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Attention: Jack Gulas

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Subject: **Hydrogeological Assessment and Terrain Analysis
Proposed Commercial Development
5923 Ottawa Street
Ottawa, Ontario**

INTRODUCTION

Further to your request, Paterson has conducted a Hydrogeological Assessment and Terrain Analysis in support of a Site Plan Control Application for the proposed commercial development to be located at 5923 Ottawa Street in Ottawa, Ontario.

The purpose of this work has been to determine the suitability of the water supply aquifer underlying the site to support the Site Plan Application for a proposed commercial development.

The subject site consists of a 2.27 ha lot which is currently vacant. The southern portion of the site is covered by grass and shrubs while the northern portion is covered by mature trees. The ground surface across the site is generally level at an approximate geodetic elevation of 94 m above sea level (asl). The general overburden groundwater flow direction is inferred to be north towards the Jock River.

The subject site is bordered to the north by a railway followed by forested land, to the east by a commercial property, to the south by Ottawa Street followed by agricultural land and to the west by a commercial property. The subject site itself is zoned RG3. The surrounding properties to the north, east and south are also zoned RG3 with the land to the west zoned DR1 (GeoOttawa).



A hydrogeological pre-consultation was completed with a City of Ottawa Hydrogeologist on August 2, 2024.

Description of Subject Site

The subject site is an approximately 2.27 ha vacant lot and has historically remained undeveloped. The southern portion of the site is covered by grass and shrubs while the northern portion is covered by mature trees. The Site Plan Application is for a proposed commercial development. The proposed development will consist of two (2) slab-on-grade buildings consisting of a distillery with a restaurant within it and a brewery. Please refer to Figure 1 - Key Plan and Site Plan prepared by N45 Architecture Inc. attached to this report for the proposed site location and site layout.

Two new sewage systems to service the two (2) commercial buildings has been proposed. A septic flow calculation was completed and resulted in a total daily design sanitary sewage flow (TDDSSF) calculation of 9,966 L/day. Paterson has completed a new sewage system design for the proposed development. Please refer to Paterson Drawing PH4924-1(rev.5) - Sewage System Layout Plan attached to this report for specific details of the new sewage system. An approved Ottawa Sewage System Office (OSSO) Sewage System Installation Permit (SSIP) has been included with the Site Plan submission.

A drilled potable supply well was installed on February 10, 2025, hereafter referred to as Test Well 1 (TW1) and extends to a maximum depth of 73.2 m below existing ground surface (bgs). TW will be the service well for the entire site (both buildings). The property owner will need to ensure that protective measures are taken to protect the wellhead, such as the use of a barrier or bollards, when constructing the proposed commercial buildings.

The distillery / restaurant and the brewery will be serviced by the newly installed TW1. Distilling and brewing operations associated with the commercial development will be serviced by water brought in via tanker truck. As such, water usage is anticipated to be mainly associated with the general usage identified within the approved OSSO SSIP..

The suitability of the aquifer to supply the subject site was assessed using the methodology provided in City of Ottawa Hydrogeological and Terrain Analysis Guidelines (HTAG).

MISSISSIPPI-RIDEAU SOURCE PROTECTION PLAN

The Mississippi-Rideau Source Protection Plan (MRSPP) 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 been designated as a Wellhead Protection Area (WHPA) with a score of 8 within the MRSPP and are identified as one of four groundwater related vulnerable areas identified within the Clean Water Act (2006). The four vulnerable areas consist of Significant Groundwater



Recharge Area (SGRA), Highly Vulnerable Aquifer (HVA), Intake Protection Zone (IPZ) and Wellhead Protection Area (WHPA).

Based upon the designation of a WHPA the MRSPP provides a list of activities that are prohibited, managed or encouraged to change dependent upon the vulnerable area type. There are no prohibition of land uses on the subject site based upon its proposed usage. Therefore, there are no related requirements for a WHPA at this location.

FIELDWORK PROGRAM

As a means to demonstrate the adequacy of the aquifer underlying the subject lands, with respect to water quality and quantity, the drilled well (TW1) on the subject site was tested. TW1 has a Water Well Record (WWR) Well ID of A379088. TW1 has a 152.4 mm diameter steel casing that extends to 57.9 m below ground surface (bgs) with a 0.59 m stick up. The well itself extends to a depth of 73.2 m bgs. Based on available geological mapping, the drift thickness at TW1 varies from 10 to 15 m. Refer to Paterson Drawing PH4924-1(rev.5) – Sewage System Layout Plan, attached, for the approximate location of TW1.

As a means to evaluate the water supply aquifer intercepted by the well, the well was subjected to an 8-hour constant rate pumping test. The pumping test was conducted on March 19, 2025, under the full-time supervision of Paterson personnel. Prior to the pumping test, a datalogger was installed to monitor background groundwater levels and the well was disinfected by Air Rock Drilling Co. Ltd. (Air Rock) personnel.

A submersible pump was provided by Air Rock for the 8-hour pumping test. A licensed water well technician completed the necessary plumbing related activities. A discharge hose assembly with a gate valve was connected to the rented pump. The discharge line was placed at a sufficient distance to ensure that the discharge water was being directed away from the well as well as any septic systems in the area. Upon completion of the test, the pump was removed, and the well was disinfected by Air Rock.

The pumping test was carried out at a pumping rate of 78 L/min for a duration of 8 hours, after which the pumping rate was reduced to approximately 23 L/min for approximately 30 minutes in an attempt to lower turbidity levels. During the pumping test, the pumping rate was periodically measured using the timed volume correlation method. The pump rate was maintained within 5% of the selected pump rate. The static water level was recorded manually and an electronic datalogger (VanEssen TD-Diver) was installed in the test well prior to the start of the pumping test. The selected rate of 78 L/min provides approximately 3.8 times the maximum total daily design volume for the septic system during the 8-hour pumping test. The rate was determined to be representative of a flow rate which would be in excess of what the development would require.

The datalogger 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 95% recovery approximately 2 minutes after the completion of pumping.

A groundwater sample was collected 4 hours after the start of pumping. Due to elevated turbidity levels near the end of the 8-hour mark during the pumping test of TW1, the pump test was extended for an additional 30 minutes and the second sample for TW1 was collected 8.5 hours after the start of pumping. At the 8 hour mark, the flow rate for TW1 was reduced to 23 L/min. 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 and Volatile Organic Compounds (VOCs).

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 8-hour pumping test. The parameters tested at the well head included: pH, total dissolved solids, conductivity, turbidity, apparent colour, and temperature. Hydrogen sulfide was not detected olfactorily. 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.

The following equipment was used during the pumping test:

- Free Chlorine – HACH Pocket Colorimeter II;
- TDS/Conductivity/pH – Hanna Instruments 2328 BW combo pH/EC/TDS Tester;
- Colour – HACH DR 900 Colorimeter;
- Turbidity – Hanna Instruments HI98703 Turbidimeter
- Hydrogen Sulfide – HACH Hydrogen Sulfide Test Kit CAT. No. 2537800

Chloride concentrations were detected in the lab results at 262 and 267 mg/L, at the 4 hour and 8.5 hour mark, respectively, which is above the aesthetic objective of 250 mg/L. Therefore, TW1 was subjected to a supplementary 8 hour constant rate pumping test to assess the chloride concentrations under a flow rate representative of typical operational usage.

A submersible pump was provided by Air Rock for the 8 hour pumping test. A licensed water well technician completed the necessary plumbing related activities. A discharge hose assembly with a gate valve was connected to the rented pump. The discharge line was placed at a sufficient distance to ensure that the discharge water was being directed



away from the well as well as any septic systems in the area. Upon completion of the test, the pump was removed, and the well was disinfected by Air Rock.

The pumping test was carried out at a pumping rate of 23 L/min for a duration of 8 hours. A groundwater sample was collected 8 hours after the start of pumping. The water sample was submitted for comprehensive testing of bacteriological, chemical, and physical water quality parameters consistent with the standard "Subdivision Supply" suite of parameters plus trace metals.



Aquifer Analysis

Water Quantity

Pumping test data was analyzed using AQTESOLV Pro Version 4.5 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)	65
Pumping Rate (L/min)	78
Pre-test Static Water Level (m btoc)	3.8
Drawdown (m)	Max – 7.9, End – 7.1
Available Drawdown (m)	69.4
% Drawdown During Pump Test (%)	6
Specific Capacity (L/min/m drawdown)	19

The drawdown data was analyzed using the Theis and Cooper-Jacob methods of analysis. Aquifer transmissivity is estimated to be 65 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 8 hours was approximately 7.9 m at approximately 5 hours into the pumping test (6 % of the available drawdown). The final drawdown at the end of the 8-hour pumping test was 7.1 m (5 % of the available drawdown). 95% recovery was achieved approximately 2 minutes after the end of pumping.

The total volume of water pumped during the 8.5-hour pumping event was approximately 38,160 L. This is approximately 3.8 times the maximum total daily design volume of water required to support the Site Plan Control Application.

The suitability of the aquifer to supply the proposed Site Plan Application for the proposed commercial development 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 Site Plan Control Application.

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



water well records (WWR) of the neighboring properties on the MECP Well Record mapping website indicated that the surrounding wells were screened in limestone or sandstone. Surrounding WWR's are attached to this report.

Water Quality

Field Data

Turbidity, electrical conductivity, total dissolved solids (TDS), pH, apparent colour 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.

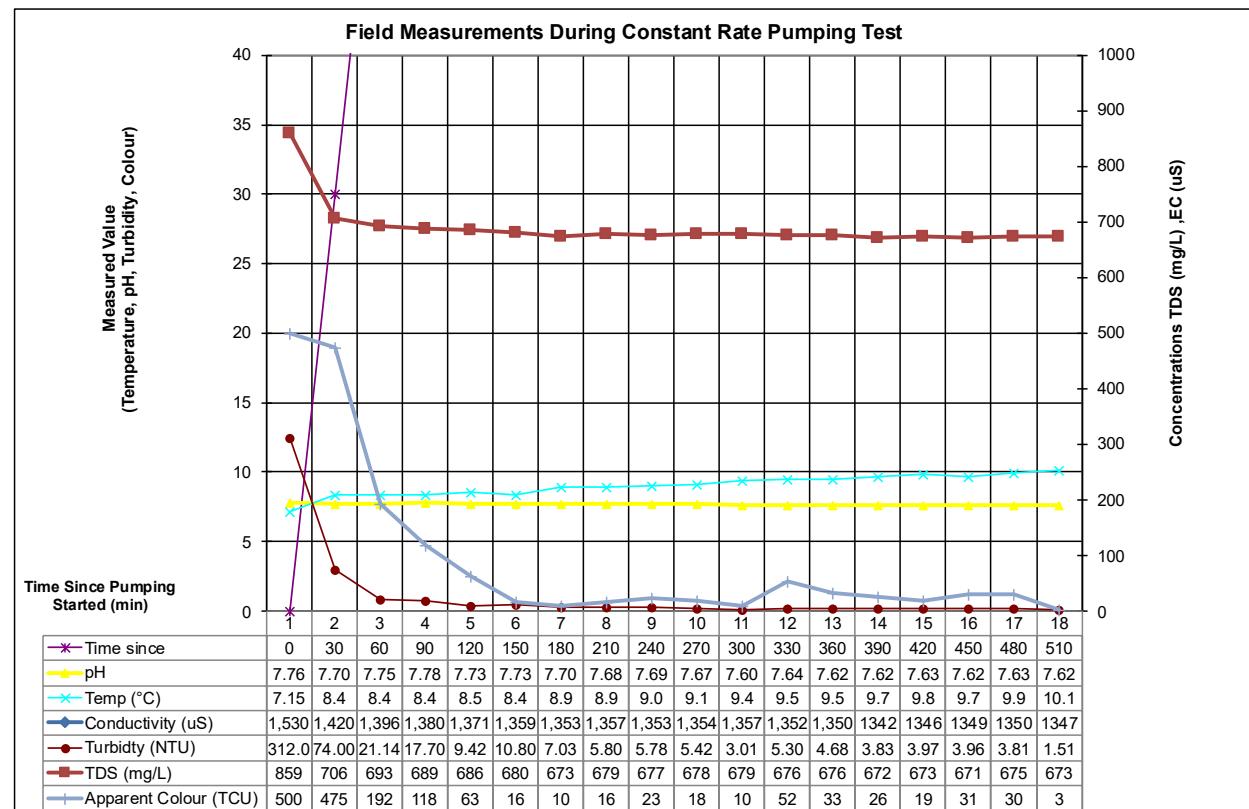


Figure 1: Field Measurements



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. VOC laboratory analytical testing were completed and measured to be non-detect in the sample results. 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 (4 hr)	TW1 - GW2 (8.5 hr)	TW1 - GW1 (8 hr)
				2025-03-18	2025-03-18	2025-04-03
MICROBIOLOGICAL						
Escherichia Coli (E.Coli)	CFU/100mL	0	MAC	0	0	0
Total Coliforms	CFU/100mL	0	MAC	0	0	0
GENERAL CHEMICAL - HEALTH RELATED						
Fluoride (F)	mg/L	1.5	MAC	0.34	0.40	0.39
Ammonia (N-NH ₃)	mg/L	-	-	0.167	0.143	0.134
Nitrite (N-NO ₂)	mg/L	1	MAC	<0.5	<0.5	<0.5
Nitrate (N-NO ₃)	mg/L	10	MAC	<0.5	<0.5	<0.5
Total Kjeldahl Nitrogen	mg/L	-	-	0.319	0.326	0.420
Turbidity (Field)	NTU	1.0 (5.0)	MAC/AO	5.78	1.51	0.96
Turbidity (Laboratory)	NTU	1.0 (5.0)	MAC/AO	9.9	9.6	4.0
GENERAL CHEMICAL - AESTHETIC RELATED						
Alkalinity (as CaCO ₃)	mg/L	30-500	OG	265	269	271
Chloride (Cl)	mg/L	250	AO	262	267	248
Colour (Field - apparent)	TCU	5	AO	23	3	0
Colour (Apparent)	TCU	5	AO	4	12	22
Colour (True)	TCU	5	AO	-	-	<2
Conductivity	uS/cm	-	-	1,380	1,380	1,360
Dissolved Organic Carbon	mg/L	5	AO	1.8	1.8	1.5
Hardness (as CaCO ₃)	mg/L	100	OG	474	470	444
Ion Balance	unitless	-	-	1.04	1.02	0.99
pH	unitless	6.5-8.5	AO	7.82	7.81	7.88
Phenols	mg/L	-	-	<0.001	<0.001	<0.001
Sulphate (SO ₄)	mg/L	500	AO	67	69	66
Sulphide (S ₂ ⁻)	mg/L	0.05	AO	<0.01	<0.01	<0.01
Tannin & Lignin	mg/L	-	-	<0.1	<0.1	0.3
Total Dissolved Solids	mg/L	500	AO	896	900	886

1. ODWS identifies the following types of parameters:

MAC = Maximum Allowable Concentration

AO = Aesthetic Objective

OG = Operational Guideline

2. Shaded Concentration Indicates an Exceedance of the ODWS Objective

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

PARAMETER	UNITS	ODWS		TW1		
		LIMIT	TYPE	TW1 - GW1 (4 hr)	TW1 - GW2 (8.5 hr)	TW1 - GW1 (8 hr)
				3/18/2025	3/18/2025	4/3/2025
METALS						
Aluminum (Al)	mg/L	0.1	OG	0.28	0.07	<0.01
Antimony (Sb)	mg/L	0.006	IMAC	<0.0005	<0.0005	<0.0005
Arsenic (As)	mg/L	0.01	IMAC	<0.001	<0.001	<0.001
Barium (Ba)	mg/L	1.0	MAC	0.133	0.134	0.121
Beryllium (Be)	mg/L	-	-	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	5.0	IMAC	0.25	0.25	0.23
Cadmium (Cd)	mg/L	0.005	MAC	<0.0001	<0.0001	<0.0001
Calcium (Ca)	mg/L	-	-	99	99	88
Chromium (Cr)	mg/L	0.05	MAC	<0.001	<0.001	<0.001
Cobalt (Co)	mg/L	-	-	0.0003	0.0002	<0.0002
Copper (Cu)	mg/L	1.0	AO	<0.001	<0.001	<0.001
Iron (Fe)	mg/L	0.3	AO	1.07	0.80	0.82
Lead (Pb)	mg/L	0.01	MAC	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L	-	-	55	54	51
Manganese (Mn)	mg/L	0.05	AO	0.02	0.02	0.02
Molybdenum (Mo)	mg/L	-	-	<0.005	<0.005	<0.005
Nickle (Ni)	mg/L	-	-	<0.005	<0.005	<0.005
Potassium (K)	mg/L	-	-	8	8	8
Selenium (Se)	mg/L	0.05	MAC	<0.001	<0.001	<0.001
Silver (Ag)	mg/L	-	-	<0.0001	<0.0001	<0.0001
Sodium (Na)	mg/L	200	AO	115	117	106
Strontium (Sr)	mg/L	-	-	5.10	4.97	4.94
Thallium (Tl)	mg/L	-	-	<0.0001	<0.0001	<0.0001
Uranium (U)	mg/L	0.02	MAC	<0.001	<0.001	<0.001
Vanadium (V)	mg/L	-	-	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	5.0	AO	<0.01	<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. 4270184) indicated that the test samples at the 4 and 8.5 hour interval were non-detect (0 CFU/100 mL) for E.Coli and Total Coliforms.

The bacteriological test results (Certificate of Analysis – Report No. 4290291) indicated that the test samples at the 8-hour interval were non-detect (0 CFU/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)
- Colour
- Iron

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

Hardness as CaCO_3

Hardness, expressed as calcium carbonate, is an operational 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. According to the Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines hardness is excess of 500 mg/L in drinking water is considered unacceptable for most domestic purposes. At the measured concentrations of 474, 470 and 444 mg/L, the water is considered to be hard, however, it is below the Ontario Drinking Water Objective of 500 mg/L specified in Table 3 of the MOECC guidance document Procedure D-5-5 (1996).

The Langelier calculation provided an LSI of 0.7. Based on the evaluation of the result, the water is super saturated and tends to precipitate a scale layer of calcium carbonate (scale forming but non-corrosive). Based on the range of stability in the positive direction, there are no mitigative measures needed. See Langelier Saturation Index Calculation attached for calculation details.

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 concentrations ranging from 886 to 900 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 recommended that a point of use reverse osmosis unit be installed, if the owner desires, for drinking purposes. As such, no taste problems will occur when the system is used.

The Langelier calculation provided an LSI of 0.7. Based on the evaluation of the result, the water is super saturated and tends to precipitate a scale layer of calcium carbonate (scale forming but non-corrosive). Based on the range of stability in the positive direction, there are no mitigative measures needed. See Langelier Saturation Index Calculation attached for calculation details.

Iron (Fe)

Concentrations of iron above 0.3 mg/L can contribute to staining of fixtures and a metallic taste at higher concentrations. Precipitation of iron can promote the growth of iron bacteria in pipes. The concentration of iron in the groundwater in TW1 was measured to be between 0.80 and 1.07 mg/L. The concentration of iron in the groundwater in the test well is considered to be reasonably treatable in accordance with Procedure D-5-5. It is recommended that an iron filter be used to reduce the levels of iron and reduce the potential for excessive precipitate occurring in the water supply system, if desired by the owner.

Colour

Colour may occur in drinking water for several reasons. It may be due to organic substances from the decay of vegetation, or the presence of metals such as iron, manganese, and copper, which are abundant in nature. The provincial aesthetic objective for colour in drinking water is 5 True Colour Units (TCU). The federal (Health Canada) guideline aesthetic objective limit for colour is 15 TCU (Guidelines for Canadian Drinking Water Quality, Health Canada June 2019). Procedure D-5-5 gives a maximum concentration considered reasonably treatable for colour as 7 TCU. As colour is a strictly aesthetic parameter, it can be reduced from the water supply, if desired by the owner, through the use of a manganese greensand treatment.

During the field pumping test, a DR900 colorimeter was used to measure the apparent colour in the groundwater at regular intervals. Apparent colour in the groundwater was measured as 0 TCU which is below the aesthetic guidelines of 15 TCU. The elevated colour levels detected in the lab samples are attributed to the precipitation of iron out of the groundwater and are not considered to be an exceedance.

The City of Ottawa has now required that all colour values be measured as true colour. As such, a groundwater sample was submitted from the end of the supplemental pumping test for the analysis of true colour. The geochemical result was <2 TCU.



Turbidity

Turbidity, which is generally an aesthetic parameter, was detected in the laboratory test samples at values ranging from 4.0 to 9.9 NTU. Field testing detected the samples at values ranging from 0.96 to 5.78 NTU. Continued pumping showed a decreasing trend towards the end of the test (0.96 NTU at the end of the supplemental pumping test). It is expected that continued use of the well would further reduce turbidity values. The elevated turbidity in the laboratory analyzed samples is attributed to the precipitation of iron. Therefore, it is anticipated that turbidity levels will also decrease due to treatment of other constituents, if treatment is desired by the owner.

During the pumping test, a Hanna Instruments HI98703 Fast Tracker Turbidity Meter was used to measure the turbidity in the groundwater at regular intervals. The ODWS maximum acceptable concentration for turbidity in drinking water entering the distribution system is 1 NTU. The Aesthetic Objective for turbidity in drinking water reaching the consumer is 5 NTU. Additionally, the MCCRT for turbidity is 5 NTU. The field test parameters are below the 1 NTU objective. All bacteriological test results were non-detect (0 CFU/100 mL) for E.Coli and Total Coliforms.

Chloride

Chloride (Cl) has an Ontario Drinking Water Objective (ODWO) and Maximum Concentration Considered Reasonably Treatable (MCCRT) of 250 mg/L. Although chloride concentrations exceeded this threshold during the initial pumping test, that pumping test was designed as a stress condition and does not reflect normal operational conditions. A follow-up constant-rate pumping test representative of typical water usage was conducted on Test Well 1 (TW1). Under these conditions, the chloride concentration in the groundwater was measured at 248 mg/L, which is below both the ODWO and MCCRT. As a result, no mitigation measures or further action are warranted.

Sodium

Sodium (Na), an aesthetic parameter, was detected in the laboratory test samples at concentrations between 106 and 117 mg/L, which does not exceed the ODWS aesthetic objective of 200 mg/L. Although sodium is not toxic and no maximum acceptable concentration has been set, concentrations above 20 mg/L require that the Medical Officer of Health be notified of the water quality results, so that this information may be passed on to local physicians for use in treatment of those requiring a sodium-restricted diet.



Terrain Analysis

Surficial Geology

Geotechnical field investigations were carried out at the subject site by Paterson between June 2024 and April 2025 which included advancing a total of eight (8) boreholes to a maximum depth of approximately 6.7 m bgs. Practical refusal to augering was encountered at two (2) borehole locations ranging from 3.4 to 3.6 m bgs. The borehole locations for the field investigations are presented on Drawing PG7183-2 Test Hole Location Plan, attached to this report.

The borehole 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.

Generally, the subsurface profile at the test hole locations were observed to consist of topsoil overlying a silty clay deposit followed by a glacial till layer. Practical refusal to augering was encountered at two (2) borehole locations at depths ranging from 3.4 to 3.6 m bgs. Four (4) PVC monitoring wells and four (4) flexible piezometers were installed as part of the geotechnical investigations. Groundwater levels were measured and varied between 0.1 and 0.5 m bgs.

It should be noted that groundwater levels can fluctuate both seasonally and in conjunction with precipitation events. Therefore, the groundwater levels could vary at the time of construction.

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. The client should be aware that any information pertaining to soils are furnished as a matter of general information only and borehole descriptions are not to be interpreted as descriptive of conditions at locations other than those described by the boreholes themselves.

Analytical results from the sieve and Atterberg Limit analysis can be found attached.

Hydrogeological Sensitivity of the Site

The subject site is currently vacant and has historically been undeveloped. Two commercial buildings with associated infrastructure and private servicing are proposed for the site. The subject site is bordered to the north by a railway followed by forested land, to the east by a commercial property, to the south by Ottawa Street followed by agricultural land and to the west by a commercial property. The adjacent properties are serviced by private wells and septic systems.

The overburden at the test hole locations generally consists of a topsoil overlying a silty clay deposit followed by glacial till. Practical refusal to augering was encountered at two (2) borehole locations ranging from 3.4 to 3.6 m bgs. The WWR from TW1 indicated that



a limestone bedrock was encountered at 9.8 m bgs. According to available geological mapping, the drift thickness within the site varies from 10 to 15 m bgs.

According to the geotechnical field investigation, and corroborated by the onsite WWR and overburden mapping, the overburden thickness is noted to be greater than 2 m.

According to the Ontario Building Code (OBC) Section 8.7.2.1 (1) (b)(i), highly permeable soils as it relates to sewage system design is defined by soils having a percolation rate of less than 1 minute per cm. According to the Ministry of Municipal Affairs and Housing (MMAH) Supplementary Standard SB-6 – Percolation time and soil descriptions dated January 1, 2024 only “Well graded gravels, gravel-sand mixtures, little or no fines” or “Poorly graded gravels, gravel-sand mixtures, little or no fines” have a percolation time of less than 1 minute per cm. According to the Geotechnical field investigation, soils with high levels of fines have been encountered onsite (clays, silts and silty sands). As such, septic impacts due to highly permeable soils are not anticipated.

