

July 15, 2025

PH4864-LET.01.REV.02

27783179 Ontario Inc.
6356 Fourth Line Road
North Gower, Ontario
K0A 2T0

Attention: Victoria La Valle

Subject: **Hydrogeological Assessment and Terrain Analysis
Re-zoning Application
6356 Fourth Line Road
Ottawa (North Gower), Ontario**

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Geotechnical Engineering
Environmental Engineering
Hydrogeology
Materials Testing
Building Science
Rural Development Design
Retaining Wall Design
Noise and Vibration Studies

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INTRODUCTION

Paterson Group Inc. (Paterson) was retained by 27783179 Ontario Inc. to conduct a Hydrogeological Assessment and Terrain Analysis in support of a Re-zoning Application for the proposed Equestrian Establishment located at 6356 Fourth Line Road in Ottawa (North Gower), Ontario. It is our understanding that the current property, identified as 6356 Fourth Line Road, Ottawa (North Gower), consists of a 1.28 hectares (ha) parcel with an existing dwelling in the eastern portion of the site. The proposed Re-zoning application aims to modify acceptable uses of the 1.28 ha parcel that is designated as Agricultural (AG). Please refer to the Key Plan attached for more details.

The purpose of this work has been to determine the suitability of the water supply aquifer underlying the site and to carry out a septic system impact assessment (terrain analysis) to determine the site's suitability for private on-site sewage systems. Specifically, the intent of the report is to determine the quality and quantity of water underlying the subject site, as well as to provide the maximum sewage flow volume which the subject site can support from a nitrate attenuation standpoint.



BACKGROUND

Subject Site

The subject property consists of a residential dwelling with associated landscaped areas and driveways, as well as a concrete block barn located at 6356 Fourth Line Road in the City of Ottawa (North Gower), Ontario. The existing dwelling is anticipated to be relocated off-site. The site is currently serviced by a private water supply and private septic system. The site is bordered by residential buildings to the north and south, by agricultural lands to the west and by Fourth Line Road to the east.

The subject site is largely rectangular in shape with a total area of 1.28 ha. The site is currently zoned as AG (agricultural). The intention of the aforementioned Re-zoning application is to amend the zoning of the subject site to allow for the zoning to include Equestrian Establishment as an allowable usage.

Regional Geology

Published surficial geology mapping (OGS MRD128) for the area in the vicinity of the subject site indicates that the majority of the site is underlain predominantly by fine-textured glaciomarine deposits largely consisting of silt and clay.

Published bedrock geology mapping (OGS MRD219) indicates that the subject lands are underlain by dolostone with minor shale and sandstone of the Beekmantown Group and Oxford Formation. The available bedrock mapping coincides with the well driller's description on the Ministry of the Environment, Conservation and Parks (MECP) Water Well Records (WWR) for the surrounding well supplies installed within the subject area, which generally indicate a grey limestone.

Technically Representative Well

As a Water Well Record (WWR) was not available for the existing well located at 6356 Fourth Line Road. An existing well, located at 6340 Fourth Line Road, will be used as a technically representative well for the subject site. The technically representative well, hereby referred to as TW1, has a WWR with ID No. 1530684, is approximately 65 m from the property boundary of the subject site. Bedrock and aquifer mapping are consistent across the area.

TW1 has a well No of 1530684 with a 158.75 mm diameter steel casing. The well has a 0.42 m stick-up above ground surface with a total casing length of 14.75 m. The total well depth extends to 24.7 m below ground surface (bgs). The well is located such that water will drain away from the wellhead and was determined, by visual inspection, to be in good condition with an intact cap and no visual damage. The Water Well Record (WWR) can be found attached to this report. Available water well records (WWR) of the neighboring properties on the MECP Well Record mapping website indicated that the



wells were screened in limestone. Surrounding WWR's are attached to this report. TW1 meets the requirements as set by O.Reg.903 and is compliant.

MISSISSIPPI-RIDEAU SOURCE PROTECTION PLAN

The Mississippi-Rideau Source Protection Plan (MRSP) provides guidance as to which policies apply to a given property, municipality or specific activity and if there are specific designations that apply to the area. The subject site and surrounding areas have not been designated as a Highly Vulnerable Aquifer (HVA), an Intake Protection Zone (IPZ) or a Significant Groundwater Recharge Area (SGRA).

Therefore, there are no related requirements for an HVA, an IPZ with a score of less than 8 or SGRA at this location.

Hydrogeological Pre-Consultation

A City of Ottawa pre-consultation was completed on April 17, 2024 to discuss the requirements for the hydrogeological assessment and terrain analysis of the subject site.

FIELDWORK PROGRAM

Well Inspection

A visual inspection of TW1 was performed by Paterson personnel which confirmed that the well casing and cap are in good condition. The grading around the well was sufficiently graded to direct surface water away from the wellhead (as required by O.Reg 903) at the time of the new sewage system installation. The stickup was measured to be 0.42 m above ground surface. Based on a visual inspection by Paterson personnel, the well was deemed to be in good condition.

Well Testing

As a means to demonstrate the adequacy of the aquifer underlying the subject lands, with respect to water quality and quantity, the existing drilled well (TW1) on the adjacent site was tested. TW1 has a Water Well Record (WWR) Well ID of 1530684. TW1 has a 158.75 mm diameter steel casing that extends to 14.33 m bgs with a 0.42 m stick up. The well itself extends to a depth of 24.7 m bgs. Based on available geological mapping, the drift thickness at TW1 varies from 5 to 10 m.

As a means to evaluate the water supply aquifer intercepted by the well, the well was subjected to a 6-hour constant rate pumping test. The pumping test was conducted on June 11, 2024 under the full-time supervision of Paterson personnel. Prior to the pumping test a data-logger was installed to monitor the background groundwater levels.



The existing submersible pump was used for the 6-hour pumping test. A licensed water well technician (Air Rock) completed the necessary plumbing related activities. The discharge line was placed at a sufficient distance to ensure that the discharge water was being directed away from the well and the septic system onsite. Upon completion of the test, the system was returned to its normal configuration.

The pumping test was carried out at a pumping rate of 38 L/min (10 US gpm) for a duration of 6 hours. During the pumping test, the pumping rate was periodically measured using the timed volume correlation method. The pumping rate was maintained within 5% of the selected pumping rate. The static water level was recorded manually and an electric datalogger (VanEssen TD-Diver) was installed in the test well prior to the start of the pumping test.

The selected rate of 38 L/min provides approximately 6.8 times the maximum total daily design volume of 2,000 L/day for the septic system during the 6-hour pumping test. The maximum total daily design sanitary sewage flows (TDDSSF) were calculated based on the maximum volume that can be attenuated by the subject site (see Predictive Nitrate Impact Assessment Calculation, attached). The rate was determined to be generally representative of a flow rate which would be in excess of what the proposed development would require.

The data logger recorded water levels at 30 second intervals. In addition, manual water level readings were taken at periodic intervals during the test.

Recovery data was collected from the well following the completion of the pumping. The well was noted to have achieved 90% recovery approximately 40 minutes after the completion of pumping and 95% recovery after the homeowner's pump was replaced, within 60 minutes of the completion of pumping.

Groundwater samples were collected at 3 hours and 6 hours after the start of pumping. Prior to collection of the groundwater samples, the free chlorine residual was verified as non-detectable. The water samples were submitted for comprehensive testing of bacteriological, chemical, and physical water quality parameters consistent with the standard "Subdivision Supply" suite of parameters plus trace metals.

All samples were collected unfiltered and unchlorinated and were placed directly into clean bottles supplied by the analytical laboratory. Samples were placed immediately into a cooler with ice and were transported directly to Environmental Testing Canada Inc.(Eurofins) laboratory in Ottawa. All samples were received by the laboratory within 24 hours of collection.

A series of field tests of the pumped water were carried out at the well head during the 6-hour pumping test. The parameters tested at the well head included: pH, total dissolved solids, conductivity, turbidity, true colour, and temperature. Calibration / confirmation of calibration of all field-testing equipment was performed in Paterson's laboratory the day



prior to the pumping test. Values are then confirmed again onsite prior to the start of the pumping test.



Aquifer Analysis

Water Quantity

Pumping test data was analyzed using AQTESOLV Pro Version 4 aquifer analysis software package by HydroSOLVE Inc. Drawdown data was measured using an electronic water level tape and an electronic datalogger unit.

Table 1: SUMMARY OF WATER SUPPLY AQUIFER CHARACTERISTICS OF TW1	
AQUIFER PARAMETER	RESULT OF ANALYSIS
Transmissivity (m ² /day)	78.83
Pumping Rate (L/min)	38
Pre-test Static Water Level (m BTOC)	1.32
Post-test Static Water Level (m BTOC)	1.91
Available Drawdown (m)	23.8
% Drawdown During Pumping Test (%)	2.5
Specific Capacity (L/min/m drawdown)	64.4

The drawdown data was analyzed using the Theis and Cooper Jacob methods of analysis. Aquifer transmissivity is estimated to be 78.83 m²/day. Refer to the Theis and Cooper Jacob methods of analysis data sheets attached to this report.

The pumping test results show that TW1 has a high yield to support the water demands that may be required. Overall maximum drawdown at a constant pumping rate for a period of 6 hours was approximately 0.59 m at approximately 6 hours into the pumping test (2.5% of the available drawdown). 95% recovery was achieved approximately 60 minutes after the end of pumping.

The total volume of water pumped during the 6-hour pumping event was approximately 13,680 L. This is approximately 6.84 times the maximum total daily design volume of water (2,000 L/d) required to support the Re-zoning Application.

The suitability of the aquifer to supply the proposed Re-zoning application was assessed using the methodology provided in the City of Ottawa Hydrogeological and Terrain Analysis Guidelines (HTAG).

Based on the information summarized in Table 1, it is readily apparent that the water supply well has intercepted an adequately strong water supply aquifer which has sufficient quantity to service the proposed zoning usage.

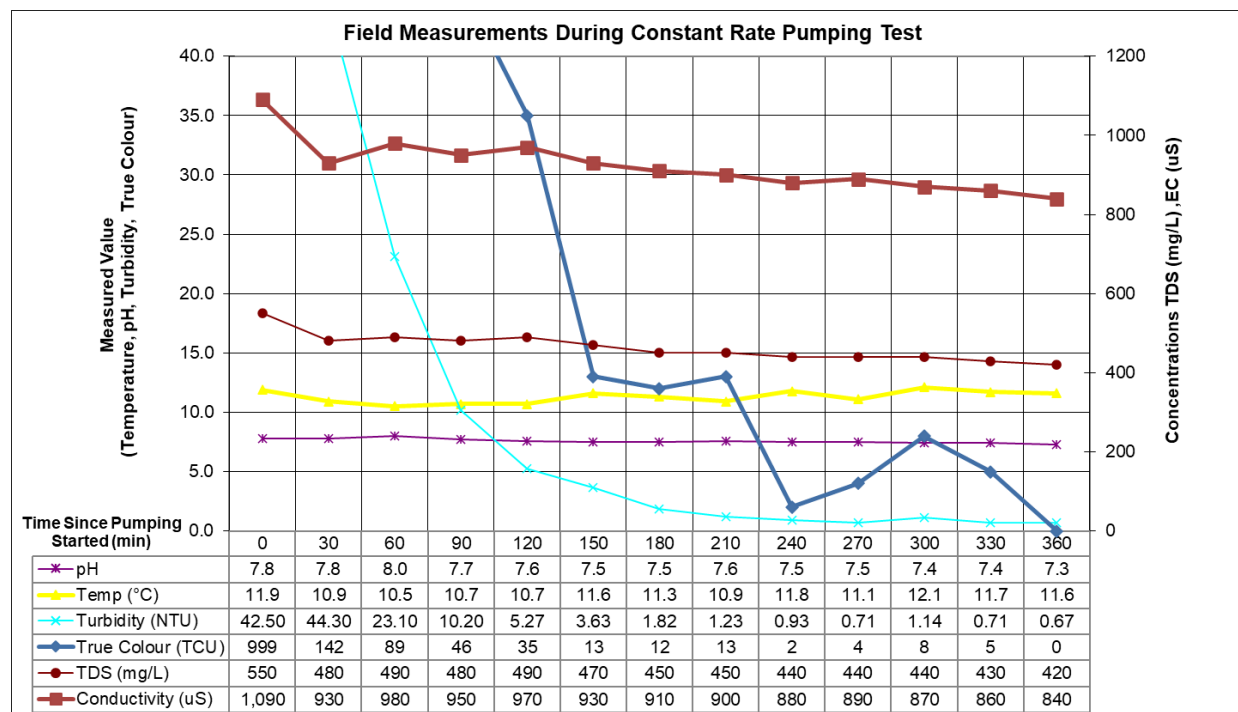
Given the analyses presented and summarized above, it is our opinion that there is an adequate supply of water to support the proposed Application



Water Quality

Field Data

Turbidity, electrical conductivity, total dissolved solids (TDS), pH, true color and temperature were measured at the wellhead during the pumping test. The measurements and time intervals for each of these parameters are summarized on the graphical representation below. In addition, a HACH Pocket Colorimeter II chlorine reader was used to measure the free chlorine residual level. No chlorine residual was detected in the discharge water prior to the collection of the water samples.





Laboratory Data

The Subdivision Package suite of parameters and trace metals laboratory water quality obtained from the pumping test of TW1 is provided in Table 2a and 2b below and the laboratory analyses reports can be found attached. All laboratory test results can be found attached to this report.

