBLE CATCH BASIN
(S)	DENOTES SET	PH	DENOTES MANHOLE
(M)	DENOTES MEASURED	PH	DENOTES FIRE HYDRANT
(RP)	DENOTES REGISTERED PLAN 51M-543	UP	DENOTES UTILITY POLE
(P1)	DENOTES PLAN OF SURVEY BY HL MELLISH, O.L.S. DATED JUNE 18, 2004	GV	DENOTES GAS VALVE
(P2)	DENOTES PLAN 51R-16901	WV	DENOTES WATER VALVE
(P3)	DENOTES PLAN BY JOHN H. HARVEY, O.L.S. DATED MARCH 30, 1971	CT	DENOTES CONFEROUS TREE
(P4)	DENOTES PLAN 51R-22591	DT	DENOTES DECIDUOUS TREE
(P5)	DENOTES SURVEYOR'S REAL PROPERTY REPORT BY HL MELLISH, O.L.S. DATED AUGUST 30, 1991	LS	DENOTES LIGHT STANDARD
(P6)	DENOTES PLAN 51R-25544	OW	DENOTES OVERHEAD WIRES
(P7)	DENOTES NOTES BY HARVEY AND PRESTON, O.L.S. DATED MAY 13, 1971	OU	DENOTES ORIGIN UNKNOWN
(840)	DENOTES JOHN MICHAEL HARVEY, O.L.S. (1328)	WT	DENOTES WITNESS
(1752)	DENOTES HARVEY AND PRESTON, O.L.S. PLAN	NSE,W	DENOTES NORTH, SOUTH, EAST, WEST
CF	DENOTES CONCRETE FOUNDATION		
BR	DENOTES TIES TO BRICK		
STN	DENOTES TIES TO STONE FRONT		
(DSE)	DENOTES DOOR SILL ELEVATION		









ASSOCIATION OF ONTARIO LAND SURVEYORS
 PLAN SUBMISSION FORM
 V-20751
 THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR in accordance with Reg.1026, Sec. 28(5).

NOTE:
 1. BUILDING TIES ARE TAKEN TO FRAME, UNLESS OTHERWISE NOTED.
 2. CONTOURS ARE ONLY FOR REFERENCE PURPOSES.
 3. UNDERGROUND SERVICES WERE NOT LOCATED IN THIS SURVEY
 4. THE TYPE AND LOCATION OF BURIED UTILITIES SERVICES ARE NOT VERIFIED.

SGRA Map



Legend

-  Source Protection Areas
-  Issue Contributing Areas
- Significant Groundwater Recharge Area
-  0
-  2
-  4
-  6
-  WHPA Groundwater Under Direct Influence (WHPA-E)
-  Assessment Parcel with Address

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Environment, Conservation and Parks (MECP) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.



Appendix B
MECP Well Records

UTM 17 1/2 58 52 640 E



57 No 3916

C 5 R 49 60 3 6 4 N

The Ontario Water Resources Commission Act

Elev. 6 R 07 5 5

WATER WELL RECORD

Basin 2 2

County or District Simcoe Township, Village, Town or City Tay

Con. 2 PT. LOT 120 Lot B-1 Date completed September 3rd, 1965 (day month year)

Address R.R. 1 Penetang, Ont.

Casing and Screen Record

Inside diameter of casing 6 1/4"

Total length of casing 170'

Type of screen Johnson #14 slot 6" O.D.

Length of screen 4 1/2' screen 8 1/2' pipe above screen

Depth to top of screen 161'

Diameter of finished hole 6 1/4" Casing 6" screen

Pumping Test

Static level 130'

Test-pumping rate 10 G.P.M.

Pumping level 130'

Duration of test pumping 1 1/2 hours

Water clear or cloudy at end of test clear

Recommended pumping rate 10 G.P.M.

with pump setting of 150' feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Top soil	0	1		
Brown sand and stone	1	18		
Brown sandy gravel and stones	18	68		
Brown sand and pebbles	68	158		
Brown coarse sand	158	169		
Brown coarse sandy gravel	169	174	169-174	fresh untested

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

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

Drilling or Boring Firm Faulkner Well Drilling Co. Ltd.

Address 687 Water St. Peterborough

Licence Number 1689

Name of Driller or Borer E. Taylor

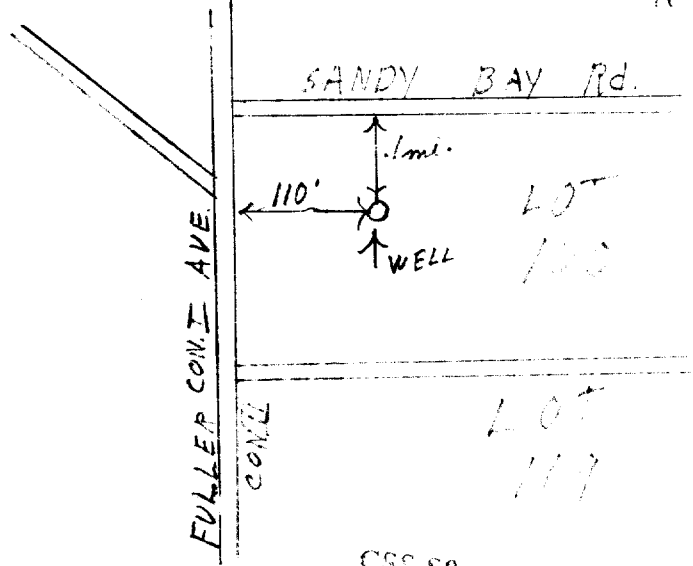
Address Box 274, Lakefield, Ont.

Date Nov. 16/65

E. H. Faulkner (Signature of Licensed Drilling or Boring Contractor)

Location of Well

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



TM 1 1 7 4 5 8 5 4 0 0 0
 4 R 4 9 6 0 1 0 0
 5 R 0 7 5 5



5706078

310/13W

Water management in Ontario

The Ontario Water Resources Commission Act

DIVISION OF WATER RESOURCES

WATER WELL RECORD

FEB 11 1969

County or District SIMCOE
 Con. II Lot 46 119

Township, Village, Town or City TAY
 Date completed 15 MAY 1968
 (day month year)
 Address MIDLAND ONT

Casing and Screen Record

Inside diameter of casing 5"
 Total length of casing 30 FT
 Type of screen _____
 Length of screen _____
 Depth to top of screen _____
 Diameter of finished hole _____
ABANDONED.

Pumping Test

Static level 18
 Test-pumping rate 3 G.P.M.
 Pumping level 20 FT
 Duration of test pumping 1 HR
 Water clear or cloudy at end of test SAUDY
 Recommended pumping rate _____ G.P.M.
 with pump setting of _____ feet below ground surface

Well Log

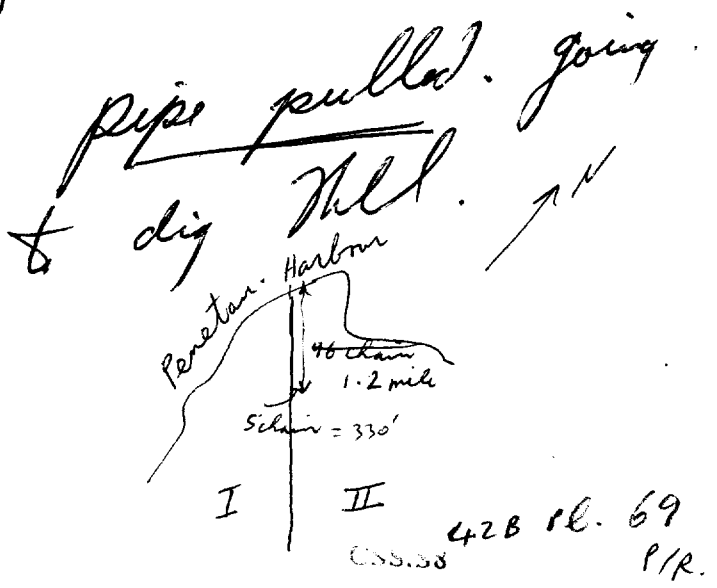
Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
<u>TOPSOIL</u>	<u>0</u>	<u>1</u>		
<u>CLAY AND BOULDERS</u>	<u>1</u>	<u>28</u>		
<u>SAND SILT</u>	<u>28</u>	<u>30</u>	<u>28-30</u>	

For what purpose(s) is the water to be used? HOUSE
 Is well on upland, in valley, or on hillside? HILLSIDE
 Drilling or Boring Firm KNELSEN WATER WELLS
R.R. #1
 Address BARRIE ONT
 Licence Number 2986
 Name of Driller or Borer ANDREAS KNELSEN
 Address SAME
 Date Jan 15 1969
Andy Kelsen
 (Signature of Licensed Drilling or Boring Contractor)

Location of Well

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





WATER WELL RECORD

Water management in Ontario 1. PRINT ONLY IN SPACES PROVIDED

2. CHECK CORRECT BOX WHERE APPLICABLE

11

5708631

MUNICIP

CON

57012 P.R.E. 9/02

COUNTY OR DISTRICT

Simcoe

TOWNSHIP, BOROUGHS, CITY, TOWN, VILLAGE

TAY

BLOCK, TRAIL, SURVEY

II

120

OWNER (SURNAME FIRST)

ADDRESS

RR#1 Penetang Box 14, Midland Ontario

DATE COMPLETED

15 MO. JAN YR 72

4960197

6

750

5

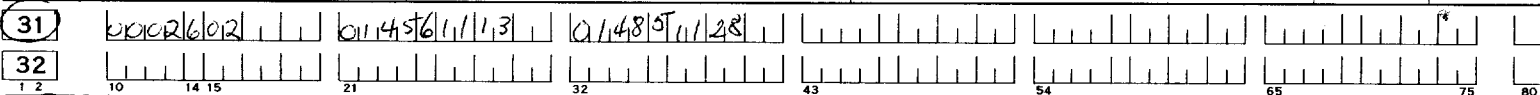
22

JAN 14, 1975

47

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown			top soil	0	2
Brown	GRAVEL	Boulders		2	145
yellow	GRAVEL	SAND		145	148



41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13	<input checked="" type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
15-18	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
20-23	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
25-28	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
30-33	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	<input checked="" type="checkbox"/> STEEL	1.88	0	0148
17-18	<input type="checkbox"/> STEEL			20-23
24-25	<input type="checkbox"/> STEEL			27-30

SCREEN

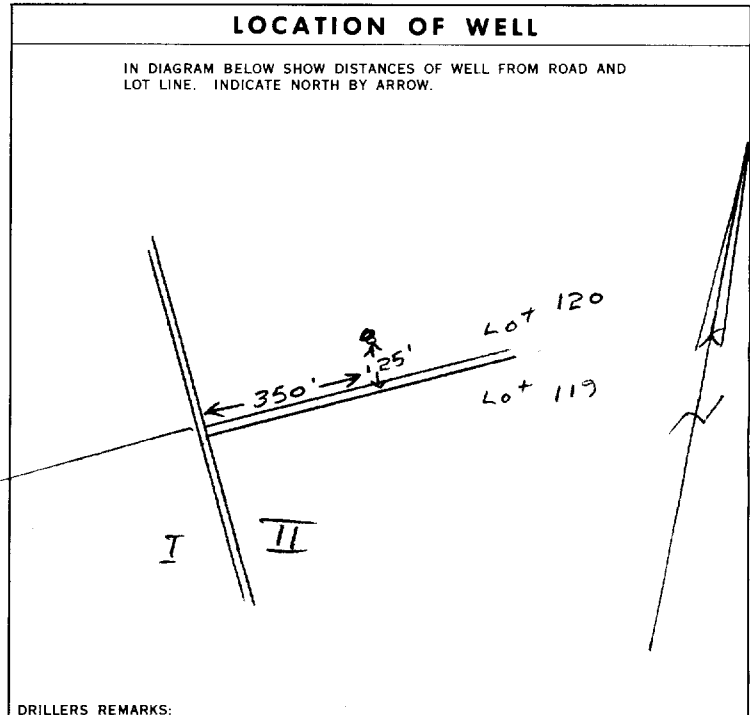
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
	31-33	39-40

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	

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
<input type="checkbox"/> PUMP <input checked="" type="checkbox"/> BAILER	0.40 GPM	02 HOURS 30 MINS.
STATIC LEVEL	WATER LEVELS DURING	
124' FEET	15 MINUTES: 124' FEET	30 MINUTES: 129' FEET
140' FEET	45 MINUTES: 124' FEET	60 MINUTES: 124' FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
	145 FEET	1.5 CLEAR 2.0 CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	145 FEET	0.40 GPM



FINAL STATUS OF WELL

WATER USE

METHOD OF DRILLING

CONTRACTOR

NAME OF WELL CONTRACTOR: HENRY HAMMERS
 ADDRESS: RR#3 BARRIE ONT
 LICENCE NUMBER: 2514

NAME OF DRILLER OR BORER: J. F. Guillet
 LICENCE NUMBER: 5805

SIGNATURE OF CONTRACTOR: Henry Hammars
 SUBMISSION DATE: DAY 14 MO. 02 YR 72

OFFICE USE ONLY

DATA SOURCE: 1
 CONTRACTOR: 2514
 DATE RECEIVED: 140272

DATE OF INSPECTION: July 30/74
 INSPECTOR: P/O.B.

