

Hydrogeological Report

Bridgenorth Townhouse Development

949 Eighth Line, Township of Selwyn,
Ontario

D.M. Wills Project Number 22-85260



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Submissions Summary

Submission No.	Submission Title	Date of Release	Submissions Summary
1	Draft Hydrogeological Study Report	June 29, 2023	Draft Submission for Client Review
2	Final Hydrogeological Study Report	July 6, 2023	Final Submission to Client
3	Revised Final Hydrogeological Study Report	November 29, 2023	Final Submission to Client
4	Revised Final Draft Hydrogeological Study Report	April 11, 2024	Addendum – Appendix K
5	Final Hydrogeological Study Report	September 9, 2024	Final Submission to Client
6	Revised Final Draft Hydrogeological Study Report	September 18, 2025	Addendum – Appendix L

This report has been formatted considering the requirements of the Accessibility for Ontarians with Disabilities Act.

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1.0 Introduction

D.M. Wills Associates Limited (Wills) was retained by Jeff Chesher (Client) to conduct a Hydrogeological Study (Study) for the property located at 949 Eighth Line Township of Selwyn, Ontario (Subject Property). The Study was completed in support of a Zoning By-law Amendment (ZBA) for the proposed Bridgenorth Townhouse Development (Proposed Development) on the Subject Property. The Proposed Development includes two three-unit townhouse buildings that are individually serviced with a water supply well and sewage disposal system.

Wills' Study is required to confirm adequate groundwater supply and quality, sewage servicing capabilities, and to assess the infiltration rates of the subsurface soils as input to proposed Low Impact Development (LID) design on the Subject Property.

The Subject Property is generally rectangular in shape and approximately 1 hectare (ha). The existing conditions on the Subject Property include the following:

- One residential dwelling and detached garage on the northeast corner. The majority of the Subject Property is currently undeveloped.
- The Subject Property is currently serviced with one water supply well and one sewage disposal system located in proximity to the existing dwelling. A Ministry of Environment, Conservation and Parks (MECP) Well Record is not available for the existing water supply well.
- Following completion of the Proposed Development, the existing dwelling, water supply well, and sewage system will remain on the Subject Property.

The Subject Property is bound to the east and west by residential properties, to the south by a commercial property, and to the north by Eighth Line Smith. Residential and commercial properties in proximity to the Subject Property along Eighth Line Smith are privately serviced for water supply and sewage disposal. A Regional Location Plan is included as **Figure 1**.

The anticipated water taking needs for the existing dwelling and the Proposed Development (Post-Development Subject Property) have been calculated to be approximately 6,000 litres per day (L/day).

2.0 Scope of Work

Wills' approved Scope of Work to complete the Study included the following:

- A review of background information provided by the Client and readily available information accessed through public databases, including MECP Well Records within 500 metres (m) of the Subject Property.
- Prior to initiating field investigations, public and private utility services locates were obtained and reviewed by Wills staff. Additionally, a Site-Specific Health

and Safety Plan, Traffic Protection Plan, and Field Work Plan were prepared to ensure a safe and efficient fieldwork program.

- Steenburgh Sand and Gravel excavated four test pits under the direct supervision of Wills Staff to a depth of 3.0 metres below ground (mbg) on the Subject Property on April 28, 2022.
- Canadian Environmental Drilling and Contractors Inc. advanced three boreholes to a depth of 6.0 mbg on May 3, 2022. Each borehole was completed as a monitor well to facilitate static groundwater level measurements and sampling activities.
- Soils samples retained from the boreholes and test pits were reviewed by Wills prior to submitting select samples to WSP Canada (WSP), a Canadian Certified Independent Laboratory (CCIL) for Particle Size Distribution and percolation time estimations.
- Three infiltration testing locations were selected to determine representative infiltration rates for LID design. Due to the high groundwater table (0.15 mbg and less than 1.0 mbg respectively) at two of the locations, infiltration testing was only feasible at one location, as discussed in **Section 4.0**.
- One single ring infiltrometer was installed on April 28, 2022, to determine representative infiltration rates for LID design on the Subject Property. Water levels within the infiltrometer were monitored manually using a Solinst Water Level Meter. A second infiltration test performed using a Guelph Permeameter at this same location on January 31, 2023, to confirm the initial infiltration testing results.
- Two additional infiltration tests were performed using a Guelph Permeameter in the locations of the proposed sewage systems on November 9, 2023:
 - The additional infiltration tests were conducted to address peer review comments provided by Engage Engineering in their letter dated August 21, 2023, regarding inputs to the sewage system calculation sheets.
 - Soil samples were collected from the testing depths at each location and submitted to PRI Engineering (PRI) CCIL, for Particle Size Distribution and percolation time estimations.
 - Depth to groundwater within the footprint of the proposed northern sewage system was recorded; however, subsurface conditions hindered the advanced of the hand auger to groundwater depth within the footprint of the southern sewage system.
 - Shallow groundwater conditions prevented representative in-situ results from being obtained at both testing locations.
- Joe Legge & Sons installed two Ontario Regulation (O. Reg.) 903 water supply wells on the Subject Property to service the Proposed Development. The new wells will be referred to herein as Well 1 (A358381) and Well 2 (A358382).
- Two six-hour pumping tests were conducted – one on Well 1 and one on Well 2, to determine production yield, maximum pumping rate, well recovery, groundwater quality, and the potential for interference with neighbouring groundwater taking activities.

- Two groundwater samples were collected from the pumping well during each pumping test (at the 1-hour and 6-hour pumping test intervals) and submitted to SGS Canada Inc. (SGS) for analysis of select physical, chemical, and biological parameters for comparison to the Ontario Drinking Water Quality Standards (ODWQS).
- During each pumping test, real-time data logging technology (Solinst Level Loggers) was employed to record the drawdown and groundwater level fluctuations in the pumping well, as well as the response to pumping in two Observation Wells (discussed in **Section 5.2**).
- An evaluation of pumping test data was completed with respect to the availability and quality of groundwater on the Subject Property in context of the anticipated water taking needs of the Proposed Development.
- Evaluation of Wills' desktop review and field investigation findings, and preparation of this Hydrogeological Study Report.

3.0 Subsurface Investigation

Borehole/monitor well, test pit, and infiltration test locations are shown on **Figure 2**.

Test pit and borehole logs detailing the encountered subsurface conditions and monitor well construction details are included in **Appendix A – Borehole and Test Pit Logs**.

Analytical results from the representative soil samples submitted to WSP were compared to the Ministry of Municipal Affairs and Housing, Building and Development Branch (MMAH) Supplementary Standard SB-6 – Percolation Time and Soil Descriptions Table 2 and Table 3 values (Ontario Building Code [OBC], 2012) (OBC Table 2/3). Percolation times are discussed in **Section 4.1**.

3.1 Soil Profile Summary

The Subject Property is situated within the Physiographic Region of the Peterborough Drumlin Field (Chapman and Putnam, 1984) which generally consists of undulating till plains punctuated with predominantly northeast trending drumlin features. Based on Ontario Geological Survey (OGS) mapping, the majority of the Subject Property lies along the flank of a drumlin feature, with the remainder being occupied by drumlined till plains.

OGS surficial geology mapping suggests the Subject Property includes stone-poor, sandy silt to silty sand fill on Paleozoic terrain. The underlying bedrock geology consisting of Middle Ordovician-aged limestone bedrock. MECP Well Records for properties adjacent to the Subject Property indicate that the underlying bedrock was encountered at depths ranging from approximately 3.4 to 28.3 mbg. OGS mapping is included in **Appendix B – Ontario Geological Survey Mapping**.

The results of the drilling and test pit program indicate the overburden is generally aligned with the published mapping and generally includes a surficial layer of silty sand topsoil that is variably underlain by silty sand to silt material with varying amounts of

sand. Based on the MECP Well Records for Well 1 and Well 2, a stratigraphically lower, coarse grained gravel material was encountered at approximately 19.0 mbg to well termination depths of approximately 20.2 mbg.

The following observations are made regarding the subsurface profile at the Subject Property:

- Based on Standard Penetration Test (SPT) N values between 3 to 21 blows per 305 millimetres (mm) of penetration, the shallow silty sand material has a very loose to compact relative compactness.
- Silt and sand were encountered beneath the silty sand material in all borehole and test pit locations to a maximum depth of 6.10 mbg. This material was described as moist to saturated. SPT N values ranged between 8 to greater than 50 blows per 305 mm of penetration, indicating a loose to very dense relative compactness.
- Silt material was encountered at most of the borehole and test pit locations, extending to a maximum depth of 5.05 mbg. Based on SPT N values between 23 to 66 blows per 305 mm of penetration, the silt material has a compact to very dense relative compactness.
- Significant variations in gravel content were noted throughout the investigation areas with high gravel content noted in TP22-01 at 3.0 mbg.
- Shallow groundwater was encountered between 0.4 mbg and 0.5 mbg in all four test pits prior to backfilling.
- Groundwater was observed in open boreholes between 0.9 mbg (MW22-02) to 6.05 mbg (MW22-03) prior to backfilling.

Six laboratory particle size distribution analyses were completed on the collected soil samples. The results are summarized in **Table 1**, based on the Unified Soil Classification System (USCS). Certificates of Analysis for the physical soil testing results are included in **Appendix C – Certificates of Analysis – Physical Soil Testing**.

Table 1 – Summary of Particle Size Distribution

Location ID	Sample Depth (mbg)	Soil Unit	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
BH22-02 SS3	1.50	Silt and Sand	15	40	33	12
BH22-03 SS2	0.75	Silt and Sand	10	40	35	15
TP22-01 GS3	3.0	Sand & Gravel	30	30	29	11
TP22-03 GS4	2.5	Silt	0	20	67	13
HA23-01	0.2	Silty Sand	2	70	25	3
HA23-02	0.4	Silt and Sand	1	42	44	13

3.2 Groundwater

Three monitor wells were installed on the Subject Property to facilitate groundwater level monitoring and sampling. Well construction details and ground surface elevations are shown on the borehole logs included in **Appendix A. Table 2** summarizes the static groundwater levels measured during the Study.

Table 2 – Monitor Well Construction and Groundwater Level Summary

Monitor Well ID	Screened Material	Stick-Up (mag)	Measurement Date	Groundwater Level (mbg)	Groundwater Elevation (masl)
MW22-01	Silt and Sand	0.89	January 31, 2023	0.25	265.29
			May 9, 2023	0.13	265.41
			November 9, 2023	0.92	264.62
MW22-02	Silt	0.92	January 31, 2023	0.47	263.88
			May 9, 2023	0.43	263.91
			November 9, 2023	1.14	263.20
MW22-03	Silt and Sand	1.12	January 31, 2023	0.83	263.49
			May 9, 2023	0.63	263.69
			November 9, 2023	2.40	261.91

*mag – metres above ground *mbg – metres below ground

3.2.1 Groundwater Flow

Shallow groundwater flow direction was calculated using static water levels collected in 2023. Monitor well top of pipe and ground elevations were measured using a Sokkia GPS unit in May 2023.

The hydraulic gradient between the three monitor wells including magnitude and direction, were calculated using the United States Environmental Protection Agency (EPA) *On-Line Tools for Site Assessment Calculation – Hydraulic Gradient – Magnitude and Direction*. The inputs and outputs of the EPA's model are summarized in **Table 3**.

Table 3 – Subject Property Hydraulic Gradient

Monitor Wells	Date	Hydraulic Gradient	Direction	Azimuth	Coefficient of Determination (R ²)
MW21-01 MW21-02 MW2103	January 31, 2023	0.0268	North-northeast	20.6	1.00
MW21-01 MW21-02 MW2103	May 9, 2023	0.0282	North-northeast	19.3	1.00

Wills' 2023 groundwater flow calculations suggest a north-northeast flow direction. It should be noted that the desired triangular orientation of the monitor wells was not feasible during drilling activities due to challenging site conditions. Very soft ground conditions and standing surface water limited the drilling contractor's ability to safely stabilize the track-mounted drill rig in the original proposed locations. Monitor wells were

sited in a more linear fashion, which may have contributed to the hydraulic gradient bias slightly to the north-northeast, as opposed to distinctly north or northwest, towards Chemong Lake. For the purposes of the Groundwater Impact Assessment, groundwater flow is assumed to flow north through the Subject Property.

4.0 In-Situ Infiltration Testing

Three infiltration test (INF-1 to INF-3) locations were selected on the Subject Property to confirm the infiltration rates of the shallow subsurface soils as input to LID design. Based on very shallow groundwater conditions encountered on April 28, 2022, in-situ infiltration testing was not feasible at locations INF-1 and INF-2.

One infiltration test (INF-3) was conducted at a depth of 1.5 mbg using a 51-millimetre open-end single ring infiltrometer on April 28, 2022. Water levels within the infiltrometer casings were manually monitored using a Solinst water level tape. No infiltration was observed at INF-3 following 45 minutes of monitoring.

The infiltration rate of soils proximal to INF-3 were re-tested on January 31, 2023, using a Guelph Permeameter (INF-3b). The testing was conducted at 0.55 mbg within the silt and sand material. The infiltration rate during this second test was calculated to be 12.1 min/cm (49.6 mm/hr).

Two additional infiltration tests were performed on November 9, 2023, in the locations of the proposed sewage systems (INF-4 and INF-5).

Infiltration test locations are shown on **Figure 2**. Detailed calculations and supporting infiltration graphs are provided in **Appendix D – Infiltration Graphs**.

4.1 Permeability and Percolation Time

Table 4 summarizes the permeability and percolation times of the tested soils based on the in-situ testing, and laboratory results compared to OBC Table 2 & Table 3.

Table 4 – Permeability and Percolation Time Summary

ID	Soil Description	Physical Soil Testing Results	Percolation Range	Laboratory Estimated Percolation (T)	Permeability	In-situ Testing
INF-4	Silty Sand	SM envelope	T = 8 – 20 min/cm or 30 – 75 mm/hr	T = 16 min/cm	Medium to low	Shallow groundwater conditions prevented infiltration testing.
INF-5	Silt and Sand	ML envelope	T = 20 – 50 min/cm or 12 – 30 mm/hr	T = 30 min/cm	Medium to low	236 min/cm 2.56 mm/hr Shallow groundwater/groundwater r mounding anticipated to have affected in-situ results
INF-3	Silt and Sand	SM envelope	T = 8 – 20 min/cm or 30 – 75 mm/hr	T = 35 min/cm 17 mm/hr	Medium to low	Water level rising after 45 minutes of testing – test abandoned.
		ML envelope	T = 20 – 50 min/cm or 12 – 30 mm/hr		Medium to low	
INF-3b	Silt and Sand	SM envelope	T = 8 – 20 min/cm or 30 – 75 mm/hr	T = 35 min/cm 17 mm/hr	Medium to low	12.1 min/cm 49.62 mm/hr
		ML envelope	T = 20 – 50 min/cm or 12 – 30 mm/hr		Medium to low	
INF-2	Silt and Sand	SM envelope	T = 8 – 20 min/cm or 30 – 75 mm/hr	T = 25 min/cm 24 mm/hr	Medium to Low	Groundwater present in open borehole – test not completed.
		ML envelope	T = 20 – 50 min/cm or 12 – 30 mm/hr		Medium to low	

ID	Soil Description	Physical Soil Testing Results	Percolation Range	Laboratory Estimated Percolation (T)	Permeability	In-situ Testing
INF-1	Silt	SM envelope	T = 8 – 20 min/cm or 30 – 75 mm/hr	T = 35 min/cm 17 mm/hr	Medium to low	Groundwater present in open borehole – test not completed.
		ML envelope	T = 20 – 50 min/cm or 12 – 30 mm/hr		Medium to low	
TP22-01	Silty Sand and Gravel	SM envelope	T = 8 – 20 min/cm or 30 – 75 mm/hr	T = 25 min/cm 24 mm/hr	Medium to low	N/A
		ML envelope	T = 20 – 50 min/cm or 12 – 30 mm/hr		Medium to low	

Notes: 1. SM envelope –silty sands, sand-silt mixtures
 ML envelope – Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, clayey silts with slight plasticity
 N/A – Scope did not include infiltration testing at this location.

The following considerations for the proposed LID feature design are provided:

- The encountered soils are anticipated to generally fall within the SM and ML soils envelopes. LID feature design should consider the abundance of silt material identified throughout the Subject Property, encountered between approximately 0.4 to 3.0 mbg.
- LID design should consider the shallow groundwater conditions encountered across the Subject Property. Shallow groundwater was observed in the monitor wells between 0.13 mbg to 0.83 mbg.
- For the purpose of LID design, Wills recommends using the upper end of T-time range for the ML envelope, 50 min/cm or 12 mm/hr. Although this T-time value is slower than that measured during the in-situ infiltration test at INF-3b, this value is considered conservative and should account for any lateral or vertical variation in infiltration rates.

5.0 Groundwater Availability

5.1 MECP Water Well Record Survey and Review

A desktop review of MECP Well Records was conducted to provide a preliminary characterization of the local hydrogeological conditions within 500 m of the Subject Property. The MECP Well Location Plan showing the relative locations and MECP well identifiers of local wells is included as **APP-E1** in **Appendix E – MECP Well Record Search**.

The MECP Well Record search identified 133 wells within 500 m of the Subject Property - 42 installed in bedrock and 91 installed in overburden material. Of the 133 wells identified, 127 were designated for domestic use, three were abandoned, two were public use, and one was commercial use.

Of the 42 wells installed in bedrock, well depths ranged from approximately 7.6 mbg to 48.8 mbg (22.8 mbg average) and static water levels ranged from approximately ground surface to 12.8 mbg (3.7 mbg average). The recommended pumping rates ranged from approximately 2.3 litres per minute (L/min) to 89.3 L/min (26.9 L/min average).

Of the 91 wells installed in overburden material, well depths ranged from approximately 3.7 mbg to 24.4 mbg (14.8 mbg average) and static water levels ranged from approximately ground surface to 10.7 mbg (2.8 mbg average). The recommended pumping rates ranged from approximately 3.8 L/min to 94.5 L/min (31.2 L/min average). As static groundwater levels are comparable between the overburden and bedrock wells, it is plausible a hydrogeological connection exists between the overburden and bedrock aquifers.

Pertinent information including MECP Well ID, well depth, depth to encountered groundwater, static groundwater level, recommended pumping rate, depth to bedrock, and general comments on water quality were summarized and included as **APP-E2** in **Appendix E**.

5.2 Pumping Test

A 6-hour pumping test was conducted on Well 1 on May 10, 2023, and a second 6-hour pumping test was conducted on Well 2 on May 11, 2023. The MECP Well Records for Well 1 and Well 2 are included in **Appendix F – MECP Well Records – Pumping Tests**. The locations and identifications of the wells used for this assessment are shown on **Figure 2**.

The pumping tests were conducted to confirm the performance of the wells over sustained pumping activity and to enable the collection of groundwater samples for quality analysis. The pumping tests were conducted at a constant rate of 19 L/min. The 19 L/min pumping rate is in surplus of that required for the Proposed Development, which was calculated to be approximately 4.3 L/min if pumped constantly over 24 hours (6,000 L/day total). The anticipated water taking needs are considered equivalent to the proposed flows to the sewage systems and are outlined on the Sewage System Calculations Sheet included in **Appendix G – Sewage System Calculations Sheet**.

During each pumping test, Solinst Level Loggers were installed in the Observation Well and the Pumping Well to record the drawdown and groundwater level fluctuations resulting from the pumping test. Confirmatory manual measurements of the groundwater levels in the wells were obtained using a Solinst water level tape.

Well details, including static water levels measured prior to the initiation of each pumping test, are summarized in **Table 5** and **Table 6**.

Table 5 – Well 1 Pumping Test Details

				Date:	May 10, 2023
Well ID	Well Depth (mbtop)	Well Depth (mbg)	Stick Up (mag)	Static Water Level (mbg)	
Pumping Well					
Well 1 (A358381)	20.15	19.30	0.85	0.86	
Observation Well					
Well 2 (A358382)	20.15	19.34	0.81	1.55	

mbtop – metres below top of pipe, **mbg** – metres below ground, **mag** – metres above ground

Table 6 – Well 2 Pumping Test Details

				Date:	May 11, 2023
Well ID	Well Depth (mbtop)	Well Depth (mbg)	Stick up	Static Water Level (mbg)	
Pumping Well					
Well 2 (A358382)	20.15	19.34	0.81 mag	1.69	
Observation Well					
Well 1 (A358381)	20.15	19.34	0.85 mag	0.89	

mbtop – metres below top of pipe, **mbg** – metres below ground, **mag** – metres above ground

Hydrographs for the Pumping Well and Observation Well for each pumping test are included in **Appendix H – Pumping Test Hyrdographs**. Pumping test details are summarized in **Table 7** and **Table 8**.

Table 7 – Pumping Test Summary Well 1 (A358381)

	Pumping Rate (L/min)	Time (minutes)	Max. Drawdown (m)	Stabilization Depth (mbg)	Volume Pumped (L)
Constant Rate	19	360	6.04	+/- 7.00	6,840
Recovery Time			% Recovery		
120 minutes			90%		

Table 8 – Pumping Test Summary Well 2 (A358382)

	Pumping Rate (L/min)	Time (minutes)	Max. Drawdown (m)	Stabilization Depth (mbg)	Volume Pumped (L)
Constant Rate	19	360	3.65	+/- 6.00	6,840
Recovery Time			% Recovery		
145 minutes			90%		

The following observations are provided for the results of the pumping tests:

- Observation Well - Well 2 showed a relatively minor response to pumping activities during the Well 1 pumping test, dropping approximately 2.45 m over the duration of the test. There was approximately 18 m of available drawdown (88%) remaining in Well 2 following the 6-hour pumping test on Well 1 at 19 L/min.

- Observation Well – Well 1 showed a relatively minor response to pumping activities during the Well 2 pumping test, dropping approximately 2.58 m. There was 17.50 m of available drawdown (87%) in Well 1 remaining following the 6-hour pumping test on Well 2 at 19 L/min.
- The pumping test results indicate a hydrogeological connection between Well 1 and Well 2; however, this connection is not anticipated to have a negative impact to either well's ability to support the Proposed Development.
 - Interference between each well is considered minor in view of the available drawdown, and the actual water taking rates are expected to be significantly lower than those utilized during the pumping tests.
 - Both pumping tests resulted in total water takings that exceeded the anticipated daily use of water for the Proposed Development.

The pumping test results indicate that both Well 1 and Well 2 can provide a constant water supply at 19 L/min for at least six hours, with reasonable recovery. Furthermore, 31% (Well 1) and 20% (Well 2) of the available drawdown was used in the pumping well during each 6-hour test. This result suggests both wells can perform at a higher pumping rate than that employed during the tests, and greatly exceed the water taking needs of the Proposed Development, as discussed in **Section 5.2.2**.

5.2.1 Groundwater Quality

Two groundwater samples were collected from the pumping well during each pumping test. One sample was collected 1-hour into the pumping test and the second sample was collected at the 6-hour mark, prior to shutting off the pump. Samples were collected in dedicated sample bottles, kept in a cooler with ice and transported to SGS immediately following completion of the field activities. Analytical results were compared to the ODWQS. The Certificates of Analysis provided by SGS are included in **Appendix I – Certificates of Analysis – Pumping Tests Groundwater**.

The quality of the groundwater samples collected during the pumping tests complies with most ODWQS, except for the following:

Well 1 Pumping Test

- Turbidity, hardness, aluminum, and iron in both the 1-hour and the 6-hour samples
- Manganese in the 1-hour sample
- Total coliform in the 6-hour sample

Further to the laboratory results, it was observed that groundwater discharging from the well was cloudy during the 1-hour sample collection. As the pumping test progressed, the groundwater became increasingly clear, indicating that the elevated concentrations of fines were likely present due to the well installation process and were being flushed from the well. However, turbidity levels were still elevated above the ODWQS in the 6-hour sample and should be considered when designing any proposed water treatment system(s).

The total coliform result in the 6-hour sample may have been unintentionally introduced into the well during construction, or on the sample jar/equipment during sampling activities. This exceedance may not be representative of the aquifer conditions, as this was the only sample (four total collected) where this parameter was identified.

Well 2 Pumping Test

- Turbidity, hardness, and iron in both the 1-hour and the 6-hour samples

The water treatment system(s) for the Proposed Development should consider the exceedances noted above. Commercial filtration and disinfection methods may be used to effectively remove and inactivate any harmful protozoa, bacteria or viruses, and commercial water softening may be used to treat elevated levels of hardness.

5.2.2 Anticipated Water Taking Needs

Anticipated water taking needs for the Proposed Development were estimated based on the Sewage System Calculation Sheet provided by the Client, included in **Appendix G**. The estimated total sewage flows (equivalent to the water taking needs) for the Post-Development Subject Property is estimated to be 6,000 L/day.

During each of the 6-hour duration pumping test, the total water taking was 6,840 L. During the Well 1 pumping test, 31% of the available drawdown was used. During the Well 2 pumping test, 20% of the available drawdown was used. These results suggest that both wells are more than capable of supporting the Proposed Development.

Wills does not expect groundwater availability to be a limiting factor for the Proposed Development, and off-site impact resulting from the proposed water taking activities are not anticipated in view of the observed aquifer conditions.

6.0 Groundwater Impact Assessment

In view of the anticipated flows greater than 4,500 L/day, a procedure derived from the Ontario Water Resources Act (OWRA), 1994, *Guideline B-7, Incorporation of the Reasonable Use Concept into MOEE Groundwater Management Activities and Procedure B-7-1, Determination of Contaminant Limits and Attenuation Zones (Reasonable Use Guideline)* was used to confirm that the projected post-development groundwater nitrate concentration meets the reasonable use criteria at the down gradient property boundary. The procedure is referenced in *Section 22.5 – Assessment of Impact on Water Resources* of the Ministry of Environment (MOE, now MECP), guidance document titled *Design Guidelines for Sewage Works 2008 (MOE Design Guidelines)*.

It is generally assumed that the reasonable use of any groundwater is drinking water, therefore the ODWQS was used for this Groundwater impact Assessment (Impact Assessment).

6.1 Groundwater Impact Assessment Guidelines

The Impact Assessment procedure provided in the *MOE Design Guidelines* incorporates concepts presented in the *Reasonable Use Guideline* and is designed to protect groundwater quality in consideration of the current and potential down gradient land uses.

In the case where sewage effluent discharges to groundwater, the critical contaminant is typically nitrate. It should be assumed that all nitrite and ammonia will convert to nitrate and concentrations should be evaluated as “Nitrogen” i.e., nitrate-N.

For this Impact Assessment, groundwater was assumed to flow north on the Subject Property, towards Chemong Lake.

The Maximum Acceptable Concentration (MAC) of nitrate-N at the down gradient property boundary, based on the *MOE Design Guidelines* procedure, is 2.5 milligrams per litre (mg/L). Detailed MAC calculations are included in **Appendix J – Groundwater Impact Assessment**.

6.2 Impact Assessment - Proposed Development

While most critical contaminants in domestic sewage effluent are typically removed within a short travel distance within soil, mobile constituents such as nitrates will require sustained dilution to meet the calculated MAC at the down gradient property boundary.

The dilution model for this Impact Assessment is premised on the contaminant attenuation equation provided in *Section 22.5.8 – Prediction of Contaminant Attenuation* in the *MOE Design Guidelines*. The model assumes that the source of groundwater recharge, which can be anticipated to attenuate (dilute) the sewage effluent, is limited to the infiltration of precipitation over the contaminant plume area.

The *MOE Design Guidelines* recommends using a constant quantity of dilution (250 millimetres [mm]) of precipitation infiltration per year over the contaminant plume area) as a surrogate for all attenuative mechanisms and in consideration of all soil textures.

The following inputs were used in the dilution model equation:

- The Contaminant Attenuation Zone (CAZ) dilution area (A_D) was estimated to be 8,995 m².
- The annual sewage volume (V_s) was calculated as a product of the anticipated sewage flows for the Proposed Development (6,000 L/day) over a 365-day period, equal to 2,190 m³.

Wills concludes that sewage effluent containing 5.1 mg/L nitrate-N would result in an acceptable level of nitrate-N at the down gradient property boundary, and would not degrade shallow groundwater quality beyond the *MOE Design Guidelines* requirements at down gradient properties.

A figure showing the anticipated dilution area (CAZ) is included as **Figure 3**. The detailed calculations for the Impact Assessment are included in **Appendix J**.

7.0 Conclusions and Recommendations

The Study was requested to confirm adequate water supply and water quality, sewage servicing capabilities, and to assess the infiltration capacity of subsurface soils as input to the proposed LID design features on the Subject Property. The following conclusions with respect to the Study are provided:

- Shallow subsurface soils were generally consistent across the Subject Property and included a thin layer of silty sand topsoil underlain by silty sand to silt material with varying amounts of gravel and clay. The encountered soils are anticipated to generally fall within the SM and ML soils envelopes.
- Groundwater seepage was encountered in all open test pits at depths ranging from 0.40 mbg to 0.50 mbg.
- Groundwater was observed in open boreholes between 0.9 mbg (MW22-02) and 6.05 mbg (MW22-03).
- Static groundwater levels in the three monitor wells ranged from 0.13 mbg to 0.83 mbg. Static groundwater levels were measured during both winter and spring conditions.
- Shallow groundwater conditions on the Subject Property permitted infiltration testing at only one location (INF-3). Infiltration was not observed at INF-3, and water levels within the infiltrometer were observed to rise slightly over the 45-minute duration test.
 - This result suggests that the test may have been conducted within the saturated zone at a depth of 1.55 mbg.
- On January 31, 2023, INF-3b was conducted at a testing depth of 0.55 mbg within the silt and sand material. The infiltration rate during this second test was calculated to be 12.1 min/cm (49.62 mm/hr).
- LID feature design should consider the silt-rich soils identified across the Subject Property, from approximately 0.4 to 3.0 mbg. Additionally, LID design should consider the shallow groundwater conditions observed.
- For the purpose of LID design, Wills recommends using the high end of the T-time range provided in the OBC for the ML soil envelope, 50 min/cm or 12 mm/hr.
 - Although this T-time value is slower than that measured during the in-situ test at INF-3b, this value is considered conservative, and should account for any lateral or vertical variation in infiltration rates, particularly those impacted by the silty soils with varying amounts of clay.
- Infiltration rates and percolation times may vary across the Subject Property, as topography, moisture content, soil gradation and relative compactness will affect in-situ infiltration rates.

- The pumping test results indicate that both Well 1 and Well 2 can provide a constant water supply at 19 L/min for at least six hours, with relatively rapid recovery. Furthermore, 31% (Well 1) and 20% (Well 2) of the available drawdown in the Pumping Wells was utilized during each 6-hour test.
 - This result suggests both wells can likely perform at higher pumping rates than that employed during the tests and greatly exceed the water taking needs of the Post-Development Subject Property.
- Significant interference with neighbouring water taking activities, including the existing dwelling, are not anticipated based on the pumping test results.
- Wills provides the following input to sewage system design:
 - Laboratory testing results indicate that soils within the footprint of the proposed sewage systems are comprised primarily of sand with varying degrees of silt, gravel, and clay content.
 - In-situ infiltration testing indicated a t-time of approximately 236 min/cm (2.56 mm/hr) in the vicinity of the southern proposed sewage systems (INF-05). This in-situ result is expected to have been impacted by shallow groundwater conditions/groundwater mounding. Laboratory t-time estimates ranged from 16-30 min/cm.
 - Sewage system design should consider the high groundwater table, and soil composition encountered within the footprints of the proposed sewage systems.
 - Wills recommends using the laboratory T-time estimate of 30 min/cm for the design of both sewage systems. This value is considered appropriate based on Wills field observations and textural classification of the encountered shallow soils.
- The Impact Assessment concluded that the Subject Property could support the Proposed Development if sewage effluent contains at a maximum 5.1 mg/L nitrate-N from each sewage disposal system. This nitrate concentration would result in an acceptable level of nitrate-N at the down gradient property boundary and would not degrade downgradient shallow groundwater quality beyond the *MOE Design Guidelines*.

8.0 Report Addenda

Following submission of Wills' Hydrogeological Study Report on November 29, 2023, the site plan for the Proposed Development was updated, resulting in the need to update the Groundwater Impact Assessment and Groundwater Availability Assessment sections of this report. Please refer to **Appendix K** for the report addendum that details the Groundwater Impact Assessment Update completed in March 2024 and **Appendix L** for the Groundwater Availability Assessment Update completed in September 2025. The addenda provided in **Appendix K** and **Appendix L** are the most recent assessments of the Subject Property and its capacity to support the Proposed Development.

We trust that the information contained in and attached to this report meets your needs at this time. The Statement of Limitations found below should be read carefully and is an integral part of this report. Do not hesitate to contact the undersigned if you have any questions or concerns.

Respectfully submitted,



Prepared by: _____
Lynsey Tutters, B.A., C.Tech.
Senior Environmental Technologist



Reviewed by: _____
Ian Ames, M.Sc., P.Geo.
Environmental Monitoring and Management Lead

LT/IA/jh

Statement of Limitations

This report is intended solely for Jeff Chesher (Client) for the Proposed Development located at 949 Eighth Line, Township of Selwyn Ontario, and is prohibited for use by others without D.M. Wills Associates Limited's (Wills) prior written consent. This report is considered Wills' professional work product and shall remain the sole property of Wills. Any unauthorized reuse, redistribution of or reliance on this report shall be at the Client and recipient's sole risk, without liability to Wills. The Client shall defend, indemnify and hold Wills harmless from any liability arising from or related to the Client's unauthorized distribution of the report. No portion of this report may be used as a separate entity; it is to be read in its entirety and shall include supporting drawings and appendices.

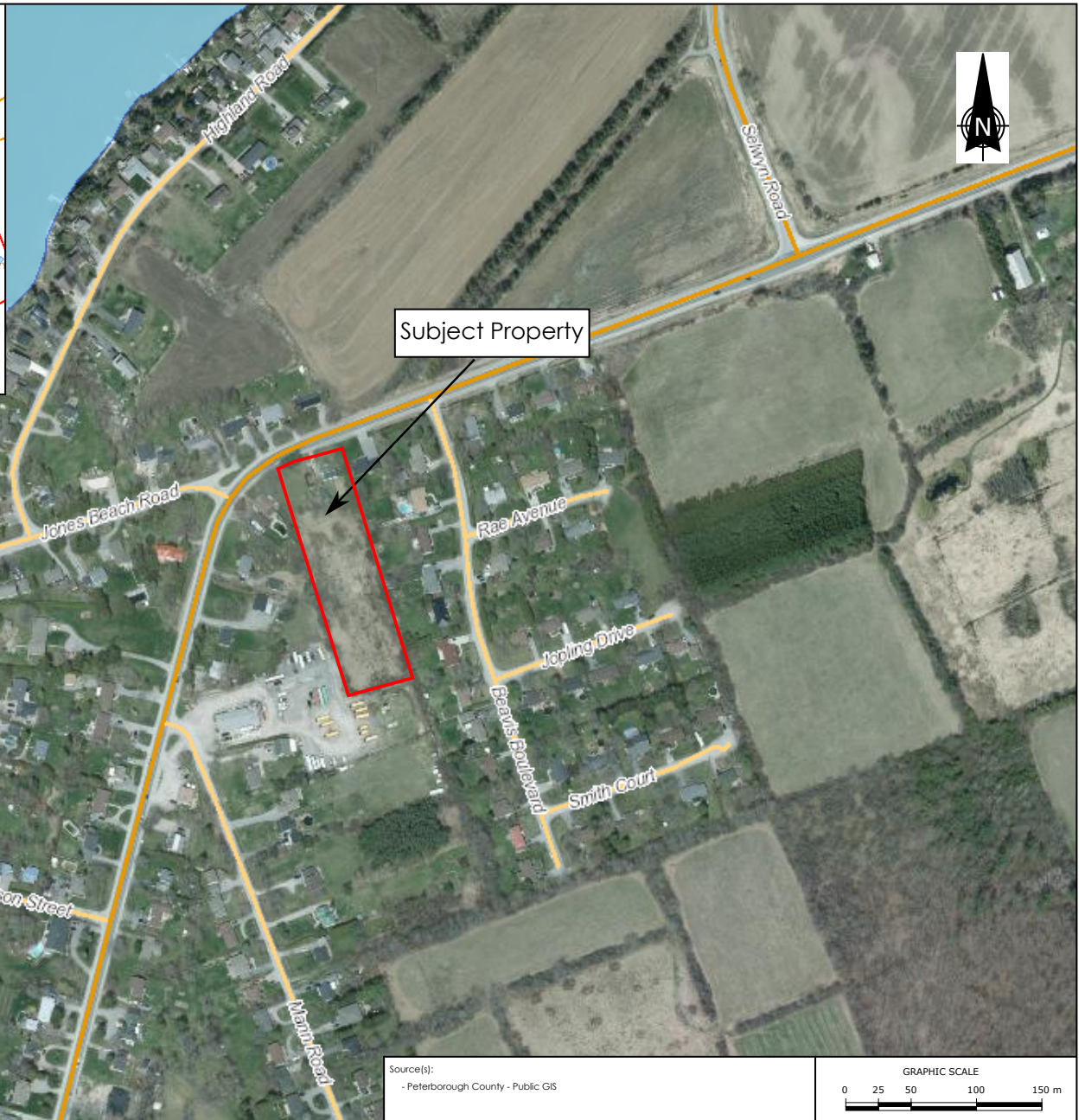
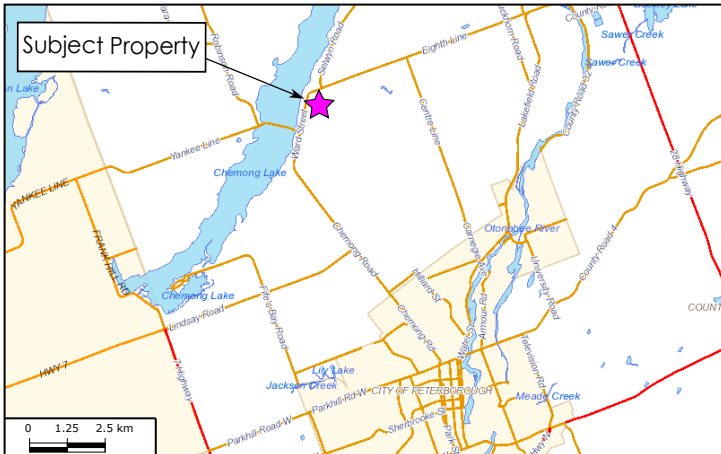
The recommendations made in this report are based on Wills' present understanding of the Project, the current and proposed site use, ground and subsurface conditions, and are based on the work scope approved by the Client and described in the report. The services were performed in a manner consistent with the level of care and skill ordinarily exercised by members of geoscience or engineering professions currently practicing under similar conditions in the same locality. No other representations, and no warranties or representations of any kind, either expressed or implied, are made. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the sole responsibility of such third parties.

