



**PATERSON
GROUP**

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Subject: **Hydrogeological Assessment and Terrain Analysis
Re-zoning Application
2966-2978 Carp Road
Ottawa (Carp), Ontario**

INTRODUCTION

Paterson Group Inc. (Paterson) was retained by Nautical Lands Group to conduct a Hydrogeological Assessment and Terrain Analysis in support of a Re-zoning Application for a proposed cheer academy located at 2966-2978 Carp Road in Ottawa (Carp), Ontario. It is our understanding that the current property consists of a 1.28 hectares (ha) parcel with an existing dwelling in the southern portion of the site. The proposed re-zoning application aims to change the zoning of the existing warehouse footprint that is designated as Rural Commercial (RC7) to include instructional facility and athletic & recreational facility use. For specific planning details, please refer to the consultant report application package and to the attached Key Plan for the approximate site location.

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



BACKGROUND

Subject Site

The subject property consists of a warehouse with associated landscaped areas and parking lots, and a residential dwelling with associated landscaped areas and driveways located at 2966 and 2978 Carp Road in the City of Ottawa (Carp), Ontario. The ground surface across the site is relatively flat, with a general downslope direction to the east. The general overburden groundwater flow direction is assumed to be north to northeast towards the Carp River.

The Carp Road corridor and buildings onsite are serviced by private services. The site is bordered to the northeast and northwest by undeveloped lands, to the southwest by Carp Road, followed by residential properties, and to the southeast by a commercial property.

The subject site is largely rectangular in shape with a total area of 1.28 ha. The site is currently zoned as RC7 (Rural Commercial). The land parcels to the north and east are zoned RC9 (Rural Commercial), and the residential properties to the west are zoned RR5 (Rural Residential Zone).

Regional Geology

Published surficial geology mapping (OGS MRD128) for the area in the vicinity of the subject site indicates that the subject site is underlain predominantly by stone-poor silty sand to sandy silt-textured till on Paleozoic Terrain.

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

Karst Mapping

Published karst mapping (OGS GRS005) for the area indicated that the subject site is not within a potential or inferred karst area.



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 has been designated as a Highly Vulnerable Aquifer (HVA within the MRSPP) and a Significant Groundwater Recharge Area (SGRA) and is identified as two of the four groundwater related vulnerable areas identified within the Clean Water Act (2006). The four vulnerable areas consists of HVA, SGRA, Intake Protection Zones (IPZ), and Wellhead Protection Areas (WHPA).

Based upon the designation, there are no restrictions of land uses on the subject site based upon its proposed usage. Therefore, there are no related requirements for an HVA or SGRA at this location.

Hydrogeological Pre-Consultation

A City of Ottawa pre-consultation was completed on August 27, 2025 to discuss the requirements for the hydrogeological assessment and terrain analysis of the subject site. Initial discussions were completed by email prior to the meeting.

FIELDWORK PROGRAM

Well Testing

As a means to demonstrate the adequacy of the aquifer underlying the subject lands, with respect to water quality and quantity, the existing drilled well (TW1) servicing the existing warehouse was tested. TW1 has a Water Well Record (WWR) Well ID of A212621. TW1 has a 150 mm diameter steel casing that extends to 6.82 m bgs with a 0.45 m stick up. The well itself extends to a depth of 58.9 m bgs. According to the water well record, limestone bedrock was recorded at a depth of approximately 4.34 m bgs. Based on available geological mapping, the drift thickness at TW1 varies from 2 to 3 m.

As a means to evaluate the water supply aquifer intercepted by the well, the well was subjected to a 8-hour constant rate pumping test. The pumping test was conducted on March 22, 2022 under the full-time supervision of Paterson personnel. Prior to the pumping test a data-logger was installed to monitor the background groundwater levels.

The existing submersible pump was used for the 8-hour pumping test. A licensed water well technician (Air Rock) completed the necessary plumbing related activities. The discharge line was placed at a sufficient distance to ensure that the discharge water was being directed away from the well and the septic system onsite. Upon completion of the test, the system was returned to its normal configuration.

The pumping test was carried out at a pumping rate of 45 L/min for a duration of 8 hours. During the pumping test, the pumping rate was periodically measured using the timed volume correlation method. The pumping rate was maintained within 5% of the selected



pumping rate. The static water level was recorded manually and an electric datalogger (VanEssen TD-Diver) was installed in the test well prior to the start of the pumping test.

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

Recovery data was collected from the well following the completion of the pumping. The well was noted to have achieved 100% recovery approximately 1 minute after the completion of pumping.

Groundwater samples were collected at 4 hours and 8 hours after the start of pumping. Prior to collection of the groundwater samples, the free chlorine residual was verified as non-detectable. The water samples were submitted for comprehensive testing of bacteriological, chemical, and physical water quality parameters consistent with the standard "Subdivision Supply" suite of parameters plus trace metals along with 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. 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.

Total coliforms were detected in the analytical testing of TW1 during the pumping test at 19 ct/100 mL (TW1-GW1) in the sample taken 4 hours into the pumping test and at 23 ct/100 mL (Tw1-GW2) at 8 hours into the pumping test.

Paterson personnel went to site on April 1, 2022 to disinfect TW1 as per the Ministry of the Environment, Conservation and Parks (MECP) disinfection instruction sheet, attached. The existing submersible pump was used to circulate the water column in order to ensure proper mixing of the disinfectant. Paterson personnel confirmed the presence and adequate mixing of the disinfectant.

On April 4, 2022, Paterson personnel confirmed the presence of free chlorine within the well water. The well was purged using the existing submersible pump to remove residual free chlorine prior to obtaining a bacteriological sample. The discharge locations were placed at a sufficient distance to ensure that the discharge water was being directed away from the wellhead.



TW1 was pumped for 8 hours at a rate of approximately 15 L/min. Paterson personnel confirmed that the free chlorine residual was 0 mg/L prior to the collection of the bacteriological sample (GW1) at the end of 8 hours of purging the well.

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 the Eurofins Environmental Testing Canada Inc. (Eurofins) laboratory in Ottawa. All samples were received by the laboratory within 24 hours of collection.

Total Coliforms were reported as 4 ct/100 mL in the analytical testing of TW1 after the disinfection process. E. Coli was found to be non-detect as per the original results.

Additional sampling was completed on October 8, 2025 for the parameters of E.Coli, Total Coliforms and Nitrates/Nitrites. The sampling was completed by Nelson Water Inc. Total Coliforms and E.Coli were noted to be non-detect. Nitrate was found to be 0.25 mg/L and Nitrite was found to be non-detect.



Aquifer Analysis

Water Quantity

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

| Table 1: SUMMARY OF WATER SUPPLY AQUIFER CHARACTERISTICS OF TW1 | |
|--|---------------------------|
| AQUIFER PARAMETER | RESULT OF ANALYSIS |
| Transmissivity (m ² /day) | 1,224 |
| Pumping Rate (L/min) | 45 |
| Pre-test Static Water Level (m BTOC) | 3.20 |
| Post-test Static Water Level (m BTOC) | 3.26 |
| Maximum Drawdown (m BTOC) | 3.34 |
| Available Drawdown (m) | 55.7 |
| % Drawdown During Pumping Test (%) | 0.3 |
| Specific Capacity (L/min/m drawdown) | 321 |

The drawdown data was analyzed using the Theis and Cooper Jacob methods of analysis. Aquifer transmissivity is estimated to be 1,224 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 0.14 m (0.3% of the available drawdown), but only 0.06 m at the end of the test period. 95% recovery was achieved approximately one minute after the end of pumping. It should be noted that the water level was measured to be increasing throughout the 8-hour constant rate pumping test.

The total volume of water pumped during the 8-hour pumping event was approximately 21,600 L. This is approximately 3.2 times the maximum total daily design volume of effluent (6,418 L/d) using 57% nitrate reduction required to support the Re-zoning Application. Further discussion in the Terrain Analysis notes an additional technology that can support greater than 10,000 L/day, however the 6,418 L/day is above the required flows as calculated under Part 8 – OBC for a subsequent application.

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



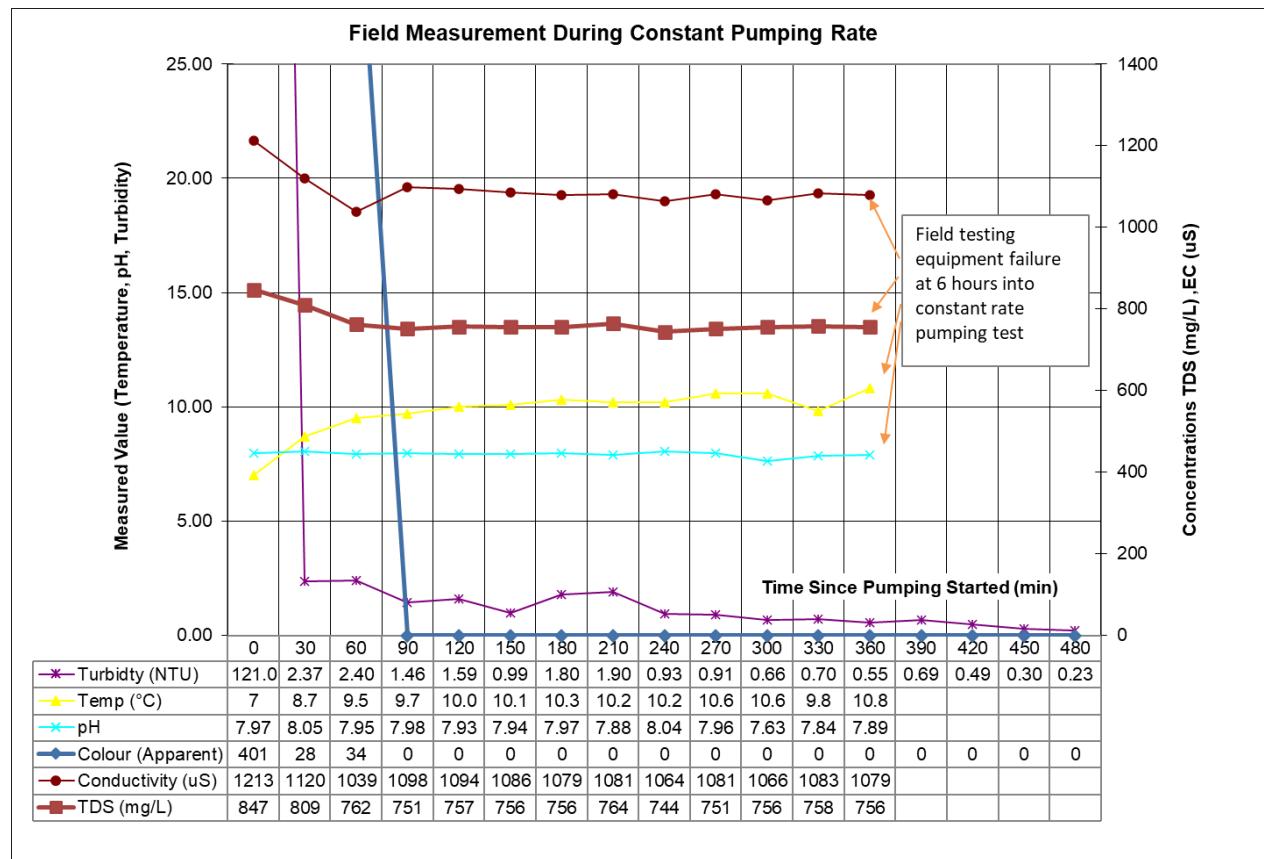
Based on the information summarized in Table 1, it is readily apparent that the water supply well has intercepted an adequately strong water supply aquifer which has sufficient quantity to service the proposed zoning usages.

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

Water Quality

Field Data

Turbidity, electrical conductivity, total dissolved solids (TDS), pH, true color and temperature were measured at the wellhead during the pumping test. The measurements and time intervals for each of these parameters are summarized on the graphical representation below. In addition, a HACH Pocket Colorimeter II chlorine reader was used to measure the free chlorine residual level. No chlorine residual was detected in the discharged water prior to the collection of the water samples. During the constant rate pumping test, the field-testing equipment which tests for pH, TDS, EC, and temperature malfunctioned at the 6-hour point. These parameters were noted to have stabilized prior to the malfunction of the equipment.



**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, 2b, and 2c below and the laboratory analyses reports can be found attached. All laboratory test results can be found attached to this report.

TABLE 2a: GROUNDWATER MICROBIOLOGY & GENERAL GEOCHEMISTRY

| PARAMETER | UNITS | ODWS | | TW1 | | |
|---|----------|-----------|--------|------------|------------|------------|
| | | LIMIT | TYPE | GW1 (4 hr) | GW2 (8 hr) | GW1 |
| | | | | 2022-03-22 | 2022-03-22 | 2022-04-04 |
| MICROBIOLOGICAL | | | | | | |
| Escherichia Coli (E.Coli) | ct/100mL | 0 | MAC | 0 | 0 | 0 |
| Total Coliforms | ct/100mL | 0 | MAC | 19 | 23 | 4 |
| GENERAL CHEMICAL - HEALTH RELATED | | | | | | |
| Fluoride (F) | mg/L | 1.5 | MAC | <0.10 | <0.10 | - |
| Ammonia (N-NH ₃) | mg/L | - | - | <0.010 | <0.010 | - |
| Nitrite (N-NO ₂) | mg/L | 1 | MAC | <0.10 | <0.10 | - |
| Nitrate (N-NO ₃) | mg/L | 10 | MAC | 3.15 | 3.02 | - |
| Total Kjeldahl Nitrogen | mg/L | - | - | 0.25 | 0.48 | - |
| Turbidity (Field) | NTU | 1.0 (5.0) | MAC/AO | 0.93 | 0.23 | - |
| Turbidity (Laboratory) | NTU | 1.0 (5.0) | MAC/AO | 0.50 | 0.50 | - |
| GENERAL CHEMICAL - AESTHETIC RELATED | | | | | | |
| Alkalinity (as CaCO ₃) | mg/L | 30-500 | OG | 251 | 243 | - |
| Chloride (Cl) | mg/L | 250 | AO | 135 | 142 | - |
| Colour | TCU | 5 | AO | <2 | <2 | - |
| Colour (Field - Apparent) | TCU | 5 | AO | 0 | 0 | - |
| Conductivity | µS/cm | - | - | 1,180 | 1,180 | - |
| Dissolved Organic Carbon | mg/L | 5 | AO | 2.40 | 2.40 | - |
| Hardness (as CaCO ₃) | mg/L | 100 | OG | 454 | 451 | - |
| Ion Balance | unitless | - | - | 0.97 | 0.97 | - |
| pH | unitless | 6.5-8.5 | AO | 7.95 | 7.93 | - |
| Phenols | mg/L | - | - | <0.001 | <0.001 | - |
| Sulphate (SO ₄) | mg/L | 500 | AO | 182 | 175 | - |
| Sulphide (S ₂ ⁻) | mg/L | 0.05 | AO | <0.01 | <0.01 | - |
| Tannin & Lignin | mg/L | - | - | 1.00 | 1.00 | - |
| Total Dissolved Solids | mg/L | 500 | AO | 767 | 767 | - |

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 | GW1 (4 hr) | GW2 (8 hr) |
| | | | | 2022-03-22 | 2022-03-22 |
| Volatiles | | | | | |
| Aluminum (Al) | mg/L | 0.1 | OG | <0.01 | <0.01 |
| Antimony (Sb) | mg/L | 0.006 | IMAC | <0.0005 | <0.0005 |
| Arsenic (As) | mg/L | 0.01 | IMAC | <0.001 | <0.001 |
| Barium (Ba) | mg/L | 1.0 | MAC | 0.12 | 0.12 |
| Beryllium (Be) | mg/L | - | - | <0.0005 | <0.0005 |
| Boron (B) | mg/L | 5.0 | IMAC | 0.04 | 0.04 |
| Cadmium (Cd) | mg/L | 0.005 | MAC | <0.0001 | <0.0001 |
| Calcium (Ca) | mg/L | - | - | 162 | 161 |
| Chromium (Cr) | mg/L | 0.05 | MAC | <0.001 | <0.001 |
| Cobalt (Co) | mg/L | - | - | <0.0002 | <0.0002 |
| Copper (Cu) | mg/L | 1.0 | AO | <0.001 | <0.001 |
| Iron (Fe) | mg/L | 0.3 | AO | <0.03 | <0.03 |
| Lead (Pb) | mg/L | 0.01 | MAC | <0.001 | <0.001 |
| Magnesium (Mg) | mg/L | - | - | 12 | 12 |
| Manganese (Mn) | mg/L | 0.05 | AO | <0.01 | <0.01 |
| Mercury (Hg) | mg/L | 0.001 | MAC | <0.0001 | <0.0001 |
| Molybdenum (Mo) | mg/L | - | - | <0.005 | <0.005 |
| Nickle (Ni) | mg/L | - | - | <0.005 | <0.005 |
| Potassium (K) | mg/L | - | - | 2 | 2 |
| Selenium (Se) | mg/L | 0.05 | MAC | <0.001 | <0.001 |
| Silver (Ag) | mg/L | - | - | <0.0001 | <0.0001 |
| Sodium (Na) | mg/L | 200 | AO | 77 | 75 |
| Strontium (Sr) | mg/L | - | - | 0.879 | 0.876 |
| Thallium (Tl) | mg/L | - | - | <0.0001 | <0.0001 |
| Uranium (U) | mg/L | 0.02 | MAC | <0.001 | <0.001 |
| Vanadium (V) | mg/L | - | - | <0.001 | <0.001 |
| Zinc (Zn) | mg/L | 5.0 | AO | <0.01 | <0.01 |

1. ODWS identifies the following types of parameters:

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IMAC = Interim Maximum Acceptable Concentration
AO = Aesthetic Objective
OG = Operational Guideline

2. Shaded Concentration Indicates an Exceedance of the ODWS Objective

**TABLE 2c: GROUNDWATER GEOCHEMISTRY - VOLATILES**

| PARAMETER | UNITS | ODWS | | TW1 | |
|-----------------------------------|-------|-------|------|--------------------------|--------------------------|
| | | LIMIT | TYPE | GW1 (4 hr) 2022-03-22 | GW2 (8 hr) 2022-03-22 |
| VOCs Surrogates | | | | | |
| 1,2-dichloroethane-d4 | % | - | - | 100 | 119 |
| 4-bromofluorobenzene | % | - | - | 71 | 76 |
| Toluene-d8 | % | - | - | 91 | 98 |
| Volatiles | | | | | |
| 1,1,1,2-tetrachloroethane | µg/L | - | - | <0.5 | <0.5 |
| 1,1,1-trichloroethane | µg/L | - | - | <0.4 | <0.4 |
| 1,1,2,2-tetrachloroethane | µg/L | - | - | <0.5 | <0.5 |
| 1,1,2-trichloroethane | µg/L | - | - | <0.4 | <0.4 |
| 1,1-dichloroethane | µg/L | - | - | <0.4 | <0.4 |
| 1,1-dichloroethylene | µg/L | 14.0 | MAC | <0.5 | <0.5 |
| 1,2-dichlorobenzene | µg/L | 200.0 | MAC | <0.4 | <0.4 |
| 1,2-dichloroethane | µg/L | 5.0 | IMAC | <0.2 | <0.2 |
| 1,2-dichloropropane | µg/L | - | - | <0.5 | <0.5 |
| 1,3,5-trimethylbenzene | µg/L | - | - | <0.3 | <0.3 |
| 1,3-dichlorobenzene | µg/L | - | - | <0.4 | <0.4 |
| 1,3-Dichloropropylene (cis+trans) | µg/L | - | - | <0.3 | <0.3 |
| 1,4-dichlorobenzene | µg/L | 5.0 | MAC | <0.4 | <0.4 |
| Acetone | µg/L | - | - | <30 | <30 |
| Benzene | µg/L | 1.0 | MAC | <0.5 | <0.5 |
| Bromodichloromethane | µg/L | - | - | <0.3 | <0.3 |
| Bromoform | µg/L | - | - | <0.4 | <0.4 |
| Bromomethane | µg/L | - | - | <0.5 | <0.5 |
| c-1,2-Dichloroethylene | µg/L | - | - | <0.4 | <0.4 |
| c-1,3-Dichloropropylene | µg/L | - | - | <0.2 | <0.2 |
| Carbon Tetrachloride | µg/L | 2.0 | MAC | <0.2 | <0.2 |
| Chloroethane | µg/L | - | - | <0.2 | <0.2 |
| Chloroform | µg/L | - | - | <0.5 | <0.5 |
| Dibromochloromethane | µg/L | - | - | <0.3 | <0.3 |
| Dichlorodifluoromethane | µg/L | - | - | <0.5 | <0.5 |
| Dichloromethane | µg/L | 50 | MAC | <4.0 | <4.0 |
| Ethylbenzene | µg/L | 140 | MAC | <0.5 | <0.5 |
| Ethylene Dibromide | µg/L | - | - | <0.2 | <0.2 |
| Hexane | µg/L | - | - | <5 | <5 |
| m/p-xylene | µg/L | - | - | <0.4 | <0.4 |
| Methyl Ethyl Ketone (MEK) | µg/L | - | - | <10 | <10 |
| Methyl Isobutyl Ketone (MIBK) | µg/L | - | - | <10 | <10 |
| Methyl Tert Butyl Ether (MTBE) | µg/L | 15 | AO | <2 | <2 |
| Monochlorobenzene | µg/L | 80 | MAC | <0.5 | <0.5 |
| o-xylene | µg/L | - | - | <0.4 | <0.4 |
| Styrene | µg/L | - | - | <0.5 | <0.5 |
| t-1,2-Dichloroethylene | µg/L | - | - | <0.4 | <0.4 |
| t-1,3-Dichloropropylene | µg/L | - | - | <0.2 | <0.2 |
| Tetrachloroethylene | µg/L | 10 | MAC | <0.3 | <0.3 |
| Toluene | µg/L | 60 | MAC | <0.4 | <0.4 |
| Trichloroethylene | µg/L | 5 | MAC | <0.3 | <0.3 |
| Trichlorofluoromethane | µg/L | - | - | <0.5 | <0.5 |
| Vinyl Chloride | µg/L | 1 | MAC | <0.2 | <0.2 |
| Xylene; total | µg/L | 90 | MAC | <0.5 | <0.5 |

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. 1973843) indicated that the test samples at the 4- and 8-hour interval were non-detect (0 ct/100 mL) for E.Coli, however, Total Coliforms were detected at concentrations of 19 ct/100 mL and 23 ct/100 mL, respectively.

Paterson personnel returned to site to disinfect the well. After the disinfection of the well and subsequent pumping, a bacteriological test was performed on the well water (Certificate of Analysis – Report No. 1974461) which indicated that E. Coli was not present (0 ct/100 mL) and that only 4 ct/100 mL Total Coliforms were present in the well water. Paterson personnel confirmed that the free chlorine residual was 0 mg/L prior to the collection of the bacteriological sample.

A water sample was taken by others on October 8, 2025. A bacteriological test was performed on the well water (Certificate of Analysis – Report No. 4491110) which indicated E.Coli and Total Coliforms were both non-detect (0 ct/100 mL). Additionally, Nitrate and Nitrite were analyzed (Certificate of Analysis – Report No. 4492546) with Nitrates at 0.25 mg/L and Nitrites at <0.1 mg/L.

