Peto MacCallum Ltd.
CONSULTING ENGINEERS

September 13, 2021

PML Ref.: 21CX007
Report: 1

Cherilyn Anne Radbourne and Blair Edward Radbourne
c/o Mr. Dennis Radbourne
558 Punkinseed Lane
Kemble, Ontario
N0H 1S0

Dear Mr. Radbourne

Nitrate Study
Proposed Land Severance
130 Maple Ridge Road
Township of Georgian Bluffs, Ontario

Peto MacCallum Ltd. (PML) is pleased to present the results of the nitrate study recently completed at the above noted project site. Authorization for the work described in this report was provided by Mr. Dennis Radbourne in a signed Engineering Services Agreement dated May 21, 2021.

It is understood that four privately serviced rural residential lots are proposed for the 31.4 ha property located at 130 Maple Ridge Road in Township of Georgian Bluffs, Ontario. Three lots will be side by side and the fourth will be separated by a ravine. The focus of this study is the area of the three lots. Each of the three lots will have a septic system and be less than 1 ha in size.

An investigation and report for a nitrate study have been requested, to assess the subsurface conditions at the site and to assess the nitrate impact as a result of the proposed on-site domestic sewage treatment. The nitrate impact assessment will be carried out in accordance with Guideline D-5-4; however, it is noted that since fewer than five lots are proposed a Ministry of the Environmental, Conservation, and Parks (MECP) review would not be anticipated.

This assessment is subject to the Statement of Limitations (Appendix B) which must be read in conjunction with the report.

Scope of Work

The objectives of the study were accomplished by:

1. Co-ordinating the clearance of buried public utilities.

2. Mobilizing an excavation subcontractor to complete three test pits.

3. Witnessing the advancement of three test pits to a depth of 3.0 m, and installation of three standpipes to determine the subsurface conditions, including depth to and direction of shallow ground water flow on the Site.

4. Conducting three particle size distribution analyses on soil samples retrieved from the test pits to determine appropriate soil permeability parameters for septic bed design.

5. Revisiting the site at least one week following installation of the standpipes to measure ground water levels and to retrieve one representative ground water sample for chemical testing, following development.

6. Submit one ground water sample to an external laboratory for chemical testing of pH, nitrite/nitrate, and phosphorous.

7. Conduct engineering analysis to determine nitrate loading from septic effluent.

8. Preparation of this report to address the factual aspects of the study, summarize the hydrogeologic conditions, document the results of the water quality laboratory test results, and assess the capability of the on-site soils to treat domestic sewage.

Methodology

Test Pit Program

The field work was carried out on July 28, 2018 and consisted of Test Pits 1 to 3 extending to 3.0 m below grade. The test pit locations are shown on Drawing 1, appended.

The test pit locations were selected and established in the field by PML. Ground surface elevations and UTM co-ordinates at the test pit locations were determined by PML's Sokkia SMC5000 OPS system equipped with a GCX3 (network RTK rover) Global Navigation Satellite System (GNSS) receiver.

The test pits were excavated by a subcontracted excavating company working under the full time supervision of a member of PML's engineering staff.

Topsoil thicknesses were measured, and representative samples of the underlying soil units were recovered for identification purposes. Ground water conditions in the test pits were closely monitored during the course of the field work.

All recovered samples were returned to our laboratory for detailed examination to confirm field classification. Grain size analyses were carried out on three representative samples of the major soil units. The results are provided in Figure 1, attached.

Standpipes were installed in each test pit comprising clean 19 mm diameter PVC pipe with cut screen at the base. The details of the standpipe construction are shown on the appended Log of Test Pit sheets.

In accordance with O. Reg. 903/90, as amended, the owner of a well/standpipe is defined as the owner of the land upon which the well/standpipe is situated and the well owner should immediately decommission the well/standpipe, if it is not being used or maintained for future use as a well/standpipe. PML would be pleased to assist in this regard.

Water levels were measured in the standpipes approximately one week following installation using a Solinst^{TM} ground water level reader.

Ground Water Sampling

PML revisited the site on August 11, 2021 and measured ground water levels in the three standpipes. One representative ground water sample was obtained from the standpipe installed in Test Pit 3.

The ground water sample was collected and placed in clean laboratory supplied glass containers and transported under chain-of-custody protocols, in a cooler with ice packs, to an accredited laboratory for chemical testing. The water sample collected was submitted for chemical analysis to Caduceon Environmental Laboratories (Caduceon), a Canadian Association for Laboratory Accreditation Inc. (CALA) accredited laboratory.

To assess the baseline ground water quality, the water sample was analyzed for nitrite/nitrate, pH and phosphorous.