TABLE 2a: GROUNDWATER MICROBIOLOGY & GENERAL GEOCHEMISTRY					
PARAMETER	UNITS	ODWS		TW1	
		LIMIT	TYPE	TW1 GW1 (3 hr)	TW1 GW2 (6 hr)
				5/30/2024	5/30/2024
MICROBIOLOGICAL					
Escherichia Coli (E.Coli)	ct/100mL	0	MAC	0	0
Total Coliforms	ct/100mL	0	MAC	0	0
GENERAL CHEMICAL - HEALTH RELATED					
Fluoride (F)	mg/L	1.5	MAC	0.10	0.10
Ammonia (N-NH ₃)	mg/L	-	-	<0.02	<0.02
Nitrite (N-NO ₂)	mg/L	1	MAC	<0.1	<0.1
Nitrate (N-NO ₃)	mg/L	10	MAC	1.28	1.61
Total Kjeldahl Nitrogen	mg/L	-	-	0.455	0.413
Turbidity (Field)	NTU	1.0 (5.0)	MAC/AO	1.81	0.67
Turbidity (Laboratory)	NTU	1.0 (5.0)	MAC/AO	1.4	0.6
GENERAL CHEMICAL - AESTHETIC RELATED					
Alkalinity (as CaCO3)	mg/L	30-500	OG	349	336
Chloride (Cl)	mg/L	250	AO	36	37
Colour (Apparent)	TCU	5	AO	8	4
Colour (Field - True)	TCU	5	AO	12	0
Conductivity	uS/cm	-	-	884	837
Dissolved Organic Carbon	mg/L	5	AO	3.3	2.8
Hardness (as CaCO3)	mg/L	100	OG	422	413
Ion Balance	unitless	-	-	1.08	1.06
pH	unitless	6.5-8.5	AO	8.04	8.06
Phenols	mg/L	-	-	<0.001	<0.001
Sulphate (SO ₄)	mg/L	500	AO	75	79
Sulphide (S ₂ ⁻)	mg/L	0.05	AO	<0.01	<0.01
Tannin & Lignin	mg/L	-	-	0.20	0.10
Total Dissolved Solids	mg/L	500	AO	575	544

- ODWS identifies the following types of parameters:
MAC = Maximum Allowable Concentration
AO = Aesthetic Objective
OG = Operational Guideline
- Shaded Concentration Indicates an Exceedance of the ODWS Objective

**TABLE 2b: GROUNDWATER GEOCHEMISTRY - METALS**

PARAMETER	UNITS	ODWS		TW1	
		LIMIT	TYPE	TW1 GW1 (3 hr)	TW1 GW2 (6 hr)
				5/30/2024	5/30/2024
METALS					
Aluminum (Al)	mg/L	0.1	OG	<0.01	<0.01
Antimony (Sb)	mg/L	0.006	IMAC	<0.0005	<0.0005
Arsenic (As)	mg/L	0.01	IMAC	<0.001	<0.001
Barium (Ba)	mg/L	1.0	MAC	0.06	0.05
Beryllium (Be)	mg/L	-	-	<0.0005	<0.0005
Boron (B)	mg/L	5.0	IMAC	0.02	0.02
Cadmium (Cd)	mg/L	0.005	MAC	<0.0001	<0.0001
Calcium (Ca)	mg/L	-	-	88	87
Chromium (Cr)	mg/L	0.05	MAC	<0.001	<0.001
Cobalt (Co)	mg/L	-	-	0.0010	0.0009
Copper (Cu)	mg/L	1.0	AO	0.004	0.003
Iron (Fe)	mg/L	0.3	AO	0.05	<0.03
Lead (Pb)	mg/L	0.01	MAC	<0.001	<0.001
Magnesium (Mg)	mg/L	-	-	49	47
Manganese (Mn)	mg/L	0.05	AO	0.05	0.05
Mercury (Hg)	mg/L	0.001	MAC	<0.0001	<0.0001
Molybdenum (Mo)	mg/L	-	-	<0.005	<0.005
Nickel (Ni)	mg/L	-	-	<0.005	<0.005
Potassium (K)	mg/L	-	-	52	47
Selenium (Se)	mg/L	0.05	MAC	<0.001	<0.001
Silver (Ag)	mg/L	-	-	<0.0001	<0.0001
Sodium (Na)	mg/L	200	AO	16	15
Strontium (Sr)	mg/L	-	-	0.216	0.206
Thallium (Tl)	mg/L	-	-	<0.0001	<0.0001
Uranium (U)	mg/L	0.02	MAC	0.012	0.01
Vanadium (V)	mg/L	-	-	<0.001	<0.001
Zinc (Zn)	mg/L	5.0	AO	<0.01	<0.01

1. ODWS identifies the following types of parameters:

MAC = Maximum Acceptable Concentration

IMAC = Interim Maximum Acceptable Concentration

AO = Aesthetic Objective

OG = Operational Guideline

2. Shaded Concentration Indicates an Exceedance of the ODWS Objective

The bacteriological test results (Certificate of Analysis – Report No. 3952152) indicated that the test samples at the 3 and 6 hour interval were non-detect (0 ct/100 mL) for E.Coli and Total Coliforms.



The water quality of the subject water supply well meets all the Ontario Drinking Water Standards maximum acceptable concentrations (MAC). Furthermore, the water meets all of the Aesthetic Objectives (AO) and Operational Guidelines (OG) with the exception of the following.

- ☐ Hardness (as CaCO_3)
- ☐ Total Dissolved Solids (TDS)

Exceedances of the above parameters are not uncommon of the water supply in the subject aquifer. Each of these groundwater parameters are discussed in detail below.

Should any water treatment be desired by the owner, it is recommended that a water treatment specialist be retained to ensure that water treatment occurs in a safe manner.

Hardness as CaCO_3

Hardness, expressed as calcium carbonate, is an operation guideline and does not appear in the ODWS. Rather, it appears in the Technical Support Documents for Ontario Drinking Water Standards, Objectives and Guidelines as a parameter with an operational guideline at 100 mg/L. At the measured concentrations of 422 and 415 mg/L, the water is considered to be very hard, however, it is below the reasonable treatable limit of 500 mg/L specified in Table 3 of the MOECC guidance document Procedure D-5-5 (1996), thus, hardness can be treated with readily available technologies.

It is recommended that water hardness be treated using conventional technologies such as water softening or reverse osmosis, if desired by the owner. Without treating hardness, scaling can occur which can result in discolouration and residue buildup on water fixtures, or reduction in boiler efficiency due to scale build-up. According to Health Canada's *Guidelines for Canadian Drinking Water Quality - Summary Tables* "Although hardness may have significant aesthetic effects, a guideline has not been established because public acceptance of hardness may vary considerably according to the local conditions; major contributors to hardness (calcium and magnesium) are not of direct public health concern".

Total Dissolved Solids (TDS)

TDS refers to the concentration of inorganic substances dissolved in water. The main constituents are typically chloride, sulphates, calcium, magnesium, and bicarbonates. The TDS concentration of 575 mg/L exceeds the Aesthetic Objective of 500 mg/L. At concentrations above 500 mg/L, some consumers may find the taste objectionable, however, as the objective is an aesthetic objective, no treatment is required. It is, however, recommended that a point-of-use reverse osmosis unit be installed or to provide bulk bottled water on an as-needed basis for drinking water purposes. As such, no taste problems will occur when the system is used, or, bottled water is consumed.

The Langelier calculation provided an LSI of 0.3. Based on the evaluation of the result, the water is super saturated and tends to precipitate a scale layer of calcium carbonate



(slightly scale forming but non-corrosive). Based on the range of stability in the positive direction, it is recommended that water softening be used to prevent scaling. See Langelier Saturation Index Calculation attached for calculation details.



TERRAIN ANALYSIS

The fieldwork which was completed as part of a Geotechnical Investigation for the site (PG7022, dated April 17, 2024) is used in support of this assessment. Additional information pertaining to this investigation was gathered from available geological mapping and surrounding WWR's.

Surficial Geology

A series of test pits were excavated on the subject parcel to delineate the subsurface soil conditions as part of a Geotechnical Field Investigation. On March 1, 2024, five (5) test pits were completed on the property. The location of the test pits are delineated on the drawing PG7022-1-Test Hole Location Plan, attached.

The test hole locations were recorded and the subsurface conditions, including the soil morphology and depth to the groundwater table (if encountered), were carefully observed and recorded. The soils encountered were classified texturally in the field, and later reviewed in the laboratory.

The test pits were advanced to a maximum depth of 3.4 m below ground surface (bgs). Refusal to excavation was not recorded in any test pit. The subsurface profile generally consisted of silty clay with trace sand to the depth of the test pit. Topsoil was recorded to extend to a maximum depth of 0.3 m bgs.

Reference should be made to the borehole logs appended to this report for the details of the soil profiles encountered at each test hole location.

Materials encountered during Paterson's Geotechnical Investigation were consistent with the available surficial and bedrock geology mapping.

Hydrogeological Sensitivity of the Site

The subject site currently consists of a residential dwelling and a barn. It is anticipated that the dwelling will be relocated off-site. The topography of the site is generally level. The local flow direction of the shallow aquifer is expected to be towards local Drains to the north or south. The regional groundwater flow is considered to be in an east / southeast direction towards Stevens Creek and the Rideau River.

The onsite overburden generally consists of silty clay with trace sand. Refusal to excavation was not recorded in any test pit to a depth of 3.4 m bgs. The bedrock depths surrounding the proposed site vary from 3.7 to 4.5 m bgs based on surrounding Water Well Records (WWR). According to the field investigation, the overburden thickness was observed to be greater than 2 m at all borehole locations. As the proposed site does not



have bedrock within 2 m of the ground surface, the site is not considered hydrogeologically sensitive.

Conceptual Lot Development

As this Terrain Analysis is completed to support a Re-zoning Application, a Site Plan is not available.

Sewage System Design and Total Daily Design Sewage Flow

As this Terrain Analysis is completed to support a Re-zoning Application, a Site Plan is not available at this time. As such a sewage system design and flows have not yet been completed. A maximum predicted nitrate concentration will be determined for the site as a whole, and the current assessment will be completed based on existing conditions.

The proposed property will be analysed as part of the Re-zoning Application to ensure the theoretical impacts are below the Ontario Drinking Water Objective maximum allowable concentration of 10 mg/L of nitrate in the groundwater prior to the property line.

PREDICTIVE NITRATE IMPACT ASSESSMENT

Nitrate is considered to be a critical parameter of concern when assessing impacts to groundwater quality downgradient of an onsite sewage system. The City of Ottawa annotated MECP Procedure D-5-4 in the Hydrogeological and Terrain Analysis Guidelines (HTAG) applies for the proposed development. For the purpose of this guideline, the Ontario Drinking Water Objective of 10 mg/L of nitrate is the maximum allowable concentration detectable in the groundwater prior to the property line.

A detailed impact assessment is required due to the proposed zoning of the site. In order to demonstrate that private services would adequately support the proposed Re-zoning Application, a predictive nitrate impact assessment for the subject site was completed. This calculation was completed to determine the maximum sewage flow volume which could be applied to the subject site with the current site conditions and without the use of tertiary treatment systems (nitrate reducing systems). The values shown in the Predictive Nitrate Impact Assessment calculation attached to this report are summarized below:

☐	Site area	1.28 ha
☐	Impervious area %	4 %
☐	Concentration of nitrate in effluent (Value based on conventional effluent concentration)	40 mg/L



- ❑ Surplus Water 360 mm/year
(The surplus water value was estimated based on Environment Canada Climate Office values with a soil type comprised of clay loam (urban lawn) and anthropogenic sources, which can be found attached.)

- ❑ Combined infiltration factor based on:
 - Topography infiltration factor 0.52
 - Soil texture infiltration factor 0.20
 - Cover infiltration factor 0.12

The topography infiltration factor of 0.20 is based upon a rolling land (average slope of 2.8 to 3.8 m/km) based on available mapping.

The soil texture infiltration factor was based upon a “medium combinations of clay and loam” with a value of 0.2 which is a reasonable generalization based upon the field investigation by Paterson, available geological mapping and surrounding WWR's.

The “vegetative cover infiltration factor” was calculated as 0.12 based upon the site being used as cultivated land with some trees throughout the site.

As part of the rezoning process, the City of Ottawa does not typically allow the use of tertiary treatment systems to support the re-zoning application. As a tertiary treatment system requires annual monitoring by the OSSO, and allows for advanced treatment of sewage effluent, a tertiary treatment system is being reviewed for the Subject Site. The mandatory monitoring required on tertiary treatment systems by the OSSO ensures that the system is properly maintained and replaced when required, whereas there is no mandatory monitoring on a conventional sewage system. In order to demonstrate the viability and sustainability aspects of private servicing on the subject site, a Nitrate Impact Assessment was completed using the above noted parameters. As tertiary treatment technology is available to lower the potential risk to the groundwater supply, the use of nitrate reduction technology was included in the assessment for information purposes only and not to determine the maximum allowable volumes for the site.

The predicted nitrate concentration calculation for a conventional sewage system (system without nitrate reduction) results in a maximum of **2.1 m³/day** of effluent using a nitrate concentration of 40 mg/L. The inclusion of nitrate reduction technology (50 % nitrogen reduction in the of the effluent nitrate) would result in a maximum of **6.3 m³/day** of a effluent using a nitrate concentration of 20 mg/L. Note that the inclusion of tertiary treatment is for information purposes and does not dictate the maximum effluent volumes attenuable by the subject site. Both maximum sewage flows volumes with their respective nitrate concentrations meet the nitrate concentration threshold of below 10 mg/L at the property boundary. Additional re-infiltration from LID's or stormwater can be further used to increase the volume of septic effluent capable of being infiltrated on the subject site.



Furthermore, changing the parameters of the calculation (i.e. topography, cover factor, impermeable surfaces etc.) will further alter the maximum allowable effluent on the subject site.

A sewage system installation application for a new sewage system on any site in the City of Ottawa with a sewage flow volume of less than 10 m³/day will require an Ottawa Septic System Office (OSSO) application.