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 CaCO₃)
- Total Dissolved Solids (TDS)

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

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

Hardness as CaCO₃

Hardness, expressed as calcium carbonate, is an operation guideline and does not appear in the ODWS. Rather, it appears in the Technical Support Documents for Ontario Drinking Water Standards, Objectives and Guidelines as a parameter with an operational guideline at 100 mg/L. At the measured concentrations of 454 and 451 mg/L, the water is considered to be very hard, however, it is below the reasonable treatable limit of 500 mg/L specified in Table 3 of the MOECC guidance document Procedure D-5-5 (1996), thus, hardness can be treated with readily available technologies.

It is recommended that water hardness be treated using conventional technologies such as water softening or reverse osmosis, if desired by the owner. Without treating hardness, scaling can occur which can result in discolouration and residue buildup on water fixtures, or reduction in boiler efficiency due to scale build-up. According to Health Canada's *Guidelines for Canadian Drinking Water Quality - Summary Tables* "Although hardness



may have significant aesthetic effects, a guideline has not been established because public acceptance of hardness may vary considerably according to the local conditions; major contributors to hardness (calcium and magnesium) are not of direct public health concern”.

Total Dissolved Solids (TDS)

TDS refers to the concentration of inorganic substances dissolved in water. The main constituents are typically chloride, sulphates, calcium, magnesium, and bicarbonates. The TDS concentration of 767 mg/L exceeds the Aesthetic Objective of 500 mg/L. At concentrations above 500 mg/L, some consumers may find the taste objectionable, however, as the objective is an aesthetic objective, no treatment is required. It is, however, recommended that a point-of-use reverse osmosis unit be installed or to provide bulk bottled water on an as-needed basis for drinking water purposes. As such, no taste problems will occur when the system is used, or bottled water is consumed.

The Langelier calculation provided an LSI of 0.7. 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, it is recommended that water softening be used to prevent scaling. See Langelier Saturation Index Calculation attached for calculation details.

Total Coliforms

Total Coliforms are a type of bacteria which naturally occur in soil and decaying vegetation. Total Coliforms may also be associated with animal and/or human waste.

The maximum acceptable concentration (MAC) for Total Coliforms for potable drinking water in support of a Re-zoning application, as established by the City of Ottawa Hydrogeological and Terrain Analysis Guidelines (HTAG, 2021), is less than 6 ct/100 mL. According to the City of Ottawa HTAG, Total Coliforms counts of less than 6 per 100 mL sample shall be considered indicative of acceptable water quality.

Total Coliforms were detected at 19 and 23 count per 100 mL at the 4- and 8- hour mark of the pumping test, respectively. After disinfecting the well and purging the chlorinated water, Total Coliforms were detected at 4 ct/100 mL. 4 ct/100 mL Total Coliforms is below the City of Ottawa HTAG standard of less than 6 ct/100 mL.

As the site is not hydrogeologically sensitive (competent bedrock was encountered during the field investigations at depths of 2.4 to 5.9 m bgs), and is not located in an area which is mapped as potentially karstic, the Total Coliform level of 4 ct/100 mL. The subsequent analytical results in October 2025 indicate that Total Coliforms is non-detect (0 ct/100 mL) and is considered acceptable.

Consideration should be given to utilizing a Ultraviolet (UV) disinfection system on the water supply entering the existing warehouse and proposed development. Additionally,



the turbidity was less than 1 NTU, indicating that there should be no turbidity based interference in disinfection.

Sodium

Sodium (Na), an aesthetic parameter, was detected in the laboratory test sample at a concentration of 77 and 75 mg/L, which does not exceed the ODWS aesthetic objective of 200 mg/L. Although sodium is not toxic and no MAC 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

The fieldwork which was completed as part of a Geotechnical Investigation for the site (PH3834-1R, dated January 5, 2017; and PG3834-2, dated March 1, 2022) is used in support of this assessment. Additional information pertaining to this investigation was gathered from available geological mapping and surrounding WWRs.

Surficial Geology

A series of test pits were excavated on the subject parcel to delineate the subsurface soil conditions as part of a Geotechnical Field Investigation. On February 8, 2022, seven (7) test pits were completed on the property. A previous investigation (PG3834-1R, dated January 5, 2017) was completed at the subject site in June and November 2016, during which fourteen (14) test pits were excavated and eleven (11) boreholes were completed onsite. The location of the test pits are delineated on the drawing PH5103-1-Test Hole Location Plan, attached. Note that the site plan on the drawing is not reflective of the proposed usage.

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

The boreholes and test pits were advanced to a maximum depth of 5.9 and 3.4 m below ground surface (bgs), respectively. Bedrock was recorded in the WWR for TW1 at 4.34 m bgs. Refusal to excavation was recorded at depths ranging from 0.7 m to 5.9 m bgs on fractured bedrock. Competent bedrock was encountered at depths of 2.4 to 5.9 m bgs.

The subsurface profile generally consisted of topsoil extending to a maximum depth of 0.6 m bgs, underlain by silty sand to sandy silt with gravel, cobbles, boulders and trace clay which extend to a maximum depth of 1.9 m bgs. Frost heave/ frost shattered bedrock infilled with silty sand, gravel, cobbles, and boulders (unconsolidated soils) was observed under the silty sand to sandy silt with gravel, cobbles, boulders and trace clay. The testhole logs note split spoon sampling within this layer with significant sample recovery. TP1-22, TP2-22, TP6-22, and TP7-22 noted a fill of varying composition underlying the topsoil extending to depths of 1.75 m bgs. Groundwater was observed at depths between 3.6 to 4.3 m bgs in the boreholes and test pits.

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.



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

Hydrogeological Sensitivity of the Site

The subject site currently consists of a warehouse and residential dwelling. The dwelling is currently unoccupied. The topography of the site is generally sloping downwards to the east. The local flow direction of the surficial aquifer is expected to be in the northeasterly direction towards the Carp River. The regional groundwater flow is considered to be in the northeast direction towards the Ottawa River.

The onsite overburden generally consists of topsoil overlying a brown silty sand with gravel, cobbles, boulders and trace clay which is underlain by a fractured bedrock (frost heave/frost shatter) infilled with unconsolidated soils. The unconsolidated soils are noted to have 50 to 80% recovery during split spoon sampling within this stratum. Competent bedrock was encountered during the field investigations at depths of 2.4 to 5.9 m bgs. The frost heave bedrock noted during the borehole field investigation contained high amounts of interspersed silty sand to sandy silt (unconsolidated soils), and some clay with fragmented bedrock. For the purposes of hydrogeological sensitivity, the "fractured bedrock" unit is considered an unconsolidated soil which would provide separation from the ground surface and the underlying competent bedrock. Furthermore, based on hydraulic conductivity testing, the fastest onsite T-time was 13.8 min/cm, which is an order of magnitude slower than the T-time of less than 1 min/ cm required for highly permeable soils. There were five additional test locations completed that have estimated T-times in the range of 20 to 40 mins/cm and are all considered to be not hydrogeologically sensitive. Based on this, the soils and underlying interbedded materials are not considered as highly permeable when reviewing against Ontario Building Code (OBC) Section 8.7.2.1 (1) (b)(i) and the MMAH Supplementary Standards SB-6.

Refusal to excavation was recorded on competent bedrock ranging from 2.4 to 5.9 m bgs. According to the geotechnical investigation, the overburden thickness (which includes the fractured bedrock unit with interspersed unconsolidated soils) was observed to be greater than 2 m at all borehole locations. The subject site does not have any mapped karst topography on site. Furthermore, from the TW1 WWR, bedrock was observed at a depth of 4.34 m bgs. As the proposed site does not have bedrock within 2 m of the ground surface, the site is not considered hydrogeologically sensitive. Although mitigative measures, such as increased separation distances, are not required, there is sufficient space onsite to keep the onsite well greater than 30 m away from any onsite septic components.



Conceptual Lot Development

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

Sewage System Design and Total Daily Design Sewage Flow

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

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

PREDICTIVE NITRATE IMPACT ASSESSMENT

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

A detailed impact assessment is required due to the proposed zoning of the site. In order to demonstrate that private services would adequately support the proposed Re-zoning Application, a predictive nitrate impact assessment for the subject site was completed. This calculation was completed to determine the maximum sewage flow volume which could be applied to the subject site with the current site conditions. As the site is within the Carp Road Corridor, the use of tertiary treatment systems (nitrate reducing systems) are allowed to be considered in support of re-zoning. The values shown in the Predictive Nitrate Impact Assessment calculation attached to this report are summarized below:

| | | |
|--------------------------|--|-----------|
| <input type="checkbox"/> | Site area | 1.28 ha |
| <input type="checkbox"/> | Impervious area % | 45 % |
| <input type="checkbox"/> | Concentration of nitrate in effluent <i>(Value based on conventional effluent concentration)</i> | 40 mg/L |
| <input type="checkbox"/> | Concentration of nitrate in effluent <i>(Value based on using NSF 245/BNQ certified 57% nitrate reduction technology)</i> | 17.2 mg/L |



| | | |
|---|--|-------------|
| <input type="checkbox"/> | Surplus Water | 378 mm/year |
| <i>(The surplus water value was estimated based on Environment Canada Climate Office values with a soil type comprised of clay loam (urban lawn) and anthropogenic sources, which can be found attached.)</i> | | |
| <input type="checkbox"/> | Combined infiltration factor based on: | 0.67 |
| ● | Topography infiltration factor | 0.25 |
| ● | Soil texture infiltration factor | 0.30 |
| ● | Cover infiltration factor | 0.12 |

The topography infiltration factor of 0.25 is based upon a slope between “flat land” (<0.6 m/km) and “rolling land” (average slope of 2.8 to 3.8 m/km) based on available mapping.

The soil texture infiltration factor was based upon a soil that is between “open sandy loam” with a value of 0.4 and “medium combinations of clay and loam” with a value of 0.2 which is a reasonable generalization based upon the field investigation by Paterson, available geological mapping and surrounding WWRs.

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

As part of the rezoning process, the City of Ottawa does not typically allow the use of tertiary treatment systems to support the re-zoning application, however, as the site is within the Carp Road Corridor, tertiary treatment systems can be used to support the re-zoning application. As a tertiary treatment system requires annual monitoring by the Ottawa Septic System Office (OSSO), and allows for advanced treatment of sewage effluent, a tertiary treatment system is being reviewed for the Subject Site. The mandatory monitoring required on tertiary treatment systems by the OSSO ensures that the system is properly maintained and replaced when required, whereas there is no mandatory monitoring on a conventional sewage system. In order to demonstrate the viability and sustainability aspects of private servicing on the subject site, a Nitrate Impact Assessment was completed using the above noted parameters.

The predicted nitrate concentration calculation for a conventional sewage system (system without nitrate reduction) results in a maximum of **1.58 m³/day** of effluent using a nitrate concentration of 40 mg/L. The inclusion of nitrate reduction technology (57 % nitrogen reduction in the effluent nitrate) would result in a maximum of **6.42 m³/day** of effluent using a nitrate concentration of 17.2 mg/L. The Waterloo-Biofilter technology (WaterNOx) is capable of up to 90% nitrate reduction, which would allow greater than **10 m³/day**. Both maximum sewage flow volumes with their respective reduced nitrate concentrations meet the nitrate concentration threshold of below 10 mg/L at the property boundary. Additional re-infiltration from stormwater (up to 10%) could be used to increase the dilution of septic effluent, if needed.



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

CONCLUSIONS

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

1. The water supply aquifer underlying the subject site is considered to be adequate to support the water quantity demands for the proposed zoning uses.
2. The preferred water supply intercepted by TW1 contains a water supply that is potable and contains only elevated concentrations of hardness and TDS. The noted parameters can be treated with current readily available water conditioning equipment.
3. Total Coliforms were detected at 0 ct/100 mL, however, it is recommended that a UV system is installed to assist in the removal of any potential Total Coliforms found in the groundwater, as a precautionary measure.
4. If desired by the property owner, a commercial grade water softener can be used to facilitate the reduction of the hardness concentration and reduce scaling. If a water softener is used for the proposed development, the owner should be made aware that additional sodium will be added to the water to reduce hardness. If desired, a point-of-use reverse osmosis system can be used to provide a drinking tap source without increasing sodium levels.
5. It is recommended that either a point-of-use reverse osmosis system be used to reduce the TDS concentration, or bulk bottled water is provided as a drinking water source.
6. The subject site is sufficient in size to accommodate two new sewage systems and meet all of the regulatory separation criteria. As a precautionary measure, a 30 m setback should be maintained between the drinking water well and any septic system components.
7. A maximum sewage flow volume of **1.58 m³/day** at a nitrate concentration of 40 mg/L or **6.42 m³/day** at a nitrate concentration of 17.2 mg/L can be accommodated on the subject site based on the current layout and still be below the predictive nitrate concentration threshold of 10 mg/L at the property boundary.



Angela Mariani

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PH5103-LET.01-REV.01

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

We trust that the current submission satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

Alexander Schopf, PhD, EIT



Michael Killam, P.Eng

Attachments:

- Key Plan
- MECP Water Well Records – 1973843 & 1974461
- Eurofins Certificate of Analysis
- Paterson PG3834 - Test Pit and Borehole Logs
- AQTESOLV - Pumping Test Analysis Reports
- Langlier Calculation
- Nitrate Impact Assessment Calculations
- Paterson Drawing PH5103-1 - Test Hole Location Plan
- Well Disinfection Instruction Sheet

Ottawa Head Office

9 Auriga Drive
Ottawa – Ontario – K2E 7T9
Tel: (613) 226-7381

Ottawa Laboratory

28 Concourse Gate
Ottawa – Ontario – K2E 7T7
Tel: (613) 226-7381

Northern Office and Laboratory

63 Gibson Street
North Bay – Ontario – P1B 8Z4
Tel: (705) 472-5331



patersongroup.ca



Figure 1 – Key Plan

CQ

UTM 18Z 41222180E



15 N°

3066

C 07/30/65

5R 5017910N

The Ontario Water Resources Commission Act

Elev. 4R 031818

Basin 25

WATER WELL RECORD

ONTARIO WATER
RESOURCES
COMMISSION

County or District

II

Lot. 10

Township, Village, Town or City

Huntley

Con.

Date completed

4

Nov

1965

dress 3159 Carling Ave

Casing and Screen Record

Pumping Test

Inside diameter of casing 5''
 Total length of casing 30'
 Type of screen
 Length of screen
 Depth to top of screen
 Diameter of finished hole 5''

Static level 25'
 Test-pumping rate 3 G.P.M.
 Pumping level 75'
 Duration of test pumping 1 hr
 Water clear or cloudy at end of test cloudy
 Recommended pumping rate 3 G.P.M.
 with pump setting of 60 + 35' tail pipe feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record

gravel & boulders
limestone

| From ft. | To ft. | Depth(s) at which water(s) found | Kind of water (fresh, salty, sulphur) |
|----------|--------|----------------------------------|---------------------------------------|
| 0' | 5' | 70 | sulphur |
| 5' | 100' | 95 | " |

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

new house

Is well on upland, in valley or on hillside?

upland

Drilling or Boring Firm

Capital Water
Supply

Address 1243 Feron Rd.

Ottawa 733-0600

Licence Number

1687

Name of Driller or Borer

G Colburne

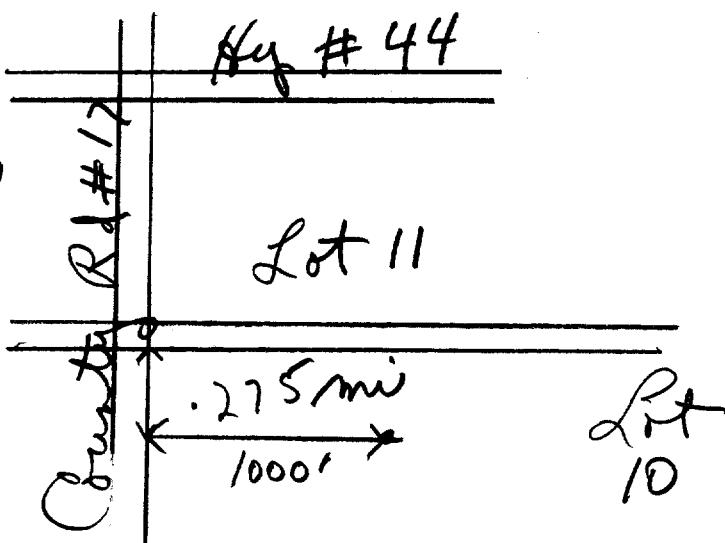
Address

Date 5 Nov 1965

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.





UTM 118 Z 421735 E

GROUND WATER BRANCH

JUN 15 1962 NO

3069

ONTARIO WATER
RESOURCES COMMISSION

Elev. 4 R 03180

Basin 25
County or District Carleton

WATER WELL RECORD

Township, Village, Town or City

Con. 2 Lot 11

Date completed

(day)

month

year

address

RR 3 Crys

Casing and Screen Record

Inside diameter of casing 4 $\frac{1}{2}$
 Total length of casing 12
 Type of screen
 Length of screen
 Depth to top of screen
 Diameter of finished hole 4"

Pumping Test

Static level 20'
 Test-pumping rate 6 G.P.M.
 Pumping level 55'
 Duration of test pumping 1 $\frac{1}{2}$
 Water clear or cloudy at end of test clear
 Recommended pumping rate 5 G.P.M.
 with pump setting of 100 feet below ground surface

Well Log

Overburden and Bedrock Record

previously drilled
limestone

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

70

70 130

125

fresh

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

Bar Edsparks

Address

Licence Number 700

Name of Driller or Borer Bar Edsparks

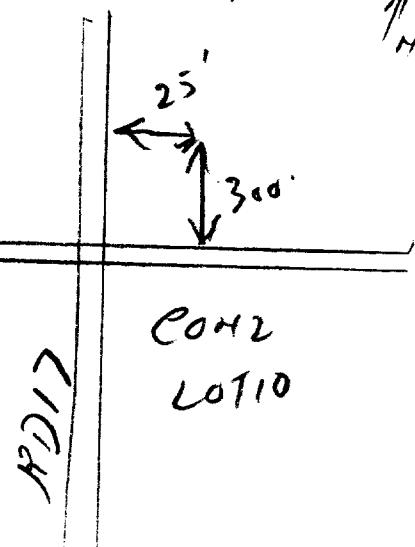
Address 413 Edgeworth

Date May 28/62

(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M Sets 60-9530

OWRC COPY



WTR 182 421660 E



RESOURCES COMMISSION

ONTARIO WATER

15 NO. 3127
MAY 17 1966WATER RESOURCES
COMMISSION

5R 5018059N The Ontario Water Resources Commission Act

Elev. 4R 0375

WATER WELL RECORD

Basin 25 County or District EAGLETON

Township, Village, Town or City

Con. 3 Lot 11

Date completed

15 MAR 66
(day month year)

Address

CARR RR

Casing and Screen Record

Inside diameter of casing 7
Total length of casing 10
Type of screen
Length of screen
Depth to top of screen
Diameter of finished hole 4

Pumping Test

Static level 15
Test-pumping rate 3 G.P.M.
Pumping level 50
Duration of test pumping 1 HR
Water clear or cloudy at end of test CLOUDY
Recommended pumping rate 3 G.P.M.
with pump setting of 70 feet below ground surface

Well Log

Overburden and Bedrock Record

GRAVEL

1 m or 3 ft

From
ft.To
ft.

0 10

10 81

Depth(s) at
which water(s)
foundKind of water
(fresh, salty,
sulphur)

FRESH

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

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

Drilling or Boring Firm

F P SPARKS

Address STITTSVILLE

Licence Number

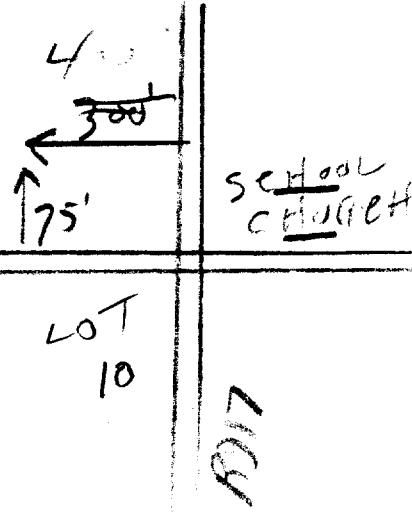
Name of Driller or Borer C. P. SPARKS

Address

Date 4/8/66

(Signature of Licensed Drilling or Boring Contractor)

Location of Well

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



WATER WELL RECORD

316/5d

Water management information

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

11

1510511

MUNICIP.

CON.

CON.

92

COUNTY OR DISTRICT

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE

Carleton

Huntley

1510511

CON., BLOCK, TRACT, SURVEY, ETC.

LOT 25-27

OWNER (NAME/NAME FIRST)

LAST

Huntley Corp.



Ministry of the Environment

The Ontario Water Resources Act

WATER WELL RECORD

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

11

1527642

MUNICIP.

CON.