The recommendations and comments made in this report are based on Wills' investigations and resulting understanding of the Project, as defined at the time of the assignment. Wills should be retained to review our recommendations when the final or any modified design drawings and specifications are complete. Without this review, Wills shall not be liable for any misunderstanding of our recommendations or their application and adaptation.

Soil, bedrock, and groundwater conditions between and beyond the test locations may differ both horizontally and vertically from those encountered at the test locations. Should any conditions at the Subject Property be encountered which differ from those found at the test locations, Wills must be notified immediately in order to permit a reassessment of our recommendations. If different conditions are identified, no matter how minor, the recommendations in this report shall be considered invalid until sufficient review and written assessment of said conditions by Wills is completed.

Figures





Legend	
	Subject Property
	Subject Property Limits

Regional Location Plan
 Hydrogeological Study
 949 Eighth Line, Bridgenorth, Township of
 Selwyn, Ontario

Source(s):
 - Peterborough County - Public GIS

D.M. Wills Associates Limited
 150 Jameson Drive
 Peterborough, Ontario
 K9J 0B9

 P. 705.742.2297
 F. 705.748.9944
 E. wills@dmwills.com

Drawn by:	C. OSTIC
Checked:	L. TUTERS
Project No.:	85260

Scale:	1:5 000 on 8.5"x11" (US Letter)
Date:	May 18, 2023
Drawing file No.:	Figure 1



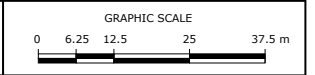


Legend	
	Subject Property
	Monitor Well (MW)
	Test Pit (TP)
	Hand Auger Hole
	Infiltration Test
	Water Supply Well

Subsurface Investigation Plan

Hydrogeological Study
949 Eighth Line, Lakefield Township of
Selwyn, Ontario

Source(s):
- Peterborough County - Public GIS

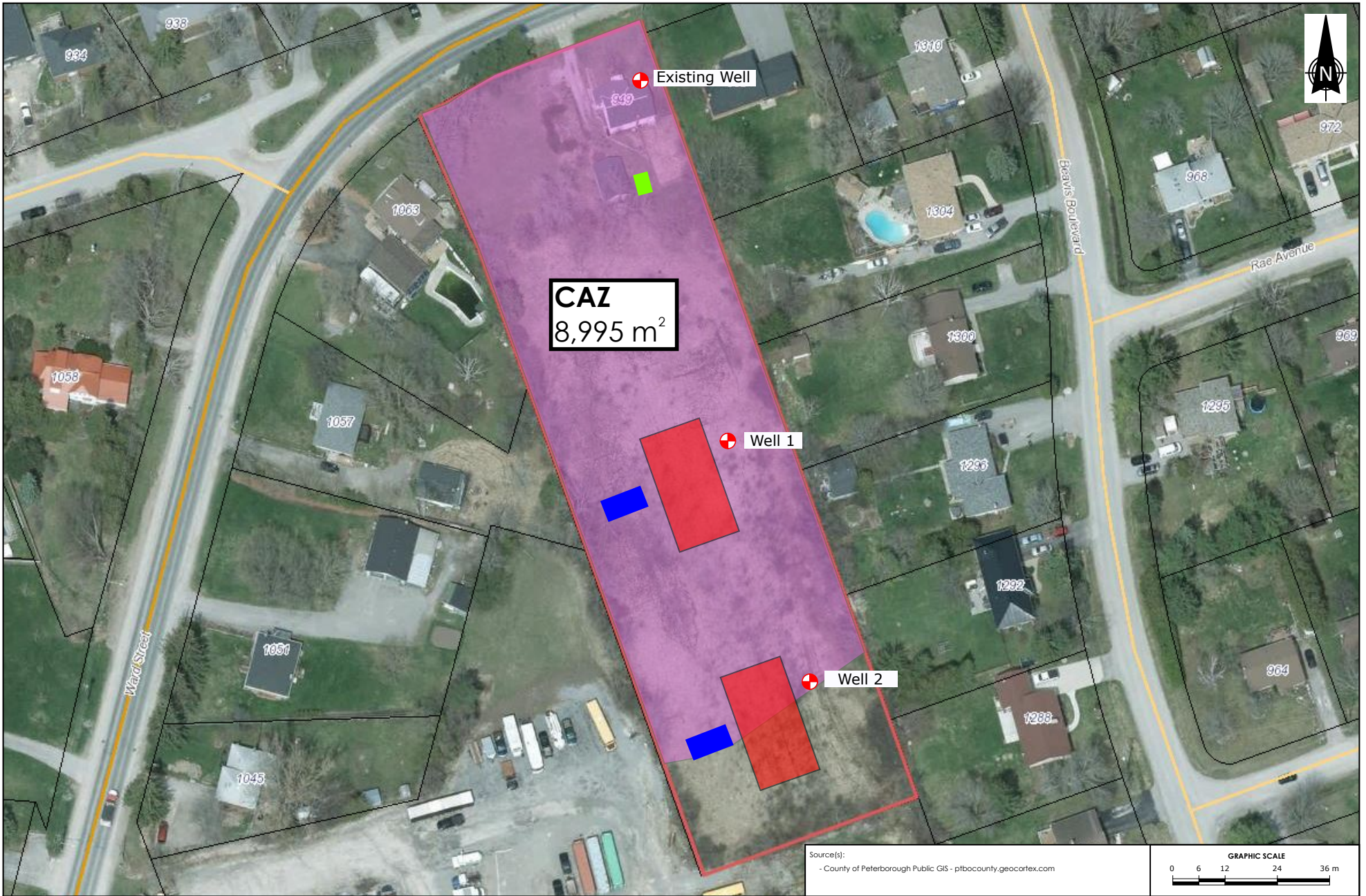


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E. wills@dmwills.com

Drawn by:	C. OSTIC
Checked:	L. TUTERS
Project No.:	85260

Scale:	1:1 250 on 8.5"x11" (US Letter)
Date:	May 18, 2023
Drawing file No.:	Figure 2



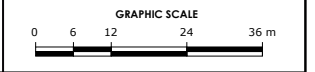
Legend	
	Subject Property
	Proposed Townhouse Building
	Contaminant Attenuation Zone (CAZ)
	Proposed Sewage Disposal System
	Existing Sewage Disposal System
	Water Supply Well

Contaminant Attenuation

949 Eighth Line, Bridgenorth, Ontario



Source(s):
- County of Peterborough Public GIS - ptbocounty.geocortex.com



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Drawn by:	L. Tuters
Checked:	I. Ames
Project No.:	85260

Scale:	1:1,200 on 8.5"x11" (US Letter)
Date:	May 23, 2023
Drawing file No.:	Figure 3

Appendix A

Borehole and Test Pit Logs





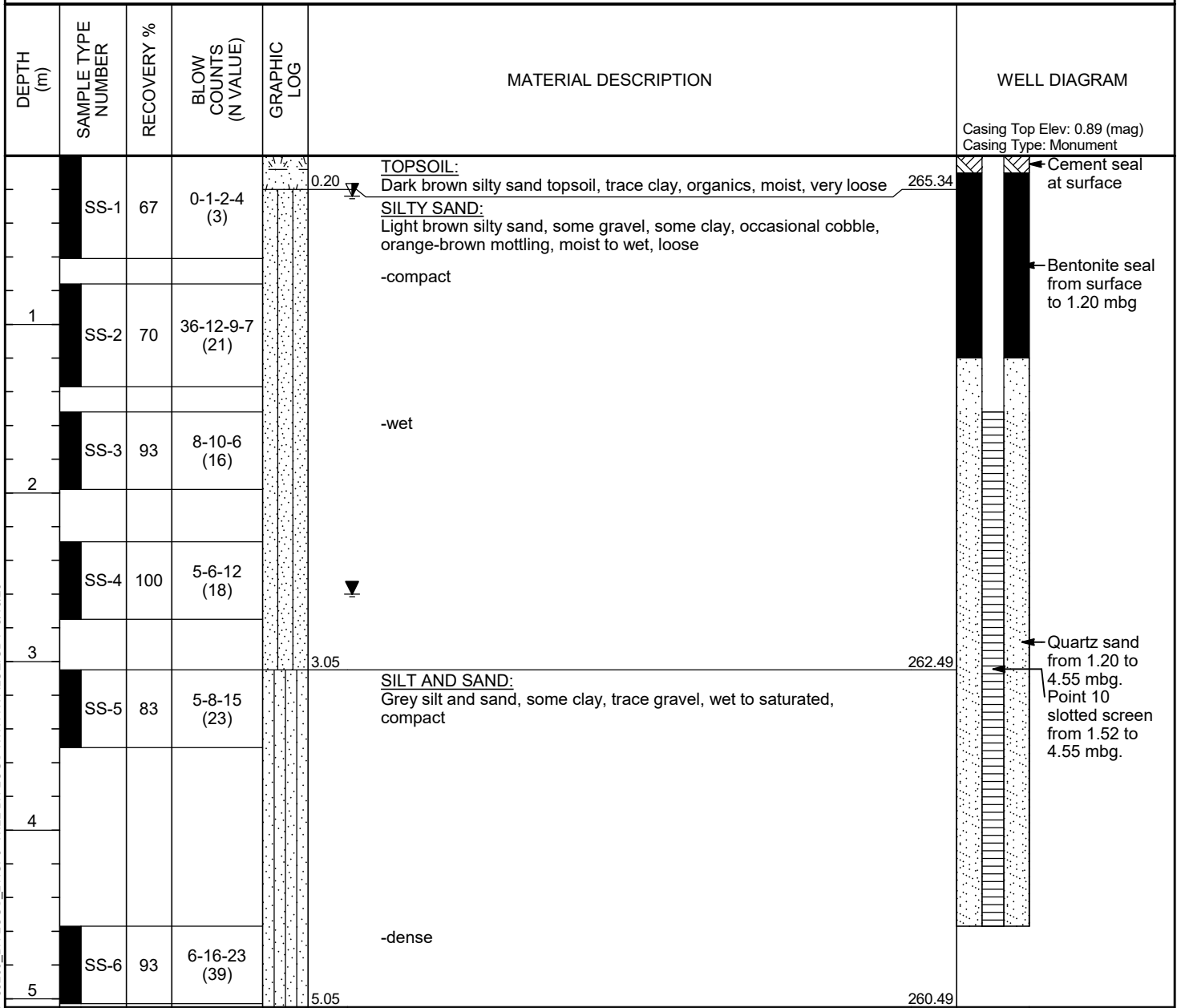
D.M. Wills Associates Limited
 150 Jameson Drive
 Peterborough, Ontario K9J 0B9

WELL NUMBER MW22-01

CLIENT Jeff Chesher
PROJECT NUMBER 22-85260
DATE STARTED 5/3/22 **COMPLETED** 5/3/22
DRILLING CONTRACTOR Canadian Environmental Drilling & Contractors Inc.
DRILLING METHOD 6" Solid Stem Auger with Split Spoons
LOGGED BY LT **CHECKED BY** IA
NOTES BH22-01

PROJECT NAME 949 8th Line, Township of Selwyn
PROJECT LOCATION Bridgenorth, Ontario
UTM ZONE 17T **EASTING** 4919136.994 **NORTHING** 708822.238
GROUND ELEVATION 265.536 masl
GROUNDWATER LEVELS:
 ▼ **AT END OF DRILLING** 2.60 m / Elev 262.94 m
 ▼ **AFTER DRILLING** 0.24 m / Elev 265.30 m Date:5/03/22

BH LOGS WITH TERMINATION NOTES 85260_BH LOGS_LT.GPJ WILL BH LOGS WITH NVALUE.GDT 5/16/23



Borehole terminated at 5.05 mbg in silt and sand material.
 Borehole open with groundwater at 2.60 mbg following completion of drilling.



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 150 Jameson Drive
 Peterborough, Ontario K9J 0B9

WELL NUMBER MW22-02

CLIENT Jeff Chesher
PROJECT NUMBER 22-85260
DATE STARTED 5/3/22 **COMPLETED** 5/3/22
DRILLING CONTRACTOR Canadian Environmental Drilling & Contractors Inc.
DRILLING METHOD 6" Solid Stem Auger with Split Spoons
LOGGED BY LT **CHECKED BY** IA
NOTES BH22-02

PROJECT NAME 949 8th Line, Township of Selwyn
PROJECT LOCATION Bridgenorth, Ontario
UTM ZONE 17T **EASTING** 4919202.444 **NORTHING** 708797.668
GROUND ELEVATION 264.344 masl
GROUNDWATER LEVELS:
 ▼ **AT END OF DRILLING** 0.90 m / Elev 263.44 m
 ▼ **AFTER DRILLING** 0.72 m / Elev 263.62 m Date:5/03/22

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0.25	SS-1	52	1-2-1-2 (3)			TOPSOIL: Dark brown silty sand topsoil, trace clay, organics, moist, very loose	Casing Top Elev: 0.92 (mag) Casing Type: Monument
0.30						SILTY SAND: Light brown silty sand, trace clay, moist, very loose	← Cement seal at surface
1.00	SS-2	54	3-4-4 (8)			SILT AND SAND: Light brown grey silt and sand, some gravel, some clay, orange-brown mottling, wet, loose	← Bentonite seal from surface to 1.20 mbg
2.00	SS-3	52	5-6-8 (14)	GSA SS3: Gravel: 15% Sand: 40% Silt: 33% Clay: 12%		-compact	
2.30							
3.00	SS-4	30	7-11-12 (23)			SILT: Light brown silt, some sand, some gravel, trace clay, saturated, compact	
4.00						-some clay	
4.55	SS-5	43	8-12-13 (25)				← Quartz sand from 1.20 to 4.55 mbg. Point 10 slotted screen from 1.52 to 4.55 mbg.
5.05	SS-6	133	30-28-38 (66)			-very dense	

BH LOGS WITH TERMINATION NOTES 85260_BH LOGS LT.GPJ WILL BH LOGS WITH NVALUE.GDT 5/16/23

Borehole terminated at 5.05 mbg in silt material.
 Borehole caved to 3.35 mbg with groundwater at 0.90 mbg following completion of drilling.



D.M. Wills Associates Limited
 150 Jameson Drive
 Peterborough, Ontario K9J 0B9

WELL NUMBER MW22-03

CLIENT Jeff Chesher
PROJECT NUMBER 22-85260
DATE STARTED 5/3/22 **COMPLETED** 5/3/22
DRILLING CONTRACTOR Canadian Environmental Drilling & Contractors Inc.
DRILLING METHOD 6" Solid Stem Auger with Split Spoons
LOGGED BY LT **CHECKED BY** IA
NOTES BH22-03

PROJECT NAME 949 8th Line, Township of Selwyn
PROJECT LOCATION Bridgenorth, Ontario
UTM ZONE 17T **EASTING** 4919231.861 **NORTHING** 708761.006
GROUND ELEVATION 264.313 masl
GROUNDWATER LEVELS:
 ▼ **AT END OF DRILLING** 6.05 m / Elev 258.26 m
 ▼ **AFTER DRILLING** 5.55 m / Elev 258.76 m Date:5/03/22

BH LOGS WITH TERMINATION NOTES 85260_BH LOGS_LT.GPJ WILL BH LOGS WITH NVALUE.GDT 5/16/23


DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0.00							Casing Top Elev: 1.12 (mag) Casing Type: Monument
0.20	SS-1	59	1-2-2-1 (4)			TOPSOIL: Dark brown silty sand topsoil, trace clay, organics, moist, loose	← Cement seal at surface
0.40						SILTY SAND: Brown silty sand, trace gravel, trace clay, moist, loose	
1.00	SS-2	56	4-4-3 (7)	GSA SS2: Gravel:10% Sand:40% Silt:35% Clay:15%		SILT AND SAND: Light brown grey silt and sand, some gravel, some clay, moist to wet, loose	
2.00	SS-3	85	4-6-4 (10)			-orange-brown mottling, wet, compact	← Bentonite from surface to 2.75 mbg
3.00	SS-4	89	5-8-8 (16)				
4.00	SS-5	83	13-13-15 (28)			-occasional cobble -grey	
5.00	SS-6	100	9-17-50/0.13			-very dense	← Quart sand from 2.75 to 6.10 mbg Point 10 slotted screen from 3.05 to 6.10 mbg
6.10							

Borehole terminated at 6.10 mbg in silt and sand material. Borehole open with groundwater at 6.05 mbg following completion of drilling.




WILLS


Test Pit Log – TP22-01

Depth (mbg)	Soil Description	
0.0 – 0.4	Dark brown silty sand topsoil, trace clay, rootlets, moist, loose.	
0.4 - 3.0	Light brown silty sand and gravel, some clay, occasional cobble/boulder, wet to saturated, loose.	
Grab Sample Summary		
GS3 collected at 3.0 mbg	<u>GSA:</u> Gravel – 30% Sand – 30% Silt – 29% Clay – 11%	<u>Moisture:</u> N/A
Groundwater		
<ul style="list-style-type: none">Groundwater encountered at 0.4 mbg, seeping in at varying depths to 3.0 mbg.		
Additional Notes		
<ul style="list-style-type: none">Test pit terminated at 3.0 mbg.Test pit walls caving at varying depths due to groundwater.Test pit backfilled and compacted using excavator following completion of stratigraphic logging and sampling.		
Test Pit Photos		
 <p data-bbox="1040 1255 1255 1331">April 28, 2022 17T 0708841 4919104 TP22-01</p>		


Test Pit Log – TP22-02

Depth (mbg)	Soil Description	
0.0 – 0.4	Dark brown silty sand topsoil, trace clay, rootlets, moist	
0.4 – 1.2	Light brown silty sand, trace gravel, trace clay, occasional cobbles, orange-brown mottling, wet	
1.2 – 1.8	Light brown gravelly silt, some sand, trace clay, occasional cobble, wet	
1.8 – 2.1	Light brown sand, some gravel, some silt, trace clay, occasional cobble/boulder, wet to saturated	
2.1 – 3.0	Light brown silt, some sand, some gravel, some clay, occasional cobble/boulder, wet to saturated	
Grab Sample Summary		
N/A	<u>GSA:</u> N/A	<u>Moisture:</u> N/A
Groundwater		
<ul style="list-style-type: none"> Groundwater seepage encountered at 0.4 mbg. 		
Additional Notes		
<ul style="list-style-type: none"> Test pit terminated at 3.0 mbg. Test pit walls caving at varying depths due to groundwater. Test pit backfilled and nominally compacted using excavator following completion of stratigraphic logging and sampling. 		
Test Pit Photos		
<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>April 28, 2022 17T 0708847 4919093 TP22-02</p> </div> </div>		

Test Pit Log – TP22-03

Depth (mbg)	Soil Description	
0.0 – 0.4	Dark brown silty sand topsoil, trace clay, rootlets, moist	
0.4 – 0.6	Light brown silty sand, trace gravel, trace clay, orange-brown mottling, wet	
0.6 – 1.8	Light brown silt and sand, some gravel, some clay, occasional cobble, wet	
1.8 – 3.0	Light brown silt, some sand, some clay, trace gravel, wet to saturated	
Grab Sample Summary		
GS4 collected 2.5 mbg	<u>GSA:</u> Gravel – 0% Sand – 20% Silt – 67% Clay – 13%	<u>Moisture:</u> N/A
Groundwater		
<ul style="list-style-type: none"> Groundwater seepage encountered at 0.4 mbg. 		
Additional Notes		
<ul style="list-style-type: none"> Test pit terminated at 3.0 mbg. Test pit walls caving at varying depths due to groundwater. Test pit backfilled and nominally compacted using excavator following completion of stratigraphic logging and sampling. 		
Test Pit Photos		
		<p align="right"> April 28, 2022 17 T 0708826 4919169 TP22-03 </p>

Test Pit Log – TP22-04

Depth (mbg)	Soil Description	
0.0 – 0.5	Dark brown silty sand topsoil, trace clay, rootlets, moist	
0.5 – 0.8	Brown silty sand, some gravel, trace clay, occasional cobble/boulder, orange-brown mottling, moist	
0.8 – 1.5	Brown sand, some silt, some gravel, trace clay, occasional cobble/boulder, wet	
1.5 – 1.8	Light brown silt and sand, some clay, trace gravel, occasional cobble/boulder, wet	
1.8 – 3.0	Light brown-grey sandy silt, some clay, trace gravel, occasional cobble/boulder, wet to saturated	
Grab Sample Summary		
N/A	<u>GSA:</u> N/A	<u>Moisture:</u> N/A
Groundwater		
<ul style="list-style-type: none"> Groundwater encountered at 0.5 mbg, seeping in at varying depths to 3.0 mbg. 		
Additional Notes		
<ul style="list-style-type: none"> Test pit terminated at 3.0 mbg. Test pit walls caving at varying depths due to groundwater. Test pit backfilled and nominally compacted using excavator following completion of stratigraphic logging and sampling. 		
Test Pit Photos		
		<p align="right"> April 29, 2022 17 T 696929 4907298 TP22-04 </p>




Appendix B

Ontario Geological Survey Mapping





Legend

-  Till Plains (Drumlinized)
-  Drumlins
-  Subject Property Boundary

Regional Physiography Map

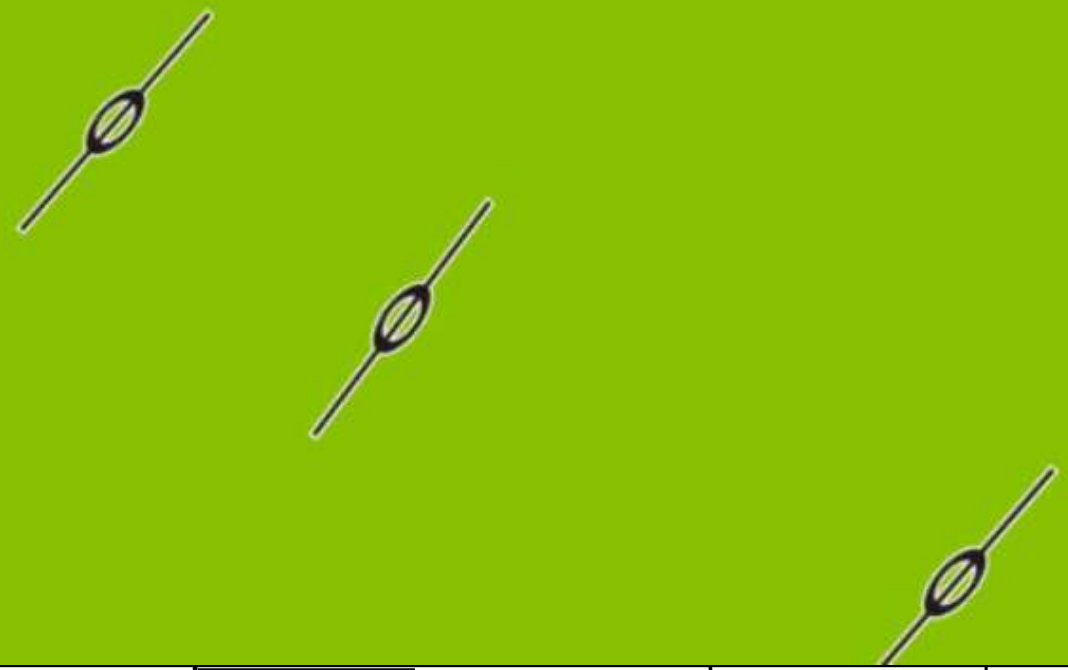
Hydrogeological Study
949 Eighth Line, Bridgenorth, Township
of Selwyn, Ontario






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E. wills@dmwills.com

Drawn By	LT	Scale	See Scale Bar
Checked	IA	Date	March 2022
Project No.	22-85260	Drawing File No.	APP-B1



-  Stone-poor, sandy silt to silty sand-textured
-  Drumlin, Drumlinoid Ridges
-  Subject Property Boundary

Legend

Regional Surficial Geology Map

Hydrogeological Study
949 Eighth Line, Bridgenorth, Township
of Selwyn, Ontario



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Drawn By	LT	Scale	See Scale Bar
Checked	IA	Date	March 2022
Project No.	22-85260	Drawing File No.	APP-B2



0 100 200 300m



Legend

-  Clastic Metasedimentary Rocks
-  Subject Property

Regional Bedrock Geology Map
Hydrogeological Study
949 Eighth Line, Bridgenorth, Township
of Selwyn, Ontario



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Drawn By	LT	Scale	See Scale Bar
Checked	IA	Date	March 2022
Project No.	22-85260	Drawing File No.	APP-B3

Appendix C

Certificates of Analysis – Physical Soil Testing



Project Name: Bridgenorth Development (85260)

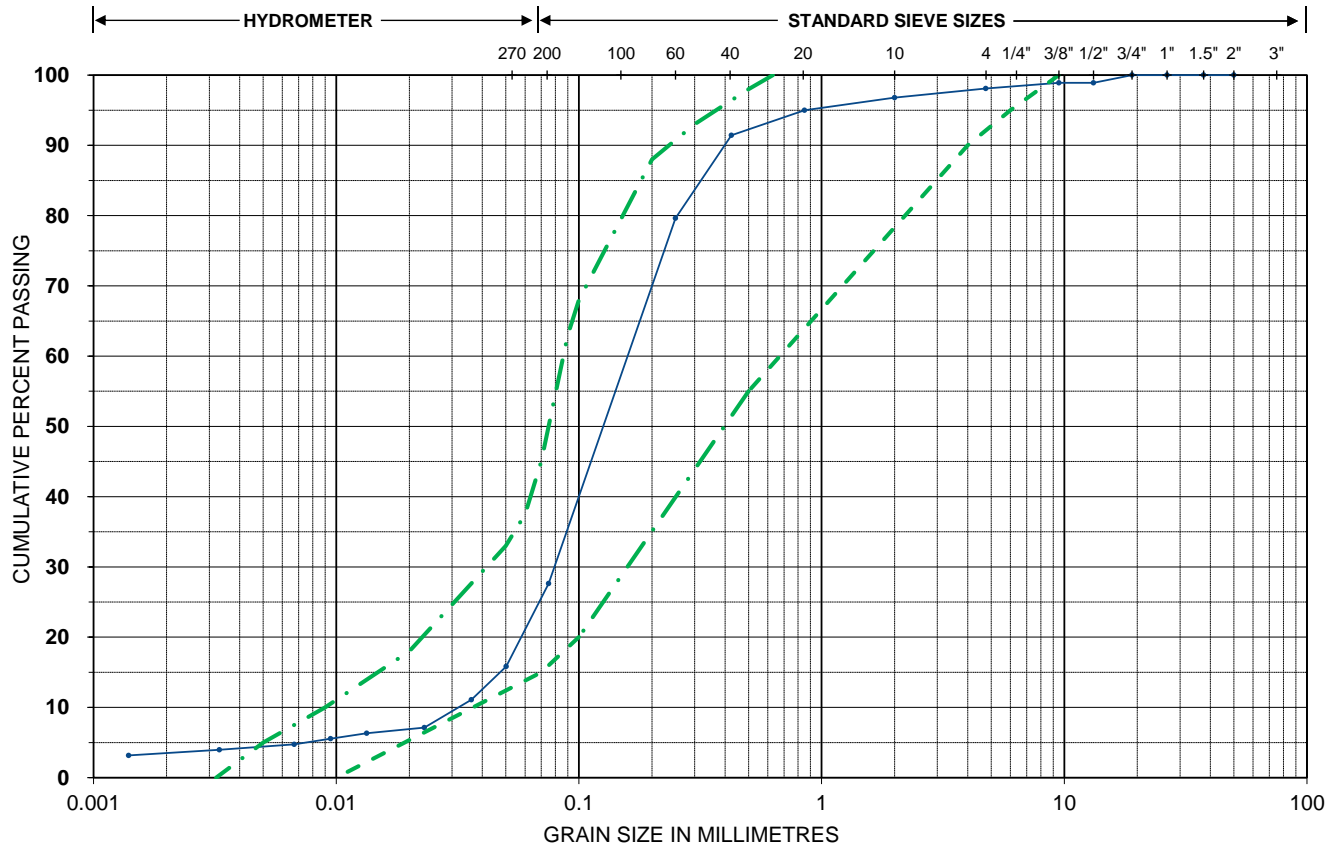
Project No.: 22-154

Sample Date: 9-Nov-23

Borehole/Test Pit ID.: INF4

Sample No./Depth: HA1 / 0 - 0.2 m

LAB ID: 23HYD-333



Silt or Clay	Sand	Gravel
--------------	------	--------

--- SM envelope T = 8 - 20 min/cm

Estimated T = 16 min/cm

Sieve Size (mm)	% Passing
37.5	100.0
26.5	100.0
19.0	100.0
13.2	98.9
9.5	98.9
4.750	98.1
2.000	96.8
0.850	95.0
0.425	91.4
0.250	79.6
0.075	27.6

Hydrometer (mm)	% Passing
0.050	15.8
0.036	11.1
0.023	7.1
0.013	6.3
0.009	5.5
0.007	4.8
0.003	4.0
0.001	3.2

NOTES

Percolation rates are based on the Supplementary Standard to the Ontario Building Code 2012 document *Percolation Time and Soil Descriptions (SB-5)*. It should be noted, PRI did not conduct field investigations in conjunction with the sample collection, or witness the collection of the sample tested. PRI assumes no responsibility for the application of the above-noted percolation rate ("T"-Time) for use in design of an on-site sewage disposal system. The design of an on-site sewage system must be conducted by a qualified professional with due regard for a number of site-specific conditions in addition to the percolation rate of the soil. The client or any third party using this information as a basis for design assumes all risk associated with their evaluation of this report and all other criteria used in the design of any private sewage disposal system. This report is based entirely on the grain size distribution curve of the soil sample submitted for analysis. Additional analyses may be required following any future processing of the subject material or following supply of the material to individual sites for use in any tile bed construction.

Project Name: Bridgenorth Development (85260)

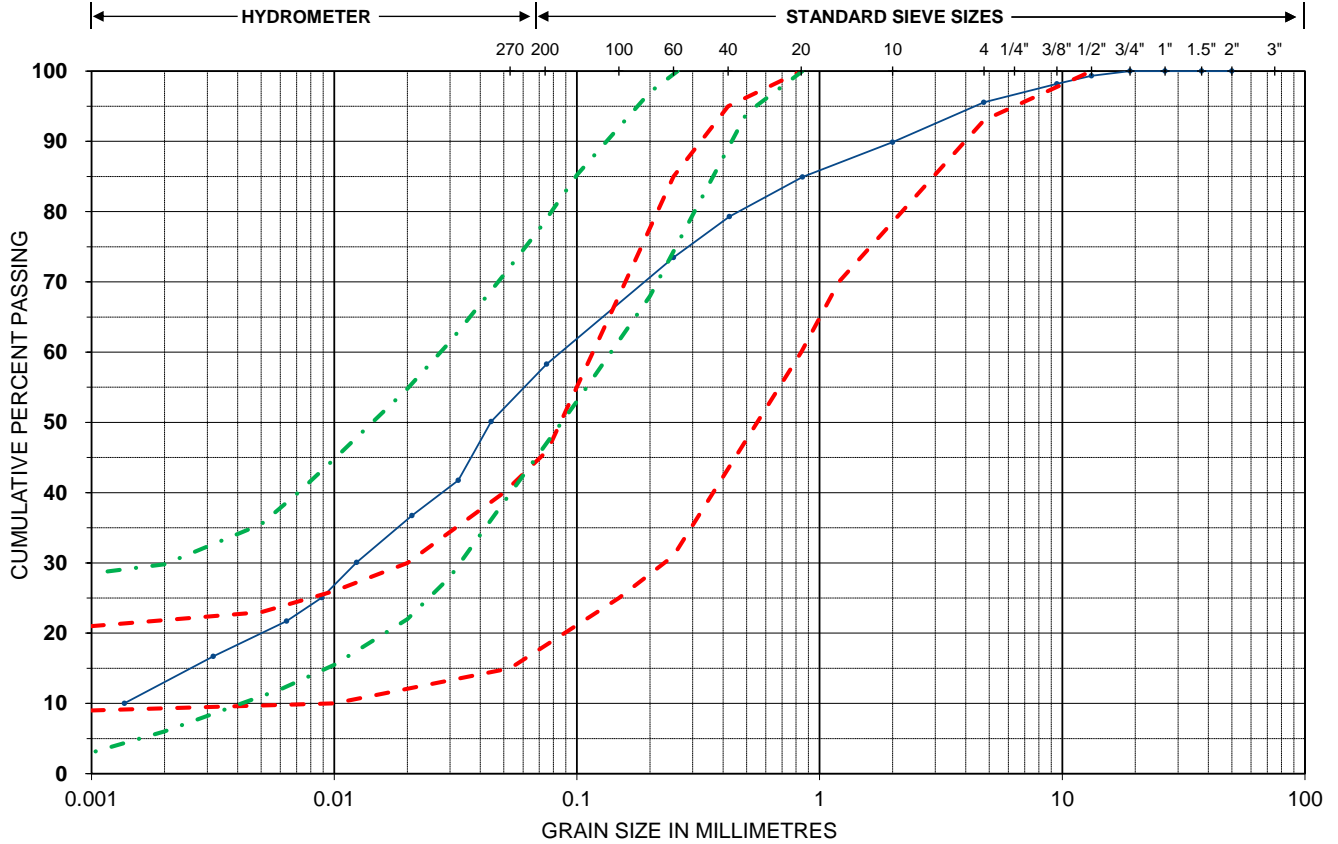
Project No.: 22-154

Sample Date: 9-Nov-23

Borehole/Test Pit ID.: INF5

Sample No./Depth: HA2 / 0.25 - 0.4 m

LAB ID: 23HYD-334



Silt or Clay	Sand	Gravel
--------------	------	--------

--- ML envelope T = 20 - 50 min/cm
 --- SC envelope T = 12 - 50 min/cm

Estimated T = 30 min/cm

Sieve Size (mm)	% Passing
37.5	100.0
26.5	100.0
19.0	100.0
13.2	99.3
9.5	98.2
4.750	95.5
2.000	89.9
0.850	84.9
0.425	79.3
0.250	73.5
0.075	58.3

Hydrometer (mm)	% Passing
0.044	50.1
0.032	41.8
0.021	36.8
0.012	30.1
0.009	25.1
0.006	21.7
0.003	16.7
0.001	10.0

NOTES

Percolation rates are based on the Supplementary Standard to the Ontario Building Code 2012 document *Percolation Time and Soil Descriptions (SB-5)*. It should be noted, PRI did not conduct field investigations in conjunction with the sample collection, or witness the collection of the sample tested. PRI assumes no responsibility for the application of the above-noted percolation rate ("T"-Time) for use in design of an on-site sewage disposal system. The design of an on-site sewage system must be conducted by a qualified professional with due regard for a number of site-specific conditions in addition to the percolation rate of the soil. The client or any third party using this information as a basis for design assumes all risk associated with their evaluation of this report and all other criteria used in the design of any private sewage disposal system. This report is based entirely on the grain size distribution curve of the soil sample submitted for analysis. Additional analyses may be required following any future processing of the subject material or following supply of the material to individual sites for use in any tile bed construction.

Appendix D

Infiltration Graphs





WILLS

Guelph Permeameter Calculations

Single Head Method

Project Name Bridgenorth Townhouse Development
Project Number 85260

Date 1/31/23
Infiltration Test Number: INF-1

Reservoir Cross-sectional area in cm ² ("35.22" for Combined or "2.16" for Inner reservoir):	35.22
Water Head Height ("H" in cm):	15
Borehole Radius ("a" in cm):	3
Soil texture-structure category:	2

Soil Texture Categories

- 1 - Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
- 2 - Soils which are both fine textured (clayey or silty) and unstructured, may also include some fine sands.
- 3 - Most structured soils from clay through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils
- 4 - Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.

USCS Soil Classification:

Sand and silt, some clay, some gravel, moist

Steady State Rate of Water Level Change ("R" in cm/min): 5.5000

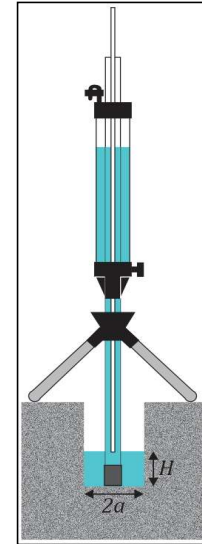
Calculations:

Res Type	35.22
H	15
a	3
H/a	5
a*	0.04
C0.01	1.518269
C0.04	1.629144
C0.12	1.666893
C0.36	1.666893
C	1.629144
R	5.500
Q	3.2285
pi	3.1415

Infiltration Rates:
49.62 mm/hr
12.1 min/cm

Calculation formulas related to shape factor (C). Where H₁ is the first water head height (cm), H₂ is the second water head height (cm), a is borehole radius (cm) and a* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C₁ needs to be calculated while for two-head method, C₁ and C₂ are calculated (Zang et al., 1998).

α* = 0.04 cm⁻¹
 C = 1.6291444
 Q = 3.2285
 K_{fs} = 0.00 cm/sec
 0.08 cm/min
 0.00 m/sec
 0.03 inch/min
 0.00 inch/sec
 Φ_m = 0.03 cm²/min



Definitions:

- H - Water Head Height
- a - Borehole radius
- R - Steady-state rate of fall
- α* - ratio of gravity to capillary forces during infiltration or drainage
- C - Shape Factor
- Q - Rate of discharge
- K_{fs} - Soil saturated hydraulic conductivity
- Φ_m - Soil matrix flux potential



Guelph Permeameter Calculations

Single Head Method

Project Name Bridgenorth Townhouse Development
Project Number 85260

Date 2023-11-09
Infiltration Test Number: INF-5 (Test 1)

Reservoir Cross-sectional area in cm ² ("35.22" for Combined or "2.16" for inner reservoir):	35.22
Water Head Height ("H" in cm):	10
Borehole Radius ("a" in cm):	3
Soil texture-structure category:	3

Soil Texture Categories

- 1 - Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
- 2- Soils which are both fine textured (clayey or silty) and unstructured, may also include some fine sands.
- 3 - Most structured soils from clay through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils
- 4- Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.