Findings

Summarized Subsurface Conditions

Reference is made to the appended Log of Test Pit sheets for details of the subsurface conditions including soil classifications, inferred stratigraphy, ground water observations, details of standpipe installation, and the results of laboratory grain size analyses.

The subsurface stratigraphy revealed in the test pits comprised topsoil overlying a layer of native sandy silt or silt.

Ground water was noted at a depth of 2.9 m in all test pits upon completion. No sloughing was noted during excavation of the test pits.

PML revisited the site on August 11, 2021 approximately one week following standpipe installation and measured ground water levels.

TEST PIT	GROUND WATER LEVEL DEPTH (m) / ELEVATION
1	1.4 / 202.9
2	0.7 / 200.5
3	0.9 / 198.1

The regional ground water table is believed to be below the depth of exploration. Local perched water stabilized at 0.7 to 1.4 m below existing grade in August, corresponding to elevation 198.1 to 202.9.

Ground water levels will fluctuate seasonally, and in response to variations in precipitation.

Septic System Consideration

Particle Size Distribution

The hydraulic conductivity of the soil samples was estimated using the grain size distribution determined by laboratory testing and an established empirical formula by Vukovic and Soro (1992). Percolation rate, "T", for the soil tested was estimated tested based on OBC (2012) Supplementary Standards SB-6. The results of the laboratory testing are included in Figure 1 and, the estimated hydraulic conductivities and percolation times are summarized below:

SAMPLE	DEPTH (m)	SOIL TYPE	ESTIMATED K (cm/sec)	PERCOLATION TIME (mins/cm)
Test Pit 1	2.5 to 2.7	Sandy Silt, Trace Clay	10^{-5} to 10^{-6}	20 to 50
Test Pit 2	2.2 to 2.4	Sandy Silt, Trace Clay	10^{-5} to 10^{-6}	20 to 50
Test Pit 3	2.3 to 2.5	Silt, Some Sand, Trace Clay	10^{-5} to 10^{-6}	20 to 50

The K value derived from the particle size distribution curve does not take into consideration site specific details such as compaction, soil structure, organic content and/or the degree of saturation.

Ground Water Quality

The laboratory certificate of chemical analyses for the analysis carried out by Caduceon on a ground water sample from Test Pit 3, in accordance with the chain-of-custody records and the protocols described above, are in included in Appendix A.

The ground water sample was analyzed for nitrate/nitrite, phosphorous, and pH to establish background conditions for septic design.

The background ground water quality is as follows:

LOCATION	PARAMETER	UNITS	MEASURED CONCENTRATION
Test Pit 3	pH	--	7.49
	Nitrite	mg/L	<0.1
	Nitrate		<0.1
	Phosphorous		1.59

Septic System Considerations

Lot Sizing

A preliminary assessment as to the number of individual lots the site can support without impairing existing/future ground water supplies was also requested. The evaluation follows a three-step assessment approach as discussed in the following sections.

Step 1 – Lot Size Considerations

Where individual lot sizes within the proposed development exceed 1 ha (2.5 ac.), the MOECC considers dilution of sewage effluent by infiltrating precipitation will be adequate to reduce nitrate concentrations to acceptable levels provided the area is not hydrogeologically sensitive. In general, further assessment would not be necessary where lots exceed 1 ha in size. Further, the MECP typically does not typically review developments with less than five lots.

PML proceeded to Step 2 since the lots are less than 1 ha in size. The lot sizing details are summarized in the table below.

LOT	TOTAL AREA (m^2)	AREA (ha)
1	5,448.62 (79.6 m x 65.45 m)	0.54
2	2,467.6 (79.6 m x 31.0 m)	0.25
3	3,024.8 (79.6 m x 38.0 m)	0.30
Total	10,941.02	1.09

Step 2 – System Isolation Considerations

Where proposed lot sizes are less than 1 ha (2.5 ac), it is necessary to assess the potential for risk to ground water. Where it can be demonstrated local water supplies are obtained from an aquifer at depth which is hydraulically isolated from the sewage effluent in the receiving soil, either by a massive relatively impervious soil layer, or by the presence of strong upward hydraulic gradients, then lot density can be established on the basis of hydraulic characteristics of the upper soil. The lot sizing must also take into account minimum set back/separation distances required by O. Reg. 358 (sewage systems), O. Reg. 903 (Ontario Water Resources: Wells), as amended and/or other municipal considerations.

Where it cannot be demonstrated that the sewage effluent is hydrogeologically isolated from the aquifer, Step 3 involves a hydrogeologic study to evaluate the impact of infiltration of septic effluent from sewage treatment systems (nitrate loading considerations).

Since system isolation is not being considered at this stage of the investigation, it is necessary to proceed to Step 3 for preliminary planning purposes.