CONCLUSIONS

Based on the information contained within the body of this report the following conclusions can be drawn:

1. The water supply aquifer underlying the subject site is considered to be adequate to support the water quantity demands for the proposed zoning.
2. The neighbouring well, located at 6340 Fourth Line Road, is considered technically representative of the aquifer underlying the subject site.
3. Based on a visual inspection performed by Paterson personnel, the well casing, stickup, well cap, and WWR details of the representative well are in compliance with O.Reg. 903.
4. The preferred water supply intercepted by TW1 contains a water supply that is potable, and contains only elevated concentrations of hardness and TDS. The noted parameters can be treated with current readily available water conditioning equipment.
5. If desired by the property owner, a residential grade water softener can be used to facilitate the reduction of the hardness concentration and reduce scaling. If a water softener is used for the proposed development, the owner should be made aware that additional sodium will be added to the water to reduce hardness. If desired, a point-of-use reverse osmosis system can be used to provide a drinking tap source without increasing sodium levels.
6. It is recommended that either a point-of-use reverse osmosis system be used to used to reduce the TDS concentration, or bulk bottled water is provided as a drinking water source.
7. A maximum sewage flow volume of **2.1 m³/day** at a nitrate concentration of 40 mg/L or **6.1 m³/day** at a nitrate concentration of 20 mg/L can be accommodated on the subject site and still be below the predictive nitrate concentration threshold of 10 mg/L at the property boundary. These values are subject to change due to numerous variable factors which will need to be considered at that time and are provided for informational purposes in support of the re-zoning application.



8. Onsite sewage disposal needs can be accommodated with a Class 4 Sewage System utilizing conventional or tertiary treatment technologies
9. A Sewage System Permit and Building Permit need to be issued prior to the commencement of construction on the proposed structures or amenities/services.
10. The results of the Hydrogeological Assessment and Terrain Analysis have provided satisfactory evidence that the subject site can support the proposed zoning usage with respect to water quality, quantity and sewage system placement.

We trust that the current submission satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

Alexander Schopf, PhD, EIT



Michael Killam, P.Eng

Attachments:

- ☐ Key Plan
- ☐ MECP Water Well Records
- ☐ Eurofins Certificate of Analysis
- ☐ Paterson PG7022 - Test Pit Logs
- ☐ AQTESOLV - Pumping Test Analysis Reports
- ☐ Langelier Calculation
- ☐ Nitrate Impact Assessment Calculations
- ☐ Paterson Drawing PG7022-1 - Test Hole Location Plan



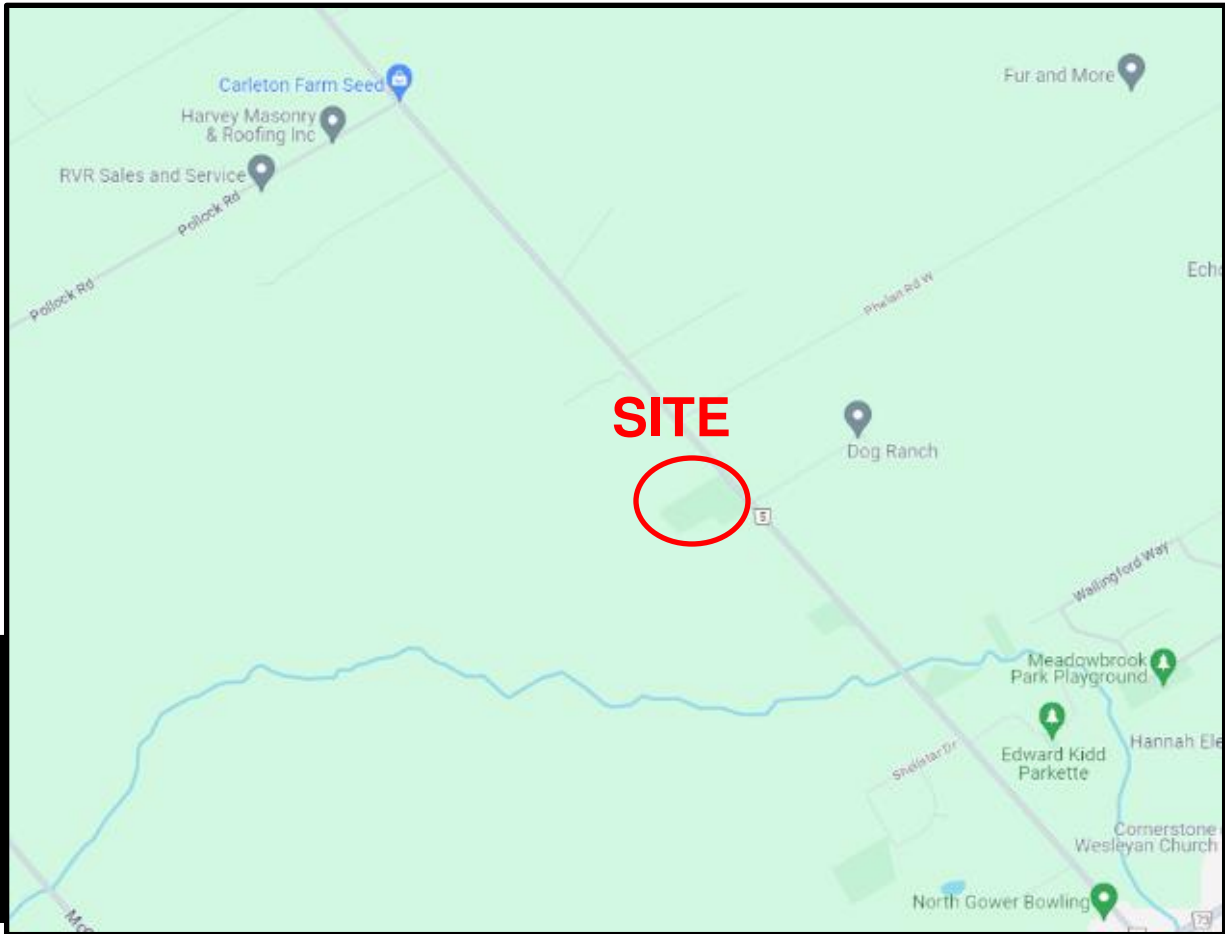


FIGURE 1

KEY PLAN



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

1530684

Municipality 15004 Con. CON 04

County or District Ottawa-Carleton		Township/Borough/City/Town/Village Rideau		Con block tract survey, etc. Can #4		Lot 16	
Address Box 303 North Gower				Date completed 26 7 99			
Northings		Elevations		Basin Code		ii iii iv	
21		K2A-378					

[illegible][illegible][illegible]

PUMPING TEST	71	Pumping test method ☒ 1 ¹⁰ Am ☐ 2 ¹¹⁻¹⁴ Bailer	Pumping rate 30 ¹¹⁻¹⁴ GPM	Duration of pumping 1 ¹⁵⁻¹⁸ Hours 0 ¹⁷⁻¹⁸ Mins
		Static level ¹⁹⁻²¹ 8 ²²⁻²⁴ 60 feet	Water level end of pumping ²⁵	Water levels during ☐ 1 ²⁶⁻²⁸ Pumping ☒ 2 ²⁹⁻³¹ Recovery
		15 minutes ²⁶⁻²⁸ 8 feet 30 minutes ²⁹⁻³¹ 8 feet	45 minutes ³²⁻³⁴ 8 feet 60 minutes ³⁵⁻³⁷ 8 feet	
	If flowing give rate ³⁸⁻⁴¹ GPM	Pump intake set at ⁴² 60 feet	Water at end of test ☐ 1 ⁴³⁻⁴⁵ Clear ☒ 2 ⁴⁶⁻⁴⁹ Cloudy	
	Recommended pump type ☐ 1 ⁵⁰⁻⁵² Shallow ☒ 2 ⁵³⁻⁵⁵ Deep	Recommended pump setting ⁵⁶⁻⁵⁸ 60 feet	Recommended pump rate ⁵⁹⁻⁶¹ 25 GPM	

FINAL STATUS OF WELL		54
1 ☒ Water supply	5 ☐ Abandoned, insufficient supply	9 ☐ Unfinished
2 ☐ Observation well	6 ☐ Abandoned, poor quality	10 ☐ Replacement well
3 ☐ Test hole	7 ☐ Abandoned (Other)	
4 ☐ Recharge well	8 ☐ Dewatering	

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

METHOD OF CONSTRUCTION		57
1 ☐ Cable tool	5 ☒ Air percussion	9 ☐ Driving
2 ☐ Rotary (conventional)	6 ☐ Boring	10 ☐ Digging
3 ☐ Rotary (reverse)	7 ☐ Diamond	11 ☐ Other
4 ☐ Rotary (air)	8 ☐ Jetting	

LOCATION OF WELL.

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

250'

30'

120'

House

Drive

6340'

Fourth Line

North Gowee 1 mile

190679

Name of Well Contractor	Well Contractor's Licence No.
Splash Well Drilling	4877
Address	
Box 1083, Prescott	
Name of Well Technician	Well Technician's Licence No.
Jedd Ferguson	1-0478
Signature of Technician/Contractor	Submission date
Jedd Ferguson	26 7 99

MINISTRY USE ONLY	Data source	Contractor	59-62	Date received	63-68	80
		4877		AUG 09 1999		
	Date of inspection	Inspector				
	Remarks					
	CSS.ES0					

CHS-58 1204

Situation: Is well on upland, in valley, or on hillside? *hillside*

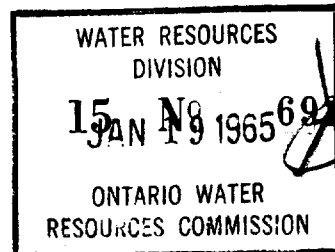
Drilling Firm *M M Meagher*

Address *361 Bunc St. Britannia Bay Ottawa*

Recorded by *M M Meagher* Address *361 Bunc St Britannia Ottawa*

Date *Dec 23/48* Licence Number

UTM 1182 442120E 31644



Col 5 R 14993119N
Elev 4103110

The Ontario Water Resources Commission Act

WATER WELL RECORD

Basin 25
County or District Carl

Township, Village, Town or City North Gower

Con. 4 Lot 15 Date completed 8 October 1964
(day month year)

Address R. No. 3 North Gower

Casing and Screen Record

Inside diameter of casing 5"
Total length of casing 68'
Type of screen
Length of screen
Depth to top of screen
Diameter of finished hole 5"

Pumping Test

Static level 35'
Test-pumping rate 10 G.P.M.
Pumping level 65
Duration of test pumping 1hr.
Water clear or cloudy at end of test cloudy
Recommended pumping rate 5 G.P.M.
with pump setting of 80' & 35' take pipe from ground surface

Well Log

Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
loam	0	5	100	fresh
hardpan & boulders	5	64	183	fresh
limestone	64	185		

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

new house

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

Drilling or Boring Firm CAPITAL WATER SUPPLY

Address 1243 Heron d.

Ottawa 735-0600

Licence Number 1223

Name of Driller or Borer M. Kavanagh

Address

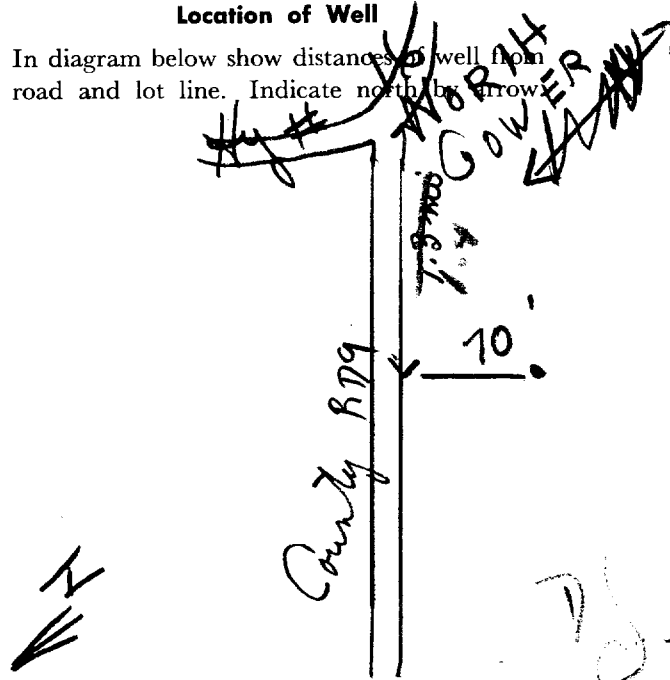
Date October 8 1964

(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

Location of Well

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



OWRC COPY

UTM 118 Z 44191810 E

31G49



15 No 6928

15 R 4999440 N

The Ontario Water Resources Commission Act

Elev. 4 R 0315

WATER WELL RECORD

Basin 25 L CHAPLTON

Township, Village, Town or City

Con. L Lot 15Date completed I

(day)

month

year

Address

Casing and Screen Record

Inside diameter of casing 5
Total length of casing 44
Type of screen
Length of screen
Depth to top of screen
Diameter of finished hole 5

Pumping Test

Static level 17
Test-pumping rate 8 G.P.M.
Pumping level 23
Duration of test pumping 1 hr
Water clear or cloudy at end of test clear
Recommended pumping rate 5 G.P.M.
with pump setting of 40 feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record

From
ft.To
ft.Depth(s) at
which water(s)
foundKind of water
(fresh, salty,
sulphur)Boulder loam019GRAVEL1944Limestone444545FRESH

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

FARM

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

Drilling or Boring Firm

M. McNEIL
OTIHO

Address

Licence Number

2157

Name of Driller or Borer

Y. F.

Address

Date

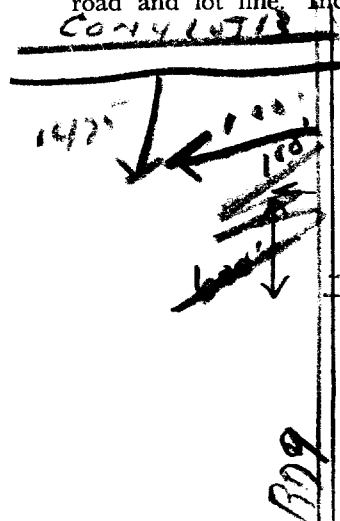
DEC 6

(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

OWRC COPY

Location of Well

In diagram below show distances of well from
road and lot line. Indicate north by arrow.C0113
LOT 1625

31G4g



ONTARIO

Basin 25

Department of Mines

2 of 16

15

GROUND WATER
N. 6929
DEC 16 1957
ONTARIO WATER
RESOURCES COMMISSION

15
GROUND NO. 6929
FEB 2 1964
RECEIVED

County or District Charleston Township, Village, Town or City N. Haver
 Con TU Lot 30 Date completed 27 Jan 61
 (day month year)
 ess Gars Out. Box 108

WATER WELL RECORD

Casing and Screen Record

Inside diameter of casing..... 5"

Total length of casing..... 50'

Type of screen..... none

Length of screen.....