To corroborate our position in this matter, the water quality of the bedrock aquifer targeted by the onsite drilled potable supply well shows no indication of surface water or surface impacts from sewage system effluent.

As the proposed site does not have bedrock within 2 m of the ground surface or highly permeable soils, the site is not considered hydrogeologically sensitive. Separation distances are not required to be increased between the septic components and the onsite well.

Karst Features

The term “karst” refers to a geologic formation characterized by the dissolution of carbonate bedrock, such as limestone or dolostone. Based on available Ontario Geological Survey (OGS) mapping (GRS005), the subject site is not within an area of known, potential or inferred karst.

Conceptual Lot Development Plan

The proposed development will consist of two (2) slab-on-grade buildings consisting of a building with a distillery, a restaurant and retail store within it and a building that is a warehouse. The location of the proposed buildings can be found on the attached Site Plan prepared by N45 Architecture Inc.

All water used in the manufacturing of products is to be brought in from outside sources and will not be derived from the onsite well. Any wastewater used as part of the manufacturing process will not be directed to the sewage systems. Due to the quality of water required for manufacturing the proposed products, all water used in the manufacturing process is brought to site via tanker trucks. An onsite tank is used for all discharge (stillage) from the distilling process, as the intent is to sell/provide the stillage to local farmers for animal feed and/or crop fertilizer. This is an industry standard.



Theoretical Sewage System Volumes

A sewage system design was completed by Paterson and submitted to the Ottawa Septic System Office (OSSO) for a Sewage System Installation Permit (SSIP). The septic flows for the proposed buildings are based on Part 8 of the Ontario Building Code (OBC). The Total Daily Design Sanitary Sewage Flow (TDDSSF) volume was calculated to be 9,967 L/day.

The approved OSSO SSIP includes an Eljen DN450 treatment system, which is a NSF 245 approved sewage treatment system capable of reducing total nitrogen levels by 57 %.

The OSSO approved SSIP will be submitted separately as part of the Site Plan application.

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's HTAG, including the annotated MECP Procedure D-5-4 applies for the proposed development. For the purpose of this guideline, the Ontario Drinking Water Objective of 10 mg/L of nitrate is used as an indicator of groundwater impact potential.

Under this guideline, where the average lot size is one hectare or larger and the minimum lot size is 0.8 ha or greater, a detailed impact assessment may not be required. It has been the City of Ottawa's policy that where the lot size of 0.8 ha or larger, a detailed assessment is typically not required since it is considered to be a low-risk development.

The subject site is 2.27 ha in size. As such, a detailed nitrate impact assessment (NIA) would not typically be necessary. An NIA was completed below to corroborate our opinion that the property can adequately support the proposed commercial development without having adverse impacts on the underlying bedrock aquifer should the minimum separation distances, well construction, and septic system be completed as per the recommendations of this report and the OBC.

In order to demonstrate that private services would adequately support the proposed commercial development, a predictive nitrate impact assessment for the subject site was completed. The values shown in the Predictive Nitrate Impact Assessment attached to this report are summarized below.

<input type="checkbox"/> Site area	2.27 ha
<input type="checkbox"/> Impervious area (%)	18 %
<input type="checkbox"/> Daily sewage flow	9.967 m ³ /d



<input type="checkbox"/> Concentration of nitrate in effluent with treatment	17.2 mg/L
(Value based on nitrate reduction system (Eljen DN450) with 57 % nitrate reduction)	
<input type="checkbox"/> Surplus Water	360 mm/yr
(The surplus water value was estimated based on Environment Canada Climate Office values with a soil type comprised of a clay loam (Urban lawns / Shallow Rooted Crops) and anthropogenic sources.)	
<input type="checkbox"/> Combined infiltration factor based on:	0.64
• Topography infiltration factor	0.20
• Soil texture infiltration factor	0.30
• Cover infiltration factor	0.14

The topography infiltration factor of 0.20 is based upon a generally rolling land with an average slope of 2.8 to 3.8 m/km. The soil texture infiltration factor of 0.3 is based upon “medium combinations of clay and loam” with a value of 0.2 and an “open sandy loam” with a value of 0.4, which is a reasonable generalization based upon the site investigations and available geological mapping. The “cover infiltration factor” was calculated at 0.14 based upon the existing and proposed cover.

An existing approved tertiary treatment system capable of reducing the nitrate loading in the effluent is from the Eljen Corporation brand and is called the Eljen Corporation GSF Denitrification System DN450. This Eljen system has passed the NSF/ANSI Standard 245 (American / International Testing standard) with a nitrate reduction value of 57 % for influent Total Nitrogen. This would reduce the nitrate concentration in the effluent from 40 mg/L down to as low as 17.2 mg/L, resulting in a predicted nitrate concentration of **7.91 mg/L**. This is below the limit of 10 mg/L of nitrate at the property boundary.

Based on the results of the predicted nitrate impact assessment, it is our opinion that the property can adequately support the proposed commercial buildings without having an adverse impact on the underlying bedrock aquifer, provided that the approved sewage system design is used.



CONCLUSIONS

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

1. The water supply aquifer intercepted by the existing well is considered to be adequate to support the water quantity demands for the proposed development.
2. The preferred water supply intercepted by TW1 contains a water supply that is potable and contains only elevated concentrations of hardness, TDS and iron. The noted parameters can be treated with current readily available water conditioning equipment, specifically a water softener, a reverse osmosis unit and an iron filter, if desired by the owner.
3. A water softener is recommended to facilitate the reduction of the hardness concentration, if desired by the owner. 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.
4. The sodium concentration was measured to be above the 20 mg/L reporting limit and, as such, the Medical Officer of Health for the City of Ottawa should be informed to assist area physicians in the treatment of local residents on sodium reduced diets.
5. The site is not considered hydrogeologically sensitive.
6. The predicted nitrate concentrations at the property boundary are calculated to be 7.91 mg/L when the approved sewage system design with 57 % nitrate reduction technology is used. The Eljen DN450 is capable of providing this level of treatment. This is below the required 10 mg/L threshold.
7. A Sewage System Permit needs to be issued as part of the Site Plan Application and a Building Permit needs to be issued prior to the commencement of construction on the proposed development.
8. The results of the Hydrogeological Assessment and Terrain Analysis have provided satisfactory evidence that the subject site can support the proposed commercial development with respect to water quality, quantity and sewage system flow volumes.



We trust that the current submission satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

Zavian Buchanan, E.I.T.



Erik Ardley, P.Geo

Attachments:

- Key Plan
- MECP Water Well Records
- Paterson Borehole Logs
- Sieve and Atterberg Limit Test Results
- Eurofins Certificate of Analysis
- AQTESOLV - Pumping Test Analysis Reports
- NSF 245 – Eljen DN450
- Nitrate Impact Assessment Calculations
- Langelier Saturation Index (LSI) Calculation
- Paterson Drawing PG7183-2 - Test Hole Location Plan
- Paterson Drawing PH4924-1(rev.5)
- N45 Architects Inc. Drawing A-001 Rev.04. dated October 9, 2025



FIGURE 1

KEY PLAN

JB 18
UTM A 11812 4131519175 E 31C4F



WATER RESOURCES
DIVISION

15 AUG 21 1965 6372

ONTARIO WATER
RESOURCES COMMISSION

The Ontario Water Resources Commission Act

Elev. 1412 103105

WATER WELL RECORD

Basin 125
County or District 125

Con. 6 A.F. Lot 4

Township, Village, Town or City

NEPEAN
APR 6 1965

Date completed

5

month

year

dress

Casing and Screen Record

Inside diameter of casing 4
Total length of casing 38
Type of screen
Length of screen
Depth to top of screen
Diameter of finished hole 4

Pumping Test

Static level 20
Test-pumping rate 5 G.P.M.
Pumping level 35
Duration of test pumping 1 hr
Water clear or cloudy at end of test
Recommended pumping rate 5 G.P.M.
with pump setting of 20 feet below ground surface

Well Log

Overburden and Bedrock Record

From
ft.

To
ft.

Depth(s) at
which water(s)
found

Kind of water
(fresh, salty,
sulphur)

COARSE GRAVEL

0 20

FINE 11

20 30

" BED SAND

30 38

LIMESTONE

28 86 85 105 ft

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

Location of Well

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

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

Drilling or Boring Firm

F P SPADS

STATION 66

Address

Licence Number

1663

Name of Driller or Borer

215123975

Address

Date

4.01.1965

(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

OWRC COPY

UTM 11 B Z 4 3 1 5 1 5 1 3 1 5 F
5 R 5 0 0 4 1 0 0 N

3194f. A



15 NO. 9235
GROUND WATER BRANCH
SEP 7 1980
3 A 10
RESOURCES COMMISSION

The Ontario Water Resources Commission Act, 1957

WATER WELL RECORD

County or District... *Caledonia*

... Township, Village, Town, or City

Con. ✓ Let

Date completed 5 Aug 60
(day month year)
Address Richmond

Casing and Screen Record

Pumping Test

Inside diameter of casing..... 4"
Total length of casing..... 26'
Type of screen.....
Length of screen.....
Depth to top of screen.....
Diameter of finished hole 4"

Static level 5' *5'*
 Test-pumping rate 6 G.P.M. *6*
 Pumping level 6 ft. *6 ft.*
 Duration of test pumping 1/2 hr. *1/2 hr.*
 Water clear or cloudy at end of test clear *clear*
 Recommended pumping rate 5 G.P.M. *5*
 with pumping level of *Set pump at 30 ft.* *30 ft.*

Well Log

Water Record

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

Location of Well

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

Drilling Firm

Address

Drilling Firm
Address

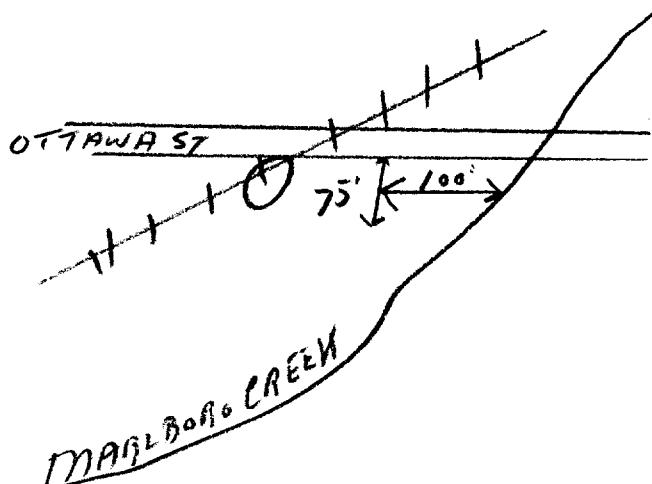
License Number 483

Name of Drillers R. E. Edwards

Address:

Date June 23/69

John Doe



31G/af. A"

WATER RESOURCES
COMMISSION
ONTARIO

B

UTM 118^z 435161510^F5^R 5001411310^N

The Ontario Water Resources Commission Act

15 N. 9315
JUL 1 1967Elev. 4^R 03110

WATER WELL RECORD

Basin 215
County or District Carleton

Township, Village, Town or City

Richmond

Con. Lot

Date completed

25

Aug

1967

ress

Richmond Ont

Casing and Screen Record

Pumping Test

Inside diameter of casing 5"
 Total length of casing 26'
 Type of screen
 Length of screen
 Depth to top of screen
 Diameter of finished hole 5"

Static level 10'
 Test-pumping rate 1.0 G.P.M.
 Pumping level 12'
 Duration of test pumping 1 hr
 Water clear or cloudy at end of test cloudy
 Recommended pumping rate 5 G.P.M.
 with pump setting of 35 feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record

From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
0'	15'	58'	fresh
15'	22'		
21	60		

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 Ltd

Address 14 Ashford Dr
Ottawa 6

Licence Number 2381

Name of Driller or Borer M. Kavanaugh

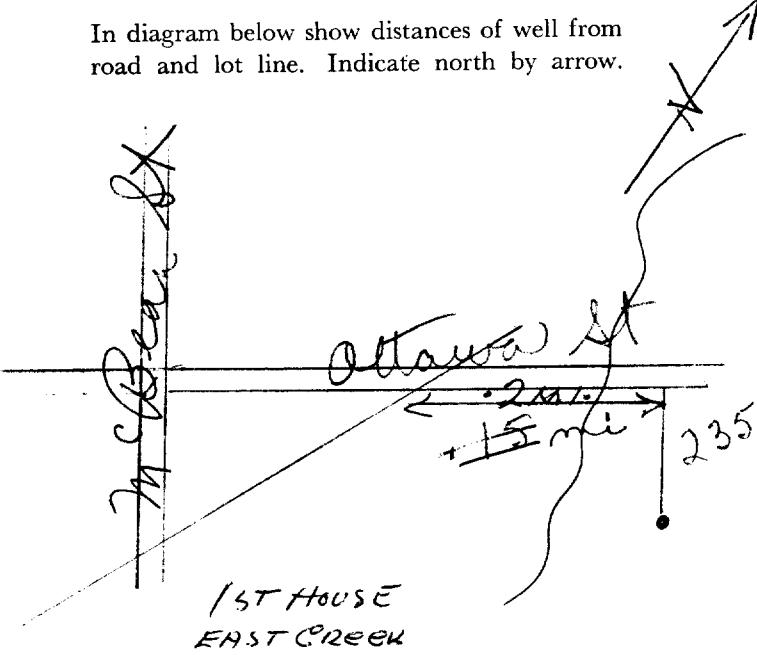
Address

Date Aug 25 1967

Halter Kavanaugh
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

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





Ontario

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

31/6/78

1. PRINT ONLY IN SPACES PROVIDED

2. CHECK CORRECT BOX WHERE APPLICABLE11
3 2

11514676

MUNICIP. 15003

CON. CBN

03

COUNCIL DISTRICT

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE

St. Albans Richmond Con 3

CON., BLOCK, TRACT, SURVEY, ETC.

LOT 25-27

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Well Owner's Information

First Name	Last Name / Organization	E-mail Address		<input type="checkbox"/> Well Constructed by Well Owner
Talos Custom Homes		Municipality	Province	Postal Code
Mailing Address (Street Number/Name)		Ottawa	Ontario	K1J 9J8
5509 Canotek Road				613 747 3993

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
Lot 29 - Richmond Forest	Goulbourn	25	3
County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Richmond	Ontario	
UTM Coordinates	Zone	Eastng	Northing
NAD	8	3 1 8 4 3 5 4 2 8	5 0 0 4 5 5 3

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Clay	Stones	Packed	0	3.65
Gray	Clay	Stones	Sticky	3.65	6.09
Gray	Limestone		Medium	6.09	45.10

Annular Space

Depth Set at (m/ft) From	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
8.53	0 Grouted Bentonite Slurry	.69m ³

Results of Well Yield Testing

After test of well yield, water was:		Draw Down	Recovery
<input checked="" type="checkbox"/> Clear and sand free			
<input type="checkbox"/> Other, specify			
Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
Static Level	4.16		
1	6.03	1	12.05
2	7.44	2	10.35
3	8.49	3	8.73
4	9.50	4	7.38
5	9.99	5	6.10
10	12.29	10	4.25
15	13.38	15	4.16
20		20	
25	14.40	25	
30	14.62	30	
40	14.95	40	
50	15.09	50	
60	15.23	60	

Method of Construction

Well Use

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

Construction Record - Casing

Status of Well

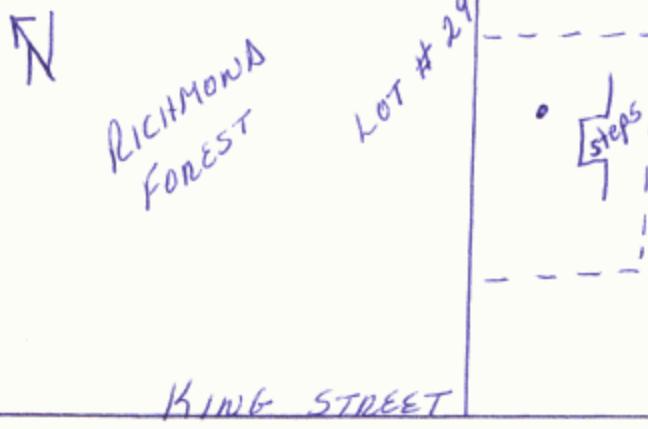
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	From	To	<input checked="" type="checkbox"/> Water Supply
15.86	Steel	.48	+.60	8.53		<input type="checkbox"/> Replacement Well

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	From	To	<input type="checkbox"/> Test Hole
						<input type="checkbox"/> Recharge Well

Map of Well Location

Please provide a map below following instructions on the back.



Water Details		Hole Diameter	
Water found at Depth	Kind of Water:	<input type="checkbox"/> Fresh	<input checked="" type="checkbox"/> Untested
42.36(m/ft)	<input type="checkbox"/> Gas	<input type="checkbox"/> Other, specify	
Water found at Depth	Kind of Water:	<input type="checkbox"/> Fresh	<input type="checkbox"/> Untested
(m/ft)	<input type="checkbox"/> Gas	<input type="checkbox"/> Other, specify	
Water found at Depth	Kind of Water:	<input type="checkbox"/> Fresh	<input type="checkbox"/> Untested
(m/ft)	<input type="checkbox"/> Gas	<input type="checkbox"/> Other, specify	

Depth (m/ft)

From

To

Diameter
(cm/in)

Well Contractor and Well Technician Information
Business Name of Well Contractor
Capital Water Supply Ltd.
Business Address (Street Number/Name)
Box 490
Province
Postal Code
Business E-mail Address
Ontario K 2 S 1 A 6 office@capitalwater.ca
Bus. Telephone No. (inc. area code)
Name of Well Technician (Last Name, First Name)
6 1 3 8 3 6 1 7 6 6 Miller, Stephen
Well Technician's Licence No.
Signature of Technician and/or Contractor
Date Submitted
0 0 9 7 2008 11 17

Well owner's information package delivered	Date Package Delivered
<input checked="" type="checkbox"/> Yes	2008 11 13
<input type="checkbox"/> No	2008 11 12

Ministry Use Only
Audit No. Z 84445
Received DEC 02 2008



Well Owner's Information

First Name	Last Name / Organization	E-mail Address		<input type="checkbox"/> Well Constructed by Well Owner
Talos Custom Homes				
Mailing Address (Street Number/Name)		Municipality	Province	Postal Code
5509 Canotek Rd. Unit 1		Ottawa	Ontario	K 1 J 9 J 8
Telephone No. (inc. area code)		613 747 3993		

Well Location

Address of Well Location (Street Number/Name)		Township	Lot	Concession
Lot 30, Richmond Forest		Goulbourn	25	3
County/District/Municipality		City/Town/Village		Province Postal Code
Ottawa Carleton		Richmond		Ontario
UTM Coordinates	Zone	Eastings	Northings	Municipal Plan and Sublot Number
NAD 83 18435437		5004548		Other

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
				From To
Brown	Sandy Soil	Stones		0 4.26
Gray	Hardpan	Boulders	Packed	4.26 8.83
Gray	Limestone		Medium	8.83 45.10

Annular Space

Depth Set at (m/ft)	From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
8.83	0		Grouted Bentonite Slurry	.84m³

Method of Construction

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

Well Use

Results of Well Yield Testing

After test of well yield, water was:	Draw Down	Recovery	
Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
<input checked="" type="checkbox"/> Clear and sand free			
<input type="checkbox"/> Other, specify			
If pumping discontinued, give reason:			
Static Level	3.99		
1	4.74	1	4.27
2	4.90	2	4.11
3	4.94	3	4.04
4	4.98	4	4
5	5.	5	
10	5.08	10	
15	5.09	15	
20	5.11	20	
25	5.12	25	
30	5.12	30	
40	5.13	40	
50	5.13	50	
60	5.14	60	

Construction Record - Casing

Status of Well

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	From	To	<input checked="" type="checkbox"/> Water Supply
15.86	Steel	.48	.45	8.83		<input type="checkbox"/> Replacement Well
						<input type="checkbox"/> Test Hole
						<input type="checkbox"/> Recharge Well
						<input type="checkbox"/> Dewatering Well
						<input type="checkbox"/> Observation and/or Monitoring Hole
						<input type="checkbox"/> Alteration (Construction)
						<input type="checkbox"/> Abandoned, Insufficient Supply
						<input type="checkbox"/> Abandoned, Poor Water Quality
						<input type="checkbox"/> Abandoned, other, specify
						<input type="checkbox"/> Other, specify

Hole Diameter

Depth (m/ft)

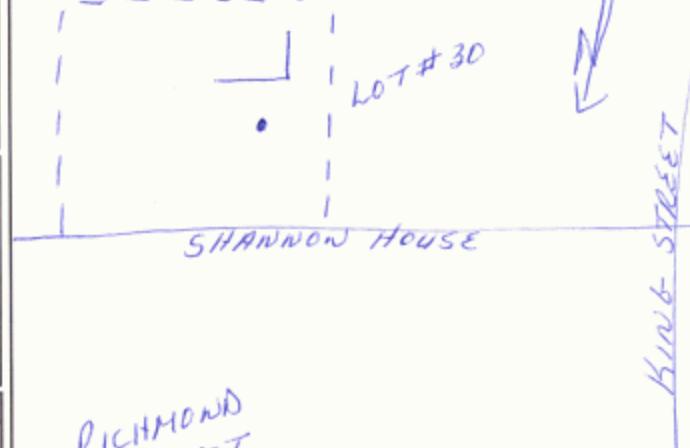
From	To	Diameter (cm/in)
0	8.83	15.86
8.83	45.10	15.23

Water Details

Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Depth (m/ft)	From	To
43.27	<input type="checkbox"/> Gas	<input type="checkbox"/> Other, specify		
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested			
(m/ft)	<input type="checkbox"/> Gas	<input type="checkbox"/> Other, specify		
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested			
(m/ft)	<input type="checkbox"/> Gas	<input type="checkbox"/> Other, specify		

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Business Name of Well Contractor	Well Contractor's Licence No.	
Capital Water Supply Ltd.	1 5 5 8	
Business Address (Street Number/Name)	Municipality	
Box 490	Stittsville	
Province	Postal Code	Business E-mail Address
Ontario	K 2 S 1 A 6	office@capitalwater.ca
Bus. Telephone No. (inc. area code) Name of Well Technician (Last Name, First Name)		
6 1 3 8 3 6 1 7 6 6 Miller, Stephen		
Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
0 0 9 7	<i>[Signature]</i>	2 0 0 9 0 3 0 6

Well owner's information package delivered	Date Package Delivered
<input checked="" type="checkbox"/> Yes	2 0 0 9 0 3 0 6
<input type="checkbox"/> No	2 0 0 9 0 3 0 5
Date Work Completed	

Ministry Use Only

Audit No.	2095337
APR 06 2009	
Received	



Well Owner's Information

First Name	Last Name / Organization Talos Custom Homes	E-mail Address	<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name) 5509 Canotek Rd. Unit 1		Municipality Ottawa	Province Ontario Postal Code K1J 9J8 Telephone No. (inc. area code) 613 747 3993
Address of Well Location (Street Number/Name) Lot 31, Richmond Forest		Township Goulbourn	Lot 25 Concession 3
County/District/Municipality Ottawa Carleton		City/Town/Village Richmond	Province Ontario Postal Code
UTM Coordinates	Zone NAD 831 84354525004599	Municipal Plan and Sublot Number	
		Other	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
				From To
Brown	Sandy Soil	Stones		0 4.26
Gray	Hardpan	Boulders	Packed	4.26 7.01
Gray	Limestone		Medium	7.01 45.10

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From	To	
8.83	0 Grouted Bentonite Slurry	.84m³

Results of Well Yield Testing

After test of well yield, water was:	Draw Down	Recovery	
Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
<input checked="" type="checkbox"/> Clear and sand free			
<input type="checkbox"/> Other, specify			
If pumping discontinued, give reason:			
Static Level	3.95		
1	5.30	1	5.62
2	5.84	2	4.50
3	6.24	3	4.04
4	6.53	4	3.93
5	6.77	5	
10	7.17	10	
15	7.37	15	
20	7.49	20	
25	7.58	25	
30	7.64	30	
40	7.68	40	
50	7.73	50	
60	7.78	60	

Method of Construction

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	From	To			
15.86	Steel	.48	.45		8.83			

Status of Well

- Water Supply
- Replacement Well
- Test Hole
- Recharge Well
- Dewatering Well
- Observation and/or Monitoring Hole
- Alteration (Construction)
- Abandoned, Insufficient Supply
- Abandoned, Poor Water Quality
- Abandoned, other, specify
- Other, specify

Construction Record - Screen

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

Water Details

Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Depth (m/ft)	Diameter (cm/in)
From	To	From	To
43.27(m/ft)	<input type="checkbox"/> Gas	<input type="checkbox"/> Other, specify	
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	0	8.83 15.86
(m/ft)	<input type="checkbox"/> Gas	<input type="checkbox"/> Other, specify	
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	8.83	45.10 15.23
(m/ft)	<input type="checkbox"/> Gas	<input type="checkbox"/> Other, specify	

Hole Diameter

Depth (m/ft)	From	To	Diameter (cm/in)

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1 5 5 8
Business Address (Street Number/Name)	Municipality
Box 490	Stittsville
Province	Postal Code
Ontario	K 2 S 1 A 6
Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
613 836 1766	Miller, Stephen
Well Technician's Licence No.	Signature of Technician and/or Contractor
	Date Submitted
0097	20090306