Step 3 - Nitrate Loading Considerations

Assessment of the nitrate loading from infiltration of effluent from the sewage treatment systems was conducted in accordance with the following documents:

- Procedure D-5-4 – Technical Guideline for Individual On Site Sewage Systems: Water Quality Impact Assessment (MOEE April 1996);
- Hydrogeological Technical Information Requirements for Land Development Chapter 4, Section 4.5 (MOEE April 1995).

Nitrate in septic effluent is attenuated by dilution with infiltrating surface water and water discharged into the septic bed as well as ground water seepage from the upstream to the downstream side of the property (ground water flux). Ground water flux was not considered in the nitrate dilution calculation for this development; consequently, the nitrate loading assessment is considered to be conservative.

The surface water infiltration rate was computed in accordance with the procedure noted in the MOEE information document. This procedure involves a three step process:

a) A water budget analysis to compute the 'water surplus' (total rainfall – evapotranspiration).

b) Selection of infiltration factors for the conditions at this particular site to compute the rate of infiltration (sum of infiltration factors x water surplus).

c) Computation of the nitrate loading on the ground water resource.

The water budget analysis was conducted using the Thornwaite and Mather procedure noted in the MOEE information document. This method is based on classic storm water management principles. Since the equations employed to compute the volume of surface water runoff were developed for heavy rainfall events of short duration, and a large volume of the precipitation occurs at a light to moderate rate over an extended period of time, the procedure over-estimates the volume of runoff and yields a conservative assessment of the infiltration rate.

The water surplus and infiltration rates noted in the following table were computed from rainfall data provided by Environment Canada and the infiltration factors noted in the MOEE information document:

Topography 0.20
Soil.....0.20
Cover 0.20
Total 0.60

MONITORING STATION	ANNUAL PRECIPITATION (mm)	WATER SURPLUS[1] (mm/year)	INFILTRATION RATE (mm/year)
Wiarton A	1,047.8	485.69	291.41

1. Computed by the Thornwaite and Mather Method

For preliminary planning purposes, in accordance with the OBC (2012) a daily sewage flow rate of 2,000 L/day was utilized for each lot with the assumption that each lot is to be occupied by a four-bedroom dwelling. It is noted that if a dwelling with more than four bedrooms is proposed the below assessment would require revision.

The nitrate loading computation was based on the following equation and input parameters noted in the MOEE Procedure.

$$N_L = \frac{N_s V_s + N_b V_b}{V_i + V_b}$$

where N_L = nitrate loading mg/L

N_s = nitrate concentration in septic effluent (40 L/day per MOEE Procedure)

N_b = background nitrate concentration (assumed 0.1 mg/L based on previous septic assessments completed by PML)

V_s = daily sewage flow volume (2,000 L/day/Lot per MOEE Procedure)

V_b = volume of sewage effluent (2,000 L/day/Lot per MOEE Procedure)

V_i = infiltration volume (L)
(infiltration rate x land area)/365 days
Where; infiltration rate = 291.41 mm/year and land area = 1.09 ha

Based on our preliminary nitrogen-loading assessment the nitrate concentration at the down gradient property line assuming three four-bedroom dwellings is 16.3 mg/L, which does not satisfy the regulatory requirement of 10.0 mg/L. A copy of the calculation is provided on Figure 2.

A second calculation was completed by PML which considers the use of a tertiary treatment system capable of reducing the nitrate concentration. Provided the use of tertiary treatment is allowed by the approval authority for lot sizing calculations and the concentration of nitrate in the effluent can be reduced to 24 mg/L; the proposed developable land parcel can support the proposed three lots. A copy of this calculation is provided on Figure 3.

Alternatively, the proposed lots may need to be enlarged in order to accommodate the calculated nitrate loading.

CLOSURE

We trust the information presented in this report is sufficient for your present purposes. Please do not hesitate to contact our office should you have any questions.

Sincerely

Peto MacCallum Ltd.

PROFESSIONAL GEOSCIENTIST
ALICIA KIMBERLEY
PRACTISING MEMBER
2949
Sept 13, 2021
ONTARIO

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LICENSED PROFESSIONAL ENGINEER
G. R. WHITE
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PROVINCE OF ONTARIO