Depth to top of screen.....

Diameter of finished hole..... 5"

Pumping Test

Static level..... 30'.....
Test-pumping rate..... 10..... G.P.M.
Pumping level..... 35'.....
Duration of test pumping..... 1 hr.....
Water clear or cloudy at end of test..... cloudy.....
Recommended pumping rate..... 10..... G.P.M.
with pumping level of..... 35'.....

Well Log

Water Record

[illegible]

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

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

Drilling Firm..... McLEAN WATER SUPPLY LTD.
1532 RAVEN AVE.

Address KENNESHA OTTAWA.....

Licence Number..... 476

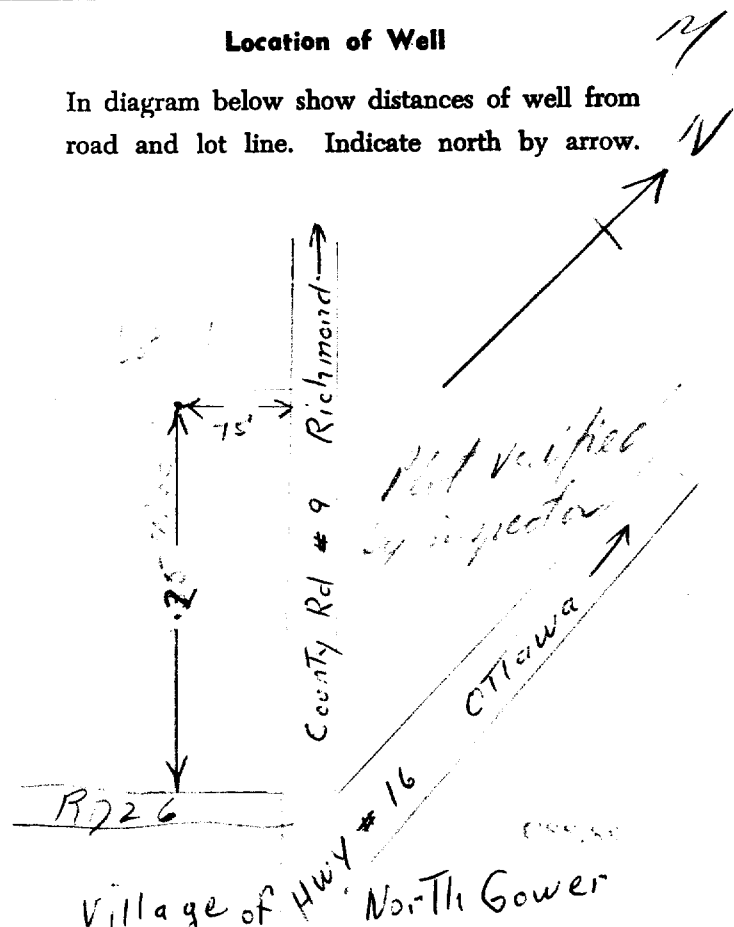
Name of Driller W. Kavanagh

Address

Date Jan 27, 1961
C. D. McLean
(Signature of Licensed Drilling Contractor)

Location of Well

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





Ontario

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

3/6/45

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

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. BLOCK, TRACT, SURVEY, ETC.	LOT
11	1515161	15004	04
DATE COMPLETED		DAY 11 08 YR 75	
988.17	4	0304	4

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
grey	clay	stone		0	37
grey	limestone			37	45

31	003720512	0015215
32		

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
15-18	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
20-23	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
25-28	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
30-33	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
10-11	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0 39
17-18	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE		20-23
24-25	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE		27-30

SCREEN

SIZE (S) OF OPENING (SLOT NO.)	31-33	DIAMETER	34-38	LENGTH	39-40
MATERIAL AND TYPE		INCHES		FEET	
		DEPTH TO TOP OF SCREEN		41-44 80	

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD	1 ☒ PUMP 2 ☐ BAILER	PUMPING RATE	0020 GPM	DURATION OF PUMPING	01 00 HOURS
STATIC LEVEL	19-21 005	WATER LEVEL END OF PUMPING	25-24 025	WATER LEVELS DURING	15 MINUTES 26-25 025 30 MINUTES 29-31 025 45 MINUTES 32-3 025 60 MINUTES 35-37 025
IF FLOWING, GIVE RATE	38-41	PUMP INTAKE SET AT	42	WATER AT END OF TEST	1 ☐ CLEAR 2 ☒ CLOUDY
RECOMMENDED PUMP TYPE	6 SHALLOW ☒ DEEP ☐	RECOMMENDED PUMP SETTING	43-45	RECOMMENDED PUMPING RATE	46-49

FINAL STATUS OF WELL

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

WATER USE

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

METHOD OF DRILLING

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

LOCATION OF WELL 4298

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

25
10
5
0
5
10
25
N. Gower Valley

CONTRACTOR

NAME OF WELL CONTRACTOR	LICENCE NUMBER
Henry Mains Well Drilling	3644
ADDRESS	
Box 326, Richmond Ont	
NAME OF DRILLER OR BORER	LICENCE NUMBER
W. J. Mair	
SIGNATURE OF CONTRACTOR	SUBMISSION DATE
	DAY 11 MO 8 YR 75

OFFICE USE ONLY

DATA SOURCE	58 CONTRACTOR	59-62 DATE RECEIVED	63-68
1	3644	15 01 76	
DATE OF INSPECTION	INSPECTOR		
16 Jan 76	P/R Dyl		
REMARKS			
	P		
	WI		

Instructions for Completing Form

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

Well Owner's Information and Location of Well Information	
Well Owner Name	
Well Owner Address	
Well Owner City	
Well Owner State	
Well Owner Zip	
Well Owner Phone	
Well Owner Email	
Well Location	
Well Location Address	
Well Location City	
Well Location State	
Well Location Zip	
Well Location Phone	
Well Location Email	

First Name		Last Name		Mailing Address (Street Number/Name, RR, Lot, Concession)					
Barasite Construction				2354 Summerside Drive					
County/District/Municipality		Township/City/Town/Village		Province	Postal Code		Telephone Number (include area code)		
Ottawa Carleton		Manotick		Ontario	K4M 1B4		613 692 5049		
Address of Well Location (County/District/Municipality)				Township		Lot		Concession	
Ottawa Carleton				Rideau		25		4	
RR#/Street Number/Name				City/Town/Village		Site/Compartment/Block/Tract etc.			
6366 4th Line Road				North Gower					
GPS Reading	NAD	Zone	Easting	Northing	Unit Make/Model	Mode of Operation:		☐ Undifferentiated ☐ Differentiated, specify _____	
	8 3	18	44 24 62	49 99 12 6	Garmin			☒ Averaged	

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523</
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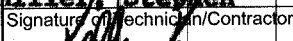
General Colour	Most common material	Other Materials	General Description	Depth From	Metres To
Brown	Clay	Boulders		0	3.65
Gray	Clay			3.65	6.09
Gray	Sandy Clay	Boulders		6.09	21.33

[illegible][illegible]

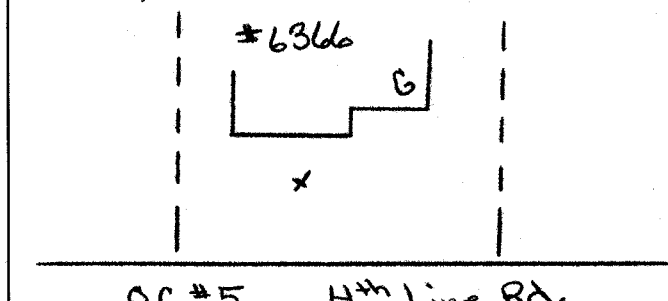
Method of Construction			
☐ Cable Tool	☒ Rotary (air)	☐ Diamond	☐ Digging
☐ Rotary (conventional)	☒ Air percussion	☐ Jetting	☐ Other
☐ Rotary (reverse)	☐ Boring	☐ Driving	

Water Use			
☒ Domestic	☐ Industrial	☐ Public Supply	☐ Other
☐ Stock	☐ Commercial	☐ Not used	
☐ Irrigation	☐ Municipal	☐ Cooling & air conditioning	

Final Status of Well			
☒ Water Supply	☐ Recharge well	☐ Unfinished	☐ Abandoned, (Other)
☐ Observation well	☐ Abandoned, insufficient supply	☐ Dewatering	
☐ Test Hole	☐ Abandoned, poor quality	☐ Replacement well	

Well Contractor/Technician Information			
Name of Well Contractor Capital Water Supply Ltd.		Well Contractor's Licence No. 1558	
Business Address (street name, number, city etc.) P.O. Box 490 Stittsville, Ontario K2S 1A6			
Name of Well Technician (last name, first name) Miller; Stephen		Well Technician's Licence No. T0097	
Signature of Technician/Contractor 		Date Submitted	
Y 		YYYY	MM DD
		2004	8 18

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



Audit No. Z 13734	Date Well Completed YYYY MM DD 2004 8 12
Was the well owner's information package delivered? ☒ Yes ☐ No	Date Delivered YYYY MM DD 2004 8 13

Ministry Use Only				
Data Source		Contractor		
		1558		
Date Received	YYYY	MM	DD	Date of Inspection
				YYYY MM DD
Remarks		Well Record Number		
SEP 10 2004		1534966		

Measurements recorded in: ☒ Metric ☐ Imperial

Address of Well Location (Street Number/Name) 6382 FOURTH LINE RD				Township NORTH GOWER		Lot		Concession	
County/District/Municipality OTTAWA-CARLETON				City/Town/Village NORTH GOWER		Province Ontario		Postal Code K0A2T0	
UTM Coordinates		Zone Easting		Northing		Municipal Plan and Sublot Number		Other	
NAD 83		18442558		4999042					

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

[illegible]

Annular Space			
Depth Set at (m/ft)		Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From	To		
0.10	1.5M	BENTONITE	0.32 m³

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

Construction Record - Casing					Status of Well
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☒ Alteration (Construction) ☐ Abandoned, Insufficient Supply
			From	To	
75.86	Steel	1.48	7.45	1.45	
10.0	Steel	1.48	1.45	UNKW	

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

☐ Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify* _____
☐ Other, *specify* _____

Water Details		Hole Diameter	
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	Depth (m/ft) From To	Diameter (cm/in)
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____		
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____		
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____		

Well Contractor and Well Technician Information			
Business Name of Well Contractor		Well Contractor's Licence No.	
H.O. WRIGHT & SONS LTD		6357	
Business Address (Street Number/Name)		Municipality	
2383 CHURCH ST NORTH GOWER			
Province	Postal Code	Business E-mail Address	
ON	K0A2T0	gpratt@hwright.ca	
Bus. Telephone No. (inc. area code)		Name of Well Technician (Last Name, First Name)	
6134893372		PRATT GEORGE	
Well Technician's Licence No.	Signature of Technician and/or Contractor		Date Submitted
1445	George Pratt		2012/10/05

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, <i>specify</i> _____	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason: _____	Static Level			
	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
	4		4	
Duration of pumping _____ hrs + _____ min	5		5	
Final water level end of pumping (m/ft)	10		10	
If flowing give rate (l/min / GPM)	15		15	
	20		20	
Recommended pump depth (m/ft)	25		25	
	30		30	
Recommended pump rate (l/min / GPM)	40		40	
Well production (l/min / GPM)	50		50	
	60		60	
Disinfected? ☐ Yes ☐ No				

Map of Well Location

Please provide a map below following instructions on the back.

PROPERTY LINE

55.9m

29.6m

6382

FOURTH LINE RD
Comments: EXTEND CASING TO ABOVE
GRADE

Well owner's information package delivered	Date Package Delivered	Ministry Use Only							
	<table border="1"> <tr> <td>Y</td><td>Y</td><td>Y</td><td>Y</td><td>M</td><td>M</td><td>D</td><td>D</td> </tr> </table>		Y	Y	Y	Y	M	M	D
Y	Y	Y	Y	M	M	D	D		
☐ Yes ☐ No	Date Work Completed	Received							
	20121005	OCT 25 2012							



Address of Well Location (Street Number/Name) 6381 Fourth Line Rd.		Township Rideau	Lot 17	Concession 3
County/District/Municipality		City/Town/Village North Gower	Province Ontario	Postal Code K0A2T0
UTM Coordinates NAD 83	Zone 18	Easting 442545	Northing 4991361	Municipal Plan and Sublot Number

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	clay	Silt	Hard	0	4.5
Grey	clay	Silt	Hard	4.5	12.6
Grey	gravel	Stone, Sand	packed	12.6	14.1
Grey	limestone		layered	14.1	24.3

Annular Space			
Depth Set at (m/ft)		Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From	To		
0	15.2	ciment grout	0.4m³

Method of Construction		Well Use		
☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial	☐ Not used
☐ Rotary (Conventional)	☐ Jetting	☒ Domestic	☐ Municipal	☐ Dewatering
☐ Rotary (Reverse)	☐ Driving	☐ Livestock	☐ Test Hole	☐ Monitoring
☐ Boring	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning	
☐ Air percussion		☐ Industrial		
☒ Other, specify Air Rotary		☐ 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)		☒ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☐ Other, specify
			From	To	
15.55	Steel	0.48	4.6	15.2	
15.55	Open Hole		15.2	24.3	

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

Water Details		Hole Diameter		
Water found at Depth	Kind of Water: ☐ Fresh ☒ Untested	Depth (m/ft)		Diameter (cm/in)
21 (m/ft) ☐ Gas ☐ Other, specify		From	To	
Water found at Depth	Kind of Water: ☐ Fresh ☐ Untested	0	15.2	24.9
(m/ft) ☐ Gas ☐ Other, specify		15.2	24.3	15.55
Water found at Depth	Kind of Water: ☐ Fresh ☐ Untested			
(m/ft) ☐ Gas ☐ Other, specify				