62

| | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|---|---|---|---|---|---|---|---|----|-------------------------------|----|-----------|----|------------|----|--------|-----|----|----|
| 2. CHECK <input checked="" type="checkbox"/> CORRECT BOX WHERE APPLICABLE | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| COUNTY OR DISTRICT | | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE | | | | | | | | | | CON. BLOCK, TRACT, SURVEY ETC | | | | LOT | | 25-27 | | | |
| Ottawa, G. L. | | West Carleton - Huntley | | | | | | | | | | 2 | | | | 10 | | 10 | | | |
| | | | | | | | | | | | | DATE COMPLETED | | | | 48-53 | | | | | |
| | | 10 McGee Road Carp, Ontario K0A 1L0 | | | | | | | | | | DAY 20 | | | | MO 12 | | YR. 93 | | | |
| | | | | | | | | | | | | HRING | RC | ELEVATION | RC | BASIN CODE | | II | III | IV | |

LOG OF OVERTBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

31

32

| | | | | | |
|-------------------------------|---|----------------------------------|-------------------------------------|----|----|
| 1 | 2 | 10 | 14 | 15 | 21 |
| 41 WATER RECORD | | | | | |
| WATER FOUND AT - FEET | | KIND OF WATER | | | |
| 10-13 | | 1 <input type="checkbox"/> FRESH | 3 <input type="checkbox"/> SULPHUR | 14 | |
| 74 | | 2 <input type="checkbox"/> SALTY | 4 <input type="checkbox"/> MINERALS | 15 | |
| 15-18 | | 5 <input type="checkbox"/> GAS | 16 | | |
| 132 | | 1 <input type="checkbox"/> FRESH | 3 <input type="checkbox"/> SULPHUR | 19 | |
| 20-23 | | 2 <input type="checkbox"/> SALTY | 4 <input type="checkbox"/> MINERALS | 20 | |
| 147 | | 5 <input type="checkbox"/> GAS | 21 | | |
| 25-28 | | 1 <input type="checkbox"/> FRESH | 3 <input type="checkbox"/> SULPHUR | 24 | |
| NOT TESTED | | 2 <input type="checkbox"/> SALTY | 4 <input type="checkbox"/> MINERALS | 25 | |
| 30-33 | | 5 <input type="checkbox"/> GAS | 26 | | |
| 147 | | 1 <input type="checkbox"/> FRESH | 3 <input type="checkbox"/> SULPHUR | 29 | |
| NOT TESTED | | 2 <input type="checkbox"/> SALTY | 4 <input type="checkbox"/> MINERALS | 30 | |
| 30-33 | | 5 <input type="checkbox"/> GAS | 31 | | |

| 51 | | CASING & OPEN HOLE RECORD | | | |
|---------------------------|---|-----------------------------|--------------|-----|-------|
| INSIDE DIAM. INCHES | MATERIAL | WALL THICKNESS INCHES | DEPTH - FEET | | |
| FRM | TO | | | | |
| 6 17/4 | <input checked="" type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE <input type="checkbox"/> PLASTIC | .188 | 0 | 22 | 16 |
| 17-18 | <input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE <input type="checkbox"/> PLASTIC | 19 | | | 20-23 |
| 6 | <input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE <input type="checkbox"/> PLASTIC | | 22 | 155 | |
| 24-25 | <input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE <input type="checkbox"/> PLASTIC | 26 | | | 27-30 |

| SCREEN | 54 | 65 | 75 | 80 | |
|----------------------------------|--------------------------------------|---------------------------|-------|---------------------------|------------------------------------|
| SIZE(S) OF OPENING (SLOT NO.) | 31-33 | DIAMETER | 34-38 | LENGTH | 39-40 |
| MATERIAL AND TYPE | | | | INCHES | FEET |
| | | | | DEPTH TO TOP OF SCREEN | 41-44 |
| | | | | | 10 FEET |
| 61 | PLUGGING & SEALING RECORD | | | | |
| DEPTH SET AT - FEET | | MATERIAL AND TYPE | | | (CEMENT GROUT LEAD PACKER ETC.) |
| FROM | TO | | | | |
| 10-13 | 14-17 | | | | |
| 21 | 0 | Grouted Cement (4) | | | |
| 18-21 | 22-25 | | | | |
| 26-28 | 30-33 | 60 | | | |

| | | | | | | | | |
|---|--|--------------------------|---------------------|------------|----------------------------------|--|---|------------|
| PUMPING TEST METHOD | | 10 | PUMPING RATE | | 11-14 | DURATION OF PUMPING | | |
| 1 <input type="checkbox"/> PUMP | 2 <input checked="" type="checkbox"/> BAILER | | 8 | GPM | | 1 | 15-16 HOURS | 17-18 MINS |
| STATIC LEVEL | WATER LEVEL END OF PUMPING | 25 | WATER LEVELS DURING | | | 1 | <input checked="" type="checkbox"/> PUMPING | |
| 19-21 | 22-24 | | 15 MINUTES | 30 MINUTES | 45 MINUTES | 2 | <input type="checkbox"/> RECOVERY | |
| 14 FEET | 85 FEET | | 26-28 | 29-31 | 32-34 | | | 35-37 |
| IF FLOWING, GIVE RATE | | 38-41 | 76 FEET | 85 FEET | 85 FEET | 85 FEET | | 85 FEET |
| | | GPM | PUMP INTAKE SET AT | | WATER AT END OF TEST | | | 42 |
| RECOMMENDED PUMP TYPE | | RECOMMENDED PUMP SETTING | 43-45 | FEET | 1 <input type="checkbox"/> CLEAR | 2 <input checked="" type="checkbox"/> CLOUDY | | |
| <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP | | | 100 | FEET | RECOMMENDED PUMPING RATE | | 46-49 | |
| 50-53 | | | | | | 5 | GPM | |

LOCATION OF WELL

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

O.C. #5

8 km

36' FEET

36'

driveway

Mc Gee Road

6'

36°

✓

138065

138065

| | | | | | | | |
|-----------------|--------------------|----|---------------------------|-------|-------------------------------------|-------|----|
| OFFICE USE ONLY | DATA SOURCE | 58 | CONTRACTOR 1558 | 59-62 | DATE RECEIVED JAN 24 1994 | 63-68 | BO |
| | DATE OF INSPECTION | | INSPECTOR | | | | |
| REMARKS | | | | | | | |

MINISTRY OF THE ENVIRONMONT COPY

| | | | | |
|---|------|-------------------|----------|----------------------------------|
| Address of Well Location (Street Number/Name) | | Township | Lot | Concession |
| # 305 west lake Circle | | West Carleton | 10 | 3 |
| County/District/Municipality | | City/Town/Village | | Province |
| Ottawa - Carleton | | Carp | | Ontario |
| UTM Coordinates | Zone | Easting | Northing | Municipal Plan and Sublot Number |
| NAD 83 | 18 | 421900 | 5017952 | PLAN 4M-1316 |
| Other | | | | |
| 3/L 28 | | | | |

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 |
| | Sand, Gravel & Boulders | | | 0' | 17' |
| | Grey limestone | | | 17' | 135' |
| | Grey limestone & Sandstone Mix | | | 135' | 160' |
| | Grey limestone | | | 160' | 200' |

| Annular Space | | | | | |
|---------------------|-----|--|--|--|--|
| Depth Set at (m/ft) | | Type of Sealant Used (Material and Type) | Volume Placed (m ³ /ft ³) | | |
| From | To | | | | |
| 28' | 18' | Neat Cement Slurry | 7.8 | | |
| 18' | 0' | Neat Bentonite Slurry | 16.8 | | |

| 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"/> Other, specify |
| <input type="checkbox"/> Rotary (Conventional) | <input type="checkbox"/> Jetting | <input checked="" type="checkbox"/> Domestic | <input type="checkbox"/> Municipal | <input type="checkbox"/> Dewatering | |
| <input type="checkbox"/> Rotary (Reverse) | <input type="checkbox"/> Driving | <input type="checkbox"/> Livestock | <input type="checkbox"/> Test Hole | <input type="checkbox"/> Monitoring | |
| <input type="checkbox"/> Boring | <input type="checkbox"/> Digging | <input type="checkbox"/> Irrigation | <input type="checkbox"/> Cooling & Air Conditioning | | |
| <input checked="" type="checkbox"/> Air percussion | | <input type="checkbox"/> Industrial | | | |
| <input type="checkbox"/> Other, specify | | <input type="checkbox"/> Other, specify | | | |

| Construction Record - Casing | | | | Status of Well | |
|------------------------------|--|------------------------|--------------|----------------|-----|
| Inside Diameter (cm/in) | Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel) | Wall Thickness (cm/in) | Depth (m/ft) | From | To |
| 6" | Steel | 188" | 28' | 18' | 28' |
| 6" | Open hole | 28' | 200' | | |

| Construction Record - Screen | | | | Status of Well | |
|------------------------------|---------------------------------------|----------|--------------|----------------|----|
| 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 | Depth (m/ft) | Diameter (cm/in) |
| 1520 | <input type="checkbox"/> Gas | <input type="checkbox"/> Other, specify | |
| 1860 | <input type="checkbox"/> Gas | <input checked="" type="checkbox"/> Fresh <input type="checkbox"/> Untested | |
| Water found at Depth (m/ft) | Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested | 0' | 20' 6" |
| (m/ft) <input type="checkbox"/> Gas | <input type="checkbox"/> Other, specify | | |

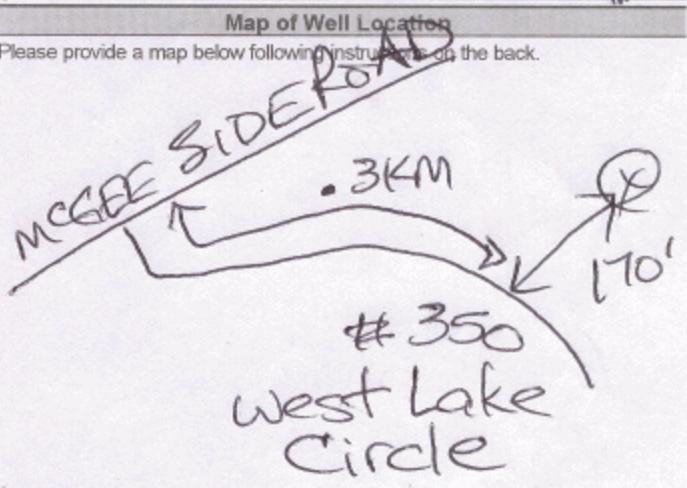
| Well Contractor and Well Technician Information | | |
|---|---|-------------------------|
| Business Name of Well Contractor | Well Contractor's Licence No. | |
| AIR ROCK DRILLING CO LTD | 1119 | |
| Business Address (Street Number/Name) | Municipality | |
| 1211 | RICHMOND | |
| Province | Postal Code | Business E-mail Address |
| ONT | K0A2Z0 | |
| Bus. Telephone No. (inc. area code) | Name of Well Technician (Last Name, First Name) | |
| 613 838 2170 | Graham REAN | |
| Well Technician's Licence No. | Signature of Technician and/or Contractor | Date Submitted |
| TB058 | REAN | 2010 03 15 |

| 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) | | |
| Static Level | 11' 7" | | 56' | | |
| 1 | 25 9" | 1 | 53 2" | | |
| 2 | 31 2" | 2 | 30' | | |
| 3 | 33 9" | 3 | 16 8" | | |
| 4 | 37 7" | 4 | 13 9" | | |
| 5 | 40 7" | 5 | 11 8" | | |
| 10 | 49 2" | 10 | 11' | | |
| 15 | 52 1" | 15 | | | |
| 20 | 53 4" | 20 | | | |
| 25 | 54 6" | 25 | | | |
| 30 | 55' | 30 | | | |
| 40 | 55 6" | 40 | | | |
| 50 | 55 8" | 50 | | | |
| 60 | 56' | 60 | | | |

| Map of Well Location | | |
|---|--|--|
| Please provide a map below following instructions on the back. | | |
| | | |
| Comments: Well owner's information package delivered <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Date Package Delivered 20100209 Date Work Completed 20100204 Received Ministry Use Only Audit No. Z 108236 MAR 22 2010 © Queen's Printer for Ontario, 2007 | | |

| | | | | | | | |
|---|--|--|---|-------------------------------------|-------------------------------|---------------------|----|
| Address of Well Location (Street Number/Name) | | | | Township | Lot | Concession | |
| # 350 WEST LAKE CIRCLE | | | | West Carleton | 10 | 3 | |
| County/District/Municipality | | | | City/Town/Village | | Province | |
| Ottawa-Carleton | | | | Carleton | | Ontario | |
| UTM Coordinates | Zone | Easting | Northing | Municipal Plan and Sublot Number | Postal Code | | |
| NAD 83 | 18 | 18465232 | 5029454 | PLAN # 4M-1316 | S1C#11 | | |
| 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 (mft) From | To |
| | Sand, Clay & Gravel Grey Limestone | | | | | 0' 15' | |
| | | | | | | 15' 12' | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Annular Space | | | | | | | |
| Depth Set at (mft) | From | To | Type of Sealant Used (Material and Type) | Volume Placed (m ³) | | | |
| 28' | 18' | | Neat Cement Slurry | 7.8 | | | |
| 18' | 0' | | Neat bentonite Slurry | 12.6 | | | |
| | | | | | | | |
| | | | | | | | |
| Method of Construction | | Well Use | | | Results of Well Yield Testing | | |
| <input type="checkbox"/> Cable Tool | <input type="checkbox"/> Diamond | <input type="checkbox"/> Public | <input type="checkbox"/> Commercial | <input type="checkbox"/> Not used | Draw Down | Recovery | |
| <input type="checkbox"/> Rotary (Conventional) | <input type="checkbox"/> Jetting | <input checked="" type="checkbox"/> Domestic | <input type="checkbox"/> Municipal | <input type="checkbox"/> Dewatering | Time (min) | Water Level (mft) | |
| <input type="checkbox"/> Rotary (Reverse) | <input type="checkbox"/> Driving | <input type="checkbox"/> Livestock | <input type="checkbox"/> Test Hole | <input type="checkbox"/> Monitoring | Time (min) | Water Level (mft) | |
| <input type="checkbox"/> Boring | <input type="checkbox"/> Digging | <input type="checkbox"/> Irrigation | <input type="checkbox"/> Cooling & Air Conditioning | <input type="checkbox"/> Monitoring | Static Level | 16'2" | |
| <input checked="" type="checkbox"/> Air percussion | | <input type="checkbox"/> Industrial | | | | 111'8" | |
| <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 (mft) | From | To | | |
| 6" | Steel | 188" | 28' | 12' | 28' | | |
| 5 5/16" | Open hole | | 28' | 120' | | | |
| | | | | | | | |
| Construction Record - Screen | | Status of Well | | | | | |
| Outside Diameter (cm/in) | Material (Plastic, Galvanized, Steel) | Slot No. | Depth (mft) | From | To | | |
| | | | | | | | |
| Water Details | | Hole Diameter | | | | | |
| Water found at Depth (mft) | Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify | Depth (mft) | From | To | Diameter (cm/in) | | |
| 112 | | 28' | 0' | 28' | 6" | | |
| Water found at Depth (mft) | Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify | 28' | 120' | 5 5/16" | | | |
| Water found at Depth (mft) | 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. | | | | |
| AIR ROCK DRILLING LTD | | | 1119 | | | | |
| Business Address (Street Number/Name) | | | Municipality | | | | |
| RR#1 | | | Richmond | | | | |
| Province | Postal Code | Business E-mail Address | | | | | |
| ONT | K0A 2Z0 | | | | | | |
| Bus. Telephone No. (inc. area code) | | | Name of Well Technician (Last Name, First Name) | | | | |
| 613-838-2170 | | | HOGAN DAN | | | | |
| Well Technician's Licence No. | | | Signature of Technician and/or Contractor | | Date Submitted | | |
| T3058 | | | K. Hogan | | 2010-09-03 | | |
| Comments: | | | | | | | |
| Well owner's information package delivered | | | Date Package Delivered | | | | |
| <input checked="" type="checkbox"/> Yes | | | 2010-09-01 | | | | |
| <input type="checkbox"/> No | | | Date Work Completed | | | | |
| | | | 2010-08-26 | | | | |
| Ministry Use Only | | | | | | | |
| Audit No. z110663 | | | | | | | |
| Received SEP 17 2010 | | | | | | | |

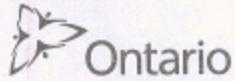
| | | |
|--|---|-------------------|
| After test of well yield, water was: | Draw Down | Recovery |
| <input type="checkbox"/> Clean and sand free | Time (min) | Water Level (mft) |
| <input type="checkbox"/> Other, specify | | |
| TESTED | | |
| If pumping discontinued, give reason: | | |
| 125 | | |
| Pump intake set at (mft) | | |
| 20 | | |
| Pumping rate (l/min / GPM) | | |
| 20 | | |
| Duration of pumping | 1 hrs + 0 min | |
| Final water level end of pumping (mft) | 111.8 | |
| If flowing give rate (l/min / GPM) | | |
| 100 | | |
| Recommended pump depth (mft) | | |
| 3/4HP-157PN 100 | | |
| Recommended pump rate (l/min / GPM) | | |
| 20 | | |
| Well production (l/min / GPM) | | |
| 20 | | |
| Disinfected? | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | |
| | | |
| | | |
| | | |
| | | |
| | | |



| | | | | | |
|--|-------------------------------|-------------------------|---|--|----------------|
| Business Name of Well Contractor | Well Contractor's Licence No. | | | | |
| AIR ROCK DRILLING LTD | 1119 | | | | |
| Business Address (Street Number/Name) | Municipality | | | | |
| RR#1 | Richmond | | | | |
| Province | Postal Code | Business E-mail Address | | | |
| ONT | K0A 2Z0 | | | | |
| Bus. Telephone No. (inc. area code) | | | Name of Well Technician (Last Name, First Name) | | |
| 613-838-2170 | | | HOGAN DAN | | |
| Well Technician's Licence No. | | | Signature of Technician and/or Contractor | | Date Submitted |
| T3058 | | | K. Hogan | | 2010-09-03 |
| Comments: | | | | | |
| Well owner's information package delivered | | | | | |
| <input checked="" type="checkbox"/> Yes | | | | | |
| <input type="checkbox"/> No | | | | | |
| Date Package Delivered | | | | | |
| 2010-09-01 | | | | | |
| Date Work Completed | | | | | |
| 2010-08-26 | | | | | |
| Ministry Use Only | | | | | |
| Audit No. z110663 | | | | | |
| Received SEP 17 2010 | | | | | |

| | | | | | | | | | |
|---|--|---|-------------------------------------|---|--|----------------------------|---|----------------------|-------|
| Address of Well Location (Street Number/Name) Lot 5 West Lake Estates | | | | Township West Carleton-Huntley | Lot 10 | | Concession 3 | | |
| County/District/Municipality Ottawa Carleton | | | | City/Town/Village Carp | | Province Ontario | | Postal Code | |
| UTM Coordinates NAD 83 | Zone 1 | Easting 421718 | Northing 5018158 | 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 | Soil | | | | | | | 0 | .60 |
| Brown | Shale | | | | Soft | | | .60 | 5.48 |
| Grey | Limestone | | Brown Layers | | Medium Soft | | | 5.48 | 70.40 |
| 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 Cement Slurry | | .21m 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 (Reversing 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) | | | | | | |
| 15.86 | Steel | .48 | From + .45 | To 8.83 | <input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____ | | | | |
| Construction Record - Screen | | | | | | | | | |
| Outside Diameter (cm/in) | Material (Plastic, Galvanized, Steel) | Slot No. | Depth (m/ft) | | | | | | |
| | | | From | To | | | | | |
| Water Details | | | | | | Hole Diameter | | | |
| Water found at Depth 70.10 m/ft | Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____ | | Depth (m/ft) | | | | | | |
| | | | From | To | | | | | |
| 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 _____ | | | | | | | | |
| 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 Capital Water Supply Ltd. | | | | Well Contractor's Licence No. 1 5 5 8 | | | | | |
| Business Address (Street Number/Name) Box 490 | | | | Municipality Stittsville | | | | | |
| Province Ontario | Postal Code K2S 1A6 | Business E-mail Address office@capitalwater.ca | | | | | | | |
| Bus. Telephone No. (inc. area code) 613 836 1766 | | Name of Well Technician (Last Name, First Name) Miller, Stephen | | | | | | | |
| Well Technician's Licence No. 0 0 9 7 | Signature of Technician and/or Contractor | | Date Submitted 20100727 | | Date Package Delivered 20100726 | | | Ministry Use Only | |
| | | | | Date Work Completed 20100726 | | | | | |
| | | | | | | | Audit No. z115581 | | |
| | | | | | | | Comments: LOT #5 WEST LAKE ESTATES McKEE SIDE RD. | | |

Ministry's Copy



Well Owner's Information

First Name E-mail Address Well Constructed by Well Owner

Mailing Address (Street Number/Name) Municipality Province Postal Code Telephone No. (inc. area code)
P.O. Box 569 Stittsville Ontario K2S 1A6 613 831 9041

Well Location

| Address of Well Location (Street Number/Name) | Township | Lot | Concession |
|---|--------------------------------|-----------|-------------|
| Lot 12 West Lake Estates | West Carleton - Huntley | 10 | 3 |
| County/District/Municipality | City/Town/Village | Province | Postal Code |
| Ontario, Canada | Gore | Ontario | |

| | | | | | | |
|-----------------|---|---|----|----------------------------------|---------|--|
| Ottawa Carleton | | | | Carp | | |
| UTM Coordinates | | | | Municipal Plan and Sublot Number | | |
| NAD | 8 | 3 | 18 | 422071 | 5017793 | |

Annular Space

| Depth Set at (m/ft) | | Type of Sealant Used (Material and Type) | Volume Placed (m ³ /ft ³) |
|---------------------|----|---|---|
| From | To | | |
| 37.48 | 0 | Grouted Bentonite Hole Plug (33 bags) | 3/8 inch |
| | | | |
| | | | |
| | | | |

Results of Well Yield Testing

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

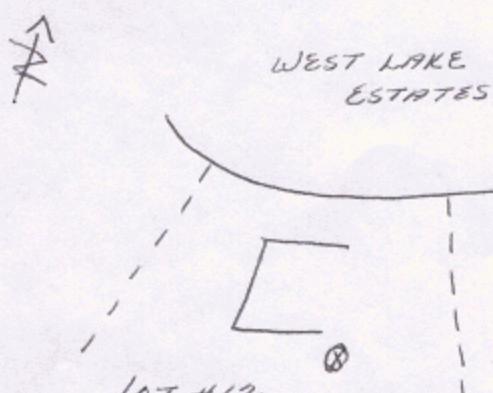
Construction Record Section

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

Abandoned, Poor Water Quality
 Abandoned, other, specify _____
 Other, specify _____

Map of Well Location

Please provide a map below following instructions on the back.



Smooth Kind of Water:

| | | | | |
|--|---|--|--|--|
| <i>(m/ft)</i> <input type="checkbox"/> Gas | <input type="checkbox"/> Other, specify _____ | | | |
| Water found at Depth | Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested | | | |
| <i>(m/ft)</i> <input type="checkbox"/> Gas | <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) | Municipality |

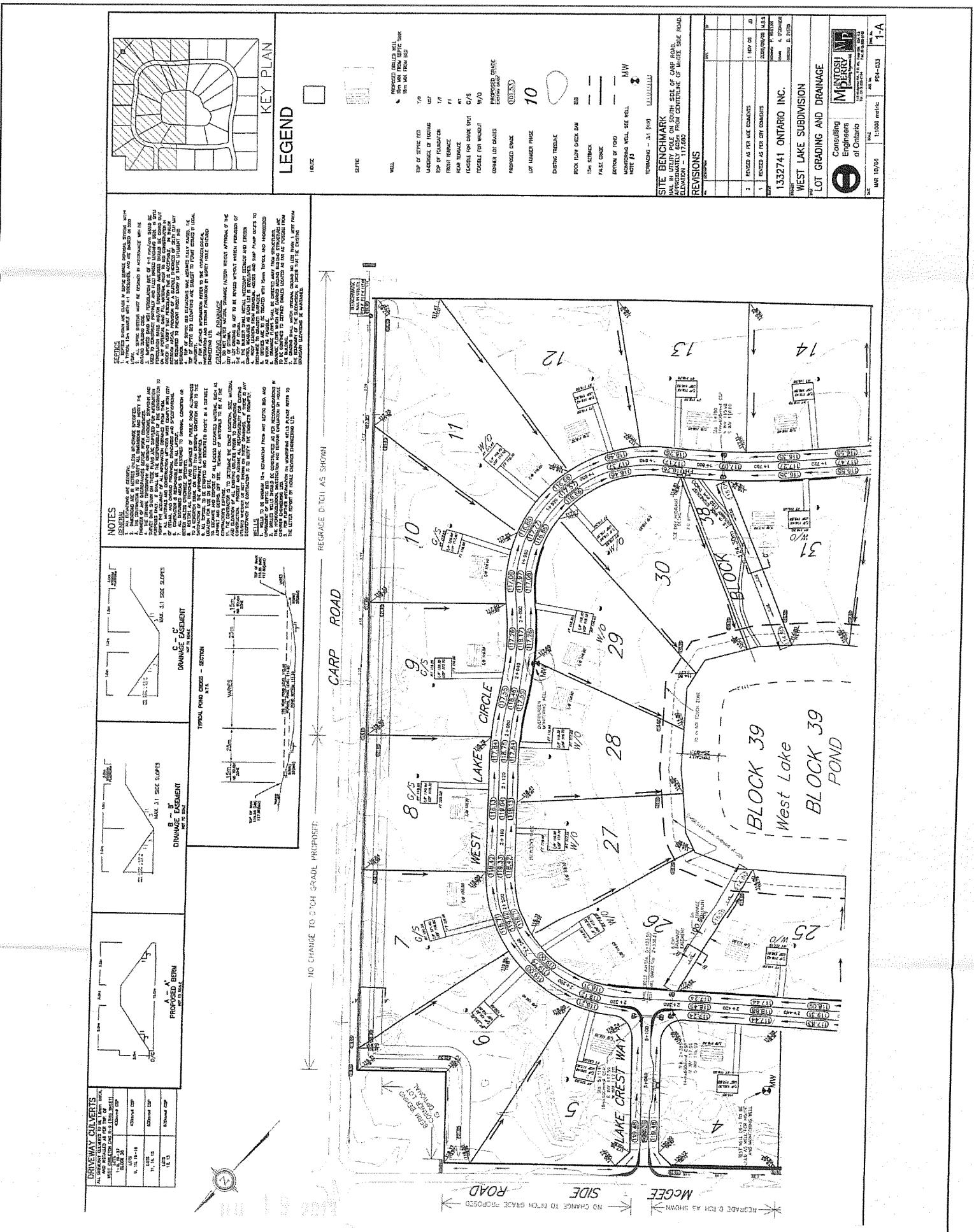
| | | | | | | | | | | | | |
|--|--|--|--|------------------------|---|---|---|-------------------|---|---|---|-----------|
| Comments: | | | | | | | | | | | | |
| Well owner's information package delivered | | | | Date Package Delivered | | | | Ministry Use Only | | | | |
| <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | | | | Y | Y | Y | Y | M | M | D | D | Audit No. |
| Date Work Completed | | | | | | | | | | | | |
| 2010 01 11 11 11 11 Received AUG 05 2011 | | | | | | | | | | | | |

Note: This **Well Record for Well Cluster Part 3 - Detailed Drawing of all Well Locations**, must be attached to Parts 1 and 2. The drawing must include all property boundaries, an arrow indicating the North direction, all named roads and sufficient measurements to locate all wells in the cluster in relation to fixed points. The drawing must show the location of each well and each well must be numbered on the drawing to match number used for that well on the **Well Record for Well Cluster Parts 1 and 2**. The well with the well tag must be clearly identified on the Drawing.