USCS Soil Classification:

Sand and silt, some clay, trace gravel, moist

Steady State Rate of Water Level Change ("R" in cm/min): 0.1250

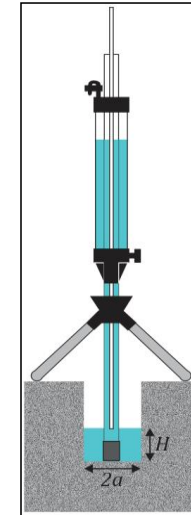
Res Type	35.22
H	10
a	3
H/a	3.333333
a*	0.12
C0.01	1.21841
C0.04	1.290234
C0.12	1.287543
C0.36	1.287543
C	1.287543
R	0.125
Q	0.073375
pi	3.1415

Infiltration Rates:

2.862 mm/hr
209.6 min/cm

Calculation formulas related to shape factor (C). Where H₁ is the first water head height (cm), H₂ is the second water head height (cm), a is borehole radius (cm) and a* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C₁ needs to be calculated while for two-head method, C₁ and C₂ are calculated (Zang et al, 1998).

α* = 0.12 cm⁻¹
C = 1.28754276
Q = 0.073375
K_{fs} = 0.00 cm/sec
0.00 cm/min
0.00 m/sec
0.00 inch/min
0.00 inch/sec
Φ_m = 0.00 cm³/min



Definitions:

- H - Water Head Height
- a - Borehole radius
- R - Steady-state rate of fall
- α* - ratio of gravity to capillary forces during infiltration or drainage
- C - Shape Factor
- Q - Rate of discharge
- K_{fs} - Soil saturated hydraulic conductivity
- Φ_m - Soil matrix flux potential



Guelph Permeameter Calculations

Single Head Method

Project Name: Bridgenorth Townhouse Developmen
Project Number: 85260

Date: 2023-11-09
Infiltration Test Number: INF-5 (Test 2)

Reservoir Cross-sectional area in cm^2 ("35.22" for Combined or "2.16" for Inner reservoir):	35.22
Water Head Height ("H" in cm):	10
Borehole Radius ("a" in cm):	3
Soil texture-structure category:	3

Soil Texture Categories

- 1 - Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
- 2 - Soils which are both fine textured (clayey or silty) and unstructured, may also include some fine sands.
- 3 - Most structured soils from clay through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils
- 4 - Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.

USCS Soil Classification:

Sand and silt, some clay, trace gravel, moist

Steady State Rate of Water Level Change ("R" in cm/min): 0.1000

Calculations:	Res Type	35.22
H	10	
a	3	
H/a	3.333333	
α^*	0.12	
C0.01	1.21841	
C0.04	1.290234	
C0.12	1.287543	
C0.36	1.287543	
C	1.287543	
R	0.100	
Q	0.0587	
pi	3.1415	

Infiltration Rates:

2.29 mm/hr
262.0 min/cm

Calculation formulas related to shape factor (C). Where H_1 is the first water head height (cm), H_2 is the second water head height (cm), a is borehole radius (cm) and α^* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C_1 needs to be calculated while for two-head method, C_1 and C_2 are calculated (Zang et al, 1998).

$\alpha^* = 0.12 \text{ cm}^{-1}$

$C = 1.28754276$

$Q = 0.0587$

$K_{fs} = 0.00 \text{ cm/sec}$

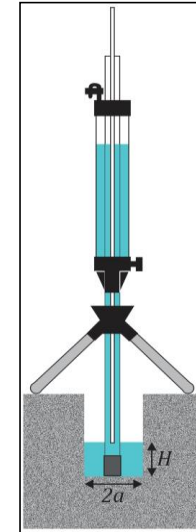
0.00 cm/min

0.00 m/sec

0.00 inch/min

0.00 inch/sec

$\Phi_m = 0.00 \text{ cm}^2/\text{min}$



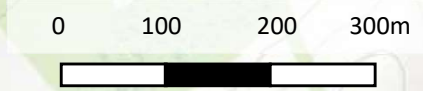
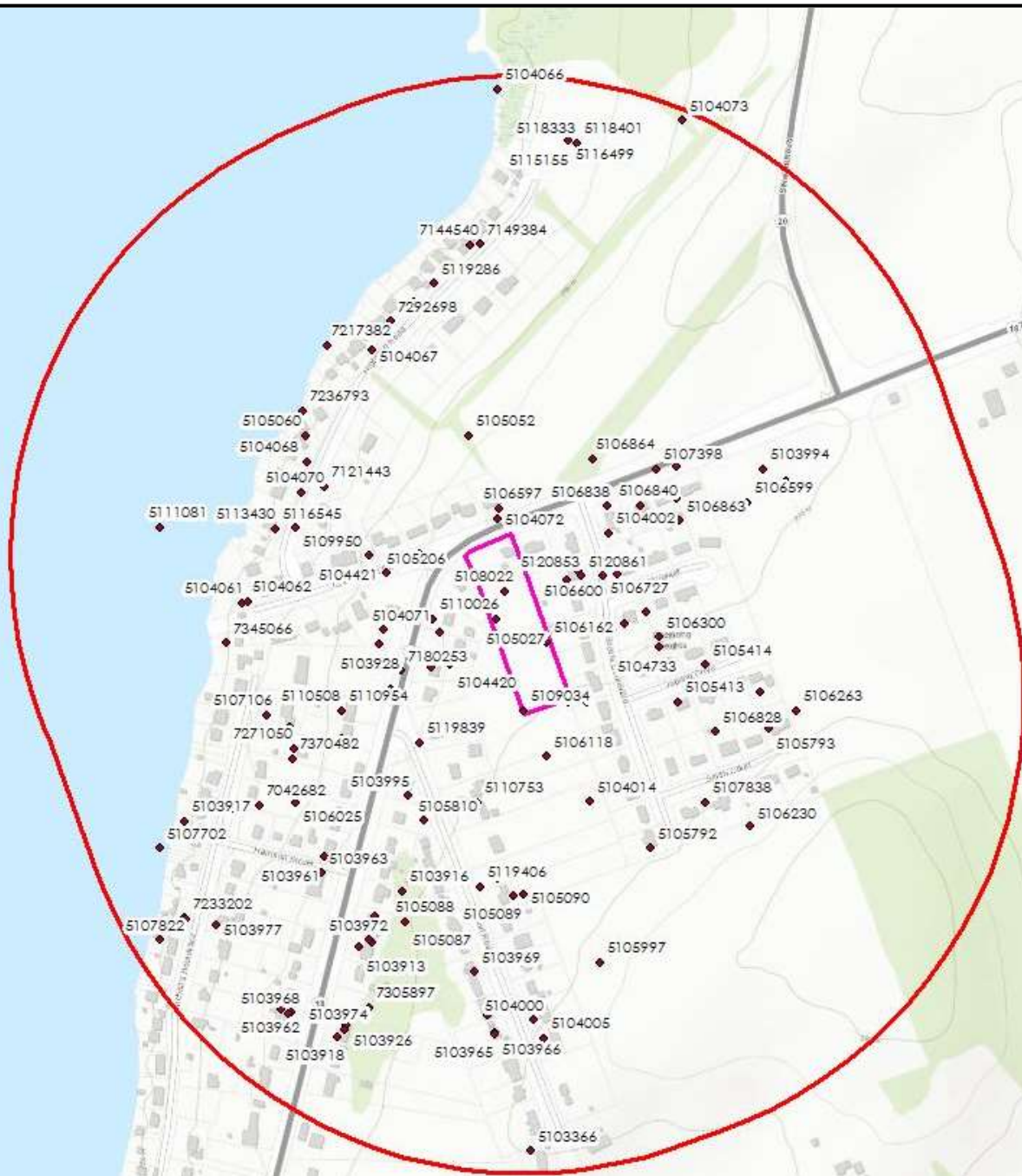
Definitions:

- H - Water Head Height
- a - Borehole radius
- R - Steady-state rate of fall
- α^* - ratio of gravity to capillary forces during infiltration or drainage
- C - Shape Factor
- Q - Rate of discharge
- K_{fs} - Soil saturated hydraulic conductivity
- Φ_m - Soil matrix flux potential

Appendix E

MECP Well Record Search





Legend	
	Subject Property
	500 m Well Search Area
	WECP Well Location and ID

MECP Well Location Plan

Hydrogeological Study
949 Eighth Line, Bridgenorth, Township
of Selwyn, Ontario



D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9

P. 705.742.2297
F. 705.749.9944
E. wills@dmwills.com

Drawn By	LT
Checked	IA
Project No.	22-85260

Scale	See Scale Bar
Date	March 2022
Drawing File No.	APP-E1

MECP WELL SUMMARY
Well Record Summary - Bedrock
Project No.: 85260

Lot No.	UTM	MECP Well No.	Well Use	Water Found		Static Level		REC Pump Rate		Well Depth		Depth to Bedrock		Comments
				Feet	Metres	Feet	Metres	Igpm	L/min	Feet	Metres	Feet	Metres	
Concession Unknown														
Unknown	708572 4919400	7236793	Domestic	70	21.3	7.1	2.2			70	21.3	67.0	20.4	Fresh water observed at 70 ft. in limestone bedrock.
Concession 7														
Lot 003	708701 4919038	5119839	Domestic	84	25.6	23.1	7.0	7.5	34.1	84	25.6	68.0	20.7	Fresh water observed at 84 ft. in limestone bedrock.
Lot 012	708705 4918953	5105810	Domestic	71	21.6	10	3.0	8.33	37.8	71	21.6	69.0	21.0	Fresh water observed at 71 ft. in shale bedrock.
Lot 012	708563 4919032	7271050	Domestic	24	7.3	4	1.2	5.83	26.5	133	40.5	59.0	18.0	Fresh water observed at 24 ft. in clay.
Lot 012	708559 4919056	7121530	Domestic	65	19.8	9.2	2.8	3.33	15.1	100	30.5	64.0	19.5	Fresh water observed at 65 ft. in limestone bedrock.
Lot 012	708442 4918952	5103917	Domestic	60	18.3	4	1.2	4.16	18.9	60	18.3	52.0	15.8	Fresh water observed at 60 ft. in limestone bedrock.
Lot 012	708484 4918865	5103959	Domestic	58	17.7	20	6.1	8.33	37.8	58	17.7	57.0	17.4	Fresh water observed at 58 ft. in limestone bedrock.
Lot 012	708645 4918749	7305897	Domestic	66	20.1	7	2.1	14.98	68.0	92	28.0	71.0	21.6	Fresh water observed at 66 ft. in gravel.
Lot 012	708435 4918673	5104631	Domestic	20	6.1	9	2.7	6.66	30.2	27	8.2	22.0	6.7	Fresh water observed at 20 ft. in gravel.
Lot 012	708615 4919073	5110954	Domestic	54	16.5	3	0.9	8.33	37.8	64	19.5	56.0	17.1	Fresh water observed at 54 ft. in clay.
Lot 012	708669 4919096	5106879	Domestic	54	16.5	10	3.0	4.16	18.9	58	17.7	54.0	16.5	Fresh water observed at 54 ft. in limestone bedrock.
Lot 012	708532 4919068	5107106	Domestic	69	21.0	15	4.6	12.49	56.7	69	21.0	64.0	19.5	Fresh water observed at 69 ft. in limestone bedrock.
Lot 013	708525 4918970	7042682	Domestic	57.74	17.6	0	0.0	2.51	11.4	86.94	26.5	58.1	17.7	Fresh water observed at 57.74 ft. in limestone bedrock.
Lot 013	708765 4918973	5110753	Domestic	77	23.5	12	3.7	5	22.7	86	26.2	80.0	24.4	Fresh water observed at 77 ft. in gravel.
Lot 013	709015 4918973	5107838	Domestic	61	18.6	31	9.4	9.99	45.4	72	21.9	67.0	20.4	Fresh water observed at 61 ft. in gravel.
Lot 013	708480 4918651	7308882	Domestic	26	7.9	0	0.0	3.33	15.1	36	11.0	27.0	8.2	Fresh water observed at 26 ft. in gravel.
Lot 013	708662 4919161	5104071	Domestic	80	24.4	18	5.5	5.82	26.4	80	24.4	76.0	23.2	Fresh water observed at 80 ft. in limestone bedrock.
Lot 013	708715 4919173	5110026	Domestic	50	15.2	25	7.6	6.66	30.2	52	15.8	42.0	12.8	Fresh water observed at 50 ft. in limestone bedrock.
Lot 013	708879 4919220	5120853	Domestic	55	16.8	4.3	1.3	4.16	18.9	60	18.3	55.0	16.8	Fresh water observed at 55 ft. in limestone bedrock.
Lot 013	708903 4919220	5106727	Domestic	53	16.2			2.5	11.4	65	19.8	52.0	15.8	Fresh water observed at 52 ft. in limestone bedrock.
Lot 013	708909 4919267	5104002	Domestic	60	18.3	10	3.0	11.66	52.9	66	20.1	64.0	19.5	Fresh water observed at 60 ft. in sand.
Lot 013	708907 4919296	5106838	Domestic	50	15.2	4	1.2	19.68	89.3	54	16.5	50.0	15.2	Fresh water observed at 50 ft. in limestone bedrock.
Lot 013	708961 4919337	5107398	Domestic	38	11.6	14	4.3	4.5	20.4	40	12.2	36.0	11.0	Fresh water observed at 38 ft. in limestone bedrock.
Lot 013	709105 4919324	5106598	Domestic	42	12.8	0	0.0	4.16	18.9	49	14.9	42.0	12.8	Fresh water observed at 42 ft. in limestone bedrock.
Lot 014	709298 4919403	5104008	Domestic	87	26.5	6	1.8	2.5	11.4	120	36.6	87.0	26.5	Fresh water observed at 87 ft. in limestone bedrock.
Concession 8														
Lot 012	708597 4919318	7121443	Public	84.97	25.90	41.99	12.80	0.5	2.27	134.97	41.1	72.99	22.2	Fresh water observed at 84.97 ft. in limestone bedrock.
Lot 012	708543 4919271	5113430	Domestic	24	7.32	7	2.13	2.5	11.35	25	7.6	11	3.4	Fresh water observed at 24 ft. in limestone bedrock.
Lot 012	708543 4919271	5116545	Domestic	48	14.63	6	1.83	4.16	18.89	50	15.2	48	14.6	Fresh water observed at 48 ft. in shale bedrock.
Lot 012	708415 4919273	5111081	Domestic	64	19.51	5	1.52	4	18.16	67	20.4	65	19.8	Fresh water observed at 64 ft. in limestone bedrock.
Lot 012	708512 4919192	5104062	Domestic	155	47.24	15	4.57	1.66	7.54	160	48.8	52	15.8	Fresh water observed at 155 ft. in limestone bedrock.
Lot 013	708865 4919695	5111975	Domestic	84	25.60	11	3.35	2.5	11.35	115	35.1	85	25.9	Fresh water observed at 84 ft. in gravel.
Lot 013	708865 4919695	5115155	Domestic	58	17.68	20	6.10	4.16	18.89	72	21.9	58	17.7	Fresh water observed at 58 ft. in gravel.
Lot 013	708865 4919695	5116499	Domestic	81	24.69	21	6.40	4.16	18.89	81	24.7	80	24.4	Fresh water observed at 81 ft. in limestone bedrock.
Lot 013	708874 4919692	5118401	Domestic	93	28.35	18	5.49	2.5	11.35	93	28.3	93	28.3	Fresh water observed at 93 ft. in limestone bedrock.
Lot 013	708599 4919472	7217382	Domestic	80	24.38	5.4	1.65	4.16	18.89	85	25.9	80	24.4	Fresh water observed at 80 ft. in shale bedrock.
Lot 013	708575 4919373	5105060	Domestic	80	24.38	2	0.61	8.33	37.82	80	24.4	74	22.6	Fresh water observed at 80 ft. in shale bedrock.
Lot 013	708645 4919243	5104421	Domestic	105	32.0	42	12.8	2.49	11.3	105	32.0	58.0	17.7	Fresh water observed at 105 ft. in limestone bedrock.
Lot 013	708787 4919282	5104072	Domestic	62	18.9	18	5.5	8.33	37.8	62	18.9	60.0	18.3	Fresh water observed at 62 ft. in limestone bedrock.
Lot 013	708755 4919373	5105052	Domestic	64	19.5	26	7.9	4.16	18.9	84	25.6	64.0	19.5	Fresh water observed at 64 ft. in limestone bedrock.
Lot 013	708892 4919348	5106864	Domestic	32	9.8	2	0.6	11.66	52.9	34	10.4	60.0	18.3	Fresh water observed at 32 ft. in granite boulders.
Lot 018	708717 4919539	5119286	Domestic	57	17.37	10	3.05	4.16	18.89	57	17.4	55	16.8	Fresh water observed at 57 ft. in shale bedrock.
Concession 6														
Lot 012	708615 4919073	5110508	Domestic			0.83	0.25	7	31.78	86	26.2	52	15.8	

Number of Wells: 42

	Water Found		Static Level		REC Pump Rate		Well Depth		Depth to Bedrock	
	Feet	Metres	Feet	Metres	Igpm	L/min	Feet	Metres	Feet	Metres
TOTALS	2603.7	793.6	496.9	151.5	243.0	1103.2	3143.9	958.3	2507.1	764.2
AVERAGE	63.5	19.4	12.1	3.7	5.9	26.9	74.9	22.8	59.7	18.2
MAXIMUM	155.0	47.2	42.0	12.8	19.7	89.3	160.0	48.8	93.0	28.3
MINIMUM	20.0	6.1	0.0	0.0	0.5	2.3	25.0	7.6	11.0	3.4

MECP WELL SUMMARY
Well Record Summary - Overburden
Project No.: 85260

Lot No.	UTM	MECP Well No.	Well Use	Water Found		Static Level		REC Pump Rate		Well Depth		Comments
				Feet	Metres	Feet	Metres	Igpm	L/min	Feet	Metres	
(CR E)												
Lot 012	708823 491593	5103366	Domestic	62	18.9	30	9.1	2.5	11.4	62	18.9	Fresh water observed at 62 ft. in gravel.
Concession 7												
Lot 012	708615 4919043	5104536	Domestic	69	21.0	12	3.7	6.66	30.2	69	21.0	Fresh water observed at 69 ft. in gravel.
Lot 012	708415 4918923	5107702	Domestic	25	7.6	16	4.9	4.16	18.9	25	7.6	Fresh water observed at 25 ft. in gravel.
Lot 012	708565 4918973	5106025	Domestic	52	15.8	8	2.4	5.83	26.5	54	16.5	Fresh water observed at 52 ft. in gravel.
Lot 012	708443 4918848	5103970	Domestic	40	12.2	5	1.5	2.5	11.4	45	13.7	Fresh water observed at 40 ft. in gravel.
Lot 012	708444 4918846	7233202	Abandoned - Other	12	3.7	9	2.7			12	3.7	Well abandonment.
Lot 012	708477 4918839	5103977	Domestic	57	17.4	4	1.2	1.66	7.5	57	17.4	Fresh water observed at 57 ft. in clay.
Lot 012	708495 4918966	5103929	Domestic	52	15.8			1.67	7.6	52	15.8	Fresh water observed at 52 ft. in gravel.
Lot 012	708762 4918788	5103969	Domestic	75	22.9	12	3.7	8.33	37.8	75	22.9	Fresh water observed at 75 ft. in gravel.
Lot 012	708620 4918730	5103926	Domestic	60	18.3	8	2.4			60	18.3	Fresh water observed at 60 ft. in gravel.
Lot 012	708618 4918725	5103974	Domestic	49	14.9	6	1.8	8.33	37.8	49	14.9	Fresh water observed at 49 ft. in gravel.
Lot 012	708611 4918718	5103918	Domestic	26	7.9					26	7.9	Fresh water observed at 26 ft. in gravel.
Lot 012	708775 4918741	5103964	Domestic	78	23.8	18	5.5	12.49	56.7	78	23.8	Fresh water observed at 78 ft. in gravel.
Lot 012	708784 4918722	5103965	Domestic	71	21.6	12	3.7	5	22.7	71	21.6	Fresh water observed at 71 ft. in gravel.
Lot 012	708783 4918720	5103966	Domestic	80	24.4	24	7.3	4	18.2	80	24.4	Fresh water observed at 80 ft. in gravel.
Lot 012	708656 4918908	5103914	Domestic	64	19.5	2	0.6	6.66	30.2	64	19.5	Fresh water observed at 64 ft. in gravel.
Lot 012	708682 4918876	5103916	Domestic	39	11.9	0	0.0			40	12.2	Fresh water observed at 40 ft. in gravel.
Lot 012	708651 4918849	5103967	Domestic	65	19.8	8	2.4	8.33	37.8	65	19.8	Fresh water observed at 65 ft. in gravel.
Lot 012	708685 4918843	5105087	Domestic	41	12.5	6	1.8	4.16	18.9	41	12.5	Fresh water observed at 41 ft. in gravel.
Lot 012	708685 4918843	5105088	Domestic	56	17.1	8	2.4	5.83	26.5	56	17.1	Fresh water observed at 56 ft. in gravel.
Lot 012	708648 4918820	5103386	Domestic	36	11.0	2	0.6	8.33	37.8	36	11.0	Fresh water observed at 36 ft. in gravel.
Lot 012	708645 4978823	5103972	Domestic	52	15.8	8	2.4	8.32	37.8	54	16.5	Fresh water observed at 52 ft. in gravel.
Lot 012	708635 4918815	5103913	Domestic	49	14.9	0	0.0	6.66	30.2	49	14.9	Fresh water observed at 49 ft. in gravel.
Lot 012	708656 4919146	5103928	Commercial	63	19.2	2	0.6			63	19.2	Fresh water observed at 63 ft. in gravel.
Lot 012	708415 4918723	5108839	Domestic	20	6.1	18	5.5	9.16	41.6	30	9.1	Fresh water observed at 20 ft. in clay.
Lot 012	708548 4918748	5103962	Domestic	44	13.4			11.09	50.3	47	14.3	Fresh water observed at 44 ft. in gravel.
Lot 012	708556 4918743	5103968	Domestic	32	9.8	0	0.0	4	18.2	36	11.0	Fresh water observed at 32 ft. in gravel.
Lot 012	708560 4918744	5103912	Domestic	25	7.6	0.33	0.1	5	22.7	28	8.5	Fresh water observed from 25 to 28 ft. in gravel.
Lot 012	708615 4919073	5104630	Domestic	26	7.9	5	1.5	4	18.2	68	20.7	Fresh water observed at 26 ft. in clay.
Lot 012	708489 4919147	7345066	Public	40	12.2	6.67	2.0	1.66	7.5	45	13.7	Fresh water observed at 40 ft. in sand.
Lot 012	708435 4918833	5105209	Domestic	58	17.7	3	0.9	5.8	26.3	60	18.3	Fresh water observed at 58 ft. in gravel.
Lot 012	708596 4918914	5103961	Domestic	60	18.3			8	36.3	60	18.3	Fresh water observed at 66 ft. in gravel.
Lot 013	708827 4918736	5104000	Domestic	50	15.2	20	6.1	8.33	37.8	50	15.2	Fresh water observed at 50 ft. in gravel.
Lot 013	708838 4918716	5104005	Domestic	54	16.5	20	6.1	6.66	30.2	54	16.5	Fresh water observed at 54 ft. in gravel.
Lot 013	708888 4918974	5104014	Domestic	51	15.5	5	1.5	7.49	34.0	56	17.1	Fresh water observed at 51 ft. in gravel.
Lot 013	709065 4918948	5106230	Domestic	55	16.8	35	10.7	16.65	75.6	55	16.8	Fresh water observed at 55 ft. in gravel.
Lot 013	708955 4918923	5105792	Domestic	45	13.7	12	3.7	4.99	22.7	45	13.7	Fresh water observed at 45 ft. in gravel.
Lot 013	708786 4918890	5103999	Domestic	64	19.5	12	3.7	16.65	75.6	64	19.5	Fresh water observed at 64 ft. in gravel.
Lot 013	708767 4918881	5119406	Domestic	74	22.6	28	8.5	4.99	22.7	54	16.5	Fresh water observed at 54 ft. in sand and gravel.
Lot 013	708804 4918872	5103996	Domestic	74	22.6	12	3.7	10.83	49.2	74	22.6	Fresh water observed at 74 ft. in sand and gravel.
Lot 013	708815 4918873	5105089	Domestic	39	11.9	3	0.9	4.99	22.7	39	11.9	Fresh water observed at 39 ft. in gravel.
Lot 013	708815 4918873	5105090	Domestic	39	11.9	5	1.5	4.16	18.9	39	11.9	Fresh water observed at 39 ft. in gravel.
Lot 013	708803 4918856	5103998	Domestic	58	17.7	12	3.7	9.99	45.4	62	18.9	Fresh water observed at 58 ft. in gravel.
Lot 013	708688 4918980	5103995	Domestic	71	21.6	6	1.8	6.66	30.2	71	21.6	Fresh water observed at 71 ft. in clay and gravel.
Lot 013	708714 4919121	5104001	Domestic	45	13.7	10	3.0	5.83	26.5	45	13.7	Fresh water observed at 45 ft. in sandy gravel.
Lot 013	708735 4919123	5104420	Domestic	45	13.7	6	1.8	4	18.2	46	14.0	Fresh water observed at 45 ft. in gravel.
Lot 013	708926 4919168	5104004	Domestic	25	7.6	0	0.0	8.32	37.8	30	9.1	Fresh water observed at 25 ft. in gravel.
Lot 013	708951 4919180	5104003	Domestic	25	7.6	4	1.2	8.33	37.8	28	8.5	Fresh water observed at 25 ft. in gravel.
Lot 013	708965 4919153	5106300	Domestic	40	12.2	0	0.0	8.33	37.8	42	12.8	Fresh water observed at 40 ft. in gravel.
Lot 013	708965 4919143	5104733	Domestic	36	11.0	4	1.2	4	18.2	36	11.0	
Lot 013	709075 4919133	5104539	Domestic	45	13.7	18	5.5	6.66	30.2	49	14.9	Fresh water observed at 45 ft. in gravel.
Lot 013	709015 4919123	5105414	Domestic	46	14.0	12	3.7	6.66	30.2	46	14.0	Fresh water observed at 46 ft. in gravel.
Lot 013	709075 4919093	5104538	Domestic	41	12.5	18	5.5	5.83	26.5	41	12.5	Fresh water observed at 41 ft. in gravel.
Lot 013	709026 4919050	5106828	Domestic	35	10.7	15	4.6	8.33	37.8	35	10.7	Fresh water observed at 35 ft. in gravel.
Lot 013	709115 4919073	5106263	Domestic	40	12.2	8	2.4	5.83	26.5	42	12.8	Fresh water observed at 40 ft. in gravel.
Lot 013	709085 4919053	5105793	Domestic	40	12.2	28	8.5	4.16	18.9	40	12.2	Fresh water observed at 40 ft. in gravel.
Lot 013	708885 4919083	5104540	Domestic	39	11.9	12	3.7	5.83	26.5	39	11.9	Fresh water observed at 39 ft. in gravel.
Lot 013	708865 4919083	5104734	Domestic	43	13.1	2	0.6	4.16	18.9	44	13.4	Fresh water observed at 43 ft. in gravel.
Lot 013	708815 4919073	5109034	Domestic	48	14.6	0	0.0	4.16	18.9	48	14.6	Fresh water observed at 48 ft. in gravel.
Lot 013	708680 4919117	7180253	Domestic	15	4.6	5.97	1.8	4.84	22.0	51.18	15.6	
Lot 013	708665 4919223	5105206	Domestic	57	17.4	0	0.0	4	18.2	59	18.0	Fresh water observed at 57 ft. in gravel.
Lot 013	708723 4919159	5103997	Domestic	42	12.8	3	0.9	8.33	37.8	45	13.7	Fresh water observed at 42 ft. in sand and gravel.
Lot 013	708785 4919173	5105027	Domestic	60	18.3	10	3.0	20.82	94.5	62	18.9	Fresh water observed at 60 ft. in sand.
Lot 013	708795 4919203	5108022	Domestic	34	10.4	2	0.6	3.33	15.1	35	10.7	Fresh water observed at 34 ft. in gravel.
Lot 013	708840 4919148	5106162	Domestic	61	18.6	8	2.4	8.33	37.8	61	18.6	Fresh water observed at 61 ft. in gravel.
Lot 013	708863 4919215	5103992	Domestic	51	15.5					51	15.5	Fresh water observed at 51 ft. in gravel.
Lot 013	708875 4919225	5106600	Domestic	38	11.6	1	0.3	11.66	52.9	41	12.5	Fresh water observed at 38 ft. in gravel.
Lot 013	708919 4919222	5106862	Domestic	42	12.8	2	0.6	5.83	26.5	46	14.0	Fresh water observed at 42 ft. in gravel.
Lot 013	708944 4919297	5106840	Domestic	35	10.7	3	0.9	5.83	26.5	38	11.6	Fresh water observed at 35 ft. in sand.
Lot 013	708986 4919280	5106863	Domestic	34	10.4	2	0.6	5.83	26.5	37	11.3	Fresh water observed at 34 ft. in gravel.
Lot 013	708983 4919305	5103993	Domestic	53	16.2	33	10.1	6.66	30.2	53	16.2	Fresh water observed at 53 ft. in gravel.
Lot 013	708984 4919339	5106839	Domestic	30	9.1	2	0.6	8.33	37.8	31	9.4	Fresh water observed at 30 ft. in gravel.
Lot 013	709061 4919300	5106599	Domestic	28	8.5	0	0.0	5.83	26.5	32	9.8	Fresh water observed at 28 ft. in gravel.
Lot 013	709079 4919337	5103994	Domestic	65	19.8	8	2.4	8.32	37.8	65	19.8	Fresh water observed at 65 ft. in gravel.
Lot 017	708593 4918896	5103963	Domestic	66	20.1	8	2.4	16.65	75.6	66	20.1	Fresh water observed at 66 ft. in gravel.
Lot 022	708900 4918798	5105997	Domestic	42	12.8	25	7.6	8.33	37.8	44	13.4	Fresh water observed at 42 ft. in gravel.
Concession 8												
Lot 012	708695 4919519	7126130	Domestic	60	18.29	10.75	3.28	4.99	22.65	60	18.3	Fresh water observed at 60 ft. in gravel.
Lot 012	708565 4919273	5109950	Domestic	44	13.41	4	1.22			45	13.7	Fresh water observed at 44 ft. in gravel.
Lot 012	708505 4919191	5104061	Abandoned - Supply									
Lot 013	708786 4919751	5104066	Domestic	31	9.45					31	9.4	Fresh water observed at 31 ft. in gravel.
Lot 013	708865 4919695	5112008	Domestic	48	14.63	8	2.44	8.33	37.82	50	15.2	Fresh water observed at 48 ft. in gravel.
Lot 013	708874 4919692	5118333	Domestic	62	18.90	10	3.05	6.66	30.24	62	18.9	Fresh water observed at 62 ft. in gravel.
Lot 013	708767 4919582	71493										

Appendix F

MECP Well Records – Pumping Tests



A 358 382

Measurements recorded in: Metric Imperial

Page _____ of _____

Well Owner's Information

First Name GRAVITE	Last Name/Organization RIDGE BUILDERS	E-mail Address	<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name) Box 100	Municipality BUCKHORN	Province ONT	Postal Code K0K 1J0
		Telephone No. (inc. area code) 705 657 9311	

Well Location

Address of Well Location (Street Number/Name)	Township SMITH	Lot	Concession
County/District/Municipality PETERBOROUGH	City/Town/Village BRIDENORTH	Province Ontario	Postal Code
UTM Coordinates Zone Easting Northing NAD 83 17 70 883 249 19 131	Municipal Plan and Sublot Number	Other	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
BROWN	SANDY	CLAY	DENSE	0	4
GREY	CLAY		DENSE	4	49
GREY	CLAY	STONES	HARD PAN	49	63
GREY	GRAVEL		COARSE	63	66

Annular Space			
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)	
0 63	BENTONITE SLURRY	18M ³	

Results of Well Yield Testing				
After test of well yield, water was: <input checked="" type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason: Pump intake set at (m/ft) 61.4 Pumping rate (l/min / GPM) 15 Duration of pumping 1 hrs + 0 min Final water level end of pumping (m/ft) 61.4 If flowing give rate (l/min/GPM) Recommended pump depth (m/ft) 55 Recommended pump rate (l/min/GPM) 6 Well production (l/min/GPM) 9.6 Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Static Level	7.7		61.4
	1	17.1	1	52.7
	2	23.2	2	46.4
	3	29.0	3	41.2
	4	34.1	4	37.3
	5	38.6	5	33.2
10	53.1	10	18.7	
15	61.4	15	12.7	
20		20	10.2	
25		25	8.6	
30		30	7.9	
40		40	7.8	
50		50	7.8	
60	61.4	60	7.7	

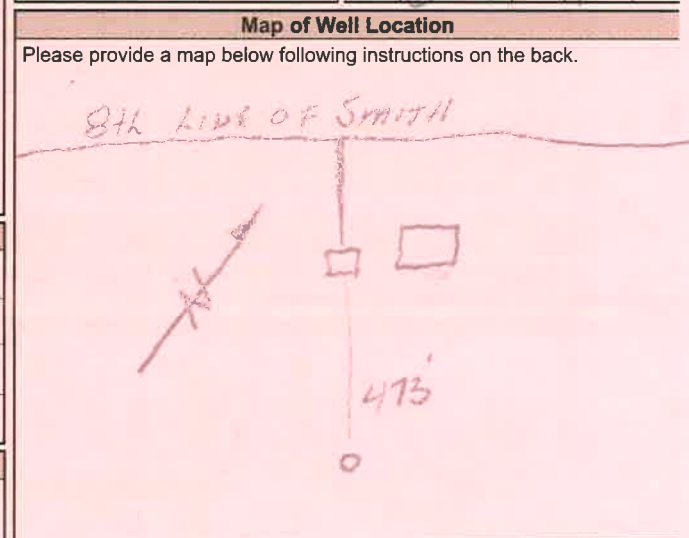
Method of Construction		Well Use		
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input checked=""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

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____	
6 1/4	STEEL	1.88	+2 66		

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

Water Details		Hole Diameter	
Water found at Depth 66 (m/ft) <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	Depth (m/ft)	Diameter (cm/in)
Water found at Depth (m/ft) <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	From To	
Water found at Depth (m/ft) <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	0 63	9"
		63 66	6"

Well Contractor and Well Technician Information			
Business Name of Well Contractor JOE LEGGE & SONS	Well Contractor's Licence No. 7 0 5 2		
Business Address (Street Number/Name) RR#3	Municipality BANKSBOFT		
Province ONT	Postal Code K0K 1J0	Business E-mail Address	
Bus. Telephone No. (inc. area code) 613 334 9254	Name of Well Technician (Last Name, First Name) LEGGE JOE		
Well Technician's Licence No. 1 0 7 9	Signature of Technician and/or Contractor		Date Submitted



Comments:

Well owner's information package delivered <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Date Package Delivered Y Y Y Y M M D D	Ministry Use Only Audit No. Z398468 Received
Date Work Completed 2023 04 28	Y Y Y Y M M D D	

Measurements recorded in: Metric Imperial

A 358381

Page _____ of _____

Well Owner's Information

First Name GRANITE	Last Name/Organization RIDGE BUILDERS	E-mail Address	<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name) BOX 100	Municipality BUCKHORN	Province ONT	Postal Code K0K 1C0
		Telephone No. (inc. area code) 705 657 9311	

Well Location

Address of Well Location (Street Number/Name)	Township SMITH	Lot	Concession
County/District/Municipality PETERBOROUGH	City/Town/Village BRIDGENORTH	Province Ontario	Postal Code
UTM Coordinates Zone 17	Easting 708829	Northings 4919161	Municipal Plan and Sublot Number
NAD 83	Other		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
BROWN	SANDY	CLAY	DENSE	0	4
GREY	CLAY		DENSE	4	46
GREY	CLAY	STONES	HARD PAN	46	64
GREY	GRAVEL		COARSE	64	67

Annular Space			
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	
From	To		
0	64 BENTONITE SLURRY	19 ft³	

Method of Construction		Well Use	
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input checked="" type="checkbox"/> Domestic	<input type="checkbox"/> Municipal
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input type="checkbox"/> Test Hole
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning
<input checked="" type="checkbox"/> Air percussion		<input type="checkbox"/> Industrial	<input type="checkbox"/> Monitoring
<input type="checkbox"/> Other, specify		<input type="checkbox"/> Other, specify	

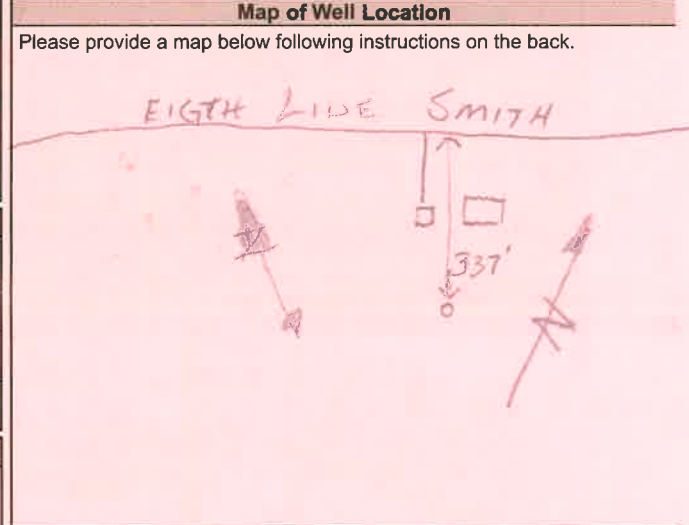
Construction Record - Casing			Status of Well		
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		
			From	To	
6 1/4	STEEL	.188	+2	67	<input checked="" type="checkbox"/> Water Supply
					<input type="checkbox"/> Replacement Well
					<input type="checkbox"/> Test Hole
					<input type="checkbox"/> Recharge Well
					<input type="checkbox"/> Dewatering Well
					<input type="checkbox"/> Observation and/or Monitoring Hole
					<input type="checkbox"/> Alteration (Construction)
					<input type="checkbox"/> Abandoned, Insufficient Supply
					<input type="checkbox"/> Abandoned, Poor Water Quality
					<input type="checkbox"/> Abandoned, other, specify
					<input type="checkbox"/> Other, specify