Ministry's Copy

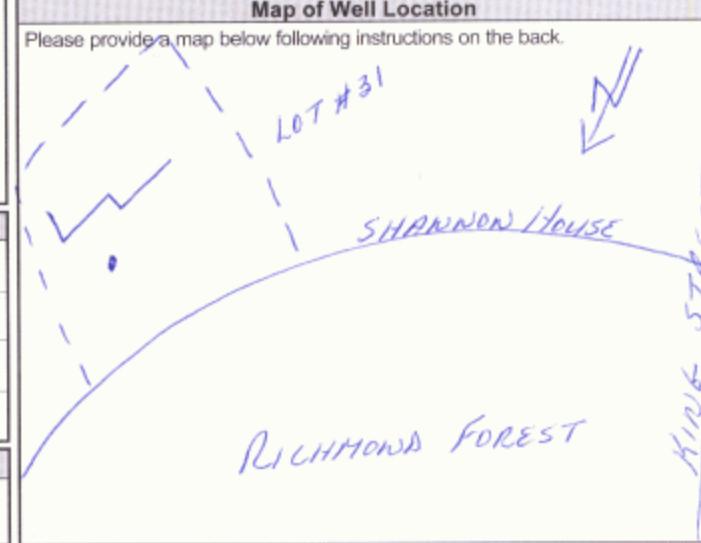
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<input type="checkbox"/> No	20090305

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2095338

APR 06 2009

Received

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Well Owner's Information

First Name	Last Name / Organization	E-mail Address		<input type="checkbox"/> Well Constructed by Well Owner
	Talos Custom Homes			
Mailing Address (Street Number/Name)		Municipality	Province	Postal Code
5509 Canotek Road - Unit 1		Ottawa	Ontario	K1J 9J8
Telephone No. (inc. area code)		613 747 3993		

Well Location

Address of Well Location (Street Number/Name)		Township	Lot	Concession
Lot 26 Richmond Forest		Goulbourn	3	25
County/District/Municipality		City/Town/Village	Province	Postal Code
Ottawa Carleton		Richmond	Ontario	
UTM Coordinates	Zone	Easting	Northing	Other
NAD 8	3	1 8 4 3 5 3 7 1 5 0 0 4 5 1 7		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sandy Soil	Stones	Packed	0	3.35
Gray	Sandy Soil	Stones	Packed	3.35	5.79
Gray	Limestone		Medium	5.79	45.10

Annular Space					
Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)		
8.83	0	Grouted Bentonite Slurry		.42m ³	

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

Construction Record - Casing			Status of Well		
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify <input type="checkbox"/> Other, specify
15.86	Steel	.48	+.45	8.83	

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

Water Details			Hole Diameter		
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	<input type="checkbox"/> Other, specify	Depth (m/ft) From	To	Diameter (cm/in)
43.88			0	8.83	15.86
44.19			8.83	45.10	15.23

Well Contractor and Well Technician Information		
Business Name of Well Contractor	Well Contractor's Licence No.	
Capital Water Supply Ltd.	1 5 5 8	
Business Address (Street Number/Name)	Municipality	
Box 490	Stittsville	
Province	Postal Code	Business E-mail Address
Ontario	K 2 S 1 A 6	office@capitalwater.ca
Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)	
6 1 3 8 3 6 1 7 6 6	Miller, Stephen	
Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
0 0 9 7		2 0 0 9 0 3 3 0

Well owner's information package delivered	Date Package Delivered
<input checked="" type="checkbox"/> Yes	20090330
<input type="checkbox"/> No	Date Work Completed
	20090324

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Received	MAY 20 2009
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Results of Well Yield Testing			
After test of well yield, water was:	Draw Down	Recovery	
<input checked="" type="checkbox"/> Clear and sand free	Time (min)	Water Level (m/ft)	Time (min)
<input type="checkbox"/> Other, specify			
If pumping discontinued, give reason:			
Pump intake set at (m/ft)	3.32		
30.48	1	4.79	1
Pumping rate (l/min / GPM)	2	5.30	2
54.6	3	5.64	3
Duration of pumping	4	5.88	4
1 hrs + min	5	5.98	5
Final water level end of pumping (m/ft)	10	6.24	10
6.46	15		
If flowing give rate (l/min / GPM)	20	6.37	20
Recommended pump depth (m/ft)	25		
22.85	30		
Recommended pump rate (l/min / GPM)	40	6.43	40
45.5	50	6.44	50
Well production (l/min / GPM)	60	6.46	60
Disinfected?			
<input checked="" type="checkbox"/> Yes			
<input type="checkbox"/> No			

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



Address of Well Location (Street Number/Name)

Lot 27 Chanonhouse Drive

County/District/Municipality

Ottawa Carleton

UTM Coordinates Zone Easting Northing

NAD 83 184354075004510

Township

Goulbourn

Lot

25

Concession

3

City/Town/Village

Richmond

Province

Ontario

Postal Code

Municipal Plan and Sublot Number

Other

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sandy Clay	Stones	Packed	0	3.65
Gray	Sandy Clay	Stones	Packed	3.65	5.48
Gray	Limestone		Medium	5.48	45.10

Annular Space

Depth Set at (m/ft) From	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
8.53	0 Grouted Bentonite Slurry	.63m ³

Method of Construction

Well Use

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

Construction Record - Casing

Status of Well

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To	<input checked="" type="checkbox"/> Water Supply
15.86	Steel	.48	+.45	8.53	<input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify <input type="checkbox"/> Other, specify

Construction Record - Screen

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

Water Details

Hole Diameter

Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Depth (m/ft)	Diameter (cm/in)
From	To	From	To
43.58	<input type="checkbox"/> Gas	0	8.53
	<input type="checkbox"/> Other, specify _____		15.86
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	8.53	45.10
	<input type="checkbox"/> Gas		15.23
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested		
	<input type="checkbox"/> Gas		
	<input type="checkbox"/> Other, specify _____		

Well Contractor and Well Technician Information

Business Name of Well Contractor

Well Contractor's Licence No.

Capital Water Supply Ltd.

1 5 5 8

Business Address (Street Number/Name)

Municipality

Box 490

Stittsville

Province

Postal Code

Business E-mail Address

Ontario K 2 S 1 A 6 office@capitalwater.ca

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

6 1 3 8 3 6 1 7 6 6 Miller, Stephen

Well Technician's Licence No. Signature of Technician and/or Contractor

Date Submitted

0 0 9 7

2 0 0 9 0 3 3 0

Well owner's information package delivered

Date Package Delivered

Yes

2 0 0 9 0 3 3 0

No

Date Work Completed

2 0 0 9 0 3 2 4

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Z 095325

Received MAY 20 2009

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Well Owner's Information

First Name	Last Name / Organization Talos Custom Homes	E-mail Address		<input type="checkbox"/> Well Constructed by Well Owner	
Mailing Address (Street Number/Name) 5509 Canotek Road		Municipality Ottawa	Province Ontario	Postal Code K1J 9J8	Telephone No. (inc. area code) 613 747 3993

Well Location

Address of Well Location (Street Number/Name) Lot 34 Richmond Forest		Township Goulbourn	Lot 25	Concession 3
County/District/Municipality Ottawa Carleton		City/Town/Village Richmond	Province Ontario	Postal Code
UTM Coordinates NAD 1983	Zone 118	Eastng 435406	Northng 15001642	Municipal Plan and Sublot Number

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

Annular Space

Depth Set at (m/ft)		Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
From	To		
9.44	0	Grouted Bentonite Slurry	1.15m ³

Results of Well Yield Testing

After test of well yield, water was:	Draw Down		Recovery	
<input checked="" type="checkbox"/> Clear and sand free	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
<input type="checkbox"/> Other, specify _____	Static Level	4.05		
If pumping discontinued, give reason:	1	4.47	1	4.15
Pump intake set at (m/ft)	2	4.51	2	4.13
30.47	3	4.52	3	4.12
Pumping rate (l/min / GPM)	4	4.54	4	4.11
54.6	5	4.55	5	4.10
Duration of pumping	10	4.58	10	4.09
1 hrs + _____ min	15	4.60	15	4.07
Final water level end of pumping (m/ft)	20	4.60	20	
4.60	25	4.59	25	
If flowing give rate (l/min / GPM)	30	4.59	30	
Recommended pump depth (m/ft)	40	4.60	40	
22.85	50	4.60	50	
Recommended pump rate (l/min / GPM)	60	4.60	60	
45.5				
Well production (l/min / GPM)				
Disinfected?				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				

Other, .

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)		
15.86	Steel	.48	From	To	

Map of Well Location

Map of Well Escalation
Please provide a map below following instructions on the back.

Please provide a map below following instructions on the back.

LOT #34
HOUSE #46
CHANON HOUSE
RICHMOND FOREST
KING STREET

Water Details

Water found at Depth 43.58 (m/ft) <input type="checkbox"/> Gas	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested <input type="checkbox"/> Other, specify _____	Depth (m/ft) From 0 To 9.44	Diameter (cm/in) 15.86
Water found at Depth (m/ft) <input type="checkbox"/> Gas	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Other, specify _____	9.44	45.10 15.23
Water found at Depth (m/ft) <input type="checkbox"/> Gas	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Other, specify _____		

Well Contractor and Well Technician Information

Business Name of Well Contractor Capital Water Supply Ltd.	Well Contractor's Licence No 1 5 5 8
Business Address (Street Number/Name) Box 400	Municipality Stittsville

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
	2 0 0 9 1 1 2 6	Audit No. Z 101774
<input checked="" type="checkbox"/> Yes	Date Work Completed	FEB 16 2010
<input type="checkbox"/> No	2 0 0 9 1 1 2 5	Received

EASTING: 358362.138 NORTHING:

EASTING: 358362.138 NORTHING: 5005913.959 ELEVATION: 94.20

DATUM: Geodetic

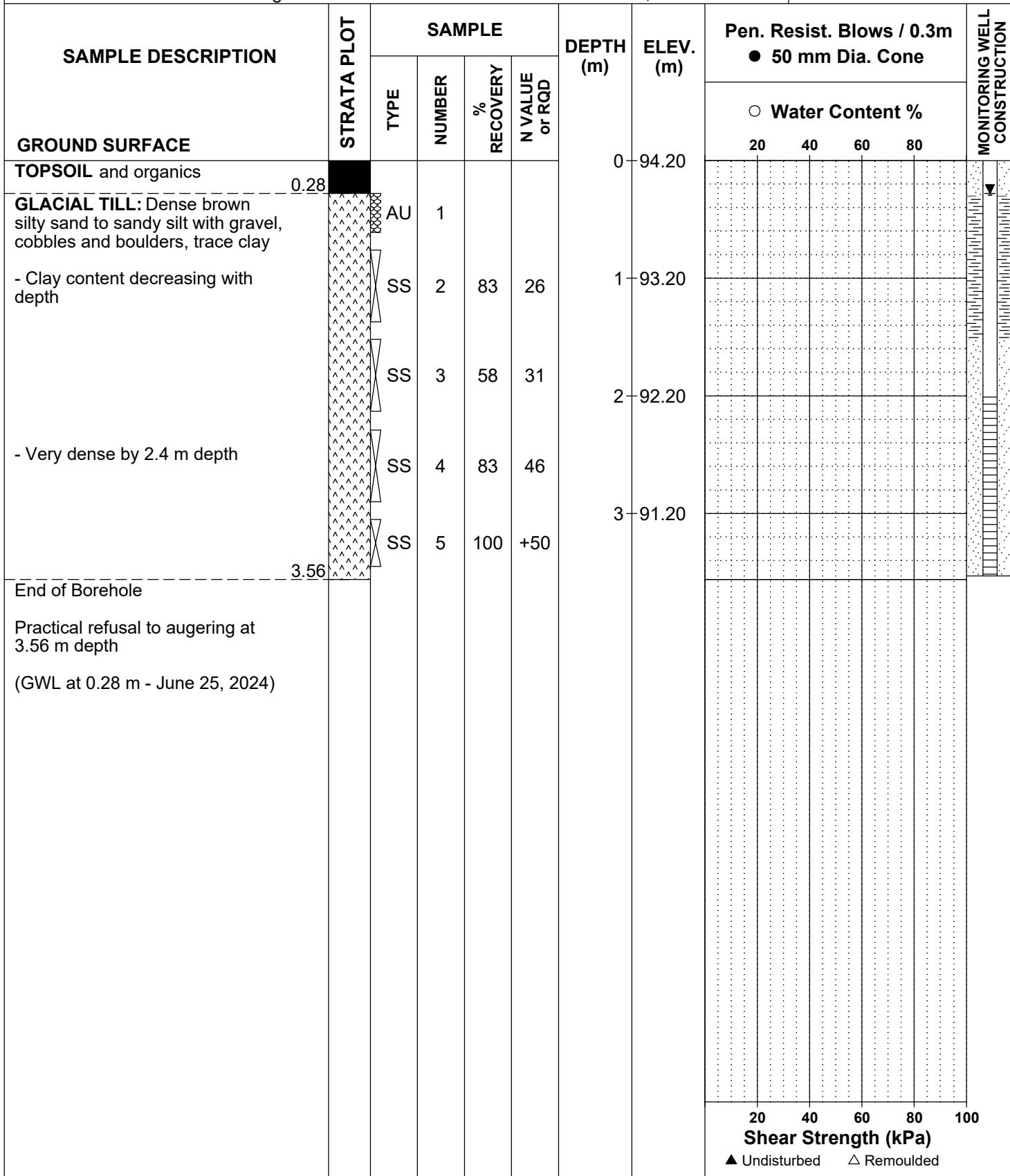
REMARKS:

BORINGS BY: CME 55 Power Auger

DATE: June 17, 2024

FILE NO. **PG7183**

HOLE NO. **BH 1-24**



EASTING: 358409.319 NORTHING: 5005999.639 ELEVATION: 93.69

FILE NO. **PG7183**

DATUM: Geodetic

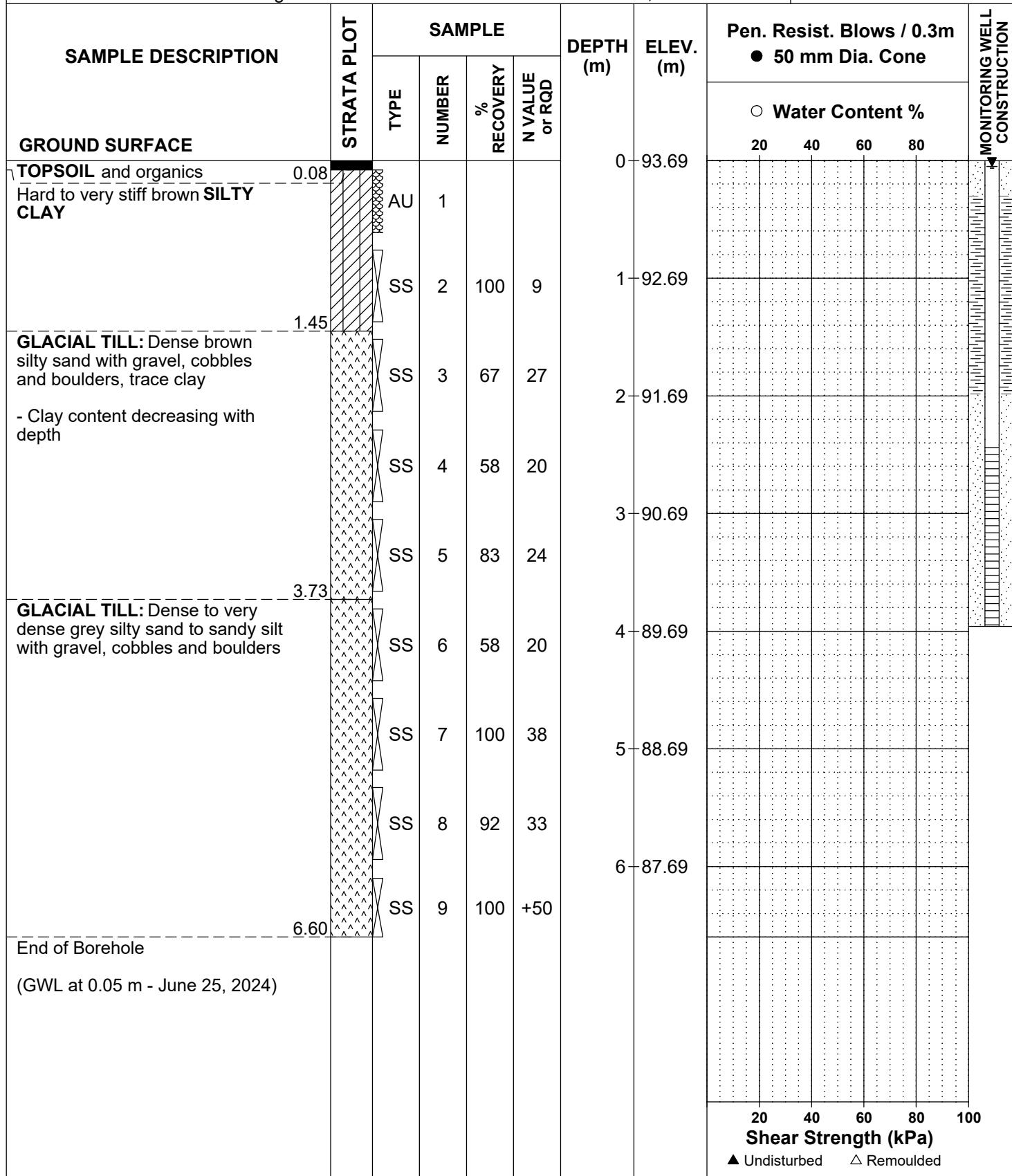
REMARKS:

BORINGS BY: CME 55 Power Auger

DATE: June 17, 2024

HOLE NO.

BH 2-24



EASTING: 358326.994 NORTHING: 5005950.976 ELEVATION: 93.85

FILE NO. **PG7183**

DATUM: Geodetic

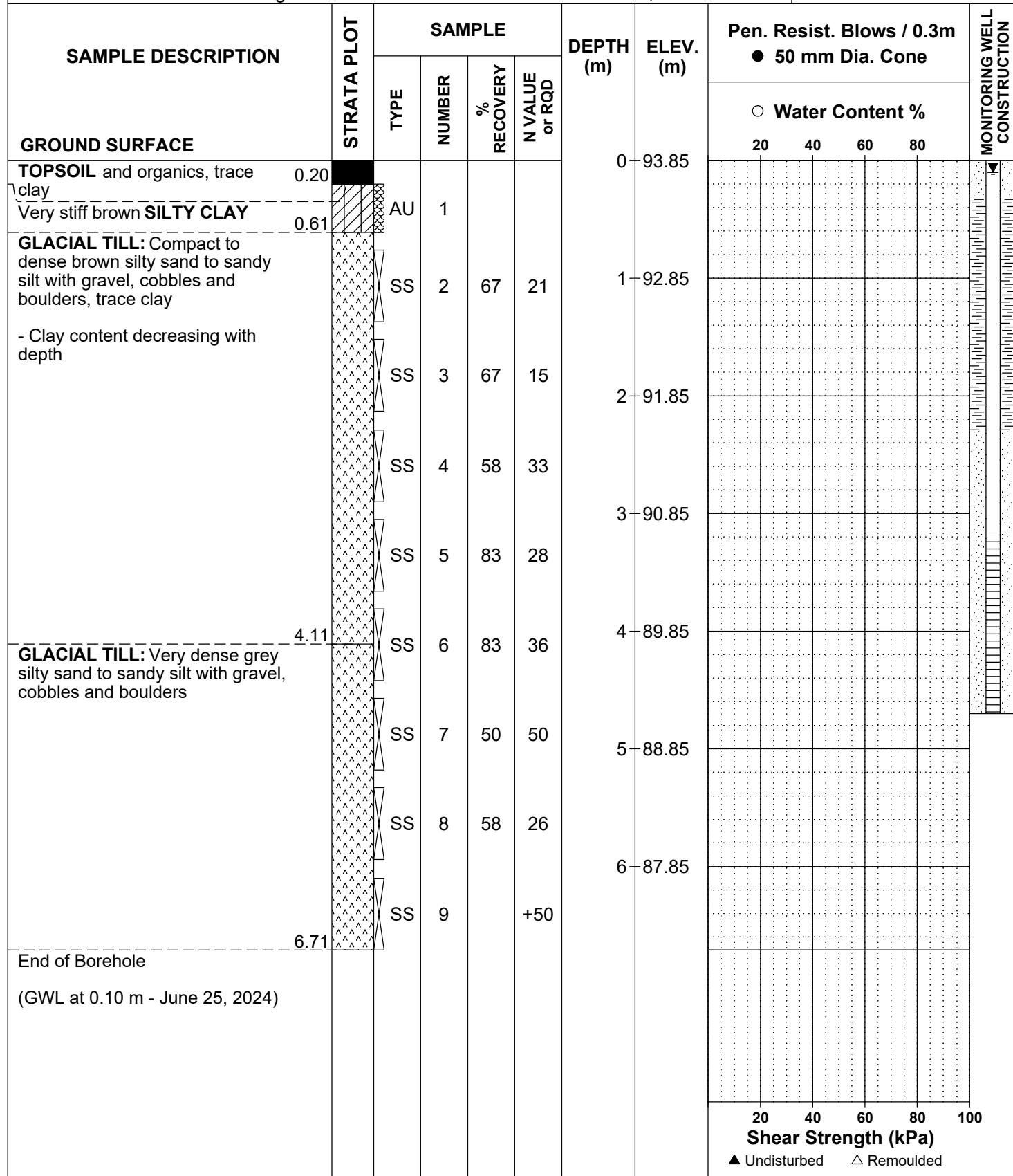
REMARKS:

BORINGS BY: CME 55 Power Auger

DATE: June 17, 2024

HOLE NO.

BH 3-24



EASTING: 358331.858 NORTHING: 5005978.835 ELEVATION: 94.11

FILE NO. **PG7183**

DATUM: Geodetic

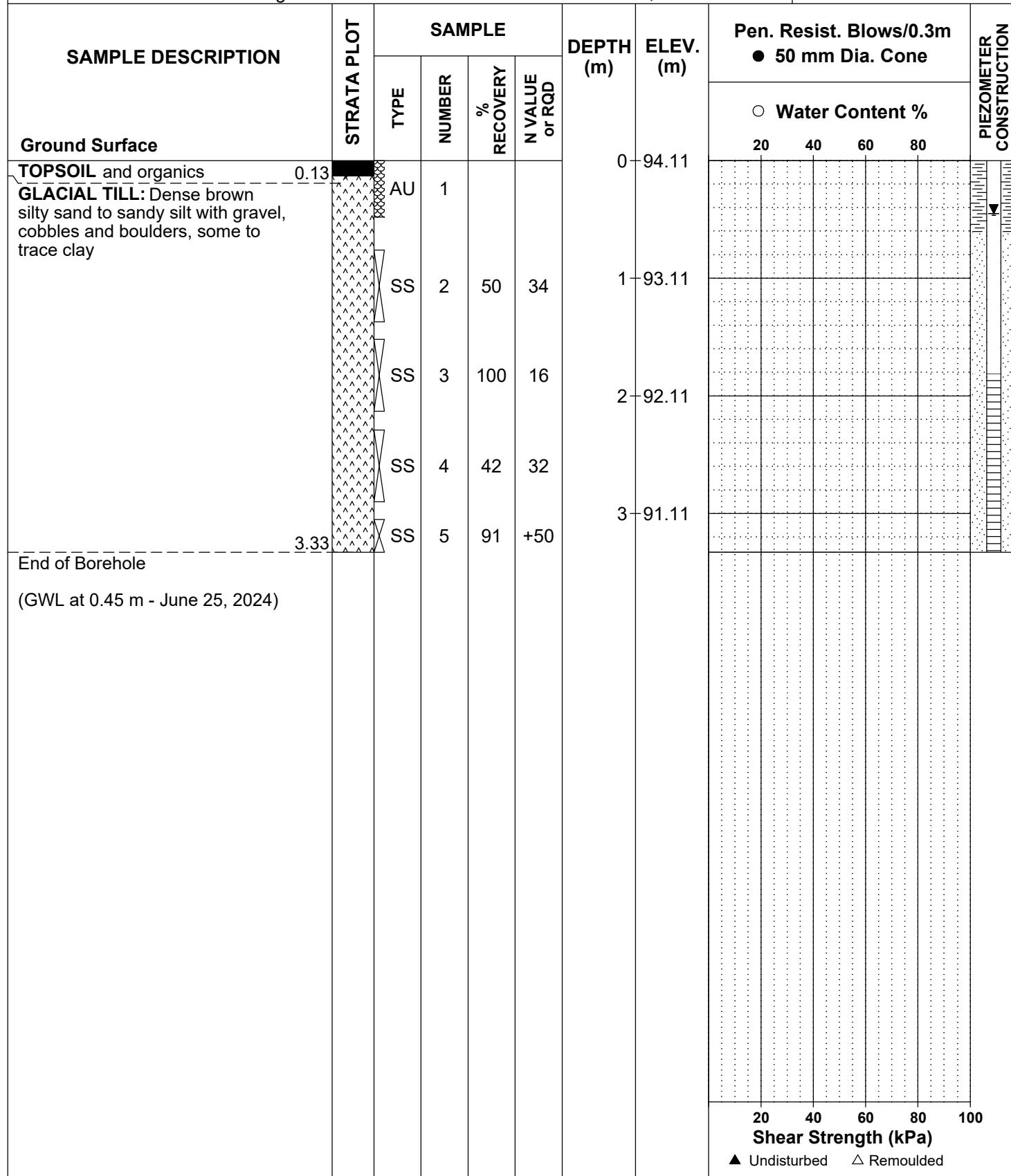
REMARKS:

BORINGS BY: CME 55 Power Auger

DATE: June 17, 2024

HOLE NO.