UTM coordinates should appear beside each well, if space permits. Additional comments on wells can be included on the drawing.

Well Tag Number: # A137237

"Well Record for Well Cluster" Form Audit Number: # Z 163946



6964 2163946

Client: Paterson Group
154 Colonnade Rd. South
Nepean, ON
K2E 7T7
Attention: Mr. Oliver Blume
PO#:
Invoice to: Paterson Group

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

Page 1 of 14

Dear Oliver Blume:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:



Addrine Thomas
2022.03.30 13:55:02 -04'00'

APPROVAL:

Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) 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: <http://www.cala.ca/scopes/2602.pdf>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Oliver Blume
 PO#:
 Invoice to: Paterson Group

Report Number: 1973843
 Date Submitted: 2022-03-23
 Date Reported: 2022-03-30
 Project: PH4484
 COC #: 887701

| | | | | | Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. | 1615821 GW 2022-03-22 GW1 | 1615822 GW 2022-03-22 GW2 |
|-------------------|---------------------|--------|-------|-----------|--|------------------------------------|------------------------------------|
| Group | Analyte | MRL | Units | Guideline | | | |
| Anions | Cl | 1 | mg/L | AO 250 | 135 | 142 | |
| | F | 0.10 | mg/L | MAC 1.5 | <0.10 | <0.10 | |
| | N-NO2 | 0.10 | mg/L | MAC 1.0 | <0.10 | <0.10 | |
| | N-NO3 | 0.10 | mg/L | MAC 10.0 | 3.15 | 3.02 | |
| | SO4 | 1 | mg/L | AO 500 | 182 | 175 | |
| General Chemistry | Alkalinity as CaCO3 | 5 | mg/L | OG 30-500 | 251 | 243 | |
| | Colour (Apparent) | 2 | TCU | AO 5 | <2 | <2 | |
| | Conductivity | 5 | uS/cm | | 1180 | 1180 | |
| | DOC | 0.5 | mg/L | AO 5 | 2.4 | 2.4 | |
| | pH | 1.00 | | 6.5-8.5 | 7.95 | 7.93 | |
| | Phenols | 0.001 | mg/L | | <0.001 | <0.001 | |
| | S2- | 0.01 | mg/L | AO 0.05 | <0.01 | <0.01 | |
| | TDS (COND - CALC) | 1 | mg/L | AO 500 | 767* | 767* | |
| | Turbidity | 0.1 | NTU | AO 5 | 0.5 | 0.5 | |
| Hardness | Hardness as CaCO3 | 1 | mg/L | OG 80-100 | 454* | 451* | |
| Indices/Calc | Ion Balance | 0.01 | | | 0.97 | 0.97 | |
| Mercury | Hg | 0.0001 | mg/L | MAC 0.001 | <0.0001 | <0.0001 | |
| Metals | Ag | 0.0001 | mg/L | | <0.0001 | <0.0001 | |
| | Al | 0.01 | mg/L | OG 0.1 | <0.01 | <0.01 | |
| | As | 0.001 | mg/L | IMAC 0.01 | <0.001 | <0.001 | |
| | B | 0.01 | mg/L | IMAC 5.0 | 0.04 | 0.04 | |
| | Ba | 0.01 | mg/L | MAC 1.0 | 0.12 | 0.12 | |
| | Be | 0.0005 | mg/L | | <0.0005 | <0.0005 | |
| | Ca | 1 | mg/L | | 162 | 161 | |
| | Cd | 0.0001 | mg/L | MAC 0.005 | <0.0001 | <0.0001 | |

Guideline = ODWSOG

*** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
 Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Oliver Blume
 PO#:
 Invoice to: Paterson Group

Report Number: 1973843
 Date Submitted: 2022-03-23
 Date Reported: 2022-03-30
 Project: PH4484
 COC #: 887701

| | | | | Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. | 1615821 GW 2022-03-22 GW1 | 1615822 GW 2022-03-22 GW2 |
|-----------------|-------------------------|--------|----------|--|------------------------------------|------------------------------------|
| Group | Analyte | MRL | Units | Guideline | | |
| Metals | Co | 0.0002 | mg/L | | <0.0002 | <0.0002 |
| | Cr | 0.001 | mg/L | MAC 0.05 | <0.001 | <0.001 |
| | Cu | 0.001 | mg/L | AO 1 | <0.001 | <0.001 |
| | Fe | 0.03 | mg/L | AO 0.3 | <0.03 | <0.03 |
| | K | 1 | mg/L | | 2 | 2 |
| | Mg | 1 | mg/L | | 12 | 12 |
| | Mn | 0.01 | mg/L | AO 0.05 | <0.01 | <0.01 |
| | Mo | 0.005 | mg/L | | <0.005 | <0.005 |
| | Na | 1 | mg/L | AO 200 | 77 | 75 |
| | Ni | 0.005 | mg/L | | <0.005 | <0.005 |
| | Pb | 0.001 | mg/L | MAC 0.010 | <0.001 | <0.001 |
| | Sb | 0.0005 | mg/L | IMAC 0.006 | <0.0005 | <0.0005 |
| | Se | 0.001 | mg/L | MAC 0.05 | <0.001 | <0.001 |
| | Sr | 0.001 | mg/L | | 0.879 | 0.876 |
| | Tl | 0.0001 | mg/L | | <0.0001 | <0.0001 |
| Microbiology | U | 0.001 | mg/L | MAC 0.02 | <0.001 | <0.001 |
| | V | 0.001 | mg/L | | <0.001 | <0.001 |
| Nutrients | Zn | 0.01 | mg/L | AO 5 | <0.01 | <0.01 |
| | Escherichia Coli | 0 | ct/100mL | MAC 0 | 0 | 0 |
| Subcontract | Total Coliforms | 0 | ct/100mL | MAC 0 | 19* | 23* |
| | N-NH3 | 0.010 | mg/L | | <0.010 | <0.010 |
| VOCs Surrogates | Total Kjeldahl Nitrogen | 0.100 | mg/L | | 0.252 | 0.477 |
| | Tannin & Lignin | 1 | mg/L | | | 1 |
| | | 1.0 | mg/L | | 1.0 | |
| | 1,2-dichloroethane-d4 | 0 | % | | 100 | 119 |

Guideline = ODWSOG

*** = Guideline Exceedence**

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Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Oliver Blume
 PO#:
 Invoice to: Paterson Group

Report Number: 1973843
 Date Submitted: 2022-03-23
 Date Reported: 2022-03-30
 Project: PH4484
 COC #: 887701

| | | | | Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. | 1615821 GW 2022-03-22 GW1 | 1615822 GW 2022-03-22 GW2 |
|-----------------|-----------------------------------|-----|-------|--|------------------------------------|------------------------------------|
| Group | Analyte | MRL | Units | Guideline | | |
| VOCs Surrogates | 4-bromofluorobenzene | 0 | % | | 71 | 76 |
| | Toluene-d8 | 0 | % | | 91 | 98 |
| Volatiles | 1,1,1,2-tetrachloroethane | 0.5 | ug/L | | <0.5 | <0.5 |
| | 1,1,1-trichloroethane | 0.4 | ug/L | | <0.4 | <0.4 |
| | 1,1,2,2-tetrachloroethane | 0.5 | ug/L | | <0.5 | <0.5 |
| | 1,1,2-trichloroethane | 0.4 | ug/L | | <0.4 | <0.4 |
| | 1,1-dichloroethane | 0.4 | ug/L | | <0.4 | <0.4 |
| | 1,1-dichloroethylene | 0.5 | ug/L | MAC 14 | <0.5 | <0.5 |
| | 1,2-dichlorobenzene | 0.4 | ug/L | MAC 200 | <0.4 | <0.4 |
| | 1,2-dichloroethane | 0.2 | ug/L | IMAC 5 | <0.2 | <0.2 |
| | 1,2-dichloropropane | 0.5 | ug/L | | <0.5 | <0.5 |
| | 1,3,5-trimethylbenzene | 0.3 | ug/L | | <0.3 | <0.3 |
| | 1,3-dichlorobenzene | 0.4 | ug/L | | <0.4 | <0.4 |
| | 1,3-Dichloropropylene (cis+trans) | 0.3 | ug/L | | <0.3 | <0.3 |
| | 1,4-dichlorobenzene | 0.4 | ug/L | MAC 5 | <0.4 | <0.4 |
| | Acetone | 30 | ug/L | | <30 | <30 |
| | Benzene | 0.5 | ug/L | MAC 1 | <0.5 | <0.5 |
| | Bromodichloromethane | 0.3 | ug/L | | <0.3 | <0.3 |
| | Bromoform | 0.4 | ug/L | | <0.4 | <0.4 |
| | Bromomethane | 0.5 | ug/L | | <0.5 | <0.5 |
| | c-1,2-Dichloroethylene | 0.4 | ug/L | | <0.4 | <0.4 |
| | c-1,3-Dichloropropylene | 0.2 | ug/L | | <0.2 | <0.2 |
| | Carbon Tetrachloride | 0.2 | ug/L | MAC 2 | <0.2 | <0.2 |
| | Chloroethane | 0.2 | ug/L | | <0.2 | <0.2 |
| | Chloroform | 0.5 | ug/L | | <0.5 | <0.5 |

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Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Oliver Blume
 PO#:
 Invoice to: Paterson Group

Report Number: 1973843
 Date Submitted: 2022-03-23
 Date Reported: 2022-03-30
 Project: PH4484
 COC #: 887701

| Group | Analyte | MRL | Units | Guideline | Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. | 1615821 GW 2022-03-22 GW1 | 1615822 GW 2022-03-22 GW2 |
|----------|--------------------------------|-----|-------|-----------|--|------------------------------------|------------------------------------|
| Volatile | Dibromochloromethane | 0.3 | ug/L | | <0.3 | <0.3 | |
| | Dichlorodifluoromethane | 0.5 | ug/L | | <0.5 | <0.5 | |
| | Dichloromethane | 4.0 | ug/L | MAC 50 | <4.0 | <4.0 | |
| | Ethylbenzene | 0.5 | ug/L | MAC 140 | <0.5 | <0.5 | |
| | Ethylene Dibromide | 0.2 | ug/L | | <0.2 | <0.2 | |
| | Hexane | 5 | ug/L | | <5 | <5 | |
| | m/p-xylene | 0.4 | ug/L | | <0.4 | <0.4 | |
| | Methyl Ethyl Ketone (MEK) | 10 | ug/L | | <10 | <10 | |
| | Methyl Isobutyl Ketone (MIBK) | 10 | ug/L | | <10 | <10 | |
| | Methyl Tert Butyl Ether (MTBE) | 2 | ug/L | AO 15 | <2 | <2 | |
| | Monochlorobenzene | 0.5 | ug/L | MAC 80 | <0.5 | <0.5 | |
| | o-xylene | 0.4 | ug/L | | <0.4 | <0.4 | |
| | Styrene | 0.5 | ug/L | | <0.5 | <0.5 | |
| | t-1,2-Dichloroethylene | 0.4 | ug/L | | <0.4 | <0.4 | |
| | t-1,3-Dichloropropylene | 0.2 | ug/L | | <0.2 | <0.2 | |
| | Tetrachloroethylene | 0.3 | ug/L | MAC 10 | <0.3 | <0.3 | |
| | Toluene | 0.4 | ug/L | MAC 60 | <0.4 | <0.4 | |
| | Trichloroethylene | 0.3 | ug/L | MAC 5 | <0.3 | <0.3 | |
| | Trichlorofluoromethane | 0.5 | ug/L | | <0.5 | <0.5 | |
| | Vinyl Chloride | 0.2 | ug/L | MAC 1 | <0.2 | <0.2 | |
| | Xylene; total | 0.5 | ug/L | MAC 90 | <0.5 | <0.5 | |

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Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Oliver Blume
 PO#:
 Invoice to: Paterson Group

Report Number: 1973843
 Date Submitted: 2022-03-23
 Date Reported: 2022-03-30
 Project: PH4484
 COC #: 887701

QC Summary

| Analyte | Blank | QC % Rec | QC Limits |
|---|--------------------|----------|-----------|
| Run No 418950 Analysis/Extraction Date 2022-03-23 | Analyst AaN | | |
| Method C SM2130B | | | |
| Turbidity | <0.1 NTU | 99 | 70-130 |
| Run No 418958 Analysis/Extraction Date 2022-03-24 | Analyst DRA | | |
| Method AMBCOLM1 | | | |
| Escherichia Coli | | | |
| Total Coliforms | | | |
| Run No 418995 Analysis/Extraction Date 2022-03-24 | Analyst Z S | | |
| Method M SM3120B-3500C | | | |
| Calcium | <1 mg/L | 95 | 90-110 |
| Potassium | <1 mg/L | 96 | 87-113 |
| Magnesium | <1 mg/L | 95 | 76-124 |
| Sodium | <1 mg/L | 102 | 82-118 |
| Run No 419016 Analysis/Extraction Date 2022-03-24 | Analyst SKH | | |
| Method EPA 350.1 | | | |
| N-NH3 | <0.010 mg/L | 113 | 80-120 |
| Run No 419027 Analysis/Extraction Date 2022-03-24 | Analyst SKH | | |
| Method EPA 351.2 | | | |
| Total Kjeldahl Nitrogen | <0.100 mg/L | 110 | 70-130 |

Guideline = ODWSOG

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Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Oliver Blume
 PO#:
 Invoice to: Paterson Group

Report Number: 1973843
 Date Submitted: 2022-03-23
 Date Reported: 2022-03-30
 Project: PH4484
 COC #: 887701

QC Summary

| Analyte | Blank | QC % Rec | QC Limits |
|-----------------------------|-------------------------------------|------------|-----------|
| Run No 419078 | Analysis/Extraction Date 2022-03-24 | Analyst YH | |
| Method EPA 8260 | | | |
| Tetrachloroethane, 1,1,1,2- | <0.5 ug/L | 92 | 60-130 |
| Trichloroethane, 1,1,1- | <0.4 ug/L | 88 | 60-130 |
| Tetrachloroethane, 1,1,2,2- | <0.5 ug/L | 114 | 60-130 |
| Trichloroethane, 1,1,2- | <0.4 ug/L | 104 | 60-130 |
| Dichloroethane, 1,1- | <0.4 ug/L | 94 | 60-130 |
| Dichloroethylene, 1,1- | <0.5 ug/L | 93 | 60-130 |
| Dichlorobenzene, 1,2- | <0.4 ug/L | 104 | 60-130 |
| Dichloroethane, 1,2- | <0.2 ug/L | 115 | 60-130 |
| Dichloropropane, 1,2- | <0.5 ug/L | 106 | 60-130 |
| 1,3,5-trimethylbenzene | <0.3 ug/L | 97 | 60-130 |
| Dichlorobenzene, 1,3- | <0.4 ug/L | 96 | 60-130 |
| Dichloropropene, 1,3- | <0.3 ug/L | | |
| Dichlorobenzene, 1,4- | <0.4 ug/L | 97 | 60-130 |
| Acetone | <30 ug/L | | 60-130 |
| Benzene | <0.5 ug/L | 100 | 60-130 |
| Bromodichloromethane | <0.3 ug/L | 108 | 60-130 |

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Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Oliver Blume
 PO#:
 Invoice to: Paterson Group

Report Number: 1973843
 Date Submitted: 2022-03-23
 Date Reported: 2022-03-30
 Project: PH4484
 COC #: 887701

QC Summary

| Analyte | Blank | QC % Rec | QC Limits |
|--------------------------------|-----------|----------|-----------|
| Bromoform | <0.4 ug/L | 104 | 60-130 |
| Bromomethane | <0.5 ug/L | 93 | 60-130 |
| Dichloroethylene, 1,2-cis- | <0.4 ug/L | 98 | 60-130 |
| Dichloropropene,1,3-cis- | <0.2 ug/L | 103 | 60-130 |
| Carbon Tetrachloride | <0.2 ug/L | 93 | 60-130 |
| Chloroethane | <0.2 ug/L | 91 | 60-130 |
| Chloroform | <0.5 ug/L | 100 | 60-130 |
| Dibromochloromethane | <0.3 ug/L | 96 | 60-130 |
| Dichlorodifluoromethane | <0.5 ug/L | 86 | 60-130 |
| Methylene Chloride | <4.0 ug/L | 113 | 60-130 |
| Ethylbenzene | <0.5 ug/L | 85 | 60-130 |
| Ethylene dibromide | <0.2 ug/L | 98 | 60-130 |
| Hexane (n) | <5 ug/L | 110 | 60-130 |
| m/p-xylene | <0.4 ug/L | 93 | 60-130 |
| Methyl Ethyl Ketone | <10 ug/L | 100 | 60-130 |
| Methyl Isobutyl Ketone | <10 ug/L | | 60-130 |
| Methyl tert-Butyl Ether (MTBE) | <2 ug/L | 110 | 60-130 |
| Chlorobenzene | <0.5 ug/L | 93 | 60-130 |

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Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Oliver Blume
 PO#:
 Invoice to: Paterson Group

Report Number: 1973843
 Date Submitted: 2022-03-23
 Date Reported: 2022-03-30
 Project: PH4484
 COC #: 887701

QC Summary

| Analyte | Blank | QC % Rec | QC Limits |
|------------------------------|-------------------------------------|-------------|-----------|
| o-xylene | <0.4 ug/L | 84 | 60-130 |
| Styrene | <0.5 ug/L | 90 | 60-130 |
| Dichloroethylene, 1,2-trans- | <0.4 ug/L | 89 | 60-130 |
| Dichloropropene,1,3-trans- | <0.2 ug/L | 112 | 60-130 |
| Tetrachloroethylene | <0.3 ug/L | 91 | 60-130 |
| Toluene | <0.4 ug/L | 96 | 60-130 |
| Trichloroethylene | <0.3 ug/L | 82 | 60-130 |
| Trichlorofluoromethane | <0.5 ug/L | 87 | 60-130 |
| Vinyl Chloride | <0.2 ug/L | 88 | 60-130 |
| Run No 419082 | Analysis/Extraction Date 2022-03-25 | Analyst YH | |
| Method EPA 8260 | | | |
| Xylene Mixture | | | |
| Run No 419088 | Analysis/Extraction Date 2022-03-25 | Analyst IP | |
| Method SM5530D/EPA420.2 | | | |
| Phenols | <0.001 mg/L | 50 | 50-120 |
| Run No 419093 | Analysis/Extraction Date 2022-03-25 | Analyst AsA | |
| Method C SM4500-S2-D | | | |
| S2- | <0.01 mg/L | 111 | 80-120 |

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Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Oliver Blume
 PO#:
 Invoice to: Paterson Group

Report Number: 1973843
 Date Submitted: 2022-03-23
 Date Reported: 2022-03-30
 Project: PH4484
 COC #: 887701

QC Summary

| Analyte | Blank | QC % Rec | QC Limits |
|---|------------|--------------------|-----------|
| Run No 419123 Analysis/Extraction Date 2022-03-28 | | Analyst AsA | |
| Method C SM2120C | | | |
| Colour (Apparent) | <2 TCU | 106 | 90-110 |
| Run No 419127 Analysis/Extraction Date 2022-03-28 | | Analyst AaN | |
| Method SM 4110 | | | |
| Chloride | <5 mg/L | | 90-110 |
| N-NO2 | <0.10 mg/L | 103 | 90-110 |
| N-NO3 | <0.10 mg/L | 104 | 90-110 |
| SO4 | <5 mg/L | 105 | 90-110 |
| Run No 419170 Analysis/Extraction Date 2022-03-25 | | Analyst AET | |
| Method SUBCONTRACT-A | | | |
| Tannin & Lignin | <1.0 mg/L | 106 | |
| Run No 419184 Analysis/Extraction Date 2022-03-28 | | Analyst AsA | |
| Method SM2320,2510,4500H/F | | | |
| Alkalinity (CaCO3) | <5 mg/L | 98 | 90-110 |
| Conductivity | <5 uS/cm | 101 | 90-110 |
| F | <0.10 mg/L | 99 | 90-110 |
| pH | | 100 | 90-110 |

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Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Oliver Blume
 PO#:
 Invoice to: Paterson Group

Report Number: 1973843
 Date Submitted: 2022-03-23
 Date Reported: 2022-03-30
 Project: PH4484
 COC #: 887701

QC Summary

| Analyte | Blank | QC % Rec | QC Limits |
|---|--------------|--------------------|-----------|
| Run No 419188 Analysis/Extraction Date 2022-03-28 | | Analyst AsA | |
| Method SM 5310B | | | |
| DOC | <0.5 mg/L | 102 | 80-120 |
| Run No 419190 Analysis/Extraction Date 2022-03-25 | | Analyst R K | |
| Method SUBCONTRACT-A | | | |
| Tannin & Lignin | <1.0 mg/L | 106 | |
| Run No 419203 Analysis/Extraction Date 2022-03-29 | | Analyst AET | |
| Method C SM2340B | | | |
| Hardness as CaCO ₃ | | | |
| Ion Balance | | | |
| TDS (COND - CALC) | | | |
| Run No 419228 Analysis/Extraction Date 2022-03-29 | | Analyst SD | |
| Method EPA 200.8 | | | |
| Silver | <0.0001 mg/L | 82 | 80-120 |
| Aluminum | <0.01 mg/L | 111 | 80-120 |
| Arsenic | <0.001 mg/L | 97 | 80-120 |
| Boron (total) | <0.01 mg/L | 116 | 80-120 |
| Barium | <0.01 mg/L | 102 | 80-120 |
| Beryllium | <0.0005 mg/L | 105 | 80-120 |

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Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Oliver Blume
 PO#:
 Invoice to: Paterson Group

Report Number: 1973843
 Date Submitted: 2022-03-23
 Date Reported: 2022-03-30
 Project: PH4484
 COC #: 887701

QC Summary

| Analyte | Blank | QC % Rec | QC Limits |
|----------------|-----------------|--------------------------|------------|
| Cadmium | <0.0001 mg/L | 101 | 80-120 |
| Cobalt | <0.0002 mg/L | 99 | 80-120 |
| Chromium Total | <0.001 mg/L | 94 | 80-120 |
| Copper | <0.001 mg/L | 106 | 80-120 |
| Iron | <0.03 mg/L | 99 | 80-120 |
| Manganese | <0.01 mg/L | 104 | 80-120 |
| Molybdenum | <0.005 mg/L | 99 | 80-120 |
| Nickel | <0.005 mg/L | 101 | 80-120 |
| Lead | <0.001 mg/L | 102 | 80-120 |
| Antimony | <0.0005 mg/L | 83 | 80-120 |
| Selenium | <0.001 mg/L | 108 | 80-120 |
| Strontium | <0.001 mg/L | 97 | 80-120 |
| Thallium | <0.0001 mg/L | 102 | 80-120 |
| Uranium | <0.001 mg/L | 99 | 80-120 |
| Vanadium | <0.001 mg/L | 98 | 80-120 |
| Zinc | <0.01 mg/L | 108 | 80-120 |
| Run No | 419288 | Analysis/Extraction Date | 2022-03-30 |
| Method | M SM3112B-3500B | | |
| Analyst | AaN | | |

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Certificate of Analysis

Client: Paterson Group
154 Colonnade Rd. South
Nepean, ON
K2E 7T7
Attention: Mr. Oliver Blume
PO#:
Invoice to: Paterson Group

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

QC Summary

| Analyte | Blank | QC % Rec | QC Limits |
|---------|--------------|----------|-----------|
| Mercury | <0.0001 mg/L | 96 | 76-123 |

Guideline = ODWSOG

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Client: Paterson Group
154 Colonnade Rd. South
Nepean, ON
K2E 7T7
Attention: Mr. Oliver Blume
PO#:
Invoice to: Paterson Group

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

Sample Comment Summary

Sample ID: 1615821 GW1 CI & SO4 MRL elevated due to matrix interference (dilution was done). Sediments not included for Hg analysis.