REMARKS: WI



WATER WELL RECORD

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

11 5710051 57012 P.R.E. 902

COUNTY OR DISTRICT: **Simcoe** TOWNSHIP, BOROUGH, CITY, OR VILLAGE: **Tay** CON., BLOCK, FRACT., SURV., ETC.: **P.R.E.** LOT 25-27: **120**

ADDRESS: **66 Scott St. Midland** DATE COMPLETED: DAY **22** MO. **Mar** YR. **73**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	sand & stones			0	24
	Gravel & stones			24	56
	sand		cemented	56	132
	sand		medium	132	140
	sand		cemented	140	168
	sand		medium	168	194

31	0024	28	12	0056	11	12	0132	23	0140	09	0168	28	0194	09
32														

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR
2 0190	2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR
2	2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR
2	2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR
2	2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR
2	2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
10-11	1 <input checked="" type="checkbox"/> STEEL	12	FROM TO
06	2 <input type="checkbox"/> GALVANIZED	.188	0 0133
	3 <input type="checkbox"/> CONCRETE		
	4 <input type="checkbox"/> OPEN HOLE		
17-18	1 <input checked="" type="checkbox"/> STEEL	19	FROM TO
05	2 <input type="checkbox"/> GALVANIZED	.188	119 090
	3 <input type="checkbox"/> CONCRETE		
	4 <input type="checkbox"/> OPEN HOLE		
24-25	1 <input type="checkbox"/> STEEL	26	FROM TO
	2 <input type="checkbox"/> GALVANIZED		
	3 <input type="checkbox"/> CONCRETE		
	4 <input type="checkbox"/> OPEN HOLE		

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN
FROM TO	(CEMENT GROUT, LEAD PACKER, ETC.)	41-44 80
10-13		14-17
18-21		22-25
26-29		30-33 80

71 PUMPING TEST

PUMPING TEST METHOD: 1 PUMP 2 BAILER

PUMPING RATE: 025 GPM. DURATION OF PUMPING: 02 HOURS 00 MINS

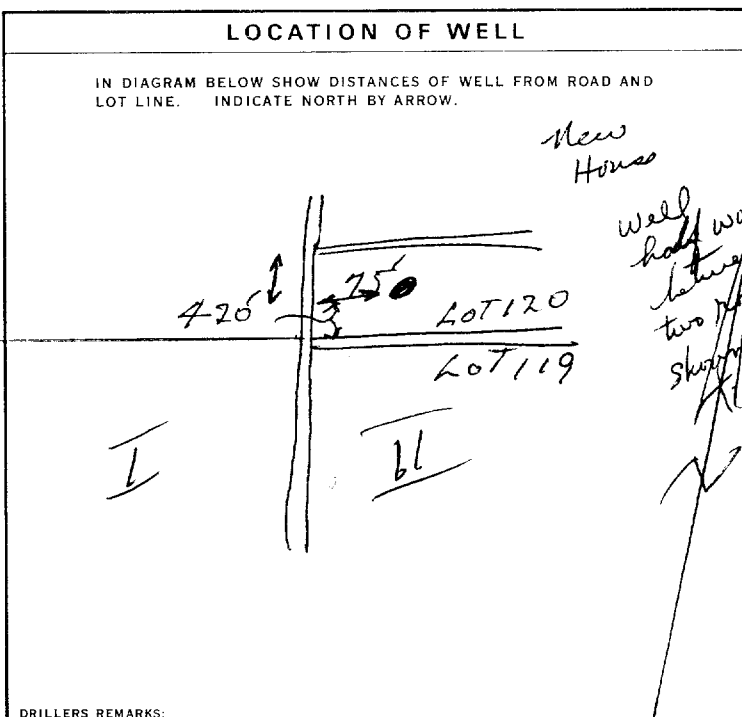
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING				
10-13	25	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES	
133		26-28	29-31	32-34	35-37	
FEET	FEET	FEET	FEET	FEET	FEET	FEET

IF FLOWING, GIVE RATE: 38-41 GPM. PUMP INTAKE SET AT: 42 FEET

RECOMMENDED PUMP TYPE: SHALLOW DEEP

RECOMMENDED PUMP SETTING: 180 FEET

RECOMMENDED PUMPING RATE: 0015 GPM.



FINAL STATUS OF WELL

1 WATER SUPPLY 5 ABANDONED, INSUFFICIENT SUPPLY

2 OBSERVATION WELL 6 ABANDONED, POOR QUALITY

3 TEST HOLE 7 UNFINISHED

4 RECHARGE WELL

WATER USE

1 DOMESTIC 5 COMMERCIAL

2 STOCK 6 MUNICIPAL

3 IRRIGATION 7 PUBLIC SUPPLY

4 INDUSTRIAL 8 COOLING OR AIR CONDITIONING

9 OTHER 9 NOT USED

METHOD OF DRILLING

1 CABLE TOOL 6 BORING

2 ROTARY (CONVENTIONAL) 7 DIAMOND

3 ROTARY (REVERSE) 8 JETTING

4 ROTARY (AIR) 9 DRIVING

5 AIR PERCUSSION

CONTRACTOR

NAME OF WELL CONTRACTOR: **Snider Drilling** LICENCE NUMBER: **4816**

ADDRESS: **Craighurst**

NAME OF DRILLER OR BORER: **Don Prince** LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: **Ralph Snider** SUBMISSION DATE: DAY **15** MO. **08** YR. **73**

OFFICE USE ONLY

DATA SOURCE: **1** CONTRACTOR: **4816** DATE RECEIVED: **150873**

DATE OF INSPECTION: **July, 30/74** INSPECTOR: **J.B.**

REMARKS: **CSB, SS**



Ontario

WATER WELL RECORD

31D13W

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

11

5713245

MUNICIPALITY 57012

CON. C0N

02

COUNTY OR DISTRICT Simcoe	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE Tay	CON., BLOCK, TRACT, SURVEY, ETC. II P.T.E.	LOT 119
OWNER (SURNAME FIRST) [REDACTED]	ADDRESS Box 1023, Barrie, Ont.	DATE COMPLETED DAY 06 MO. April YR. 76	

21 ZONE **17** EASTING **585510** NORTHING **4960200** S ELEVATION **0750** BASIN CODE **6 22**

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	sand	gravel & Stones		0	184
	clay &	stones		184	200

31 **0.184 281112 0200 0512**

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0 165	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
	15-18 1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
	20-23 1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
	25-28 1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
	30-33 1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

DEPTH - FEET	MATERIAL	WALL THICKNESS - INCHES
0 0 161	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	.188
	17-18 1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	
	24-25 1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	

SCREEN

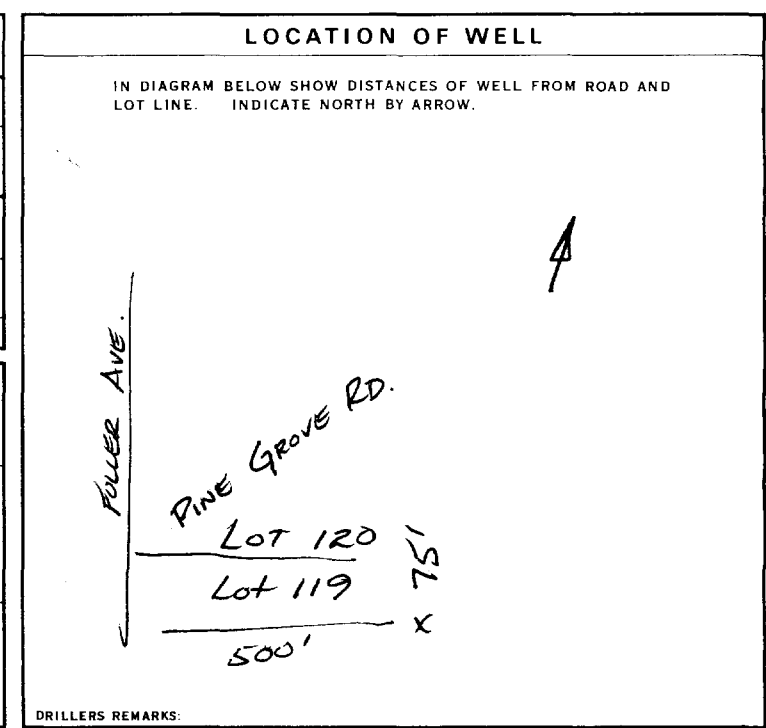
SIZE(S) OF OPENING (SLOT NO.) 0 30	DIAMETER 0 6000	LENGTH 0 4
MATERIAL AND TYPE stainless steel	DEPTH TO TOP OF SCREEN 0 157	

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
0 165 0 200	drill cuttings

71 PUMPING TEST

PUMPING TEST METHOD 1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILEY	PUMPING RATE 0004 GPM	DURATION OF PUMPING 15-16 HOURS 00 17-18 MINS
STATIC LEVEL 117 FEET	WATER LEVEL END OF PUMPING 22-24 FEET	WATER LEVELS DURING
		15 MINUTES 26-28 FEET 30 MINUTES 29-31 FEET 45 MINUTES 32-34 FEET 60 MINUTES 35-37 FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT 155 FEET	WATER AT END OF TEST 0 0 0 4 GPM
RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE 0 0 0 4 GPM



FINAL STATUS OF WELL

1 WATER SUPPLY 5 ABANDONED, INSUFFICIENT SUPPLY
2 OBSERVATION WELL 6 ABANDONED, POOR QUALITY
3 TEST HOLE 7 UNFINISHED
4 RECHARGE WELL

WATER USE

1 DOMESTIC 5 COMMERCIAL
2 STOCK 6 MUNICIPAL
3 IRRIGATION 7 PUBLIC SUPPLY
4 INDUSTRIAL 8 COOLING OR AIR CONDITIONING
 OTHER 9 NOT USED

METHOD OF DRILLING

1 CABLE TOOL 6 BORING
2 ROTARY (CONVENTIONAL) 7 DIAMOND
3 ROTARY (REVERSE) 8 JETTING
4 ROTARY (AIR) 9 DRIVING
5 AIR PERCUSSION