BH 4-24



EASTING: 358383.011 NORTHING:

EASTING: 358383.011 NORTHING: 5005949.836 ELEVATION: 93.92

DATUM: Geodetic

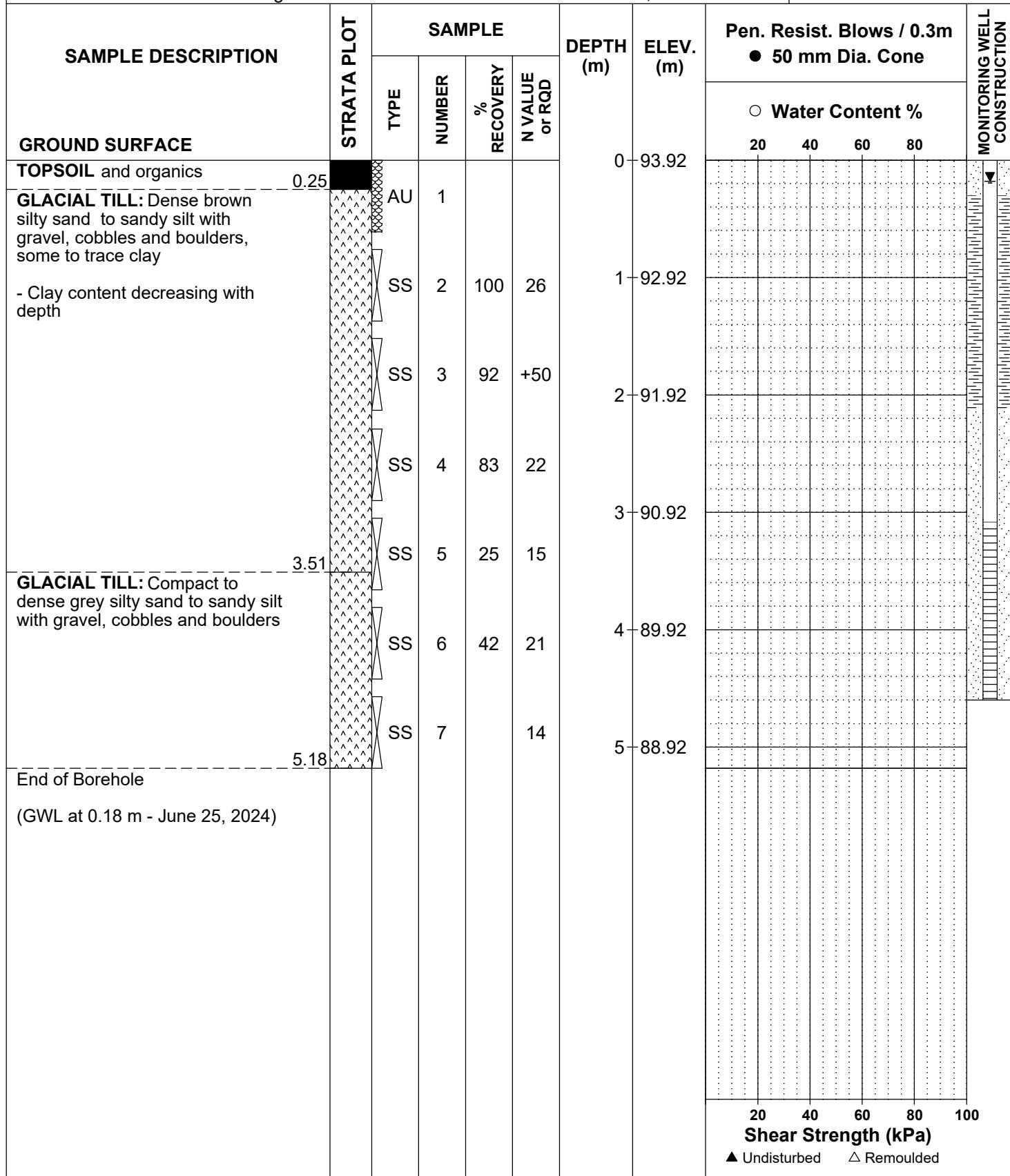
REMARKS:

BORINGS BY: CME 55 Power Auger

DATE: June 17, 2024

FILE NO. PG7183

HOLE NO. **BH 5-24**





COORD. SYS.: MTM ZONE 9

EASTING: 358355.92

NORTHING: 5006024.43

ELEVATION: 94.07

PROJECT: Proposed Commercial Development

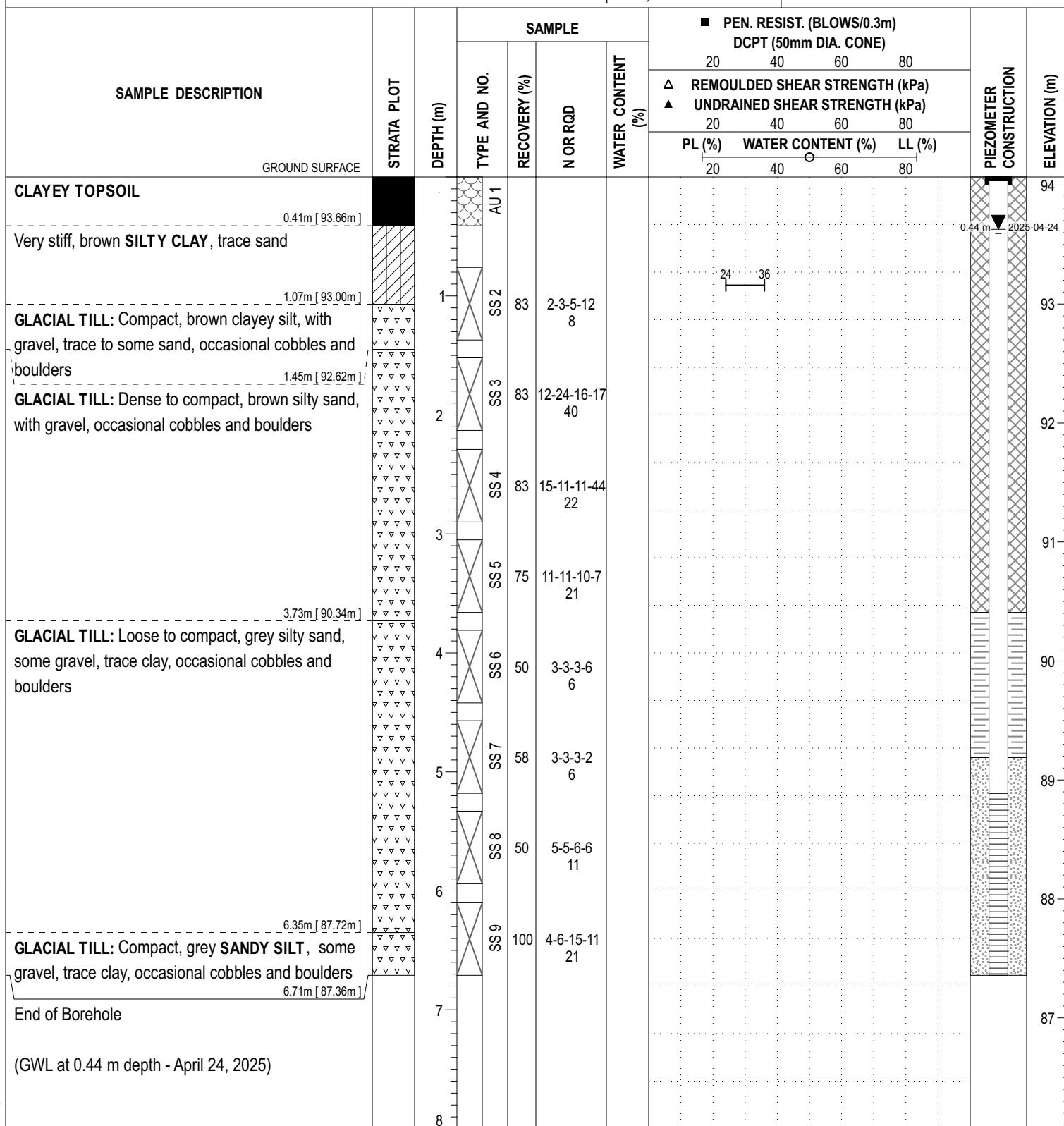
FILE NO.: PG7183

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: April 17, 2025

HOLE NO.: BH 1-25





COORD. SYS.: MTM ZONE 9

EASTING: 358380.22

NORTHING: 5006016.15

ELEVATION: 94.07

PROJECT: Proposed Commercial Development

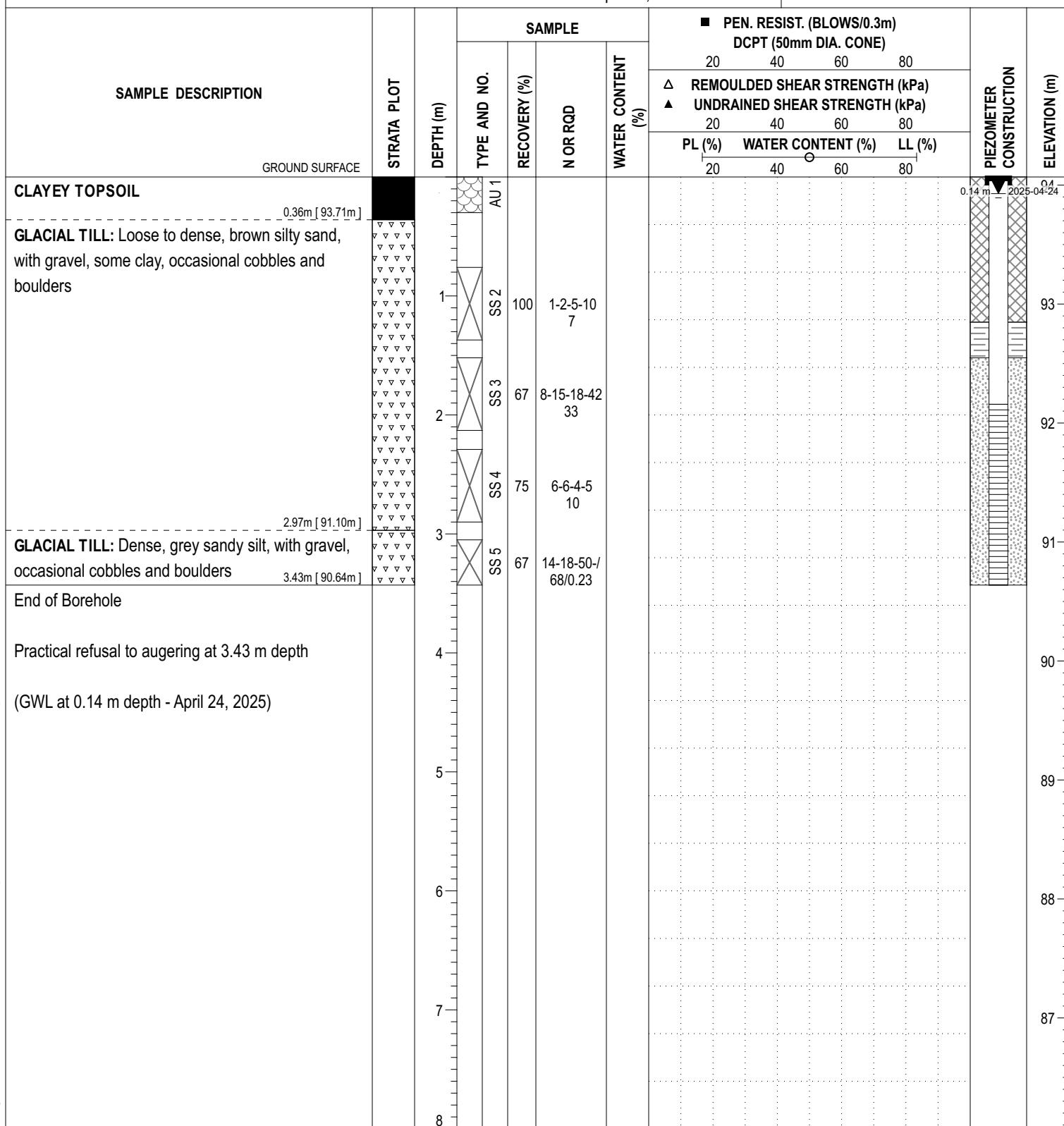
FILE NO.: PG7183

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: April 17, 2025

HOLE NO.: BH 2-25



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COORD. SYS.: MTM ZONE 9

EASTING: 358388.50

NORTHING: 5005993.41

ELEVATION: 94.07

PROJECT: Proposed Commercial Development

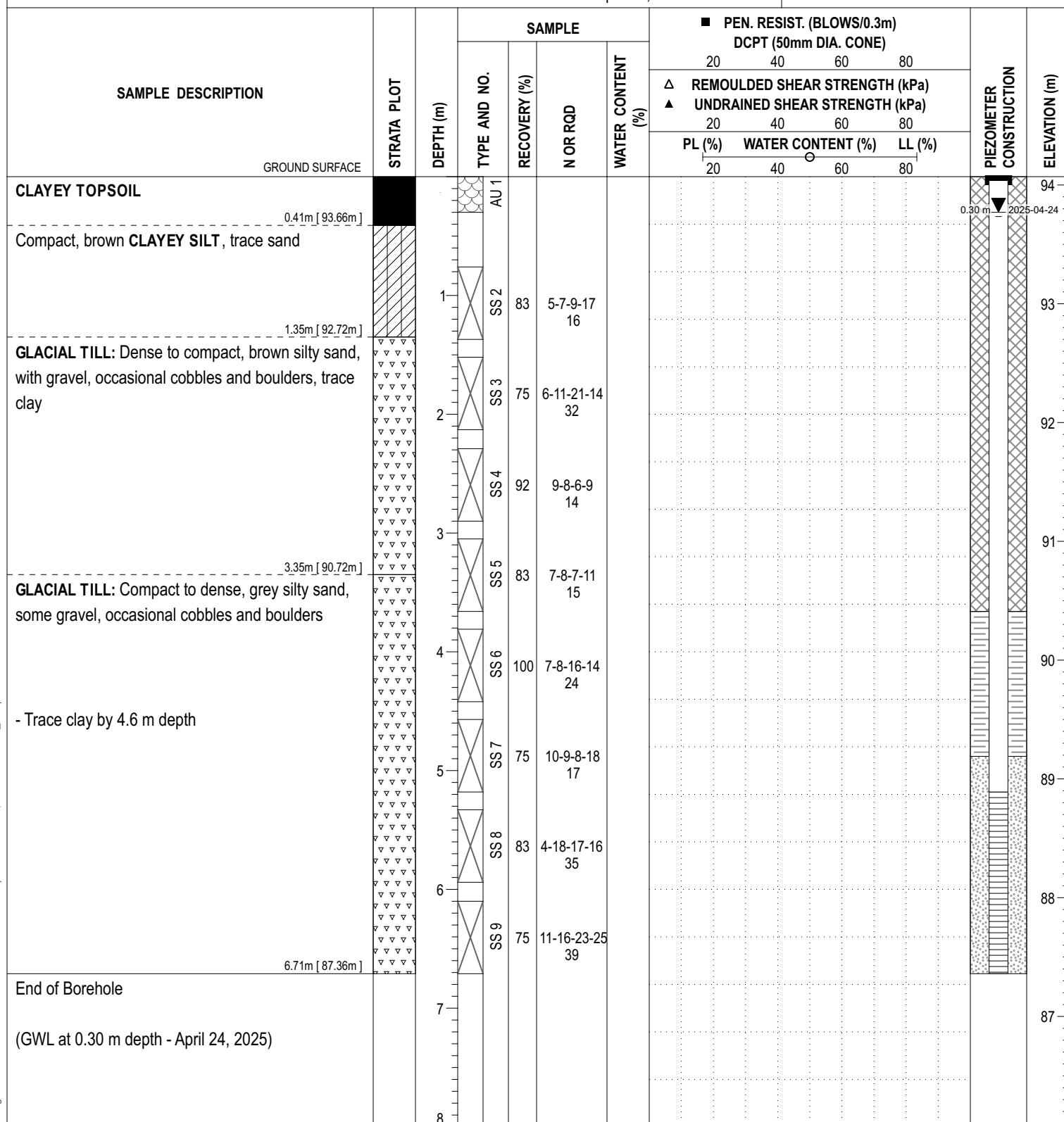
FILE NO.: PG7183

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: April 17, 2025

HOLE NO.: BH 3-25



DISCLAIMER: THE DATA PRESENTED IN THIS SHEET IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHOM IT WAS PRODUCED. THIS SHEET SHOULD BE READ IN CONJUNCTION WITH ITS CORRESPONDING REPORT. PATERSON GROUP IS NOT RESPONSIBLE FOR THE UNAUTHORIZED USE OF THIS DATA.

SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the relative strength of cohesionless soils is the compactness condition, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm. An SPT N value of "P" denotes that the split-spoon sampler was pushed 300 mm into the soil without the use of a falling hammer.

Compactness Condition	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory shear vane tests, unconfined compression tests, or occasionally by the Standard Penetration Test (SPT). Note that the typical correlations of undrained shear strength to SPT N value (tabulated below) tend to underestimate the consistency for sensitive silty clays, so Paterson reviews the applicable split spoon samples in the laboratory to provide a more representative consistency value based on tactile examination.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their "sensitivity". The sensitivity, S_t , is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil. The classes of sensitivity may be defined as follows:

Low Sensitivity:	$S_t < 2$
Medium Sensitivity:	$2 < S_t < 4$
Sensitive:	$4 < S_t < 8$
Extra Sensitive:	$8 < S_t < 16$
Quick Clay:	$S_t > 16$

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NQ or larger size core. However, it can be used on smaller core sizes, such as BQ, if the bulk of the fractures caused by drilling stresses (called "mechanical breaks") are easily distinguishable from the normal in situ fractures.

RQD %	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube, generally recovered using a piston sampler
G	-	"Grab" sample from test pit or surface materials
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size BQ, NQ, HQ, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

PLASTICITY LIMITS AND GRAIN SIZE DISTRIBUTION

WC%	-	Natural water content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic Limit, % (water content above which soil behaves plastically)
PI	-	Plasticity Index, % (difference between LL and PL)
Dxx	-	Grain size at which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D_{30})^2 / (D_{10} \times D_{60})$
Cu	-	Uniformity coefficient = D_{60} / D_{10}

Cc and Cu are used to assess the grading of sands and gravels:

Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$

Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$

Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.

Cc and Cu are not applicable for the description of soils with more than 10% silt and clay
(more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

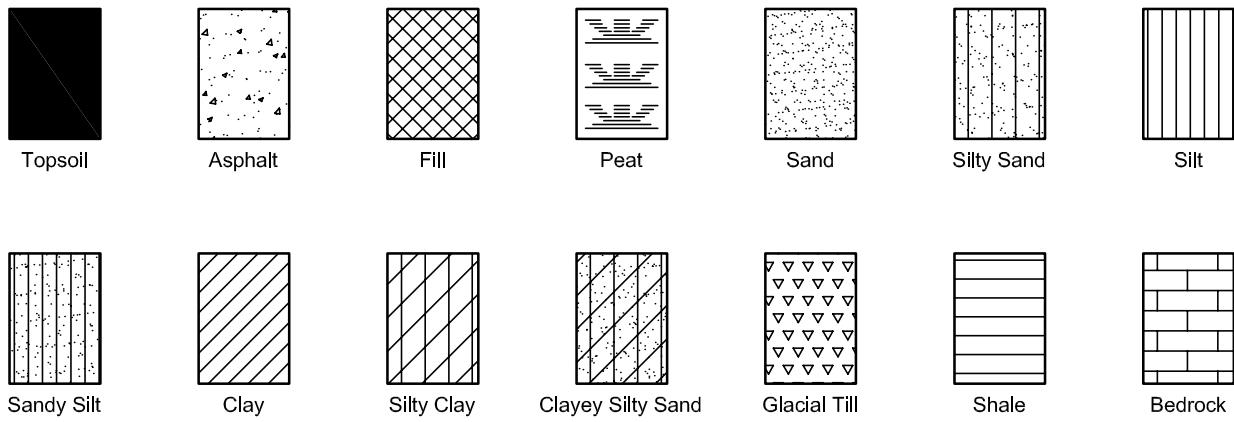
p'	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidation ratio = p'_c / p'
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.
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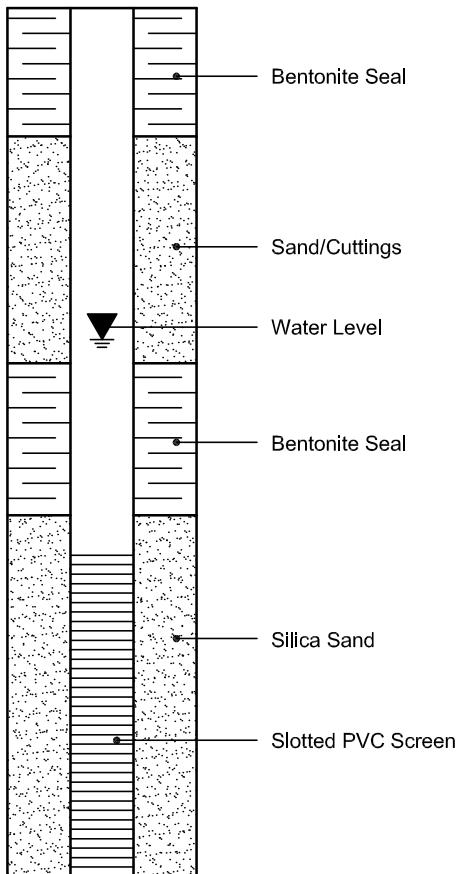
SYMBOLS AND TERMS (continued)

STRATA PLOT

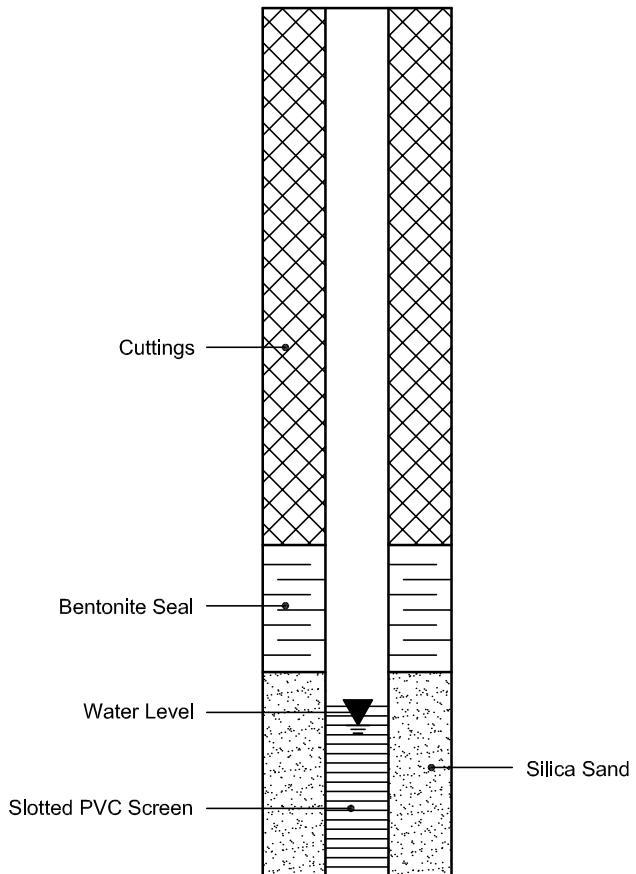


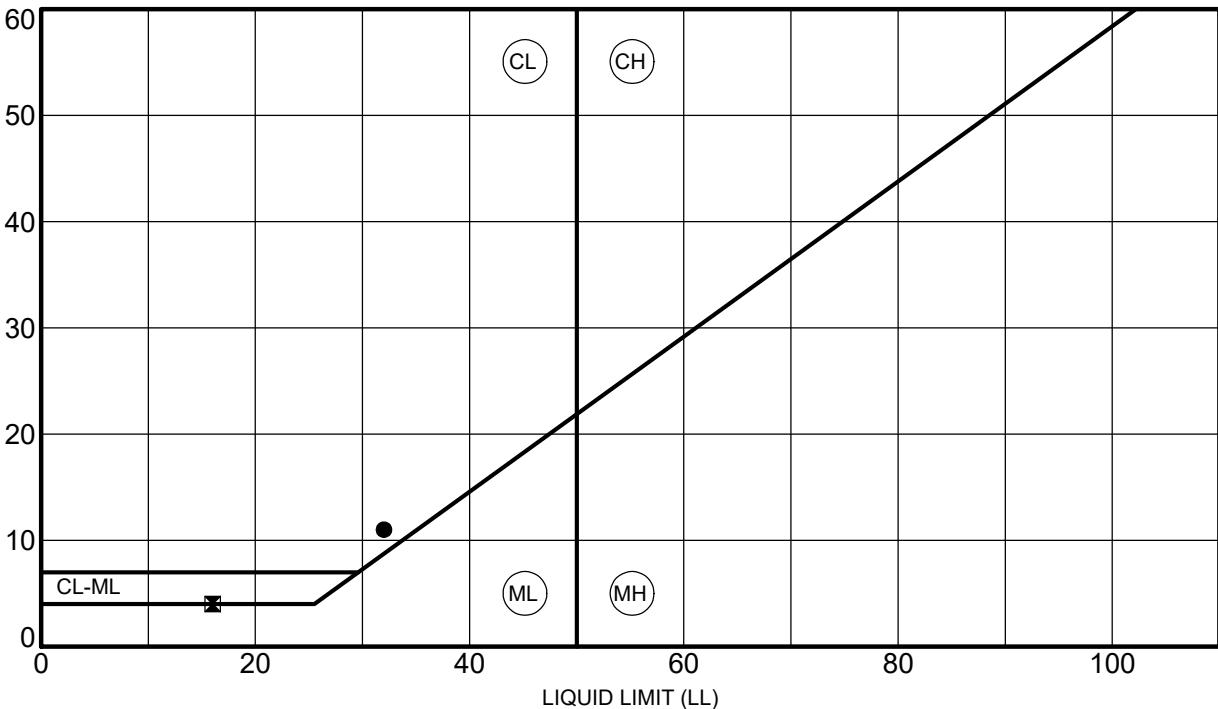
MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION





LL: Liquid Limit

PL: Plastic Limit

MC: Moisture Content in %

CLIENT

Stratford Foxrun

FILE NO.