Sample ID: 1615822 GW2 CI & SO4 MRL elevated due to matrix interference (dilution was done). Sediments not included for Hg analysis.

Guideline = ODWSOG

*** = Guideline Exceedence**

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MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Paterson Group
154 Colonnade Rd. South
Nepean, ON
K2E 7T7
Attention: Mr. Oliver Blume
PO#: 32614
Invoice to: Paterson Group

Report Number: 1974461
Date Submitted: 2022-04-04
Date Reported: 2022-04-05
Project: PH4484
COC #: 889009

Page 1 of 2

Dear Oliver Blume:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Dragana
Dzeletovic
Dragana Dzeletovic 2022.04.05
16:55:16
-04'00'
APPROVAL: _____
Dragana Dzeletovic-Andric, Microbiology Team Lead

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) 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: <http://www.cala.ca/scopes/2602.pdf>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Oliver Blume
 PO#: 32614
 Invoice to: Paterson Group

Report Number: 1974461
 Date Submitted: 2022-04-04
 Date Reported: 2022-04-05
 Project: PH4484
 COC #: 889009

| | |
|---------------|------------|
| Lab I.D. | 1617476 |
| Sample Matrix | GW |
| Sample Type | |
| Sampling Date | 2022-04-04 |
| Sample I.D. | GW1 |

| Group | Analyte | MRL | Units | Guideline | |
|--------------|------------------|-----|----------|-----------|----|
| Microbiology | Escherichia Coli | 0 | ct/100mL | MAC 0 | 0 |
| | Total Coliforms | 0 | ct/100mL | MAC 0 | 4* |

Guideline = ODWSOG
*** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.

Analytical Method: AMBCOLM1

additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Environment Testing

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

OFFICIAL CERTIFICATE OF ANALYSIS : 4491110

WORK REQUEST : 100392148

Report Date : 2025-10-09

Nelson Water
 248 Westbrook Rd.
 Carp, Ontario
 K0A 1L0
 Attention : Customer Service

Reception Date : 2025-10-08
 Project : NELSON WATER - Non-Regulated
 Sampler : NA
 PO Number : Not Applicable
 Temperature : 14 °C

| Analysis | Quantity | External Method |
|---------------------------------------|----------|--------------------------|
| E.Coli and Total Coliforms (DC Plate) | 1 | Modified from MECP E3407 |

Criteria :

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

Sample status upon receipt :

9096463

Compliant

Notes :

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

Legend :

RL : Reporting limit

QC : Reference material (QC)

N/A : Not applicable

1 : Results in annex

* : Analysis conducted by external subcontracting

^ : Analysis not accredited

Environment Testing

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

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Nelson Water

Project : NELSON WATER - Non-Regulated

Reception Date: 2025-10-08

| | | | | | | | | | | |
|--|--|----|--------------------------------|----------|---|----------------|---|--|--|--|
| | | | Eurofins Sample No : | | | 9096463 | | | | |
| | | | Matrix : | | | Drinking water | | | | |
| | | | Sampling Date : | | | 2025-10-07 | | | | |
| | | | Client Sample Identification : | | | York - HOP | | | | |
| 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 | | | |

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 : Nelson Water

Project : NELSON WATER - Non-Regulated

Reception Date: 2025-10-08

| Parameter | Unit | RL | Blank | QC | | Matrix Spike | | Duplicate | | | | |
|---|-----------|----|-------|------------|---------|--------------|---------|-----------|---------|--|--|--|
| | | | | Recovery % | Range % | Recovery % | Range % | RPD % | Range % | | | |
| E.Coli and Total Coliforms (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 | | | |
| Total Coliforms (DC) | CFU/100mL | 0 | 0 | | | | | - | 0-30 | | | |
| Associated Samples : 9096463 | | | | | | | | | | | | |
| Prep Date: 2025-10-08 Analysis Date: 2025-10-09 | | | | | | | | | | | | |

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



DRINKING WATER CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

100392148



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Environment Testing

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

OFFICIAL CERTIFICATE OF ANALYSIS : 4492546

WORK REQUEST : 100392167

Report Date : 2025-10-14

Nelson Water
 248 Westbrook Rd.
 Carp, Ontario
 K0A 1L0
 Attention : Customer Service

Reception Date : 2025-10-08
 Project : NELSON WATER - Non-Regulated
 Sampler : NA
 PO Number : Not Applicable
 Temperature : 14 °C

| Analysis | Quantity | External Method |
|--|----------|-----------------------------|
| Nitrate and Nitrite (Water, Colorimetry) | 1 | Modified from SM 4500-NO3-F |

Criteria :

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

Sample status upon receipt :

9096602

Compliant

Notes :

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

Legend :

RL : Reporting limit

QC : Reference material (QC)

N/A : Not applicable

1 : Results in annex

* : Analysis conducted by external subcontracting

^ : Analysis not accredited

Environment Testing

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

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Nelson Water

Project : NELSON WATER - Non-Regulated

Reception Date: 2025-10-08

| | | | | | | | | | | |
|---|--|-----|--------------------------------|----------|--|----------------|---|-------|--|--|
| | | | Eurofins Sample No : | | | 9096602 | | | | |
| | | | Matrix : | | | Drinking water | | | | |
| | | | Sampling Date : | | | 2025-10-07 | | | | |
| | | | Client Sample Identification : | | | YORK - HOP | | | | |
| Nutrients | | RL | Unit | Criteria | | A | B | C | | |
| Nitrate and Nitrite (Water, Colorimetry) | | | | | | | | | | |
| Nitrate (as Nitrogen) | | 0.1 | mg/L | 10.0 | | | | 0.25 | | |
| Nitrate + Nitrite (as Nitrogen) | | 0.1 | mg/L | | | | | 0.25 | | |
| Nitrite (as Nitrogen) | | 0.1 | mg/L | 1.0 | | | | <0.10 | | |

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 : Nelson Water

Project : NELSON WATER - Non-Regulated

Reception Date: 2025-10-08

| Parameter | Unit | RL | Blank | QC | | Matrix Spike | | Duplicate | | | | |
|---|------|-----|-------|------------|---------|--------------|---------|--|---------|--|--|--|
| | | | | Recovery % | Range % | Recovery % | Range % | RPD % | Range % | | | |
| Nitrate and Nitrite (Water, Colorimetry) | | | | | | | | | | | | |
| <i>Method : Nitrates/Nitrites (Water, Colorimetry). Internal method: OTT-I-NUT-WI46199.</i> | | | | | | | | | | | | |
| Nitrate (as Nitrogen) | mg/L | 0.1 | <0.10 | 99 | 80-120 | | | 8 | 0-20 | | | |
| Nitrate + Nitrite (as Nitrogen) | mg/L | 0.1 | <0.10 | 99 | 80-120 | 104 | 80-120 | 5 | 0-20 | | | |
| Nitrite (as Nitrogen) | mg/L | 0.1 | <0.10 | 106 | 80-120 | 104 | 80-120 | - | 0-20 | | | |
| Associated Samples : 9096602 | | | | | | | | Prep Date: 2025-10-09 Analysis Date: 2025-10-09 | | | | |

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



DRINKING WATER CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5221

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DATUM Geodetic

FILE NO.

PG3834

REMARKS

HOLE NO.

TP 1-22

BORINGS BY Backhoe

DATE 2022 February 8

SOIL DESCRIPTION

GROUND SURFACE

TOPSOIL

0.15 m: **FILL:** Brown silty sand with gravel

0.40 m: Brown **SILTY SAND** with gravel, cobbles and boulders, trace clay

1.25 m: Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock

1.83 m: End of Test Pit

TP terminated on fractured bedrock surface at 1.83 m depth
(TP dry upon completion)

STRATA PLOT

| DEPTH (m) | ELEV. (m) | SAMPLE | | | | Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone |
|-------------|-----------|--------|--------|------------|----------------|--|
| | | TYPE | NUMBER | % RECOVERY | N VALUE or RQD | |
| 0 - 1.25 | 120.05 | G | 1 | | | ● 50 mm Dia. Cone |
| 1.25 - 1.83 | 119.05 | G | 2 | | | ○ Water Content % |
| | | G | 3 | | | 20 40 60 80 |
| | | G | 4 | | | 20 40 60 80 100 |

Piezometer Construction

DATUM Geodetic

FILE NO.

PG3834

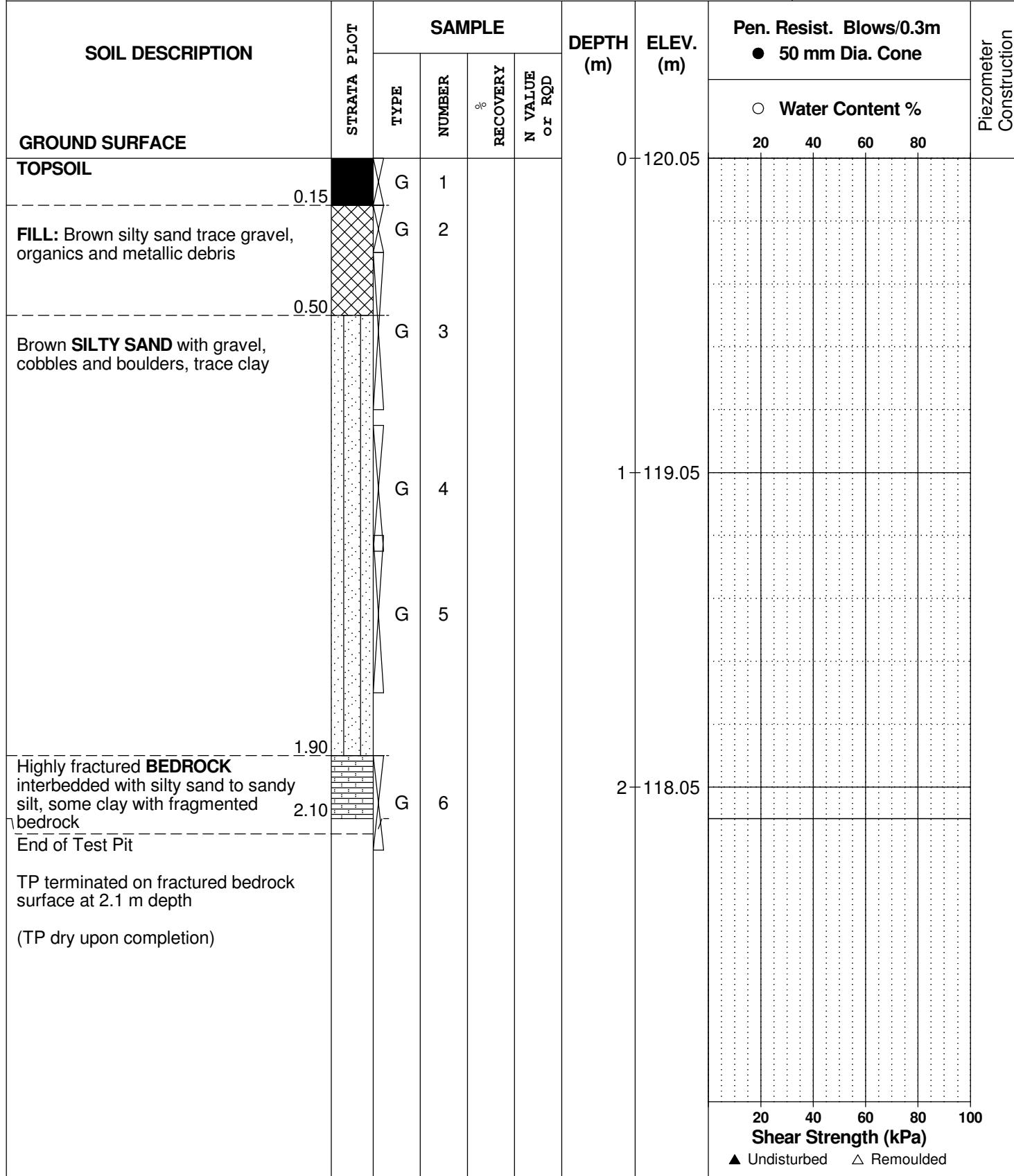
REMARKS

HOLE NO

TP 2-22

BORINGS BY Backhoe

DATE 2022 February 8



DATUM Geodetic

FILE NO.

PG3834

REMARKS

HOLES NO

TP 3-22

BORINGS BY Backhoe

DATE 2022 February 8

SOIL DESCRIPTION

GROUND SURFACE

TOPSOIL

Brown **SILTY SAND** with gravel, cobbles and boulders

0.10

Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock

1.20

1.45

End of Test Pit

TP terminated on fractured bedrock surface at 1.45 m depth

(TP dry upon completion)

STRATA PLOT

SAMPLE

| TYPE | NUMBER | % RECOVERY | N VALUE or ROD | DEPTH (m) | ELEV. (m) | Pen. Resist. Blows/0.3m | |
|------|--------|---------------|----------------------|--------------|--------------|-------------------------|-------------------------|
| | | | | | | ● 50 mm Dia. Cone | ○ Water Content % |
| G | 1 | | | 0 | 119.19 | 20 40 60 80 | Piezometer Construction |
| G | 2 | | | | | | |
| G | 3 | | | | | | |
| G | 4 | | | | | | |

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

FILE NO.
PG3834

HOLE NO.
TP 4-22

DATE 2022 February 8

| SOIL DESCRIPTION | STRATA PLOT | SAMPLE | | | | DEPTH (m) | ELEV. (m) | Pen. Resist. Blows/0.3m | | | | Piezometer Construction |
|--|-------------|--------|--------|------------|----------------|-----------|-----------|-------------------------|-------------------|----|----|-------------------------|
| | | TYPE | NUMBER | % RECOVERY | N VALUE or ROD | | | ● 50 mm Dia. Cone | ○ Water Content % | 20 | 40 | |
| GROUND SURFACE | | | | | | | | | | | | |
| TOPSOIL | | G | 1 | | | 0 | 118.33 | | | | | |
| Brown SILTY SAND with gravel, cobbles and boulders | | G | 2 | | | | | | | | | |
| | | G | 3 | | | | | | | | | |
| 0.15 | | | | | | | | | | | | |
| 1.00 | | | | | | 1 | 117.33 | | | | | |
| End of Test Pit | | | | | | | | | | | | |
| TP terminated on possible boulder or inferred fractured bedrock surface at 1.0 m depth | | | | | | | | | | | | |
| (TP dry upon completion) | | | | | | | | | | | | |
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DATUM Geodetic

FILE NO.

PG3834

REMARKS

HOLE NO.

TP 5-22

BORINGS BY Backhoe

DATE 2022 February 8

DATUM Geodetic

FILE NO.

PG3834

REMARKS

HOLE NO.

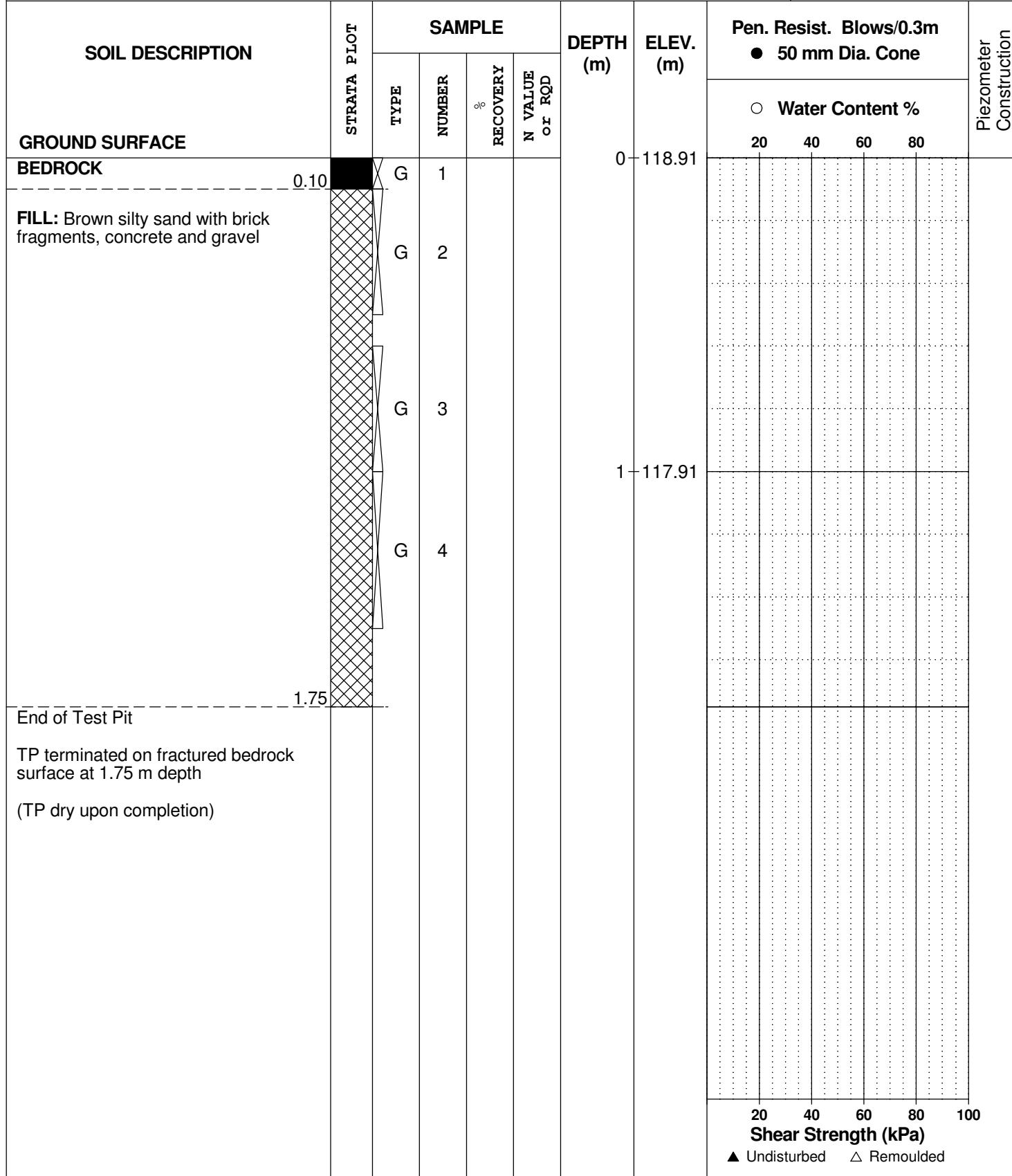
TP 6-22

BORINGS BY Backhoe

DATE 2022 February 8

HOLE NO.

TP 6-22



DATUM Geodetic

FILE NO.

PG3834

REMARKS

HOLE NO.