CONTRACTOR

NAME OF WELL CONTRACTOR Snider Drilling Limited,	LICENCE NUMBER 4816
ADDRESS Craighurst, Ont.	
NAME OF CONTRACTOR Phillip Brown,	LICENCE NUMBER
SIGNATURE OF CONTRACTOR Ralph Snider.	SUBMISSION DATE DAY _____ MO. _____ YR. _____

OFFICE USE ONLY

DATA SOURCE 1	CONTRACTOR 4816	DATE RECEIVED 0 8 07 76
DATE OF INSPECTION	INSPECTOR	
REMARKS 500'		

CSS.S8

P
WI

30 013w



Ministry of the Environment Ontario

The Ontario Water Resources Act WATER WELL RECORD

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

11 5715605 57606 CON. 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

COUNTY OR DISTRICT: [REDACTED] TOWNSHIP, BOROUGH CITY, TOWN VILLAGE: Penetanguishene CON. BLOCK, TRACT, SURVEY, ETC: I LOT: 19B-118

DATE COMPLETED: DAY 06 MO 10 YR 78

ADDRESS: Simcoe St., Penetanguishene

ELEVATION: 597.50 5 0750 6 22

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	sand	gravel		0	56
	sand	stones		56	191
grey	clay			191	193
NOV 19 1986					
total depth: 186 feet					

31 0056 2811 0191 2812 0193205

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
<u>0180</u> <u>180-191</u>	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
15-18	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
20-23	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
25-28	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
30-33	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
<u>06</u>	<input checked="" type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE	<u>0.188</u>	<u>+ 1 0182</u>
17-18	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE		20-23
24-25	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE		27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO): 014 slot

DIAMETER: 06090 INCHES

LENGTH: 03 FEET

MATERIAL AND TYPE: stainless steel wire wound

DEPTH TO TOP OF SCREEN: 0180 FEET

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD: PUMP BAILEY

PUMPING RATE: 0030 GPM

DURATION OF PUMPING: 02 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING				
<u>122</u> FEET	FEET	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES	
		26-28	29-31	32-34	35-37	

IF FLOWING, GIVE RATE: _____ GPM

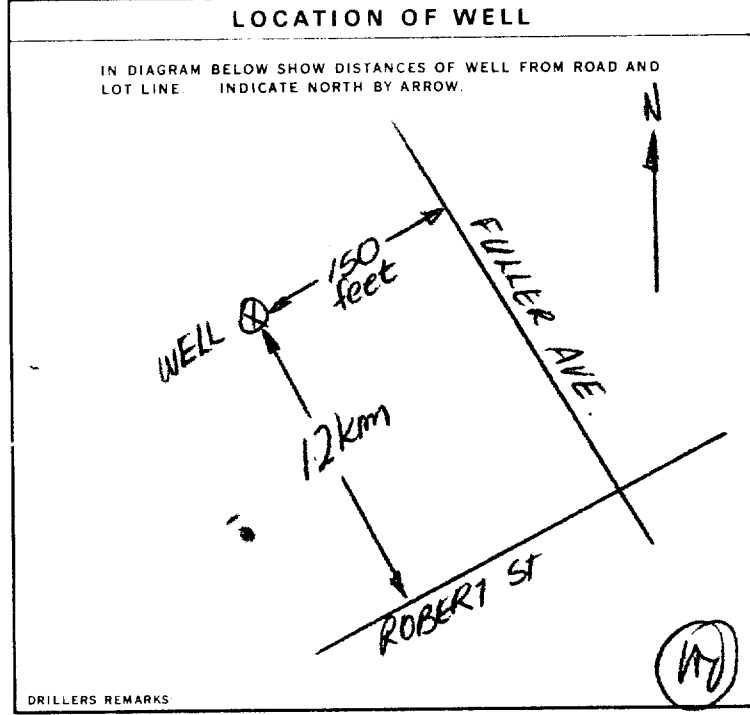
PUMP INTAKE SET AT: _____ FEET

WATER AT END OF TEST: CLEAR CLOUDY

RECOMMENDED PUMP TYPE: SHALLOW DEEP

RECOMMENDED PUMP SETTING: 170 FEET

RECOMMENDED PUMPING RATE: 0010 GPM



FINAL STATUS OF WELL 1

WATER USE 01

METHOD OF DRILLING 2

CONTRACTOR

NAME OF WELL CONTRACTOR: Snider Drilling Limited, LICENCE NUMBER: 4816

ADDRESS: Craighurst, Ontario.

NAME OF DRILLER OR BORER: Ralph Snider. LICENCE NUMBER: _____

SIGNATURE OF CONTRACTOR: Ralph Snider. SUBMISSION DATE: _____

OFFICE USE ONLY

DATA SOURCE: 1 CONTRACTOR: 4816 DATE RECEIVED: 091178

DATE OF INSPECTION: _____ INSPECTOR: _____

CSS.ES



WATER WELL RECORD

31013

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

11 5716422 57013 PRE 102
42B Part M Plan 69

COUNTY OR DISTRICT: Simcoe TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Tav CON., BLOCK, TRACT, SURVEY, ETC: PRE II LOT: 25-27
DATE COMPLETED: 48-53 DAY: 07 MO: 09 YR: 79
Site 14 Comp. 4, Penetanguishene

HING: 760200 RC: 5 ELEVATION: 5750 RC: 5 BASIN CODE: 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	sand	boulders		0	36
	sand	stones		36	140
	medium sand			140	191
	sand	silt		191	196
	clay	boulders		196	217
	limestone	broken		217	225
	limestone			225	233
total depth: 182 feet					

P69
lot m42-B

31 32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13	<input checked="" type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
125-191	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
10-11	<input checked="" type="checkbox"/> STEEL	0.188	+1	179

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	CEMENT GROUP
10-13	20 slot stainless steel wire wound	LEAD PACKER

71 PUMPING TEST

PUMPING TEST METHOD: 1 PUMP 2 BAILER

AIR

PUMPING RATE: 20 GPM

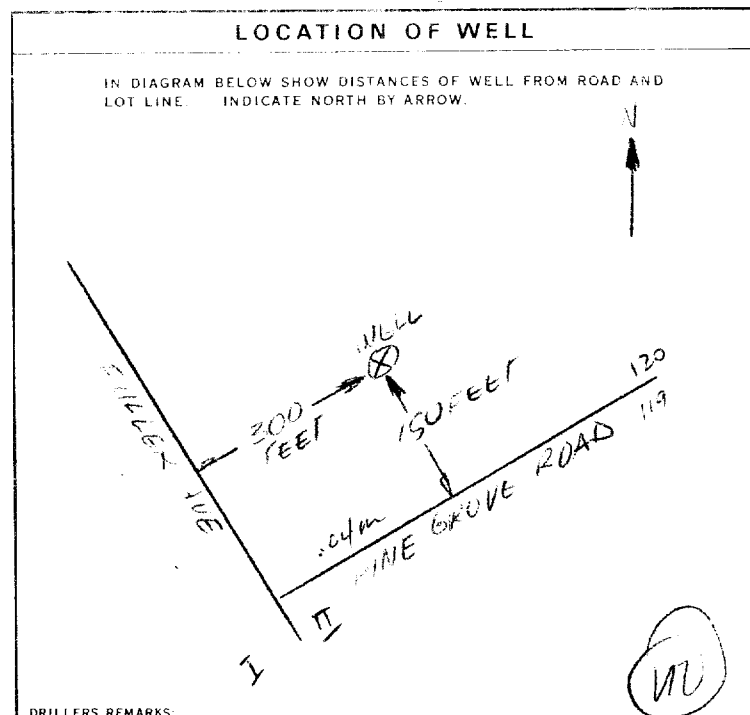
DURATION OF PUMPING: 3 HOURS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING					
125 FEET	125 FEET	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES	75 MINUTES	90 MINUTES

RECOMMENDED PUMP TYPE: SHALLOW DEEP

RECOMMENDED PUMP SETTING: 175 FEET

RECOMMENDED PUMPING RATE: 12 GPM



54 FINAL STATUS OF WELL: 1 WATER SUPPLY

55-56 WATER USE: 1 DOMESTIC

57 METHOD OF DRILLING: 1 CABLE TOOL, 2 ROTARY (CONVENTIONAL)

CONTRACTOR: Snider Drilling Limited, 4816 Craighurst, Ontario. Allan Wright

LICENCE NUMBER: 4816

SIGNATURE OF CONTRACTOR: Snider Drilling Limited.

OFFICE USE ONLY

DATE RECEIVED: 28 11 79

DATE OF INSPECTION: 28/4/87

REMARKS: Working Owner advised

CSS.FW1

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK [X] CORRECT BOX WHERE APPLICABLE

11 5718418 57012 PRE 02

COUNTY OR DISTRICT, TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE, CON. BLOCK, TRACT, SURVEY ETC, DATE COMPLETED, PENETANG. OUT. DAY 07 MO 10 82

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

Table with columns: GENERAL COLOUR, MOST COMMON MATERIAL, OTHER MATERIALS, GENERAL DESCRIPTION, DEPTH - FEET (FROM, TO). Includes handwritten entries: BLACK OVERBURDEN + BOULDERS, BROWN SILT-TYPE SAND, L.BROWN SAND (LAYERED).

NOV 18 1986

P69. P.H. Sub 7

31 001482513 001462884 01656287475
32

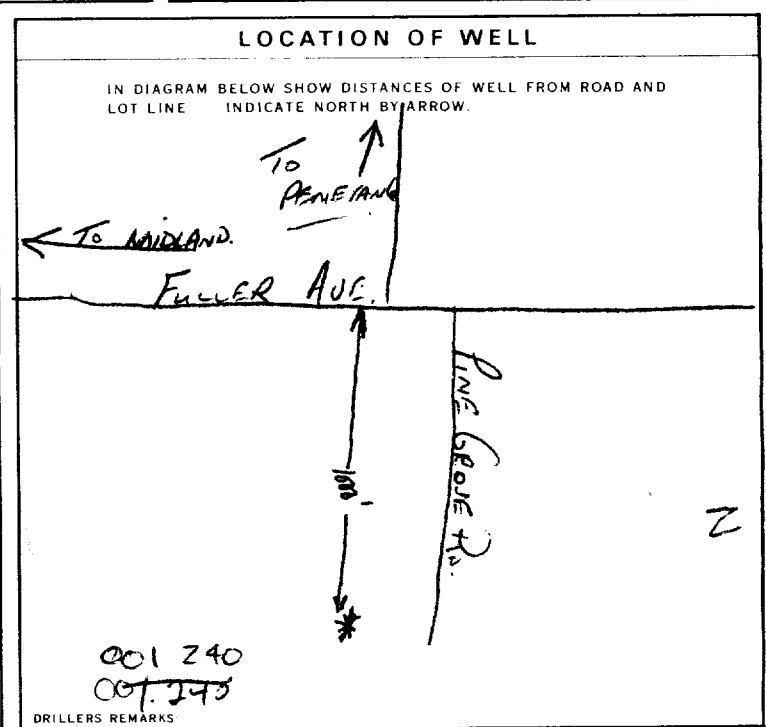
41 WATER RECORD. Includes fields for WATER FOUND AT FEET (0165'), KIND OF WATER (FRESH, SALTY, SULPHUR, MINERAL).

51 CASING & OPEN HOLE RECORD. Includes fields for INSIDE DIAM INCHES (06 1/4), MATERIAL (STEEL), WALL THICKNESS INCHES (.188), DEPTH - FEET (0 0161).

SCREEN. Includes fields for SIZE OF OPENING (06 000 03), MATERIAL AND TYPE (JOHNSON JS).

61 PLUGGING & SEALING RECORD. Includes fields for DEPTH SET AT FEET, MATERIAL AND TYPE.

71 PUMPING TEST. Includes fields for PUMPING TEST METHOD (BAILER), PUMPING RATE (0006 GPM), DURATION OF PUMPING (01 00 HOURS), WATER LEVELS DURING (130, 160, 140, 133 FEET).