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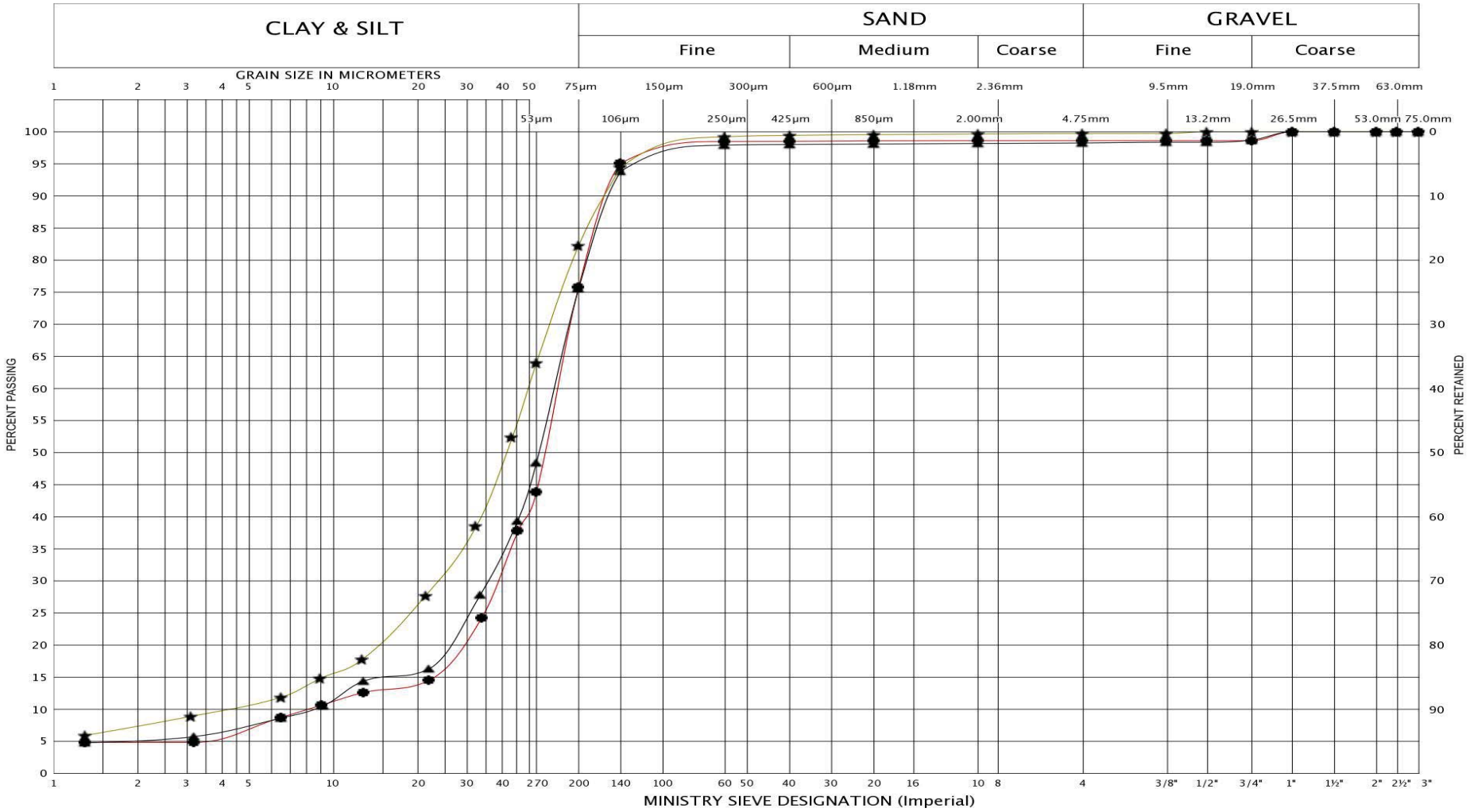
Director
Manager, Geotechnical Services

AK/GRW:tc

Enclosures:
Figures 1 – Particle Size Distribution Charts
Figures 2 and 3 – Nitrate Loading Calculations
List of Abbreviations Sheet
Test Pit Logs 1 to 3
Drawing 1 – Test Pit Location Plan
Appendix A – Ground Water Chemical Testing Results
Appendix B – Statement of Limitations

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	TP 1	TP 2	TP 3
	SAMPLE	1	1	1
	SYMBOL	●	▲	★

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GRAIN SIZE DISTRIBUTION

SANDY SILT, Trace Clay to Silt, Some Sand Trace Clay Trace Gravel

FIG No.: 1

Project No.: 21CX007

PML REF: 21CX007
REPORT: 1
FIGURE: 2

Nitrate Loading Calculations - Minimum Lot Size

Use/Notes	**Use/# Units**	**Sewage flow volume (L)**	**Total L/day**	
land to be severed for 3 residential lots (4 bedroom dwellings); each lot	3	2000	6000	
TOTAL Volume			6000	
Water Budget Calculation	485.69	mm		
Infiltration factors				
topo.	0.2			
soil	0.2			
cover	0.2			
	0.6			
Infiltration=Infiltration factor*water budget balance	291.4	mm/year		
Infiltration area	10941	m2	**1.09**	ha
			2.69	acres
days in year	365			
Infiltration Volume =Infiltration* area/365 days	8735.2	L/day		
Background - Maximum Nitrate Results	0.10	mg/L		
Note: Nitrate volume < 10 mg/L required				
nitrate loading (per MOE)	40	mg/L		
nitrate concentration for site equals:	16.3	mg/L N		
nitrate loading*flow volume				
vol.infiltration+flow volume				