TP 7-22

BORINGS BY Backhoe

DATE 2022 February 8

SOIL DESCRIPTION

GROUND SURFACE

TOPSOIL

0.15

FILL: Brown silty sand with gravel some clay

1.05

Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock

1.50

End of Test Pit

TP terminated on fractured bedrock surface at 1.50 m depth

(TP dry upon completion)

STRATA PLOT

SAMPLE

TYPE

NUMBER

%
RECOVERY

N
VALUE
or RQD

DEPTH
(m)

ELEV.
(m)

Pen. Resist. Blows/0.3m

● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

Piezometer Construction

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

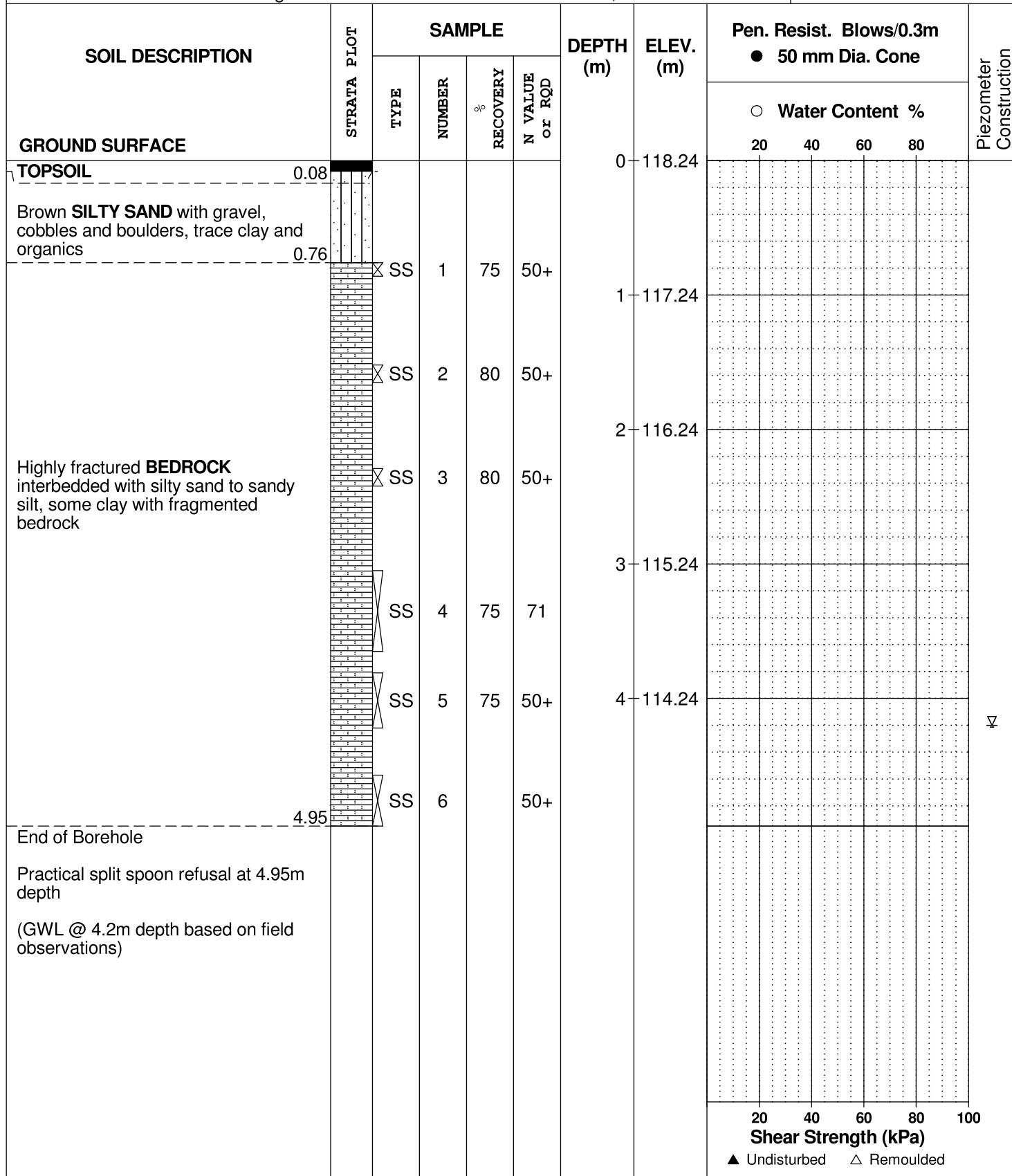
FILE NO. PG3834

REMARKS

HOLE NO. BH 1

BORINGS BY CME 55 Power Auger

DATE June 1, 2016



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

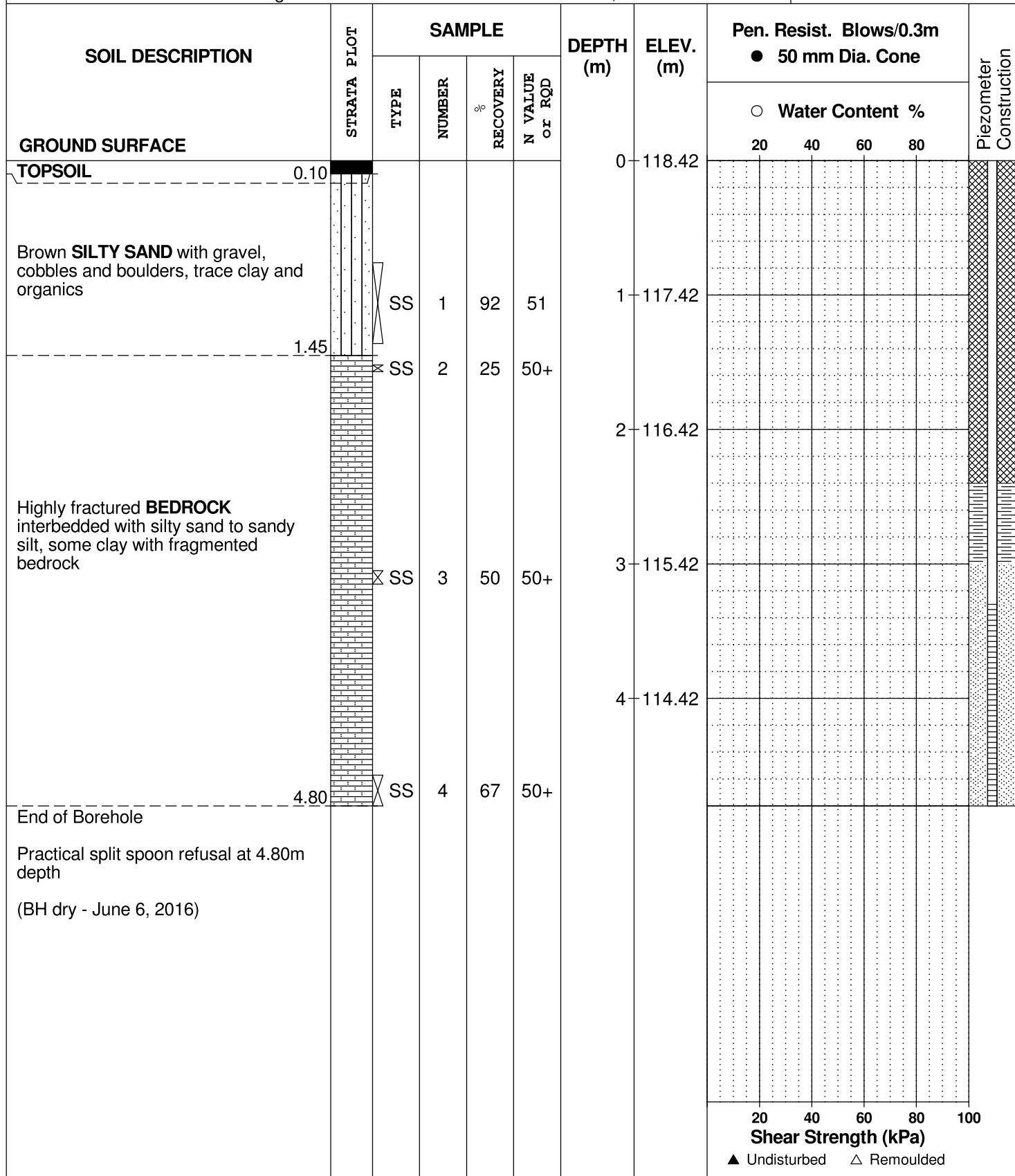
FILE NO. PG3834

REMARKS

HOLE NO. BH 2

BORINGS BY CME 55 Power Auger

DATE June 1, 2016



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO.

PG3834

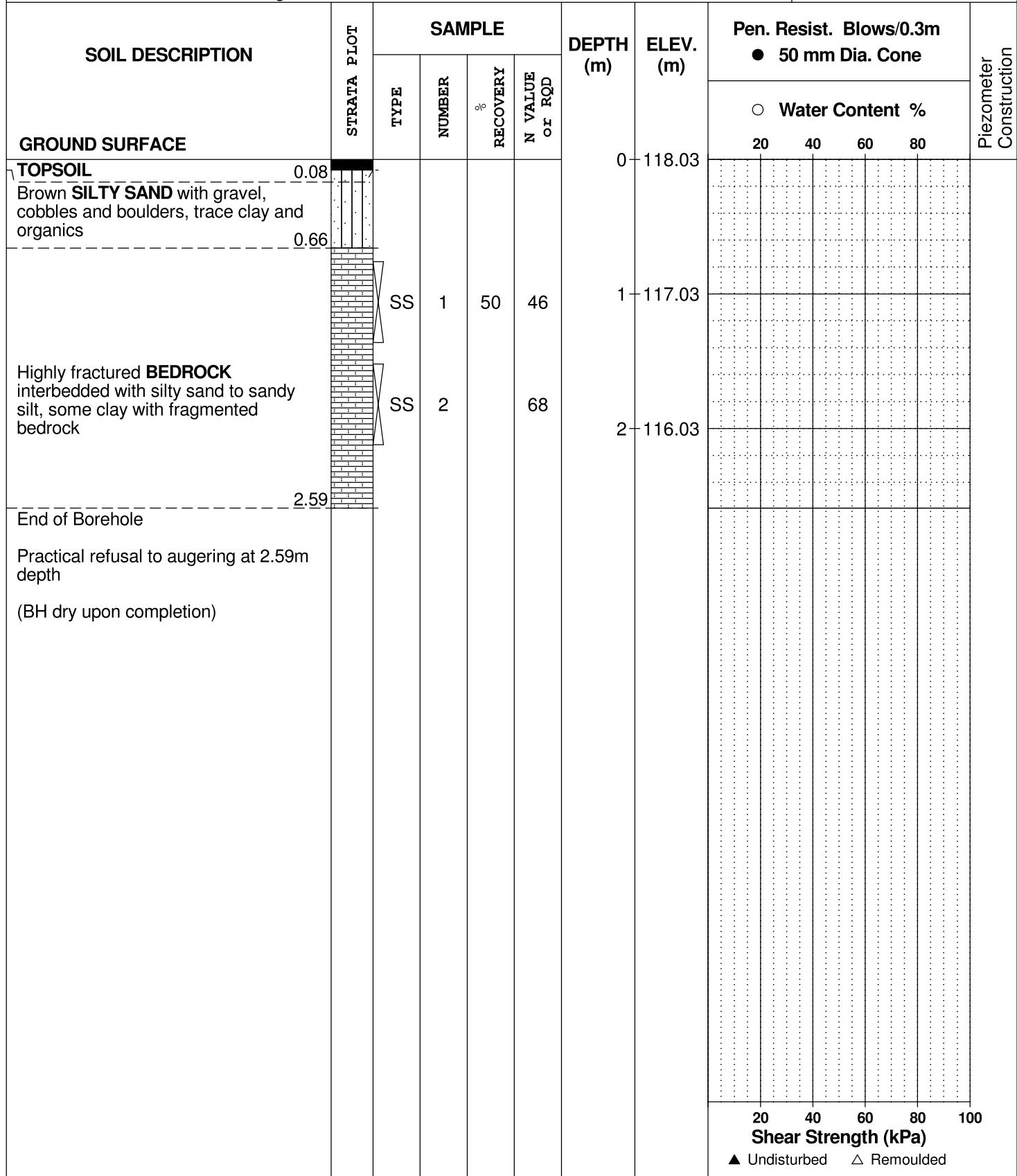
REMARKS

HOLE NO.

BH 4

BORINGS BY CME 55 Power Auger

DATE June 1, 2016



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO.

PG3834

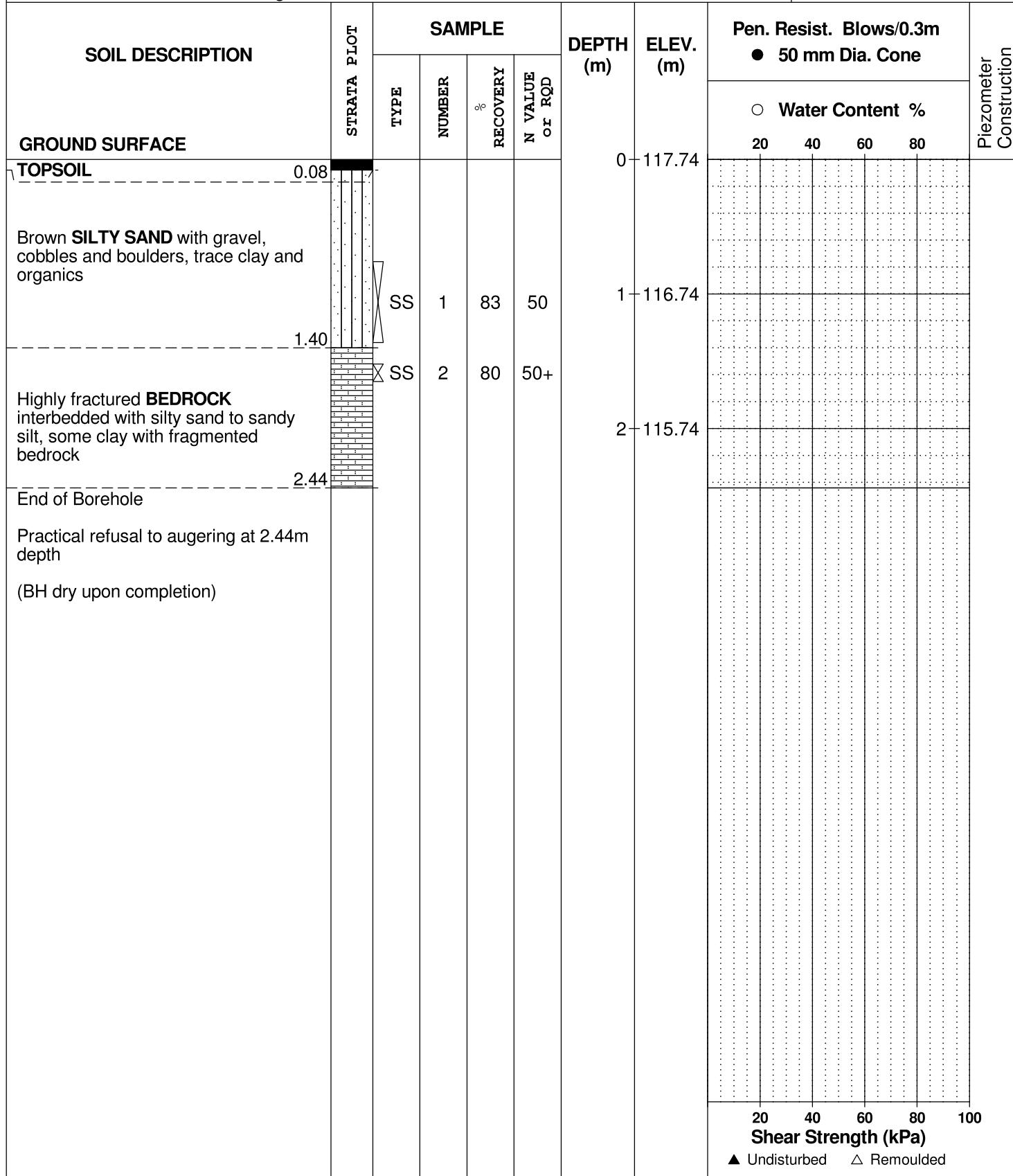
REMARKS

HOLE NO.

BH 5

BORINGS BY CME 55 Power Auger

DATE June 1, 2016



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. **PG3834**

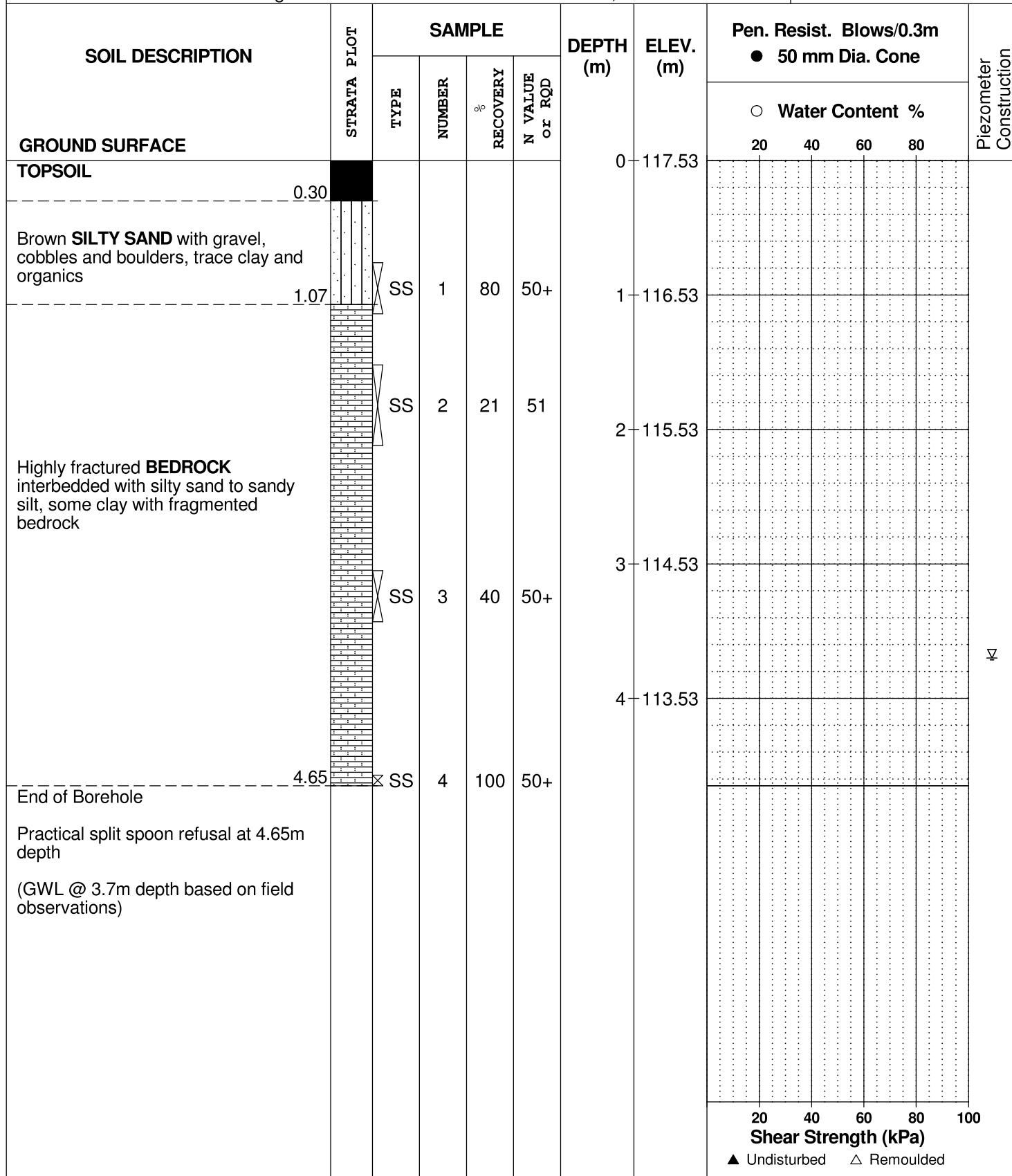
REMARKS

HOLE NO. **BLUE**

BORINGS BY CME 55 Power Auger

DATE June 1, 2016

HOLE NO. BH 7



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. **PG3834**

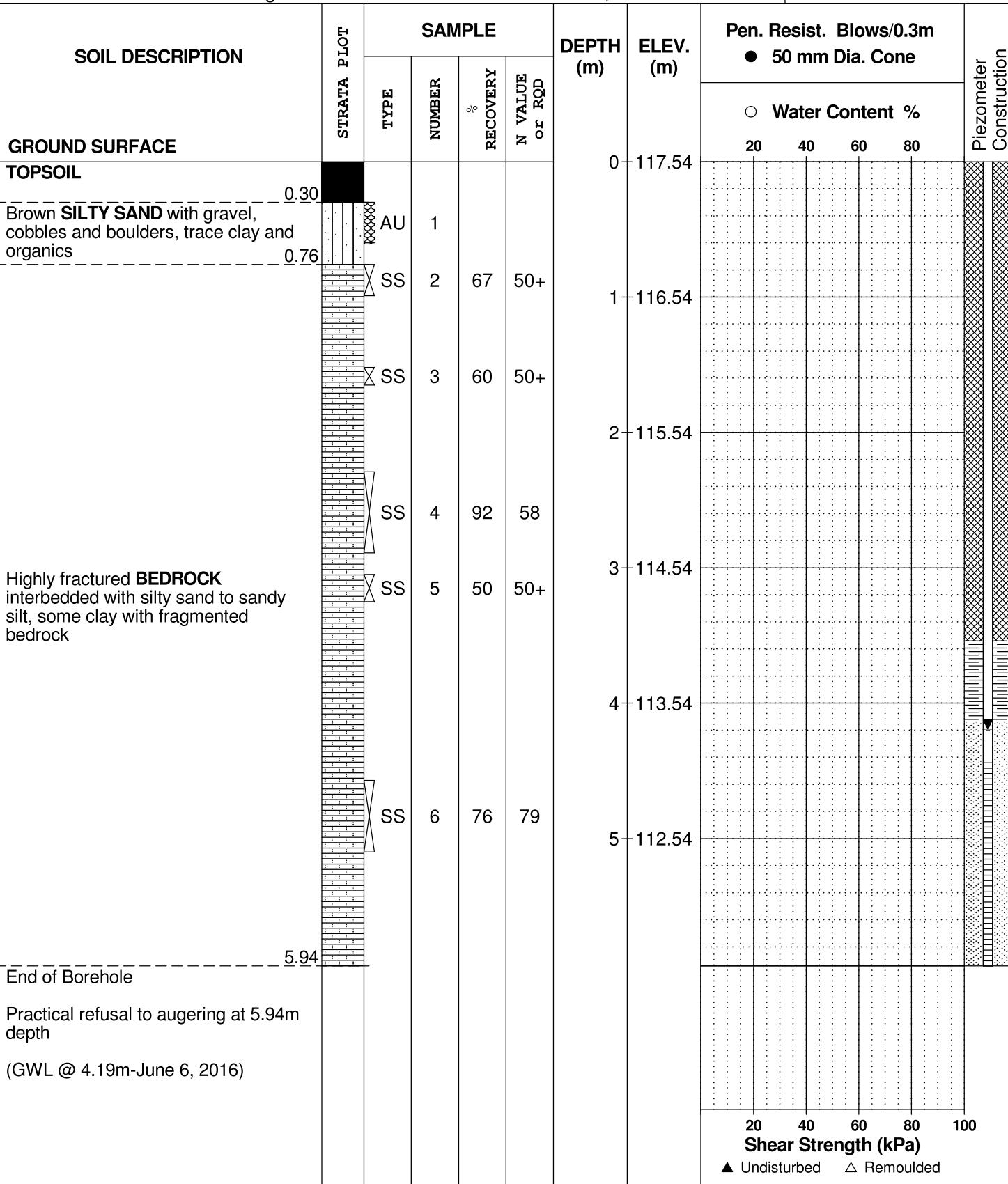
REMARKS

BORINGS BY CME 55 Power Auger

DATE June 2, 2016

HOLE NO. **BU-8**

HOLE NO. BH 8



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. **PG3834**

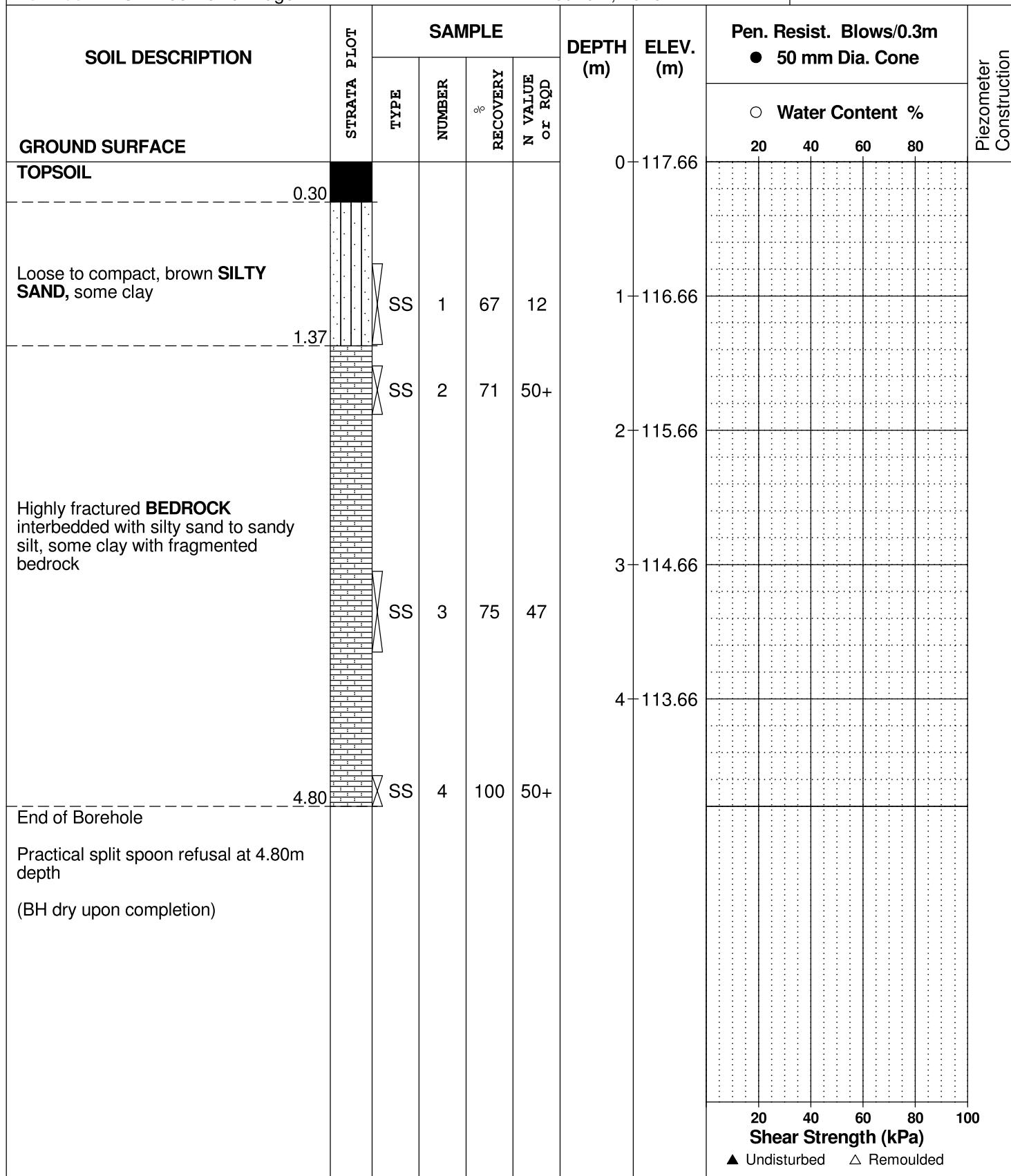
REMARKS

BORINGS BY CME 55 Power Auger

DATE June 2, 2016

HOLE NO.