FINAL STATUS OF WELL (1), WATER USE (1), METHOD OF DRILLING (1). Includes checkboxes for various well types and drilling methods.

CONTRACTOR. Includes fields for NAME OF WELL CONTRACTOR (Howell Drilling), ADDRESS (RR1), NAME OF DRILLER OR BORER (W. AUBAUSHENE), SIGNATURE OF CONTRACTOR (Doug Howell), LICENCE NUMBER (2652), SUBMISSION DATE (20 MO 10 82).

OFFICE USE ONLY. Includes fields for DATA SOURCE (1 2652), DATE RECEIVED (16 03 83), DATE OF INSPECTION, INSPECTOR, REMARKS.



WATER WELL RECORD

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

11

5722523

MUNICIPALITY: 10 14 15 22 23 24

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE TAY	CON. BLOCK, TRACT, SURVEY, ETC. 2 - PLAN 69	LOT 115
DATE COMPLETED DAY 6 MO 10 YR 87			

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	SAND	GRAVEL - CLAY		0	35
	SAND	GRAVEL		35	60
Brown	SAND		Med	60	170
Plan 69					

31
32

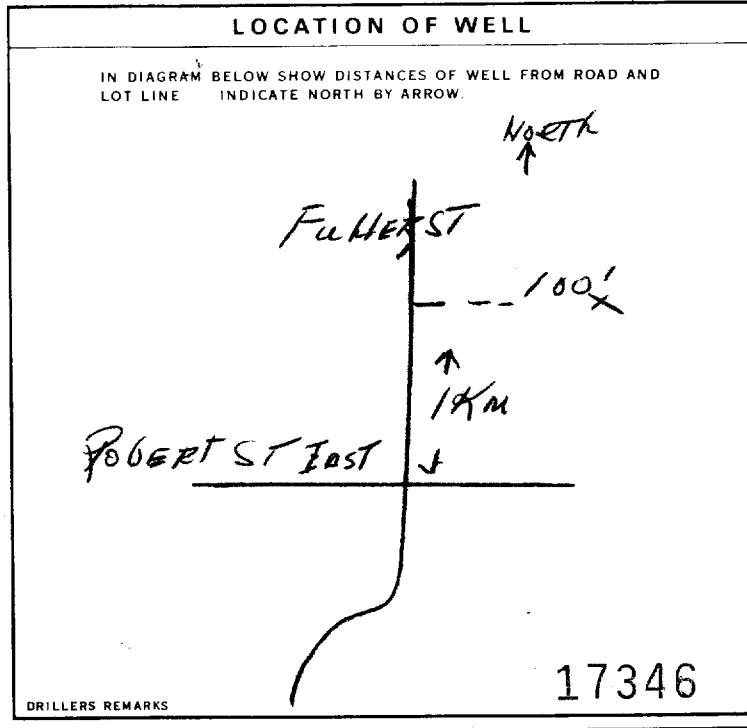
41 WATER RECORD			
WATER FOUND AT - FEET	KIND OF WATER		
10-13	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	14
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS	
		6 <input type="checkbox"/> GAS	
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	19
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS	
		6 <input type="checkbox"/> GAS	
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	24
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS	
		6 <input type="checkbox"/> GAS	
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	29
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS	
		6 <input type="checkbox"/> GAS	
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	34
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS	
		6 <input type="checkbox"/> GAS	

51 CASING & OPEN HOLE RECORD				
INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
6 7/8	STEEL GALVANIZED	1.88	0	163
5	STEEL GALVANIZED	1.88	160	163

SCREEN	SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
	16	3 INCHES	3 FEET
	MATERIAL AND TYPE STAINLESS STEEL		
		DEPTH TO TOP OF SCREEN 163 FEET	

61 PLUGGING & SEALING RECORD			
DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)	
FROM	TO		
0-13	14-17	20	Hole Plug
18-21	22-25		
26-29	30-33		

71 PUMPING TEST	PUMPING TEST METHOD 1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	PUMPING RATE 30 GPM	DURATION OF PUMPING 3 HOURS
	STATIC LEVEL 120 FEET	WATER LEVEL END OF PUMPING 140 FEET	WATER LEVELS DURING
	IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
	RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING 140 FEET	RECOMMENDED PUMPING RATE 20 GPM



74 FINAL STATUS OF WELL	1 <input checked="" type="checkbox"/> WATER SUPPLY	6 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
2 <input type="checkbox"/> OBSERVATION WELL	7 <input type="checkbox"/> UNFINISHED	8 <input type="checkbox"/> ABANDONED, POOR QUALITY
3 <input type="checkbox"/> TEST HOLE	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING	9 <input type="checkbox"/> DEWATERING
4 <input type="checkbox"/> RECHARGE WELL	9 <input type="checkbox"/> NOT USED	
75-76 WATER USE	1 <input checked="" type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL	
3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY	
4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING	
	9 <input type="checkbox"/> NOT USED	
77 METHOD OF CONSTRUCTION	1 <input type="checkbox"/> CABLE TOOL	6 <input type="checkbox"/> BORING
2 <input checked="" type="checkbox"/> ROTARY (CONVENTIONAL)	7 <input type="checkbox"/> DIAMOND	
3 <input type="checkbox"/> ROTARY (REVERSE)	8 <input type="checkbox"/> JETTING	
4 <input type="checkbox"/> ROTARY (AIR)	9 <input type="checkbox"/> DRIVING	
5 <input type="checkbox"/> AIR PERCUSSION	10 <input type="checkbox"/> DIGGING	11 <input type="checkbox"/> OTHER

CONTRACTOR	NAME OF WELL CONTRACTOR CLEARWATER DRILLING	WELL CONTRACTOR'S LICENCE NUMBER 1583
	ADDRESS R.R. 1 BAARIE	
	NAME OF WELL TECHNICIAN ALLAN WRIGHT	WELL TECHNICIAN'S LICENCE NUMBER 10 0250
	SIGNATURE OF TECHNICIAN/CONTRACTOR <i>[Signature]</i>	SUBMISSION DATE DAY 9 MO 11 YR 87

OFFICE USE ONLY	DATA SOURCE	CONTRACTOR	DATE RECEIVED NOV 16 1987
	DATE OF INSPECTION	INSPECTOR	
	REMARKS CSS.ES		

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

11 5727044 57012 CON 102

COUNTY OR DISTRICT: [REDACTED] TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: AY CON. BLOCK, TRACT, SURVEY ETC: CON 2 LOT: 25-27
DATE COMPLETED: 02 MO 07 YR 90
#1 SITE 14 CMP #2 PENETANG

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	Topsoil			0	1
Brown	SAND	Boulders		1	23
Grey	FINE SAND			23	87
Brown	SAND		FINE	87	159
Brown	SAND	GRAVEL	MEDIUM	159	193
Plan M-42B					

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	6 <input type="checkbox"/> GAS
175	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS	6 <input type="checkbox"/> GAS	
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	6 <input type="checkbox"/> GAS
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS	6 <input type="checkbox"/> GAS	
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	6 <input type="checkbox"/> GAS
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS	6 <input type="checkbox"/> GAS	
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	6 <input type="checkbox"/> GAS
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS	6 <input type="checkbox"/> GAS	
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	6 <input type="checkbox"/> GAS
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS	6 <input type="checkbox"/> GAS	

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			13-16
6 1/4		.188	0	191'
17-18	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			20-23
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			27-30

SCREEN

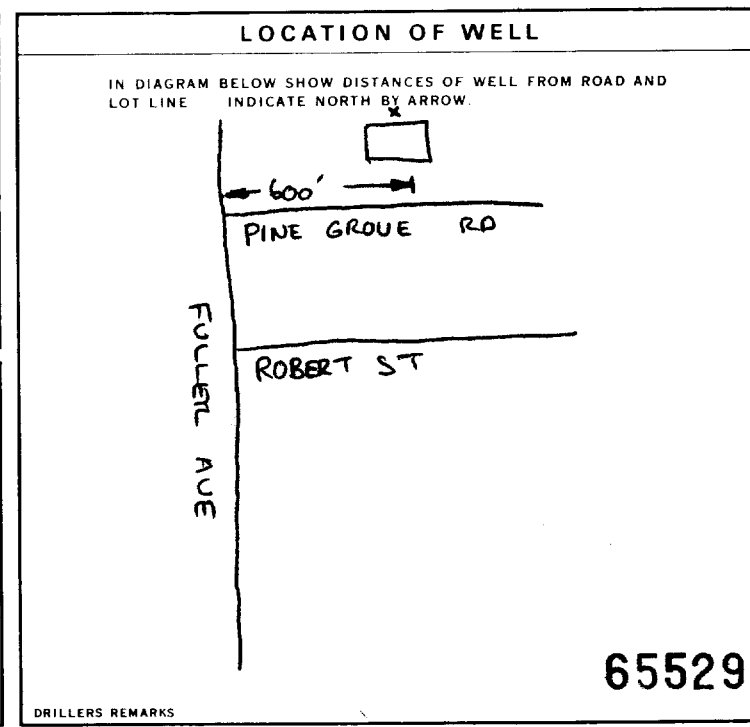
SIZE(S) OF OPENING (SLOT NO): 10	DIAMETER: 6 INCHES	LENGTH: 3 FEET
MATERIAL AND TYPE: STAINLESS STEEL		DEPTH TO TOP OF SCREEN: 186'9" FEET

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	

71 PUMPING TEST

PUMPING TEST METHOD: 1 <input type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	PUMPING RATE: 8.0 GPM	DURATION OF PUMPING: 1 HOURS 0 MINS
STATIC LEVEL: 150 FEET	WATER LEVEL END OF PUMPING: 22-24 FEET	WATER LEVELS DURING:
IF FLOWING, GIVE RATE: 38-41 GPM	PUMP INTAKE SET AT: FEET	WATER AT END OF TEST: 42 FEET
RECOMMENDED PUMP TYPE: <input checked="" type="checkbox"/> SHALLOW <input type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING: 188 FEET	RECOMMENDED PUMPING RATE: 8.0 GPM



FINAL STATUS OF WELL

1 <input checked="" type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
2 <input type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED POOR QUALITY
3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
4 <input type="checkbox"/> RECHARGE WELL	<input type="checkbox"/> DEWATERING

WATER USE

1 <input checked="" type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
<input type="checkbox"/> OTHER	9 <input type="checkbox"/> NOT USED

METHOD OF CONSTRUCTION

1 <input type="checkbox"/> CABLE TOOL	6 <input type="checkbox"/> BORING
2 <input type="checkbox"/> ROTARY (CONVENTIONAL)	7 <input type="checkbox"/> DIAMOND
3 <input type="checkbox"/> ROTARY (REVERSE)	8 <input type="checkbox"/> JETTING
4 <input checked="" type="checkbox"/> ROTARY (AIR)	9 <input type="checkbox"/> DRIVING
5 <input type="checkbox"/> AIR PERCUSSION	<input type="checkbox"/> DIGGING <input type="checkbox"/> OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Howell Drilling
WELL CONTRACTOR'S LICENCE NUMBER: 2652
ADDRESS: Box 368 Colwater ONT
NAME OF WELL TECHNICIAN: Kim Howell
WELL TECHNICIAN'S LICENCE NUMBER: 11057
SIGNATURE OF TECHNICIAN/CONTRACTOR: Kim Howell
SUBMISSION DATE: DAY 05 MO 07 YR 90