Construction Record - Screen					
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		
			From	To	
					<input type="checkbox"/> Other, specify

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Depth (m/ft)	Diameter (cm/in)
67	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify	From	To
		0	64
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	64	67
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify		
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested		
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify		

Well Contractor and Well Technician Information			
Business Name of Well Contractor JOE HEGGE & SONS	Well Contractor's Licence No. 71052		
Business Address (Street Number/Name) RR#3	Municipality BRANDON		
Province ONT	Postal Code K041C0	Business E-mail Address	
Bus. Telephone No. (inc. area code) 613 334 9234	Name of Well Technician (Last Name, First Name) HEGGE JOE		
Well Technician's Licence No. 1879	Signature of Technician and/or Contractor <i>J. Hegge</i>	Date Submitted Y Y Y Y M M D D	

Results of Well Yield Testing				
After test of well yield, water was: <input checked="" type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason: Pump intake set at (m/ft) 60.1	Static Level	5.3		60.1
	1	15.1	1	58.0
	2	22.1	2	48.1
	3	29.6	3	44.2
	4	36.7	4	40.4
	5	43.5	5	36.7
Pumping rate (l/min / GPM) 15				
Duration of pumping 1 hrs + 0 min				
Final water level end of pumping (m/ft) 60.1				
If flowing give rate (l/min/GPM)	10	60.1	10	20.1
	15		15	15.6
	20		20	11.2
	25		25	10.1
	30		30	9.3
	40		40	7.6
Well production (l/min/GPM) 5				
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
60	60.1	60	5.9	



Comments:

Well owner's information package delivered		Date Package Delivered		Ministry Use Only	
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Y Y Y Y M M D D	Y Y Y Y M M D D	Audit No. Z398469	
		Date Work Completed 20230501		Received	

Measurements recorded in: Metric Imperial

Well Owner's Information

First Name: GRANITE RIDGE BUILDERS Last Name/Organization: GRANITE RIDGE BUILDERS E-mail Address: _____ Well Constructed by Well Owner

Mailing Address (Street Number/Name): BOX 100 Municipality: BUCKHORN Province: ONT Postal Code: K9A1J0 Telephone No. (inc. area code): 7056979311

Well Location

Address of Well Location (Street Number/Name): SELWYN 8th LINE Township: SELWYN Lot: _____ Concession: _____

County/District/Municipality: PETERBOROUGH City/Town/Village: BRIDGENORTH Province: **Ontario** Postal Code: _____

UTM Coordinates: Zone 83 Easting 11770880349192114 Northing _____ Municipal Plan and Sublot Number: _____ Other: _____

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
BLACK	TOPSOIL		PACKED	0	2
BROWN	CLAY	STONES	HARDPAN	2	10
GREY	CLAY, SILTY		DENSE	10	59
GREY	SAND, GRAVEL	STONES	COARSE	59	64

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	64	BENTONITE SLURRY	17 ft³

Results of Well Yield Testing

After test of well yield, water was:
 Clear and sand free
 Other, specify CLOUDY

If pumping discontinued, give reason: _____

Pump intake set at (m/ft): 42.7

Pumping rate (l/min / GPM): 15

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 42.7

If flowing give rate (l/min/GPM): _____

Recommended pump depth (m/ft): 45

Recommended pump rate (l/min/GPM): 10

Well production (l/min/GPM): 14

Disinfected? Yes No

Time (min)	Draw Down		Recovery	
	Water Level (m/ft)	Time (min)	Water Level (m/ft)	Time (min)
Static Level	8.3		42.7	
1	16.7	1	33.7	
2	21.5	2	29.0	
3		3	26.8	
4	26.0	4	25.4	
5	27.8	5	24.3	
10	32.8	10	21.3	
15	35.3	15		
20	37.2	20		
25		25		
30	39.8	30		
40	41.8	40		
50	42.7	50		
60	42.7	60	9.2	

Method of Construction

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
6 1/4	STEEL	.188	+2	64	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		Status of Well
			From	To	
					<input type="checkbox"/> Other, specify _____

Water Details

Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Hole Diameter	
		Depth (m/ft) From	Diameter (cm/in) To
64	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	0	64 9"
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____		
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____		

Well Contractor and Well Technician Information

Business Name of Well Contractor: JOE LEGGE & SONS Well Contractor's Licence No.: 710512

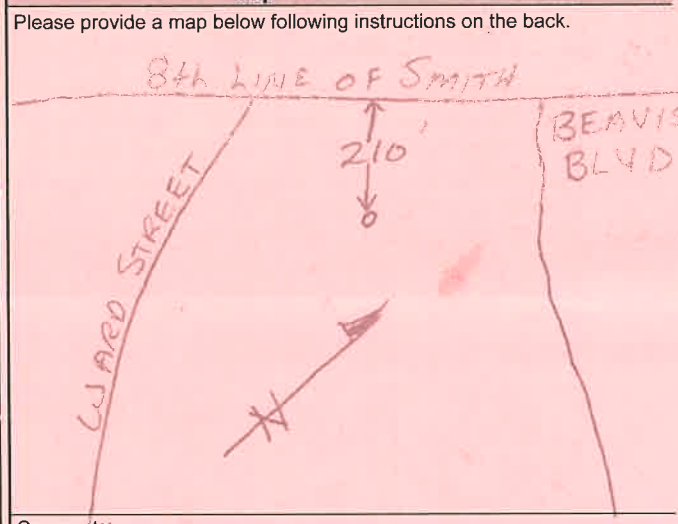
Business Address (Street Number/Name): RR#3 Municipality: BANCROFT

Province: ONT Postal Code: K0L1C0 Business E-mail Address: _____

Bus. Telephone No. (inc. area code): 6133349254 Name of Well Technician (Last Name, First Name): LEGGÉ JOE

Well Technician's Licence No.: 118719 Signature of Technician and/or Contractor: _____ Date Submitted: 1/19/20

Map of Well Location



Comments: _____

Well owner's information package delivered: Yes No

Date Package Delivered: 20200119

Date Work Completed: 20200130

Ministry Use Only
 Audit No.: **2424202**
 Received: _____

Appendix G

Sewage System Calculations Sheet



* These numbers are for the property as a whole *

SEWAGE SYSTEM CALCULATION SHEET

Date: 12/7/2022

Name: Proposed Tri-Plexes & Rental House

Location: Bridgenorth

1. SEWAGE FLOW

a) Number of bedrooms 5 = 2500 Litres (1) (max. 2500 litres)
 (1 bed = 750 2 bed = 1100 3 bed = 1600 4 bed = 2000 5 bed = 2500)
 (If over 5 bedrooms, use 2,500 & add extra bedrooms below.)

Total of all
bedrooms

Extra bedrooms 7 x 500 = 3500 Litres (1-a)

6000 litres

b) Living Space 6500 Sq. Ft. = 605 m2
 (Each 10 m2 **between** 200 - 400 m2) 20 x 100 = 2000 Litres
 (Each 10 m2 **over** 400 m2) 21 x 75 = 1575 Litres

Total 3575 Litres (2)

c) Total Fixture Units 78
 Each fixture over 20 58 x 50 = 2900 Litres (3)

Add 1a plus the higher of 1b or 1c (except as noted below)

* As of 2013, if over 5 bedrooms use 2500 plus extra bedrooms (at 500 each)
 or total living space (2) or total fixtures (3) which ever is higher.

Total Sewage Flow: (Q)

6000 Litres

2. SEPTIC TANK SIZE

Residential Occupancy:	Sewage Flow	<u>6000</u>	x 2	<u>12000</u> Litres
Commercial Occupancy:	Sewage Flow		x 3	<u>0</u> Litres
Holding Tank:	Sewage Flow		x 7	<u>0</u> Litres
				<u> </u> Gallons

3. LOADING RATE

Percolation Time	Loading Rate			Loading Area
2 - 20	10			
20 - 35	8			
35 - 50	6	<u>6000</u>	/	<u>10</u>
>50	4	Sewage Flow	/	Loading Rate
				<u>600.0</u> m2
				<u>6458.4</u> Sq. Ft.

4. FILTER BED SIZE

Sewage Flow <3000 Litres/day / 75 = 0.0 m2 of filter bed 0.0 Sq. Ft.
 Sewage Flow >3000 Litres/day 6000 / 50 = 120.0 m2 of filter bed 1291.7 Sq. Ft.

5. FILTER BED CONTACT AREA

Sewage Flow 6000 0.0 m2 of contact area 0.0 Sq. Ft.
 Percolation Rate (Formula = Sewage flow x Perc. Rate / 850)

Bedrooms

Rental House	4 bedrooms	2,000
Unit # 1	4 bedrooms	2,000
Unit # 2	4 bedrooms	2,000

6,000

Living Space

Rental House	900 F ²	6500 F ² = 605 m ²
Unit # 1	A) 800	each 10m ² between 200-400 =
	B) 800	20 x 150 = 2000
	C) 1200	each 10 m ² over 400
Unit # 2	A) 800	21 x 75 = 1575
	B) 800	
	C) 1200	

3575

6,500 F²

Fixtures

Rental House		18
Unit 1	1 3pc bath	6
	1 kitchen sink	1.5
	1 DW	1
	1 washer	1.5
	<u>10</u> x 6 units	<u>60</u>

78

fixtures

SEWAGE SYSTEM CALCULATION SHEET

Date: 12/7/2022

Name: Proposed Triplex #2

Location: 949 8th Line

1. SEWAGE FLOW

a) Number of bedrooms 4 = 2000 Litres (1) (max. 2500 litres)
 (1 bed = 750 2 bed = 1100 3 bed = 1600 4 bed = 2000 5 bed = 2500)
 (If over 5 bedrooms, use 2,500 & add extra bedrooms below.)

Extra bedrooms _____ x 500 = 0 Litres (1-a)

Total of all bedrooms 2000 litres

b) Living Space 2800 Sq. Ft. = 260 m2
 (Each 10 m2 **between** 200 - 400 m2) 6 x 100 = 600 Litres
 (Each 10 m2 **over** 400 m2) _____ x 75 = 0 Litres

Total 600 Litres (2)

c) Total Fixture Units 30
 Each fixture over 20 10 x 50 = 500 Litres (3)

Add 1a plus the higher of 1b or 1c (except as noted below) 2600

* As of 2013, if over 5 bedrooms use 2500 plus extra bedrooms (at 500 each)
 or total living space (2) or total fixtures (3) which ever is higher.

Total Sewage Flow: (Q) 2600 Litres

2. SEPTIC TANK SIZE

Residential Occupancy:	Sewage Flow	<u>2600</u>	x 2	<u>5200</u> Litres
Commercial Occupancy:	Sewage Flow	_____	x 3	<u>0</u> Litres
Holding Tank:	Sewage Flow	_____	x 7	<u>0</u> Litres
				_____ Gallons

3. LOADING RATE

Percolation Time	Loading Rate			Loading Area
2 - 20	10			<u>260.0</u> m2
20 - 35	8	<u>2600</u>	<u>10</u>	<u>2798.6</u> Sq. Ft.
35 - 50	6	Sewage Flow /	Loading Rate	
>50	4			

4. FILTER BED SIZE

Sewage Flow <3000 Litres/day 2600 / 75 = 34.7 m2 of filter bed 373.2 Sq. Ft.
 Sewage Flow >3000 Litres/day _____ / 50 = 0.0 m2 of filter bed 0.0 Sq. Ft.

5. FILTER BED CONTACT AREA

Sewage Flow 2600 _____ m2 of contact area 493.9 Sq. Ft.
 Percolation Rate 15 (Formula = Sewage flow x Perc. Rate / 850)

Township of Selwyn
 PO Box 270
 Bridgenorth ON K0L 1H0
 Tel 705-292-9507 Fax 705-292-8964

TAX BILL

REPRINT-2019 Final (FTX0083)

Billing Date **Oct. 22, 2019**

Roll No. **1516 020 202 22300 0000**

Group Code

Mortgage Company

Mortgage Account #

Mailing Information

1447147 ONTARIO INC
 PO BOX 100
 BUCKHORN ON K0L 1J0

Legal Owner and
 Legal Description

1447147 ONTARIO INC

 949 8TH LINE
 CON 7 PT LOT 13 BLK NO 17617
 REG
 2.51AC 200.00FR 601.90D

Assessments		Municipal			Education	
Tax Class	Value	Municipal Levies	Tax Rate %	Amount	Tax Rate %	Amount
RTEP	246,500	MUNICIPAL	.217340	535.74	.161000	396.87
RTEP	246,500	POLICE S-E/D-D AREA	.074838	184.48		
RTEP	246,500	Conservation Levy	.006701	16.52		
RTEP	246,500	COUNTY	.342050	843.15		

Sub Totals

Municipal Levy

1,579.89

Education Levy

396.87

SPECIAL CHARGES / CREDITS

SUMMARY

Tax Levy Sub-total (Municipal + Education)	1,976.76
Special Charges/Credits	.00
	.00
2019 Tax Cap Adjustment	.00
Final 2019 Taxes	1,976.76
Less Interim Billing	941.37
Past Due / Credit (as of Oct. 22,2019)	-1,035.39
Total Amount Due	0.00

Total 0.00

Next Payment Aug 12, 2019 518.00

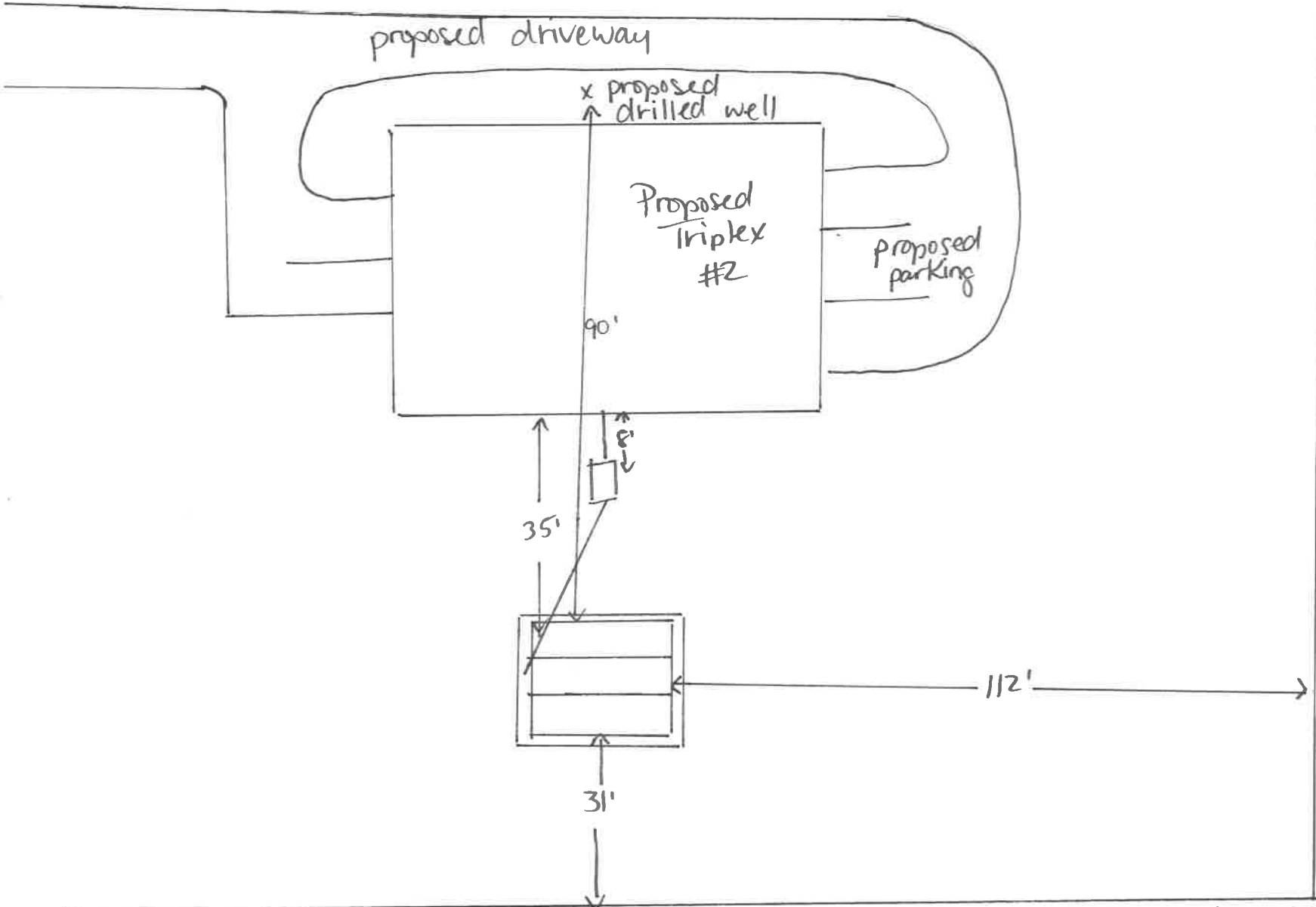
Next Payment Oct. 07, 2019 517.39

If a mortgage company name appears under Roll No. this bill is for information only - do not pay
 if you are paying by pre-authorized payment (PAP) this bill is for information only - do not pay.
 Penalty and/or interest are fixed at a rate of 1.25%. Penalty and/or interest will accrue on
 unpaid taxes commencing the first day of default and the first day of each calendar month thereafter.

220' of 622'

← property continues 402'

Triplex #2
949 8th Line
Selwyn



← property continues 389'

220' of 609'

Proposed:
 1,350 gallon tank (6,135L)
 500 sq ft (46.45 sq m)
 20' x 25' (6.10m x 7.62m)
 4 runs 47" centers

Application for a Permit to Construct or Demolish

This form is authorized under subsection 8(1.1) of the Building Code Act.

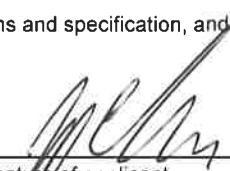
For use by Principal Authority				
Application number		Permit number		
Date received:		Roll number:		
Application submitted to: <u style="text-decoration: underline;">PETERBOROUGH PUBLIC HEALTH</u>				
A. Project information				
Building number, street name		Unit number	Lot	Con.
949 8th Line Selwyn		Triplex #2		
Municipality/Ward	Postal Code	Plan number/other description		
Selwyn	K9J 6X5	Roll #1516 020 202 22300		
Project value est. \$		Project Dimensions (m2)		
B. Purpose of application				
<input checked="" type="checkbox"/> New construction <input type="checkbox"/> Addition to an existing building <input type="checkbox"/> Alteration/repair <input type="checkbox"/> Demolition <input type="checkbox"/> Conditional Permit				
Proposed use of building		Current use of building		
Single Family Dwelling		Single Family Dwelling		
Description of proposed work (reason for sewage system installation)				
New sewage system for a new build (triplex)				
C. Applicant				
Applicant is:		<input type="checkbox"/> Owner or <input checked="" type="checkbox"/> Authorized agent of owner		
Last name	First name	Corporation or partnership		
BUCKHORN SAND & GRAVEL		CORPORATION		
Street Address		Unit number	Lot/con.	
P. O. Box 100				
Municipality	Postal Code	Province	E-mail	
Buckhorn	K0L 1J0	Ontario		
Telephone number	Fax	Cell number		
(705) 657-9311	(705) 657-9627	()		
E-Mail Address: info@buckhornsandgravel.com				
D. Owner (if different from applicant)				
Last Name		First name	Corporation or partnership	
1447147 Ontario Inc		o/a Granite Ridge Estates		
Street address		Unit number	Lot/con.	
P.O. Box 100				
Municipality	Postal Code	E-mail		
Buckhorn	K0L 1J0			
Telephone number	Email	Cell number		
705 657-9311	info@buckhornsandgravel.com			

E. Builder (optional)			
Last Name	First name	Corporation or partnership	
Street address		Unit number	Lot/con.
Municipality	Postal Code	Province	E-mail
Telephone number	Fax ()	Cell number ()	

F. Tarion Warranty Corporation (Ontario New Home Warranty Program)			
i. Is proposed construction for a new home as defined in the <i>Ontario New Home Warranties Plan Act</i> ? If no, go to section G.		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
ii. Is registration required under the <i>Ontario New Home Warranties Plan Act</i> ?		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
iii. If yes to (ii) provide registration number(s): _____			

G. Required Schedules	
i) Attach Schedule 1 for each individual who reviews and takes responsibility for design activities.	
ii) Attach Schedule 2 where application is to construct on-site, install or repair a sewage system.	


H. Completeness and compliance with applicable law		
i) This application meets all the requirements of clauses 1.3.1.3 (5) (a) to (d) Division C of the Building code (the application is made in the correct form and by the owner or authorized agent, all applicable fields have been completed on the application and required schedules, and all required schedules are submitted). Payment has been made of all fees that are required, under the applicable by-law, resolution or regulation made under clause 7(1)(c) of the <i>Building Code Act, 1992</i> , to be paid when the application made.	X Yes	___ NO
ii) This application is accompanied by the plans and specifications prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the <i>Building Code Act, 1992</i> .	X Yes	___ NO
iii) This application is accompanied by the information and documents prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the <i>Building Code Act, 1992</i> which enable the chief building official to determine whether the proposed building, construction or demolition will contravene any applicable law.	X Yes	___ NO
iv) The proposed building, construction or demolition will not contravene any applicable law.	X Yes	___ NO

H. Declaration of applicant.	
I, JEFF CHESHER (print name)	declare that:
1. The information contained in this application, attached schedules, attached plans and specification, and other attached documentation is true to the best of my knowledge.	
2. I have authority to bind the corporation or partnership (if applicable).	
December 8, 2022 Date	 Signature of applicant

Personal information contained in this form and schedules is collected under the authority of subsection 8(1.1) of the Building Code Act, 1992, and will be used in the administration and enforcement of the *Building Code Act, 1992*. Questions about the collection of personal information may be addressed to: a) the Chief Building Official of the municipality or upper-tier municipality to which this application is being made, or, b) the inspector having the powers and duties of a chief building official in relation to sewage systems or plumbing for an upper-tier municipality, board of health or conservation authority to whom this application is made, or, 2) Director, Building and Development Branch, Ministry of Municipal Affairs and Housing 777 Bay St., 2nd Floor, Toronto. M5G 2E5. (416) 585-6666.

Schedule 1: Designer Information


Use one form for each individual who reviews and take responsibility for design activities with respect to the project.

A. Project information			
Building number, street name 94 South Line Selwyn		Unit number	Lot. 0
Municipality Selwyn		Postal Code K9J 6X5	Plan number/other description Roll #1516 020 202 22300
B. Individual who reviews and takes responsibility for design activities			
Name Jeff Chesher		Firm BUCKHORN SAND & GRAVEL	
Street address P. O. Box 100		Unit no	Lot/con.
Municipality Buckhorn	Postal Code K0L 1J0	Province Ontario	E-Mail info@buckhornsandgravel.com
Telephone number (705) 657-9311	Fax number (705) 657-9627	Cell number	
C. Designe activities undertaken by individual identified in Section B. (Building Code Table 2.20.2.1)			
<input type="checkbox"/> House <input type="checkbox"/> Small Buildings <input type="checkbox"/> Large Buildings <input type="checkbox"/> Complete Buildings		<input type="checkbox"/> HVAC -House <input type="checkbox"/> Building Services <input type="checkbox"/> Detection, Lighting & Power <input type="checkbox"/> Fire Protection	
		<input type="checkbox"/> Building Structural <input type="checkbox"/> Plumbing -House <input type="checkbox"/> Plumbing - All Buildings <input checked="" type="checkbox"/> On-Site Sewage Systems	
Description of designer's work Sewage system design & installation.			
D. Declaration of designer			
I, Jeff Chesher declare that (choose one as appropriate) :			
<input checked="" type="checkbox"/> I review and take responsibility for the design work on behalf of a firm registered under subsection 2.17.4 of the Building code. I am qualified, and firm is registered, in the appropriate classes/categories. Individual BCIN: <u>11330</u> Firm BCIN: <u>16113</u> BUCKHORN SAND & GRAVEL			
<input type="checkbox"/> I review and take responsibility for the design work and am qualified in the appropriate category as an "other designer" under subsection 2.17.5. of the Building Code Individual BCIN: _____ Basis for exemption from registration: _____			
<input type="checkbox"/> The design work is exempt from the registration and qualification requirements of the Building Code. Basis for exemption from registration and qualification: _____			
I certify that:			
1. The information contained in this schedule is true to the best of my knowledge.			
2. I have submitted this application with the knowledge and consent of the firm.			
<u>Dec 9 2022</u> Date		 Signature of applicant	

NOTE:

- For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) d). Of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
- Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of practice, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

Schedule 2: Sewage System Installer Information

A. Project information			
Building number, street name 94th Line Selwyn		Unit number	Lot 0
		Con. 0	
Municipality Selwyn	Postal Code K9J 6X5	Plan number/other description Roll #1516 020 202 22300	
B. Sewage system installer			
Is the installer of the sewage system engaged in the business of construction on-site, installing, repairing, servicing, cleaning or emptying sewage systems, in accordance with Building Code Article 2.18.1.1?			
<input checked="" type="checkbox"/> Yes (Continue to Section c) <input type="checkbox"/> No (Continued to Section E) <input type="checkbox"/> Installer unknown at time of application (Continue to Section E)			
C. Registered installer information (where answer to B is "Yes")			
Name BUCKHORN SAND & GRAVEL		BCIN 16113	
Street Address P. O. Box 100		Unit number	Lot/con.
Municipality Buckhorn	Postal Code K0L 1J0	Province Ontario	E-mail
Telephone number (705) 657-9311	Fax (705) 657-9627	Cell number ()	
D. Qualified supervisor information (where answer to section B is "Yes")			
Name of qualified supervisor(s) JEFF CHESHER		Building Code Identification Number (BCIN) 11330	
E. Declaration of Applicant:			
I, JEFF CHESHER declare that:			
(print name)			
<input checked="" type="checkbox"/> I am the applicant for the permit to construct the sewage system. If the installer is unknown at the time of application, I shall submit a new Schedule 2 prior to construction when the installer is known;			
OR			
<input type="checkbox"/> I am the holder of the permit to construct the sewage system, and am submitting a new Schedule 2 now that the installer is known.			
I certify that:			
1. The information contained in this schedule is true to the best of my knowledge.			
2. If the owner is a corporation or partnership, I have the authority to bind the corporation or partnership.			
December 8, 2022			
Date		Signature of applicant	

A. Directions to the property:

From Chemong Rd, head to Bridgenoth. Follow Ward St through R. idgenorth, staying straight at lights. Follow past Jones Beach Rd (on left), around bend where Ward St. turns into 8th line. #949 will be just past the bend on the right-hand side.

B. Site and Design Information:

Water Supply: Proposed () or Existing () Municipal () Drilled Well () or Dug Well () Other: _____

Depth of Water-Tight Well Casing: _____

State number of Fixture Units:

Toilets	_____	x 4	_____
Kitchen Sink	_____	x 1.5	_____ 4.5
Wash Basin	_____	x 1.5	_____
Bathtub and/or Shower	_____	x 1.5	_____
Dishwasher	_____	x 1.0	_____ 3
Clothes Washing Machine	_____	x 1.5	_____ 4.5
Sink or Double Laundry Tub	_____	x 1.5	_____
Floor Drain - 2 in. trap	_____	x 2.0	_____
Floor Drain - 3 in. trap	_____	x 3.0	_____

"Bathroom Group means: a group of plumbing fixtures installed in the same room consisting of 1 toilet 1 wash basin, and 1 tub, shower or tub/shower combo.
 _____ x 6.0 _____ 18

List any additional toilets, wash basin or tubs and/or showers below

Other - list details _____ Total _____ 30

Total number of Bedrooms on the property:	A)	_____ 4
Total Floor Area of Buildings:	B)	_____ 2800
Total Fixture Units:	C)	_____ 30
Total Daily Design Flow Rate	L/Day	_____ 2600

Soils: Depth to bedrock: _____ Depth to high ground water table: _____

Percolation Rate: _____ Date of assessment: _____

Will more than one sewage system be used? Yes () No ()

H. Proposed Sewage System Design:

Class of Sewage System applied for:

Class 2: Dimensions _____ Depth of Excavation: _____

Class 3: Dimensions _____ Depth of Excavation: _____

Class 4: Treatment Unit Septic Tank: Capacity - 1,350 gallon (6135 L)
 Other (State manufacturer, model, size etc.) _____

Leaching Bed:

Filter bed Filter bed area: 500 sq ft Expanded Contact Area:
(46.45 sq m)
Depth of excavation:

Absorption trench
Total length of distribution pipe Maximum depth of trench excavation

Other: List type and details of System:

Class 5: Size of Holding Tank:
Attached Pump out Agreement Yes No

Attention Applicant or Agent

- I agree to comply with the provisions of the Ontario Building Code, as amended. I further agree that neither the granting of a permit, nor the approval of plans, nor inspections made by the Inspector shall in any way relieve me from my responsibility for carrying out the work in accordance with the legislation mentioned above. I also understand that it is my responsibility to arrange for the necessary inspections as specified in writing by the Inspector at the time of permit issuance.
- Applicants are responsible for ensuring that the information provided is true and accurate. I also understand that, once a Permit has been issued, there shall be no change in the plans, specifications, documents or other information on which the Permit was issued unless, written authorization is first received from the Public Health Inspector. The Peterborough County-City Health Unit will not be held responsible for incorrect information provided herein by the applicant.



Owner's Signature

Dec. 9/22

Date

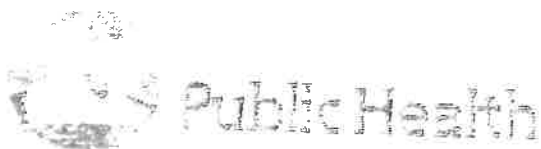


Agent's Signature

Dec. 9/22

Date

- The Inspector will return all applications, which are incomplete or unsigned. This application does not constitute a permit.
- No work shall commence until a permit has been issued.**



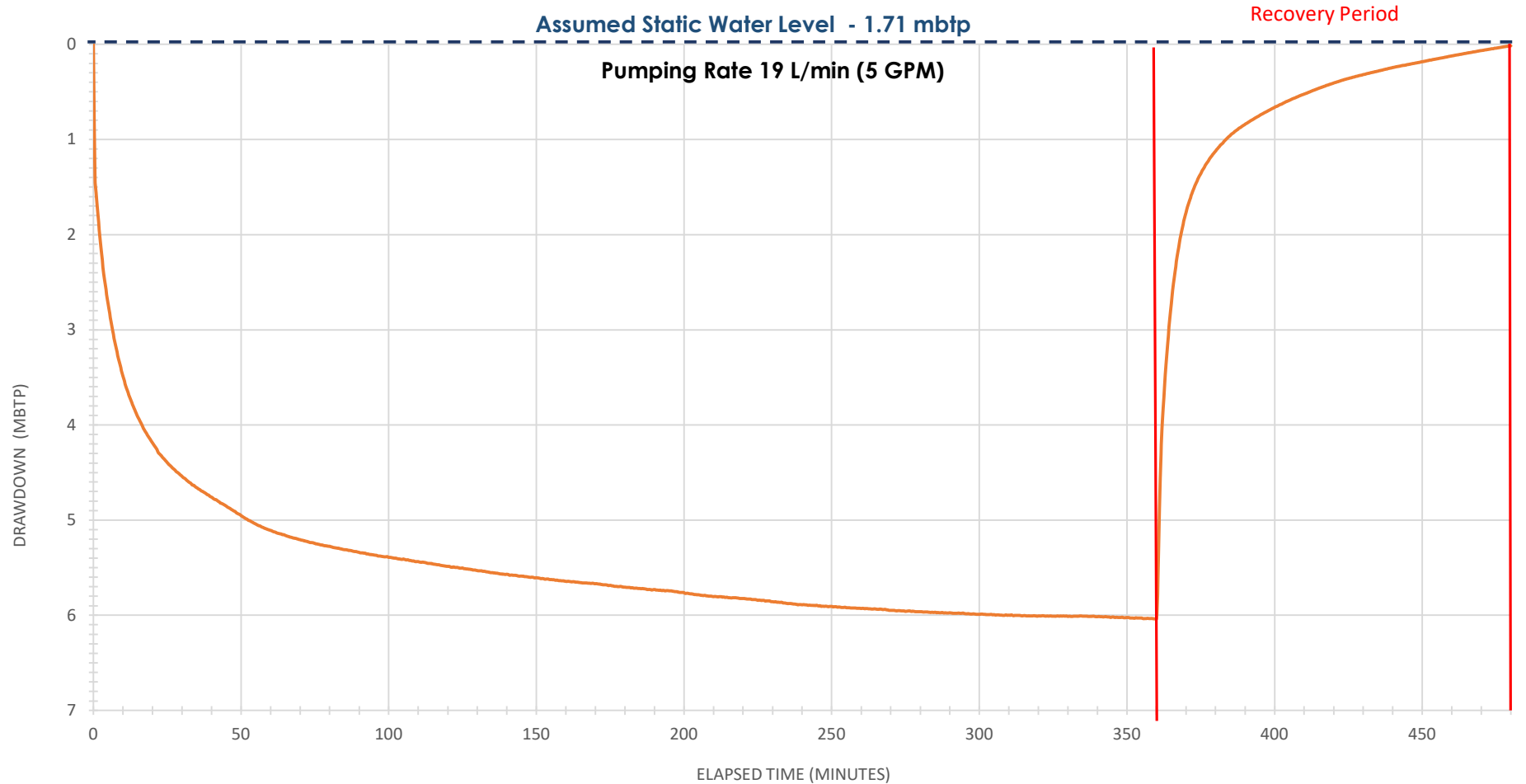
peterboroughpublichealth.ca
Jackson Square, 185 King Street
Peterborough, ON K9J 2R8
Phone: 705-743-1000 or Toll Free 1-877-743-0101
Fax: 705-743-2397

Appendix H

Pumping Test Hydrographs



WELL 1 (MECP WELL ID A358381) PUMP TEST CURVE



Hydrograph

Well 1 (MECP ID A358381)

Pumping Date: May 10, 2023
 Pumping Initiation Time: 8:32 am



D.M. Wills Associates Limited
 150 Jameson Drive
 Peterborough, Ontario
 Canada K9J 0B9

P. 705.742.2297
F. 705.748.9944
E. wills@dmwills.com

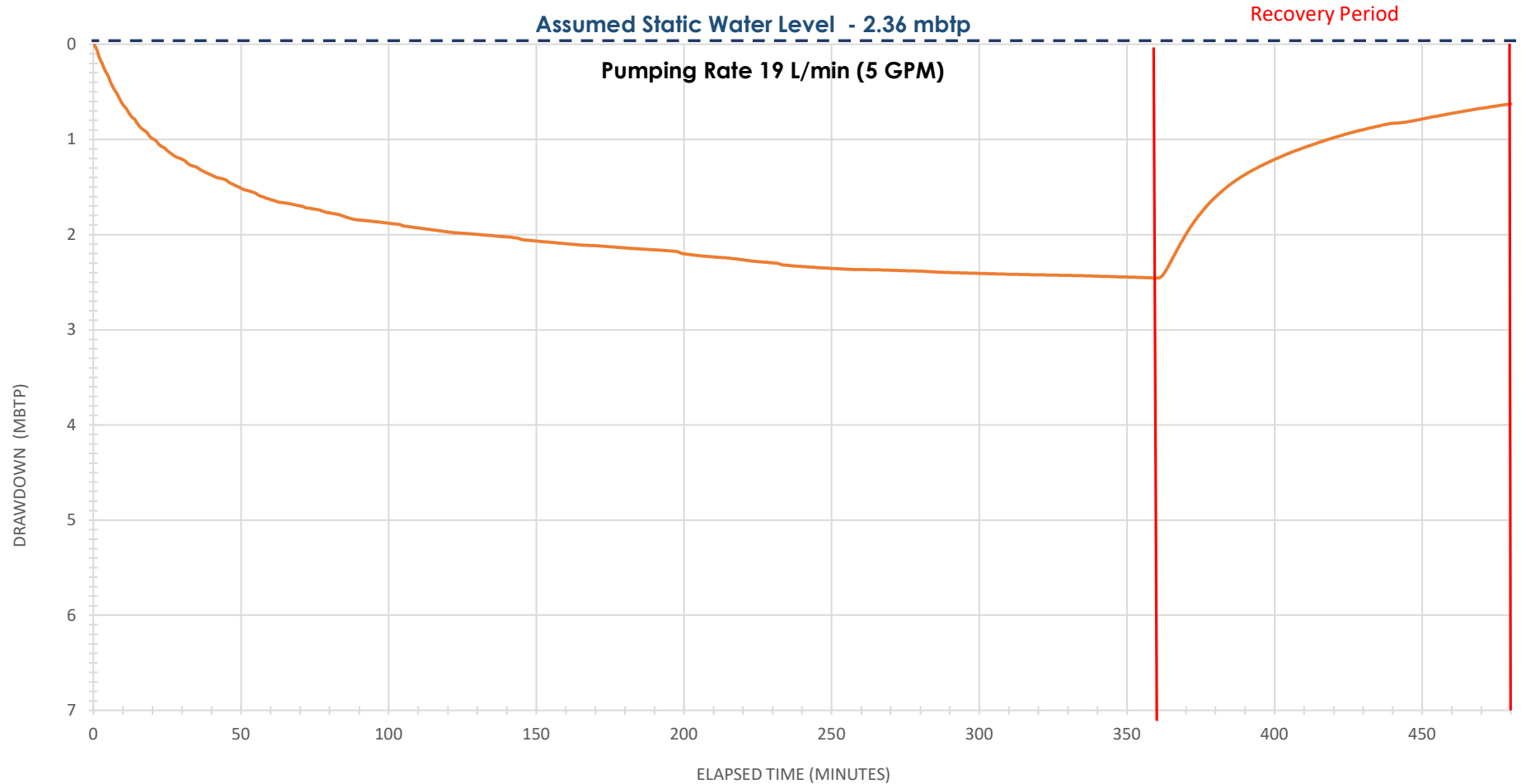
Created By: LT

Checked By: IA

Date: May 12, 2023

Project No.: 85260

WELL 1 (A358381) PUMPING TEST - OBSERVATION WELL - WELL 2



Hydrograph

Observation Well: Well 2 (MECP ID A358382)

Pumping Date: May 10, 2023

Pumping Initiation Time: 8:32 am



D.M. Wills Associates Limited
 150 Jameson Drive
 Peterborough, Ontario
 Canada K9J 0B9