HOLE NO. **RH 8**



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

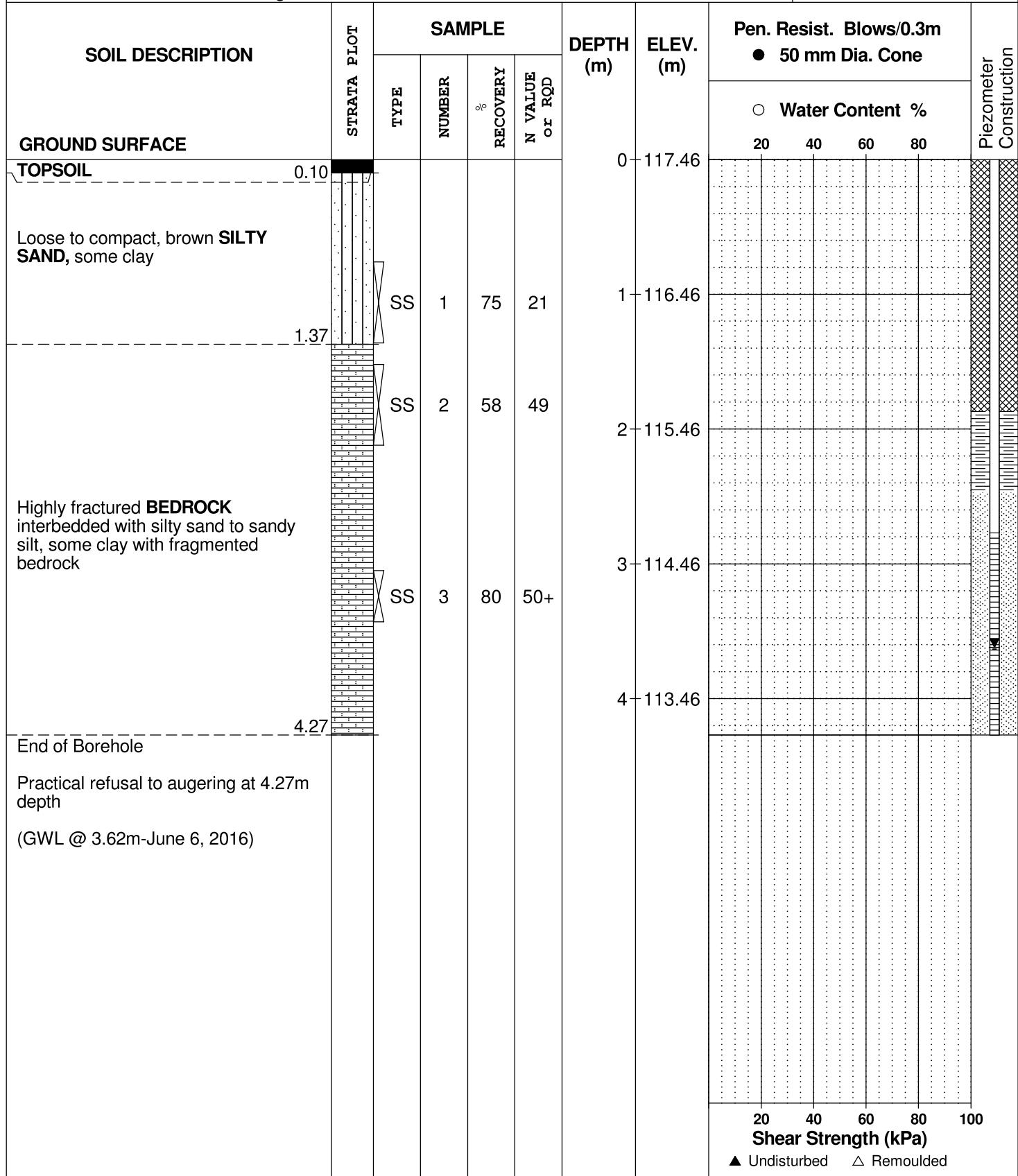
FILE NO. PG3834

REMARKS

HOLE NO. BH10

BORINGS BY CME 55 Power Auger

DATE June 2, 2016



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO.

PG3834

HOLE NO

TP 2

REMARKS

BORINGS BY Backhoe

DATE November 3, 2016

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. **PG3834**

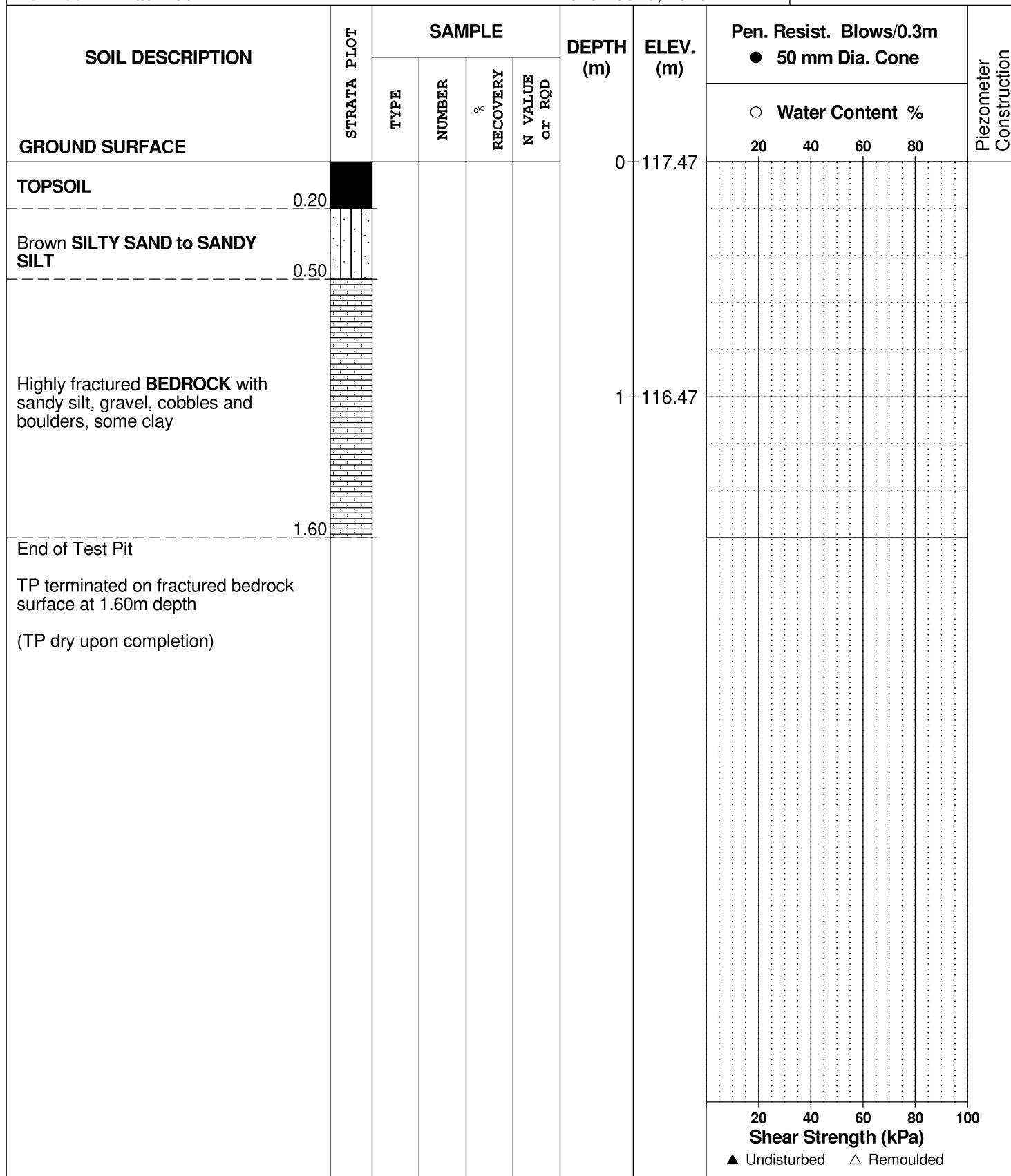
REMARKS

BORINGS BY Backhoe

DATE November 3, 2016

HOLE NO. TP 2

HOLE NO. **TP 8**



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. **PG3834**

HOLE NO. **TD 6**

REMARKS

BORINGS BY Backhoe

DATE November 3, 2016

| SOIL DESCRIPTION | STRATA PLOT | SAMPLE | | | DEPTH (m) | ELEV. (m) | Pen. Resist. Blows/0.3m | | | |
|---|-------------|--------|--------|---------------|-----------|------------|-------------------------|----|----|----|
| | | TYPE | NUMBER | % RECOVERY | | | ● 50 mm Dia. Cone | | | |
| GROUND SURFACE | | | | | | | | | | |
| TOPSOIL | 0.10 | | | | | 0 - 118.08 | | 20 | 40 | 60 |
| Highly fractured BEDROCK | 0.40 | | | | | | | 80 | | |
| End of Test Pit | | | | | | | | | | |
| TP terminated on fractured bedrock surface at 0.40m depth | | | | | | | | | | |
| (TP dry upon completion) | | | | | | | | | | |
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DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. **PG3834**

REMARKS

HOLE NO. 10

BORINGS BY Backhoe

DATE November 3, 2016

HOLE NO. TR 7

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. **PG3834**

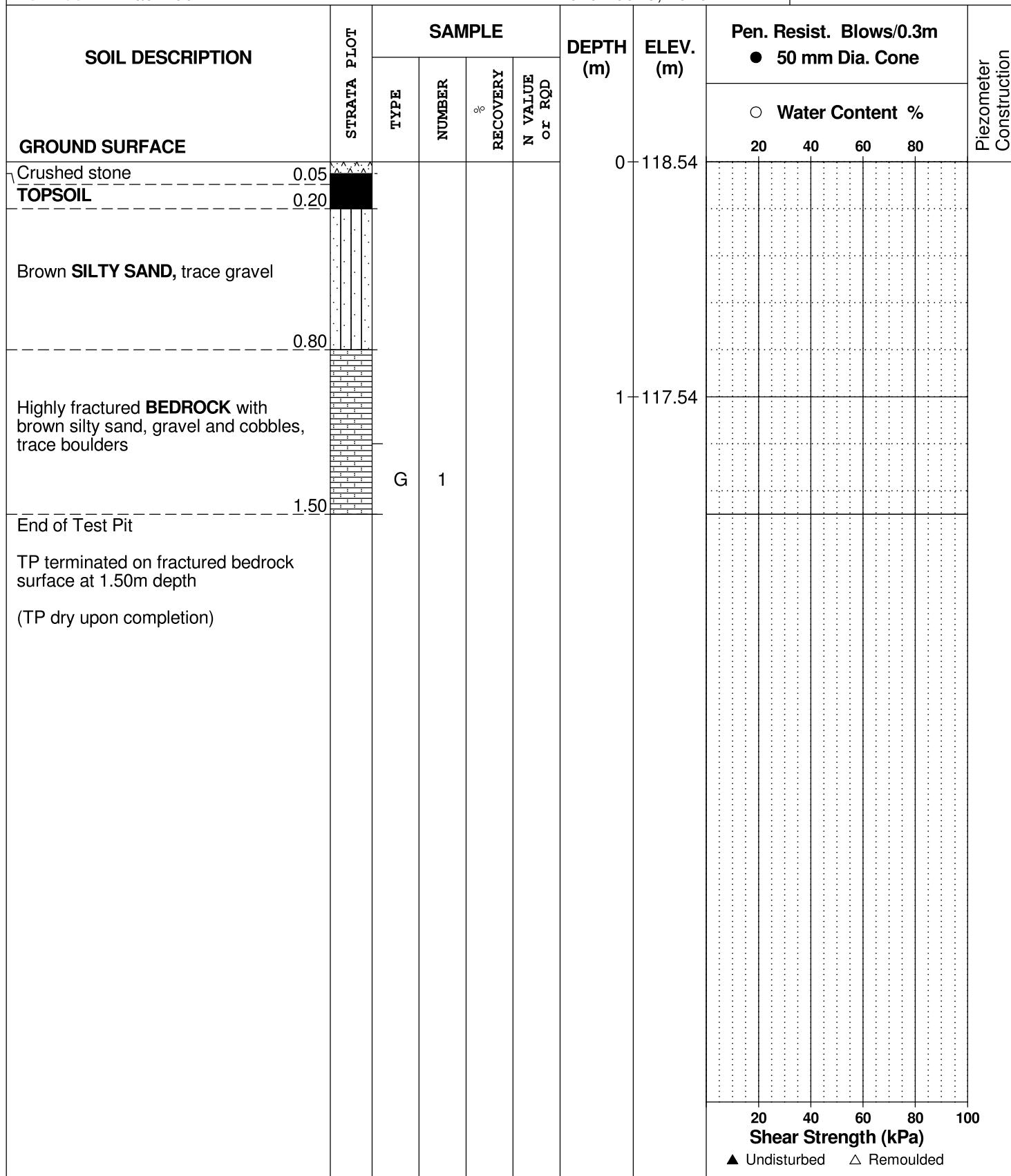
REMARKS

BORINGS BY Backhoe

DATE November 3, 2016

HOLE NO.

HOLE NO. **TD 8**



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. **PG3834**

REMARKS

BORINGS BY Backhoe

DATE November 3, 2016

HOLE NO. TP 2

HOLE NO. **TD 9**

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. **PG3834**

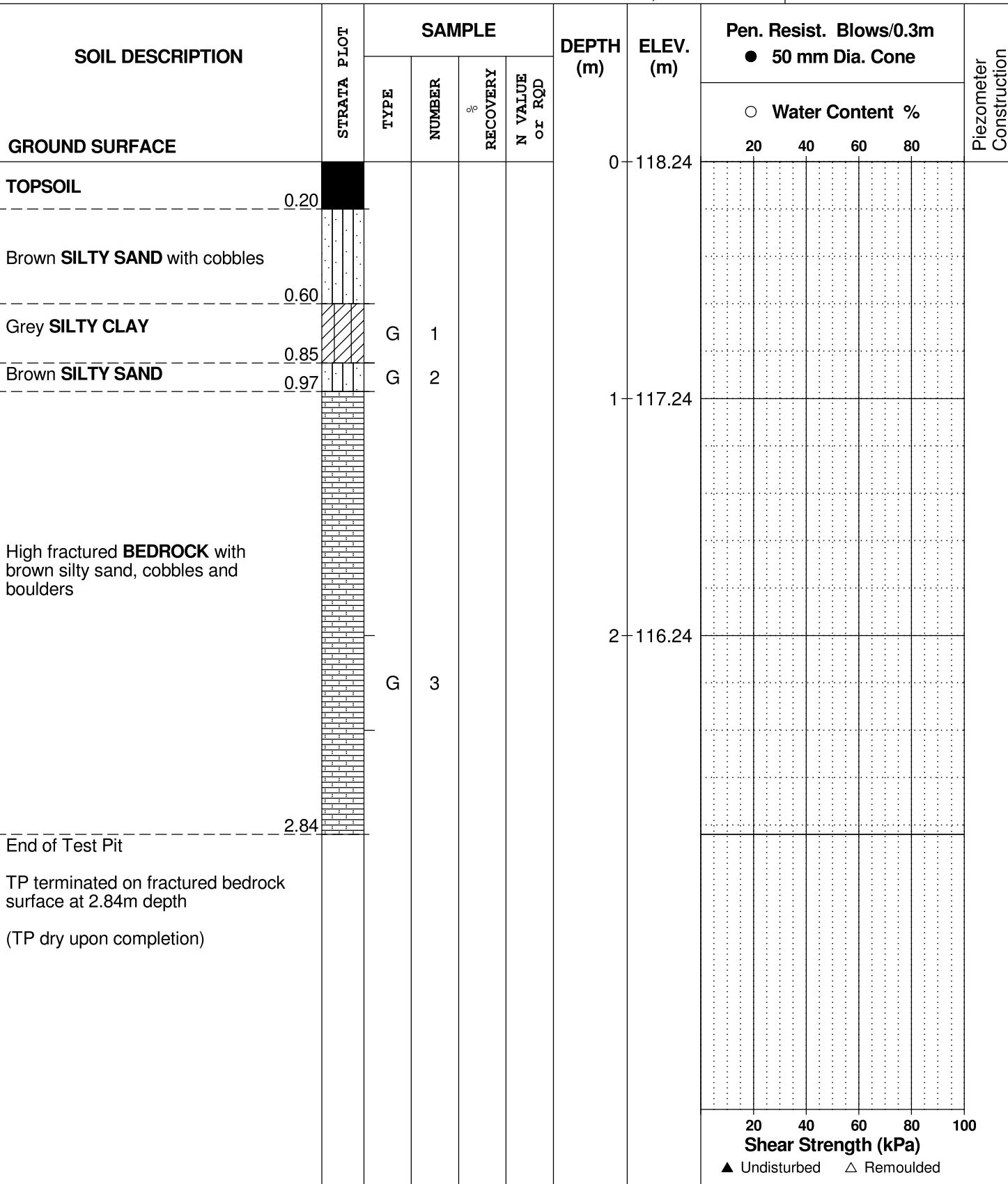
REMARKS

BORINGS BY Backhoe

DATE November 3, 2016

HOLE NO. TP12

HOLE NO. **TP12**



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

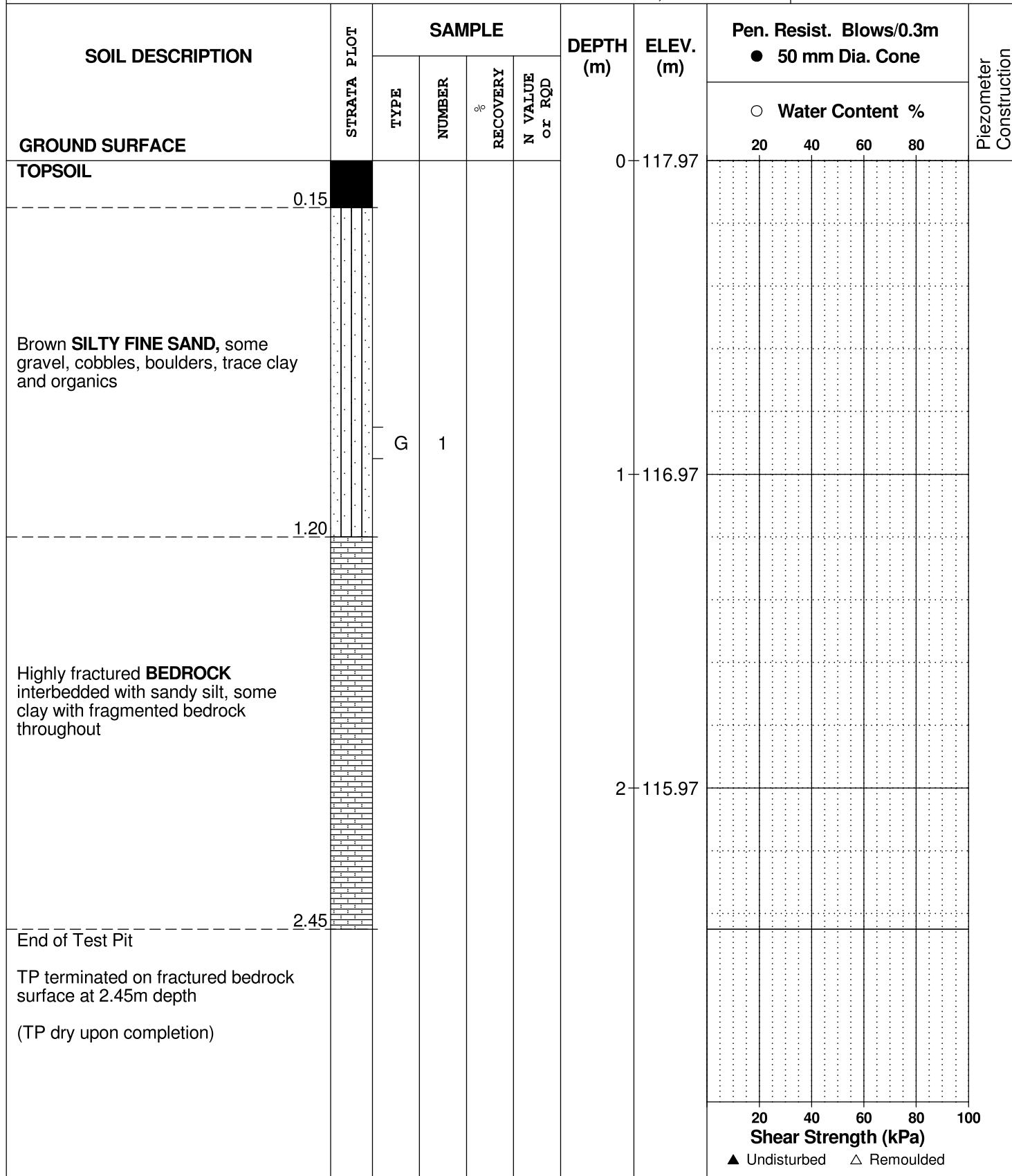
FILE NO. **PG3834**

REMARKS

BORINGS BY Backhoe

DATE November 8, 2016

HOLE NO. **TR11**



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO.