OFFICE USE ONLY

DATA SOURCE: 2652
DATE RECEIVED: AUG 28 1990
DATE OF INSPECTION: _____
INSPECTOR: _____
REMARKS: _____
CSS.ES

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

11 5728101 57012 CON 02

COUNTY OR DISTRICT: Simcoe TOWN: Day BLOCK TRACT. SURVEY ETC: 2 LOT: 120
 RR#1 Perkinsfield DATE COMPLETED: DAY 06 MO 06 YR 91
 ELEVATION: 104.2 TP

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Black	T Soil			0	2
Red	Sand			2	4
Red	gravel	Stones		4	105
grey	Clay	Boulders	Str. gravel	105	170
Red	Sand		hard, clean	170	210

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER		
203	1 <input checked="" type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	14
	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	19
	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	24
	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	29
	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	34

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL TH. GAGES INCHES	DEPTH - FEET	
			FROM	TO
8	1 <input checked="" type="checkbox"/> STEEL 2 <input checked="" type="checkbox"/> GALVANIZED 3 <input checked="" type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	264 + 2	184	
	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			20-23
	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			27-30

SCREEN

SIZE OF OPENING (SLOT NO.): 18 DIAMETER: 6 INCHES LENGTH: 12 FEET
 MATERIAL AND TYPE: SS DEPTH TO TOP OF SCREEN: 190 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	(CEMENT GROUT LEAD PACKER ETC.)
26-10-13	0	Cement
18-21	22-25	Bentonite
26-29	30-33	hole plug

71 PUMPING TEST

PUMPING METHOD: PUMP BAILER
 PUMPING RATE: 80 GPM DURATION OF PUMPING: 2 HOURS
 STATIC LEVEL: 141 FEET WATER LEVEL END OF PUMPING: 148 FEET
 WATER LEVELS DURING: 15 MINUTES: 148 FEET 30 MINUTES: 148 FEET 45 MINUTES: 148 FEET 60 MINUTES: 148 FEET
 PUMP INTAKE SET AT: 170 FEET WATER AT END OF TEST: 155 FEET
 RECOMMENDED PUMP TYPE: SHALLOW DEEP
 RECOMMENDED PUMP SETTING: 155 FEET RECOMMENDED PUMPING RATE: 70 GPM

FINAL STATUS OF WELL

1 WATER SUPPLY 5 ABANDONED, INSUFFICIENT SUPPLY
 2 OBSERVATION WELL 6 ABANDONED POOR QUALITY
 3 TEST HOLE 7 UNFINISHED
 4 RECHARGE WELL 8 DEWATERING

WATER USE

1 DOMESTIC 5 COMMERCIAL
 2 STOCK 6 MUNICIPAL
 3 IRRIGATION 7 PUBLIC SUPPLY
 4 INDUSTRIAL 8 COOLING OR AIR CONDITIONING
 OTHER 9 NOT USED

METHOD OF CONSTRUCTION

1 CABLE TOOL 6 BORING
 2 ROTARY (CONVENTIONAL) 7 DIAMOND
 3 ROTARY (REVERSE) 8 JETTING
 4 ROTARY (AIR) 9 DRIVING
 5 AIR PERCUSSION DIGGING OTHER

LOCATION OF WELL

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

Fuller Ave. 3/4 mile 1/2 mi.

103639

DRILLERS REMARKS:

CONTRACTOR

NAME OF WELL CONTRACTOR: Burton Drilling LTD WELL CONTRACTOR'S LICENCE NUMBER: 1456
 ADDRESS: RR#1 ORR STATION
 NAME OF WELL TECHNICIAN: DAVID BURTON WELL TECHNICIAN'S LICENCE NUMBER: 10547
 SIGNATURE OF TECHNICIAN/CONTRACTOR: [Signature] SUBMISSION DATE: DAY 06 MO 06 YR 91

OFFICE USE ONLY

DATA SOURCE: 1456 CONTRACTOR: 1456 DATE RECEIVED: JUN 17 1991
 DATE OF INSPECTION: _____ INSPECTOR: _____
 REMARKS: _____

CSS.ES

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

5732542

Municipality 57606

Con. 15 22 23 24

11

County or District: [Redacted] Township/Borough/City/Town/Village: **PENETANGUISHENE ONT**
 Address: **14 CENTENNIAL DR. PENETANG ONT** Date completed: **8 day NOV 96** year
 Northing RC Elevation RC Basin Code ii iii iv

General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
	FILL			0	3
	SAND	CLAY		3	15
	SAND	+ GRAVEL		15	160
	GRAVEL	SOME GREY CLAY		160	170
	GRAVEL	STONES	HARD	170	203

31
32

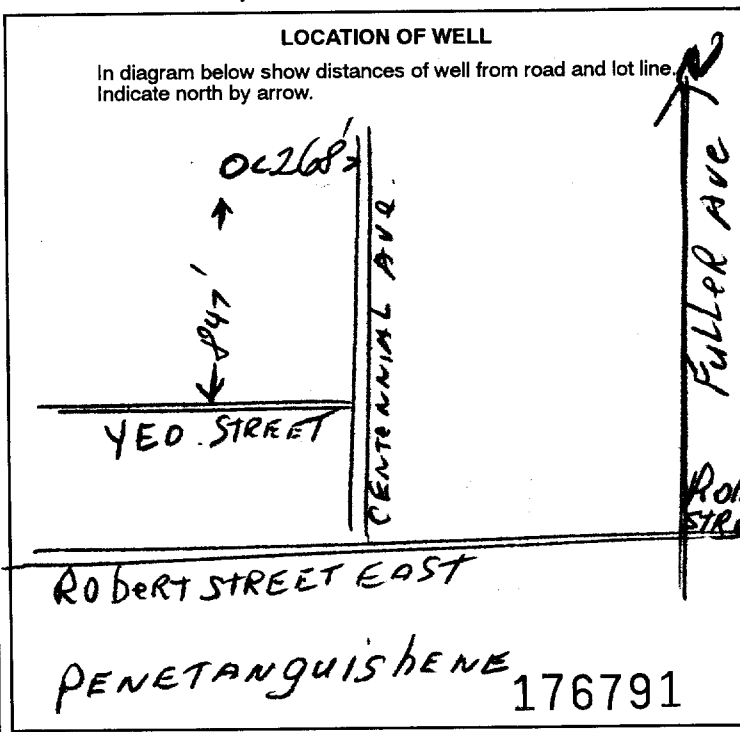
WATER RECORD	
Water found at - feet	Kind of water
10-33	1 <input type="checkbox"/> Fresh 3 <input type="checkbox"/> Sulphur 14 2 <input type="checkbox"/> Salty 4 <input type="checkbox"/> Minerals 6 <input type="checkbox"/> Gas 7
15-18	1 <input type="checkbox"/> Fresh 3 <input type="checkbox"/> Sulphur 19 2 <input type="checkbox"/> Salty 4 <input type="checkbox"/> Minerals 6 <input type="checkbox"/> Gas 7
20-23	1 <input type="checkbox"/> Fresh 3 <input type="checkbox"/> Sulphur 24 2 <input type="checkbox"/> Salty 4 <input type="checkbox"/> Minerals 6 <input type="checkbox"/> Gas 7
25-18	1 <input type="checkbox"/> Fresh 3 <input type="checkbox"/> Sulphur 29 2 <input type="checkbox"/> Salty 4 <input type="checkbox"/> Minerals 6 <input type="checkbox"/> Gas 7
30-33	1 <input type="checkbox"/> Fresh 3 <input type="checkbox"/> Sulphur 34 2 <input type="checkbox"/> Salty 4 <input type="checkbox"/> Minerals 6 <input type="checkbox"/> Gas 7

CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
6 1/2	1 <input type="checkbox"/> Steel 12 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input checked="" type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic		0	203
2"	1 <input type="checkbox"/> Steel 19 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input checked="" type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic		+2	193
24-25	1 <input type="checkbox"/> Steel 26 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic			27-30

SIZES OF OPENING (Slot No.)	Diameter	Length
10	2 inches	10 feet
Material and type		Depth at top of screen
PLASTIC		193 feet

PLUGGING & SEALING RECORD		
Annular space		Abandonment
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)
From	To	
0	190	BEN SEAL + Hole plug
190	203	NO 3. GRAVEL

PUMPING TEST	
Pumping test method	Pumping rate
1 <input type="checkbox"/> Pump 2 <input type="checkbox"/> Bailer	GPM
Static level	Water level end of pumping
173 feet	feet
Water levels during	
15 minutes	30 minutes
45 minutes	60 minutes
feet	feet
If flowing give rate	Pump intake set at
GPM	feet
Recommended pump type	Recommended pump setting
1 <input type="checkbox"/> Shallow 2 <input type="checkbox"/> Deep	feet



FINAL STATUS OF WELL

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

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

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

Name of Well Contractor: **HENRY HAMMER WELL DRILLING LTD** Well Contractor's Licence No.: **2514**
 Address: **544 ST. VINCENT ST (N) BARRIE, ONT.**
 Name of Well Technician: **HENRY HAMMERS** Well Technician's Licence No.: **T0186**
 Signature of Technician/Contractor: **Henry Hammars** Submission date: _____ day _____ mo _____ yr

MINISTRY USE ONLY

Data source: _____ Contractor: **2514** Date received: **NOV 18 1996**
 Date of inspection: _____ Inspector: _____
 Remarks: _____
CSS.ES

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

11

5732671

MUNICIPALITY 57606

CON.

COUNTY OR DISTRICT: [REDACTED] TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Penetanguishene CON. BLOCK, TRACT, SURVEY, ETC.: [REDACTED] LOT: 25-27

DATE COMPLETED: 48 53 DAY: 23 MO: 10 YR: 90

NG: [REDACTED] RC: [REDACTED] ELEVATION: [REDACTED] RC: [REDACTED] BASIN CODE: [REDACTED] II: [REDACTED] III: [REDACTED] IV: [REDACTED]

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
BROWN	SAND	GRAVEL	FINE	0	86
BROWN	GRAVEL	BOULDERS	COARSE	86	244
BROWN	GRAVEL	SAND	MEDIUM	244	286 1/2

31 [REDACTED] 32 [REDACTED]

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
250 to 286 1/2	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
10-11	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	3/75	13-16
17-18	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	0 1/2	20-23
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC		27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO.): #25 DIAMETER: 12 INCHES LENGTH: 39 FEET

MATERIAL AND TYPE: STAINLESS STEEL DEPTH TO TOP OF SCREEN: 250 1/2 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	(CEMENT GROUT LEAD PACKER ETC.)
10-13	14-17	Hole plug & Bentonite Slurry
18-21	22-25	
26-29	30-33	

71 PUMPING TEST

PUMPING TEST METHOD: 1 PUMP 2 BAILER

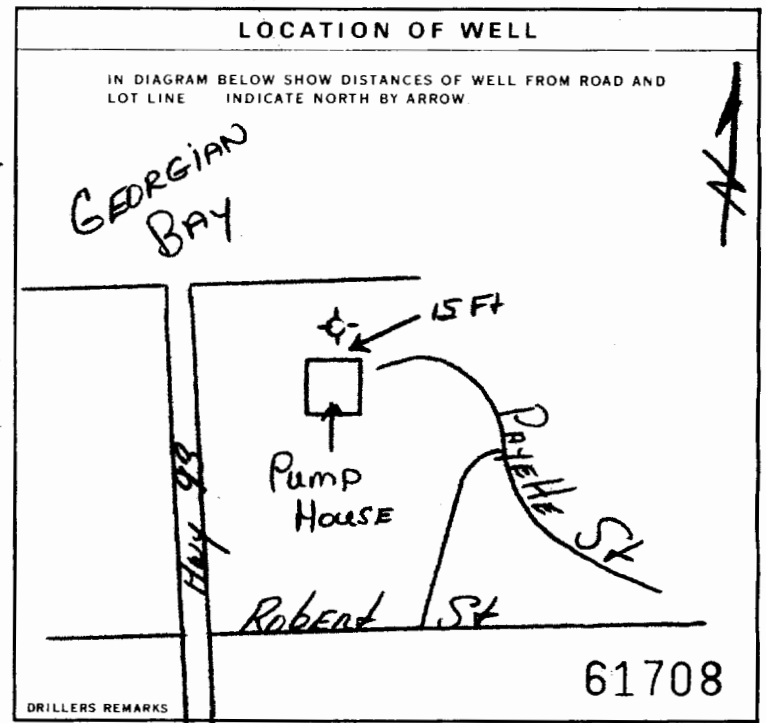
PUMPING RATE: 700 GPM DURATION OF PUMPING: 9 HOURS 0 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
51.25 FEET	65.25	15 MINUTES: 65.24 30 MINUTES: 65.25 45 MINUTES: 65.25 60 MINUTES: 65.25