P. 705.742.2297

F. 705.748.9944

E. wills@dmwills.com

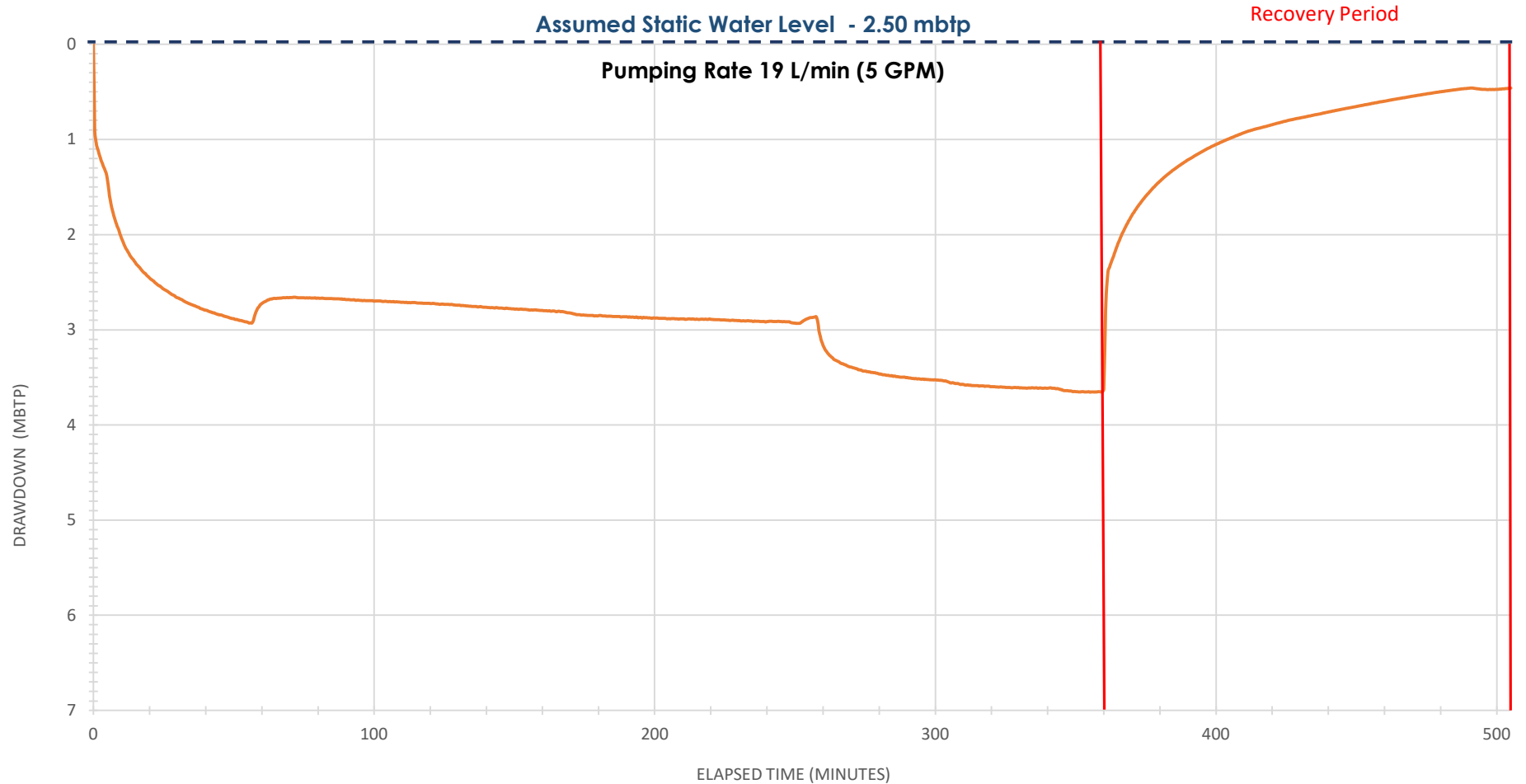
Created By: LT

Checked By: IA

Date: May 12, 2023

Project No.: 85260

WELL 2 (MECP WELL ID A358382) PUMP TEST CURVE



Hydrograph

Well 2 - MECP ID A358382

Pumping Date: May 11, 2023
 Pumping Initiation Time: 8:10 am



D.M. Wills Associates Limited
 150 Jameson Drive
 Peterborough, Ontario
 Canada K9J 0B9

P. 705.742.2297
F. 705.748.9944
E. wills@dmwills.com

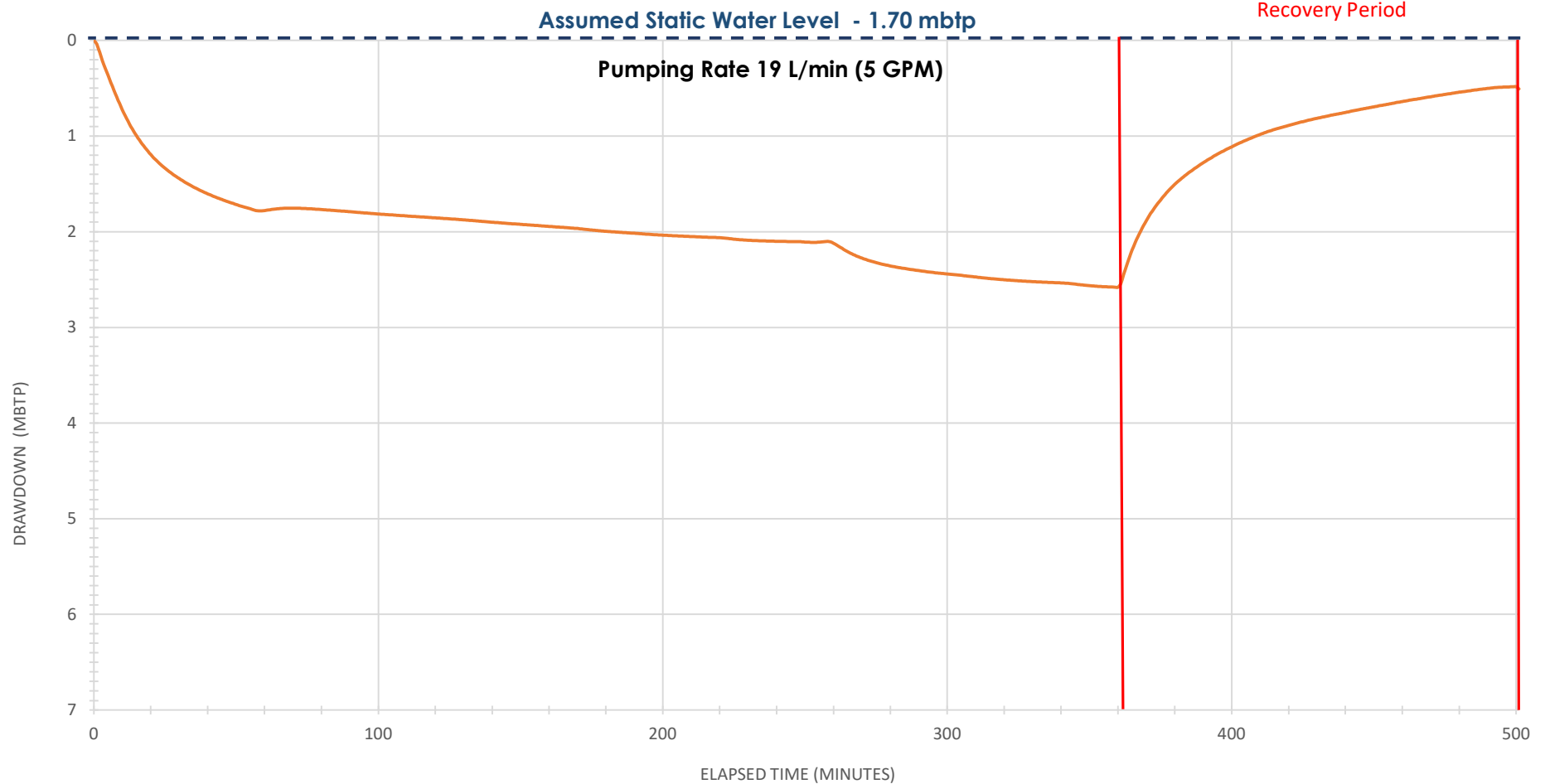
Created By: LT

Checked By: IA

Date: May 15, 2023

Project No.: 85260

WELL 2 (MECP WELL ID A358382) PUMP TEST CURVE - OBSERVATION WELL 1



Hydrograph

Observation Well - Well 1 (MECP ID A358381)

Pumping Date: May 11, 2023
Pumping Initiation Time: 8:10 am



D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9

P. 705.742.2297
F. 705.748.9944
E. wills@dmwills.com

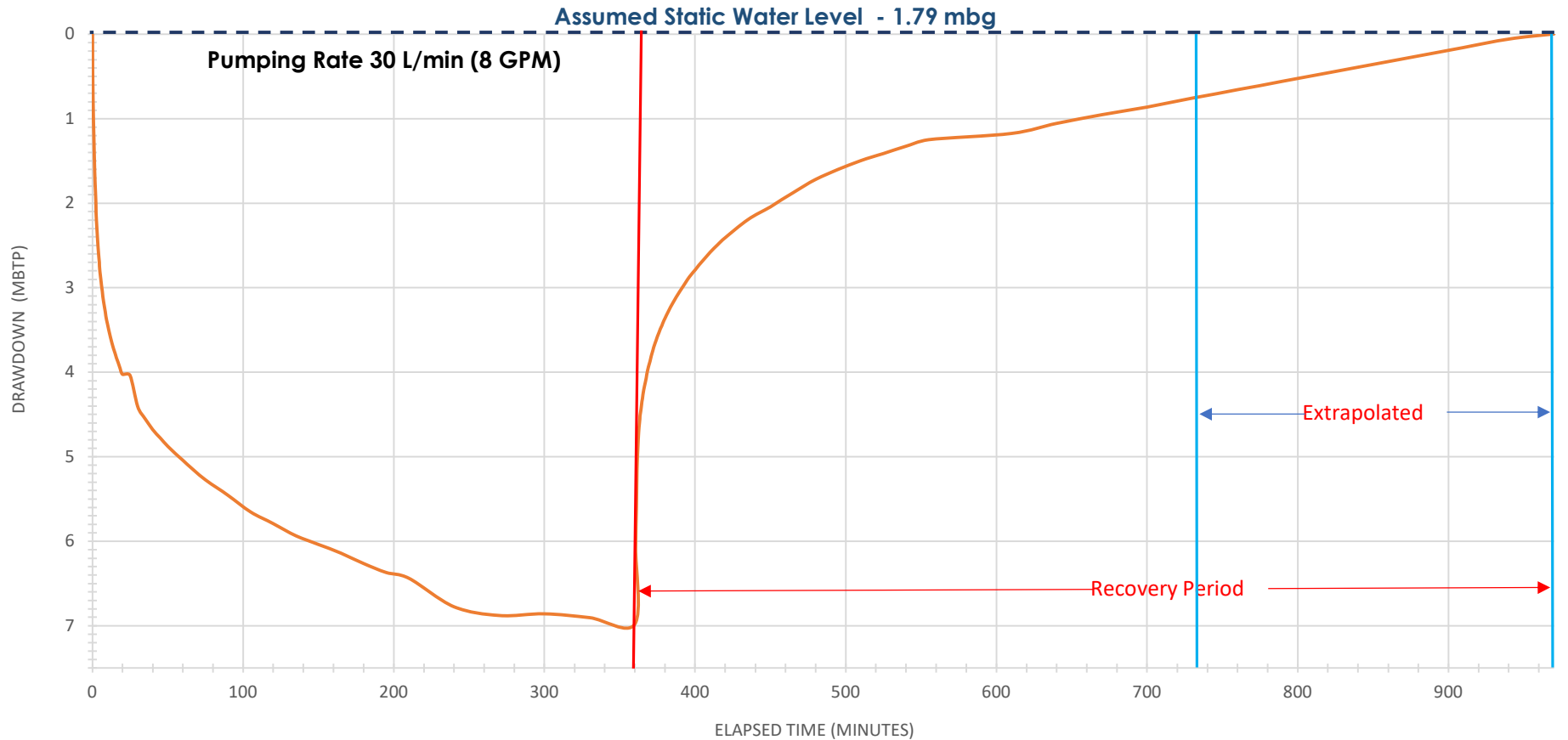
Created By: LT

Checked By: IA

Date: May 15, 2023

Project No.: 85260

WELL 3 (MECP WELL ID A398091) PUMP TEST CURVE



Hydrograph

Well 3 - MECP ID A398091

Pumping Date: August 29, 2025
 Pumping Initiation Time: 8:01 am



D.M. Wills Associates Limited
 150 Jameson Drive
 Peterborough, Ontario
 Canada K9J 0B9

P. 705.742.2297
 F. 705.748.9944
 E. wills@dmwills.com

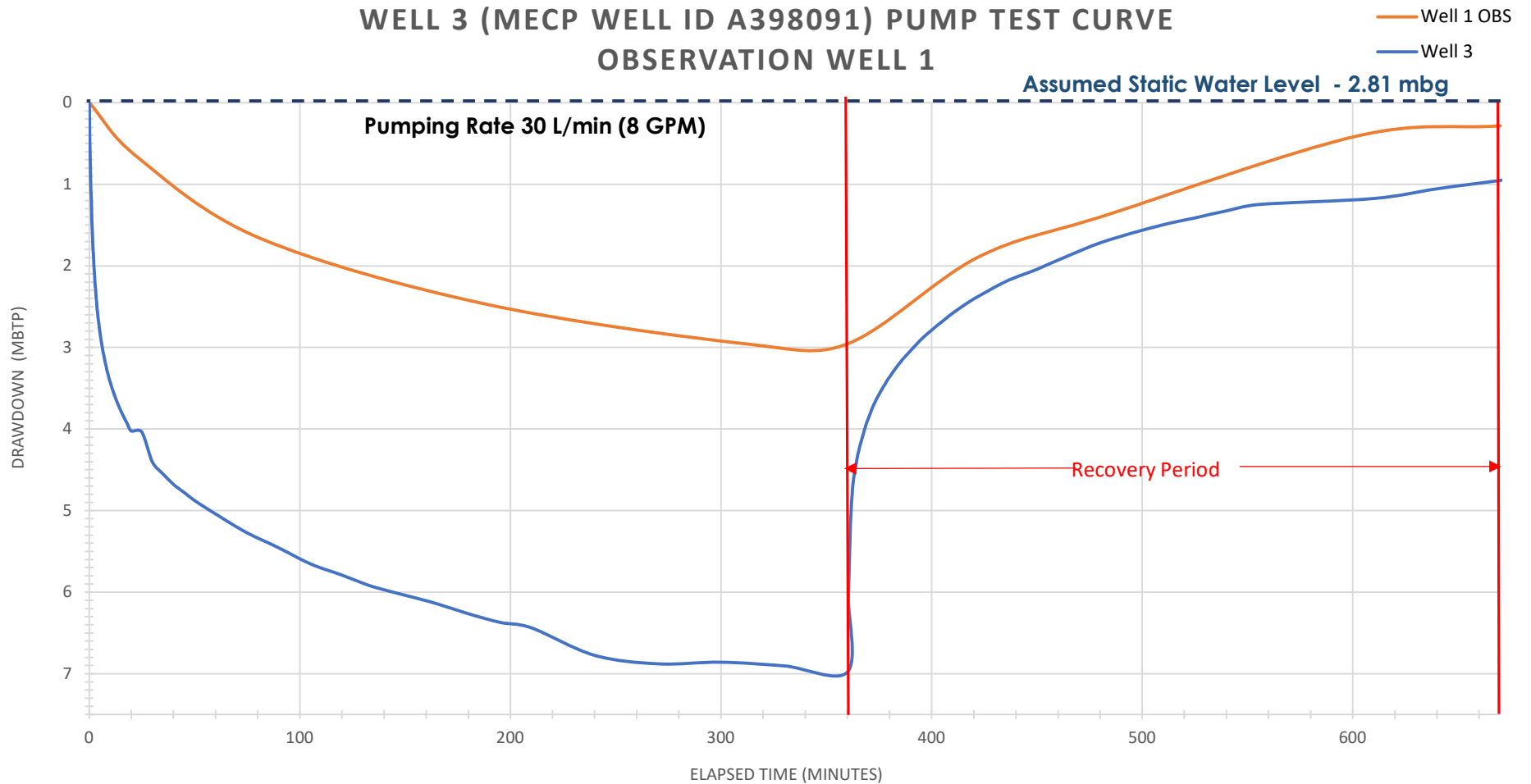
Created By: LT

Checked By: IA

Date: September 10, 2025

Project No.: 85260

WELL 3 (MECP WELL ID A398091) PUMP TEST CURVE OBSERVATION WELL 1



Hydrograph

Observation Well - Well 1 (MECP ID A358381)

Pumping Date: August 29, 2025

Pumping Initiation Time: 8:01 am



D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9

P. 705.742.2297

F. 705.748.9944

E. wills@dmwills.com

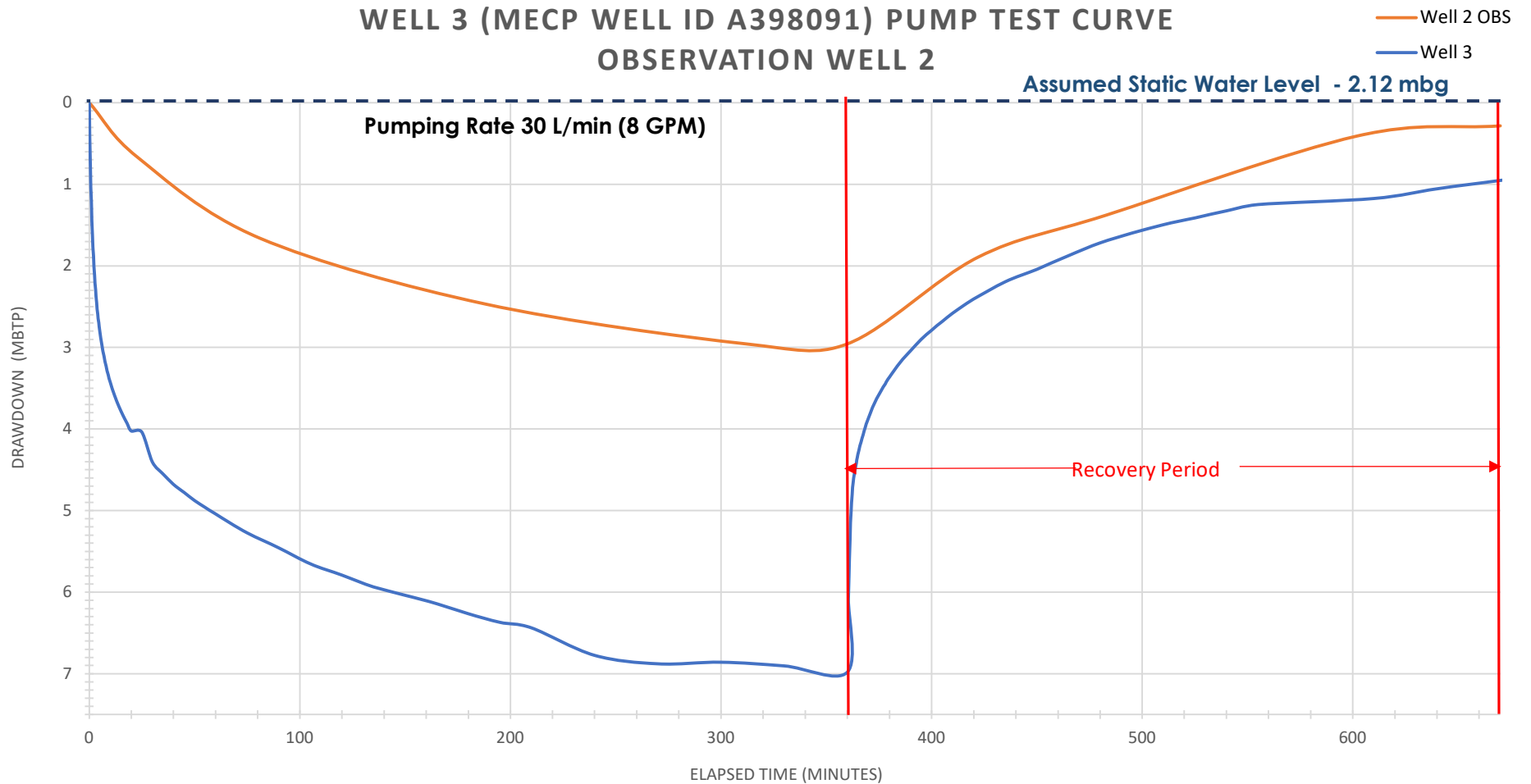
Created By: LT

Checked By: IA

Date: September 10, 2025

Project No.: 85260

WELL 3 (MECP WELL ID A398091) PUMP TEST CURVE OBSERVATION WELL 2



Hydrograph

Observation Well - Well 2 (MECP ID A358382)

Pumping Date: August 29, 2025

Pumping Initiation Time: 8:01 am



D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9

P. 705.742.2297

F. 705.748.9944

E. wills@dmwills.com

Created By: LT

Checked By: IA

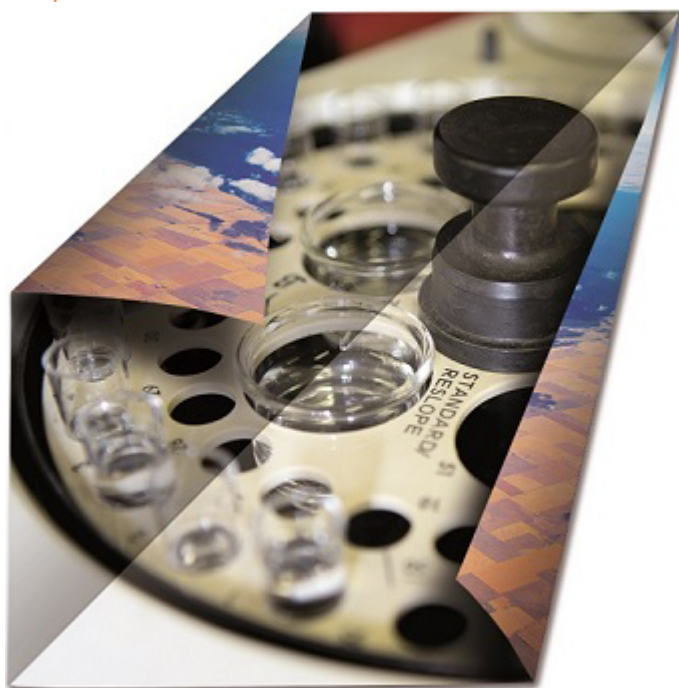
Date: September 10, 2025

Project No.: 85260

Appendix I

Certificates of Analysis – Groundwater Pumping Tests





FINAL REPORT

CA14421-MAY23 R1

85260

Prepared for

D.M. Wills -Peterborough

First Page

CLIENT DETAILS

Client D.M. Wills -Peterborough

Address 150 Jameson Drive
Peterborough, ON
K9J 0B9, Canada

Contact Lynsey Tuters

Telephone 289-385-6230

Facsimile 705-741-3568

Email ltuters@dmwills.com

Project 85260

Order Number

Samples Ground Water (2)

LABORATORY DETAILS

Project Specialist Maarit Wolfe, Hon.B.Sc

Laboratory SGS Canada Inc.

Address 185 Concession St., Lakefield ON, K0L 2H0

Telephone 705-652-2000

Facsimile 705-652-6365

Email Maarit.Wolfe@sgs.com

SGS Reference CA14421-MAY23

Received 05/10/2023

Approved 05/17/2023

Report Number CA14421-MAY23 R1

Date Reported 05/17/2023

COMMENTS

MAC - Maximum Acceptable Concentration
 AO/OG - Aesthetic Objective / Operational Guideline
 NR - Not reportable under applicable Provincial drinking water regulations as per client.

Temperature of Sample upon Receipt: 8 degrees C
 Cooling Agent Present: YES
 Custody Seal Present: YES

Chain of Custody Number:031755

SIGNATORIES

Maarit Wolfe, Hon.B.Sc



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FINAL REPORT

CA14421-MAY23 R1

Client: D.M. Wills -Peterborough

Project: 85260

Project Manager: Lynsey Tutters

Samplers: L. Tutters/J. Gorman

MATRIX: WATER

Sample Number	7	8
Sample Name	85260 Well 1 - 1	85260 Well 1 - 6
	hr	hr
Sample Matrix	Ground Water	Ground Water
Sample Date	10/05/2023	10/05/2023

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1.2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result	Result
General Chemistry						
UV Transmittance	%T				75.8	94.4
Alkalinity	mg/L as CaCO3	2	500		258	253
Bicarbonate	mg/L as CaCO3	2			258	253
Carbonate	mg/L as CaCO3	2			< 2	< 2
OH	mg/L as CaCO3	2			< 2	< 2
Colour	TCU	3	5		< 3	< 3
Conductivity	uS/cm	2			650	653
Total Suspended Solids	mg/L	2			95	9
Turbidity	NTU	0.10	5	1	75	14
Organic Nitrogen	mg/L	0.05	0.15		< 0.05	0.06
Total Kjeldahl Nitrogen (N)	as N mg/L	0.05			< 0.05	0.07
Ammonia+Ammonium (N)	as N mg/L	0.04			< 0.04	< 0.04
Dissolved Organic Carbon	mg/L	1	5		1	1
Total Organic Carbon	mg/L	1			1	1
Ion Ratio	-	-9999			1.23	1.03
Total Dissolved Solids (calculated)	mg/L	-9999			410	377
Conductivity (calculated)	uS/cm	-9999			816	732
Langeliers Index 4° C	@ 4° C	-9999			0.58	0.46
Saturation pH 4°C	pHs @ 4°C	-9999			7.45	7.56



FINAL REPORT

CA14421-MAY23 R1

Client: D.M. Wills -Peterborough

Project: 85260

Project Manager: Lynsey Tuters

Samplers: L. Tuters/J. Gorman

MATRIX: WATER

Sample Number	7	8
Sample Name	85260 Well 1 - 1 hr	85260 Well 1 - 6 hr
Sample Matrix	Ground Water	Ground Water
Sample Date	10/05/2023	10/05/2023

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1.2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result	Result
Metals and Inorganics						
Fluoride	mg/L	0.06		1.5	0.18	0.18
Bromide	mg/L	0.3			< 0.3	< 0.3
Nitrite (as N)	as N mg/L	0.03		1	< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06		10	< 0.06	< 0.06
Sulphate	mg/L	2	500		43	41
Sulphide	mg/L	0.02			< 0.02	< 0.02
Hardness	mg/L as CaCO3	0.05	100		404	332
Aluminum (total)	mg/L	0.001	0.1		0.313	0.044
Arsenic (total)	mg/L	0.0002		0.01	0.0007	0.0004
Boron (total)	mg/L	0.002		5	0.028	0.028
Barium (total)	mg/L	0.00008		1	0.184	0.169
Beryllium (total)	mg/L	0.000007			0.000025	< 0.000007
Bismuth (total)	mg/L	0.00001			< 0.00001	< 0.00001
Cobalt (total)	mg/L	0.000004			0.000221	0.000037
Calcium (total)	mg/L	0.01			129	101
Cadmium (total)	mg/L	0.000003		0.005	0.000004	< 0.000003
Copper (total)	mg/L	0.0002	1		0.0030	0.0007
Chromium (total)	mg/L	0.00008		0.05	0.00098	0.00029
Iron (total)	mg/L	0.007	0.3		1.92	0.868
Potassium (total)	mg/L	0.009			2.82	2.54
Magnesium (total)	mg/L	0.001			19.9	19.7



FINAL REPORT

CA14421-MAY23 R1

Client: D.M. Wills -Peterborough

Project: 85260

Project Manager: Lynsey Tuters

Samplers: L. Tuters/J. Gorman

MATRIX: WATER

Sample Number	7	8
Sample Name	85260 Well 1 - 1 hr	85260 Well 1 - 6 hr
Sample Matrix	Ground Water	Ground Water
Sample Date	10/05/2023	10/05/2023

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1.2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result	Result
Metals and Inorganics (continued)						
Manganese (total)	mg/L	0.00001	0.05		0.0785	0.0275
Molybdenum (total)	mg/L	0.00004			0.00112	0.00099
Nickel (total)	mg/L	0.0001			0.0010	0.0006
Sodium (total)	mg/L	0.01	200	20	16.1	15.5
Phosphorus (total)	mg/L	0.003			0.083	0.009
Lead (total)	mg/L	0.00009		0.01	0.00063	0.00013
Silicon (total)	mg/L	0.02			9.40	8.68
Silver (total)	mg/L	0.00005			< 0.00005	< 0.00005
Strontium (total)	mg/L	0.00008			0.435	0.393
Thallium (total)	mg/L	0.000005			0.000007	< 0.000005
Tin (total)	mg/L	0.00006			0.00007	0.00008
Titanium (total)	mg/L	0.00005			0.02280	0.00439
Antimony (total)	mg/L	0.0009		0.006	< 0.0009	< 0.0009
Selenium (total)	mg/L	0.00004		0.05	< 0.00004	< 0.00004
Uranium (total)	mg/L	0.000002		0.02	0.00232	0.00134
Vanadium (total)	mg/L	0.00001			0.00070	0.00016
Zinc (total)	mg/L	0.002	5		0.005	0.004
Cation sum	meq/L	-9999			9.01	7.44
Anion Sum	meq/L	-9999			7.31	7.20
Anion-Cation Balance	% difference	-9999			10.45	1.66



FINAL REPORT

CA14421-MAY23 R1

Client: D.M. Wills -Peterborough

Project: 85260

Project Manager: Lynsey Tuters

Samplers: L. Tuters/J. Gorman

MATRIX: WATER

Sample Number	7	8
Sample Name	85260 Well 1 - 1	85260 Well 1 - 6
	hr	hr
Sample Matrix	Ground Water	Ground Water
Sample Date	10/05/2023	10/05/2023

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1.2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result	Result
Microbiology						
Total Coliform	cfu/100mL	0		0	0	1
E. Coli	cfu/100mL	0		0	0	0
Heterotrophic Plate Count (HPC)	cfu/1mL	0			85	49
Other (ORP)						
pH	No unit	0.05	8.5		8.03	8.02
Chloride	mg/L	1	250		45	46
Mercury (total)	mg/L	0.00001			< 0.00001	< 0.00001
Phenols						
4AAP-Phenolics	mg/L	0.002			< 0.002	0.002

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03	ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03
				L1	L2

85260 Well 1 - 1 hr

Turbidity	SM 2130	NTU	75	5	1
Aluminum	SM 3030/EPA 200.8	mg/L	0.313	0.1	
Hardness	SM 3030/EPA 200.8	mg/L as CaCO3	404	100	
Iron	SM 3030/EPA 200.8	mg/L	1.92	0.3	
Manganese	SM 3030/EPA 200.8	mg/L	0.0785	0.05	

85260 Well 1 - 6 hr

Total Coliform	OMOE MICROMFDC-E3407A	cfu/100mL	1		0
Turbidity	SM 2130	NTU	14	5	1
Hardness	SM 3030/EPA 200.8	mg/L as CaCO3	332	100	
Iron	SM 3030/EPA 200.8	mg/L	0.868	0.3	



FINAL REPORT

CA14421-MAY23 R1

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0306-MAY23	mg/L as CaCO3	2	< 2	ND	20	102	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0128-MAY23	mg/L	0.04	<0.04	ND	10	101	90	110	92	75	125

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO5066-MAY23	mg/L	1	<1	ND	20	108	80	120	116	75	125
Sulphate	DIO5066-MAY23	mg/L	2	<2	2	20	106	80	120	96	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Bromide	DIO0326-MAY23	mg/L	0.3	<0.3	ND	20	98	90	110	88	75	125
Nitrite (as N)	DIO0326-MAY23	mg/L	0.03	<0.03	ND	20	98	90	110	105	75	125
Nitrate (as N)	DIO0326-MAY23	mg/L	0.06	<0.06	2	20	102	90	110	106	75	125
Bromide	DIO0328-MAY23	mg/L	0.3	<0.3	ND	20	100	90	110	86	75	125
Nitrite (as N)	DIO0328-MAY23	mg/L	0.03	<0.03	ND	20	99	90	110	99	75	125
Nitrate (as N)	DIO0328-MAY23	mg/L	0.06	<0.06	ND	20	98	90	110	94	75	125

QC SUMMARY

Carbon by SFA

Method: SM 5310 | Internal ref.: ME-CA-ENVISFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0129-MAY23	mg/L	1	<1	1	20	100	90	110	98	75	125
Total Organic Carbon	SKA0129-MAY23	mg/L	1	<1	1	20	100	90	110	98	75	125

Carbonate/Bicarbonate

Method: SM 2320 | Internal ref.: ME-CA-ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Carbonate	EWL0306-MAY23	mg/L as CaCO3	2	< 2	ND	10	NA	90	110	NA		
Bicarbonate	EWL0306-MAY23	mg/L as CaCO3	2	< 2	ND	10	NA	90	110	NA		
OH	EWL0306-MAY23	mg/L as CaCO3	2	< 2	ND	10	NA	90	110	NA		

QC SUMMARY

Colour

Method: SM 2120 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Colour	EWL0293-MAY23	TCU	3	< 3	ND	10	105	80	120	NA		

Conductivity

Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0306-MAY23	uS/cm	2	< 2	0	20	99	90	110	NA		

Fluoride by Specific Ion Electrode

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-014

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Fluoride	EWL0336-MAY23	mg/L	0.06	<0.06	ND	10	101	90	110	95	75 125	



FINAL REPORT

CA14421-MAY23 R1

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0026-MAY23	mg/L	0.00001	< 0.00001	0	20	103	80	120	99	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0093-MAY23	mg/L	0.00005	<0.00005	ND	20	105	90	110	94	70	130
Aluminum (total)	EMS0093-MAY23	mg/L	0.001	<0.001	1	20	104	90	110	121	70	130
Arsenic (total)	EMS0093-MAY23	mg/L	0.0002	<0.0002	2	20	103	90	110	102	70	130
Barium (total)	EMS0093-MAY23	mg/L	0.00008	<0.00008	0	20	95	90	110	100	70	130
Beryllium (total)	EMS0093-MAY23	mg/L	0.000007	<0.000007	ND	20	96	90	110	93	70	130
Boron (total)	EMS0093-MAY23	mg/L	0.002	<0.002	ND	20	101	90	110	98	70	130
Bismuth (total)	EMS0093-MAY23	mg/L	0.00001	<0.00001	ND	20	96	90	110	79	70	130
Calcium (total)	EMS0093-MAY23	mg/L	0.01	<0.01	1	20	101	90	110	92	70	130
Cadmium (total)	EMS0093-MAY23	mg/L	0.000003	<0.000003	ND	20	103	90	110	111	70	130
Cobalt (total)	EMS0093-MAY23	mg/L	0.000004	<0.000004	12	20	103	90	110	101	70	130
Chromium (total)	EMS0093-MAY23	mg/L	0.00008	<0.00008	ND	20	104	90	110	101	70	130
Copper (total)	EMS0093-MAY23	mg/L	0.0002	<0.0002	ND	20	104	90	110	105	70	130
Iron (total)	EMS0093-MAY23	mg/L	0.007	<0.007	ND	20	105	90	110	125	70	130
Potassium (total)	EMS0093-MAY23	mg/L	0.009	<0.009	1	20	105	90	110	83	70	130
Magnesium (total)	EMS0093-MAY23	mg/L	0.001	<0.001	0	20	98	90	110	95	70	130
Manganese (total)	EMS0093-MAY23	mg/L	0.00001	<0.00001	1	20	105	90	110	85	70	130
Molybdenum (total)	EMS0093-MAY23	mg/L	0.00004	<0.00004	0	20	107	90	110	105	70	130
Sodium (total)	EMS0093-MAY23	mg/L	0.01	<0.01	1	20	100	90	110	98	70	130
Nickel (total)	EMS0093-MAY23	mg/L	0.0001	<0.0001	ND	20	105	90	110	100	70	130
Lead (total)	EMS0093-MAY23	mg/L	0.00009	<0.00009	ND	20	98	90	110	98	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	EMS0093-MAY23	mg/L	0.003	<0.003	ND	20	102	90	110	NV	70	130
Antimony (total)	EMS0093-MAY23	mg/L	0.0009	<0.0009	ND	20	101	90	110	95	70	130
Selenium (total)	EMS0093-MAY23	mg/L	0.00004	<0.00004	ND	20	100	90	110	126	70	130
Silicon (total)	EMS0093-MAY23	mg/L	0.02	<0.02	1	20	104	90	110	NV	70	130
Tin (total)	EMS0093-MAY23	mg/L	0.00006	<0.00006	ND	20	100	90	110	NV	70	130
Strontium (total)	EMS0093-MAY23	mg/L	0.00008	<0.00008	1	20	100	90	110	105	70	130
Titanium (total)	EMS0093-MAY23	mg/L	0.00005	<0.00005	19	20	105	90	110	NV	70	130
Thallium (total)	EMS0093-MAY23	mg/L	0.000005	<0.000005	ND	20	96	90	110	90	70	130
Uranium (total)	EMS0093-MAY23	mg/L	0.000002	<0.000002	2	20	94	90	110	80	70	130
Vanadium (total)	EMS0093-MAY23	mg/L	0.00001	<0.00001	1	20	105	90	110	105	70	130
Zinc (total)	EMS0093-MAY23	mg/L	0.002	<0.002	ND	20	102	90	110	108	70	130



FINAL REPORT

CA14421-MAY23 R1

QC SUMMARY

Microbiology

Method: OMOE MICROMFDC-E3407A | Internal ref.: ME-CA-1ENVIMIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
E. Coli	BAC9211-MAY23	cfu/100mL	-	ACCEPTED	ACCEPTED							
Heterotrophic Plate Count (HPC)	BAC9211-MAY23	cfu/1mL	-	ACCEPTED	ACCEPTED							
Total Coliform	BAC9211-MAY23	cfu/100mL	-	ACCEPTED	ACCEPTED							

pH

Method: SM 4500 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0306-MAY23	No unit	0.05	NA	0		100			NA		



FINAL REPORT

CA14421-MAY23 R1

QC SUMMARY

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0145-MAY23	mg/L	0.002	<0.002	ND	10	98	80	120	96	75	125

Sulphide by SFA

Method: SM 4500 | Internal ref.: ME-CA-IENVISFA-LAK-AN-008

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphide	SKA0126-MAY23	mg/L	0.02	<0.02	ND	20	100	80	120	NA	75	125

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0425-MAY23	mg/L	2	< 2	3	10	104	90	110	NA		



FINAL REPORT

CA14421-MAY23 R1

QC SUMMARY

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen (N)	SKA0131-MAY23	mg/L	0.05	<0.05	ND	10	104	90	110	105	75	125

Turbidity

Method: SM 2130 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Turbidity	EWL0300-MAY23	NTU	0.10	< 0.10	1	10	99	90	110	NA		

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.
RL Reporting Limit.
 ↑ Reporting limit raised.
 ↓ Reporting limit lowered.
NA The sample was not analysed for this analyte
ND Non Detect

Results relate only to the sample tested.

Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.

"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm.

The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Reproduction of this analytical report in full or in part is prohibited.

This report supersedes all previous versions.

-- End of Analytical Report --



Request for Laboratory Services and CHAIN OF CUSTODY

No: 031755

Page of

Laboratory Information Section - Lab use only

Received By: Katelyn Medard
Received Date: 05/10/23 (mm/dd/yy)
Received Time: 17:30 (hr:min)

Received By (signature): [Signature]
Custody Seal Present: Yes [X] No []
Cooling Agent Present: Yes [X] No [] Type:
Custody Seal Intact: Yes [X] No []
Temperature Upon Receipt (°C): 8, 8, 8

LAB LIMS #: CA14421-May23

REPORT INFORMATION
Company: P.M. Wills
Contact: Lynsey Tuters
Address: 156 Jameson Dr. Peterborough
Phone: 289-385-6230
Fax:
Email: ltuters@dmwills.com

INVOICE INFORMATION
[] (same as Report Information)
Company:
Address:
Phone:
Email: accounts@dmwills.com

Quotation #:
Project #: 056 85260
P.O. #: 85260
Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED
[] Regular TAT (5-7 days)
TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): [] 1 Day [] 2 Days [] 3 Days [] 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION
Specify Due Date:
*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS
[] O.Reg 153/04 [] O.Reg 406/19
Other Regulations: [] Reg 347/558 (3 Day min TAT) [] Sanitary [] Storm
[] PWQO [] MMER [] CCME [] Other: MSA
Soil Volume [] <350m3 [] >350m3
[] WODWS Not Reportable *See note

ANALYSIS REQUESTED

Table with columns: M & I, SVOC, PCB, PHC, VOC, Pest, Other (please specify), SPLP, TCLP. Includes checkboxes for various tests like Metals, VOC, PCB, etc.

RECORD OF SITE CONDITION (RSC) [] YES [] NO

Table with columns: SAMPLE IDENTIFICATION, DATE SAMPLED, TIME SAMPLED, # OF BOTTLES, MATRIX. Contains sample data for wells 1-1hr and 1-6hr.

COMMENTS:

Observations/Comments/Special Instructions

Sampled By (NAME): L. Tuters / J. Gorman Signature: [Signatures] Date: 05/10/2023 (mm/dd/yy) Pink Copy - Client
Relinquished by (NAME): [Signature] J. Gorman Signature: [Signature] Date: 05/10/2023 (mm/dd/yy) Yellow & White Copy - SGS



FINAL REPORT

CA14319-MAY23 R1

85260

Prepared for

D.M. Wills -Peterborough

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	D.M. Wills -Peterborough	Project Specialist	Maarit Wolfe, Hon.B.Sc
Address	150 Jameson Drive Peterborough, ON K9J 0B9, Canada	Laboratory Address	SGS Canada Inc. 185 Concession St., Lakefield ON, K0L 2H0
Contact	Lynsey Tutters	Telephone	705-652-2000
Telephone	289-385-6230	Facsimile	705-652-6365
Facsimile	705-741-3568	Email	Maarit.Wolfe@sgs.com
Email	ltutters@dmwills.com	SGS Reference	CA14319-MAY23
Project	85260	Received	05/11/2023
Order Number		Approved	05/18/2023
Samples	Ground Water (2)	Report Number	CA14319-MAY23 R1
		Date Reported	05/19/2023

COMMENTS

MAC - Maximum Acceptable Concentration
 AO/OG - Aesthetic Objective / Operational Guideline
 NR - Not reportable under applicable Provincial drinking water regulations as per client.

Temperature of Sample upon Receipt: 16 degrees C
 Cooling Agent Present: Yes
 Custody Seal Present: Yes

Chain of Custody Number: 024682

SIGNATORIES

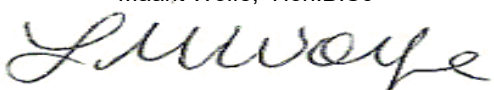
Maarit Wolfe, Hon.B.Sc


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FINAL REPORT

CA14319-MAY23 R1

Client: D.M. Wills -Peterborough

Project: 85260

Project Manager: Lynsey Tutters

Samplers: J.Gorman

MATRIX: WATER

Sample Number	7	8
Sample Name	85260 Well 2 - 1hr	85260 Well 2 - 6hr
Sample Matrix	Ground Water	Ground Water
Sample Date	11/05/2023	11/05/2023

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1.2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result	Result
General Chemistry						
UV Transmittance	%T				92.5	93.5
Alkalinity	mg/L as CaCO3	2	500		272	254
Bicarbonate	mg/L as CaCO3	2			272	254
Carbonate	mg/L as CaCO3	2			< 2	< 2
OH	mg/L as CaCO3	2			< 2	< 2
Colour	TCU	3	5		< 3	< 3
Conductivity	uS/cm	2			641	639
Total Suspended Solids	mg/L	2			3	3
Turbidity	NTU	0.10	5	1	13	11
Organic Nitrogen	mg/L	0.05	0.15		< 0.05	< 0.05
Total Kjeldahl Nitrogen (N)	as N mg/L	0.05			< 0.05	< 0.05
Ammonia+Ammonium (N)	as N mg/L	0.04			< 0.04	< 0.04
Dissolved Organic Carbon	mg/L	1	5		< 1	< 1
Total Organic Carbon	mg/L	1			< 1	< 1
Ion Ratio	-	-9999			0.85	0.90
Total Dissolved Solids (calculated)	mg/L	-9999			372	354
Conductivity (calculated)	uS/cm	-9999			706	678
Langeliers Index 4° C	@ 4° C	-9999			0.19	0.21
Saturation pH 4°C	pHs @ 4°C	-9999			7.61	7.64



FINAL REPORT

CA14319-MAY23 R1

Client: D.M. Wills -Peterborough

Project: 85260

Project Manager: Lynsey Tutters

Samplers: J.Gorman

MATRIX: WATER

Sample Number	7	8
Sample Name	85260 Well 2 - 1hr	85260 Well 2 - 6hr
Sample Matrix	Ground Water	Ground Water
Sample Date	11/05/2023	11/05/2023

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1.2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result	Result
Metals and Inorganics						
Fluoride	mg/L	0.06		1.5	0.22	0.19
Bromide	mg/L	0.3			< 0.3	< 0.3
Nitrite (as N)	as N mg/L	0.03		1	< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06		10	< 0.06	< 0.06
Sulphate	mg/L	2	500		44	41
Sulphide	mg/L	0.02			< 0.02	< 0.02
Hardness	mg/L as CaCO3	0.05	100		286	285
Aluminum (total)	mg/L	0.001	0.1		0.002	< 0.001
Arsenic (total)	mg/L	0.0002		0.01	0.0002	< 0.0002
Boron (total)	mg/L	0.002		5	0.022	0.034
Barium (total)	mg/L	0.00008		1	0.149	0.141
Beryllium (total)	mg/L	0.000007			< 0.000007	< 0.000007
Bismuth (total)	mg/L	0.00001			< 0.00001	< 0.00001
Cobalt (total)	mg/L	0.000004			0.000020	0.000012
Calcium (total)	mg/L	0.01			83.7	83.4
Cadmium (total)	mg/L	0.000003		0.005	< 0.000003	< 0.000003
Copper (total)	mg/L	0.0002	1		0.0008	0.0002
Chromium (total)	mg/L	0.00008		0.05	< 0.00008	< 0.00008
Iron (total)	mg/L	0.007	0.3		0.945	0.815
Potassium (total)	mg/L	0.009			2.20	2.15
Magnesium (total)	mg/L	0.001			18.7	18.7



FINAL REPORT

CA14319-MAY23 R1

Client: D.M. Wills -Peterborough

Project: 85260

Project Manager: Lynsey Tuters

Samplers: J.Gorman

MATRIX: WATER

Sample Number	7	8
Sample Name	85260 Well 2 - 1hr	85260 Well 2 - 6hr
Sample Matrix	Ground Water	Ground Water
Sample Date	11/05/2023	11/05/2023

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1.2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result	Result
Metals and Inorganics (continued)						
Manganese (total)	mg/L	0.00001	0.05		0.0229	0.0208
Molybdenum (total)	mg/L	0.00004			0.00139	0.00104
Nickel (total)	mg/L	0.0001			0.0004	0.0004
Sodium (total)	mg/L	0.01	200	20	15.1	14.3
Phosphorus (total)	mg/L	0.003			< 0.003	< 0.003
Lead (total)	mg/L	0.00009		0.01	0.00011	< 0.00009
Silicon (total)	mg/L	0.02			7.61	7.32
Silver (total)	mg/L	0.00005			< 0.00005	< 0.00005
Strontium (total)	mg/L	0.00008			0.388	0.389
Thallium (total)	mg/L	0.000005			< 0.000005	< 0.000005
Tin (total)	mg/L	0.00006			0.00032	0.00011
Titanium (total)	mg/L	0.00005			0.00016	0.00011
Antimony (total)	mg/L	0.0009		0.006	< 0.0009	< 0.0009
Selenium (total)	mg/L	0.00004		0.05	0.00006	< 0.00004
Uranium (total)	mg/L	0.000002		0.02	0.000432	0.000441
Vanadium (total)	mg/L	0.00001			0.00005	0.00004
Zinc (total)	mg/L	0.002	5		0.004	0.003
Cation sum	meq/L	-9999			6.49	6.44
Anion Sum	meq/L	-9999			7.63	7.11
Anion-Cation Balance	% difference	-9999			-8.06	-5.01



FINAL REPORT

CA14319-MAY23 R1

Client: D.M. Wills -Peterborough

Project: 85260

Project Manager: Lynsey Tutters

Samplers: J.Gorman

MATRIX: WATER

Sample Number	7	8
Sample Name	85260 Well 2 - 1hr	85260 Well 2 - 6hr
Sample Matrix	Ground Water	Ground Water
Sample Date	11/05/2023	11/05/2023

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result	Result
-----------	-------	----	----	----	--------	--------

Microbiology

Total Coliform	cfu/100mL	0		0	0	0
E. Coli	cfu/100mL	0		0	0	0
Heterotrophic Plate Count (HPC)	cfu/1mL	0			74	26

Other (ORP)

pH	No unit	0.05	8.5		7.80	7.85
Chloride	mg/L	1	250		45	42
Mercury (total)	mg/L	0.00001			< 0.00001	< 0.00001

Phenols

4AAP-Phenolics	mg/L	0.002			< 0.002	< 0.002
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EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	ODWS_AO_OG /	ODWS_MAC /
				WATER / - - Table 4	WATER / - - Table
				- Drinking Water -	1,2 and 3 -
				Reg O.169_03	Drinking Water -
					Reg O.169_03
				L1	L2

85260 Well 2 - 1hr

Turbidity	SM 2130	NTU	13	5	1
Hardness	SM 3030/EPA 200.8	mg/L as CaCO3	286	100	
Iron	SM 3030/EPA 200.8	mg/L	0.945	0.3	

85260 Well 2 - 6hr

Turbidity	SM 2130	NTU	11	5	1
Hardness	SM 3030/EPA 200.8	mg/L as CaCO3	285	100	
Iron	SM 3030/EPA 200.8	mg/L	0.815	0.3	



FINAL REPORT

CA14319-MAY23 R1

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0342-MAY23	mg/L as CaCO3	2	< 2	2	20	98	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0142-MAY23	mg/L	0.04	<0.04	ND	10	100	90	110	93	75	125

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO5076-MAY23	mg/L	1	<1	2	20	111	80	120	78	75	125
Sulphate	DIO5076-MAY23	mg/L	2	<2	3	20	110	80	120	103	75	125
Chloride	DIO5077-MAY23	mg/L	1	<1	6	20	104	80	120	99	75	125
Sulphate	DIO5077-MAY23	mg/L	2	<2	9	20	107	80	120	101	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Bromide	DIO0357-MAY23	mg/L	0.3	<0.3	ND	20	99	90	110	94	75	125
Nitrite (as N)	DIO0357-MAY23	mg/L	0.03	<0.03	ND	20	99	90	110	99	75	125
Nitrate (as N)	DIO0357-MAY23	mg/L	0.06	<0.06	1	20	103	90	110	105	75	125
Bromide	DIO0358-MAY23	mg/L	0.3	<0.3	ND	20	101	90	110	95	75	125
Nitrite (as N)	DIO0358-MAY23	mg/L	0.03	<0.03	ND	20	99	90	110	97	75	125
Nitrate (as N)	DIO0358-MAY23	mg/L	0.06	<0.06	ND	20	100	90	110	101	75	125

QC SUMMARY

Carbon by SFA

Method: SM 5310 | Internal ref.: ME-CA-ENVISFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0144-MAY23	mg/L	1	<1	ND	20	96	90	110	100	75	125
Total Organic Carbon	SKA0144-MAY23	mg/L	1	<1	ND	20	96	90	110	100	75	125

Carbonate/Bicarbonate

Method: SM 2320 | Internal ref.: ME-CA-ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Carbonate	EWL0342-MAY23	mg/L as CaCO3	2	< 2	ND	10	NA	90	110	NA		
Bicarbonate	EWL0342-MAY23	mg/L as CaCO3	2	2	ND	10	NA	90	110	NA		
OH	EWL0342-MAY23	mg/L as CaCO3	2	< 2	ND	10	NA	90	110	NA		

QC SUMMARY

Colour

Method: SM 2120 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Colour	EWL0328-MAY23	TCU	3	< 3	4	10	105	80	120	NA		

Conductivity

Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0342-MAY23	uS/cm	2	5	0	20	99	90	110	NA		

Fluoride by Specific Ion Electrode

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-014

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Fluoride	EWL0336-MAY23	mg/L	0.06	<0.06	ND	10	101	90	110	95	75 125	



FINAL REPORT

CA14319-MAY23 R1

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0027-MAY23	mg/L	0.00001	< 0.00001	0	20	116	80	120	115	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0108-MAY23	mg/L	0.00005	<0.00005	ND	20	100	90	110	91	70	130
Aluminum (total)	EMS0108-MAY23	mg/L	0.001	<0.001	5	20	101	90	110	106	70	130
Arsenic (total)	EMS0108-MAY23	mg/L	0.0002	<0.0002	2	20	99	90	110	110	70	130
Barium (total)	EMS0108-MAY23	mg/L	0.00008	<0.00008	3	20	97	90	110	108	70	130
Beryllium (total)	EMS0108-MAY23	mg/L	0.000007	<0.000007	ND	20	104	90	110	109	70	130
Boron (total)	EMS0108-MAY23	mg/L	0.002	<0.002	4	20	106	90	110	99	70	130
Bismuth (total)	EMS0108-MAY23	mg/L	0.00001	<0.00001	ND	20	97	90	110	88	70	130
Calcium (total)	EMS0108-MAY23	mg/L	0.01	<0.01	1	20	98	90	110	97	70	130
Cadmium (total)	EMS0108-MAY23	mg/L	0.000003	<0.000003	ND	20	99	90	110	114	70	130
Cobalt (total)	EMS0108-MAY23	mg/L	0.000004	<0.000004	1	20	97	90	110	97	70	130
Chromium (total)	EMS0108-MAY23	mg/L	0.00008	<0.00008	ND	20	97	90	110	121	70	130
Copper (total)	EMS0108-MAY23	mg/L	0.0002	<0.0002	0	20	99	90	110	103	70	130
Iron (total)	EMS0108-MAY23	mg/L	0.007	<0.007	0	20	100	90	110	NV	70	130
Potassium (total)	EMS0108-MAY23	mg/L	0.009	<0.009	2	20	105	90	110	98	70	130
Magnesium (total)	EMS0108-MAY23	mg/L	0.001	<0.001	1	20	104	90	110	100	70	130
Manganese (total)	EMS0108-MAY23	mg/L	0.00001	<0.00001	2	20	100	90	110	107	70	130
Molybdenum (total)	EMS0108-MAY23	mg/L	0.00004	<0.00004	ND	20	98	90	110	99	70	130
Sodium (total)	EMS0108-MAY23	mg/L	0.01	<0.01	1	20	100	90	110	95	70	130
Nickel (total)	EMS0108-MAY23	mg/L	0.0001	<0.0001	2	20	99	90	110	98	70	130
Lead (total)	EMS0108-MAY23	mg/L	0.00009	<0.00009	ND	20	101	90	110	90	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	EMS0108-MAY23	mg/L	0.003	<0.003	12	20	99	90	110	NV	70	130
Antimony (total)	EMS0108-MAY23	mg/L	0.0009	<0.0009	ND	20	103	90	110	109	70	130
Selenium (total)	EMS0108-MAY23	mg/L	0.00004	<0.00004	ND	20	92	90	110	110	70	130
Silicon (total)	EMS0108-MAY23	mg/L	0.02	<0.02	1	20	100	90	110	NV	70	130
Tin (total)	EMS0108-MAY23	mg/L	0.00006	<0.00006	3	20	105	90	110	NV	70	130
Strontium (total)	EMS0108-MAY23	mg/L	0.00008	<0.00008	1	20	100	90	110	80	70	130
Titanium (total)	EMS0108-MAY23	mg/L	0.00005	<0.00005	ND	20	108	90	110	NV	70	130
Thallium (total)	EMS0108-MAY23	mg/L	0.000005	<0.000005	ND	20	101	90	110	96	70	130
Uranium (total)	EMS0108-MAY23	mg/L	0.000002	<0.000002	7	20	98	90	110	95	70	130
Vanadium (total)	EMS0108-MAY23	mg/L	0.00001	<0.00001	4	20	98	90	110	98	70	130
Zinc (total)	EMS0108-MAY23	mg/L	0.002	<0.002	ND	20	100	90	110	111	70	130
Boron (total)	EMS0139-MAY23	mg/L	0.002	<0.002	4	20	106	90	110	104	70	130



FINAL REPORT

CA14319-MAY23 R1

QC SUMMARY

Microbiology

Method: OMOE MICROMFDC-E3407A | Internal ref.: ME-CA-1ENVIMIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
E. Coli	BAC9233-MAY23	cfu/100mL	-	ACCEPTED	ACCEPTED							
Heterotrophic Plate Count (HPC)	BAC9233-MAY23	cfu/1mL	-	ACCEPTED	ACCEPTED							
Total Coliform	BAC9233-MAY23	cfu/100mL	-	ACCEPTED	ACCEPTED							

pH

Method: SM 4500 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0342-MAY23	No unit	0.05	NA	0		100			NA		



FINAL REPORT

CA14319-MAY23 R1

QC SUMMARY

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0145-MAY23	mg/L	0.002	<0.002	ND	10	98	80	120	96	75	125

Sulphide by SFA

Method: SM 4500 | Internal ref.: ME-CA-IENVISFA-LAK-AN-008

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphide	SKA0149-MAY23	mg/L	0.02	<0.02	ND	20	96	80	120	NA	75	125

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0320-MAY23	mg/L	2	< 2	1	10	97	90	110	NA		



FINAL REPORT

CA14319-MAY23 R1

QC SUMMARY

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen (N)	SKA0148-MAY23	mg/L	0.05	<0.05	0	10	105	90	110	106	75	125

Turbidity

Method: SM 2130 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Turbidity	EWL0319-MAY23	NTU	0.10	< 0.10	ND	10	99	90	110	NA		

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

- NSS** Insufficient sample for analysis.
- RL** Reporting Limit.
 - ↑ Reporting limit raised.
 - ↓ Reporting limit lowered.
- NA** The sample was not analysed for this analyte
- ND** Non Detect

Results relate only to the sample tested.

Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.

"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm.

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This report supersedes all previous versions.

-- End of Analytical Report --



Request for Laboratory Services and CHAIN OF CUSTODY

Laboratory Information Section - Lab use only

Received By: Katelyn Medland Received By (signature): [Signature]
 Received Date: 05/11/23 (mm/dd/yy) Custody Seal Present: Yes No Cooling Agent Present: Yes No Type: ke
 Received Time: 17:00 (hr:min) Custody Seal Intact: Yes No Temperature Upon Receipt (°C): 16.16.16
 LAB LIMS #: CA14319-May23

REPORT INFORMATION	INVOICE INFORMATION	QUOTATION AND PROJECT INFO
Company: <u>DM Wills</u> Contact: <u>Lynsey Tutters</u> Address: <u>150 Jameson Dr Peterborough</u> Phone: <u>289-385-6230</u> Fax: _____ Email: <u>ltutters@dmwills.com</u>	<input checked="" type="checkbox"/> (same as Report Information) Company: _____ Contact: _____ Address: _____ Phone: _____ Email: <u>accounts@dmwills.com</u>	Quotation #: _____ P.O. #: <u>85260</u> Project #: <u>85260</u> Site Location/ID: _____
TURNAROUND TIME (TAT) REQUIRED		
<input checked="" type="checkbox"/> Regular TAT (5-7 days) TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day RUSH TAT (Additional Charges May Apply): <input type="checkbox"/> 1 Day <input type="checkbox"/> 2 Days <input type="checkbox"/> 3 Days <input type="checkbox"/> 4 Days PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION		
Specify Due Date: _____		*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS **ANALYSIS REQUESTED**

<input type="checkbox"/> O.Reg 153/04 <input type="checkbox"/> O.Reg 406/19 <input type="checkbox"/> Table 1 <input type="checkbox"/> Res/Park <input type="checkbox"/> Soil Texture: <input type="checkbox"/> Table 2 <input type="checkbox"/> Ind/Com <input type="checkbox"/> Coarse <input type="checkbox"/> Table 3 <input type="checkbox"/> Agri/Other <input type="checkbox"/> Medium/Fine <input type="checkbox"/> Table _____ Appx. _____ Soil Volume <input type="checkbox"/> <350m3 <input type="checkbox"/> >350m3	Other Regulations: <input type="checkbox"/> Reg 347/558 (3 Day min TAT) <input type="checkbox"/> PWQO <input type="checkbox"/> MMR <input type="checkbox"/> CCME <input type="checkbox"/> Other: <input type="checkbox"/> MISA <input checked="" type="checkbox"/> ODWS Not Reportable *See note	Sewer By-Law: <input type="checkbox"/> Sanitary <input type="checkbox"/> Storm Municipality: _____	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>M & I</th> <th>SVOC</th> <th>PCB</th> <th>PHC</th> <th>VOC</th> <th>Pest</th> <th>Other (please specify)</th> <th>SPLP</th> <th>TCLP</th> </tr> <tr> <td style="font-size: small;">Field Filtered (Y/N) Metals & Inorganics (incl. CrVI, CN, Hg, pH, (B)HWS, (EC, SAR-soil) (Cl, Ni-water) Full Metals Suite (Cr metals plus Sr/Mn/S-soil only) Hg, CrVI ICP Metals only Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mo, Ni, PAHs only SVOCs (all incl. PAHs, ABNs, CPs) PCBs Total <input type="checkbox"/> Arochlor <input type="checkbox"/> F1-F4 + BTEX F1-F4 only no BTEX VOCs all incl. BTEX BTEX only Pesticides Organochlorine or specify other</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Specify tests</td> <td>Specify tests</td> </tr> </table>	M & I	SVOC	PCB	PHC	VOC	Pest	Other (please specify)	SPLP	TCLP	Field Filtered (Y/N) Metals & Inorganics (incl. CrVI, CN, Hg, pH, (B)HWS, (EC, SAR-soil) (Cl, Ni-water) Full Metals Suite (Cr metals plus Sr/Mn/S-soil only) Hg, CrVI ICP Metals only Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mo, Ni, PAHs only SVOCs (all incl. PAHs, ABNs, CPs) PCBs Total <input type="checkbox"/> Arochlor <input type="checkbox"/> F1-F4 + BTEX F1-F4 only no BTEX VOCs all incl. BTEX BTEX only Pesticides Organochlorine or specify other							Specify tests	Specify tests
M & I	SVOC	PCB	PHC	VOC	Pest	Other (please specify)	SPLP	TCLP													
Field Filtered (Y/N) Metals & Inorganics (incl. CrVI, CN, Hg, pH, (B)HWS, (EC, SAR-soil) (Cl, Ni-water) Full Metals Suite (Cr metals plus Sr/Mn/S-soil only) Hg, CrVI ICP Metals only Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mo, Ni, PAHs only SVOCs (all incl. PAHs, ABNs, CPs) PCBs Total <input type="checkbox"/> Arochlor <input type="checkbox"/> F1-F4 + BTEX F1-F4 only no BTEX VOCs all incl. BTEX BTEX only Pesticides Organochlorine or specify other							Specify tests	Specify tests													

RECORD OF SITE CONDITION (RSC) YES NO

SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	Metals & Inorganics	Full Metals Suite	ICP Metals only	PAHs only	SVOCs	PCBs	F1-F4 + BTEX	F1-F4 only no BTEX	VOCs	BTEX only	Pesticides	Sewer Use:	Water Characterization Pkg:	SPLP	TCLP	COMMENTS:			
1	85260 Well 2 - 1hr	May 11/23	9:15am	14	GW	N												<input checked="" type="checkbox"/> General <input type="checkbox"/> Extended	<input type="checkbox"/> Metals <input type="checkbox"/> M&I	<input type="checkbox"/> VOC <input type="checkbox"/> VOC		<input type="checkbox"/> 1,4-Dioxane <input type="checkbox"/> PCB	<input type="checkbox"/> B(a)P <input type="checkbox"/> ABN <input type="checkbox"/> ABN <input type="checkbox"/> Ignit.	
2	85260 Well 2 - 6hr	May 11/23	2:00pm	14	GW	N												<input checked="" type="checkbox"/> General <input type="checkbox"/> Extended	<input type="checkbox"/> Metals <input type="checkbox"/> M&I	<input type="checkbox"/> VOC <input type="checkbox"/> VOC		<input type="checkbox"/> 1,4-Dioxane <input type="checkbox"/> PCB	<input type="checkbox"/> B(a)P <input type="checkbox"/> ABN <input type="checkbox"/> ABN <input type="checkbox"/> Ignit.	
3																								
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10																								
11																								
12																								

Observations/Comments/Special Instructions

Sampled By (NAME): <u>J. Gorman</u>	Signature: <u>[Signature]</u>	Date: <u>05/11/2023</u> (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME): <u>J. Gorman</u>	Signature: <u>[Signature]</u>	Date: <u>05/11/2023</u> (mm/dd/yy)	Yellow & White Copy - SGS



SGS Canada Inc.

P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - K0L 2H0
Phone: 705-652-2000 FAX: 705-652-6365

11-September-2025

Granite Ridge Estates

Attn : Jeff Chesher

Date Rec. : 29 August 2025
LR Report: CA17251-AUG25

PO Box 100,
Buckhorn,
ON. K0L 1J0
Phone:705-657-9311
Email: crystal@buckhornsandgravel.com

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MAC	6: AO/OG	7: NR 949 Eighth Line sample 1	8: NR 949 Eighth Line sample 2
Sample Date & Time							29-Aug-25 09:00	29-Aug-25 13:58
Temperature Upon Receipt [°C]	---	---	---	---	---	---	16.0	16.0
UV Transmittance [%T]	03-Sep-25	14:21	03-Sep-25	15:39	---	---	92.6	92.6
Colour [TCU]	02-Sep-25	14:55	02-Sep-25	16:13	---	5	17	15
Alkalinity [mg/L as CaCO3]	02-Sep-25	08:13	09-Sep-25	14:57	---	30-500	274	268
Conductivity [uS/cm]	02-Sep-25	08:13	09-Sep-25	14:57	---	---	627	615
Temperature @ pH [°C]	02-Sep-25	08:13	---	---	---	---	19.9	18.2
pH [No unit]	02-Sep-25	08:13	02-Sep-25	14:09	---	6.5-8.5	7.17	7.32
Total Suspended Solids [mg/L]	04-Sep-25	08:27	05-Sep-25	14:23	---	---	2	2
Total Dissolved Solids [mg/L]	29-Aug-25	17:28	02-Sep-25	15:54	---	500	351	377
Turbidity [NTU]	29-Aug-25	19:45	02-Sep-25	09:15	1	5	20	14
Hydrogen Sulphide [ug/L]	04-Sep-25	13:49	11-Sep-25	09:41	---	50	< 6	< 6
Sulphide [ug/L]	04-Sep-25	13:49	11-Sep-25	09:40	---	50 (as H2S)	7.0	< 6
Organic Nitrogen [mg/L]	29-Aug-25	15:37	09-Sep-25	08:53	---	0.15	< 0.05	0.05
Total Kjeldahl Nitrogen (N) [mg/L]	29-Aug-25	15:37	02-Sep-25	15:19	---	---	0.07	0.06
Ammonia+Ammonium (N) [mg/L]	02-Sep-25	09:37	03-Sep-25	08:58	---	---	< 0.04	< 0.04
Dissolved Organic Carbon [mg/L]	03-Sep-25	15:21	04-Sep-25	08:13	---	5	< 1	< 1
Fluoride [mg/L]	02-Sep-25	09:28	02-Sep-25	13:21	1.5	---	0.17	0.22
Nitrite (as N) [mg/L]	30-Aug-25	09:37	02-Sep-25	13:11	1	---	<0.003	<0.003
Nitrate (as N) [mg/L]	30-Aug-25	09:37	02-Sep-25	13:11	10	---	<0.006	<0.006
Chloride [mg/L]	30-Aug-25	12:36	02-Sep-25	15:07	---	250	31	31
Sulphate [mg/L]	30-Aug-25	12:36	02-Sep-25	15:07	---	500	33	33
Mercury [ug/L]	04-Sep-25	12:52	04-Sep-25	13:21	1	---	<0.01	<0.01
Hardness [mg/L as CaCO3]	04-Sep-25	09:46	05-Sep-25	13:04	---	80-100	289	298
Aluminum [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	---	100	1	<1
Antimony [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	6	---	<0.6	<0.6
Arsenic [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	10	---	0.3	<0.2
Barium [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	1000	---	130	130
Boron [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	5000	---	29	31
Calcium [mg/L]	04-Sep-25	09:46	05-Sep-25	13:04	---	---	85.5	88.7
Cadmium [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	5	---	<0.003	<0.003
Chromium [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	50	---	<0.08	<0.08
Cobalt [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	---	---	0.022	0.016
Copper [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	---	1000	<0.2	<0.2
Iron [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	---	300	1200	880
Lead [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	10	---	<0.01	<0.01
Magnesium [mg/L]	04-Sep-25	09:46	05-Sep-25	13:04	---	---	18.4	18.5
Manganese [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	---	50	33	28
Nickel [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	---	---	0.2	0.2

Online LIMS

0004253559

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MAC	6: AO/OG	7: NR 949 Eighth Line sample 1	8: NR 949 Eighth Line sample 2
Potassium [mg/L]	04-Sep-25	09:46	05-Sep-25	13:04	---	---	2.26	2.30
Selenium [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	50	---	<0.04	<0.04
Silver [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	---	---	<0.05	<0.05
Sodium [mg/L]	04-Sep-25	09:46	05-Sep-25	13:04	20	200	15.5	15.4
Uranium [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	20	---	1.7	1.2
Zinc [ug/L]	04-Sep-25	09:46	05-Sep-25	13:04	---	5000	<2	<2
Total Coliform [cfu/100mL]	29-Aug-25	16:10	01-Sep-25	20:56	0	---	0	0
E. Coli [cfu/100mL]	29-Aug-25	16:10	01-Sep-25	20:56	0	---	0	0

MAC - Maximum Acceptable Concentration

AO/OG - Aesthetic Objective / Operational Guideline

NR - Not regulated under applicable Provincial drinking water regulations as per client.

Note: Hydrogen Sulphide (H₂S) calculated using Lab results for pH, temperature and conductivity.

Method Descriptions

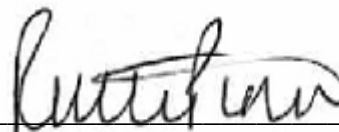
Units	Description	SGS Method Code
mg/L as CaCO ₃	Alkalinity by Titration	ME-CA-[ENV]EWL-LAK-AN-006
ug/L	Aluminum by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	NH ₃ +NH ₄ by Skalar - drinking water to MDL	ME-CA-[ENV]SFA-LAK-AN-007
ug/L	Antimony by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
ug/L	Arsenic by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
ug/L	Barium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
ug/L	Boron by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
ug/L	Cadmium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Calcium by ICP-MS drinking water	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Chloride by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
ug/L	Chromium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
ug/L	Cobalt by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
TCU	True Colour by colourimetric method	ME-CA-[ENV]EWL-LAK-AN-002
uS/cm	Conductivity by Conductivity Meter	ME-CA-[ENV]EWL-LAK-AN-006
ug/L	Copper by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	DOC by Skalar	ME-CA-[ENV]SFA-LAK-AN-009
cfu/100mL	E.Coli by membrane filtration on DC media	ME-CA-[ENV]MIC-LAK-AN-001
mg/L	Fluoride by specific ion electrode	ME-CA-[ENV]EWL-LAK-AN-014
mg/L as CaCO ₃	Hardness (CaCO ₃) by ICP	ME-CA-[ENV]SPE-LAK-AN-003
ug/L	H ₂ S calculation form Sulphide	ME-CA-[ENV]SFA-LAK-AN-008
ug/L	Iron by ICP-MS drinking water	ME-CA-[ENV]SPE-LAK-AN-006
ug/L	Lead by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Magnesium by ICP-MS drinking water	ME-CA-[ENV]SPE-LAK-AN-006
ug/L	Manganese by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
ug/L	Hg drinking water by CVAAS	ME-CA-[ENV]SPE-LAK-AN-004
ug/L	Nickel by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Nitrate by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
mg/L	Nitrite by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
mg/L	TKN-NH ₃ = Org N	calculation
No unit	pH - solution	ME-CA-[ENV]EWL-LAK-AN-006
mg/L	Potassium by ICP-MS drinking water	ME-CA-[ENV]SPE-LAK-AN-006
ug/L	Selenium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
ug/L	Silver by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Sodium by ICP-MS drinking water	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Sulphate by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
ug/L	Sulphide by Skalar	ME-CA-[ENV]SFA-LAK-AN-008
°C	Temperature at time of pH	
cfu/100mL	Total Coliform by membrane filtration using DC media	ME-CA-[ENV]MIC-LAK-AN-001
mg/L	Total Dissolved Solids by Gravimetric	ME-CA-[ENV]EWL-LAK-AN-005
mg/L	Tot. kjeldahl Nitrogen by Skalar - drinking water	ME-CA-[ENV]SFA-LAK-AN-002
mg/L	Total Suspended Solids	ME-CA-[ENV]EWL-LAK-AN-004

SGS Canada Inc.

P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2H0
Phone: 705-652-2000 FAX: 705-652-6365

LR Report : CA17251-AUG25

Units	Description	SGS Method Code
NTU	Turbidity - APHA.AWWA.WPCF 2130B	ME-CA-[ENV]EWL-LAK-AN-003
ug/L	Uranium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
%T	UV Transmittance by spectrophotometer	ME-CA-[ENV]EWL-LAK-AN-012
ug/L	Zinc by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006



Ruth Pinn
Project Specialist,
Environment, Health & Safety

Appendix J

Groundwater Impact Assessment



Reasonable Use Guideline - Maximum Acceptable Concentration Equation

$$C_m = f(Cr)$$

Where: C_m = Acceptable concentration at property boundary
 f = constant equal to 0.25 (health related parameter) or 0.5 (non-health related parameter)
 Cr = ODWQS Nitrate Concentration

Therefore,

$$C_M = 0.25(10)$$

$$C_M = \mathbf{2.50 \quad mg/L}$$

Contaminant Attenuation Calculations

$$V_A = A_D \times K$$

$$V_T = V_A + V_S$$

$$C_M = (C_S \times V_S) / V_T$$

Where: V_A = annual dilution volume (m^3)
 A_D = dilution area (m^2) = 8,995.00 m^2
 V_T = total volume of water (m^3)
 V_S = annual sewage volume (m^3) = 365 days x 6 m^3 /day = 2,190 m^3
 C_M = concentration at property boundary (mg/L)
 C_{PB} = allowable concentration in sewage (mg/L)
 K = 0.25 m - constant: 250 mm annual dilution precipitation rate

Therefore,

$$V_A = 8,995 \times 0.25$$

$$V_A = 2,249 \text{ m}^3$$

$$V_T = 2,249 + 2,190$$

$$V_T = 4,439$$

$$C_{PB} = (C_M \times V_T) / V_S$$

$$= (2.5 \times 4,439) / 2,190$$

$$C_{PB} = \mathbf{5.1 \quad mg/L}$$

Therefore, the allowable nitrate concentration in the sewage may not exceed 5.1 mg/L in order to achieve a nitrate (as N) concentration BELOW the RUC acceptable concentration (2.50 mg/L) at the property boundary.

Appendix K

**Report Addendum – Groundwater Impact Assessment
Update, March 2024**





April 11, 2024

Jeff Chesher
P.O. Box 100
Buckhorn, ON
K0L 1J0

**Re: Addendum to Hydrogeological Report - Groundwater Impact Assessment – March 2024 Update
Bridgenorth Townhouse Development
949 Eighth Line, Bridgenorth, Township of Selwyn
D.M. Wills Associates Project No. 22-85260**

PARTNERS IN
ENGINEERING, PLANNING &
ENVIRONMENTAL SERVICES

D.M. Wills Associates Limited (Wills) was retained by Jeff Chesher (Client) to update the Groundwater Impact Assessment included in Wills' Hydrogeological Study (Study) for the proposed Townhouse Development (Proposed Development) at 949 Eighth Line, Bridgenorth, Township of Selwyn (Subject Property).

Wills Hydrogeological Study Report (Report) was submitted to the Client as Final on November 29, 2023. Wills Study was initially based on a Proposed Development that included two three-unit townhouses and one four-bedroom existing dwelling.