PG7183

PROJECT

Geotechnical Investigation - 5923 Ottawa Street

DATE

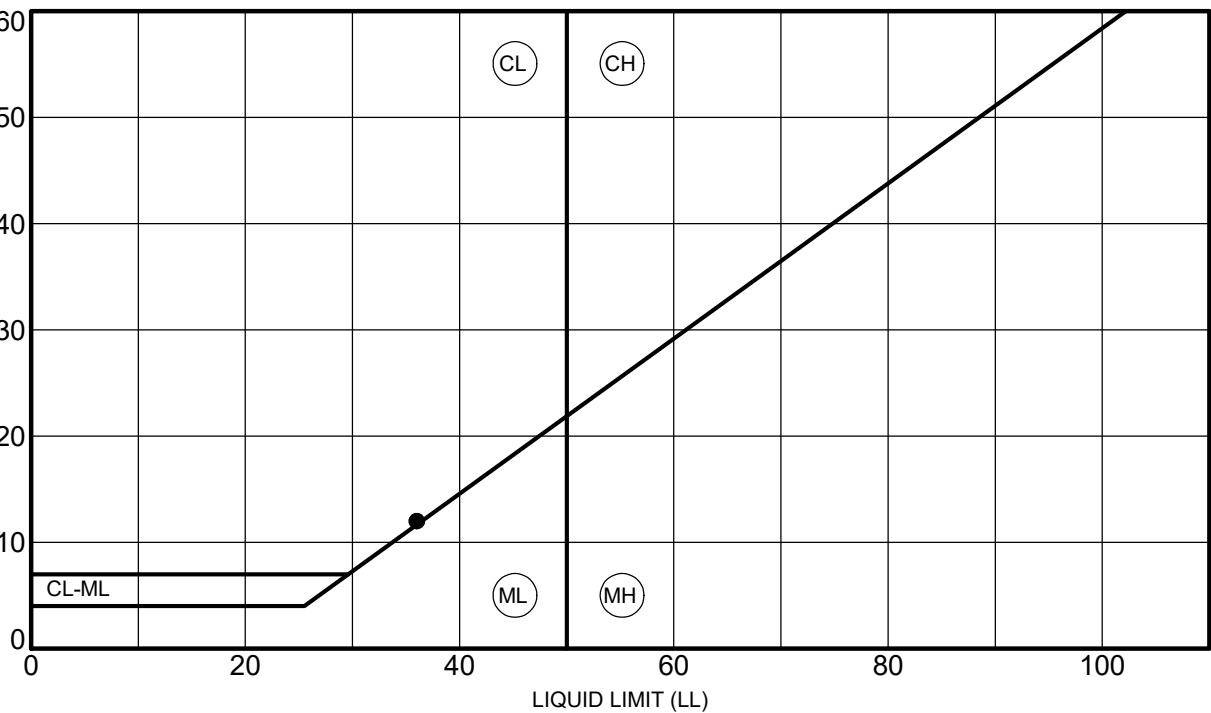
17 Jun 24



PATERSON
GROUP

**9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381**

ATTERBERG LIMITS' RESULTS



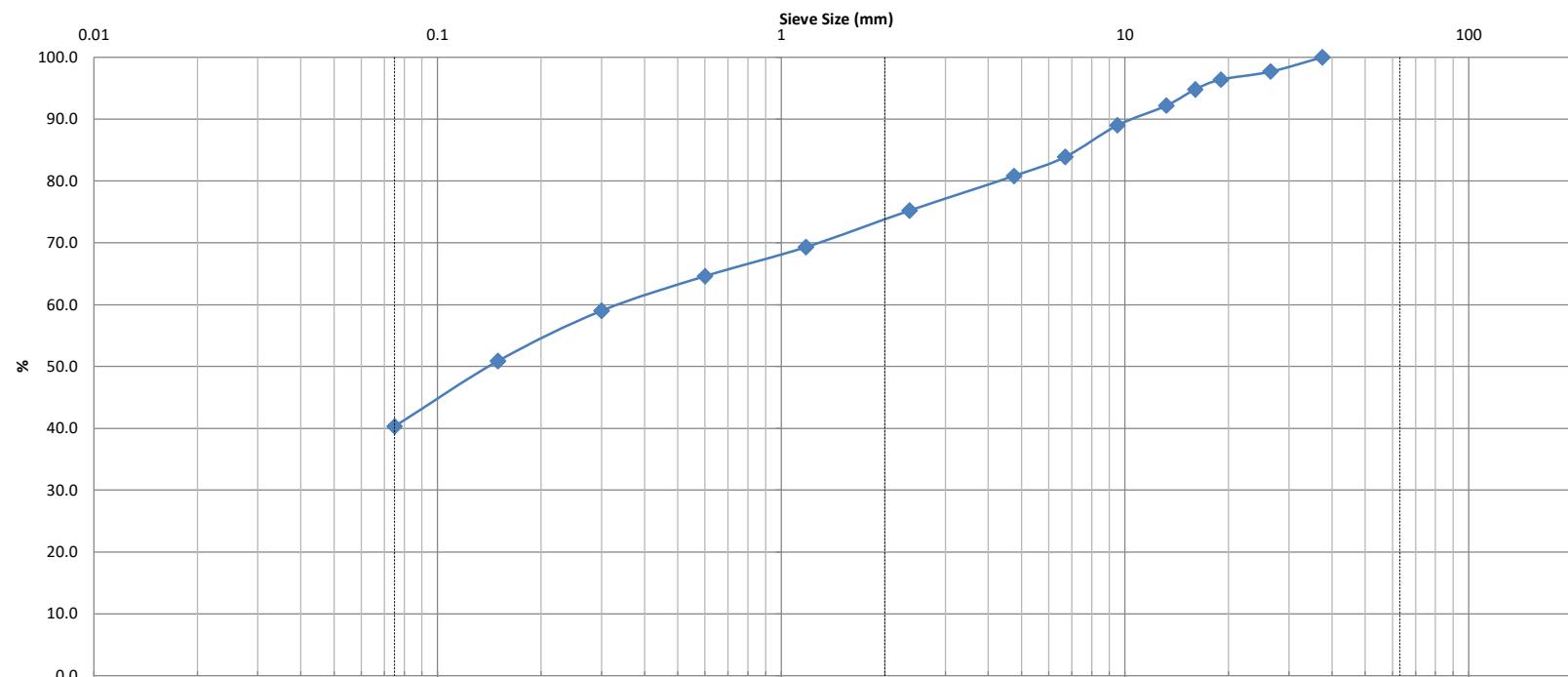
CLIENT Stratford Foxrun
PROJECT Geotechnical Investigation - 5923 Ottawa Street

FILE NO. **PG7183**
DATE **28 Apr 25**



SIEVE ANALYSIS
ASTM C136

CLIENT:	Stratford Foxrun	DESCRIPTION:	Silty Sand w Gravel	FILE NO:	PG7183
CONTRACT NO.:	-	SPECIFICATION:	Silty Sand w Gravel	LAB NO:	53405
PROJECT:	5293 Ottawa Street	INTENDED USE:	-	DATE RECEIVED:	20-Jun-24
		PIT OR QUARRY:	-	DATE TESTED:	20-Jun-24
DATE SAMPLED:	-	SOURCE LOCATION:	BH2-24 SS3	DATE REPORTED:	5-Jul-24
SAMPLED BY:	Adam E.	SAMPLE LOCATION:	-	TESTED BY:	CP



Silt and Clay	Sand			Gravel		Cobble
	Fine	Medium	Coarse	Fine	Coarse	

Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)						
	37.5	0.34	0.035	0.015	19.2	40.5				0.24	22.7
											Clay (%)
											40.3

Comments:

Curtis Beadow

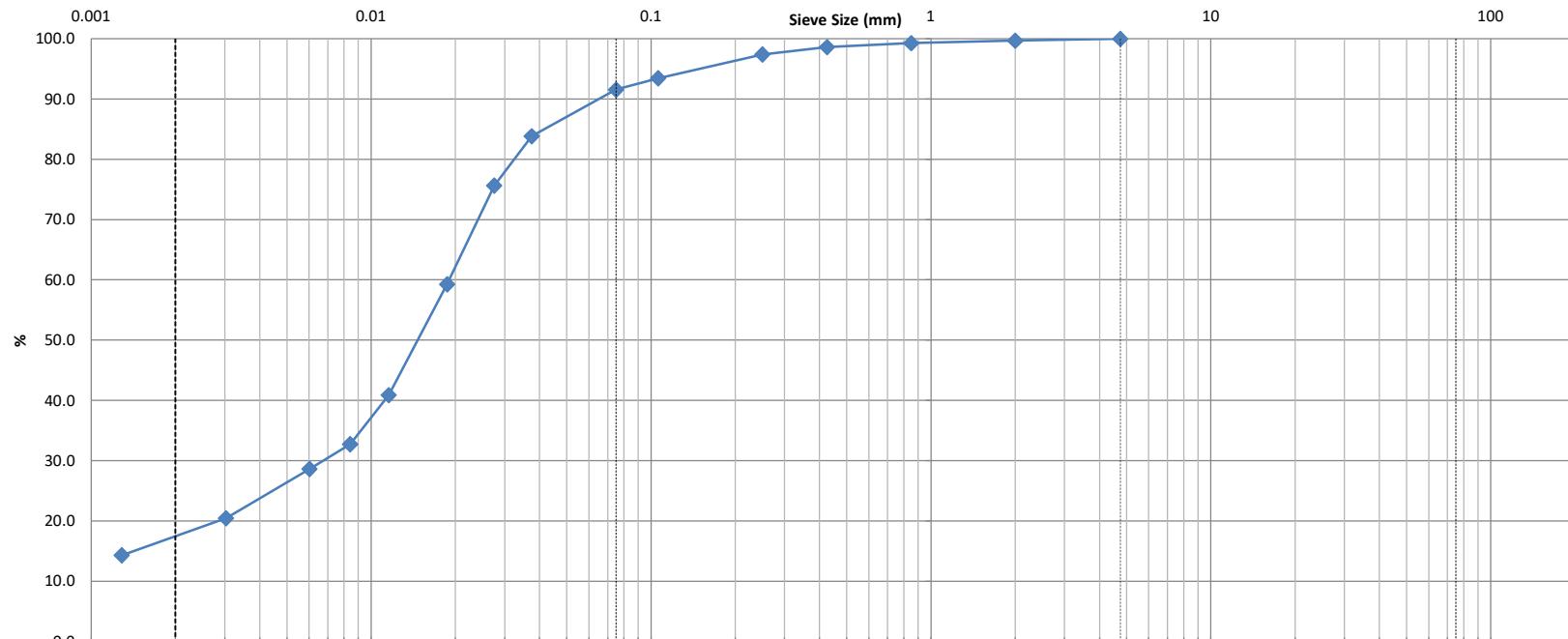
Joe Fosyth, P. Eng.

REVIEWED BY:		
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SIEVE ANALYSIS
ASTM C136

CLIENT:	Stratford Foxrun	DEPTH:	BH3-25 SS2	FILE NO:	PG7183
CONTRACT NO.:		BH OR TP No.:	-	LAB NO:	59250
PROJECT:	5923 Ottawa Street			DATE RECEIVED:	21-Apr-25
DATE SAMPLED:	17-Apr-25			DATE TESTED:	21-Apr-25
SAMPLED BY:	C.A.			DATE REPORTED:	28-Apr-25
				TESTED BY:	D.K



Clay	Silt		Sand			Gravel		Cobble
	Fine	Medium	Coarse	Fine	Coarse			

Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	23.9%					
					0.0		Sand (%)		Silt (%)		Clay (%)
							8.4		73.6		18.0

Comments:

Curtis Beadow

Joe Forsyth, P. Eng.

REVIEWED BY:

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS : 4270184

WORK REQUEST : 100343595

Report Date : 2025-03-25

Paterson Group

9 Auriga Dr
Nepean, Ontario
K2E 7T9
Attention : Alex Schopf

Reception Date : 2025-03-19
Project : PH4924
Sampler : NA
PO Number : 62639
Temperature : 14 °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
VOCs (Water, GC/MS)	1	Modified from EPA 8260

Criteria :

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

Sample status upon receipt :

8447153 8447155

Compliant

Certificate Comments :

8447153 8447155

N-NO2 and N-NO3 MRL increased due to matrix interference. Al, Sb and Zn spike not available due to high native analyte concentration in the mother sample.

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

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - EXCEEDENCE SUMMARY

Client : Paterson Group

Project : PH4924

Reception Date : 2025-03-19

Eurofins Sample No	Client Sample Identification	Analyte	Result	Units	Exceeded Criteria		
					A	B	C
Chloride (Water, IC)							
8447153	TW1 - GW1	Chloride	262	mg/L	250		
8447155	TW1 - GW2	Chloride	267	mg/L	250		
Colour, Apparent (Water, Spectrophotometry)							
8447155	TW1 - GW2	Colour (Apparent)	12	TCU	5		
Hardness (Water, Calculation Only)							
8447153	TW1 - GW1	Hardness as CaCO ₃ (Calculation)	474	mg/L	80-100		
8447155	TW1 - GW2	Hardness as CaCO ₃ (Calculation)	470	mg/L	80-100		
Metals Scan (Water, ICP/MS)							
8447153	TW1 - GW1	Aluminum	0.28	mg/L	0.1		
8447153	TW1 - GW1	Iron	1.07	mg/L	0.3		
8447155	TW1 - GW2	Iron	0.80	mg/L	0.3		
TDS (Estimated)							
8447153	TW1 - GW1	TDS (Estimated) [^]	896	mg/L	500		
8447155	TW1 - GW2	TDS (Estimated) [^]	900	mg/L	500		
Turbidity (Water, Turbidimeter)							
8447153	TW1 - GW1	Turbidity	9.9	NTU	5		
8447155	TW1 - GW2	Turbidity	9.6	NTU	5		

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH4924

Reception Date: 2025-03-19

			Eurofins Sample No :			8447153	8447155			
			Matrix :			Groundwater	Groundwater			
			Sampling Date :			2025-03-18	2025-03-18			
			Client Sample Identification :			TW1 - GW1	TW1 - GW2			
Anions			Criteria							
			A			B			C	
Chloride	0.5	mg/L	250			262	267			
Nitrate (as Nitrogen)	0.1	mg/L	10.0			<0.5	<0.5			
Nitrite (as Nitrogen)	0.1	mg/L	1.0			<0.5	<0.5			
Sulphate	1	mg/L	500			67	69			
			Eurofins Sample No :			8447153	8447155			
			Matrix :			Groundwater	Groundwater			
			Sampling Date :			2025-03-18	2025-03-18			
			Client Sample Identification :			TW1 - GW1	TW1 - GW2			
Calculations			RL							
Ion Balance (Calculation) [^]			RL							
			Unit							
			1.04			1.02				
			Eurofins Sample No :			8447153	8447155			
			Matrix :			Groundwater	Groundwater			
			Sampling Date :			2025-03-18	2025-03-18			
			Client Sample Identification :			TW1 - GW1	TW1 - GW2			
General Chemistry			Criteria							
			A			B			C	
Alkalinity (as CaCO ₃)	5	mg/L	500			265	269			
Colour (Apparent)	2	TCU	5			4	12			
Conductivity @ 25°C	5	µS/cm				1380	1380			
Dissolved Organic Carbon	0.5	mg/L	5			1.8	1.8			
Fluoride	0.1	mg/L	1.5			0.34	0.40			
Hardness as CaCO ₃ (Calculation)	1	mg/L	80-100			474	470			
pH @ 25°C	1		6.5-8.5			7.82	7.81			
Phenols-4AAP	0.001	mg/L				<0.001	<0.001			
Sulphide (S ²⁻)	0.01	mg/L	0.05			<0.01	<0.01			
Tannin and Lignin	0.1	mg/L				<0.1	<0.1			
TDS (Estimated) [^]	5	mg/L	500			896	900			
Turbidity	0.1	NTU	5			9.9	9.6			

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH4924

Reception Date: 2025-03-19

Metals	RL	Unit	Criteria			Eurofins Sample No : 8447153	Matrix : Groundwater	Sampling Date : 2025-03-18	Client Sample Identification : TW1 - GW1
			A	B	C				
			Metals Scan (Water, ICP/MS)						
			Aluminum	0.01	mg/L	0.1		0.28	0.07
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			0.133		0.134	
Beryllium	0.0005	mg/L				<0.0005		<0.0005	
Boron	0.01	mg/L	5			0.25		0.25	
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				0.0003		0.0002	
Copper	0.001	mg/L	1			<0.001		<0.001	
Iron	0.03	mg/L	0.3			1.07		0.80	
Lead	0.001	mg/L	0.01			<0.001		<0.001	
Manganese	0.01	mg/L	0.05			0.02		0.02	
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				5.10		4.97	
Thallium	0.0001	mg/L				<0.0001		<0.0001	
Uranium	0.001	mg/L	0.02			<0.001		<0.001	
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				99		99	
Magnesium	1	mg/L				55		54	
Potassium	1	mg/L				8		8	
Sodium	1	mg/L	200			115		117	

Microbiology	RL	Unit	Criteria			Eurofins Sample No : 8447153	Matrix : Groundwater	Sampling Date : 2025-03-18	Client Sample Identification : TW1 - GW1
			A	B	C				
			Client Sample Identification :						
			Escherichia coli (DC)	0	CFU/100mL	0		0	0
Total Coliforms (DC)	0	CFU/100mL	0			0		0	

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH4924

Reception Date: 2025-03-19

Eurofins Sample No :		8447153	8447155					
Matrix :		Groundwater	Groundwater					
Sampling Date :		2025-03-18	2025-03-18					
Client Sample Identification :		TW1 - GW1	TW1 - GW2					
Nutrients	RL	Unit						
Ammonia (Total, as Nitrogen)	0.02	mg/L	0.167	0.143				
Total Kjeldahl Nitrogen	0.1	mg/L	0.319	0.326				

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

 Client : Paterson Group
 Project : PH4924

Reception Date: 2025-03-19

Volatile Organic Compounds	RL	Unit	Eurofins Sample No : 8447155			Matrix : Groundwater	Sampling Date : 2025-03-18	Client Sample Identification : TW1 - GW2			
			Criteria								
			A	B	C						
VOCs (Water, GC/MS)											
1,1,1,2-Tetrachloroethane	0.5	ug/L				<0.5					
1,1,1-Trichloroethane	0.4	ug/L				<0.4					
1,1,2,2-Tetrachloroethane	0.5	ug/L				<0.5					
1,1,2-Trichloroethane	0.4	ug/L				<0.4					
1,1-Dichloroethane	0.4	ug/L				<0.4					
1,1-Dichloroethene	0.5	ug/L	14			<0.5					
1,2-Dibromoethane	0.2	ug/L				<0.2					
1,2-Dichlorobenzene	0.4	ug/L	200			<0.4					
1,2-Dichloroethane	0.2	ug/L	5			<0.2					
1,2-Dichloropropane	0.5	ug/L				<0.5					
1,3,5-Trimethylbenzene	0.3	ug/L				<0.3					
1,3-Dichlorobenzene	0.4	ug/L				<0.4					
1,4-Dichlorobenzene	0.4	ug/L	5			<0.4					
Acetone	5	ug/L				<5.0					
Benzene	0.5	ug/L	1			<0.5					
Bromodichloromethane	0.3	ug/L				<0.3					
Bromoform	0.4	ug/L				<0.4					
Bromomethane	0.5	ug/L				<0.5					
Carbon tetrachloride	0.2	ug/L	2			<0.2					
Chloroethane	0.5	ug/L				<0.5					
Chloroform	0.5	ug/L				<0.5					
Chloromethane	0.2	ug/L				<0.2					
cis-1,2-Dichloroethene	0.4	ug/L				<0.4					
cis-1,3-Dichloropropene	0.5	ug/L				<0.5					
Dibromochloromethane	0.3	ug/L				<0.3					
Dichloromethane	4	ug/L	50			<4.0					
Diethyl ether	5	ug/L				<5.0					
Ethylbenzene	0.5	ug/L	140			<0.5					
m/p-Xylene	0.4	ug/L				<0.4					
Methyl ethyl ketone (MEK)	2	ug/L				<2.0					
Methyl isobutyl ketone (MIBK)	5	ug/L				<5.0					
Methyl tert-butyl ether (MTBE)	2	ug/L				<2.0					
Monochlorobenzene	0.5	ug/L	80			<0.5					
o-Xylene	0.4	ug/L				<0.4					
Styrene	0.5	ug/L				<0.5					
Tetrachloroethylene (PCE)	0.3	ug/L	10			<0.3					
Toluene	0.4	ug/L	60			<0.4					
trans-1,2-dichloroethene	0.4	ug/L				<0.4					
trans-1,3-dichloropropene	0.5	ug/L				<0.5					
Trichloroethylene (TCE)	0.3	ug/L	5			<0.3					
Trichlorofluoromethane	0.5	ug/L				<0.5					
Vinyl chloride	0.2	ug/L	1			<0.2					
Xylene (Total)	0.5	ug/L	90			<0.5					
1,2-dichloroethane-d4 (surrogate)	0	%				73					
4-bromofluorobenzene (surrogate)	0	%				82					

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
 Project : PH4924

Reception Date: 2025-03-19

			Eurofins Sample No :			8447155			
			Matrix :			Groundwater			
			Sampling Date :			2025-03-18			
			Client Sample Identification :			TW1 - GW2			
Volatile Organic Compounds		RL	Unit	Criteria					
				A	B	C			
Toluene-d8 (surrogate)		0	%				80		

Approved by :



Addrine Thomas,
 Inorganic supervisor, Ottawa

Approved by :



Patrick Jacques,
 Ottawa, Environmental Chemist,

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group

Project : PH4924

Reception Date: 2025-03-19

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate				
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %			
Alkalinity (Water, Automated)												
<i>Method : Alkalinity (water, titration to pH 4.5, automated). Internal method: OTT-I-AT-WI45398.</i>												
Alkalinity (as CaCO ₃)	mg/L	5	<5	97	95-105			0	0-20			
Associated Samples : 8447153, 8447155												
Prep Date: 2025-03-20 Analysis Date: 2025-03-21												
Ammonia, Total (Water, Colorimetry)												
<i>Method : Ammonia (Water, Colorimetry). Internal method: OTT-I-NUT-WI46201.</i>												
Ammonia (Total, as Nitrogen)	mg/L	0.02	<0.020	95	80-120	98	80-120	6	0-20			
Associated Samples : 8447153, 8447155												
Prep Date: 2025-03-20 Analysis Date: 2025-03-20												
Chloride (Water, IC)												
<i>Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.</i>												
Chloride	mg/L	0.5	<0.5	100	80-120	116	80-120	1	0-20			
Associated Samples : 8447153, 8447155												
Prep Date: 2025-03-20 Analysis Date: 2025-03-20												
Colour, Apparent (Water, Spectrophotometry)												
<i>Method : Colour (Water, Spectrophotometric). Internal method: OTT-I-SPEC-WI45980.</i>												
Colour (Apparent)	TCU	2	<2	97	78-116			3	0-40			
Associated Samples : 8447153, 8447155												
Prep Date: 2025-03-24 Analysis Date: 2025-03-25												
Conductivity (Water, Automated)												
<i>Method : Conductivity (Water, Autotitrator). Internal Method: OTT-I-AT-WI45398.</i>												
Conductivity @ 25°C	uS/cm	5	<5	100	98-102			2	0-20			
Associated Samples : 8447153, 8447155												
Prep Date: 2025-03-20 Analysis Date: 2025-03-21												
DOC (Water, IR)												
<i>Method : Organic carbon (water, IR, combustion). Internal method: OTT-I-DEM-WI46148.</i>												
Dissolved Organic Carbon	mg/L	0.5	<0.5	104	84-116	86	80-120	10	0-15			
Associated Samples : 8447153, 8447155												
Prep Date: 2025-03-21 Analysis Date: 2025-03-24												
Escherichia coli (DC Plate)												
<i>Method : Total Coliforms and E.Coli by MF (Water, DC plate). Internal method: OTT-M-BAC-WI45296.</i>												
Escherichia coli (DC)	CFU/100mL	0	0					-	0-30			
Associated Samples : 8447153, 8447155												
Prep Date: 2025-03-19 Analysis Date: 2025-03-20												
Fluoride (Water, Auto/ISE)												
<i>Method : Fluoride by autotitrator, ion selective electrode. Internal method: OTT-I-AT-WI45398.</i>												
Fluoride	mg/L	0.1	<0.10	97	90-110			-	0-20			
Associated Samples : 8447153, 8447155												
Prep Date: 2025-03-20 Analysis Date: 2025-03-21												