Well Contractor and Well Technician Information			
Business Name of Well Contractor Bourgeois Well Drilling	Well Contractor's Licence No. 7417		
Business Address (Street Number/Name) 14245 Conc. 10-11	Municipality Crysler		
Province On.	Postal Code K0A1R0	Business E-mail Address N/A	

Telephone No. (inc. area code) 1398752911	Name of Well Technician (Last Name, First Name) GENIER MICHAEL		
Well Technician's Licence No. 3493	Signature of Technician and/or Contractor 	Date Submitted 20150824	

Results of Well Yield Testing					
After test of well yield, water was: ☐ Clear and sand free ☐ Other, <i>specify</i>		Draw Down		Recovery	
		Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:		Static Level	3.44		11.63
		1	5.10	1	9.22
Pump intake set at (m/ft) 22		2	5.99	2	8.05
Pumping rate (l/min) / GPM 60		3	6.82	3	7.03
Duration of pumping 1 hrs + min		4	6.98	4	6.30
Final water level end of pumping (m/ft) 11.63		5	7.26	5	5.78
If flowing give rate (l/min / GPM)		10	8.05	10	5.20
		15	8.47	15	4.10
Recommended pump depth (m/ft) 22		20	9.13	20	3.45
Recommended pump rate (l/min) / GPM 60		25	9.54	25	3.44
Well production (l/min) / GPM 85		30	9.82	30	3.44
Disinfected? ☒ Yes ☐ No		40	10.60	40	3.44
		50	11.13	50	3.44
		60	11.63	60	3.44

Map of Well Location	
Please provide a map below following instructions on the back.	
Comments:	

Well owner's information package delivered ☒ Yes ☐ No	Date Package Delivered 20150818	Ministry Use Only Audit No. 202984 SEP 04 2015
	Date Work Completed 20150818	

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

11

1530684

Municipality 15004 Con. 04

County or District Ottawa-Carleton	Township/Borough/City/Town/Village Rideau	Con. block tract survey, etc. Con #9	Lot 16
Address Box 303 North Gower		Date completed 26 7 99 day month year	
Northing		Elevation 601.2	Basin Code

General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
Brown	Clay		Packed	0	8
Grey	Clay		Soft	8	40
Grey	Clay	Stones	Packed	40	44
Grey	Limestone		Hard	44	81

31	32
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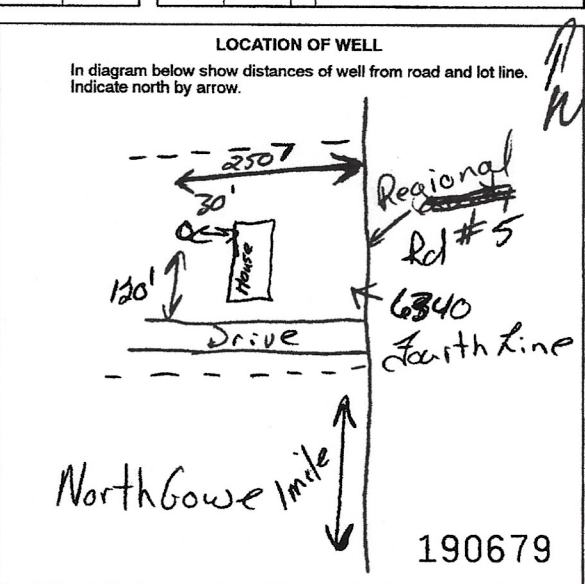
Water found at - feet	Kind of water
72	☒ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas

Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
9 7/8	Steel		0	47
6 1/4	Galvanized	.188	0	47
6	Steel		47	81

Sizes of opening (Slot No.)	Diameter inches	Length feet

Annular space		Abandonment	
Depth set at - feet	Material and type (Cement grout, bentonite, etc.)	From	To
47	Cement Pressure Grouted	0	47

Pumping test method ☒ Pump ☐ Bailer	Pumping rate 30 GPM	Duration of pumping 0 Hours 0 Mins
Static level 8 feet	Water level end of pumping 60 feet	Water levels during 15 minutes 8 feet 30 minutes 8 feet 45 minutes 8 feet 60 minutes 8 feet



☒ Water supply ☐ Observation well ☐ Test hole ☐ Recharge well	☐ Abandoned, insufficient supply ☐ Abandoned, poor quality ☐ Abandoned (Other) ☐ Dewatering	☐ Unfinished ☐ Replacement well
---	--	--

☒ Domestic ☐ Stock ☐ Irrigation ☐ Industrial	☐ Commercial ☐ Municipal ☐ Public supply ☐ Cooling & air conditioning	☐ Not used ☐ Other
--	--	---

☐ Cable tool ☐ Rotary (conventional) ☐ Rotary (reverse) ☐ Rotary (air)	☐ Air percussion ☐ Boring ☐ Diamond ☐ Jetting	☐ Driving ☐ Digging ☐ Other
---	--	--

Name of Well Contractor Splash Well Drilling	Well Contractor's Licence No. 4877	Data source 4877	Date received AUG 09 1999
Address Box 1083, Prescott	Name of Well Technician Todd Ferguson	Inspector	Remarks
Signature of Technician/Contractor Todd Ferguson	Well Technician's Licence No. T-0478	CSS.ES0	
Submission date 26 7 99			

OFFICIAL CERTIFICATE OF ANALYSIS : 3952152
WORK REQUEST : 100288909
Report Date : 2024-06-18
Paterson Group

9 Auriga Dr

Nepean, Ontario

K2E 7T9

Attention : Alex Schopf

Reception Date : 2024-06-11

Project : PH4864

Sampler : NA

PO Number : 60414

Temperature : 13 °C

Analysis	Quantity	External Method
Alkalinity (Water, Automated)	2	Modified from SM 2320 B
Ammonia, Total (Water, Colorimetry)	2	Modified from EPA 350.1
Chloride (Water, IC)	2	Modified from SM 4110 B and C
Colour, Apparent (Water, Spectrophotometry)	2	Modified from SM 2120 C
Conductivity (Water, Automated)	2	Modified from SM 2510 B
DOC (Water, IR)	2	Modified from SM 5310 B
Escherichia coli (DC Plate)	2	Modified from MECP E3407
Fluoride (Water, Auto/ISE)	2	Modified from SM 4500-F A and 4500-F C
Hardness (Water, Calculation Only)	2	SM 2340 B
Ion Balance (Water, Calculation)	2	Modified from SM1030 E
Metals Scan (Water, ICP/MS)	2	Modified from EPA 200.8
Metals Scan (Water, ICP/OES)	2	Modified from SM 3120 B
Nitrate (Water, IC)	2	Modified from SM 4110 B and C
Nitrite (Water, IC)	2	Modified from SM 4110 B and C
pH (25°C) (Water, Automated)	2	Modified from SM 4500-H+ B
Phenols (Water, Colorimetry)	2	Modified from EPA 420.2
Sulphate (Water, IC)	2	Modified from SM 4110 B and C
Sulphide (Water, Colorimetry)	2	Modified from SM 4500-S2 D
Tannin and Lignin (Water, Spec)	2	Modified from SM 5550 B
TDS (Estimated)	2	Modified from SM 2510 A
Total Coliforms (DC Plate)	2	Modified from MECP E3407
Total Kjeldahl Nitrogen (Water, Colorimetry)	2	Modified from EPA 351.2
Turbidity (Water, Turbidimeter)	2	Modified from SM 2130 B

Criteria :
A : Ontario Regulation 169/03 (Non-Regulated Drinking Water)

Sample status upon receipt :

7773595 7773596

Compliant
Notes :

- All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated.
- Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at <https://directory.cala.ca/>
- Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Legend :

RL : Reporting limit

QC : Reference material (QC)

N/A : Not applicable

1 : Results in annex

* : Analysis conducted by external subcontracting

^ : Analysis not accredited

OFFICIAL CERTIFICATE OF ANALYSIS - EXCEEDENCE SUMMARY

Client : Paterson Group
Project : PH4864

Reception Date : 2024-06-11

Eurofins Sample No	Client Sample Identification	Analyte	Result	Units	Exceeded Criteria		
					A	B	C
Colour, Apparent (Water, Spectrophotometry)							
7773595	TW1-GW1	Colour (Apparent)	8	TCU	5		
Hardness (Water, Calculation Only)							
7773595	TW1-GW1	Hardness as CaCO3 (Calculation)	422	mg/L	80-100		
7773596	TW1-GW2	Hardness as CaCO3 (Calculation)	413	mg/L	80-100		
TDS (Estimated)							
7773595	TW1-GW1	TDS (Estimated)^	575	mg/L	500		
7773596	TW1-GW2	TDS (Estimated)^	544	mg/L	500		

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH4864

Reception Date: 2024-06-11

Eurofins Sample No :					7773595	7773596			
Matrix :					Drinking water	Drinking water			
Sampling Date :					2024-06-11	2024-06-11			
Client Sample Identification :					TW1-GW1	TW1-GW2			
Anions	RL	Unit	Criteria						
			A	B	C				
Chloride	0.5	mg/L	250			35.6	37.3		
Nitrate (as Nitrogen)	0.1	mg/L	10.0			1.28	1.61		
Nitrite (as Nitrogen)	0.1	mg/L	1.0			<0.1	<0.1		
Sulphate	1	mg/L	500			75	79		

Eurofins Sample No :					7773595	7773596			
Matrix :					Drinking water	Drinking water			
Sampling Date :					2024-06-11	2024-06-11			
Client Sample Identification :					TW1-GW1	TW1-GW2			
Calculations	RL	Unit							
			A	B	C				
Ion Balance (Calculation)^	0.1		1.08	1.06					

Eurofins Sample No :					7773595	7773596			
Matrix :					Drinking water	Drinking water			
Sampling Date :					2024-06-11	2024-06-11			
Client Sample Identification :					TW1-GW1	TW1-GW2			
General Chemistry	RL	Unit	Criteria						
			A	B	C				
Alkalinity (as CaCO3)	5	mg/L	500			349	336		
Colour (Apparent)	2	TCU	5			8	4		
Conductivity @ 25°C	5	µS/cm				884	837		
Dissolved Organic Carbon	0.5	mg/L	5			3.3	2.8		
Fluoride	0.1	mg/L	1.5			0.10	0.10		
Hardness as CaCO3 (Calculation)	1	mg/L	80-100			422	413		
pH @ 25°C	1		6.5-8.5			8.04	8.06		
Phenols-4AAP	0.001	mg/L				<0.001	<0.001		
Sulphide (S2-)	0.01	mg/L	0.05			<0.01	<0.01		
Tannin and Lignin	0.1	mg/L				0.2	0.1		
TDS (Estimated)^	5	mg/L	500			575	544		
Turbidity	0.1	NTU	5			1.40	0.643		

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH4864

Reception Date: 2024-06-11

Eurofins Sample No :						7773595	7773596			
Matrix :						Drinking water	Drinking water			
Sampling Date :						2024-06-11	2024-06-11			
Client Sample Identification :						TW1-GW1	TW1-GW2			
Metals	RL	Unit	Criteria							
			A	B	C					
Metals Scan (Water, ICP/MS)										
Aluminum	0.01	mg/L	0.1			<0.01	<0.01			
Antimony	0.0005	mg/L	0.006			<0.0005	<0.0005			
Arsenic	0.001	mg/L	0.01			<0.001	<0.001			
Barium	0.001	mg/L	1			0.057	0.052			
Beryllium	0.0005	mg/L				<0.0005	<0.0005			
Boron	0.01	mg/L	5			0.02	0.02			
Cadmium	0.0001	mg/L	0.005			<0.0001	<0.0001			
Chromium	0.001	mg/L	0.05			<0.001	<0.001			
Cobalt	0.0002	mg/L				0.0010	0.0009			
Copper	0.001	mg/L	1			0.004	0.003			
Iron	0.03	mg/L	0.3			0.05	<0.03			
Lead	0.001	mg/L	0.01			<0.001	<0.001			
Manganese	0.01	mg/L	0.05			0.05	0.05			
Mercury	0.0001	mg/L	0.001			<0.0001	<0.0001			
Molybdenum	0.005	mg/L				<0.005	<0.005			
Nickel	0.005	mg/L				<0.005	<0.005			
Selenium	0.001	mg/L	0.05			<0.001	<0.001			
Silver	0.0001	mg/L				<0.0001	<0.0001			
Strontium	0.001	mg/L				0.216	0.206			
Thallium	0.0001	mg/L				<0.0001	<0.0001			
Uranium	0.001	mg/L	0.02			0.012	0.010			
Vanadium	0.001	mg/L				<0.001	<0.001			
Zinc	0.01	mg/L	5			<0.01	<0.01			
Metals Scan (Water, ICP/OES)										
Calcium	1	mg/L				88	87			
Magnesium	1	mg/L				49	47			
Potassium	1	mg/L				52	47			
Sodium	1	mg/L	200			16	15			

Eurofins Sample No :						7773595	7773596			
Matrix :						Drinking water	Drinking water			
Sampling Date :						2024-06-11	2024-06-11			
Client Sample Identification :						TW1-GW1	TW1-GW2			
Microbiology	RL	Unit	Criteria							
			A	B	C					
Escherichia coli (DC)	0	CFU/100mL	0			0	0			
Total Coliforms (DC)	0	CFU/100mL	0			0	0			

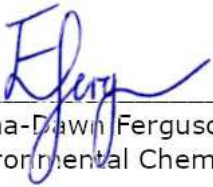
OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH4864

Reception Date: 2024-06-11

Eurofins Sample No :			7773595	7773596				
Matrix :			Drinking water	Drinking water				
Sampling Date :			2024-06-11	2024-06-11				
Client Sample Identification :			TW1-GW1	TW1-GW2				
Nutrients	RL	Unit						
Ammonia (Total, as Nitrogen)	0.02	mg/L	<0.020	<0.020				
Total Kjeldahl Nitrogen	0.1	mg/L	0.455	0.413				