The Client has since updated the Proposed Development to include three three-unit townhouses. Wills understands that the existing dwelling will be demolished. Wills prepared an updated Site Plan, dated December 20, 2023, of the Proposed Development layout. The updated Site Plan is found enclosed to this addendum.

The updated daily flows to the proposed sewage systems on the Subject Property are assumed to be 9,750 L/day, as provided by the Client.

The Groundwater Impact Assessment procedures were conducted as per **Section 6.1** and **Section 6.2** of the original Study Report. Based on the updated Site Plan and estimated daily sewage flows, the following inputs were used in the dilution model equation:

- The Contaminant Attenuation Zone (CAZ) dilution area (A_D) was estimated to be 7,914 m².
- The annual sewage volume (V_S) was calculated as a product of the anticipated sewage flows for the Proposed Development (9,750 L/day) over a 365-day period, equal to 3,577 m³.

Based on the updated model, sewage effluent containing 3.9 mg/L nitrate-N would result in an acceptable level of nitrate-N at the down gradient property



boundary. **Figure 1** shows the CAZ and is found enclosed to this addendum. Additionally, the detailed calculations for the Groundwater Impact Assessment are found enclosed.

The following conclusions and recommendations are provided based on the updated Site Plan for the Proposed Development:

- The updated Groundwater Impact Assessment concludes that the Subject Property could support the Proposed Development if sewage effluent leaving each proposed sewage system contains at a maximum 3.9 mg/L nitrate-N. This nitrate concentration would result in an acceptable level of nitrate-N at the down gradient property boundary and would not degrade downgradient shallow groundwater quality beyond the *MOE Design Guidelines*.
- A new water supply well should be drilled on the Subject Property to supply water to the additional townhouse. This new water supply well should undergo a 6-hour constant rate pumping test to assess the water supply availability for the Subject Property, based on the additional townhouse and updated daily flow rates.

Respectfully Submitted,



Lynsey Tuters, B.A., C. Tech
Senior Environmental Technologist



Ian Ames, M.Sc., P.Geo.
Group Leader, Environmental Monitoring and Management

LT/IA

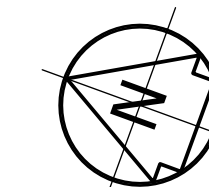
Enclosures:

Figure 1

Updated Site Plan, December 20, 2023

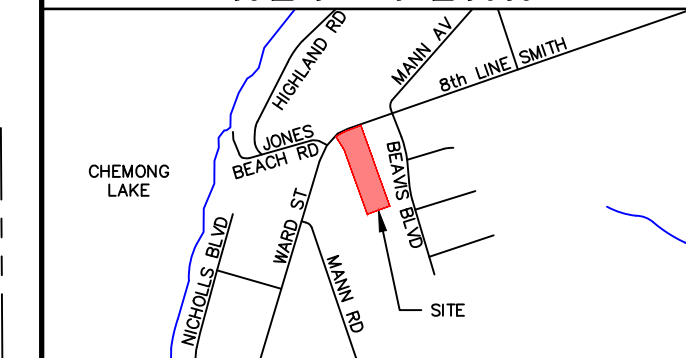
Groundwater Impact Assessment Calculations

BM1 - ELEV. 264.03
TOP OF IRON BAR IN
NORTHWEST CORNER OF SITE.



TRUE NORTH

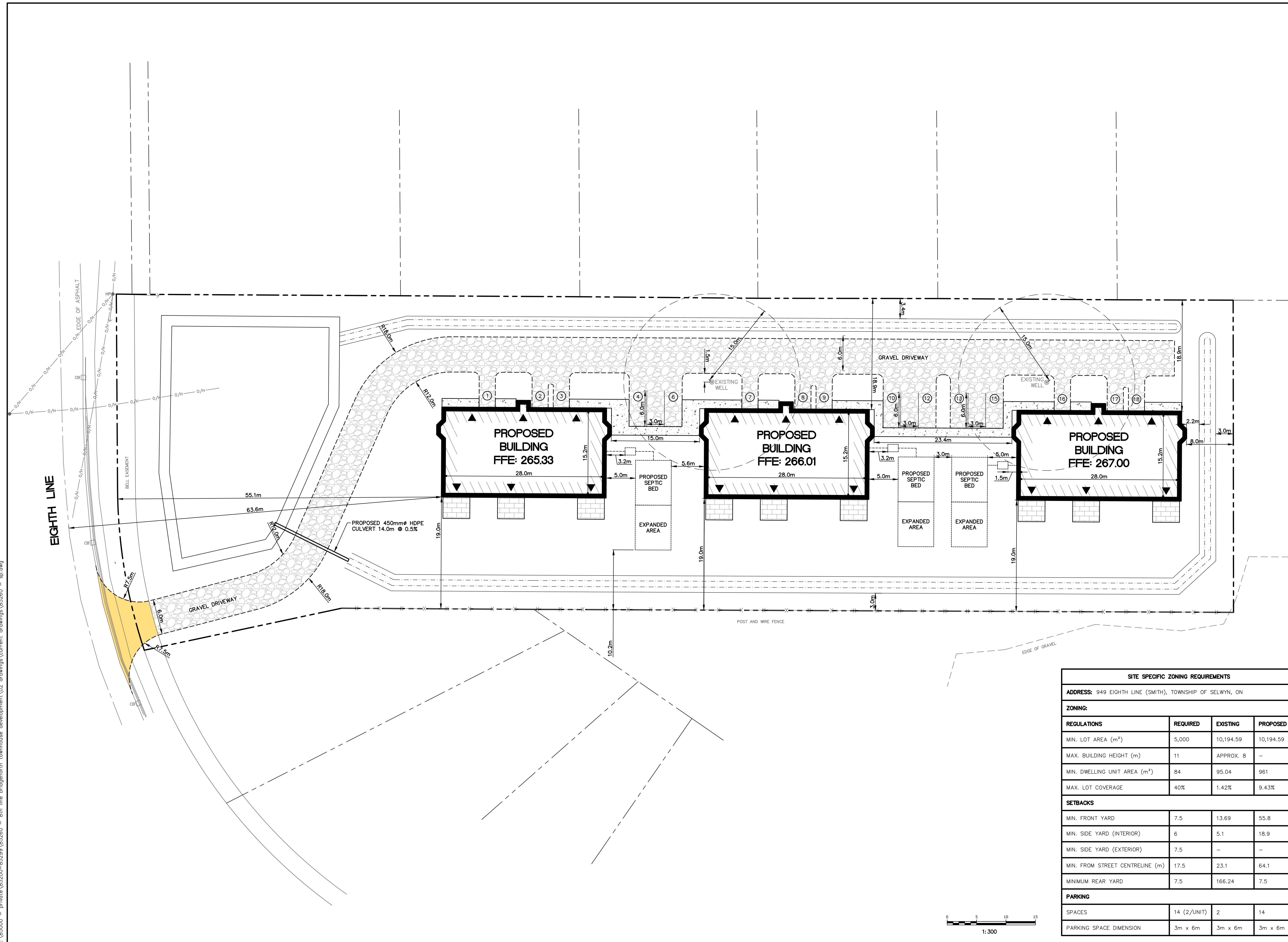
KEY PLAN



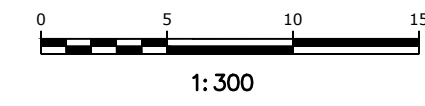
No.	Description	Date
1	1ST SUBMISSION	20/12/23

METRIC
Dimensions are in METRES and/or MILLIMETRES unless otherwise shown
TO BE READ IN CONJUNCTION WITH QPSD 100 SERIES

LEGEND	
	PR. ASPHALT
	PR. GRAVEL
	PR. CONCRETE
	PR. INTERLOCK
	EX./PR. BUILDING
	EX./PR. EDGE OF PAVEMENT
	EX./PR. CURB
	EX. ROAD CENTERLINE
	EX. EDGE OF SHOULDER
	EX. CATCH BASIN
	EX. STORM SEWER
	PR. DITCH
	PR. CULVERT
	EX. HYDRO POLE
	EX. OVERHEAD HYDRO
	EX. BELL PEDESTAL
	EX./PR. CONTOUR
	EX. FENCE
	R.O.W.
	PROPERTY LINE



SITE SPECIFIC ZONING REQUIREMENTS			
ADDRESS: 949 EIGHTH LINE (SMITH), TOWNSHIP OF SELWYN, ON			
ZONING:			
REGULATIONS	REQUIRED	EXISTING	PROPOSED
MIN. LOT AREA (m ²)	5,000	10,194.59	10,194.59
MAX. BUILDING HEIGHT (m)	11	APPROX. 8	-
MIN. DWELLING UNIT AREA (m ²)	84	95.04	961
MAX. LOT COVERAGE	40%	1.42%	9.43%
SETBACKS			
MIN. FRONT YARD	7.5	13.69	55.8
MIN. SIDE YARD (INTERIOR)	6	5.1	18.9
MIN. SIDE YARD (EXTERIOR)	7.5	-	-
MIN. FROM STREET CENTRELINE (m)	17.5	23.1	64.1
MINIMUM REAR YARD	7.5	166.24	7.5
PARKING			
SPACES	14 (2/UNIT)	2	14
PARKING SPACE DIMENSION	3m x 6m	3m x 6m	3m x 6m



D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9
P. 705.742.2297
F. 705.748.9944
E. wills@dmwills.com

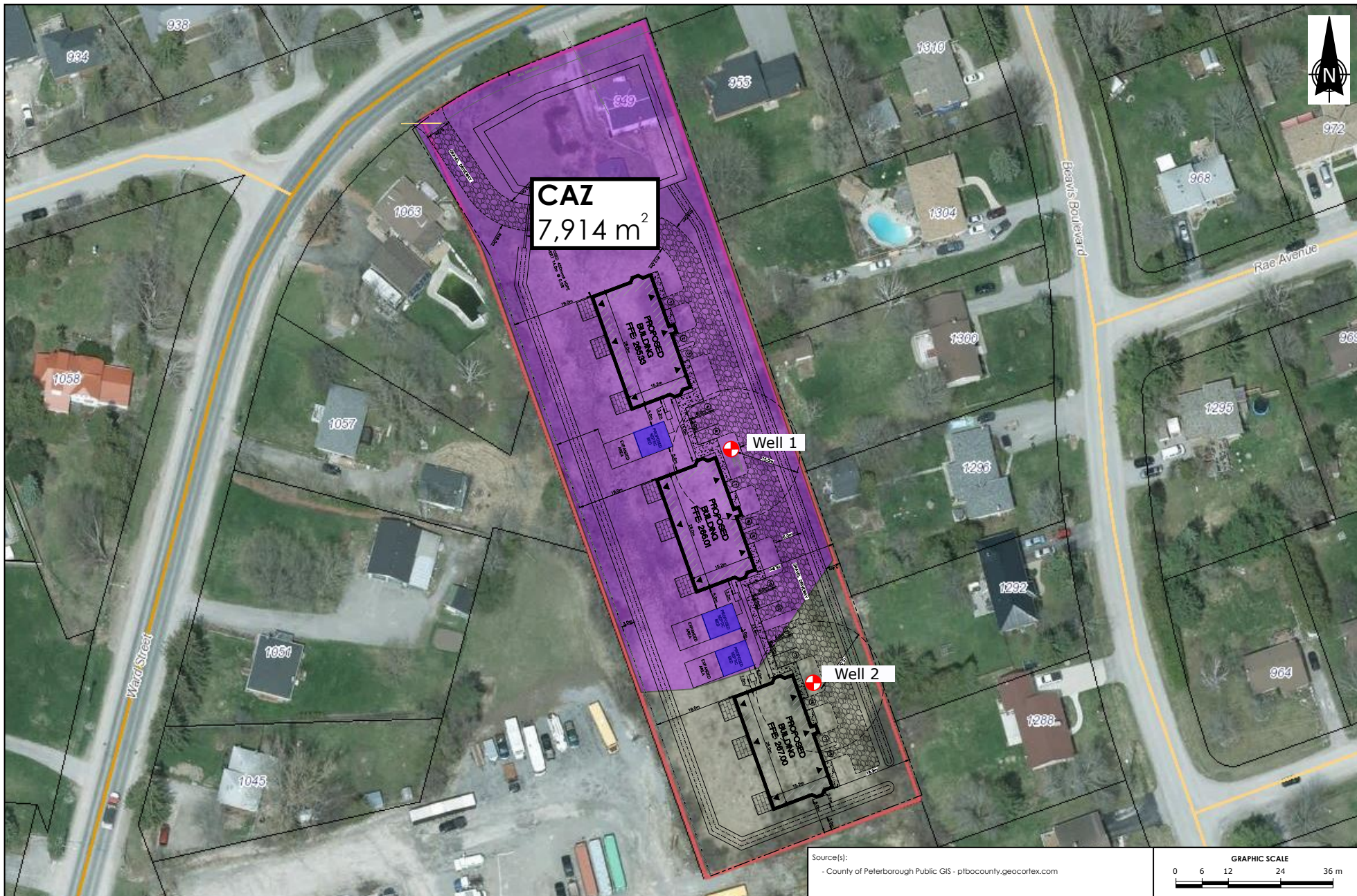
Project Name/Location
BRIDGENORTH TOWNHOUSE DEVELOPMENT
BRIDGENORTH, ONTARIO

Drawing Title
SITE PLAN

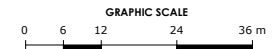
Drawn By: M.G.	SCALE: Horz. 1:300	Vert. -
Designed By: M.G.	Plot Date: DECEMBER 20, 2023	
Checked By: J.F./J.R.	Project No.: 22-85260	Sht. No.:
Engineer: E.S.P.	Dwg File No.: 85260 - SP	400

NOT FOR CONSTRUCTION

Printed By: m:\projects\bridgenorth\development\02_drawing\current_drawing\85260 - sp.dwg
 c:\85000 - private\85200-85260 - 8th line bridgenorth townhouse development\02_drawing\current_drawing\85260 - sp.dwg



Source(s):
 - County of Peterborough Public GIS - ptbocounty.geocortex.com



Legend	
	Subject Property
	Contaminant Attenuation Zone (CAZ)
	Proposed Sewage Disposal System
	Water Supply Well

Contaminant Attenuation

949 Eighth Line, Lakefield, Ontario



D.M. Wills Associates Limited
 150 Jameson Drive
 Peterborough, Ontario
 K9J 0B9

P. 705.742.2297
 F. 705.748.9944
 E. wills@dmwills.com

Drawn by:	L. Tuters	Scale:	1:1,200 on 8.5"x11" (US Letter)
Checked:	I. Ames	Date:	March 7, 2024
Project No.:	85260	Drawing file No.:	Figure 1

Reasonable Use Guideline - Maximum Acceptable Concentration Equation

$$C_m = f(C_r)$$

Where: C_m = Acceptable concentration at property boundary
 f = constant equal to 0.25 (health related parameter) or 0.5 (non-health related parameter)
 C_r = ODWQS Nitrate Concentration

Therefore,

$$C_M = 0.25(10)$$

$$\mathbf{C_M = 2.50 \quad mg/L}$$

Contaminant Attenuation Calculations

$$V_A = A_D \times K$$

$$V_T = V_A + V_S$$

$$C_M = (C_S \times V_S) / V_T$$

Where: V_A = annual dilution volume (m^3)
 A_D = dilution area (m^2) = 7,914.00 m^2
 V_T = total volume of water (m^3)
 V_S = annual sewage volume (m^3) = 365 days x 9.8 m^3 /day = 3577 m^3
 C_M = concentration at property boundary (mg/L)
 C_{PB} = allowable concentration in sewage (mg/L)
 $K = 0.25$ m - constant: 250 mm annual dilution precipitation rate

Therefore,

$$V_A = 7914 \times 0.25$$

$$V_A = 1979 \text{ m}^3$$

$$V_T = 1979 + 3,577$$

$$V_T = 5,556$$

$$C_{PB} = (C_M \times V_T) / V_S$$

$$= (2.5 \times 5,556) / 3,577$$

$$\mathbf{C_{PB} = 3.9 \quad mg/L}$$

Therefore, the allowable nitrate concentration in the sewage may not exceed 5.1 mg/L in order to achieve a nitrate (as N) concentration BELOW the RUC acceptable concentration (2.50 mg/L) at the property boundary.

Appendix L

**Report Addendum – Groundwater Availability
Assessment Update, Sept 2025**





September 18, 2025

Jeff Chesher
P.O. Box 100
Buckhorn, ON
K0L 1J0

**Re: Addendum to Hydrogeological Report - Groundwater Availability
Assessment Update – September 2025
Bridgenorth Townhouse Development
949 Eighth Line, Bridgenorth, Township of Selwyn
D.M. Wills Associates Project No. 22-85260**

PARTNERS IN
ENGINEERING, PLANNING &
ENVIRONMENTAL SERVICES

D.M. Wills Associates Limited (Wills) was retained by Jeff Chesher (Client) to update the Groundwater Availability Assessment (Assessment) that was completed as part of Wills' Hydrogeological Study (Study) for the proposed Townhouse Development (Proposed Development) at 949 Eighth Line, Bridgenorth, Township of Selwyn (Subject Property).

1.0 Background

Wills' Hydrogeological Study Report (Report) was submitted as final to the Client on November 29, 2023, and considered the Proposed Development to include two three-unit townhouses and one four-bedroom existing dwelling.

The Client has since updated the Proposed Development to include three three-unit townhouses and Wills understands that the existing dwelling will be demolished. Wills prepared an updated site plan for the Proposed Development, which is included in Wills' Drawing Package, dated April 4, 2024, enclosed to this addendum.

The updated daily flows to the proposed sewage systems on the Subject Property are assumed to be 9,750 L/day, as provided by the Client.

The Assessment included the following Scope of Work:

- A Licensed Well Contractor (Joe Legge & Sons) was retained by the Client to install a third water supply well on the Subject Property in accordance with Ontario Regulation 903. This well will herein be referred to as Well 3 (A398091). Following installation of Well 3, Joe Legge & Sons completed the following Scope of Work:
 - A 6-hour pumping test was conducted to determine production yield, well recovery, groundwater quality, and the potential for interference with neighbouring groundwater taking activities.



- During the pumping test, two groundwater samples were collected from the pumping well (at the 1-hour and 6-hour pumping test intervals) and submitted to SGS Canada Inc. (SGS) for analysis of select physical, chemical, and biological parameters for comparison to the Ontario Drinking Water Quality Standards (ODWQS).
- During the pumping test, manual measurements were taken to record the drawdown and groundwater level fluctuations in the pumping well, as well as the response to pumping in two Observation Wells (Well 1 & Well 2) on the Subject Property.
- Wills evaluated the pumping test data with respect to the availability and quality of groundwater on the Subject Property in context of the anticipated water taking needs of the Proposed Development. The results of this evaluation are summarized herein.

The most recent Site Plan for the Proposed Development (dated April 4, 2024) and the locations of the three water supply wells (Well 1, Well 2, and Well 3) are shown on **Figure 1**, enclosed.

2.0 Pumping Test

A 6-hour duration pumping test was conducted on Well 3 on August 29, 2025. The MECP Well Record for Well 3 is included in **Appendix F**.

The pumping test was conducted to confirm the performance of Well 3 over sustained pumping activity and to enable the collection of groundwater samples for quality analysis. The pumping test was conducted at a constant rate of 30 L/min. The 30 L/min pumping rate is in surplus of that required for the Proposed Development, which was calculated to be approximately 6.8 L/min if pumped constantly over 24 hours (9,750 L/day total). The anticipated water taking needs are considered equivalent to the proposed flows to the sewage systems as detailed in **Appendix K**.

Well details, including static water levels measured prior to the initiation of the pumping test, are summarized in **Table 1**.

Table 1– Well 3 Pumping Test Details

				Date:	August 29, 2025
Well ID	Well Depth (mbtp)	Well Depth (mbg)	Stick Up (mag)	Static Water Level (mbg)	
Pumping Well					
Well 3 (A398091)	20.10	19.50	0.60	1.79	
Observation Well					
Well 1 (A358381)	20.15	19.30	0.85	2.81	
Well 2 (A358382)	20.15	19.34	0.81	2.12	

mbtp – metres below top of pipe, **mbg** – metres below ground, **mag** – metres above ground

Hydrographs for the Pumping Well and Observation Wells are included in **Appendix H**. Pumping test details are summarized in **Table 2**.

Table 2 – Pumping Test Summary Well 3 (A398091)

	Pumping Rate (L/min)	Time (minutes)	Max. Drawdown (m)	Drawdown During Pumping Test (%)	Stabilization Depth (mbg)	Volume Pumped (L)
Constant Rate	30	360	6.98	36	+/- 6.50	10,800
Recovery Time				% Recovery		
400 minutes				90%		

L/min – litres per minute, % - percent, **mbg** – metres below ground

Table 3 – Pumping Test Summary – Observation Wells

Well ID	Available Drawdown (m)	Drawdown During Pumping Test (m)	Drawdown During Pumping Test (%)	Remaining Drawdown (m)	Remaining Drawdown (%)
Well 1	16.49	2.96	18	13.53	82
Well 2	17.22	3.81	22	13.41	78

% - percent

2.1 Groundwater Quality

During the pumping test, one groundwater sample was collected 1-hour into the pumping test, and the second sample was collected at the 6-hour mark, prior to shutting off the pump. Analytical results were compared to the Ontario Drinking Water Quality Standards (ODWQS). The Certificate of Analysis provided by SGS is included in **Appendix I**.

Groundwater quality was found to comply with most ODWQS, except for the following:

- Colour, turbidity, hardness, and iron in both the 1-hour and the 6-hour samples.

All ODWQS exceedances are for aesthetic/operational objectives and are consistent with the groundwater quality results from the historical pumping tests on Well 1 and Well 2.

The water treatment system(s) for the Proposed Development should consider the exceedances noted above. Though no exceedances for biological parameters (*E. coli*, total coliform) were observed in the groundwater during the Well 3 pumping test, commercial filtration and disinfection methods may be used to effectively remove and inactivate any harmful protozoa, bacteria or viruses. Commercial water softening may be used to treat elevated levels of hardness.

2.2 Anticipated Water Taking Needs

Anticipated water taking needs for the Proposed Development were estimated based on sewage flows of 9,750 L/day, as provided by the Client.

During the 6-hour duration pumping test on Well 3, the total water taking was 10,800 L with 36% of the available drawdown used. This result suggests that Well 3 is more than capable of supporting the Proposed Development. Observation Wells showed relatively minor responses to the pumping activities. Well 1 had a drawdown of 2.96 m (19% of the available drawdown), and Well 2 had a drawdown of 3.81 m (22% of the available drawdown).

The pumping test results indicate a hydrogeological connection between Well 1, Well 2, and Well 3; however, this connection is not anticipated to have a negative impact on the wells' abilities to support the Proposed Development.

The pumping test results indicate that Well 3 can provide a constant water supply at 30 L/min for at least 6 hours, with minimal drawdown and reasonable recovery. Wills does not expect groundwater availability to be a limiting factor

for the Proposed Development, and off-site impacts resulting from the proposed water taking activities are not anticipated in view of the observed aquifer conditions.

Respectfully Submitted,



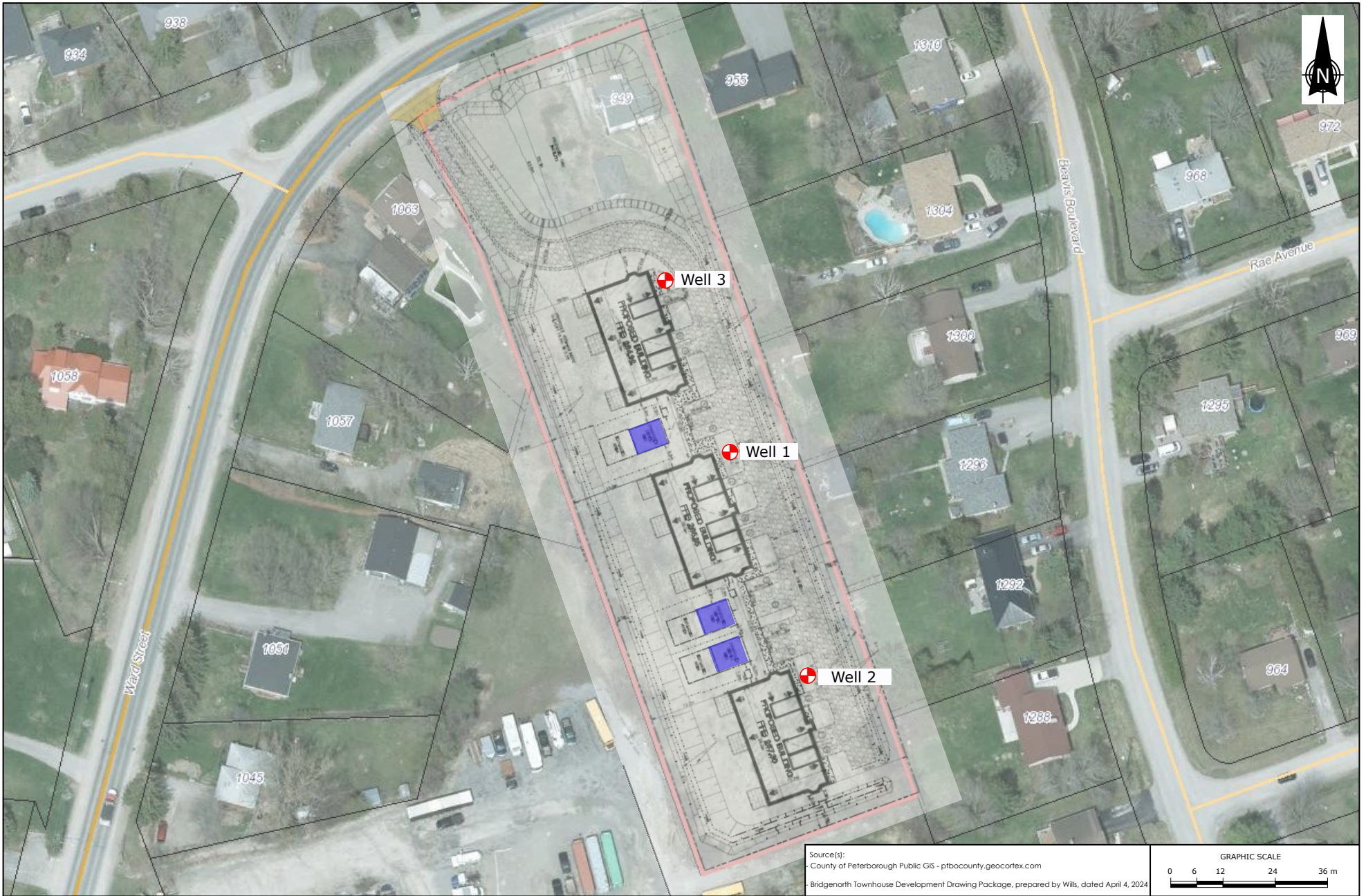
Lynsey Tutters, B.A., C.Tech.
Senior Environmental Technologist



Ian Ames, M.Sc., P.Geo.
Group Leader, Environmental Monitoring and Management

LT/IA/jh

Enclosures: Figure 1 – Water Supply Well Location Plan
Wills' Drawing Package, April 4, 2024



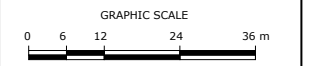
Legend	
	Subject Property
	Water Supply Well

**Water Supply Well
Location Plan**

949 Eighth Line, Bridgenorth, Ontario



Source(s):
County of Peterborough Public GIS - ptbcounty.geocortex.com
Bridgenorth Townhouse Development Drawing Package, prepared by Wills, dated April 4, 2024



D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
K9J 0B9

P. 705.742.2297
F. 705.748.9944
E. wills@dmwills.com

Drawn by:	L. TUTERS
Checked:	I. AMES
Project No.:	85260

Scale:	1:1 200 on 8.5"x11" (US Letter)
Date:	September 10, 2025
Drawing file No.:	Figure 1

NOTES

1.0 SOURCE DATA

- 1.01 THE ENGINEERING DESIGN RELIES ON THE SURVEY PLAN DATED SEPTEMBER 7, 2022, PROJECT NUMBER 8529TOP0, PREPARED BY JBF SURVEYORS.
1.02 THE ENGINEERING DESIGN RELIES ON THE HYDROGEOLOGICAL REPORT DATED NOVEMBER 2023, PROJECT NUMBER 22-85260, PREPARED BY DM WILLS ASSOCIATES LIMITED.
1.03 THE LOCATION OF EXISTING UNDERGROUND ELECTRIC, GAS, DATA TRANSMISSION, TELEPHONE AND CABLE TELEVISION IDENTIFIED ON THE CONTRACT DRAWINGS ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL LOCATE ALL UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO COMMENCEMENT OF CONSTRUCTION IN ACCORDANCE WITH OPSS 100 GC 7.01.09.

2.0 GENERAL CONSTRUCTION

- 2.01 REFERENCES WITHIN THESE CONTRACT DOCUMENTS TO AN OPSS SHALL BE DEEMED TO MEAN OPSS/MUNI, UNLESS USE OF A PROVINCIAL-ORIENTED SPECIFICATION IS SPECIFIED IN THE CONTRACT DOCUMENTS. WHEN THERE IS NOT A CORRESPONDING MUNICIPAL ORIENTED SPECIFICATION, THE REFERENCES BELOW SHALL BE CONSIDERED TO BE THE OPSS.COMM.
2.02 THE WORK IS TO BE COMPLETED IN ACCORDANCE WITH OPSS MUNI 100 GENERAL CONDITIONS OF CONTRACT.
2.03 THE ENGINEERING DESIGN REFERENCES THE FOLLOWING BENCHMARK, PROVIDED BY JBF SURVEYORS:

BENCHMARK TABLE table with columns: BM#, ELEVATION, NORTHING, EASTING, DESCRIPTION. Row 1: BM#1, 264.03, 4919241.65m, 708746.11m, TOP OF IRON BAR IN NORTHWEST CORNER OF SITE

- 2.04 THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS WITH THE CONTRACT ADMINISTRATOR IN A FORMAT AS PRESCRIBED BY THE CONTRACT ADMINISTRATOR PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
2.05 THE CONTRACTOR SHALL UNDERTAKE ALL LAYOUT REQUIRED TO FACILITATE THE CONSTRUCTION OF THIS CONTRACT.
2.06 WITH THE EXCEPTION OF THE REFERENCED LOCAL CONTROL POINTS SPECIFICALLY PROVIDED IN THE CONTRACT DRAWINGS, NO ELEVATION WITHIN THE CONTRACT DRAWINGS ARE TO BE USED AS A REFERENCE FOR LAYOUT.
2.07 LOCAL CONTROL POINTS, MONUMENTS, PROPERTY MONUMENTS, AND BENCHMARKS SHALL BE INVENTORIED IN THE FORM PROVIDED IN IN A FORMAT AS PRESCRIBED BY THE CONTRACT ADMINISTRATOR.
2.08 DISTURBED OR OTHERWISE DAMAGED CONTROL POINTS SHALL BE REINSTATED BY AN OLS SURVEYOR AT THE SOLE EXPENSE OF THE CONTRACTOR.
2.09 THE CONTRACTOR SHALL USE THE LOCAL CONTROL POINTS AS SPECIFIED ON THE CONTRACT DRAWINGS. THE USE OF AN INCORRECT CONTROL POINT BY THE CONTRACTOR, THAT RESULTS IN DEFICIENT WORK, EITHER IN VERTICAL OR HORIZONTAL ALIGNMENT, SHALL BE CORRECTED BY THE CONTRACTOR AT THE SOLE EXPENSE OF THE CONTRACTOR.
2.10 ANY DISCREPANCY BETWEEN THE SITE CONDITIONS AND THE CONTRACT DRAWINGS SHALL IMMEDIATELY BE REPORTED TO THE CONTRACT ADMINISTRATOR.
2.11 THE CONTRACTOR SHALL OBTAIN AND MAINTAIN COPIES OF ALL REFERENCED STANDARD DOCUMENTS AND DRAWINGS ON SITE FOR THE DURATION OF THE WORK.
2.12 THE CONTRACTOR SHALL KEEP RECORDS AND SUPPLY THE CONTRACT ADMINISTRATOR WITH RED-LINED AS CONSTRUCTED DRAWINGS NOTING THAT ALL SITE SERVICE INSTALLATION WORKS WERE INSTALLED AS PER THE CONTRACT DOCUMENTS, OR OTHERWISE NOTING THE ACTUAL STRUCTURE LOCATIONS, PIPE DETAILS (LENGTH, SIZE AND / OR MATERIAL), AND INVERTS AND ANY OTHER DEVIATION FROM THE CONTRACT DOCUMENTS.
2.13 NO ADDITIONAL PAYMENT WILL BE MADE FOR COSTS ASSOCIATED WITH THE SUPPORT, PRESERVATION AND / OR RELOCATION OF EXISTING UTILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS, UNLESS SPECIFICALLY NOTED OTHERWISE.

3.0 EROSION AND SEDIMENT CONTROL

- 3.01 EROSION AND SEDIMENT CONTROL AND TREE PROTECTION MEASURES SHALL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING CONSTRUCTION TO PREVENT ENTRY OF SEDIMENT LADEN WATER INTO EXISTING INFRASTRUCTURE, WATERBODIES OR ONTO ADJACENT LANDS. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REPAIRED OR REPLACED WITHIN 48 HOURS OF INSPECTION.
3.02 DISTURBANCE TO EXISTING VEGETATED AREAS WITHIN THE WORK AREA SHALL BE MINIMIZED TO THE EXTENT POSSIBLE. NO ADDITIONAL PAYMENT WILL BE MADE FOR RESTORATION OF AREAS DISTURBED BY CONSTRUCTION UNLESS NOTED IN THE CONTRACT DOCUMENTS.
3.03 THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED / AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREA. ADDITIONAL OR ALTERNATIVE CONTROL MEASURES SHALL BE IMPLEMENTED IMMEDIATELY UPON DIRECTION FROM THE CONTRACT ADMINISTRATOR. ADDITIONAL MATERIALS SHALL BE KEPT ON SITE TO BE USED AS NECESSARY.
3.04 ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, SHALL BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES ONTO ROADS OR ADJACENT PROPERTIES, OR INTO SEWERS OR ADJACENT WATERBODIES.
3.05 SILT SACKS SHALL BE PLACED UNDER GRATES ON ALL CATCHBASINS TO TRAP SEDIMENT. SILT SACKS ARE TO BE CLEANED REGULARLY, REPLACED AS NECESSARY AND ARE NOT TO BE SEALED IN PLACE DURING PAVING OPERATIONS.
3.06 ALL EROSION AND SEDIMENT CONTROL AND TREE PROTECTION SHALL REMAIN IN PLACE UNTIL REMOVAL IS AUTHORIZED BY THE CONTRACT ADMINISTRATOR.
3.07 CONTRACTOR EQUIPMENT AND VEHICLES ARE NOT PERMITTED WITHIN THE DRIPLINE OF TREES NOT DESIGNATED FOR REMOVAL.
3.08 ALL COSTS ASSOCIATED WITH THE MAINTENANCE OF EROSION AND SEDIMENT CONTROLS, INCLUDING REMOVAL OF ACCUMULATED SEDIMENT AND REPAIR / REPLACEMENT OF DAMAGED MEASURES SHALL BE INCLUDED IN THE CONTRACT PRICE. NO ADDITIONAL PAYMENT WILL BE MADE.
3.09 SEED SHALL BE LOWLAND MIX.

4.0 GRADING / EARTHWORKS

- 4.01 MANAGEMENT OF EXCESS MATERIAL BY OPEN BURNING IS NOT PERMITTED.

5.0 REMOVALS

- 5.01 NATURAL WOOD SHALL BE MANAGED AS EXCESS MATERIAL AND MAY NOT BE MANAGED AS DISPOSABLE FILL WITHIN THE CONTRACT LIMITS.

6.0 STRIPPING, COMPACTION, AND DEWATERING

- 6.01 EXCAVATION OF THE SWM FACILITY AREA TO OCCUR TO THE ELEVATION OF THE BOTTOM OF THE CLAY LINER. THIS ELEVATION WOULD CORRESPOND TO 263.40 M PLUS THE THICKNESS OF CLAY LINER, WHICH IS TO BE SPECIFIED BY A QUALIFIED GEOTECHNICAL ENGINEER.
6.02 ANY WATER PRESENT WITHIN THE EXCAVATED FOOTPRINT OF THE SWM FACILITY FOLLOWING STRIPPING SHALL BE DEWATERED PRIOR TO THE INSTALLATION OF THE CLAY LINER. THE CONTRACTOR SHALL DIRECT WATER TO A FILTER BAG (TERRAFIX ENVIROBAG OR SIMILAR) PRIOR TO OVERLAND DISCHARGE.
6.03 THE CLAY LINER SHALL BE INSTALLED IN DRY CONDITIONS AND AS PER THE SPECIFICATIONS SHOWN IN THE DRAWINGS. THE CLAY LINER SHALL BE COMPACTED TO A DENSITY RECOMMENDED BY A QUALIFIED GEOTECHNICAL ENGINEER.
6.04 RESTORE THE SWM FACILITY INSIDE AND OUTSIDE WITH 150 MM OF TOPSOIL AND SEED (LOWLAND MIX). WATER SEEDED AREAS AS REQUIRED TO ENSURE GERMINATION AND CONTINUOUS GROWTH.
6.05 THE IDENTICAL PROCESS IS TO BE FOLLOWED WHEN CONSTRUCTING THE ENHANCED GRASSED SWALES, HOWEVER ELEVATIONS WILL DIFFER. A QUALIFIED GEOTECHNICAL ENGINEER SHALL SPECIFY THE LENGTH AND DEPTH OF CLAY LINER REQUIRED FOR SWALE CONSTRUCTION.