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
 Project : PH4924

Reception Date: 2025-03-19

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Metals Scan (Water, ICP/MS)									
				<i>Method : Metals (Water, ICP/MS). Internal method: AMMTFQE1.</i>					
Aluminum	mg/L	0.01	<0.01	100	80-120			1	0-20
Antimony	mg/L	0.0005	<0.0005	80	80-120			-	0-20
Arsenic	mg/L	0.001	<0.001	94	80-120	97	70-130	-	0-20
Barium	mg/L	0.001	<0.001	90	80-120	89	70-130	0	0-20
Beryllium	mg/L	0.0005	<0.0005	103	80-120	113	70-130	-	0-20
Boron	mg/L	0.01	<0.01	100	80-120	108	70-130	-	0-20
Cadmium	mg/L	0.0001	<0.0001	98	80-120	98	70-130	-	0-20
Chromium	mg/L	0.001	<0.001	110	80-120	103	70-130	26	0-20
Cobalt	mg/L	0.0002	<0.0002	102	80-120	95	70-130	1	0-20
Copper	mg/L	0.001	<0.001	100	80-120	77	70-130	1	0-20
Iron	mg/L	0.03	<0.03	90	80-120	88	70-130	1	0-20
Lead	mg/L	0.001	<0.001	100	80-120	82	70-130	0	0-20
Manganese	mg/L	0.01	<0.01	100	80-120	95	70-130	0	0-20
Mercury	mg/L	0.0001	<0.0001	111	80-120	85	70-130	-	0-20
Molybdenum	mg/L	0.005	<0.005	90	80-120	95	70-130	-	0-20
Nickel	mg/L	0.005	<0.005	100	80-120	96	70-130	0	0-20
Selenium	mg/L	0.001	<0.001	95	80-120	87	70-130	-	0-20
Silver	mg/L	0.0001	<0.0001	111	80-120	103	70-130	-	0-20
Strontium	mg/L	0.001	<0.001	100	80-120	93	70-130	1	0-20
Thallium	mg/L	0.0001	<0.0001	104	80-120	84	70-130	-	0-20
Uranium	mg/L	0.001	<0.001	90	80-120	83	70-130	-	0-20
Vanadium	mg/L	0.001	<0.001	100	80-120	108	70-130	0	0-20
Zinc	mg/L	0.01	<0.01	100	80-120			0	0-20
Associated Samples : 8447153, 8447155									
Prep Date: 2025-03-20 Analysis Date: 2025-03-21									
Metals Scan (Water, ICP/OES)									
				<i>Method : Metals (Water, ICP/OES). Internal method: OTT-I-MET-WI48491.</i>					
Calcium	mg/L	1	<1	103	86-115	98	70-130	2	0-20
Magnesium	mg/L	1	<1	98	91-109	100	70-130	-	0-20
Potassium	mg/L	1	<1	112	87-113	117	70-130	-	0-20
Sodium	mg/L	1	<1	107	85-115	106	70-130	-	0-20
Associated Samples : 8447153, 8447155									
Prep Date: 2025-03-24 Analysis Date: 2025-03-19									
Nitrate (Water, IC)									
				<i>Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.</i>					
Nitrate (as Nitrogen)	mg/L	0.1	<0.1	103	80-120	116	80-120	-	0-20
Associated Samples : 8447153, 8447155									
Prep Date: 2025-03-20 Analysis Date: 2025-03-20									
Nitrite (Water, IC)									
				<i>Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.</i>					
Nitrite (as Nitrogen)	mg/L	0.1	<0.1	102	80-120	110	80-120	-	0-20
Associated Samples : 8447153, 8447155									
Prep Date: 2025-03-20 Analysis Date: 2025-03-20									
pH (25°C) (Water, Automated)									
				<i>Method : pH (Water, Automated Meter). Internal method: OTT-I-AT-WI45398.</i>					
pH @ 25°C		1	6.59	100	97-103			1	0-20
Associated Samples : 8447153, 8447155									
Prep Date: 2025-03-20 Analysis Date: 2025-03-21									

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group

Project : PH4924

Reception Date: 2025-03-19

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate				
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %			
Phenols (Water, Colorimetry)												
<i>Method : Phenols (Water, Colorimetry). Internal method: OTT-I-4AAP-WI46150.</i>												
Phenols-4AAP	mg/L	0.001	<0.001	105	75-125	105	70-130	-	0-20			
Associated Samples : 8447153, 8447155								Prep Date: 2025-03-20 Analysis Date: 2025-03-20				
Sulphate (Water, IC)												
<i>Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.</i>												
Sulphate	mg/L	1	<1	107	90-110	114	80-120	1	0-20			
Associated Samples : 8447153, 8447155								Prep Date: 2025-03-20 Analysis Date: 2025-03-20				
Sulphide (Water, Colorimetry)												
<i>Method : Sulphide, S2- (Water, Colorimetry). Internal method: OTT-I-SPEC-WI45931.</i>												
Sulphide (S2-)	mg/L	0.01	<0.01	88	80-120			-	0-20			
Associated Samples : 8447153, 8447155								Prep Date: 2025-03-24 Analysis Date: 2025-03-25				
Tannin and Lignin (Water, Spec)												
<i>Method : Tannin and Lignin (Water, Spec). Internal method: OTT-I-SPEC-WI57693.</i>												
Tannin and Lignin	mg/L	0.1	<0.1	112	80-120			-	0-20			
Associated Samples : 8447153, 8447155								Prep Date: 2025-03-21 Analysis Date: 2025-03-21				
Total Coliforms (DC Plate)												
<i>Method : Total Coliforms and E.Coli by MF (Water, DC plate). Internal method: OTT-M-BAC-WI45296.</i>												
Total Coliforms (DC)	CFU/100mL	0	0					-	0-30			
Associated Samples : 8447153, 8447155								Prep Date: 2025-03-19 Analysis Date: 2025-03-20				
Total Kjeldahl Nitrogen (Water, Colorimetry)												
<i>Method : TKN (Water, colorimetry). Internal method: OTT-I-NUT-WI46201.</i>												
Total Kjeldahl Nitrogen	mg/L	0.1	<0.100	98	70-130	119	70-130	4	0-20			
Associated Samples : 8447153, 8447155								Prep Date: 2025-03-20 Analysis Date: 2025-03-21				
Turbidity (Water, Turbidimeter)												
<i>Method : Turbidity (Water, Turbidimeter). Internal method: OTT-I-TUR-WI46288.</i>												
Turbidity	NTU	0.1	<0.1	103	80-120			5	0-30			
Associated Samples : 8447153, 8447155								Prep Date: 2025-03-20 Analysis Date: 2025-03-24				

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
 Project : PH4924

Reception Date: 2025-03-19

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate				
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %			
VOCs (Water, GC/MS)												
<i>Method : Volatile Organic Compounds (Water, GC/MS). Internal method: AMVOMSE8.</i>												
1,1,1,2-Tetrachloroethane	ug/L	0.5	<0.5	105	70-130	73	70-130	-	0-30			
1,1,1-Trichloroethane	ug/L	0.4	<0.4	113	70-130	74	70-130	-	0-30			
1,1,2,2-Tetrachloroethane	ug/L	0.5	<0.5	109	70-130	78	70-130	-	0-30			
1,1,2-Trichloroethane	ug/L	0.4	<0.4	106	70-130	74	70-130	-	0-30			
1,1-Dichloroethane	ug/L	0.4	<0.4	115	70-130	75	70-130	-	0-30			
1,1-Dichloroethene	ug/L	0.5	<0.5	119	70-130	128	70-130	-	0-30			
1,2-Dibromoethane	ug/L	0.2	<0.2	95	70-130	104	70-130	-	0-30			
1,2-Dichlorobenzene	ug/L	0.4	<0.4	103	70-130	92	70-130	-	0-30			
1,2-Dichloroethane	ug/L	0.2	<0.2	111	70-130	106	70-130	-	0-30			
1,2-Dichloropropane	ug/L	0.5	<0.5	105	70-130	112	70-130	-	0-30			
1,3,5-Trimethylbenzene	ug/L	0.3	<0.3	86	70-130	114	70-130	-	0-30			
1,3-Dichlorobenzene	ug/L	0.4	<0.4	89	70-130	83	70-130	-	0-30			
1,4-Dichlorobenzene	ug/L	0.4	<0.4	89	70-130	89	70-130	-	0-30			
Acetone	ug/L	5	<5.0	107	70-130	78	70-130	-	0-30			
Benzene	ug/L	0.5	<0.5	95	70-130	77	70-130	-	0-30			
Bromodichloromethane	ug/L	0.3	<0.3	118	70-130	79	70-130	-	0-30			
Bromoform	ug/L	0.4	<0.4	112	70-130	78	70-130	-	0-30			
Bromomethane	ug/L	0.5	<0.5	126	70-130	117	70-130	-	0-30			
Carbon tetrachloride	ug/L	0.2	<0.2	122	70-130	78	70-130	-	0-30			
Chloroethane	ug/L	0.5	<0.5	116	70-130	116	70-130	-	0-30			
Chloroform	ug/L	0.5	<0.5	123	70-130	81	70-130	-	0-30			
Chloromethane	ug/L	0.2	<0.2	128	70-130	105	70-130	-	0-30			
cis-1,2-Dichloroethene	ug/L	0.4	<0.4	118	70-130	78	70-130	-	0-30			
cis-1,3-Dichloropropene	ug/L	0.5	<0.5	83	70-130	88	70-130	-	0-30			
Dibromochloromethane	ug/L	0.3	<0.3	100	70-130	98	70-130	-	0-30			
Dichloromethane	ug/L	4	<4.0	106	70-130	76	70-130	-	0-30			
Diethyl ether	ug/L	5	<5.0	120	70-130	110	70-130	-	0-30			
Ethylbenzene	ug/L	0.5	<0.5	96	70-130	78	70-130	-	0-30			
m/p-Xylene	ug/L	0.4	<0.4	129	70-130	87	70-130	-	0-30			
Methyl ethyl ketone (MEK)	ug/L	2	<2.0	94	70-130	76	70-130	-	0-30			
Methyl isobutyl ketone (MIBK)	ug/L	5	<5.0	124	70-130	90	70-130	-	0-30			
Methyl tert-butyl ether (MTBE)	ug/L	2	<2.0	130	70-130	89	70-130	-	0-30			
Monochlorobenzene	ug/L	0.5	<0.5	89	70-130	108	70-130	-	0-30			
o-Xylene	ug/L	0.4	<0.4	100	70-130	101	70-130	-	0-30			
Styrene	ug/L	0.5	<0.5	99	70-130	124	70-130	-	0-30			
Tetrachloroethylene (PCE)	ug/L	0.3	<0.3	92	70-130	82	70-130	-	0-30			
Toluene	ug/L	0.4	<0.4	124	70-130	70	70-130	4	0-30			
trans-1,2-dichloroethene	ug/L	0.4	<0.4	122	70-130	77	70-130	-	0-30			
trans-1,3-dichloropropene	ug/L	0.5	<0.5	100	70-130	103	70-130	-	0-30			
Trichloroethylene (TCE)	ug/L	0.3	<0.3	95	70-130	113	70-130	-	0-30			
Trichlorofluoromethane	ug/L	0.5	<0.5	126	70-130	122	70-130	-	0-30			
Vinyl chloride	ug/L	0.2	<0.2	128	70-130	94	70-130	-	0-30			
Xylene (Total)	ug/L	0.5	<0.5					-	-			

Associated Samples : 8447155

Prep Date: 2025-03-20

Analysis Date: 2025-03-24

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

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS : 4290291

WORK REQUEST : 100346311

Report Date : 2025-04-15

Paterson Group
 9 Auriga Drive
 Ottawa, Ontario
 Attention : Zavian Buchanan

Reception Date : 2025-04-04
 Project : PH4924
 Sampler : NA
 PO Number : 62782
 Temperature : 5 °C

Analysis	Quantity	External Method
Alkalinity (Water, Automated)	1	Modified from SM 2320 B
Ammonia, Total (Water, Colorimetry)	1	Modified from EPA 350.1
Chloride (Water, IC)	1	Modified from SM 4110 B and C
Colour, Apparent (Water, Spectrophotometry)	1	Modified from SM 2120 C
Colour, True (Water, Spectrophotometry)	1	Modified from SM 2120 C
Conductivity (Water, Automated)	1	Modified from SM 2510 B
DOC (Water, IR)	1	Modified from SM 5310 B
E.Coli and Total Coliforms (DC Plate)	1	Modified from MECP E3407
Fluoride (Water, Auto/ISE)	1	Modified from SM 4500-F A and 4500-F C
Hardness (Water, Calculation Only)	1	SM 2340 B
Ion Balance (Water, Calculation)	1	Modified from SM1030 E
Metals Scan (Water, ICP/MS)	1	Modified from EPA 200.8
Metals Scan (Water, ICP/OES)	1	Modified from SM 3120 B
Nitrate (Water, IC)	1	Modified from SM 4110 B and C
Nitrite (Water, IC)	1	Modified from SM 4110 B and C
pH (25°C) (Water, Automated)	1	Modified from SM 4500-H+ B
Phenols (Water, Colorimetry)	1	Modified from EPA 420.2
Sulphate (Water, IC)	1	Modified from SM 4110 B and C
Sulphide (Water, Colorimetry)	1	Modified from SM 4500-S2 D
Tannin and Lignin (Water, Spec)	1	Modified from SM 5550 B
TDS (Estimated)	1	Modified from SM 2510 A
Total Kjeldahl Nitrogen (Water, Colorimetry)	1	Modified from EPA 351.2
Turbidity (Water, Turbidimeter)	1	Modified from SM 2130 B

Criteria :

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

Sample status upon receipt :

8476750

Compliant

Certificate Comments :

Revision 1: This is an amendment and supersedes certificate 4282411. Colour (apparent) has been re-analysed and result has been changed. Colour (true) analysis added as per client's request.

8476750

N-NO2 and N-NO3 MRL increased due to matrix interference.

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

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - EXCEEDENCE SUMMARY

Client : Paterson Group

Project : PH4924

Reception Date : 2025-04-04

Eurofins Sample No	Client Sample Identification	Analyte	Result	Units	Exceeded Criteria		
					A	B	C
Colour, Apparent (Water, Spectrophotometry)							
8476750	TW1-GW1	Colour (Apparent)	22	TCU	5		
Hardness (Water, Calculation Only)							
8476750	TW1-GW1	Hardness as CaCO ₃ (Calculation)	444	mg/L	80-100		
Metals Scan (Water, ICP/MS)							
8476750	TW1-GW1	Iron	0.82	mg/L	0.3		
TDS (Estimated)							
8476750	TW1-GW1	TDS (Estimated) [^]	886	mg/L	500		

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH4924

Reception Date: 2025-04-04

			Eurofins Sample No :			8476750				
			Matrix :			Groundwater				
			Sampling Date :			2025-04-03				
			Client Sample Identification :			TW1-GW1				
Anions	RL	Unit	Criteria							
Nitrate (as Nitrogen)	0.1	mg/L	A	B	C					
Nitrite (as Nitrogen)	0.1	mg/L	10.0			<0.5				
Sulphate	1	mg/L	1.0							
						66				
			Eurofins Sample No :			8476750				
			Matrix :			Groundwater				
			Sampling Date :			2025-04-03				
			Client Sample Identification :			TW1-GW1				
Anions & Nutrients	RL	Unit	Criteria							
Chloride	0.5	mg/L	A	B	C					
			250			248				
			Eurofins Sample No :			8476750				
			Matrix :			Groundwater				
			Sampling Date :			2025-04-03				
			Client Sample Identification :			TW1-GW1				
Calculations	RL	Unit								
Ion Balance (Calculation) [^]	0.1		0.99							
			Eurofins Sample No :			8476750				
			Matrix :			Groundwater				
			Sampling Date :			2025-04-03				
			Client Sample Identification :			TW1-GW1				
General Chemistry	RL	Unit	Criteria							
Alkalinity (as CaCO ₃)	5	mg/L	A	B	C					
Colour (Apparent)	2	TCU	500			271				
Colour (True)	2	TCU	5			22				
Conductivity @ 25°C	5	µS/cm				<2				
Dissolved Organic Carbon	0.5	mg/L	5			1360				
Fluoride	0.1	mg/L	5			1.5				
Hardness as CaCO ₃ (Calculation)	1	mg/L	1.5			0.39				
pH @ 25°C	1		80-100			444				
Phenols-4AAP	1		6.5-8.5			7.88				
Sulphide (S ²⁻)	0.001	mg/L				<0.001				
Tannin and Lignin	0.01	mg/L	0.05			<0.01				
TDS (Estimated) [^]	0.1	mg/L	500			0.3				
Turbidity	0.1	NTU	5			886				
						4.0				

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH4924

Reception Date: 2025-04-04

			Eurofins Sample No : 8476750			
			Matrix : Groundwater			
			Sampling Date : 2025-04-03			
			Client Sample Identification : TW1-GW1			
Metals	RL	Unit	Criteria	A	B	C
Metals Scan (Water, ICP/MS)						
Aluminum	0.01	mg/L	0.1			<0.01
Antimony	0.0005	mg/L	0.006			<0.0005
Arsenic	0.001	mg/L	0.01			<0.001
Barium	0.001	mg/L	1			0.121
Beryllium	0.0005	mg/L				<0.0005
Boron	0.01	mg/L	5			0.23
Cadmium	0.0001	mg/L	0.005			<0.0001
Chromium	0.001	mg/L	0.05			<0.001
Cobalt	0.0002	mg/L				<0.0002
Copper	0.001	mg/L	1			<0.001
Iron	0.03	mg/L	0.3			0.82
Lead	0.001	mg/L	0.01			<0.001
Manganese	0.01	mg/L	0.05			0.02
Molybdenum	0.005	mg/L				<0.005
Nickel	0.005	mg/L				<0.005
Selenium	0.001	mg/L	0.05			<0.001
Silver	0.0001	mg/L				<0.0001
Strontium	0.001	mg/L				4.94
Thallium	0.0001	mg/L				<0.0001
Uranium	0.001	mg/L	0.02			<0.001
Vanadium	0.001	mg/L				<0.001
Zinc	0.01	mg/L	5			<0.01
Metals Scan (Water, ICP/OES)						
Calcium	1	mg/L				94
Magnesium	1	mg/L				51
Potassium	1	mg/L				8
Sodium	1	mg/L	200			106

			Eurofins Sample No : 8476750			
			Matrix : Groundwater			
			Sampling Date : 2025-04-03			
			Client Sample Identification : TW1-GW1			
Microbiology	RL	Unit	Criteria	A	B	C
E.Coli and Total Coliforms (DC Plate)						
Escherichia coli (DC)	0	CFU/100mL	0			0
Total Coliforms (DC)	0	CFU/100mL	0			0

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
 Project : PH4924

Reception Date: 2025-04-04

Eurofins Sample No :		8476750					
Matrix :		Groundwater					
Sampling Date :		2025-04-03					
Client Sample Identification :		TW1-GW1					
Nutrients	RL	Unit					
Ammonia (Total, as Nitrogen)	0.02	mg/L	0.134				
Total Kjeldahl Nitrogen	0.1	mg/L	0.420				

Approved by :



Patrick Jacques, B.Sc, C.Chem,
 Environmental Chemist, Ottawa

Approved by :



Jason Kennedy,
 Project Manager

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
 Project : PH4924

Reception Date: 2025-04-04

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 CaCO ₃)	mg/L	5	<5	98	95-105			0	0-20			
Associated Samples : 8476750								Prep Date: 2025-04-07 Analysis Date: 2025-04-07				
Ammonia, Total (Water, Colorimetry)												
Method : Ammonia (Water, Colorimetry). Internal method: OTT-I-NUT-WI46201.												
Ammonia (Total, as Nitrogen)	mg/L	0.02	<0.020	98	80-120	108	80-120	5	0-20			
Associated Samples : 8476750								Prep Date: 2025-04-07 Analysis Date: 2025-04-07				
Chloride (Water, IC)												
Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.												
Chloride	mg/L	0.5	<0.5	100	80-120	108	80-120	1	0-20			
Associated Samples : 8476750								Prep Date: 2025-04-07 Analysis Date: 2025-04-07				
Colour, Apparent (Water, Spectrophotometry)												
Method : Colour (Water, Spectrophotometric). Internal method: OTT-I-SPEC-WI45980.												
Colour (Apparent)	TCU	2	<2	109	78-116			3	0-40			
Associated Samples : 8476750								Prep Date: 2025-04-11 Analysis Date: 2025-04-15				
Colour, True (Water, Spectrophotometry)												
Method : Colour (Water, Spectrophotometric). Internal method: OTT-I-SPEC-WI45980.												
Colour (True)	TCU	2	<2	97	78-116			-	0-40			
Associated Samples : 8476750								Prep Date: 2025-04-15 Analysis Date: 2025-04-15				
Conductivity (Water, Automated)												
Method : Conductivity (Water, Autotitrator). Internal Method: OTT-I-AT-WI45398.												
Conductivity @ 25°C	uS/cm	5	<5	99	98-102			1	0-20			
Associated Samples : 8476750								Prep Date: 2025-04-07 Analysis Date: 2025-04-07				
DOC (Water, IR)												
Method : Organic carbon (water, IR, combustion). Internal method: OTT-I-DEM-WI46148.												
Dissolved Organic Carbon	mg/L	0.5	<0.5	99	85-115	90	80-120	12	0-15			
Associated Samples : 8476750								Prep Date: 2025-04-08 Analysis Date: 2025-04-08				
E.Coli and Total Coliforms (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			
Total Coliforms (DC)	CFU/100mL	0	0					-	0-30			
Associated Samples : 8476750								Prep Date: 2025-04-04 Analysis Date: 2025-04-04				
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 : 8476750								Prep Date: 2025-04-07 Analysis Date: 2025-04-07				

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
 Project : PH4924

Reception Date: 2025-04-04

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate				
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %			
Metals Scan (Water, ICP/MS)												
<i>Method : Metals (Water, ICP/MS). Internal method: AMMTFQE1.</i>												
Aluminum	mg/L	0.01	<0.01	100	80-120	97	70-130	1	0-20			
Antimony	mg/L	0.0005	<0.0005	87	80-120	83	70-130	-	0-20			
Arsenic	mg/L	0.001	<0.001	98	80-120	99	70-130	-	0-20			
Barium	mg/L	0.001	<0.001	90	80-120	93	70-130	1	0-20			
Beryllium	mg/L	0.0005	<0.0005	109	80-120	108	70-130	-	0-20			
Boron	mg/L	0.01	<0.01	110	80-120	103	70-130	-	0-20			
Cadmium	mg/L	0.0001	<0.0001	101	80-120	99	70-130	-	0-20			
Chromium	mg/L	0.001	<0.001	100	80-120	95	70-130	-	0-20			
Cobalt	mg/L	0.0002	<0.0002	100	80-120	97	70-130	-	0-20			
Copper	mg/L	0.001	<0.001	110	80-120	98	70-130	-	0-20			
Iron	mg/L	0.03	<0.03	100	80-120	91	70-130	2	0-20			
Lead	mg/L	0.001	<0.001	100	80-120	98	70-130	-	0-20			
Manganese	mg/L	0.01	<0.01	100	80-120	97	70-130	-	0-20			
Molybdenum	mg/L	0.005	<0.005	90	80-120	88	70-130	-	0-20			
Nickel	mg/L	0.005	<0.005	100	80-120	101	70-130	-	0-20			
Selenium	mg/L	0.001	<0.001	98	80-120	101	70-130	-	0-20			
Silver	mg/L	0.0001	<0.0001	113	80-120	90	70-130	-	0-20			
Strontium	mg/L	0.001	<0.001	90	80-120	92	70-130	1	0-20			
Thallium	mg/L	0.0001	<0.0001	103	80-120	97	70-130	-	0-20			
Uranium	mg/L	0.001	<0.001	100	80-120	97	70-130	-	0-20			
Vanadium	mg/L	0.001	<0.001	90	80-120	92	70-130	-	0-20			
Zinc	mg/L	0.01	<0.01	110	80-120	105	70-130	-	0-20			
Associated Samples : 8476750												
Prep Date: 2025-04-07 Analysis Date: 2025-04-07												
Metals Scan (Water, ICP/OES)												
<i>Method : Metals (Water, ICP/OES). Internal method: OTT-I-MET-WI48491.</i>												
Calcium	mg/L	1	<1	99	86-115	96	70-130	1	0-20			
Magnesium	mg/L	1	<1	93	91-109	100	70-130	-	0-20			
Potassium	mg/L	1	<1	101	87-113	110	70-130	-	0-20			
Sodium	mg/L	1	<1	100	85-115	104	70-130	-	0-20			
Associated Samples : 8476750												
Prep Date: 2025-04-07 Analysis Date: 2025-04-04												
Nitrate (Water, IC)												
<i>Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.</i>												
Nitrate (as Nitrogen)	mg/L	0.1	<0.1	103	80-120	106	80-120	-	0-20			
Associated Samples : 8476750												
Prep Date: 2025-04-07 Analysis Date: 2025-04-07												
Nitrite (Water, IC)												
<i>Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.</i>												
Nitrite (as Nitrogen)	mg/L	0.1	<0.1	100	80-120	103	80-120	-	0-20			
Associated Samples : 8476750												
Prep Date: 2025-04-07 Analysis Date: 2025-04-07												
pH (25°C) (Water, Automated)												
<i>Method : pH (Water, Automated Meter). Internal method: OTT-I-AT-WI45398.</i>												
pH @ 25°C		1	6.75	100	97-103			0	0-20			
Associated Samples : 8476750												
Prep Date: 2025-04-07 Analysis Date: 2025-04-07												

Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group

Project : PH4924

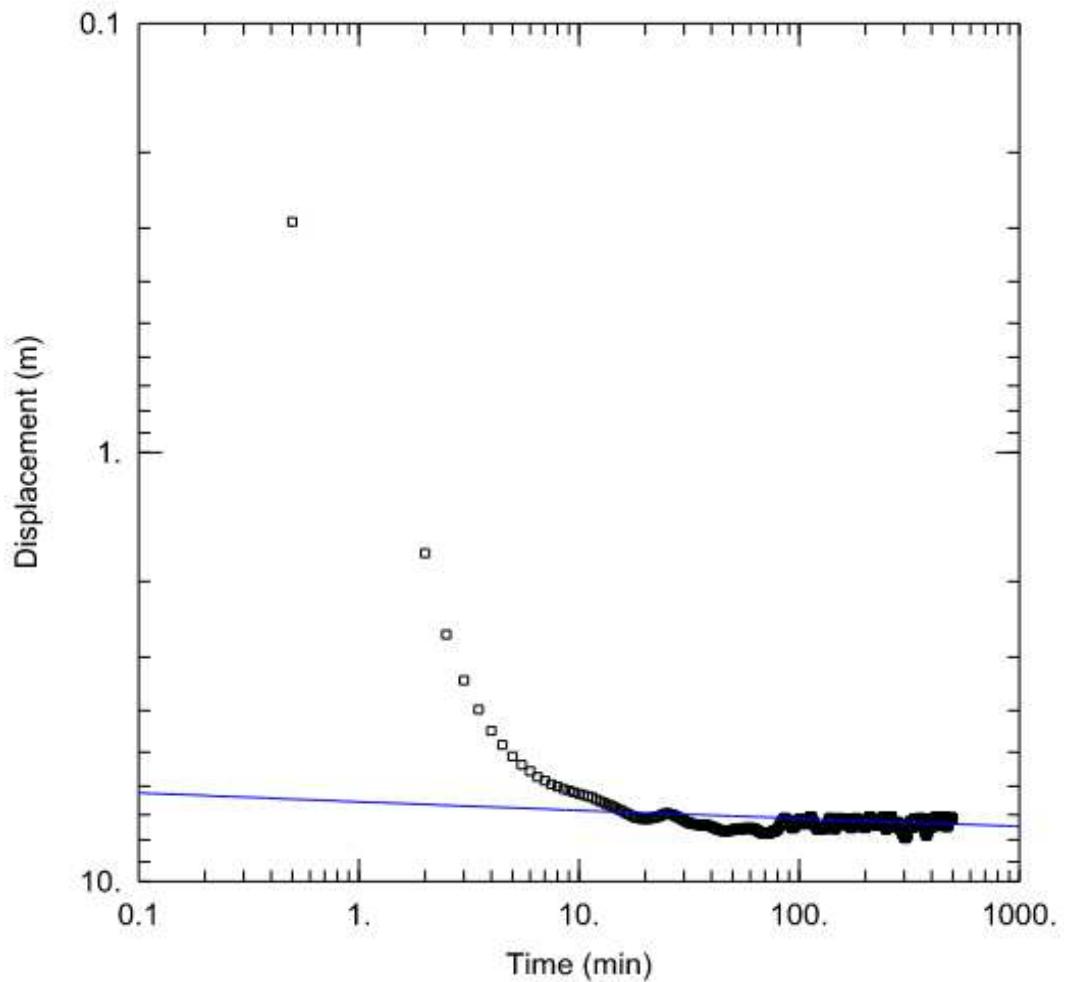
Reception Date: 2025-04-04

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate				
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %			
Phenols (Water, Colorimetry)												
<i>Method : Phenols (Water, Colorimetry). Internal method: OTT-I-4AAP-WI46150.</i>												
Phenols-4AAP	mg/L	0.001	<0.001	101	75-125	105	70-130	-	0-20			
Associated Samples : 8476750								Prep Date: 2025-04-08				
								Analysis Date: 2025-04-08				
Sulphate (Water, IC)												
<i>Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.</i>												
Sulphate	mg/L	1	<1	103	90-110	107	80-120	0	0-20			
Associated Samples : 8476750								Prep Date: 2025-04-07				
								Analysis Date: 2025-04-07				
Sulphide (Water, Colorimetry)												
<i>Method : Sulphide, S2- (Water, Colorimetry). Internal method: OTT-I-SPEC-WI45931.</i>												
Sulphide (S2-)	mg/L	0.01	<0.01	91	80-120			-	0-20			
Associated Samples : 8476750								Prep Date: 2025-04-08				
								Analysis Date: 2025-04-08				
Tannin and Lignin (Water, Spec)												
<i>Method : Tannin and Lignin (Water, Spec). Internal method: OTT-I-SPEC-WI57693.</i>												
Tannin and Lignin	mg/L	0.1	<0.1	104	80-120			-	0-20			
Associated Samples : 8476750								Prep Date: 2025-04-08				
								Analysis Date: 2025-04-08				
Total Kjeldahl Nitrogen (Water, Colorimetry)												
<i>Method : TKN (Water, colorimetry). Internal method: OTT-I-NUT-WI46201.</i>												
Total Kjeldahl Nitrogen	mg/L	0.1	<0.100	89	70-130	105	70-130	11	0-20			
Associated Samples : 8476750								Prep Date: 2025-04-07				
								Analysis Date: 2025-04-07				
Turbidity (Water, Turbidimeter)												
<i>Method : Turbidity (Water, Turbidimeter). Internal method: OTT-I-TUR-WI46288.</i>												
Turbidity	NTU	0.1	<0.1	98	80-120			2	0-30			
Associated Samples : 8476750								Prep Date: 2025-04-05				
								Analysis Date: 2025-04-05				

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

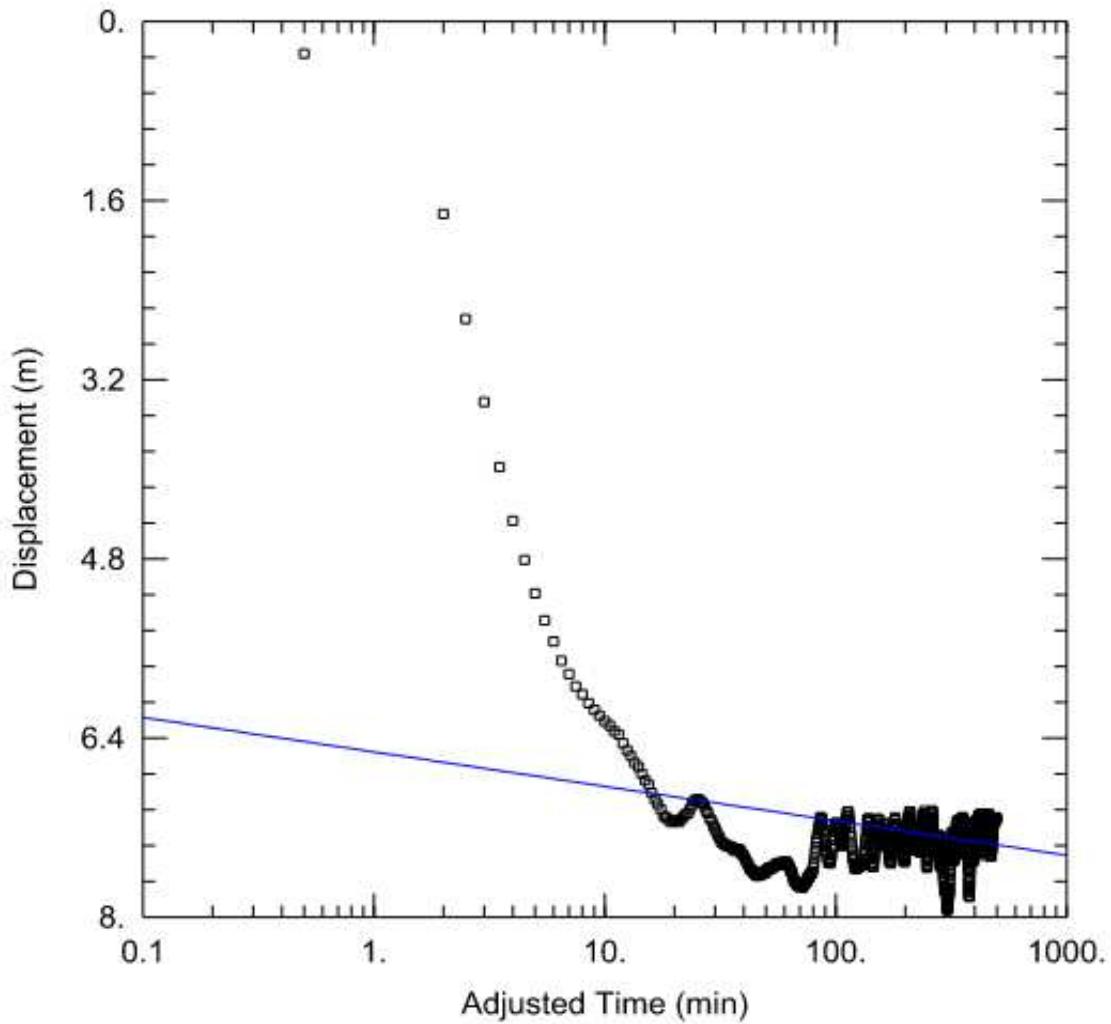
Pumping Test Analysis Report

File No.	PH4924	Well ID:	TW1
Date:	March 19, 2025	Solution Method:	Theis
Client:	Stratford Foxrun	Transmissivity (m^2/day):	65
Site Address:	5923 Ottawa Street, Ottawa	Discharge Rate (L/min)	78
Project:	Proposed Commercial Development	Analysis performed by:	ZB



Pumping Test Analysis Report

File No.	PH4924	Well ID:	TW1
Date:	March 19, 2025	Solution Method:	Cooper-Jacob
Client:	Stratford Foxrun	Transmissivity (m ² /day):	65
Site Address:	5923 Ottawa Street, Ottawa	Discharge Rate (L/min)	78
Project:	Proposed Commercial Development	Analysis performed by:	ZB



Pumping Test Analysis Report

File No. PH4924
Date: March 19, 2025
Client: Stratford Foxrun
Site Address: 5923 Ottawa Street, Ottawa
Project: Proposed Commercial Development

Summary Table:

Solution Method:	Well ID:	Transmissivity (m ² /day):
Theis	TW1	65
Cooper-Jacob	TW1	65
Average:		65.0

WASTEWATER TECHNOLOGY

NSF/ANSI Standard 245 - *Wastewater Treatment Systems – Nitrogen Reduction*

Final Report:

**Eljen Corporation
GSF Denitrification System DN450
15/10/055/0030**



NSF International
789 N. Dixboro Road
PO Box 130140
Ann Arbor, Michigan 48113-0140 USA

Submitted to Ontario Ministry of Environment
8.13.19

**Evaluation Report:
Eljen Corporation
GSF Denitrification System DN450
Wastewater Treatment System**

**Under the provisions of NSF/ANSI Standard 245
Wastewater Treatment Systems – Nitrogen Reduction**

**Submitted to Ontario Ministry of Environment
8.13.19**

EXECUTIVE SUMMARY

Testing of the Eljen Corporation GSF Denitrification System DN450 was conducted under the provisions of NSF/ANSI Standard 245 for Residential Wastewater Treatment Systems (April 2013 revision). NSF/ANSI Standard 245 was developed by the NSF Joint Committee on Wastewater Technology.

The performance evaluation was conducted at the Massachusetts Alternative Septic System Test Center (MASSTC), located in Bourne, Massachusetts, using wastewater diverted from the Otis Air National Guard Base municipal wastewater collection system, which serves the base residential development. The evaluation consisted of sixteen weeks of dosing at design flow, seven and one half weeks of stress testing and an additional two and one half weeks of dosing at design flow. Sampling started in the summer and continued through the fall and winter, covering a range of operating temperatures.

Over the course of the evaluation, the average influent Total Nitrogen was 35 mg/L, ranging between 26 mg/L and 57 mg/L. The DN450 produced an average effluent Total Nitrogen of 15 mg/L, which resulted in a 57% reduction in the influent Total Nitrogen. The DN450 produced an effluent that successfully met the performance requirements established by NSF/ANSI Standard 245.

The DN450 produced an effluent that successfully met the performance requirements established by NSF/ANSI Standard 40 for Class I effluent:

The maximum 7-day arithmetic mean was 34 mg/L for CBOD₅ and 32 mg/L for total suspended solids, both below the allowed maximums of 40 and 45 mg/L respectively. The maximum 30-day arithmetic mean was 25 mg/L for CBOD₅ and 21 mg/L for total suspended solids, both below the allowed maximums of 25 mg/L and 30 mg/L respectively.

The effluent pH during the entire evaluation ranged between 6.0 and 6.8, within the required range of 6.0 to 9.0. The DN450 met the requirements for noise levels (less than 60 dbA at a distance of 20 feet), color, threshold odor, oily film and foam.

Submitted to Ontario Ministry of Environment
8.13.19

PREDICTIVE NITRATE IMPACT ASSESSMENT

Infiltration Factors

Topography	0.20
Soil	0.30
Cover	0.14
Total	0.64

Site Characteristics

Area of Site :	22680	m ²
Total of roof areas:	1572	m ²
Total area of paved driveway areas:	2575	m ²
Roof + paved driveway areas	4147	m ²
Impervious Area	4147	m ²
Percent Impervious Area =	18	%
Infiltration Area =	18533	m ²

Septic Effluent

Concentration of Effluent (Cs) =	17.2	mg/L
Daily Sewage Flow (Qs)=	9.967	m ³

See Notes below.

Infiltration Calculation

Nitrate concentration in precipitation (C _i) =	0	mg/L
Surplus Water (Environment Canada)	360	mm/yr
Factored Water Surplus =	230	mm/yr
Infiltration % due to stormwater management measures	-	%
Infiltration rate from stormwater management measures =	0	mm/yr
Infiltration Flow Entering the System (Q _i) =	12	m ³ /day

Mass Balance Model (MOEE, 1995)

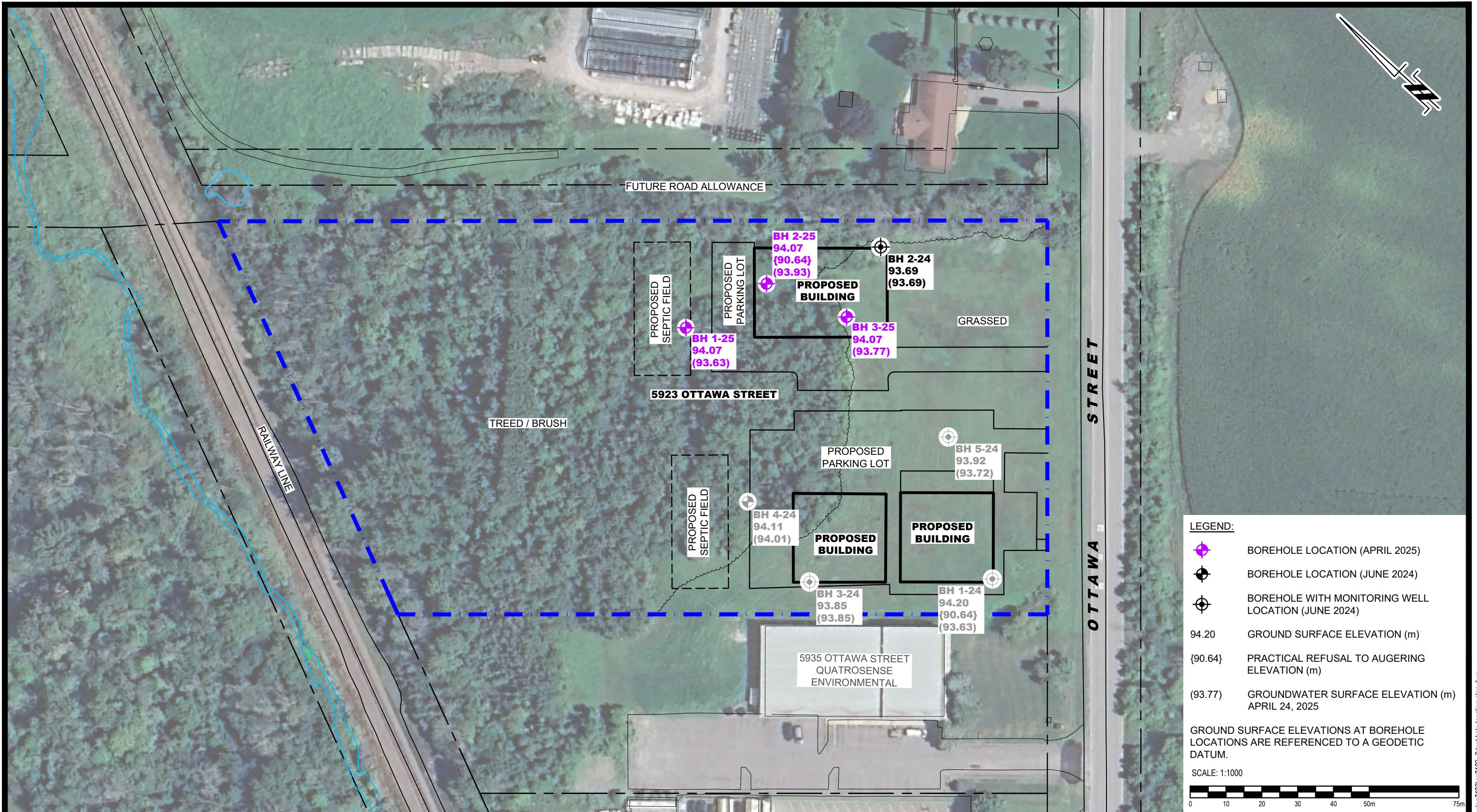
$$C_T = (Q_b C_b + Q_e C_e + Q_i C_i) / (Q_b + Q_e + Q_i) = \text{Cumulative Nitrate Concentration}$$

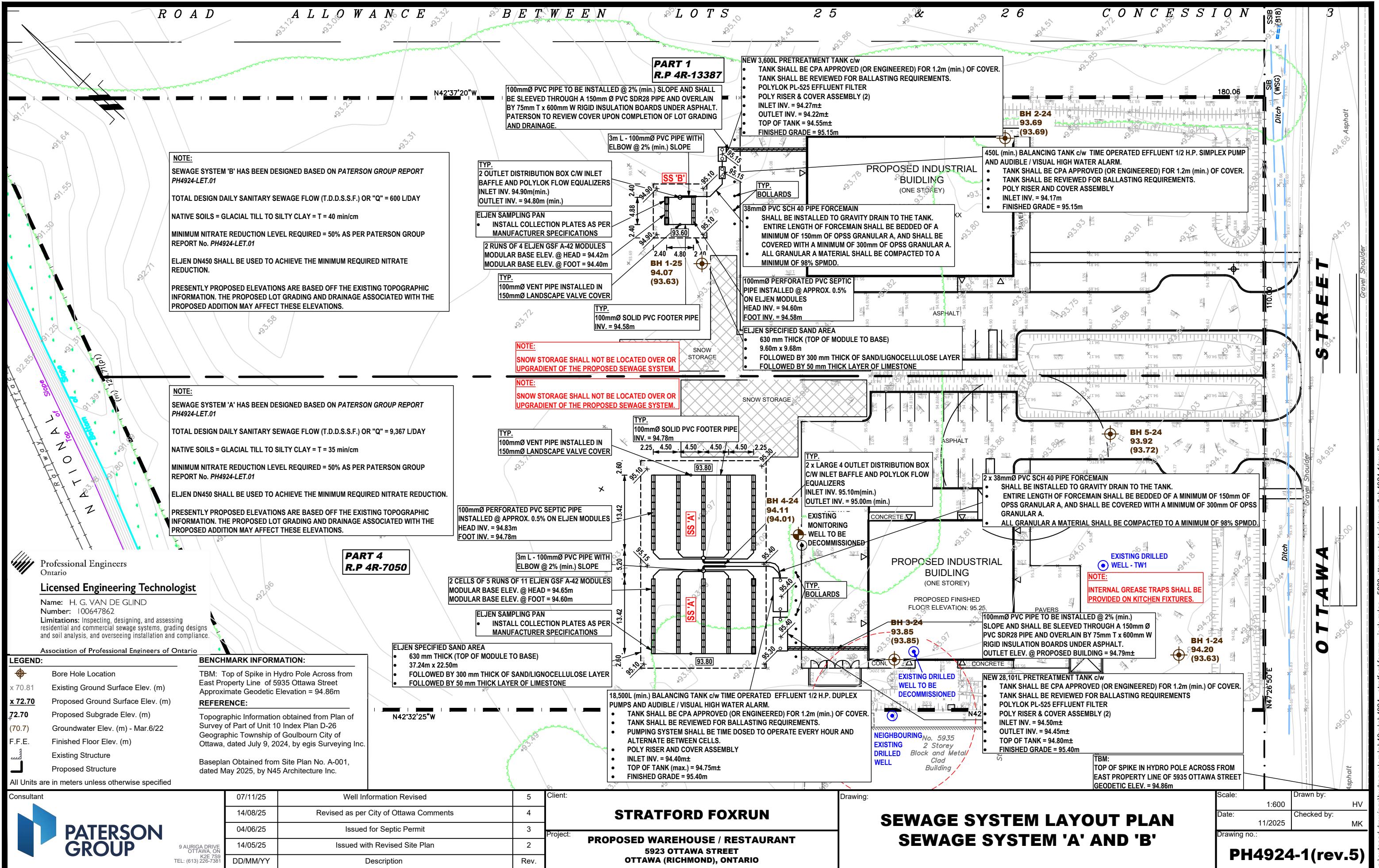
Q _b = flow entering the system across the upgradient area	0	m ³ /day
C _b = background nitrate concentration	0	mg/L
Q _e = flow entering the system from the septic drainfield	9.967	m ³ /day
C _e = concentration of nitrates in the septic effluent	17.2	mg/L
Q _i = flow entering the system from infiltration	12	m ³ /day
C _i = Concentration of nitrates in the infiltrate	0	mg/L
C_T =	7.91	mg/L

Notes: Site characteristic values were measured as approximate values from the available site plan. Daily Sewage Flow volume was calculated by Paterson Group as a preliminary design flow.

TW1 Inputs			
pH	7.88	A	0.19
TDS	886	B	2.38
Hardness	444	C	2.25
Alkalinity	271	D	2.43
Temp.	10.1	pHs =	7.194940025

Langelier Saturation Index (LSI) Calculation		(Langelier, 1936)
LSI = pH - pHs		A = (Log10 [TDS] - 1) / 10
pHs = (9.3 + A + B) - (C + D)		B = -13.12 x Log10 (oC + 273) + 34.55
Where:		C = Log10 [Ca ²⁺ as CaCO ₃] - 0.4
		D = Log10 [alkalinity as CaCO ₃]
		LSI = 0.7
LSI	Effect	
0.5 to 2	Water is super saturated and tends to precipitate a scale layer of calcium carbonate (scale forming but non-corrosive)	
0 to 0.5	Water is super saturated and tends to precipitate a scale layer of calcium carbonate (slightly scale forming and corrosive).	
0	Water is saturated (in equilibrium) with calcium carbonate. A scale layer of calcium carbonate is neither precipitated nor dissolved.	
0 to -0.5	Water is under saturated and tends to dissolve solid calcium carbonate (slightly corrosive but non-scale forming).	
-0.5 to -2	Water is under saturated and tends to dissolve solid calcium carbonate (seriously corrosive).	