RECOMMENDED PUMP TYPE: SHALLOW DEEP

RECOMMENDED PUMP SETTING: 240 FEET

RECOMMENDED PUMPING RATE: 700 GPM



FINAL STATUS OF WELL

1 WATER SUPPLY 5 ABANDONED, INSUFFICIENT SUPPLY
2 OBSERVATION WELL 6 ABANDONED POOR QUALITY
3 TEST HOLE 7 UNFINISHED
4 RECHARGE WELL 8 DEWATERING

WATER USE

1 DOMESTIC 5 COMMERCIAL
2 STOCK 6 MUNICIPAL
3 IRRIGATION 7 PUBLIC SUPPLY
4 INDUSTRIAL 8 COOLING OR AIR CONDITIONING
9 OTHER 9 NOT USED

METHOD OF CONSTRUCTION

1 CABLE TOOL 6 BORING
2 ROTARY (CONVENTIONAL) 7 DIAMOND
3 ROTARY (REVERSE) 8 JETTING
4 ROTARY (AIR) 9 DRIVING
5 AIR PERCUSSION 10 DIGGING 11 OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Lunny Well Drilling WELL CONTRACTOR'S LICENCE NUMBER: 3406

ADDRESS: RR#1 Grand Valley Ont.

NAME OF WELL TECHNICIAN: Cecil Johnston WELL TECHNICIAN'S LICENCE NUMBER: T-0275

SIGNATURE OF TECHNICIAN/CONTRACTOR: [Signature] SUBMISSION DATE: DAY 03 MO: 09 YR: 91

OFFICE USE ONLY

DATA SOURCE: 3406 CONTRACTOR: 58-62 DATE RECEIVED: 63-68 80 FEB 27 1997

DATE OF INSPECTION: [REDACTED] INSPECTOR: [REDACTED]

REMARKS: [REDACTED]

CSS. S [Signature]



Appendix C

Borehole Logs



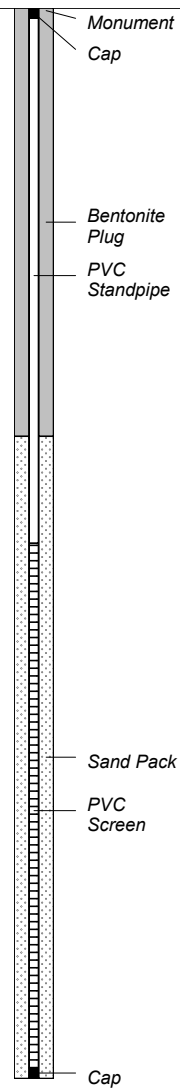
Client: Koenig Developments Ltd. **Project Name:** 245 Church Street, Penetanguishene, ON **Project No.:** 13237-001
Contractor: Walker Drilling **Method:** Hollow Stem Auger **Date Completed:** July 21, 2021
Location: 245 Church Street, Penetanguishene, ON **UTM:** 17T, 4960179 m N, 584981 m E **Elevation:** 228.16 mASL

SUBSURFACE PROFILE				SAMPLE											
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N) / DCPT	% Moisture			SPT (N) / DCPT			Well Installation	Remarks
								25	50	75	10	20	30		
228	0		TOPSOIL: Black sand, some silt, with organics, loose, moist [TOPSOIL]	1A											
			SAND: Brown sand, some silt, trace clay trace gravel, loose, moist	1B	SS	60	6								
	1			2	SS	90	5								
227															
	2		SILTY SAND: Grey silty sand, trace gravel, compact, moist	3	SS	80	20								
226			-trace cobbles, very dense	4	SS	70	50/ 280 mm								
	3			5	SS	80	50/ 230 mm								
225															
	4			6	SS	10	50/ 150 mm								
224															
	5			7	SS	50	50/ 125 mm								
223															
	6														
222															
	7		Borehole terminated at 6.6 mbgs due to target depth achieved.												
221															Borehole open and dry upon completion of drilling



Client: Koenig Developments Ltd. **Project Name:** 245 Church Street, Penetanguishene, ON **Project No.:** 13237-001
Contractor: Walker Drilling **Method:** Hollow Stem Auger **Date Completed:** July 21, 2021
Location: 245 Church Street, Penetanguishene, ON **UTM:** 17T, 4960189 m No, 585057 m East **Elevation:** 224.67 mASL

SUBSURFACE PROFILE				SAMPLE												
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N) / DCPT	% Moisture			SPT (N) / DCPT	Well Installation	Remarks			
								25	50	75	10	20	30	40		
0			TOPSOIL: Black sand, some silt, with organics, loose, moist [TOPSOIL]	1A	SS	90	6									
224			SAND: Brown sand, some silt, trace clay, trace gravel, loose, moist	1B	SS	90	6									
	1		-less silt content	2	SS	80	7									
223				3	SS	70	6									
	2															
222				4	SS	70	9									
	3		-compact													
221				5	SS	70	21									
	4															
220			SILTY SAND: Grey silty sand, some gravel, trace clay, very dense, moist	6	SS	70	50									
	5															
219																
	6															
218			Borehole terminated at 6.6 mbgs due to target depth achieved.	7	SS	0	50/100 mm									
	7															



Top of Pipe (TOP) elevation: 225.46 mASL. Groundwater measured at 5.95 mbgs (218.72 m Rel. El.) on July 6, 2022

GSA SS2:
 1% Gravel
 80% Sand
 15% Silt
 4% Clay

GSA SS6:
 11% Gravel
 62% Sand
 24% Silt
 3% Clay



Client: Koenig Developments Ltd. **Project Name:** 245 Church Street, Penetanguishene, ON **Project No.:** 13237-001
Contractor: Walker Drilling **Method:** Hollow Stem Auger **Date Completed:** July 21, 2021
Location: 245 Church Street, Penetanguishene, ON **UTM:** 17T, 4960146 m N, 585079 m E **Elevation:** 223.86 mASL

SUBSURFACE PROFILE				SAMPLE											
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N) / DCPT	% Moisture			SPT (N) / DCPT			Well Installation	Remarks
								25	50	75	10	20	30		
0			TOPSOIL: Black sand, some silt, with organics, loose, moist [TOPSOIL]	1A											Top of Pipe (TOP) elevation: 224.70 mASL. Groundwater measured at 5.92 mbgs (217.94 m Rel. El.) on July 6, 2022 GSA SS2: 3% Gravel 62% Sand 35% Silt and Clay
			SAND and SILT: Brown sand and silt, trace gravel, loose, moist	1B	SS	60	3								
223	1		-trace cobbles	2	SS	100	3								
			-grey, no cobbles	3	SS	50	7								
222	2		-compact	4	SS	60	21								
221	3			5	SS	0	20								
220	4														
219	5		-dense	6	SS	90	39								
218	6		-very dense, wet	7	SS	90	50/ 280 mm								
217	7		Borehole terminated at 6.6 mbgs due to target depth achieved.												



Client: Koenig Developments Ltd. **Project Name:** 245 Church Street, Penetanguishene, ON **Project No.:** 13237-001
Contractor: Walker Drilling **Method:** Hollow Stem Auger **Date Completed:** July 21, 2021
Location: 245 Church Street, Penetanguishene, ON **UTM:** 17T, 4960145 m N, 585117 m E **Elevation:** 222.65 mASL

SUBSURFACE PROFILE				SAMPLE							Well Installation		Remarks		
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N) / DCPT	% Moisture			SPT (N) / DCPT				
								25	50	75	10	20	30	40	
0			TOPSOIL: Black sand, some silt, with organics, loose, moist [TOPSOIL]	1A	SS	90	4								Monument Cap Bentonite Plug PVC Standpipe Sand Pack PVC Screen Cap Top of Pipe (TOP) elevation: 223.49 mASL. Groundwater measured at 6.14 mbgs (216.51 m Rel. El.) on July 6, 2022 GSA SS4: 4% Gravel 87% Sand 9% Silt and Clay
222			SAND: Brown sand, trace gravel, trace silt, loose, moist	1B											
	1		-trace cobbles, wet	2	SS	80	8								
221				3	SS	60	6								
	2			4	SS	70	16								
220			-trace clay, compact	5	SS	80	21								
	3			6	SS	0	50/ 205 mm								
219				7	SS	60	50/ 180 mm								
	4		-very dense												
218															
	5														
217															
	6		-saturated												
216			Borehole terminated at 6.6 mbgs due to target depth achieved.												
	7														



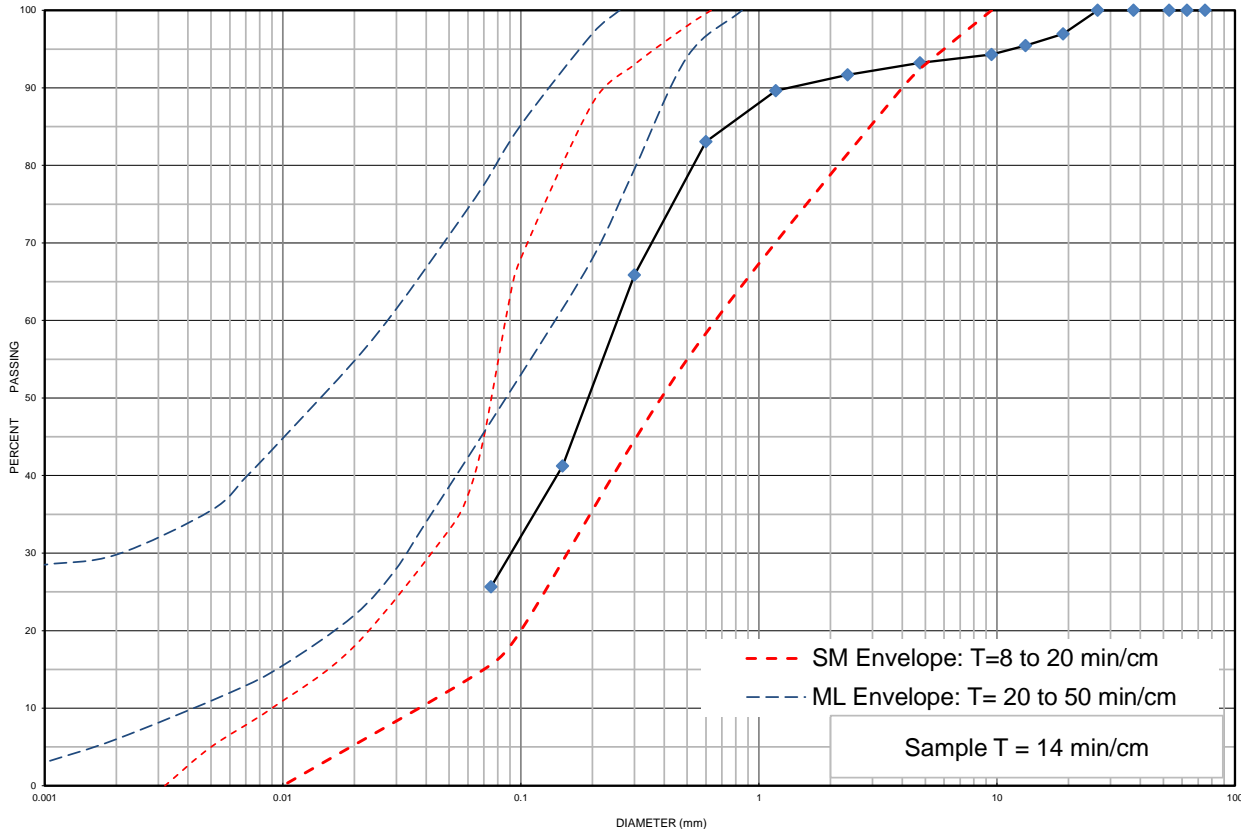
Appendix D
Grain Size Analysis



Grain Size Distribution Chart

Project Number: 13237-001 **Client:** Koenig Developments Ltd.
Project Name: Water Balance and Hydrogeological Assessment - 245 Church St
Sample Date: July 21, 2021 **Sampled By:** Ben White - Cambium Inc.
Location: BH 101-21 SS 3 **Depth:** 1.5 m to 2 m **Lab Sample No:** S-21-0882