Nitrate Loading Calculations - Minimum Lot Size

Use/Notes	Use/# Units	Sewage flow volume (L)	Total L/day	
land to be severed for 3 residential lots (4 bedroom dwellings); each lot	3	2000	6000	
TOTAL Volume			6000	
Water Budget Calculation	485.69	mm		
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topo.	0.2			
soil	0.2			
cover	0.2			
	0.6			
Infiltration=Infiltration factor*water budget balance	291.4	mm/year		
Infiltration area	10941	m2	**1.09**	ha
			2.69	acres
days in year	365			
Infiltration Volume =Infiltration* area/365 days	8735.2	L/day		
Background - Maximum Nitrate Results	0.10	mg/L		
Note: Nitrate volume < 10 mg/L required				
nitrate loading (per MOE)	24	mg/L		
nitrate concentration for site equals:	9.8	mg/L N		
nitrate loading*flow volume				
vol.infiltration+flow volume				

LIST OF ABBREVIATIONS

PENETRATION RESISTANCE

Standard Penetration Resistance N: - The number of blows required to advance a standard split spoon sampler 0.3 m into the subsoil. Driven by means of a 63.5 kg hammer falling freely a distance of 0.76 m.

Dynamic Penetration Resistance: - The number of blows required to advance a 51 mm, 60 degree cone, fitted to the end of drill rods, 0.3 m into the subsoil. The driving energy being 475 J per blow.

DESCRIPTION OF SOIL

The consistency of cohesive soils and the relative density or denseness of cohesionless soils are described in the following terms:

CONSISTENCY	N (blows/0.3 m)	c (kPa)	DENSENESS	N (blows/0.3 m)
Very Soft	0 - 2	0 - 12	Very Loose	0 - 4
Soft	2 - 4	12 - 25	Loose	4 - 10
Firm	4 - 8	25 - 50	Compact	10 - 30
Stiff	8 - 15	50 - 100	Dense	30 - 50
Very Stiff	15 - 30	100 - 200	Very Dense	> 50
Hard	> 30	> 200		

WTLL	Wetter Than Liquid Limit
WTPL	Wetter Than Plastic Limit
APL	About Plastic Limit
DTPL	Drier Than Plastic Limit

TYPE OF SAMPLE

SS	Split Spoon	ST	Slotted Tube Sample
WS	Washed Sample	TW	Thinwall Open
SB	Scraper Bucket Sample	TP	Thinwall Piston
AS	Auger Sample	OS	Oesterberg Sample
CS	Chunk Sample	FS	Foil Sample
GS	Grab Sample	RC	Rock Core

PH	Sample Advanced Hydraulically
PM	Sample Advanced Manually

SOIL TESTS

Qu	Unconfined Compression	LV	Laboratory Vane
Q	Undrained Triaxial	FV	Field Vane
Qcu	Consolidated Undrained Triaxial	C	Consolidation
Qd	Drained Triaxial		

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LOG OF TEST PIT NO. 1

17T 504039E 4940961N

PROJECT Nitrate Study
PML REF. 21CX007
LOCATION 130 Maple Ridge Road
BORING DATE July 28, 2021
ENGINEER GW
EXCAVATION METHOD Rubber Track Excavator
TECHNICIAN NT

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH (kPa) + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q / DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	UNIT WEIGHT kN/m³	GROUND WATER OBSERVATIONS AND REMARKS / GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL
		SURFACE ELEVATION 204.30						50 100 150 200 / 20 40 60 80	10 20 30 40		
0.0		TOPSOIL: Dark brown, silty sand/sandy silt, trace organics, moist					204				
0.70	203.60	SANDY SILT: Loose, brown to light brown, sandy silt, trace organics, trace gravel, trace clay, clay pockets, very moist to wet					203				19 mm slotted pipe
1.0											
2.0							202				
				1	GS						
3.0	3.0 201.3	TEST PIT TERMINATED AT 3.0 m									Upon completion of excavating: No sloughing Water at 2.9 m
4.0											Water Level Readings: Date / Depth(m) / Elev. 2021-08-11 1.4 202.9
5.0											

NOTES

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CONSULTING ENGINEERS

LOG OF TEST PIT NO. 2

17T 504027E 4941003N

PROJECT Nitrate Study
PML REF. 21CX007
LOCATION 130 Maple Ridge Road
BORING DATE July 28, 2021
ENGINEER GW
EXCAVATION METHOD Rubber Track Excavator
TECHNICIAN NT