OWNER:
99117756 CANADA INC. c/o JACK GULAS
411 LEGGET DRIVE, SUITE 710, OTTAWA, ONTARIO, K2K 3C9

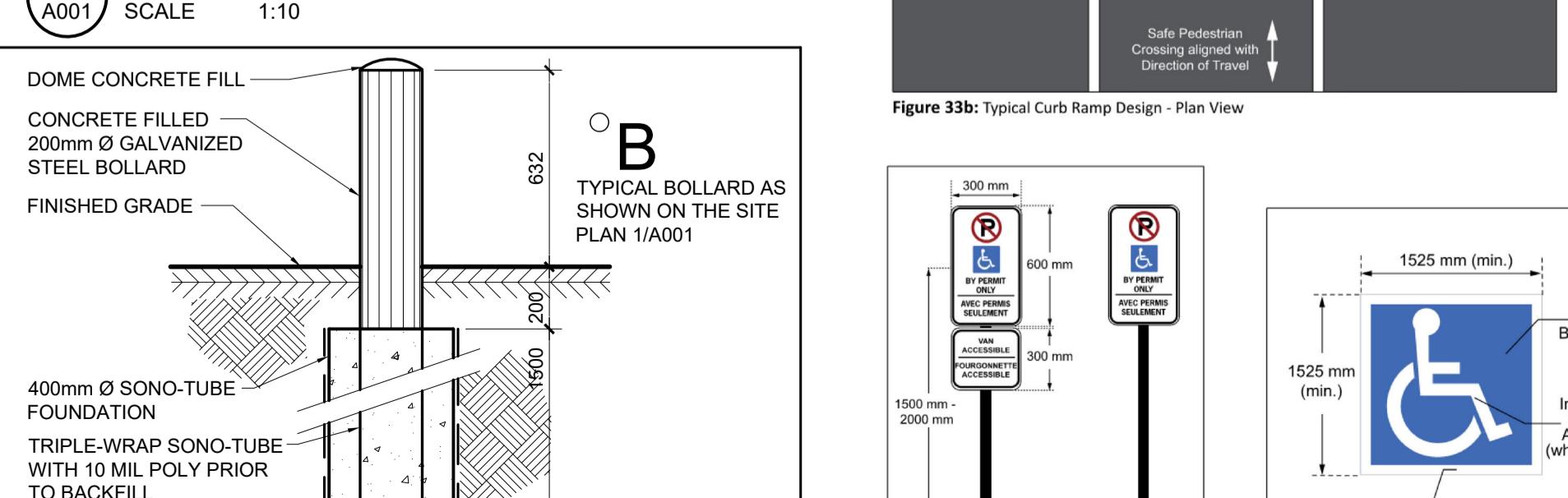
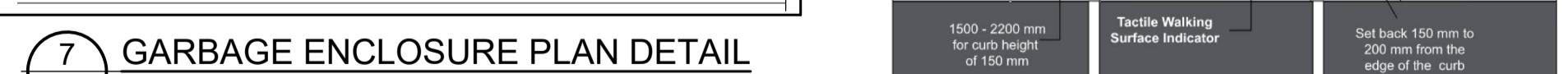
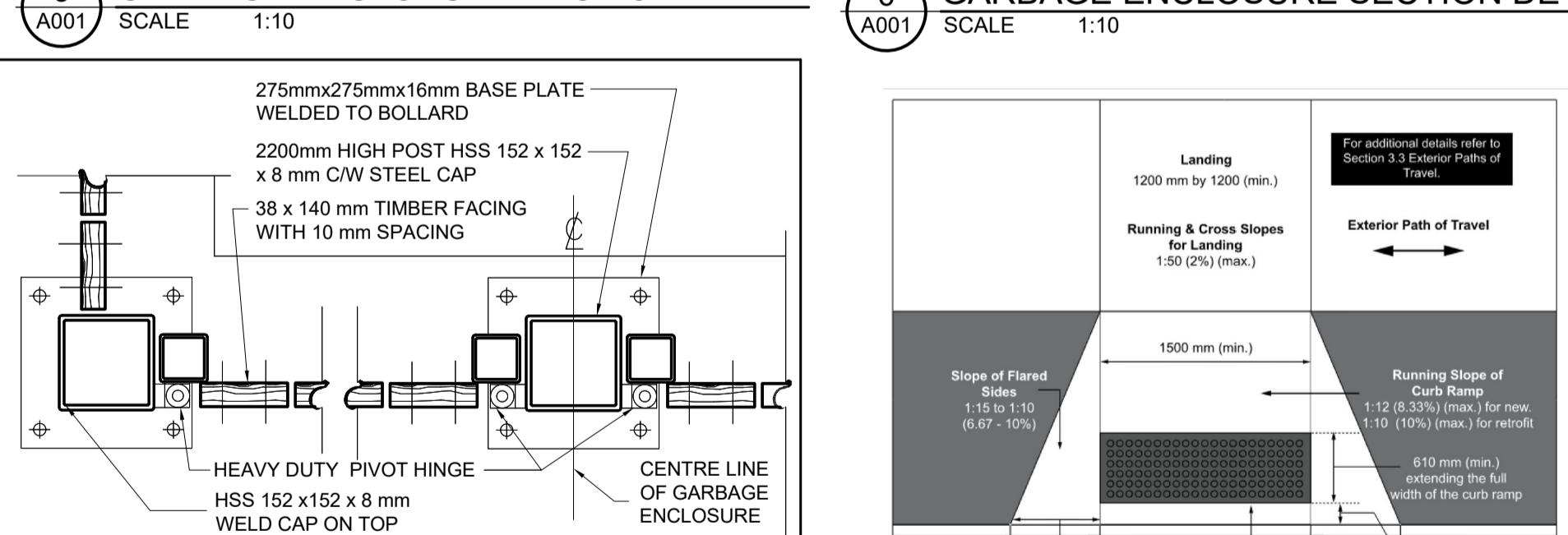
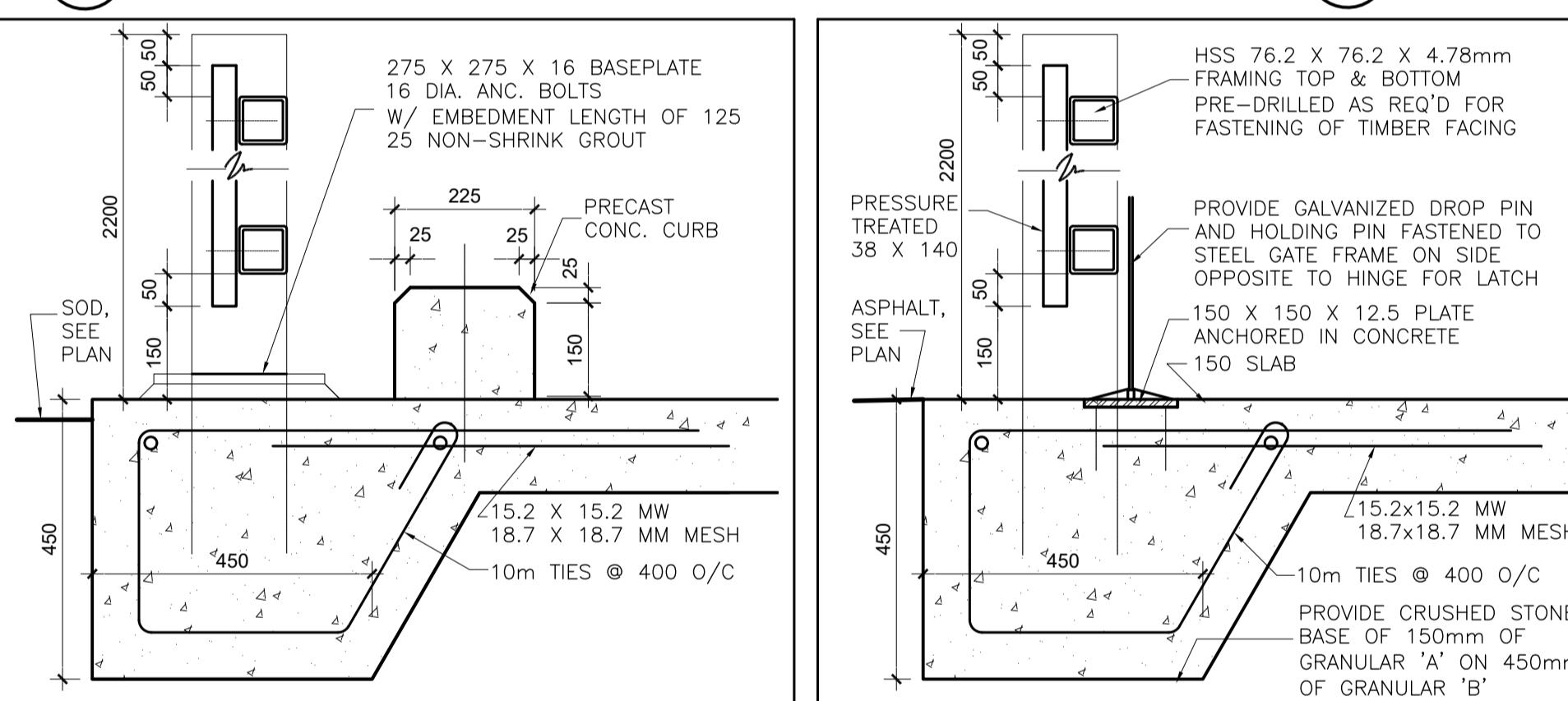
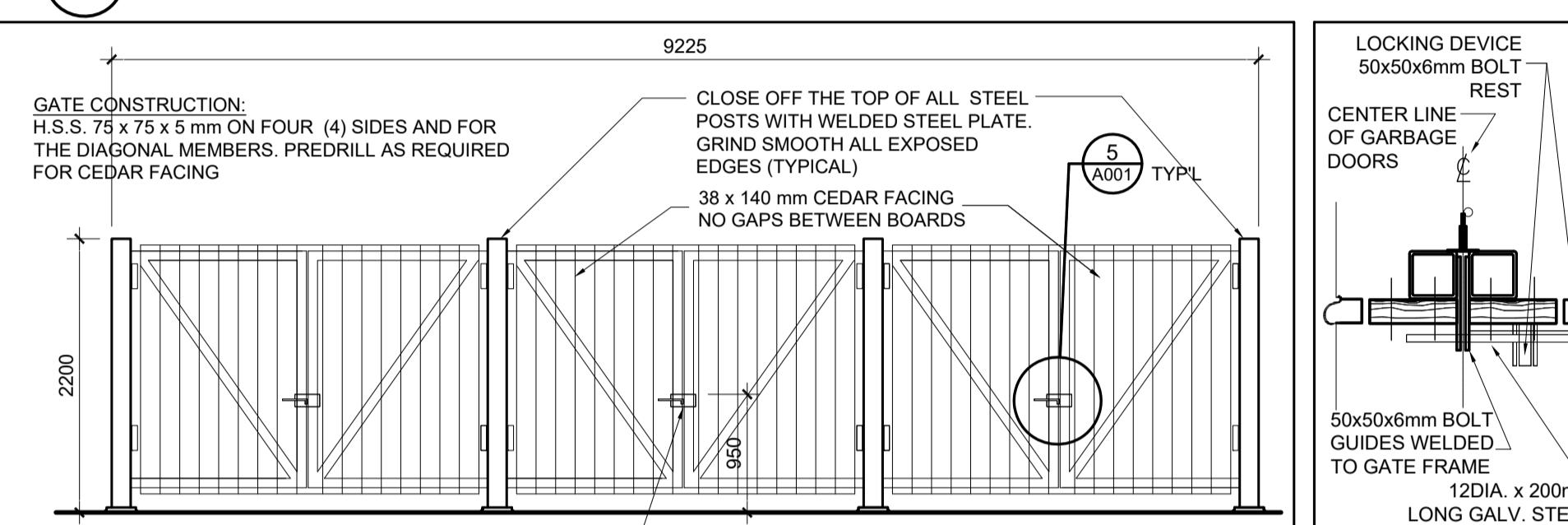
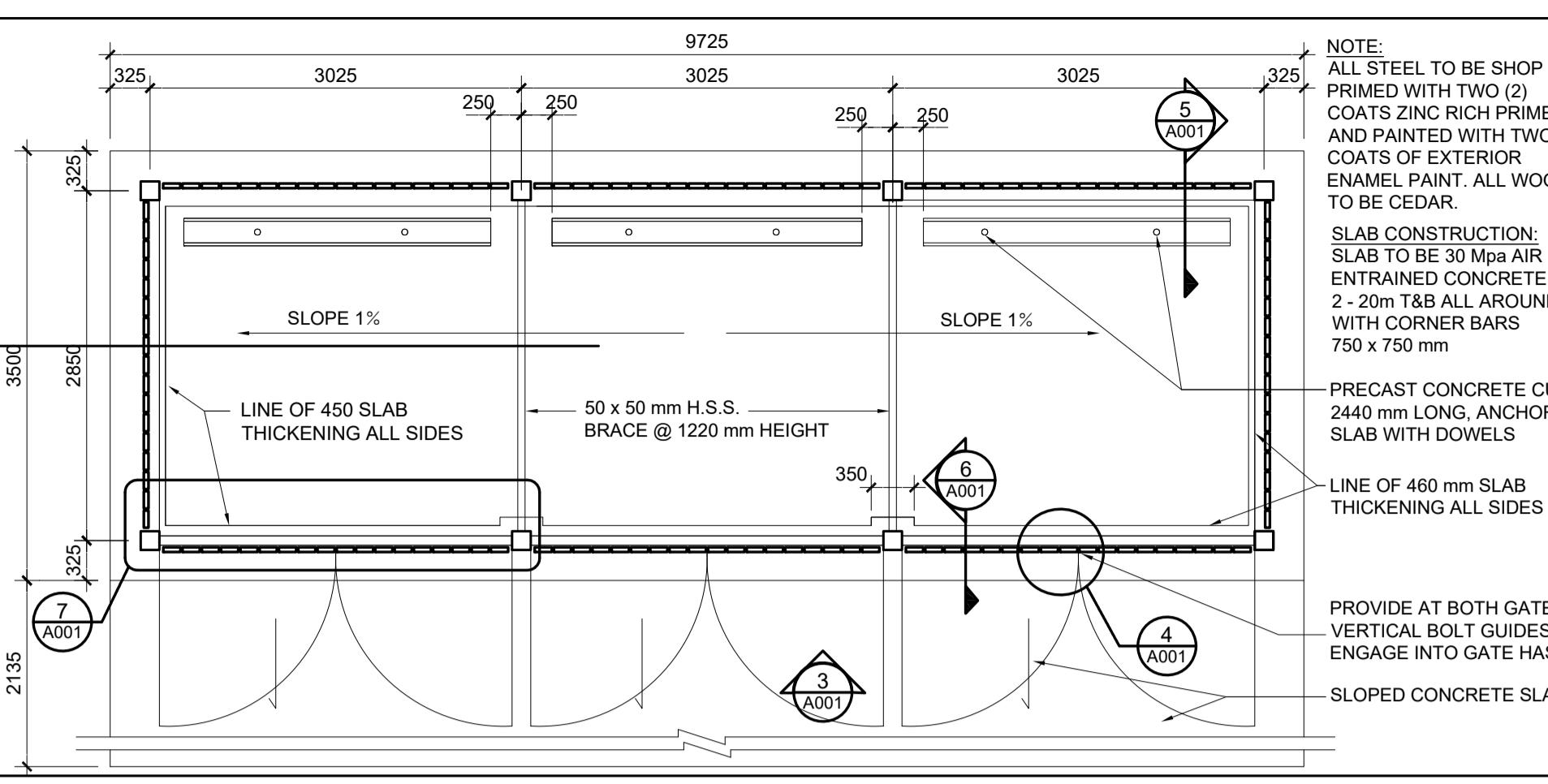
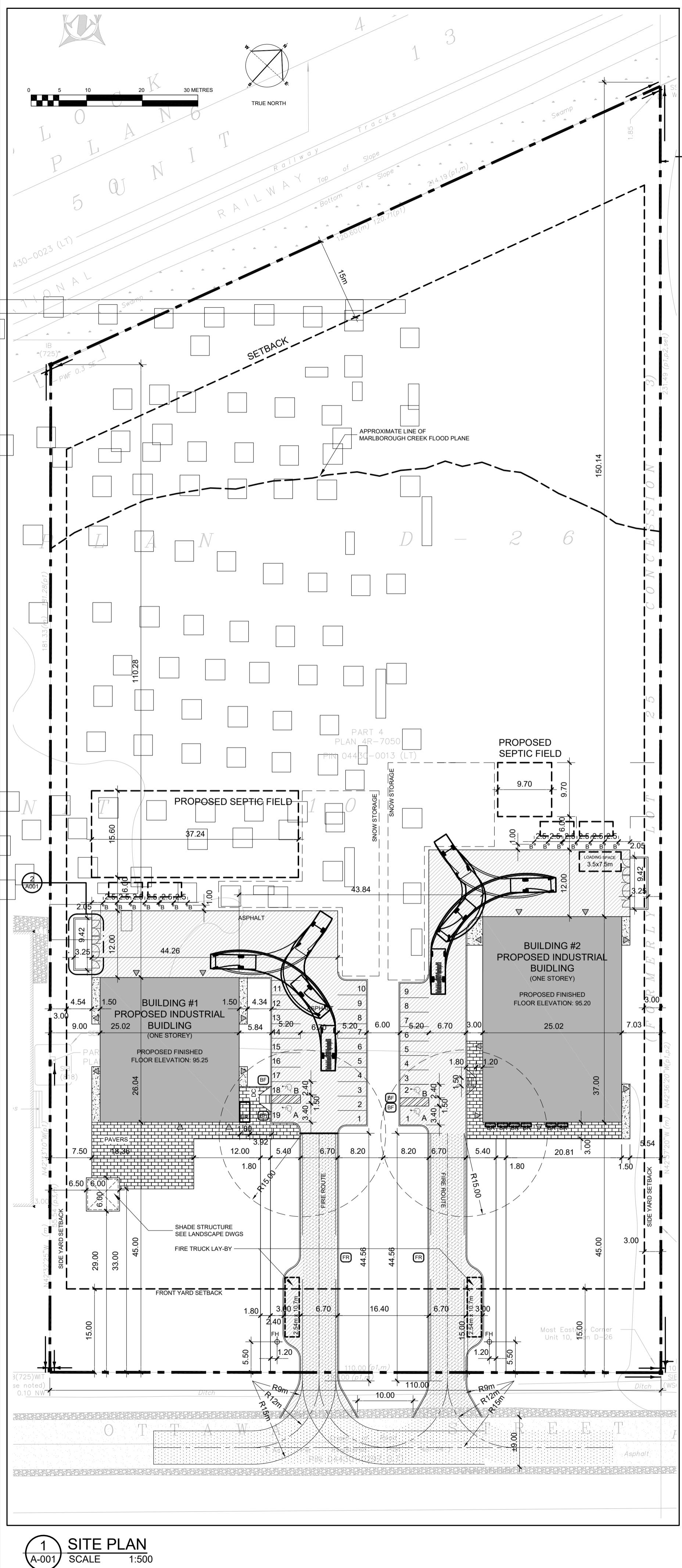
4	ISSUED FOR SPA	09OCT25
3	ISSUED FOR SPA	29JUL25
2	ISSUED FOR SPA	15MAY25
1	ISSUED FOR SITE PLAN CONTROL	07OCT24
no.	revision	date

N45 ARCHITECTURE INC.
71 Bank Street, 7th floor - Ottawa, Ontario, K1P 5N2
tel. 613.224.0095 fax 613.224.9811

project	FOXRUN RICHMOND
5923 OTTAWA STREET OTTAWA, ON	
project north	seal ONTARIO ASSOCIATION OF ARCHITECTS VLADIMIR POPOVIC LICENCE 5918

drawing title	SITE PLAN	
scale	AS NOTED	drawn by
date	JUNE 2022	checked by
project number	24-826	drawing number
revision	A-001	

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.



ZONING INFORMATION		
NOTE: ALL ZONING DEFINITIONS AND REQUIREMENTS AS PER CITY OF OTTAWA ZONING BY-LAW 2008-250		
ZONING MECHANISM	REQUIRED	PROVIDED
DEFINITION	RG3 [385] RURAL GENERAL INDUSTRIAL ZONE	BUILDING #1: WAREHOUSE, RETAIL STORE, BAR (25%) BUILDING #2: WAREHOUSE
MIN. LOT WIDTH	30.0 m	110.0 m
MIN. LOT AREA	2,000 m ²	22,680 m ² (± 5.6 Acres)
MIN. FRONT YARD SETBACK	15.0 m	45.0 m
MIN. REAR YARD SETBACK	15.0 m	110.0 m
MIN. INTERIOR SIDE YARD SETBACK	3.0 m	9.0 m
MAX. LOT COVERAGE	35%	2.85%
PARKING LANDSCAPE BUFFER	FOR A PARKING LOT CONTAINING 10-100 SPACES ABUTTING A STREET 3 m NOT ABUTTING A STREET 1.5 m	
STANDARD PARKING SPACE	2.6 WIDTH x 5.2m LENGTH	2.6m WIDTH x 5.2m LENGTH
PARALLEL PARKING SPACE	2.6 WIDTH x 6.7m LENGTH	2.6m WIDTH x 6.7m LENGTH
ACCESSIBLE PARKING SPACE	3.4x5.2m (A): 2x4.5m(B)	3.4x5.2m (A): 2x4.5m(B)
PARKING REQUIREMENTS		
BUILDING#1: LIGHT INDUSTRIAL USE (N49): 0.8 PER 100 m ² FOR THE FIRST 5,000 m ² OF GFA (3.485 REQUIRED) RETAIL STORE (N79): 3.4 PER 100m ² OF GFA (2.75 REQUIRED) BAR (N15): 6 PER 100m ² OF GFA (6.48 REQUIRED)	BUILDING#1: 19 PARKING SPACES BUILDING#2: 9 PARKING SPACES	
TOTAL REQUIRED: 12.725		
BUILDING#2: LIGHT INDUSTRIAL USE (N49): 0.8 PER 100 m ² FOR THE FIRST 5,000 m ² OF GFA (8.336 REQUIRED)		
BARRIER FREE ACCESSIBLE	AS PER CITY OF OTTAWA ACCESSIBILITY DESIGN STANDARDS, PARAGRAPH 3.1.2, TABLE 3, 1 TYPE 'A', 1 TYPE 'B'	BUILDING#1: 2 ACCESSIBLE PARKING SPACES (1xTYPE 'A' + 1xTYPE 'B') BUILDING#2: 2 ACCESSIBLE PARKING SPACES (1xTYPE 'A' + 1xTYPE 'B')
LOADING SPACES	GFA 350-999m ² - 0 required	0 PROVIDED
BICYCLE PARKING RATE	BUILDING#1: 1 LIGHT INDUSTRIAL USE: 1 PER 1,000 m ² OF GFA (0.485 REQUIRED) RETAIL STORE: 1 PER 250 m ² OF GFA (0.32 REQUIRED) BAR: 1 PER 1,500 m ² OF GFA (0.072) TOTAL REQUIRED: 0.8285	BUILDING#1: 6 BICYCLE SPACES BUILDING#2: 6 BICYCLE SPACES
BUILDING#2: LIGHT INDUSTRIAL USE: 1 PER 1,000 m ² OF GFA (1.042 REQUIRED)		

SYMBOL LEGEND:	
▲	BLDNG ENTRANCE/EXIT
▼	FDC
○	FIRE DEPARTMENT CON
○ FH	NEW FIRE HYDRANT
○ WM	WATER METER
DC	NEW DEPRESSED CURB
—	NEW CURB
—	NEW CHAIN LINK FENCE
○ B	PROPERTY LINE
BR	BOLLARD
—	BIKE RACKS
SIGNAGE LEGEND:	
BF	FIRE ROUTE
FR	BF PARKING
—	ASPHALT
—	PAVERS
—	GRASS
—	CONCRETE
PROJECT INFORMATION (BUILDING#1):	
BUILDING CLASSIFICATION:	
THE BUILDING IS CLASSIFIED AND DESIGNED TO CONFORM TO THE ONTARIO BUILDING CODE 2024 (CURRENT EDITION) PART 3	
MAJOR OCCUPANCY:	
GROUP F, DIVISION 2, SPRINKLERED, UP TO TWO STOREY (3.2.2.2)	
MINOR OCCUPANCIES:	
GROUP E, AND GROUP D	
BUILDING STATISTICS:	
BUILDING AREA (FOOTPRINT): 628 sq.m. BUILDING GFA: 738 sq.m.	
NUMBER OF STOREYS: 1 (+MEZZANINE)	
BUILDING SPRINKLERED: YES	
# OF STREET ACCESS ROUTES: 1 CONSTRUCTION TYPE: NON-COMB.	
FLOOR ASSEMBLY & F.R.R.: 1 HOUR	
PROJECT INFORMATION (BUILDING#2):	
BUILDING CLASSIFICATION:	
THE BUILDING IS CLASSIFIED AND DESIGNED TO CONFORM TO THE ONTARIO BUILDING CODE 2024 (CURRENT EDITION) PART 3	
MAJOR OCCUPANCY:	
GROUP E, DIVISION 2, SPRINKLERED, UP TO TWO STOREY (3.2.2.2)	
MINOR OCCUPANCIES:	
GROUP D	
BUILDING STATISTICS:	
BUILDING AREA (FOOTPRINT): 925 sq.m. BUILDING GFA: 1,042 sq.m.	
NUMBER OF STOREYS: 1 (+MEZZANINE)	
BUILDING SPRINKLERED: YES	
# OF STREET ACCESS ROUTES: 1 CONSTRUCTION TYPE: NON-COMB.	
FLOOR ASSEMBLY & F.R.R.: 1 HOUR	
TOPOGRAPHICAL PLAN INFORMATION:	
SURVEY PROPERTY BOUNDARIES TAKEN FROM TOPOGRAPHICAL PLAN, PLAN OF SURVEY OF PART OF UNIT 10, INDEX PLAN D-26, GEOGRAPHIC TOWNSHIP OF GOULBURN, CITY OF OTTAWA	
PREPARED BY EGIS SURVEYING INC, JULY 9, 2024	