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
BH 101-21	SS 3	1.5 m to 2 m	7	68	25		9.5
Description		Classification	D ₆₀	D ₃₀	D ₁₀	C _u	C _c
Silty Sand trace Gravel		SM	0.255	0.090	-	-	-

Additional information available upon request

Issued By: 
 (Senior Project Manager)

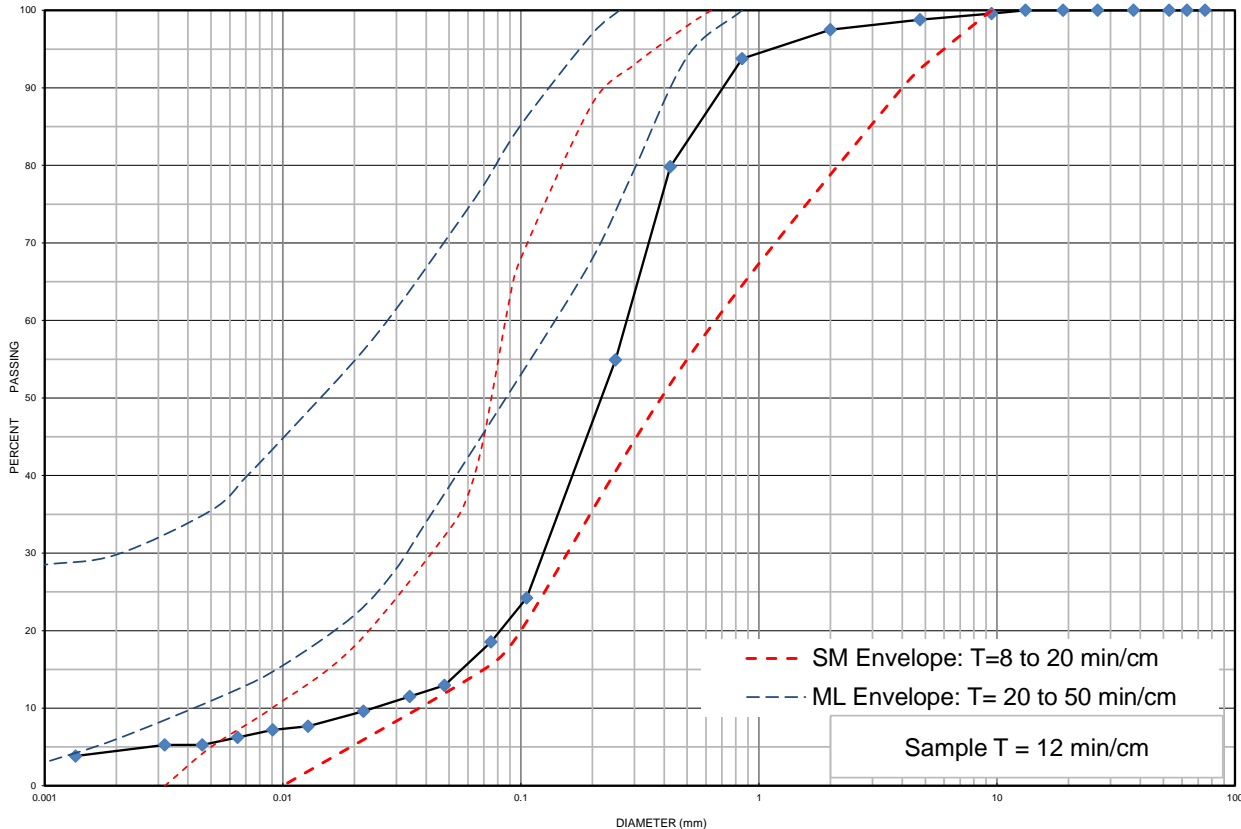
Date Issued: October 31, 2022



Grain Size Distribution Chart

Project Number: 13237-001 **Client:** Koenig Developments Ltd.
Project Name: Water Balance and Hydrogeological Assessment - 245 Church St
Sample Date: July 21, 2021 **Sampled By:** Ben White - Cambium Inc.
Location: BH 102-21 SS 2 **Depth:** 0.6 m to 1.2 m **Lab Sample No:** S-21-0879

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
BH 102-21	SS 2	0.6 m to 1.2 m	1	80	15	4	10.7
Description		Classification	D ₆₀	D ₃₀	D ₁₀	C _u	C _c
Sand some Silt trace Clay trace Gravel		SM	0.275	0.130	0.025	11.00	2.46

Additional information available upon request

Issued By: 
 (Senior Project Manager)

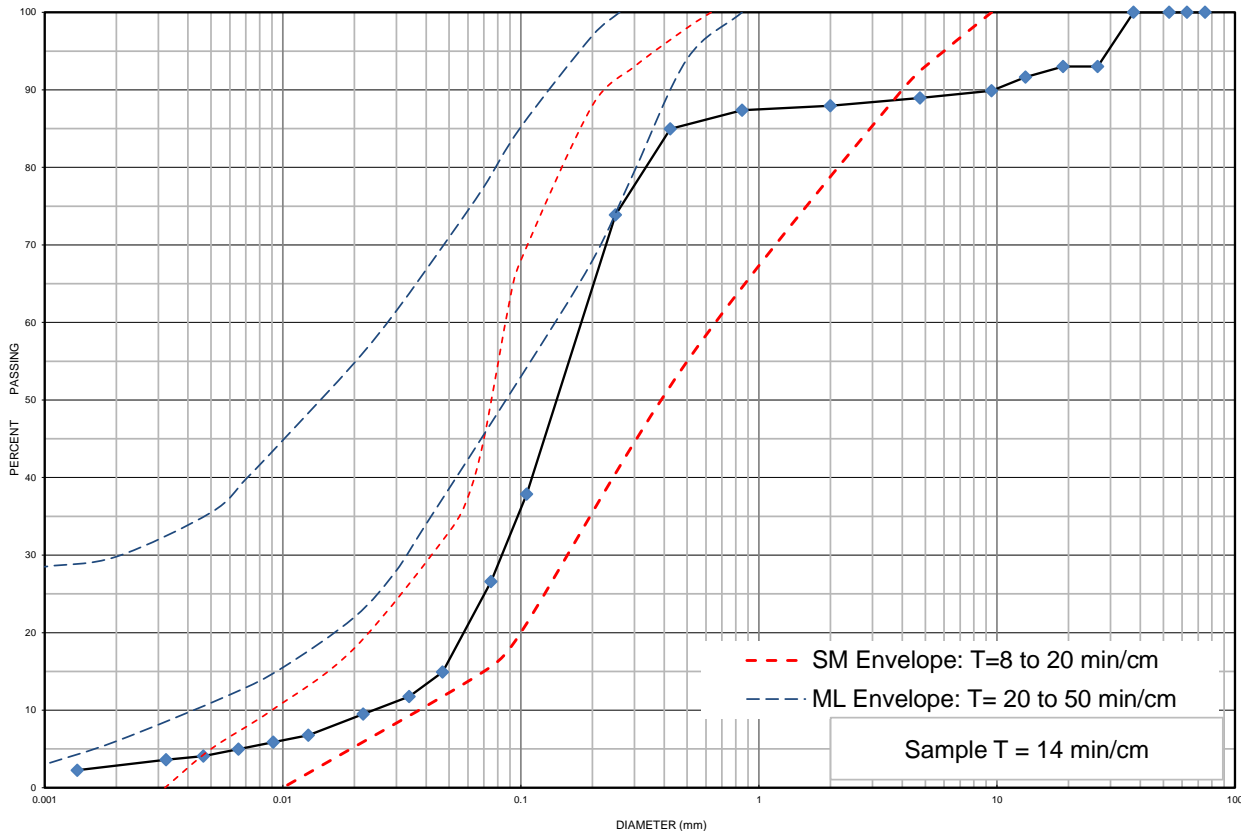
Date Issued: October 31, 2022



Grain Size Distribution Chart

Project Number: 13237-001 **Client:** Koenig Developments Ltd.
Project Name: Water Balance and Hydrogeological Assessment - 245 Church St
Sample Date: July 21, 2021 **Sampled By:** Ben White - Cambium Inc.
Location: BH 102-21 SS 6 **Depth:** 4.6 m to 5 m **Lab Sample No:** S-21-0880

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
BH 102-21	SS 6	4.6 m to 5 m	11	62	24	3	7.2
Description		Classification	D ₆₀	D ₃₀	D ₁₀	C _u	C _c
Silty Sand some Gravel trace Clay		SM	0.180	0.083	0.025	7.20	1.53

Additional information available upon request

Issued By: *John Bond*
 (Senior Project Manager)

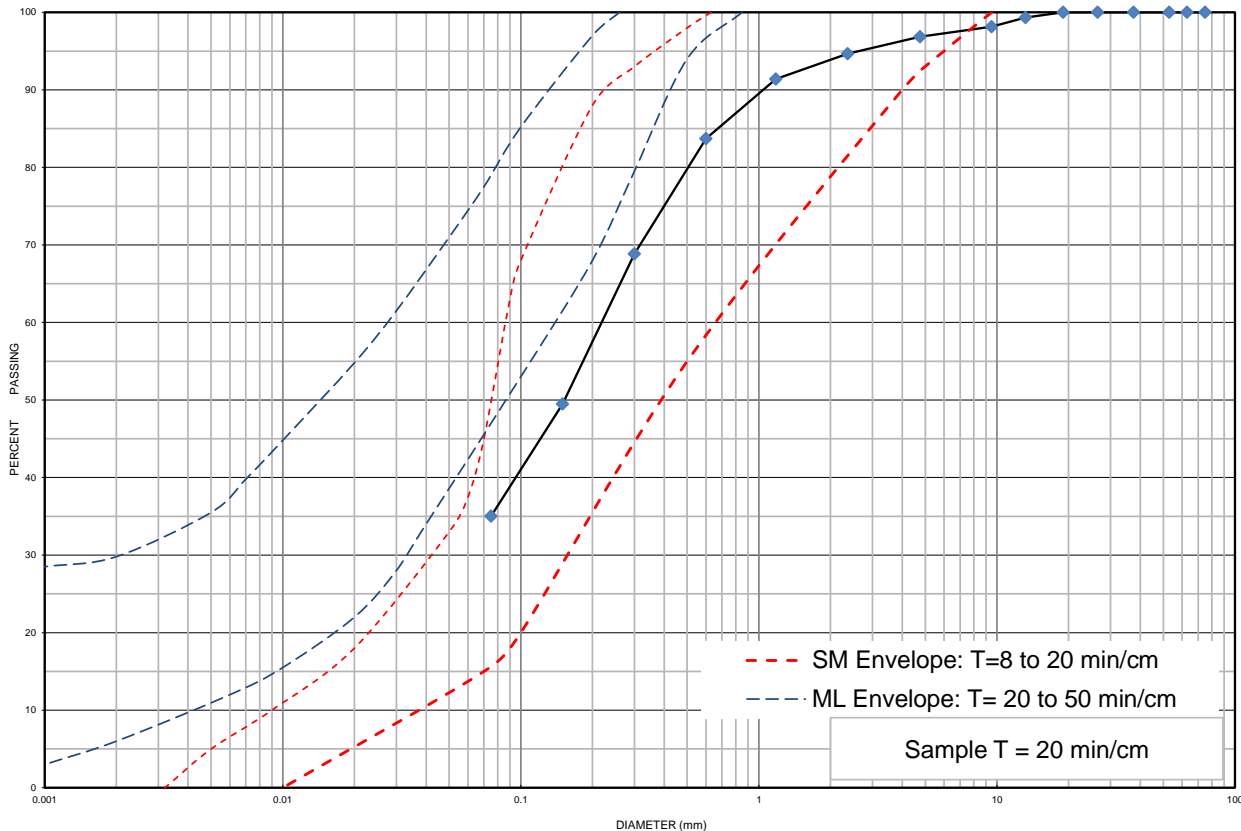
Date Issued: October 31, 2022



Grain Size Distribution Chart

Project Number: 13237-001 **Client:** Koenig Developments Ltd.
Project Name: Water Balance and Hydrogeological Assessment - 245 Church St
Sample Date: July 21, 2021 **Sampled By:** Ben White - Cambium Inc.
Location: BH 103-21 SS 2 **Depth:** 0.6 m to 1.2 m **Lab Sample No:** S-21-0883