7.0 SEWERS

- 7.01 ALL NEW STORM SEWERS SHALL BE CCTV INSPECTED. IN ADDITION WHERE THE NEW SEWERS TIE INTO EXISTING STRUCTURES ONE ADDITIONAL LENGTH, TO THE NEXT STRUCTURE DOWNSTREAM, OF EXISTING SEWER SHALL BE CCTV INSPECTED. CCTV INSPECTION SHALL BE CONDUCTED AFTER ALL MATERIAL HAS BEEN POWER CLEANED FROM DOWNSTREAM MANHOLE AND PRIOR TO THE PLACEMENT OF ASPHALT, CURB OR CONCRETE SIDEWALK. CCTV CONTRACTOR SHALL BE PACP 6.0, OR ABOVE, CERTIFIED PER OPSS 409 AND PROVIDE THREE (3) COPIES OF THE VIDEOS AND REPORTS IN DIGITAL VIDEO AND PDF FORMATS TO THE ENGINEER FOR THEIR REVIEW AND APPROVAL PRIOR TO THE RELEASE OF SITE SECURITIES. ALL TIPPING FEES SHALL BE CARRIED BY THE CONTRACTOR.
7.02 A RESILIENT CONNECTOR (I.E. A FLEXIBLE, WATER TIGHT CONNECTOR) SHALL BE INSTALLED IN THE STRUCTURE OPENING FOR FLEXIBLE AND RIGID PIPE.
7.03 THERE SHALL BE NO CHANGES TO THE DESIGN ALIGNMENT AND GRADE OF SEWERS WITHOUT THE WRITTEN AUTHORIZATION OF THE CONTRACT ADMINISTRATOR.
7.04 LOW PRESSURE AIR TESTING IS PERMITTED FOR PIPE.
7.05 AIR TEST (WATER TEST) RESULTS SHALL BE SUBMITTED PRIOR TO ACCEPTANCE OF THE SEWERS. THE TEST(S) SHALL BE DONE AFTER FINAL BACKFILL IS PLACED IN THE TRENCH AND BEFORE ASPHALT HAS BEEN PLACED. GENERAL SEQUENCE OF TESTING FOR SEWER SYSTEMS IS AS FOLLOWS (BUT NOT LIMITED TO):
7.05.01 CLEANING AND FLUSHING WITH HIGH-PRESSURE WATER BLASTING
7.05.02 WATER-TIGHTNESS (LEAKAGE) TESTING
7.05.03 CCTV (PHOTOGRAPHIC RECORD & INSPECTION FORM FOR MAINTENANCE HOLES) AFTER TESTING
7.05.04 DEFLECTION OR OUT OF ROUND TESTING (FOR THERMO-PLASTIC PIPES ONLY) IN ACCORDANCE WITH OPSS 410 MAY BE REQUIRED FOLLOWING THE REVIEW OF THE CCTV AS DIRECTED BY THE CONTRACT ADMINISTRATOR.

8.0 ROADWORKS / BOULEVARDS

- 8.01 THE CONTRACT ADMINISTRATOR MUST AUTHORIZE THE STOCKPILE LOCATIONS PROPOSED BY THE CONTRACTOR, PRIOR TO THE IMPORT OF ANY MATERIAL TO BE STOCKPILED.
8.02 ALL FORMWORK SHALL BE REVIEWED BY THE CONTRACT ADMINISTRATOR PRIOR TO PLACEMENT OF CONCRETE. THE CONTRACTOR SHALL NOTIFY THE CONTRACT ADMINISTRATOR A MINIMUM OF 2 BUSINESS DAYS PRIOR TO THE SCHEDULED CONCRETE POUR TO ALLOW TIME TO COORDINATE FORMWORK REVIEW. CONCRETE PLACED PRIOR TO THE REVIEW OF THE CONTRACT ADMINISTRATOR MAY BE REQUIRED TO BE REMOVED, DISPOSED OFF-SITE AND REPLACED AT THE SOLE EXPENSE OF THE CONTRACTOR.
8.03 DUMMY JOINTS SHALL BE CONSTRUCTED AT A MAXIMUM SPACING OF 1.5 M BETWEEN CONTRACTION / EXPANSION JOINTS.
8.04 SEED SHALL BE LOWLAND MIX.

9.0 INSPECTION AND DOCUMENTATION REQUIREMENTS

- 9.01 SUBMIT SHOP DRAWINGS TO THE CONTRACT ADMINISTRATOR PROMPTLY AND IN ORDERLY SEQUENCE TO NOT CAUSE DELAY IN WORK. FAILURE TO SUBMIT IN AMPLE TIME IS NOT CONSIDERED SUFFICIENT REASON FOR EXTENSION OF CONTRACT TIME AND NO CLAIM FOR EXTENSION BY REASON OF SUCH DEFAULT WILL BE ALLOWED. DO NOT PROCEED WITH WORK AFFECTED BY SUBMITTAL UNTIL REVIEW IS COMPLETE. REVIEW SHOP DRAWINGS PRIOR TO SUBMISSION. THIS REVIEW REPRESENTS THAT NECESSARY REQUIREMENTS HAVE BEEN DETERMINED AND VERIFIED, OR WILL BE, AND THAT EACH SUBMITTAL HAS BEEN CHECKED AND CO-ORDINATED WITH REQUIREMENTS OF WORK AND CONTRACT DOCUMENTS. SUBMITTALS NOT STAMPED, SIGNED, DATED AND IDENTIFIED AS TO SPECIFIC PROJECT WILL BE RETURNED WITHOUT BEING EXAMINED AND CONSIDERED REJECTED. ALLOW 5 BUSINESS DAYS FOR THE FIRST, AND 3 BUSINESS DAYS FOR RESUBMITTED SHOP DRAWING REVIEW.
9.02 THE CONTRACTOR SHALL CONTACT THE CONTRACT ADMINISTRATOR A MINIMUM OF 2 BUSINESS DAYS IN ADVANCE OF THE FOLLOWING ACTIVITIES IN ORDER FOR THE CONTRACT ADMINISTRATOR TO ARRANGE FOR THE PROPER INSPECTION OF THE RELATED CONSTRUCTION ACTIVITIES. IF THE REQUIRED NOTICE IS NOT PROVIDED, THE CONTRACTOR MAY BE REQUIRED TO UNDERTAKE ADDITIONAL WORKS, AT THE SOLE EXPENSE OF THE CONTRACTOR, TO PERMIT THE CONTRACT ADMINISTRATOR TO INSPECT AND / OR VERIFY THAT THE WORKS HAVE CONSTRUCTED IN CONFORMANCE WITH THE CONTRACT DOCUMENTS.
9.02.01 MOBILIZATION DATE, PROPOSED CONSTRUCTION SCHEDULE AND CONTRACTOR CONTACT INFORMATION.
9.02.02 VERIFY SITE CONTROL POINTS PRIOR TO LAYOUT.
9.02.03 UPON COMPLETION OF ALL EROSION AND SEDIMENT CONTROL WORKS.
9.02.04 PRIOR TO THE PLACEMENT OF THE FIRST STORM AND SANITARY MANHOLES.
9.02.05 PRIOR TO THE CONNECTION OF NEW WORKS TO EXISTING WORKS (STORM).
9.02.06 PRIOR TO AIR TESTING THE STORM SEWERS.
9.02.07 PRIOR TO THE PLACEMENT OF ANY GRANULAR ROAD OR PARKING LOT GRANULAR BASE.
9.02.08 PRIOR TO ASPHALT PLACEMENT.
9.02.09 PRIOR TO ANY CONCRETE POUR.
9.02.10 PRIOR TO THE DEMOBILIZATION OF THE SERVICING CONTRACTOR FROM THE SITE.
8.03 THE CONTRACTOR SHALL SUPPLY THE CONTRACT ADMINISTRATOR WITH COPIES OF ALL TESTING AND INSPECTION REPORTS RELATED TO THE WORK WITHIN 4 BUSINESS DAYS OF THE REPORTING.

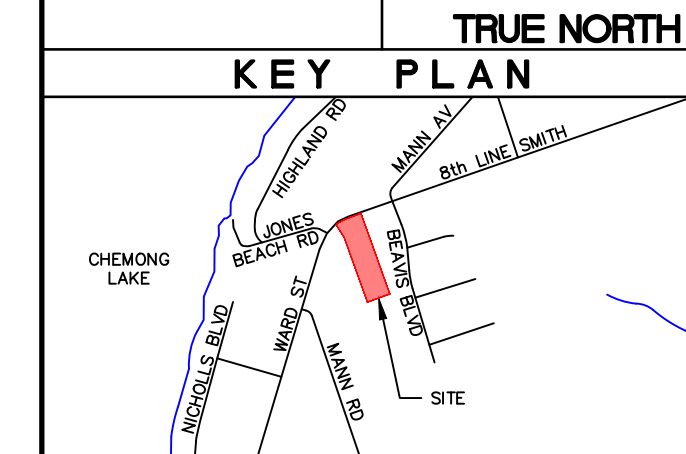
OPSS INDEX

Table with columns: NUMBER, REV., DATE, DESCRIPTION. Rows include: 180 GENERAL SPECIFICATION FOR THE MANAGEMENT OF EXCESS MATERIALS, 201 CLEARING, CLOST CUT CLEARING, GRUBBING AND REMOVAL OF SURFACE AND PILED BOULDERS, 206 GRADING, 310 HOT MIX ASPHALT, 314 UNTREATED SUB BASE, BASE, SURFACE, SHOULDER, SELECTED SUBGRADE, AND STOCKPILING, 351 CONCRETE SIDEWALK, 353 CONCRETE CURB AND GUTTER SYSTEMS, 401 TRENCHING BACKFILL AND COMPACTING, 402 EXCAVATING, BACKFILLING AND COMPACTING FOR MAINTENANCE HOLES, CATCH BASINS, DITCH INLETS AND VALVE CHAMBERS, 404 SUPPORT SYSTEMS, 407 NEW MAINTENANCE HOLE, CATCH BASIN, DITCH INLET, AND VALVE CHAMBER INSTALLATION, 409 CLOSED-CIRCUIT TELEVISION (CCTV) INSPECTION OF PIPELINES, 410 PIPE SEWER INSTALLATION IN OPEN CUT, 411 CLEANING AND FLUSHING OF PIPE, SEWERS, CATCH BASINS, MAINTENANCE HOLES, DITCH INLETS, AND OIL-GRIT SEPARATORS, 421 PIPE CULVERT INSTALLATION IN OPEN CUT, 490 SITE PREPARATION FOR PIPELINES, UTILITIES, AND ASSOCIATED STRUCTURES, 491 PRESERVATION, PROTECTION, AND RECONSTRUCTION OF EXISTING FACILITIES, 492 SITE RESTORATION FOLLOWING INSTALLATION OF PIPELINES, UTILITIES, AND ASSOCIATED STRUCTURES, 501 COMPACTING, 510 REMOVAL, 802 TOPSOIL, 804 SEED AND COVER, 805 TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES, 811 LARGE WOODY DEBRIS, 1205 MATERIAL SPECIFICATION FOR CLAY SEAL

OPSD INDEX

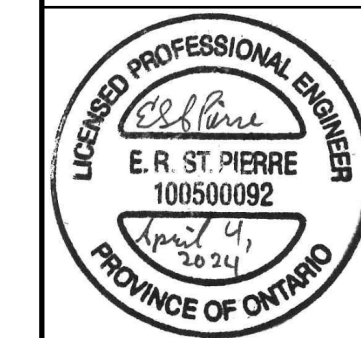
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BM1 - ELEV. 264.03 TOP OF IRON BAR IN NORTHWEST CORNER OF SITE.



REVISIONS table with columns: No., Description, Date. Row 1: 1 ISSUED FOR ZONING BY-LAW AMENDMENT - 1ST SUBMISSION, 04/04/24

METRIC Legend: Dimensions are in METRES and/or MILLIMETRES unless otherwise shown TO BE READ IN CONJUNCTION WITH OPSS 100 SERIES



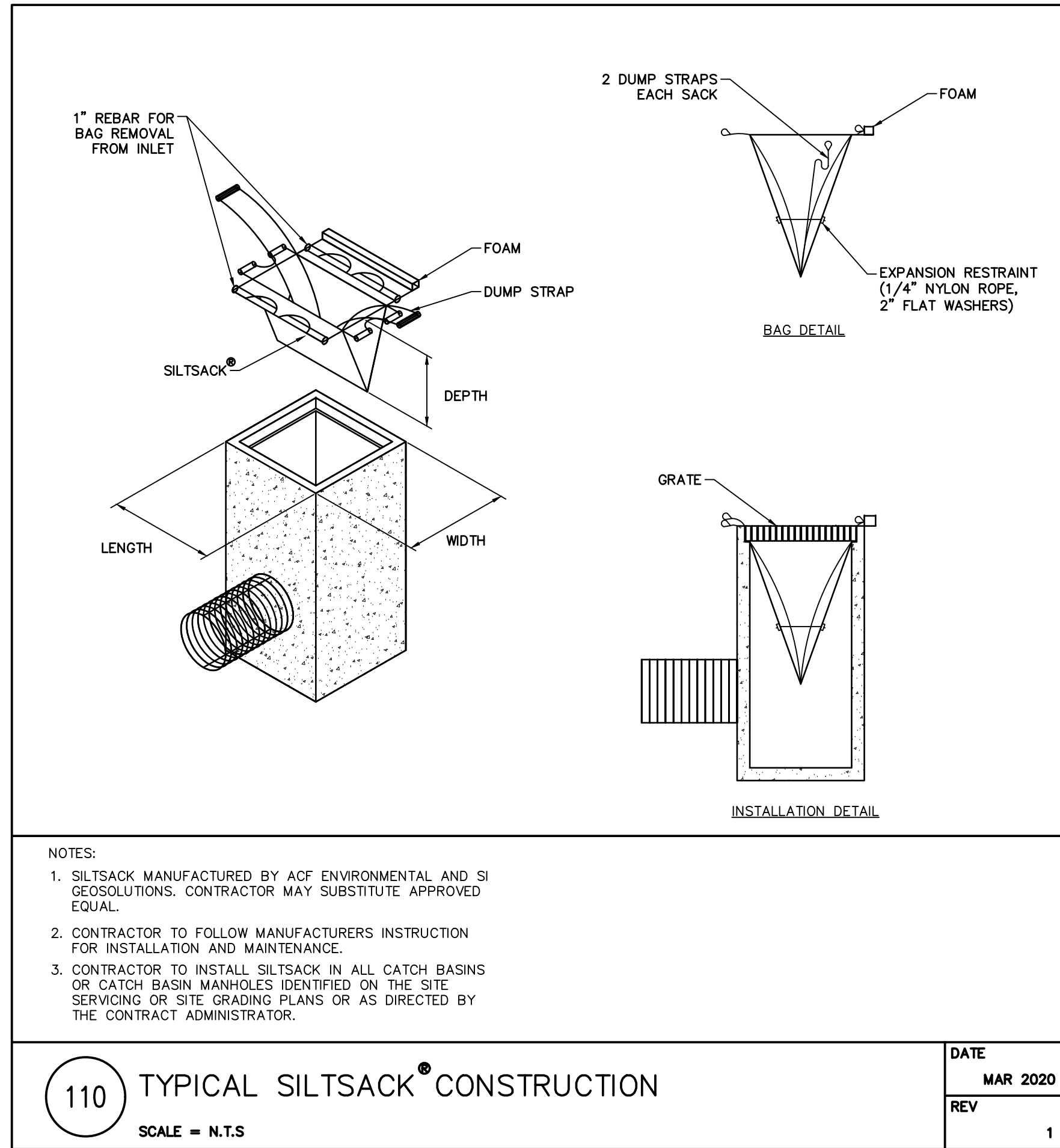
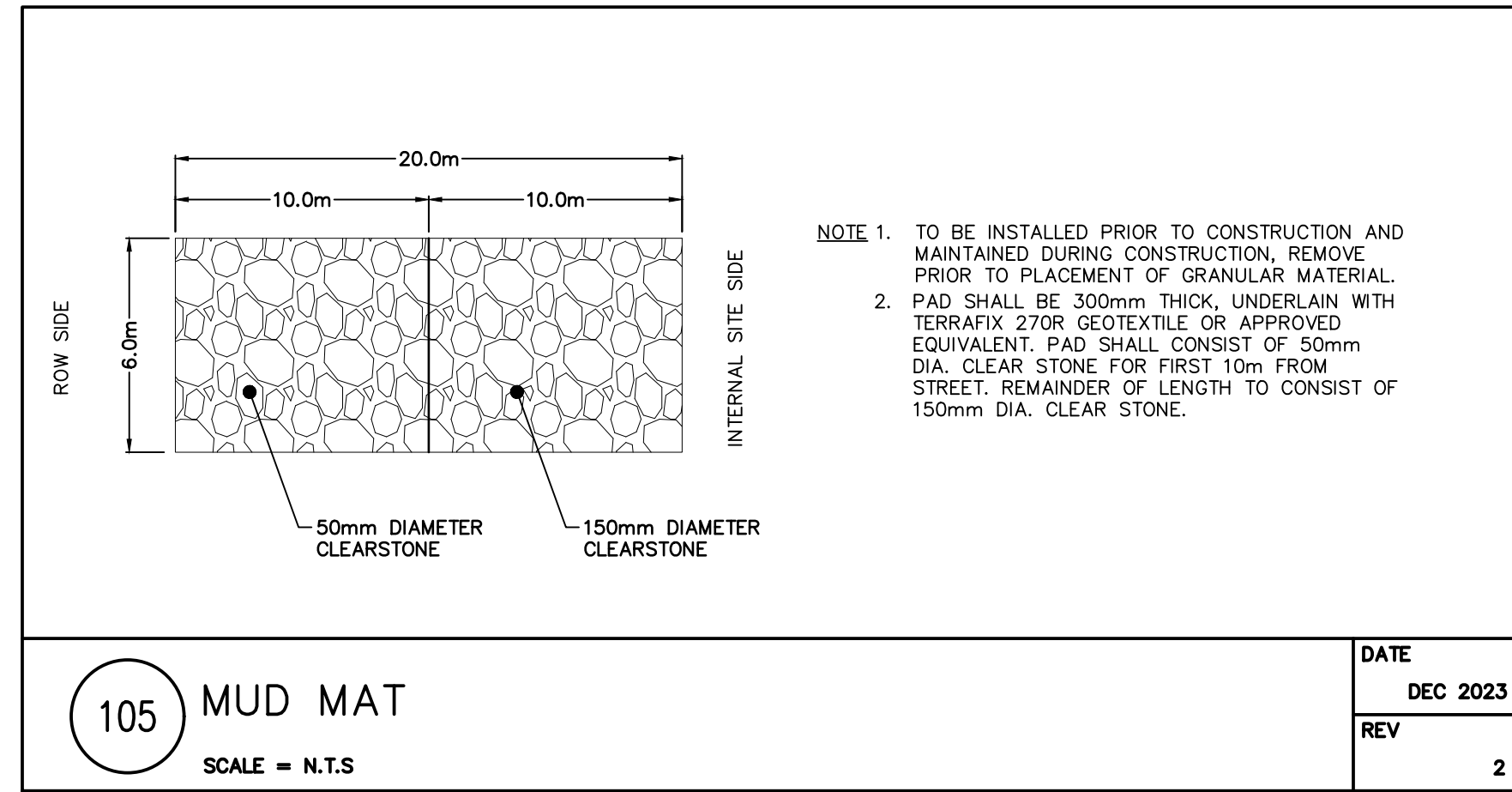
WILLS logo and contact information: D.M. Wills Associates Limited, 150 Jameson Drive, Peterborough, Ontario, Canada K9J 0B9. P. 705.742.2297, F. 705.748.9944, E. wills@dmwills.com

Project Name/Location: BRIDGENORTH TOWNHOUSE DEVELOPMENT, BRIDGENORTH, ONTARIO

Drawing Title: GENERAL NOTES

Table with columns: Drawn By, M.G., SCALE: Horz. -, Vert. -, Designed By, M.G., Plot Date: APRIL 4, 2024, Checked By, J.D.F./J.R., Project No.: 22-85260, Sht. No.: 100, Engineer: E.S.P., Dwg File No.: 85260 - GNDT

NOT FOR CONSTRUCTION



BM1 - ELEV. 264.03
TOP OF IRON BAR IN
NORTHWEST CORNER OF SITE.

TRUE NORTH

KEY PLAN

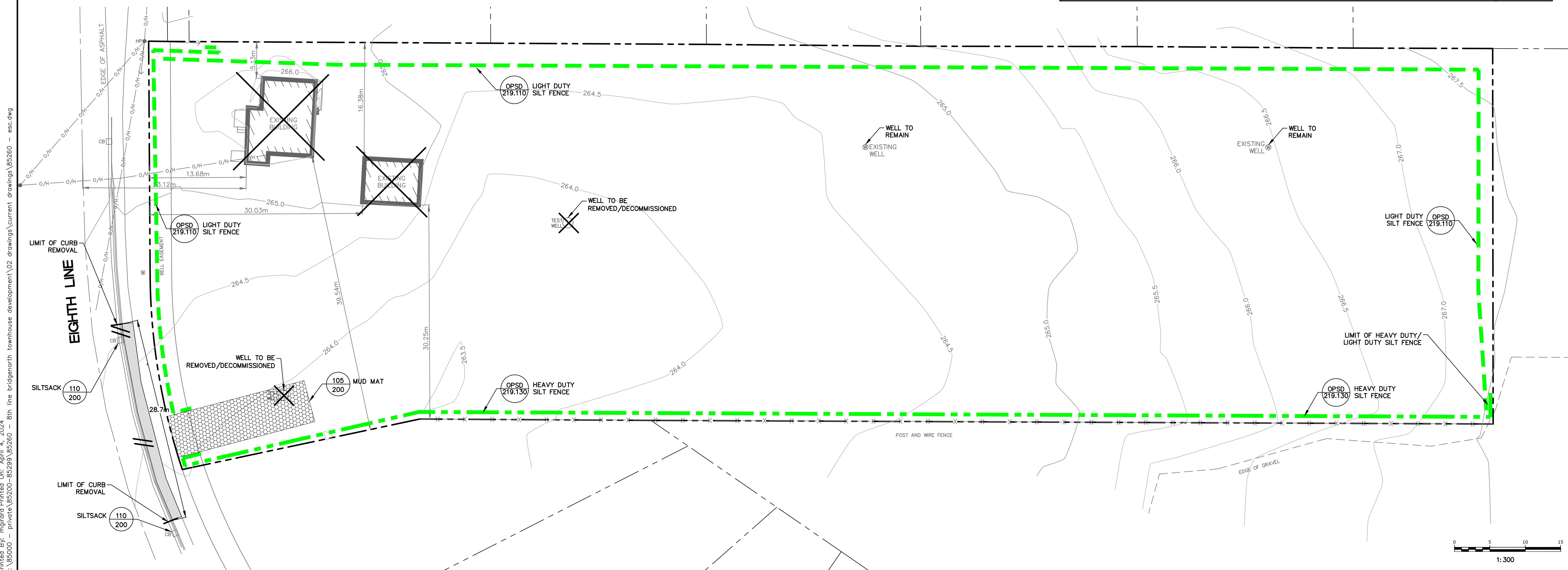
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METRIC
Dimensions are in METRES and/or MILLIMETRES unless otherwise shown
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LEGEND

- Typical illustration for removal
- Typical illustration for removal
- EX. BUILDING
- EX. EDGE OF PAVEMENT
- EX. CURB
- EX. ROAD CENTERLINE
- EX./PR. CATCH BASIN
- EXISTING FENCE
- PROPERTY LINE
- EXISTING SIGN
- LIGHT DUTY SILT FENCE
- HEAVY DUTY SILT FENCE



LICENSED PROFESSIONAL ENGINEER
E. R. ST PIERRE
100500092
April 4, 2024
PROVINCE OF ONTARIO

D.M. Wills Associates Limited
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Peterborough, Ontario
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P. 705.742.2297
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E. wills@dmwills.com

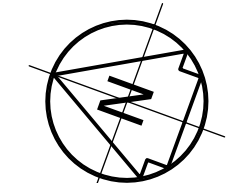
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BRIDGENORTH TOWNHOUSE DEVELOPMENT
BRIDGENORTH, ONTARIO

Drawing Title
EROSION AND SEDIMENT CONTROL

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Designed By: M.G./S.R.	Plot Date: APRIL 4, 2024	
Checked By: J.F.	Project No.: 22-85260	Sht. No.: 200
Engineer: K.S.	Dwg File No.: 85260 - ESC	

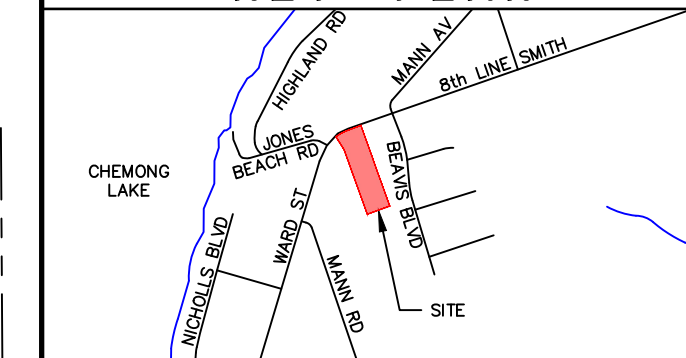
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TRUE NORTH

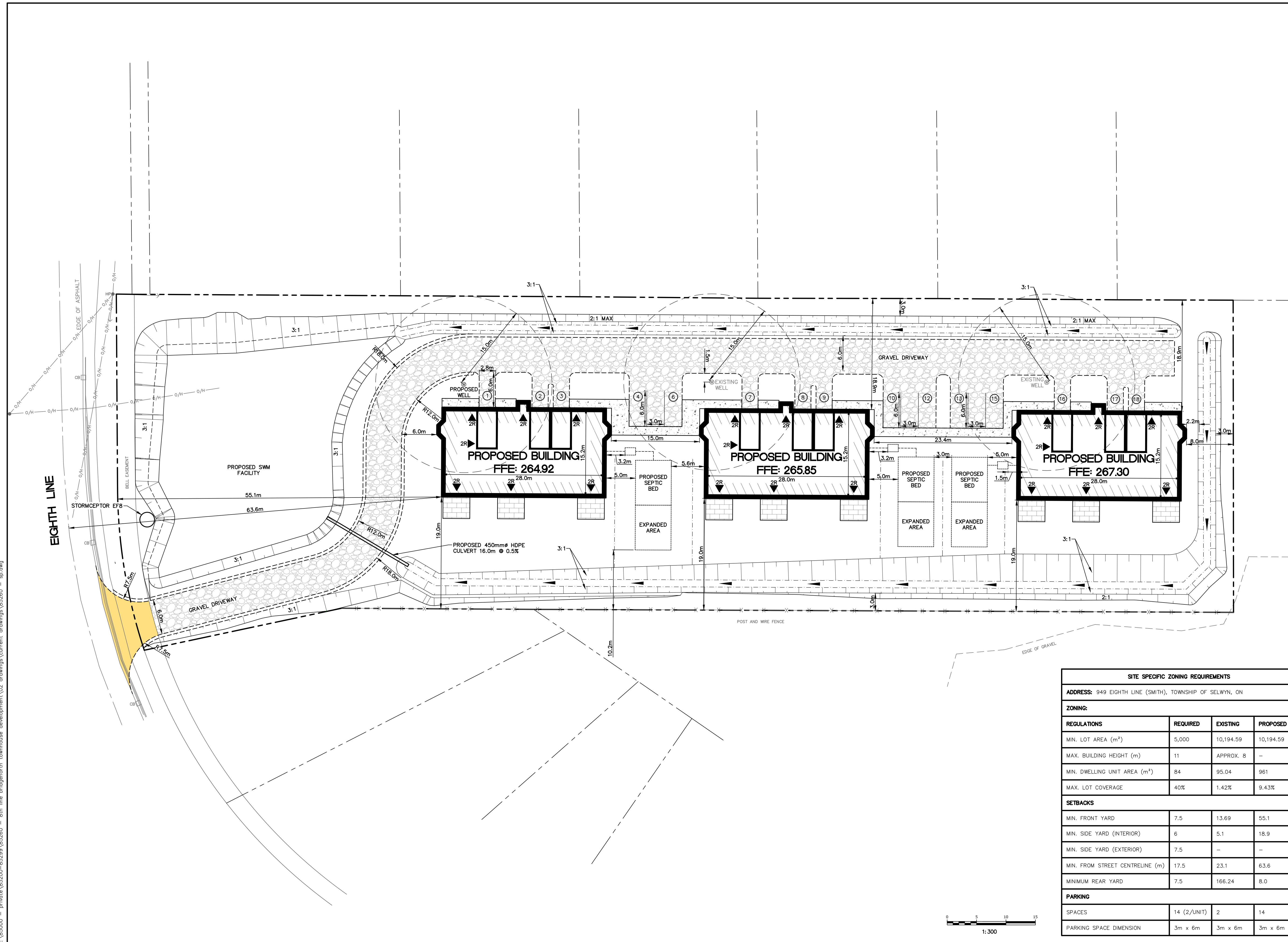
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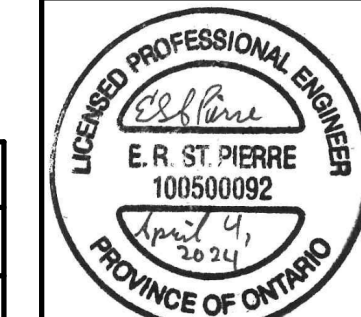
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METRIC
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LEGEND	
	PR. ASPHALT
	PR. GRAVEL
	PR. CONCRETE
	PR. INTERLOCK
	EX./PR. BUILDING
	EX./PR. EDGE OF PAVEMENT
	EX./PR. CURB
	EX. ROAD CENTERLINE
	EX. EDGE OF SHOULDER
	EX. CATCH BASIN
	EX. STORM SEWER
	PR. DITCH
	PR. CULVERT
	EX. HYDRO POLE
	EX. OVERHEAD HYDRO
	EX. BELL PEDESTAL
	EX./PR. CONTOUR
	EX. FENCE
	R.O.W.
	PROPERTY LINE



SITE SPECIFIC ZONING REQUIREMENTS			
ADDRESS: 949 EIGHTH LINE (SMITH), TOWNSHIP OF SELWYN, ON			
ZONING:			
REGULATIONS	REQUIRED	EXISTING	PROPOSED
MIN. LOT AREA (m ²)	5,000	10,194.59	10,194.59
MAX. BUILDING HEIGHT (m)	11	APPROX. 8	-
MIN. DWELLING UNIT AREA (m ²)	84	95.04	961
MAX. LOT COVERAGE	40%	1.42%	9.43%
SETBACKS			
MIN. FRONT YARD	7.5	13.69	55.1
MIN. SIDE YARD (INTERIOR)	6	5.1	18.9
MIN. SIDE YARD (EXTERIOR)	7.5	-	-
MIN. FROM STREET CENTRELINE (m)	17.5	23.1	63.6
MINIMUM REAR YARD	7.5	166.24	8.0
PARKING			
SPACES	14 (2/UNIT)	2	14
PARKING SPACE DIMENSION	3m x 6m	3m x 6m	3m x 6m



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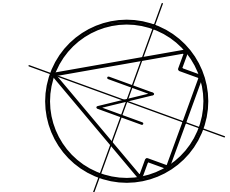
Project Name/Location
BRIDGENORTH TOWNHOUSE DEVELOPMENT
BRIDGENORTH, ONTARIO

Drawing Title
SITE PLAN
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Designed By: M.G. Plot Date: APRIL 4, 2024
Checked By: J.F./J.R. Project No.: 22-85260 Sht. No.:
Engineer: E.S.P. Dwg File No.: 85260 - SP 400

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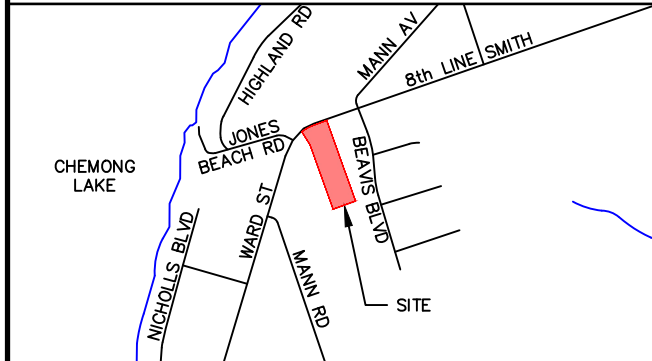
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BM1 - ELEV. 264.03
TOP OF IRON BAR IN
NORTHWEST CORNER OF SITE.



TRUE NORTH

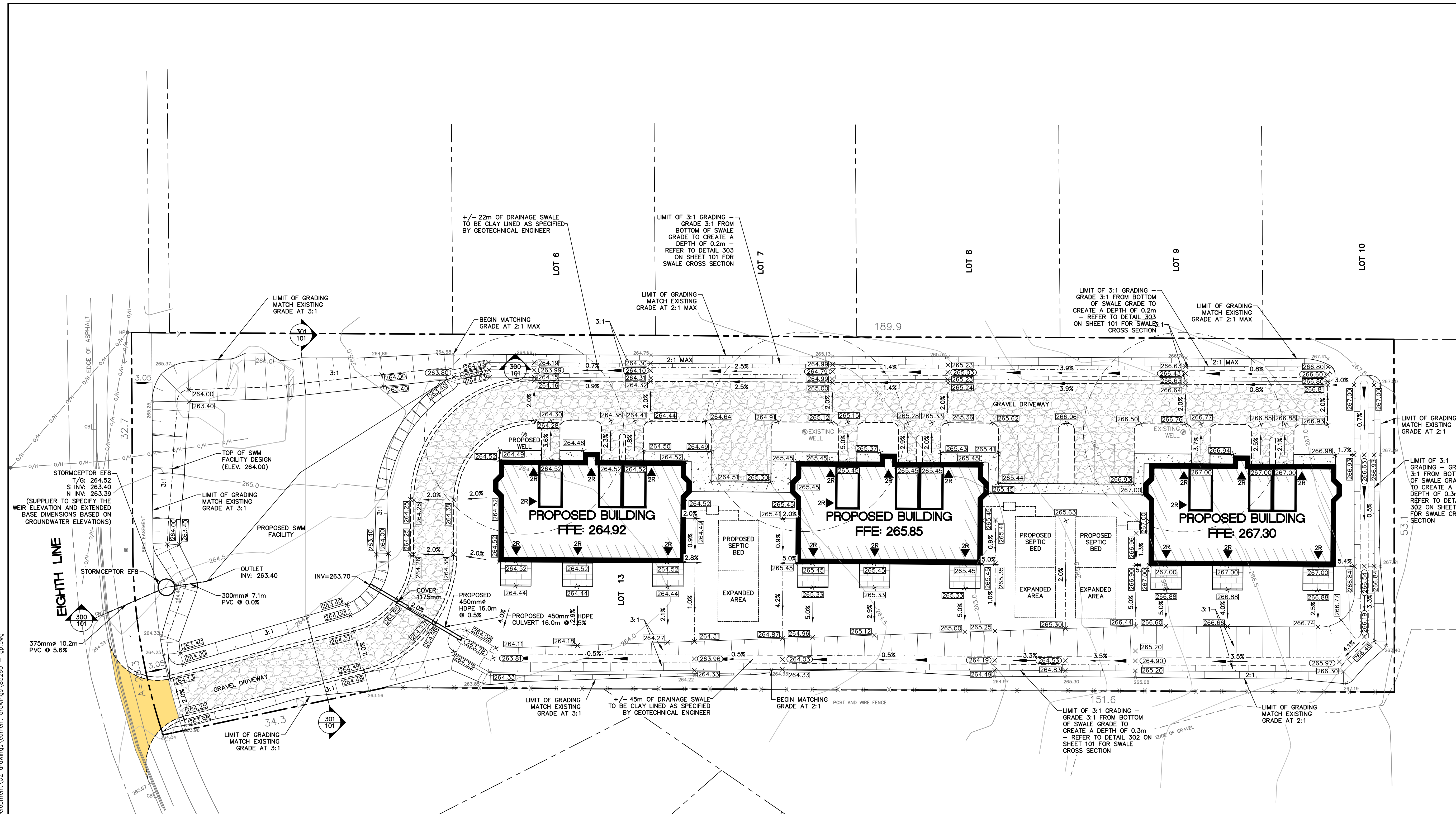
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No.	Description	Date
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METRIC
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LEGEND	
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	PR. GRAVEL
	PR. CONCRETE
	PR. INTERLOCK
	EX./PR. BUILDING
	EX./PR. EDGE OF PAVEMENT
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	EX. STORM SEWER
	PR. DITCH
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	EX. HYDRO POLE
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	PR. GRADE
	EX./PR. CONTOUR
	EX. FENCE
	R.O.W.
	PROPERTY LINE

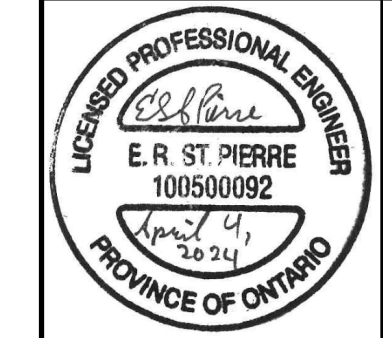
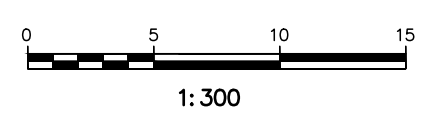


STORM AND SANITARY SEWER INVERTS

MANHOLE	TYPE	T/G	PIPE INVERTS	COMMENT
CB	STM	264.42	INV IN = S - 262.82 INV OUT = N 261.54	CORE AND CONNECT TO EXISTING CATCH BASIN USING PRE-MANUFACTURED BOOT.
OGS	STM	264.52	INV IN = S - 263.40 INV OUT = N - 263.39	OIL GRIT SEPARATOR - STORMCEPTOR EF8

STORM AND SANITARY SEWER PIPE IDENTIFICATION

FROM	TO	SEWER TYPE	LENGTH (m)	SLOPE (%)	DIA. (mm)	MATERIAL	CLASS	DETAIL No.	COMMENT
POND	OGS	STM	7.1	0.0	300	PVC	SDR-35	OPSD 802.010	-
OGS	CB	STM	10.2	5.6	375	PVC	SDR-35	OPSD 802.010	-



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E. wills@dmwills.com

Project Name/Location
BRIDGENORTH TOWNHOUSE DEVELOPMENT
BRIDGENORTH, ONTARIO

Drawing Title
GRADING AND SERVICING PLAN

Drawn By: M.G./C.M. SCALE: Horiz. 1:300 Vert. -
Designed By: M.G. Plot Date: APRIL 4, 2024
Checked By: J.D.F./J.R. Project No: 22-85260 Sht. No.:
Engineer: E.S.P. Dwg File No: 85260 - GP 500

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