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH (kPa) / DYNAMIC CONE PENETRATION / STANDARD PENETRATION TEST	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	UNIT WEIGHT kN/m³	GROUND WATER OBSERVATIONS AND REMARKS / GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL
		SURFACE ELEVATION 201.20									
0.0		TOPSOIL: Dark brown, silty sand/sandy silt, trace organics, moist									
0.20	201.00	SANDY SILT: Loose, brown, sandy silt, trace clay, trace gravel, very moist to wet					201				
1.0							200				19 mm slotted pipe
2.0				1	GS		199				
2.5	198.7	SILT: Loose, grey, silt, trace sand, trace clay, very moist to wet									
3.0	198.2	TEST PIT TERMINATED AT 3.0 m									Upon completion of excavating: No sloughing Water at 2.9 m
4.0											Water Level Readings: Date 2021-08-11, Depth(m) 0.7, Elev. 200.5
5.0											

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; 50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80
PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT
WATER CONTENT (%) 10 20 30 40

NOTES

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LOG OF TEST PIT NO. 3

17T 504030E 4941032N

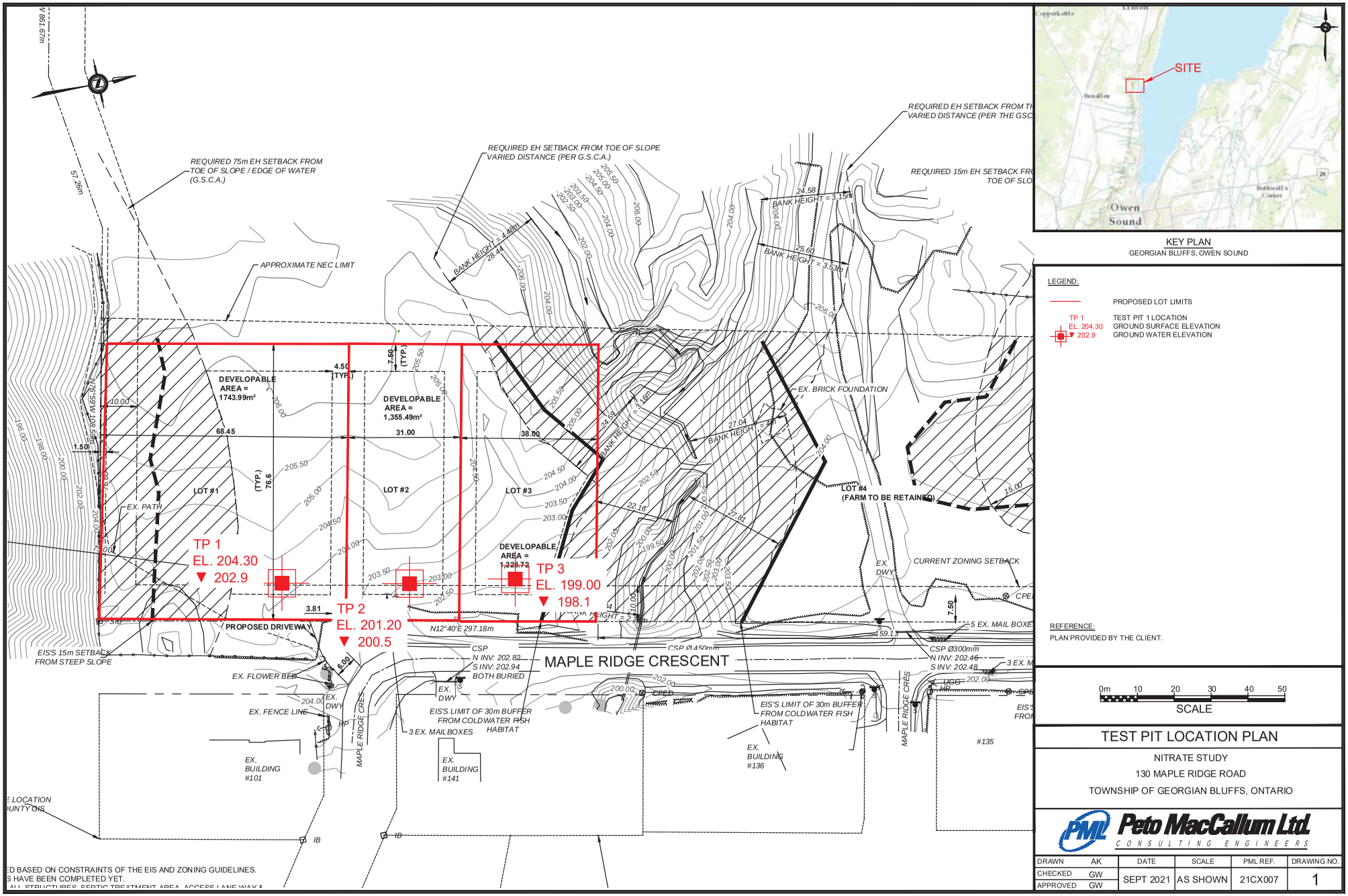
PROJECT Nitrate Study
PML REF. 21CX007
LOCATION 130 Maple Ridge Road
BORING DATE July 28, 2021
ENGINEER GW
EXCAVATION METHOD Rubber Track Excavator
TECHNICIAN NT