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
BH 103-21	SS 2	0.6 m to 1.2 m	3	62	35		16.7
Description		Classification	D ₆₀	D ₃₀	D ₁₀	C _u	C _c
Sand and Silt trace Gravel		SM	0.220	-	-	-	-

Additional information available upon request

Issued By: *John Bond*
 (Senior Project Manager)

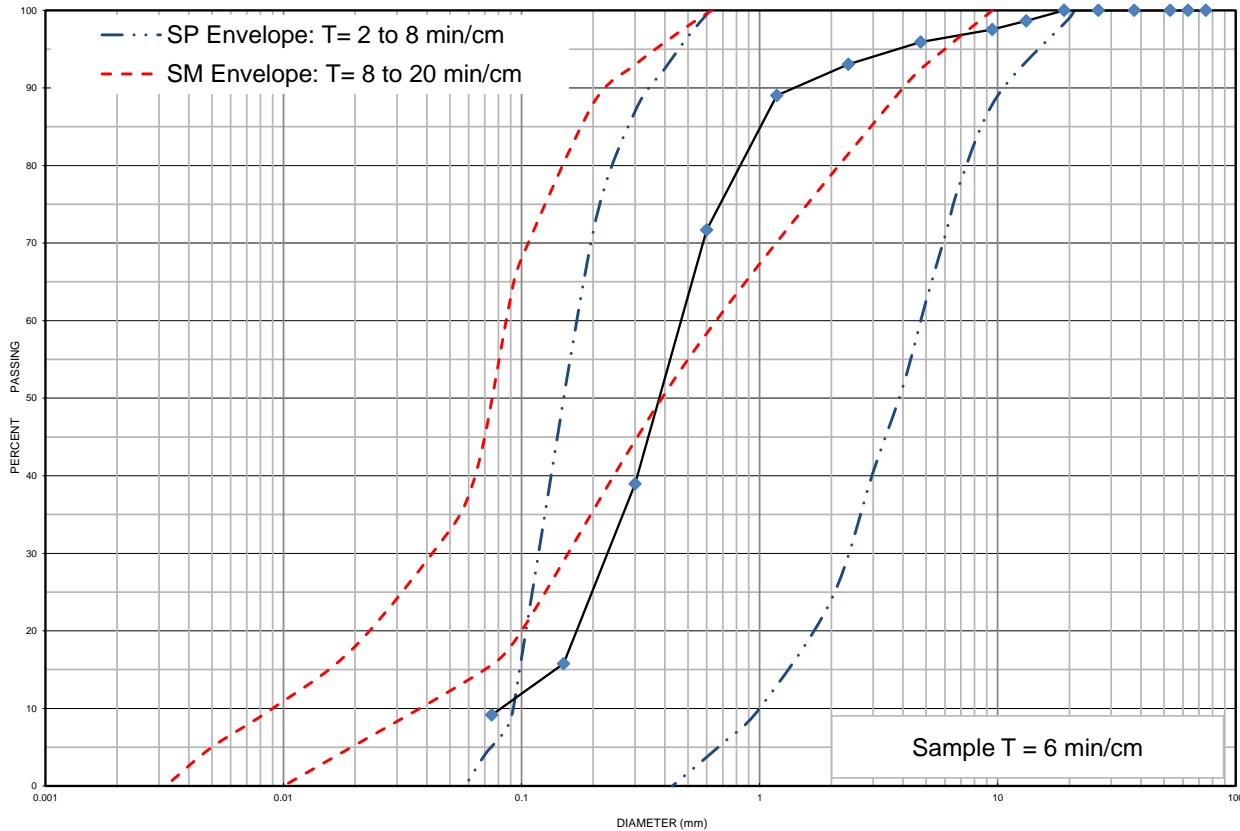
Date Issued: October 31, 2022



Grain Size Distribution Chart

Project Number: 13237-001 **Client:** Koenig Developments Ltd.
Project Name: Water Balance and Hydrogeological Assessment - 245 Church St
Sample Date: July 21, 2021 **Sampled By:** Ben White - Cambium Inc.
Location: BH 104-21 SS 4 **Depth:** 2.3 m to 2.7 m **Lab Sample No:** S-21-0881

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
BH 104-21	SS 4	2.3 m to 2.7 m	4	87	9		8.8
Description		Classification	D ₆₀	D ₃₀	D ₁₀	C _u	C _c
Sand trace Silt trace Gravel		SP	0.460	0.135	0.080	5.75	0.50

Additional information available upon request

Issued By: *John Baird*
 (Senior Project Manager)

Date Issued: October 31, 2022



Appendix E
Thornthwaite Water Balance

Midland

THORNTHWAITE-TYPE MONTHLY WATER-BALANCE MODEL													
<i>modified from Dingman 2001: ex. 7-13, Box 7-3 using ET model of Hamon (1963)</i>													
Input Data				Computed Values					Surplus				
									494 mm/yr				
Location: Midland			Lat. =		44.5 degree			SOILmax =		150 mm			
				0.78 rad									
Declination (deg)	-21.3	-13.3	-2.0	9.8	18.9	23.3	21.3	13.7	3.0	-9.0	-18.6	-23.3	
Declination (rad)	-0.37	-0.23	-0.03	0.17	0.33	0.41	0.37	0.24	0.05	-0.16	-0.32	-0.41	
DayLength (hr)*	9.0	10.2	11.7	13.3	14.6	15.3	15.0	13.8	12.4	10.8	9.4	8.7	
*For lat. > 66.5, replace #NUM! with 24 in summer; 0 in winter.													
MONTHLY WATER BALANCE DATA													
Temperatures in C, water-balance terms in mm.													
Month:	J	F	M	A	M	J	J	A	S	O	N	D	Year
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
P	110	70	66	65	93	90	73	78	99	90	104	104	1041
T	-8.5	-6.4	-1.9	5.8	12.2	18.1	20.8	19.9	15.9	9.3	3.2	-3.1	
F	0.00	0.00	0.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.53	0.00	
RAIN	0	0	0	63	93	90	73	78	99	90	55	0	640
SNOW	110	70	66	2	0	0	0	0	0	0	48	104	400
PACK	210	280	345	12	0	0	0	0	0	0	23	127	
MELT	0	0	0	336	12	0	0	0	0	0	26	0	373
INPUT (W_m)	0	0	0	399	104	90	73	78	99	90	81	0	1014
PET	0	0	0	41	67	101	116	102	72	41	24	0	565
W_m - PET	0	0	0	358	37	-12	-43	-24	27	49	57	0	
SOIL	150	150	150	150	150	139	104	89	116	150	150	150	
Δ SOIL	0	0	0	0	0	-11	-35	-15	27	34	0	0	
ET	0	0	0	41	67	101	108	93	72	41	24	0	547
SURP=W-ET- Δ SOIL	0	0	0	358	37	0	0	0	0	15	57	0	467
DEFIC=PET-ET	0	0	0	0	0	0	9	9	0	0	0	0	18



Pre- and Post-Development Water Balance Calculations

245 Church Street, Penetanguishene, ON

1 Climate Information

Precipitation	1041 mm/yr
Actual Evapotranspiration	547 mm/yr
Water Surplus	494 mm/yr

2 Infiltration Rates

Table 2 Approach - Infiltration factors

Topography: Gently Undulating Land	0.3
Soil Type: predominantly sandy loam	0.3

Cover: Open Land 0.1

Total Infiltration Factor 0.7

Infiltration (Water Surplus * Infiltration Factor)	346 mm/yr
Run-off (Water Surplus - Infiltration)	148 mm/yr

Table 3 Approach - Typical Recharge Rates

Coarse Sand and Gravel	>250	mm/yr
Fine to medium sand	200-250	mm/yr
Silty sand to sandy silt	150-200	mm/yr
Silt	125-150	mm/yr
Clayey Silt	100- 125	mm/yr
Clay	<100	mm/yr

Site development area is underlain predominantly by sand and silty sand with gravel and trace clay.

Based on the above, the recharge rate is typically 200-250 mm/yr

3 Pre-Development Property Statistics

	ha	m ²
Total Paved Area	0.00	0
Total Roof Area	0.00	0
Total Landscape Area	5.30	53,000
Total	5.30	53,000

4 Post-Development Property Statistics

	ha	m ²
Total Paved Area	1.06	10,600
Total Roof Area	0.95	9,525
Total Landscape Area	3.29	32,875
Total	5.30	53,000



Pre- and Post-Development Water Balance Calculations

245 Church Street, Penetanguishene, ON

5 Pre-Development Water Balance

Land Use		Area (m ²)	Precipitation (m ³)	Evapotranspiration (m ³)	Infiltration (m ³)	Run-off (m ³)
Impervious Areas	Paved Area	-	-	-	-	-
	Roof Area	-	-	-	-	-
Pervious Areas	Landscape Area	53,000	55,173	28,991	18,327	7,855
Totals		53,000	55,173	28,991	18,327	7,855

Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.

6 Post-Development Water Balance

Land Use		Area (m ²)	Precipitation (m ³)	Evapotranspiration (m ³)	Infiltration (m ³)	Run-off (m ³)
Impervious Areas	Paved Area	10,600	11,035	1,103	-	9,931
	Roof Area	9,525	9,916	992	-	8,924
Pervious Areas	Landscape Area	32,875	34,223	17,983	11,368	4,872
Totals		53,000	55,173	20,078	11,368	23,727

Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.

7 Comparison of Pre- and Post -Development

	Precipitation (m ³)	Evapotranspiration (m ³)	Infiltration (m ³)	Run-off (m ³)
Pre-Development	55,173	28,991	18,327	7,855
Post-Development	55,173	20,078	11,368	23,727
Change in Volume	-	-	8,913	15,873
Change in %	-	-	31	202

8 Requirement for Infiltration of Roof Run-off

Volume of Pre-Development Infiltration (m ³ /yr)	18,327
Volume of Post-Development Infiltration (m ³ /yr)	11,368
Deficit from Pre to Post Development Infiltration (m ³ /yr)	6,959
Percentage of Roof Runoff required to match the pre-development infiltration (%)	78