Approved by :


Emma-Dawn Ferguson, M.Sc.
Environmental Chemist

Approved by :


Jason Kennedy,
Project Manager

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PH4864

Reception Date: 2024-06-11

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Alkalinity (Water, Automated)									
Method : Alkalinity (water, titration to pH 4.5, automated). Internal method: OTT-I-AT-WI45398.									
Alkalinity (as CaCO3)	mg/L	5	<5	99	95-105			1	0-20
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-14 Analysis Date: 2024-06-17	
Ammonia, Total (Water, Colorimetry)									
Method : Ammonia (Water, Colorimetry). Internal method: OTT-I-NUT-WI46201.									
Ammonia (Total, as Nitrogen)	mg/L	0.02	<0.020	103	80-120	105	80-120	-	0-20
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-13 Analysis Date: 2024-06-14	
Chloride (Water, IC)									
Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.									
Chloride	mg/L	0.5	<0.5	100	80-120	106	80-120	-	0-20
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-14 Analysis Date: 2024-06-17	
Colour, Apparent (Water, Spectrophotometry)									
Method : Colour (Water, Spectrophotometric). Internal method: OTT-I-SPEC-WI45980.									
Colour (Apparent)	TCU	2	<2	101	39-159			-	0-40
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-17 Analysis Date: 2024-06-17	
Conductivity (Water, Automated)									
Method : Conductivity (Water, Autotitrator). Internal Method: OTT-I-AT-WI45398.									
Conductivity @ 25°C	uS/cm	5	<5	100	98-102			0	0-20
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-14 Analysis Date: 2024-06-17	
DOC (Water, IR)									
Method : Organic carbon (water, IR, combustion). Internal method: OTT-I-DEM-WI46148.									
Dissolved Organic Carbon	mg/L	0.5	<0.5	97	84-116	87	80-120	13	0-15
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-14 Analysis Date: 2024-06-17	
Escherichia coli (DC Plate)									
Method : Total Coliforms and E.Coli by MF (Water, DC plate). Internal method: OTT-M-BAC-WI45296.									
Escherichia coli (DC)	CFU/100mL	0	0					-	0-30
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-12 Analysis Date: 2024-06-13	
Fluoride (Water, Auto/ISE)									
Method : Fluoride by autotitrator, ion selective electrode. Internal method: OTT-I-AT-WI45398.									
Fluoride	mg/L	0.1	<0.10	98	90-110			-	0-20
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-14 Analysis Date: 2024-06-17	

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PH4864

Reception Date: 2024-06-11

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Metals Scan (Water, ICP/MS)									
Method : Metals (Water, ICP/MS). Internal method: AMMTFQE1.									
Aluminum	mg/L	0.01	<0.01	100	80-120	105	70-130	-	0-20
Antimony	mg/L	0.0005	<0.0005	103	80-120	92	70-130	1	0-20
Arsenic	mg/L	0.001	<0.001	93	80-120	103	70-130	-	0-20
Barium	mg/L	0.001	<0.001	100	80-120	94	70-130	1	0-20
Beryllium	mg/L	0.0005	<0.0005	100	80-120	107	70-130	-	0-20
Boron	mg/L	0.01	<0.01	100	80-120	98	70-130	3	0-20
Cadmium	mg/L	0.0001	<0.0001	98	80-120	99	70-130	-	0-20
Chromium	mg/L	0.001	<0.001	100	80-120	104	70-130	-	0-20
Cobalt	mg/L	0.0002	<0.0002	101	80-120	96	70-130	1	0-20
Copper	mg/L	0.001	<0.001	100	80-120	97	70-130	-	0-20
Iron	mg/L	0.03	<0.03	100	80-120	87	70-130	0	0-20
Lead	mg/L	0.001	<0.001	100	80-120	91	70-130	-	0-20
Manganese	mg/L	0.01	<0.01	100	80-120	96	70-130	1	0-20
Mercury	mg/L	0.0001	<0.0001	108	80-120	84	70-130	-	0-20
Molybdenum	mg/L	0.005	<0.005	90	80-120	99	70-130	-	0-20
Nickel	mg/L	0.005	<0.005	100	80-120	99	70-130	-	0-20
Selenium	mg/L	0.001	<0.001	95	80-120	99	70-130	-	0-20
Silver	mg/L	0.0001	<0.0001	104	80-120	94	70-130	-	0-20
Strontium	mg/L	0.001	<0.001	90	80-120	84	70-130	2	0-20
Thallium	mg/L	0.0001	<0.0001	100	80-120	92	70-130	-	0-20
Uranium	mg/L	0.001	<0.001	100	80-120	96	70-130	-	0-20
Vanadium	mg/L	0.001	<0.001	100	80-120	104	70-130	-	0-20
Zinc	mg/L	0.01	<0.01	110	80-120	92	70-130	-	0-20
Associated Samples : 7773595, 7773596						Prep Date: 2024-06-17 Analysis Date: 2024-06-17			
Metals Scan (Water, ICP/OES)									
Method : Metals (Water, ICP/OES). Internal method: OTT-I-MET-WI48491.									
Calcium	mg/L	1	<1	106	86-115	108	70-130	0	0-20
Magnesium	mg/L	1	<1	102	91-109	107	70-130	0	0-20
Potassium	mg/L	1	<1	112	87-113	121	70-130	-	0-20
Sodium	mg/L	1	<1	110	85-115	115	70-130	-	0-20
Associated Samples : 7773595, 7773596						Prep Date: 2024-06-18 Analysis Date: 2024-06-12			
Nitrate (Water, IC)									
Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.									
Nitrate (as Nitrogen)	mg/L	0.1	<0.1	101	80-120	107	80-120	-	0-20
Associated Samples : 7773595, 7773596						Prep Date: 2024-06-14 Analysis Date: 2024-06-17			
Nitrite (Water, IC)									
Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.									
Nitrite (as Nitrogen)	mg/L	0.1	<0.1	100	80-120				
Associated Samples : 7773595, 7773596						Prep Date: 2024-06-14 Analysis Date: 2024-06-17			
pH (25°C) (Water, Automated)									
Method : pH (Water, Automated Meter). Internal method: OTT-I-AT-WI45398.									
pH @ 25°C		1	6.14	100	97-103			0	0-20
Associated Samples : 7773595, 7773596						Prep Date: 2024-06-14 Analysis Date: 2024-06-17			

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PH4864

Reception Date: 2024-06-11

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Phenols (Water, Colorimetry)									
Method : Phenols (Water, Colorimetry). Internal method: OTT-I-4AAP-WI46150.									
Phenols-4AAP	mg/L	0.001	<0.001	100	75-125	98	70-130	-	0-20
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-13 Analysis Date: 2024-06-13	
Sulphate (Water, IC)									
Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.									
Sulphate	mg/L	1	<1	95	90-110	100	80-120	0	0-20
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-14 Analysis Date: 2024-06-17	
Sulphide (Water, Colorimetry)									
Method : Sulphide, S2- (Water, Colorimetry). Internal method: OTT-I-SPEC-WI45931.									
Sulphide (S2-)	mg/L	0.01	<0.01	115	80-120			-	0-20
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-17 Analysis Date: 2024-06-17	
Tannin and Lignin (Water, Spec)									
Method : Tannin and Lignin (Water, Spec), Internal method: OTT-I-SPEC-WI57693.									
Tannin and Lignin	mg/L	0.1	<0.1	94	80-120			-	0-20
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-14 Analysis Date: 2024-06-14	
Total Coliforms (DC Plate)									
Method : Total Coliforms and E.Coli by MF (Water, DC plate). Internal method: OTT-M-BAC-WI45296.									
Total Coliforms (DC)	CFU/100mL	0	0					-	0-30
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-12 Analysis Date: 2024-06-13	
Total Kjeldahl Nitrogen (Water, Colorimetry)									
Method : TKN (Water, colorimetry). Internal method: OTT-I-NUT-WI46201.									
Total Kjeldahl Nitrogen	mg/L	0.1	<0.100	113	70-130	92	70-130	15	0-20
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-14 Analysis Date: 2024-06-17	
Turbidity (Water, Turbidimeter)									
Method : Turbidity (Water, Turbidimeter). Internal method: OTT-I-TUR-WI46288.									
Turbidity	NTU	0.1	<0.1	104	80-120			4	0-30
Associated Samples : 7773595, 7773596								Prep Date: 2024-06-13 Analysis Date: 2024-06-13	

Where RPD % is reported as "-" the calculation is not available because one or both of the duplicates is within 5 times the RL.



THE CALIFORNIA COURT REPORTERS AND INTERPRETERS ASSOCIATION

[illegible]

EASTING: 365103.937 NORTHING: 5000698.79 ELEVATION: 92.54

DATUM: Geodetic

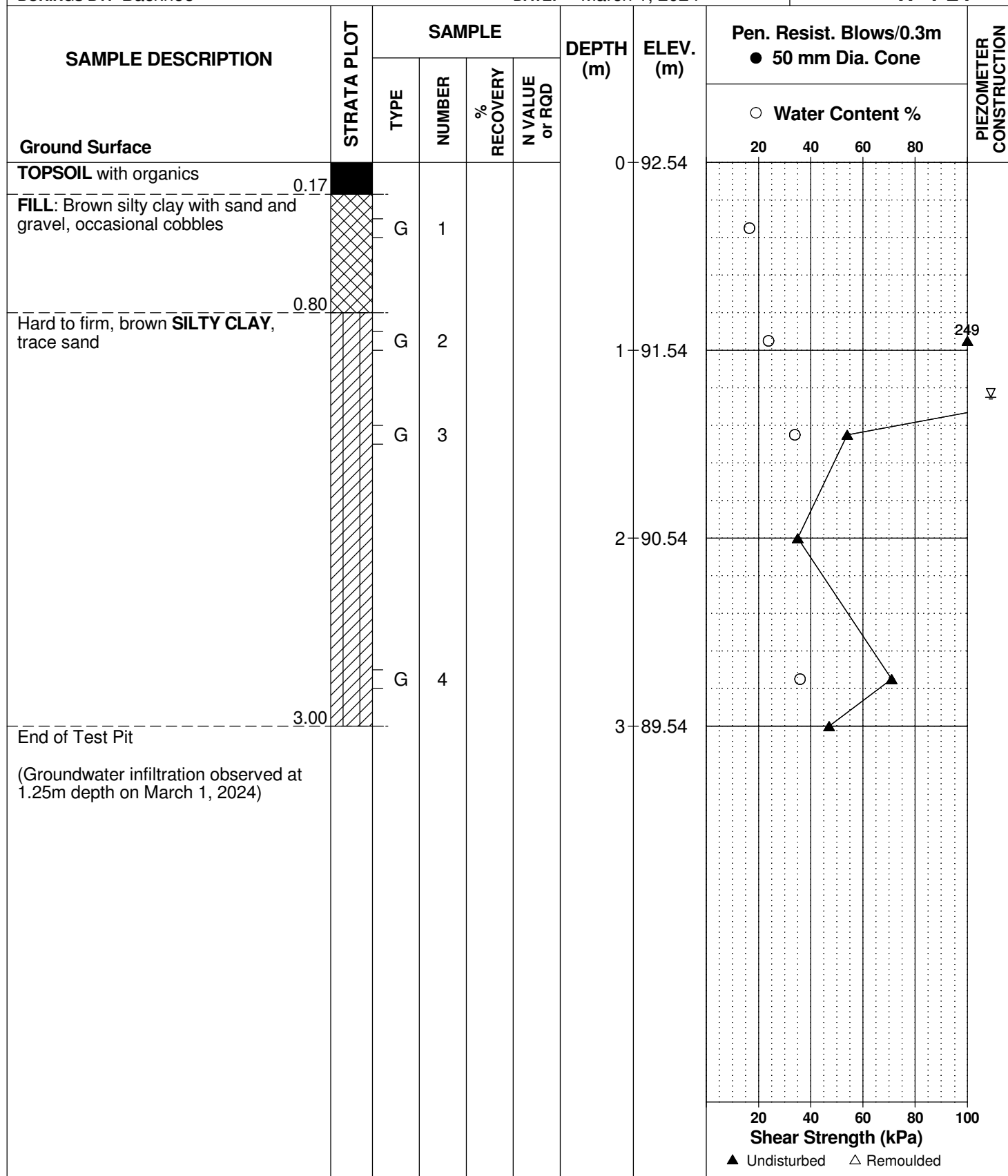
REMARKS:

BORINGS BY: Backhoe

DATE: March 1, 2024

FILE NO. **PG7022**

HOLE NO. **TP 1-24**



EASTING: 365082.851 NORTHING: 5000730.443 ELEVATION: 92.05

DATUM: Geodetic

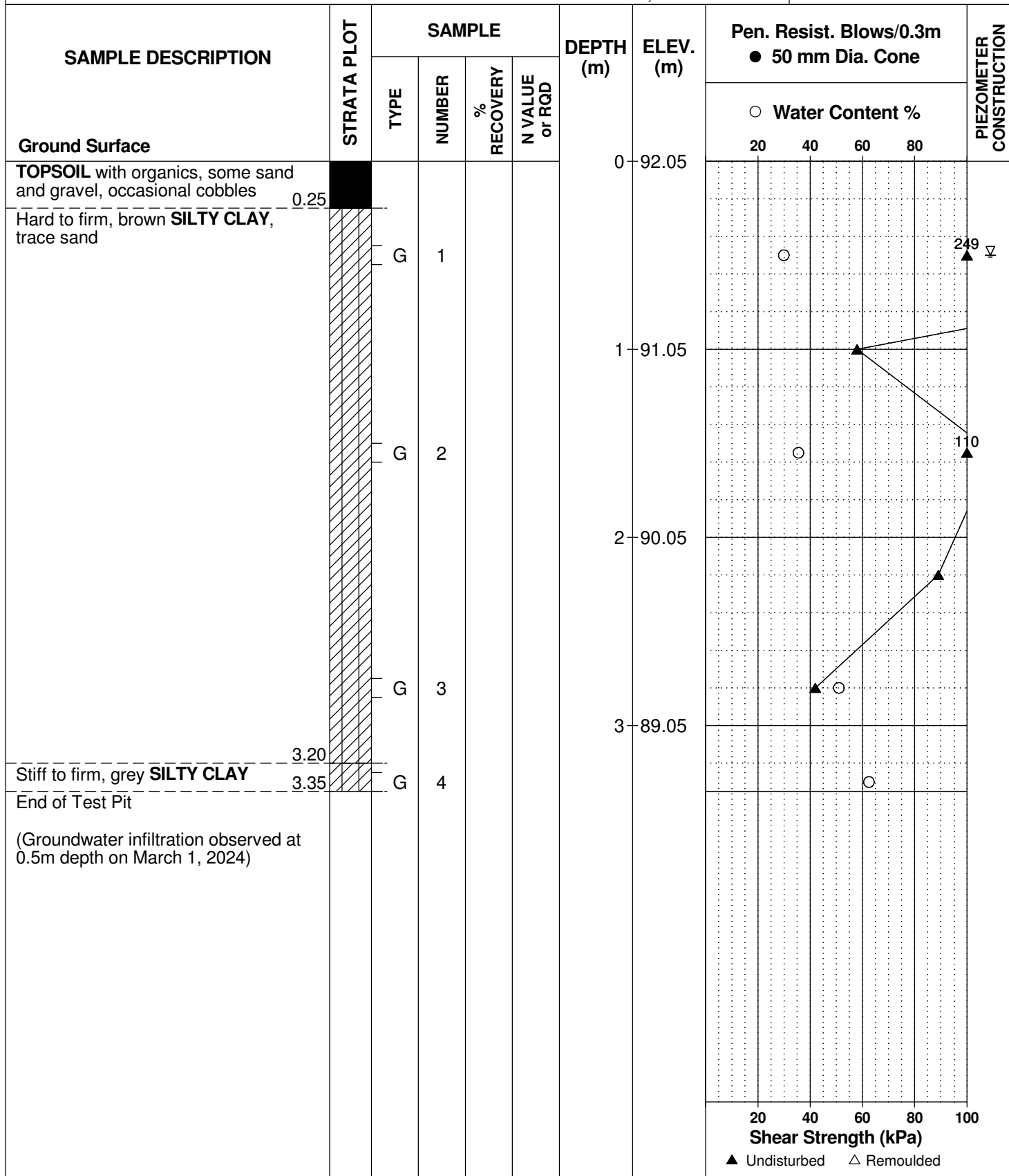
REMARKS:

BORINGS BY: Backhoe

DATE: March 1, 2024

FILE NO.
PG7022

HOLE NO.
TP 2-24



EASTING: 365138.314 NORTHING: 5000771.858 ELEVATION: 92.05

DATUM: Geodetic

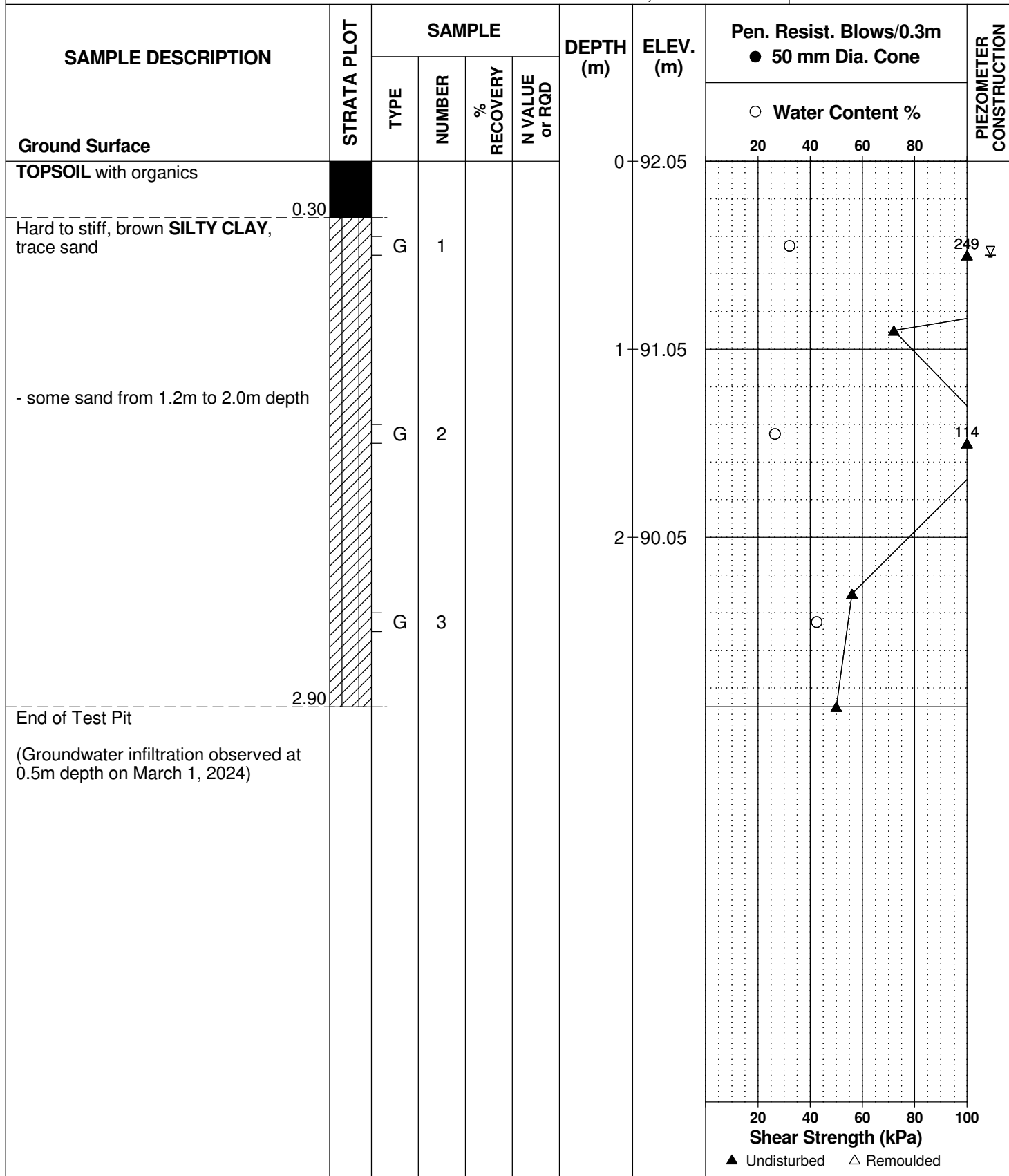
REMARKS:

BORINGS BY: Backhoe

DATE: March 1, 2024

FILE NO.
PG7022

HOLE NO.
TP 3-24



EASTING: 365155.177 NORTHING: 5000735.496 ELEVATION: 92.22

DATUM: Geodetic

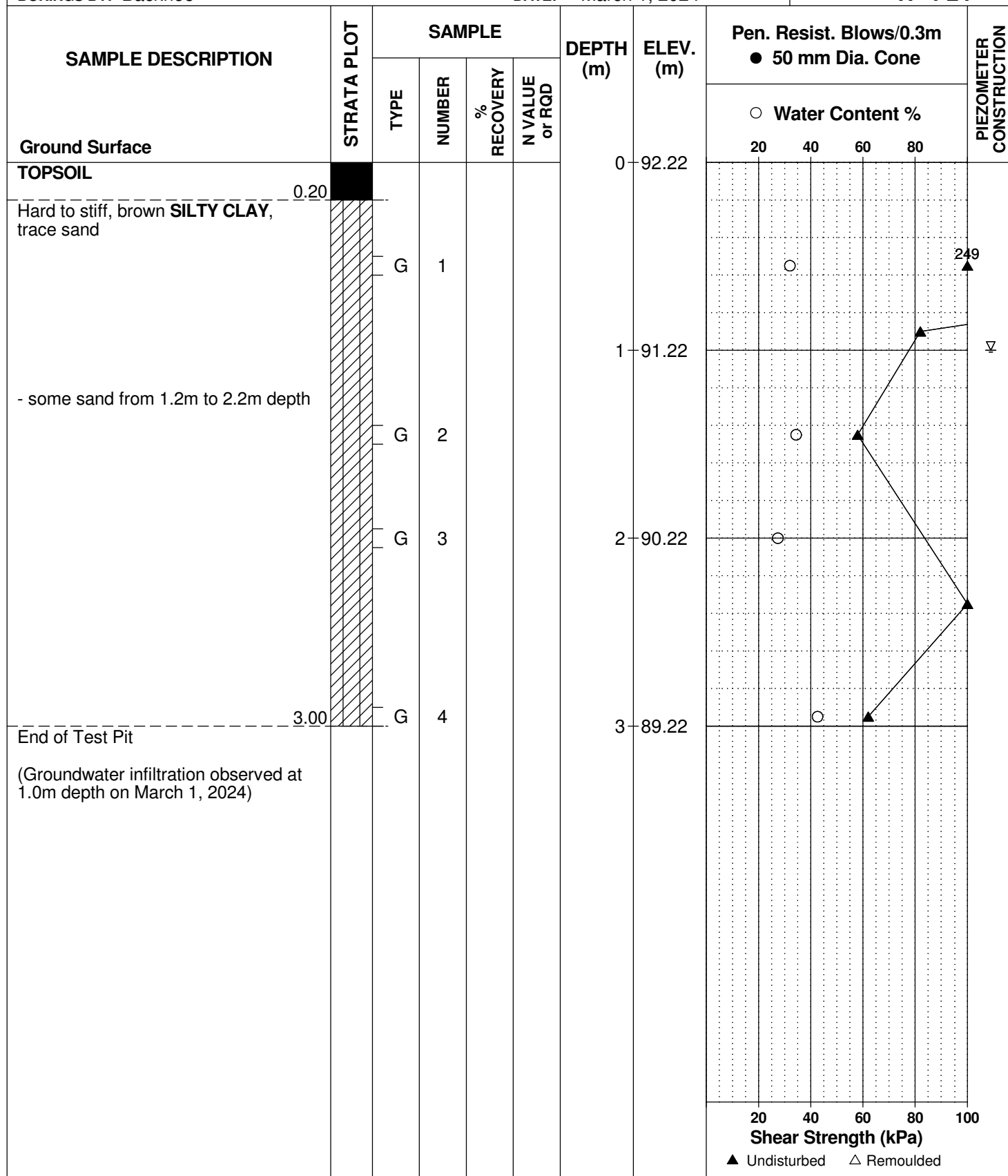
REMARKS:

BORINGS BY: Backhoe

DATE: March 1, 2024

FILE NO. PG7022

HOLE NO. **TP 4-24**



EASTING: 365182.962 NORTHING: 5000724.926 ELEVATION: 92.23

DATUM: Geodetic

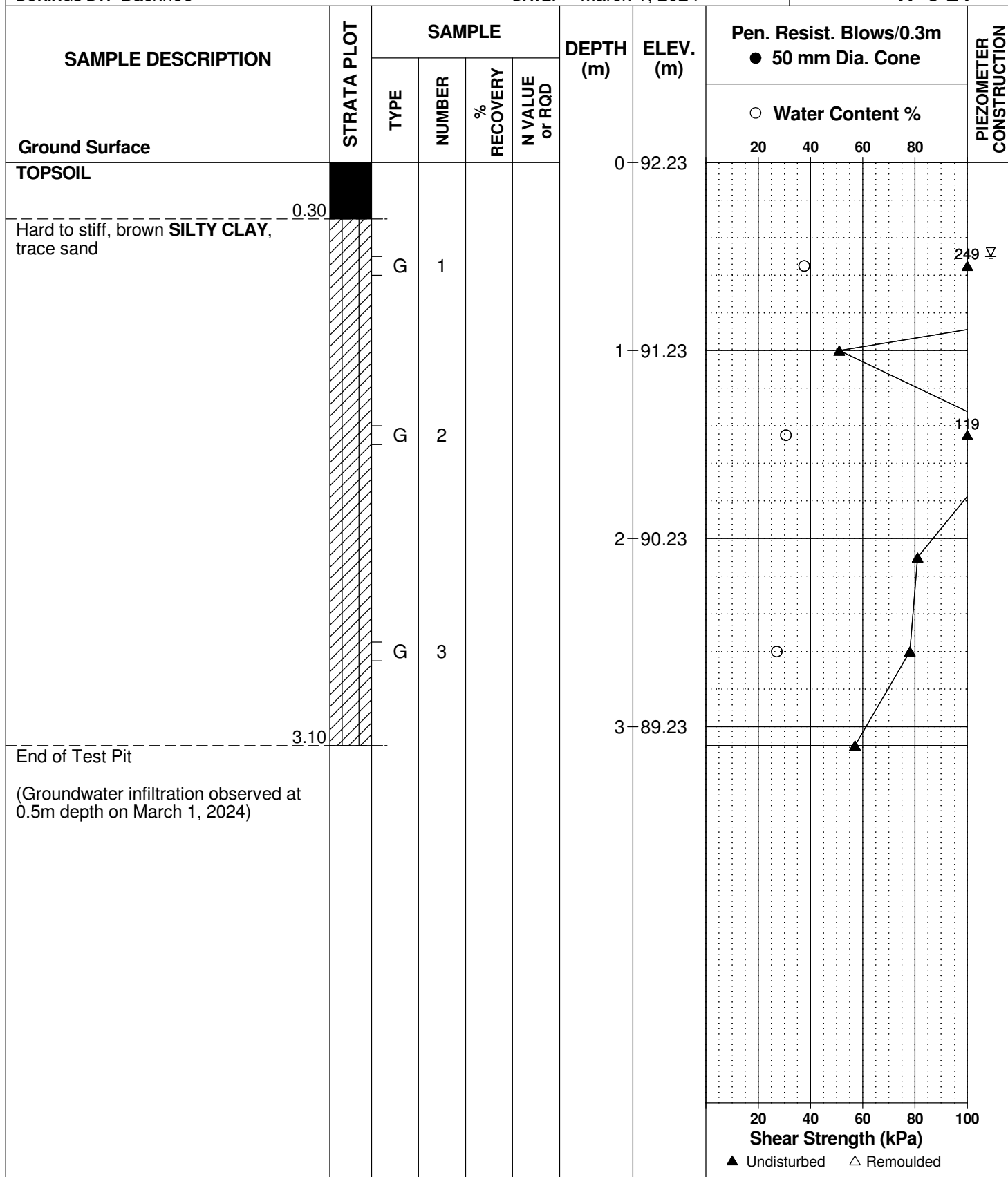
REMARKS:

BORINGS BY: Backhoe

DATE: March 1, 2024

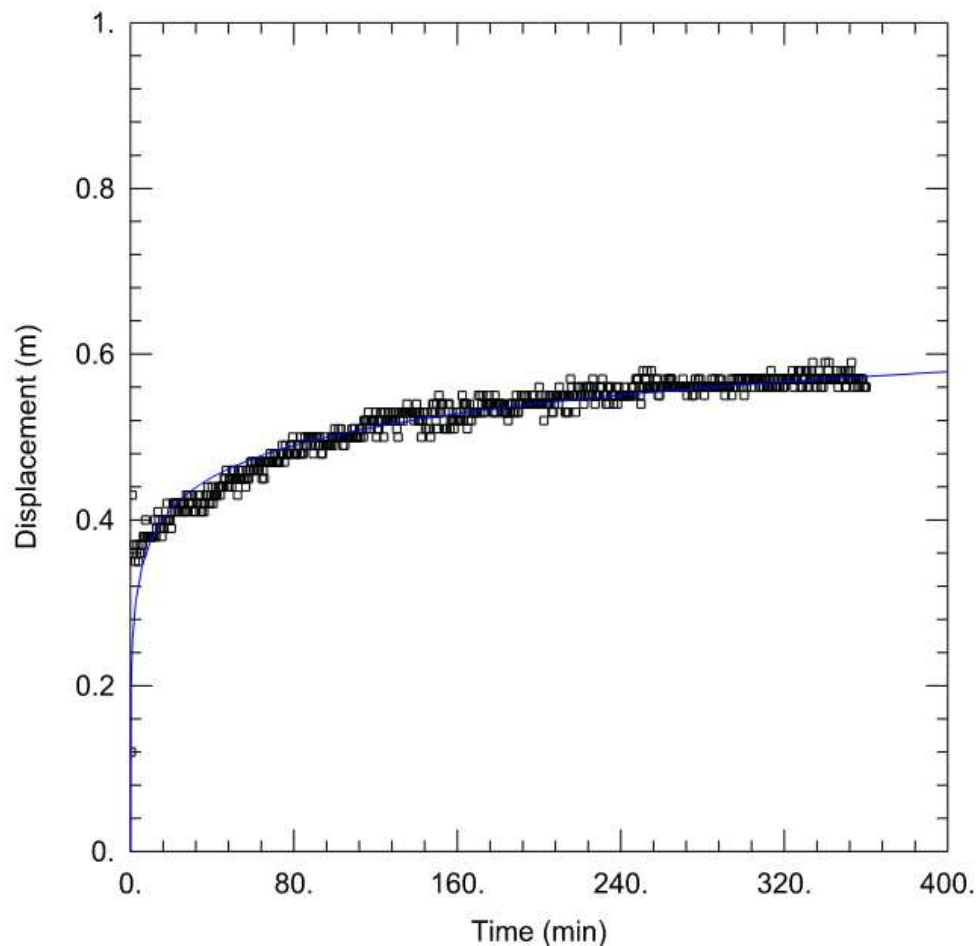
FILE NO. **PG7022**

HOLE NO. **TP 5-24**



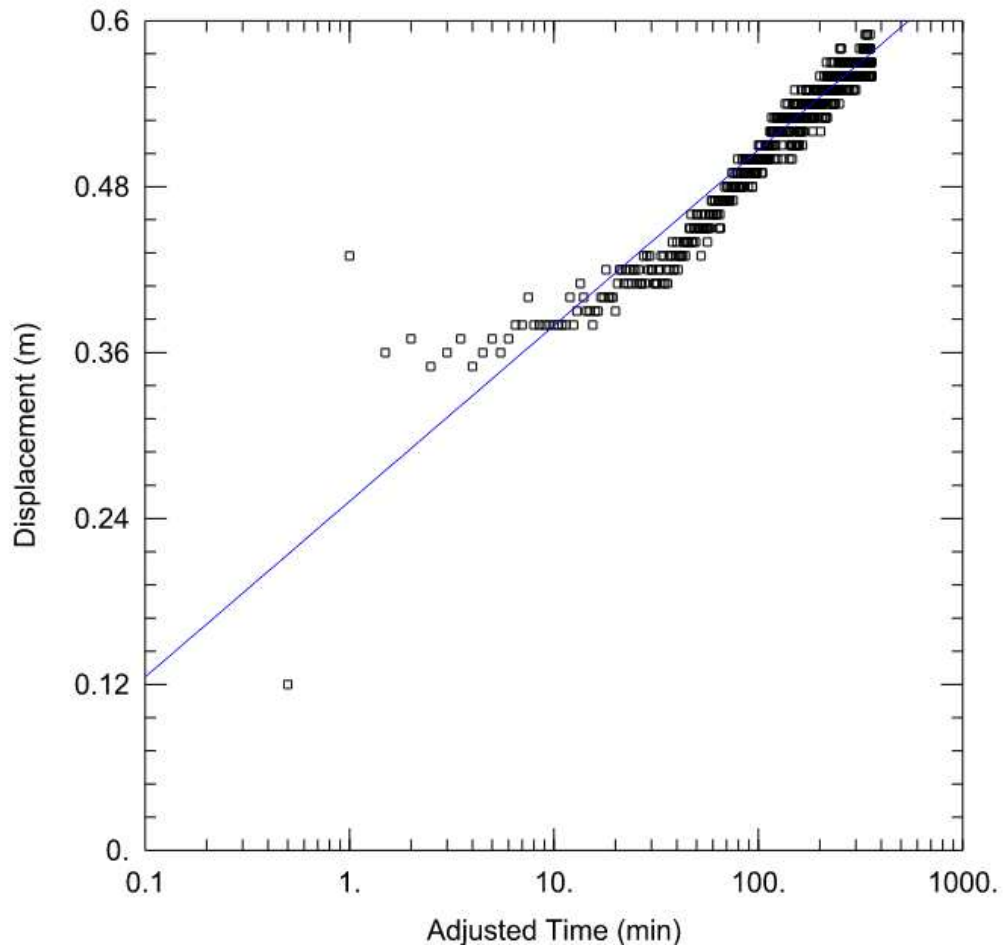
Pumping Test Analysis Report

File No.	PH4864	Well ID:	TW1
Date:	Tuesday, June 11, 2024	Solution Method:	Theis
Client:	Victoria La Valle	Transmissivity (m ² /day):	78.74
Site Address:	6356 Fourth Line Road	Discharge Rate (L/min)	38
Project:	Re-zoning Application	Analysis performed by:	AS



Pumping Test Analysis Report

File No.	PH4864	Well ID:	TW1
Date:	Tuesday, June 11, 2024	Solution Method:	Cooper-Jacob
Client:	Victoria La Valle	Transmissivity (m ² /day):	78.91
Site Address:	6356 Fourth Line Road	Discharge Rate (L/min)	38
Project:	Re-zoning Application	Analysis performed by:	AS



Pumping Test Analysis Report

File No. PH4864
Date: Tuesday, June 11, 2024
Client: Victoria La Valle
Site Address: 6356 Fourth Line Road
Project: Re-zoning Application

Summary Table:		
Solution Method:	Well ID:	Transmissivity (m ² /day):
Theis	TW1	78.74
Cooper-Jacob	TW1	78.91
Average:		78.83

PREDICTIVE NITRATE IMPACT ASSESSEMENT

Infiltration Factors

Topography	0.20
Soil	0.20
Cover	0.12
Total	0.52

Site Characteristics

Area of Site :	12794	m ²
Total of roof areas:	300	m ²
Total area of paved driveway areas:	150	m ²
Roof + paved driveway areas	450	m ²
Impervious Area	450	m ²
Percent Impervious Area =	4	%
Infiltration Area =	12344	m ²

Septic Effluent

Concentration of Effluent (Cs) =	40	mg/L
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Infiltration Calculation

Nitrate concentration in precipitation (C _i) =	0	mg/L
Surplus Water (Environment Canada)	360	mm/yr
Factored Water Surplus =	187	mm/yr
Infiltration % due to stormwater management measures	-	%
Infiltration rate from stormwater management measures =	0	mm/yr
Infiltration Flow Entering the System (Q _i) =	6	m ³ /day

Mass Balance Model (MOEE, 1995)

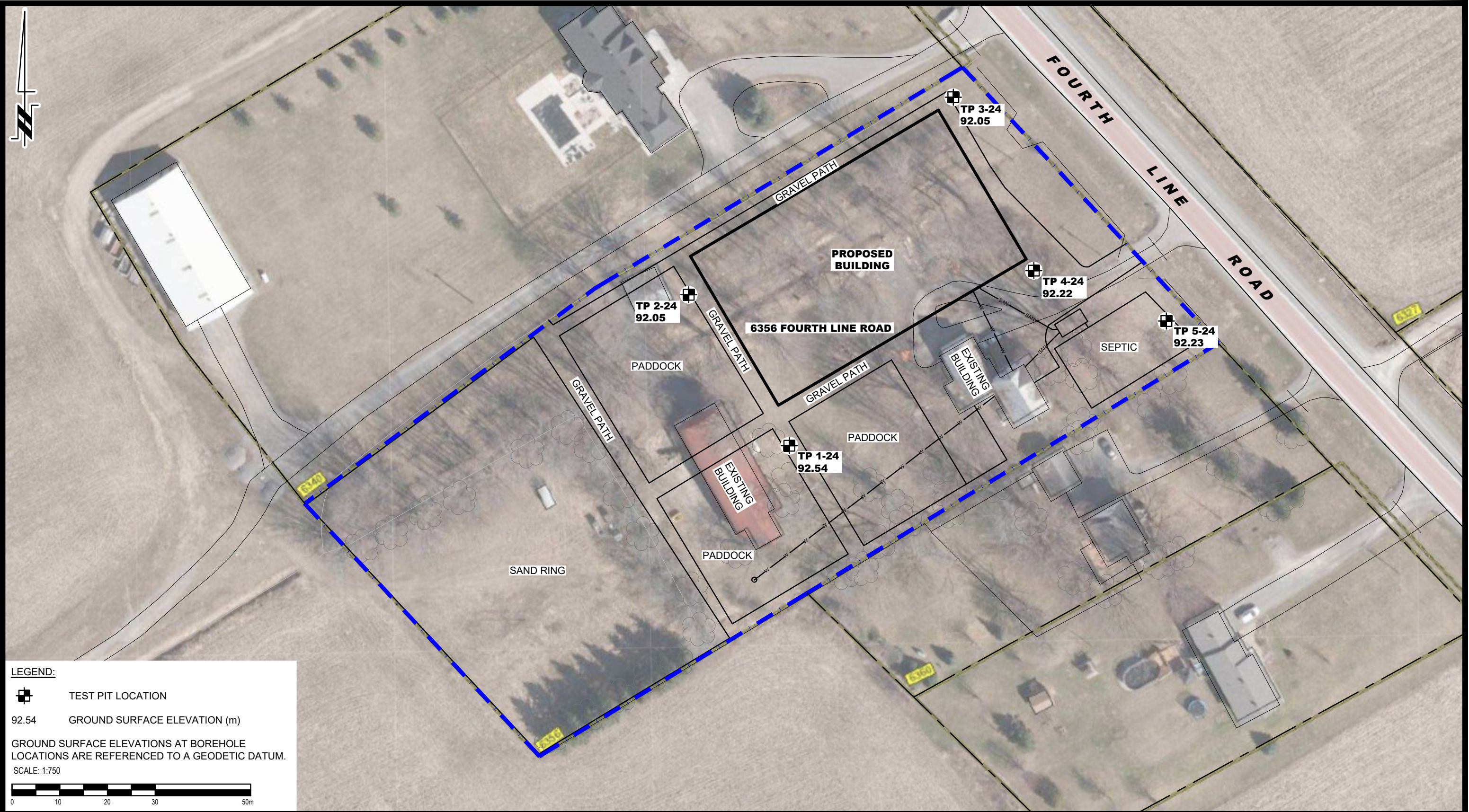
$$C_T = (Q_b C_b + Q_e C_e + Q_i C_i) / (Q_b + Q_e + Q_i) = \text{Cumulative Nitrate Concentration}$$

Q _b = flow entering the system across the upgradient area	0	m ³ /day
C _b = background nitrate concentration	0	mg/L
Cs = concentration of nitrates in the septic effluent	40	mg/L
Q _i = flow entering the system from infiltration	6	m ³ /day
C _i = Concentration of nitrates in the infiltrate	0	mg/L
C_T =	10.00	mg/L

Maximum Allowable Sewage Flow Volume

Daily Sewage Flow (Qs)=	2.110	m ³
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Notes: Site characteristic values were measured as approximate values from the available site plans and GeoOttawa.



LEGEND:

 TEST PIT LOCATION

92.54 GROUND SURFACE ELEVATION (m)

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:750



 9 AURIGA DRIVE OTTAWA, ON K2E 7T9 TEL: (613) 226-7381					2778317 ONTARIO INC. GEOTECHNICAL INVESTIGATION PROPOSED COMMERCIAL DEVELOPMENT 6356 FOURTH LINE ROAD ONTARIO TEST HOLE LOCATION PLAN	Scale:	1:750	Date:	03/2024
						Drawn by:	GK	Report No.:	PG7022-1
						Checked by:	MA	Dwg. No.:	PG7022-1
						Approved by:	KP	Revision No.:	
	NO.	REVISIONS	DATE	INITIAL					