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH (kPa) / DYNAMIC CONE PENETRATION / STANDARD PENETRATION TEST	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT / WATER CONTENT (%)	UNIT WEIGHT kN/m³	GROUND WATER OBSERVATIONS AND REMARKS / GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL
		SURFACE ELEVATION 199.00									
0.0		TOPSOIL: Dark brown, silty sand/sandy silt, trace organics, moist									
0.40	198.60	SILT: Loose, brown, silt, some sand, trace clay, trace gravel, very moist					198				19 mm slotted pipe
				1	GS						
1.0											
							197				
2.0											
3.0	3.0 196.0	TEST PIT TERMINATED AT 3.0 m					196				Upon completion of excavating: No sloughing Water at 2.9 m
4.0											
5.0											

Water Level Readings:

Date	Depth(m)	Elev.
2021-08-11	0.9	198.1

NOTES



KEY PLAN
GEORGIAN BLUFFS, OWEN SOUND

LEGEND:

PROPOSED LOT LIMITS

TP 1 — TEST PIT 1 LOCATION
EL. 204.30 — GROUND SURFACE ELEVATION
▼ 202.9 — GROUND WATER ELEVATION

REFERENCE:
PLAN PROVIDED BY THE CLIENT.

0m 10 20 30 40 50
SCALE

TEST PIT LOCATION PLAN

NITRATE STUDY
130 MAPLE RIDGE ROAD
TOWNSHIP OF GEORGIAN BLUFFS, ONTARIO

Peto MacCallum Ltd.
CONSULTING ENGINEERS

DRAWN	AK	DATE	SCALE	PML REF.	DRAWING NO.
CHECKED	GW	SEPT 2021	AS SHOWN	21CX007	1
APPROVED	GW				

ED BASED ON CONSTRAINTS OF THE EIS AND ZONING GUIDELINES.
S HAVE BEEN COMPLETED YET.
ALL STRUCTURES, SEPTIC TREATMENT AREA, ACCESS LANE WAY &
E LOCATION
UNTY GIS

APPENDIX A

Ground Water Chemical Testing Results

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: GH346 **REPORT No. B21-25539**

Report To:

Peto MacCallum Ltd
19 Churchill Drive,
Barrie ON L4N 8Z5
Attention: Alicia Kimberley

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

DATE RECEIVED: 12-Aug-21
DATE REPORTED: 17-Aug-21
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.:
P.O. NUMBER: 21CX007
WATERWORKS NO.

			Client I.D.		TP3			
			Sample I.D.		B21-25539-1			
			Date Collected		11-Aug-21			
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
pH @25°C	pH Units		SM 4500H	16-Aug-21/O	7.49			
Nitrite (N)	mg/L	0.1	SM4110C	16-Aug-21/O	< 0.1			
Nitrate (N)	mg/L	0.1	SM4110C	16-Aug-21/O	< 0.1			
Phosphorus-Total	mg/L	0.01	E3199A.1	16-Aug-21/K	1.59			

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett
Director of Laboratory Services

GENERAL SAMPLE SUBMISSION FORM

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured. Proudly Canadian

SAMPLES SUBMITTED TO:

Kingston	
Ottawa	
Richmond Hill	
Barrie	X
London	
Windsor	

TESTING REQUIREMENTS

O'Reg 153/04	1	Table (1 - 9)		Record of Site	
O'Reg 406/19		Table (1 - 9.1)		SPLP Table (1 - 9.1)	
RPI		ICC		Agricultural	
Coarse		Medium/Fine		O'Reg 558 TCLP	
MISA		PWQO		Landfill Monitoring	
Other:					

REPORT NUMBER (Lab Use)

B21-25539

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

Organization: Peto Maccallum Ltd.	Address: 19 Churchill Drive, Barrie, ON L4N 8Z5, barrie@petomaccallum.com	Invoicing Address (if different):
Contact: A. Kimberley		
Tel: 705-734-3900 Fax: 705-734-9911		
Email: akimberley@petomaccallum.com	Quote #:	Project Name/#: 21CX007
Additional Info (email, cell, etc):	P.O. #:	Additional Info:

ANALYSES REQUESTED

Nitrate/Nitrite; Phosphorous; pH; Suspected Highly Contaminated

TURNAROUND SERVICE REQUESTED (see back page)

*Must be arranged in advance

[ ]	Platinum*	200% Surcharge
[ ]	Gold*	100% Surcharge
[ ]	Silver	50% Surcharge
[ ]	Bronze	25% Surcharge
[X]	Standard	5-7 days
[ ]	Specific Date:	

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

Lab No.	Sample Source and/or Sample Identification	S.P.L.	Sample Matrix *	Date Collected (yy-mm-dd)	Time Collected	Indicate Test For Each Sample By Using A Check Mark In The Box Provided										X	Field pH	Field Temp.	# Bottles/ Sample	Field Filtered Y/N
	TP3		GW	21-08-11	3:00PM	x	x	x											2	N
	Gen chem → O																			
	Nut → K																			

SAMPLE SUBMISSION INFORMATION

	Sampled by:	Submitted by:
Print:	S. Griffith	A.Kimberley
Sign:		
	21-08-11	21-08-12
	Date (yy-mm-dd)/Time:	Date (yy-mm-dd)/Time:

SHIPPING INFORMATION

Courier (Client account)		Invoice	
Courier (Caduceon account)			
Drop Off	X	# of Pieces	
Caduceon (Pick-up)			

REPORTING / INVOICING

Report by Fax	
Report by Email	X
Invoice by Email	X
Invoice by Mail	

SAMPLE RECEIVING INFORMATION (LABORATORY USE ONLY)

Received By (print):	DLow	Signature:	
Date Received (yy-mm-dd):	21-08-12	Time Received:	13:30
Laboratory Prepared Bottles:	[X] Yes	[ ] No	
Sample Temperature °C:	9	Labeled by:	

Comments:

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APPENDIX B

Statement of Limitations

STATEMENT OF LIMITATIONS

This report is prepared for and made available for the sole use of the client named. Peto MacCallum Ltd. (PML) hereby disclaims any liability or responsibility to any person or entity, other than those for whom this report is specifically issued, for any loss, damage, expenses, or penalties that may arise or result from the use of any information or recommendations contained in this report. The contents of this report may not be used or relied upon by any other person without the express written consent and authorization of PML.

This report shall not be relied upon for any purpose other than as agreed with the client named without the written consent of PML. It shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. A portion of this report may not be used as a separate entity: that is to say the report is to be read in its entirety at all times.

The report is based solely on the scope of services which are specifically referred to in this report. No physical or intrusive testing has been performed, except as specifically referenced in this report. This report is not a certification of compliance with past or present regulations, codes, guidelines and policies.

The scope of services carried out by PML is based on details of the proposed development and land use to address certain issues, purposes and objectives with respect to the specific site as identified by the client. Services not expressly set forth in writing are expressly excluded from the services provided by PML. In other words, PML has not performed any observations, investigations, study analysis, engineering evaluation or testing that is not specifically listed in the scope of services in this report. PML assumes no responsibility or duty to the client for any such services and shall not be liable for failing to discover any condition, whose discovery would require the performance of services not specifically referred to in this report.

STATEMENT OF LIMITATIONS
(continued)

The findings and comments made by PML in this report are based on the conditions observed at the time of PML's site reconnaissance. No assurances can be made and no assurances are given with respect to any potential changes in site conditions following the time of completion of PML's field work. Furthermore, regulations, codes and guidelines may change at any time subsequent to the date of this report and these changes may effect the validity of the findings and recommendations given in this report.

The results and conclusions with respect to site conditions are therefore in no way intended to be taken as a guarantee or representation, expressed or implied, that the site is free from any contaminants from past or current land use activities or that the conditions in all areas of the site and beneath or within structures are the same as those areas specifically sampled.

Any investigation, examination, measurements or sampling explorations at a particular location may not be representative of conditions between sampled locations. Soil, ground water, surface water, or building material conditions between and beyond the sampled locations may differ from those encountered at the sampling locations and conditions may become apparent during construction which could not be detected or anticipated at the time of the intrusive sampling investigation.

Budget estimates contained in this report are to be viewed as an engineering estimate of probable costs and provided solely for the purposes of assisting the client in its budgeting process. It is understood and agreed that PML will not in any way be held liable as a result of any budget figures provided by it.

The Client expressly waives its right to withhold PML's fees, either in whole or in part, or to make any claim or commence an action or bring any other proceedings, whether in contract, tort, or otherwise against PML in anyway connected with advice or information given by PML relating to the cost estimate or Environmental Remediation/Cleanup and Restoration or Soil and Ground Water Management Plan Cost Estimate.