PG3834

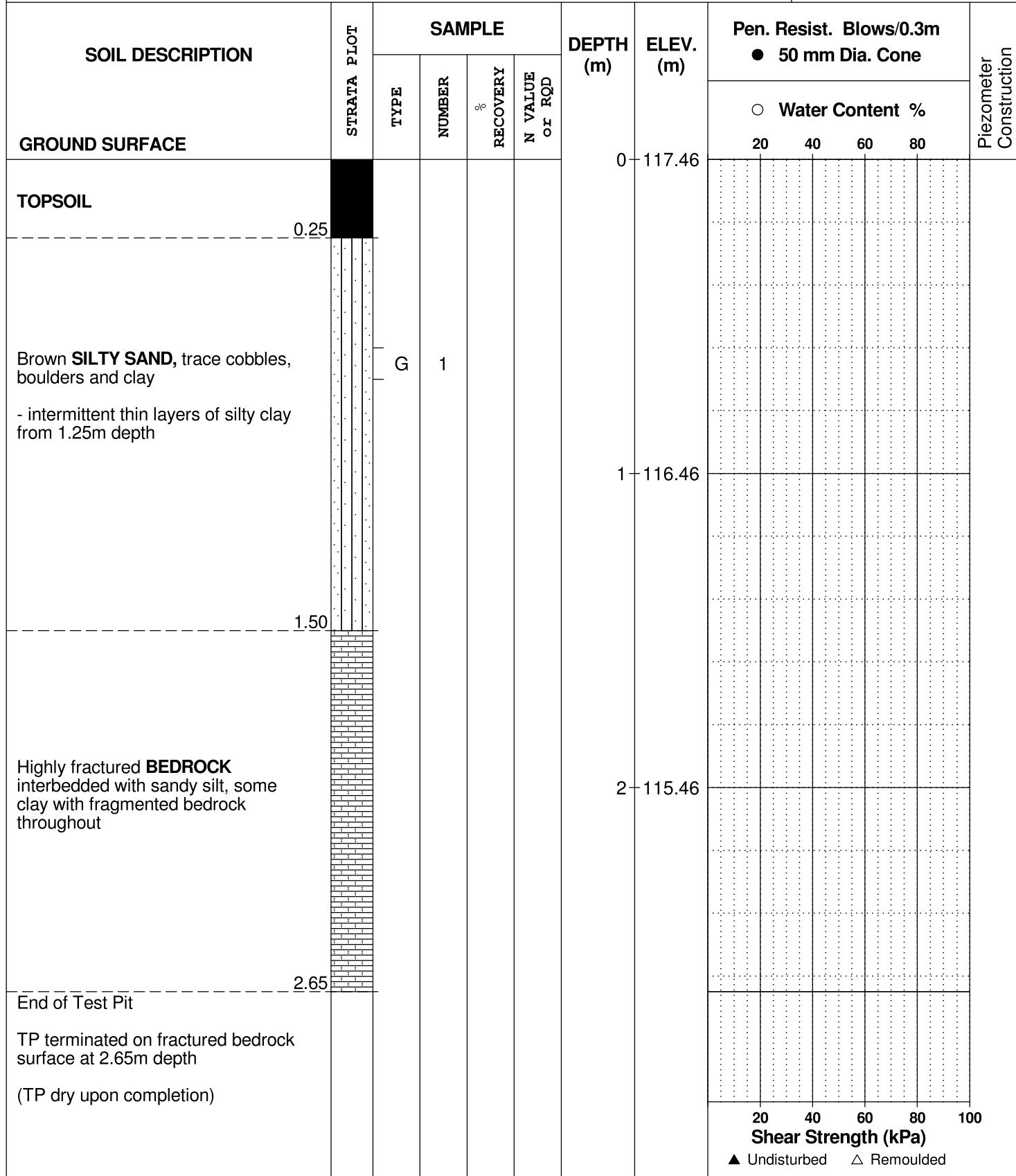
REMARKS

HOLE NO.

TP12

BORINGS BY Backhoe

DATE November 8, 2016



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

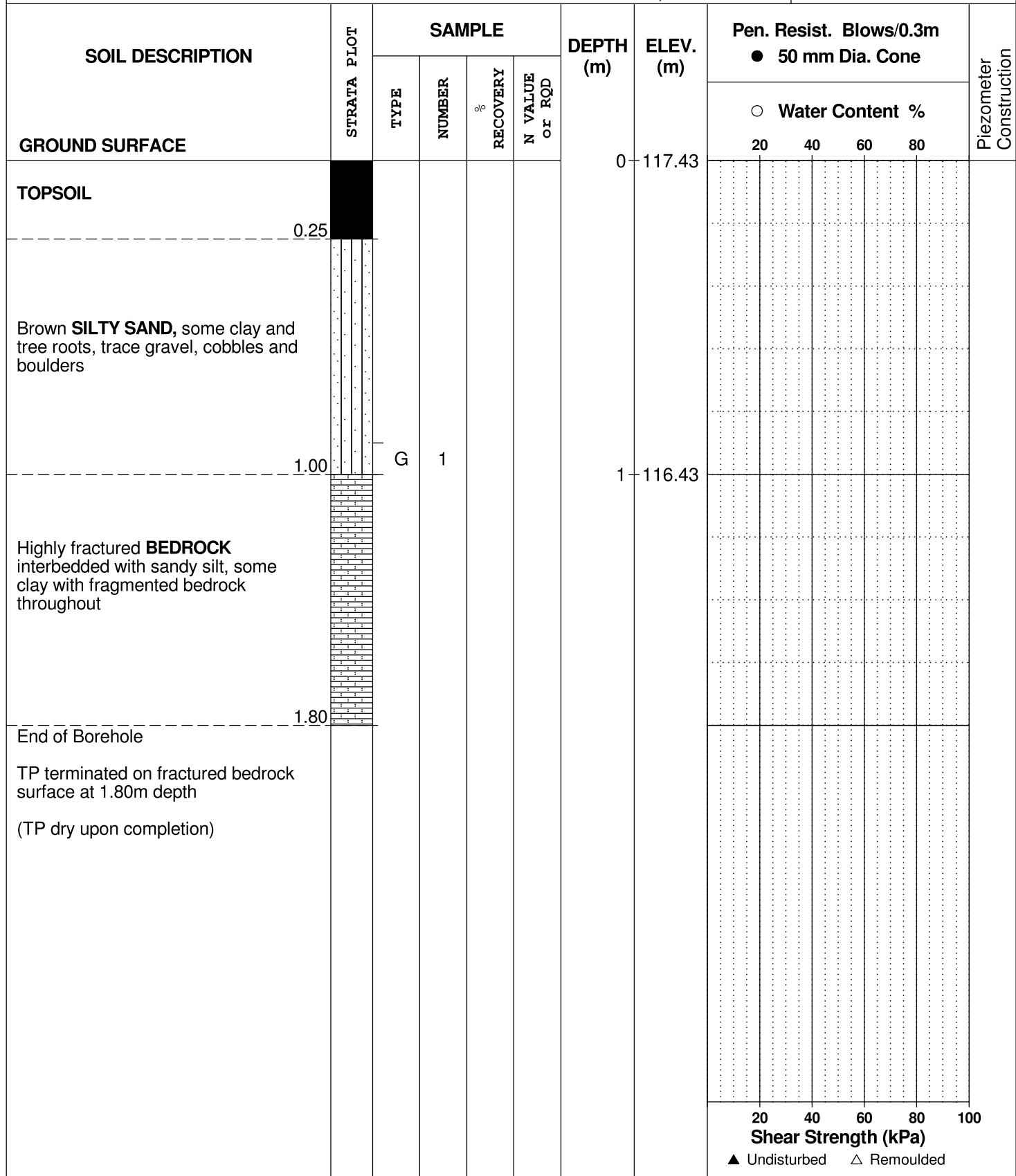
FILE NO. **PG3834**

REMARKS

BORINGS BY Backhoe

DATE November 8, 2016

HOLE NO. **TR13**



DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. **PG3834**

REMARKS

BORINGS BY Backhoe

DATE November 8, 2016

HOLE NO. **FB14**

HOLE NO. **TR14**

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 strength of cohesionless soils is the relative density, 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.

| Relative Density | '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 vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

| 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 is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

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 NXL size core. However, it can be used on smaller core sizes, such as BX, 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 |
| PS | - | Piston sample |
| AU | - | Auger sample or bulk sample |
| WS | - | Wash sample |
| RC | - | Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits. |

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

| | | |
|-----|---|--|
| MC% | - | Natural moisture 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 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 = $(D30)^2 / (D10 \times D60)$ |
| Cu | - | Uniformity coefficient = $D60 / D10$ |

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

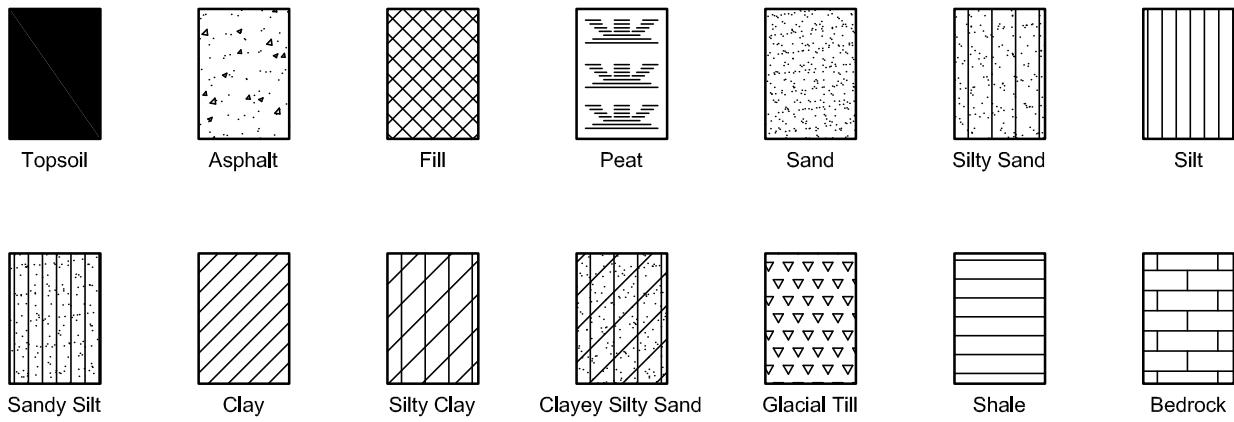
| | | |
|------------|---|--|
| p'_o | - | Present effective overburden pressure at sample depth |
| p'_c | - | Preconsolidation pressure of (maximum past pressure on) sample |
| Ccr | - | Recompression index (in effect at pressures below p'_c) |
| Cc | - | Compression index (in effect at pressures above p'_c) |
| OC Ratio | | Overconsolidation ratio = p'_c / p'_o |
| 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. |
|---|---|--|

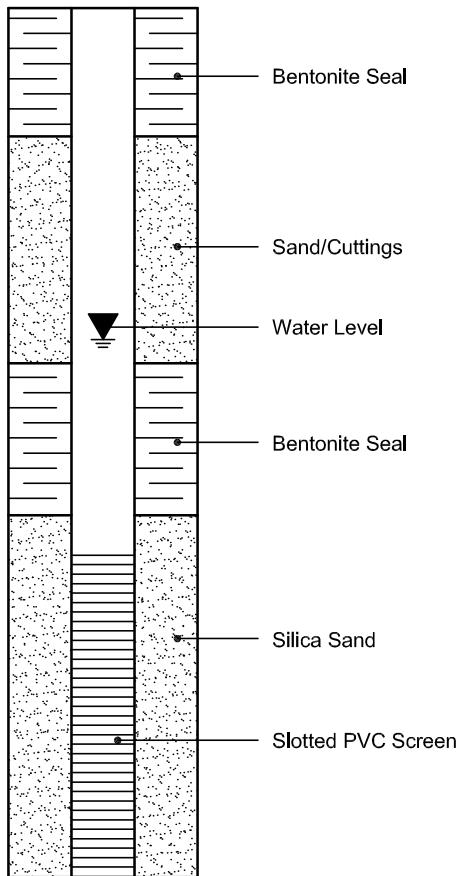
SYMBOLS AND TERMS (continued)

STRATA PLOT

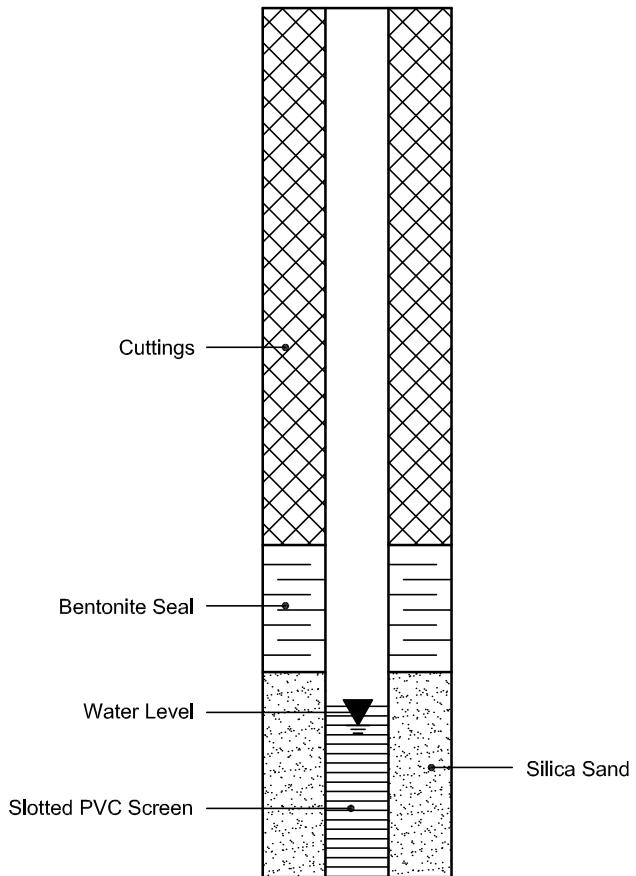


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION

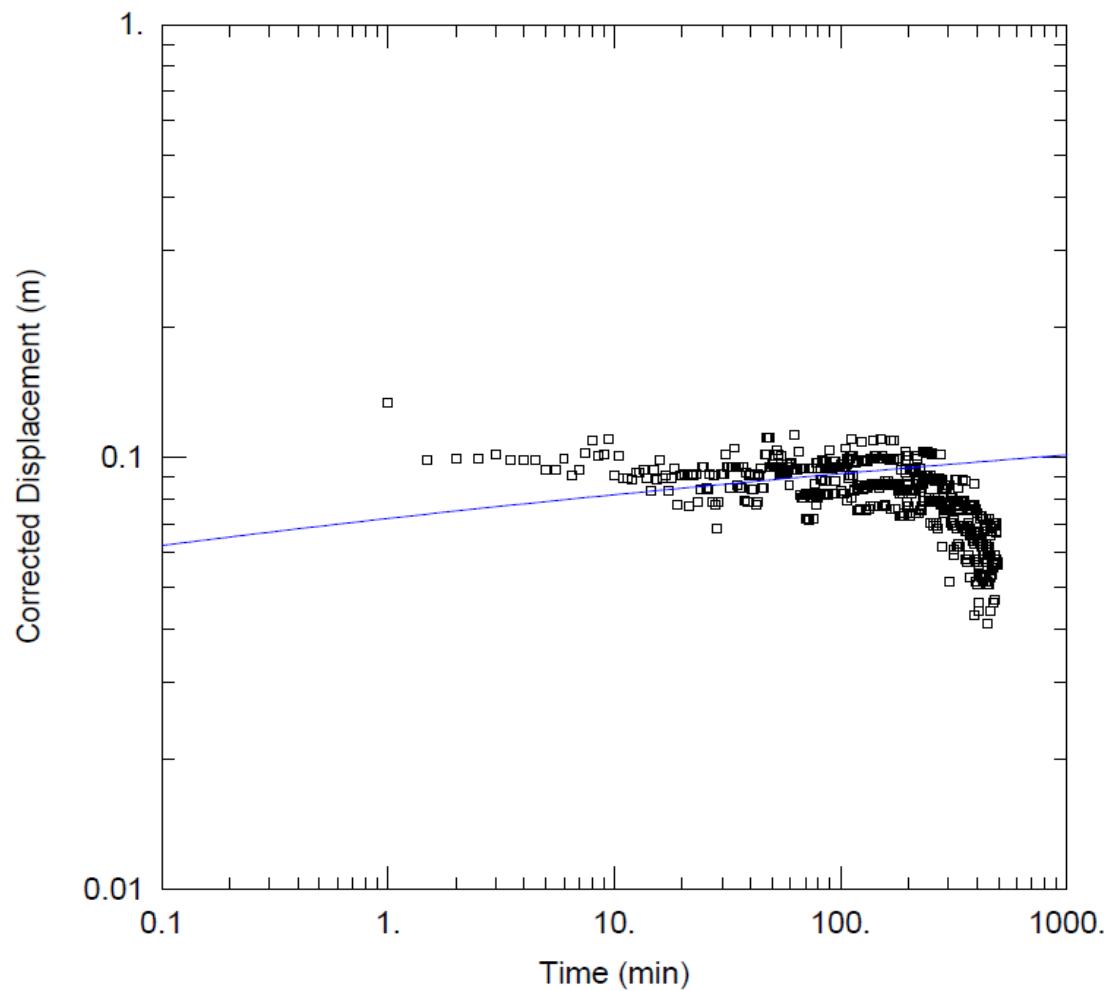


PIEZOMETER CONSTRUCTION



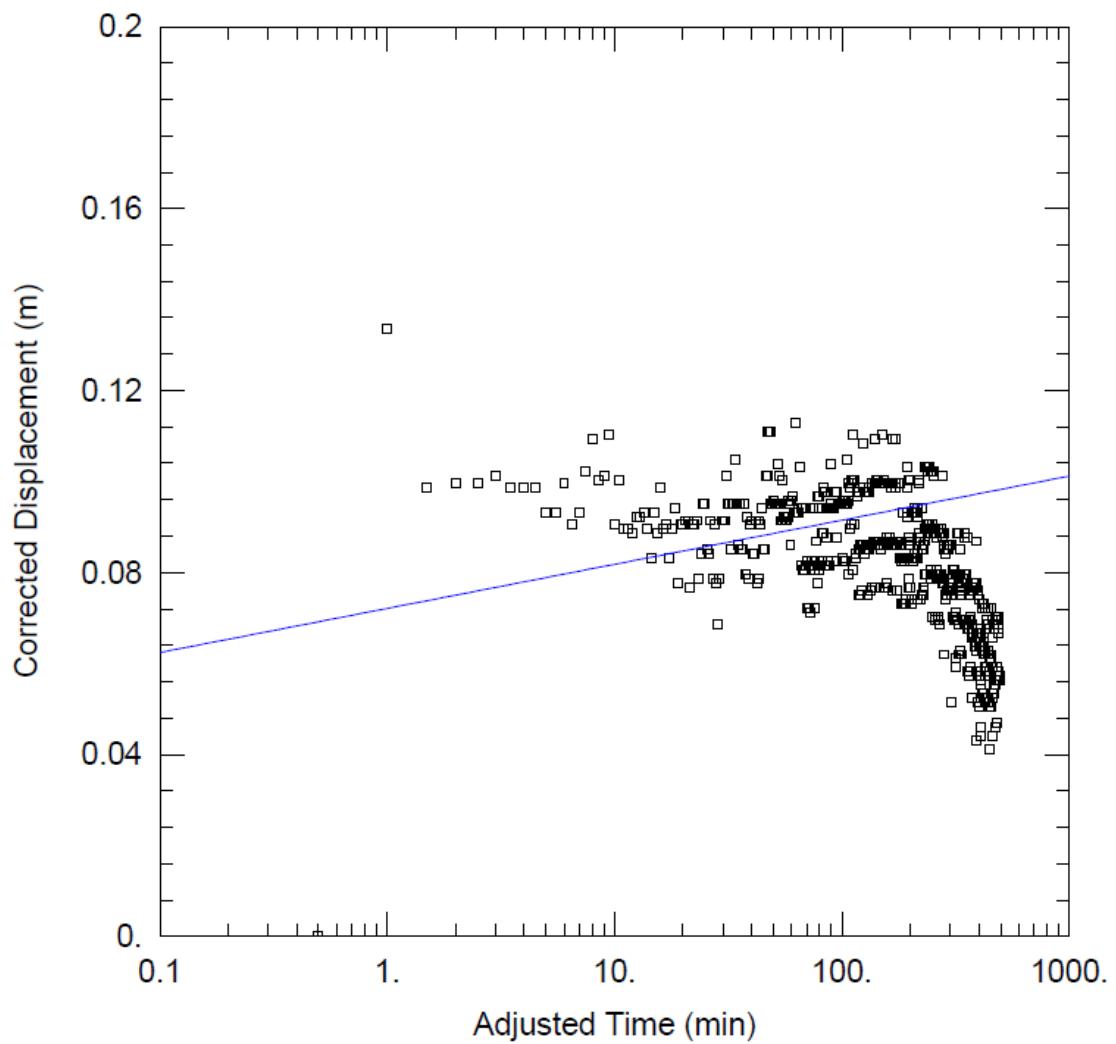
Pumping Test Analysis Report

| | | | |
|---------------|------------------------|---|--------|
| File No. | PH4484 | Well ID: | TW1 |
| Date: | April 13, 2022 | Solution Method: | Theis |
| Client: | Nautical Lands Group | Transmissitivity (m ² /day): | 1224.1 |
| Site Address: | 2966 Carp Road, Ottawa | Discharge Rate (L/min) | 45 |
| Project: | Site Plan Application | Analysis performed by: | EA |



Pumping Test Analysis Report

| | | | |
|---------------|------------------------|---|--------------|
| File No. | PH4484 | Well ID: | TW1 |
| Date: | April 13, 2022 | Solution Method: | Cooper-Jacob |
| Client: | Nautical Lands Group | Transmissitivity (m ² /day): | 1224.1 |
| Site Address: | 2966 Carp Road, Ottawa | Discharge Rate (L/min) | 45 |
| Project: | Site Plan Application | Analysis performed by: | EA |



Pumping Test Analysis Report

File No. PH4484
Date: April 13, 2022
Client: Nautical Lands Group
Site Address: 2966 Carp Road, Ottawa
Project: Site Plan Application

Summary Table:

| Solution Method: | Well ID: | Transmissitivity (m ² /day): |
|------------------|----------|---|
| Theis | TW1 | 1224.1 |
| Cooper-Jacob | TW1 | 1224.1 |
| Average: | | 1224.10 |

patersongroup
 2966 Carp Road, Ottawa
 PH4484

| TW1 inputs | | | |
|------------|------|-------|-------------|
| pH | 7.93 | A | 0.19 |
| TDS | 767 | B | 2.37 |
| Hardness | 451 | C | 2.25 |
| Alkalinity | 243 | D | 2.39 |
| Temp. | 10.8 | pHs = | 7.215174149 |

Langelier Saturation Index (LSI) Calculation (Langelier, 1936)

$$LSI = pH - pHs$$

$$A = (\log_{10} [TDS] - 1) / 10$$

$$pHs = (9.3 + A + B) - (C + D)$$

$$B = -13.12 \times \log_{10} (oC + 273) + 34.55$$

Where:

$$C = \log_{10} [Ca^{2+} \text{ as CaCO}_3] - 0.4$$

$$D = \log_{10} [\text{alkalinity as CaCO}_3]$$

| | |
|-------|-----|
| 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). |

PREDICTIVE NITRATE IMPACT ASSESSMENT

Infiltration Factors

| | |
|--------------|-------------|
| Topography | 0.25 |
| Soil | 0.30 |
| Cover | 0.12 |
| Total | 0.67 |

Site Characteristics

| | | |
|-------------------------------------|-------|-------|
| Area of Site : | 12832 | m^2 |
| Total of roof areas: | 1713 | m^2 |
| Total area of paved driveway areas: | 4051 | m^2 |
| Roof + paved driveway areas | 5764 | m^2 |
| Impervious Area | 5764 | m^2 |
| Percent Impervious Area = | 45 | % |
| Infiltration Area = | 7068 | m^2 |

Septic Effluent

| | | |
|----------------------------------|------|------|
| Concentration of Effluent (Cs) = | 17.2 | mg/L |
|----------------------------------|------|------|

Infiltration Calculation

| | | |
|--|-----|-----------|
| Nitrate concentration in precipitation (C _i) = | 0 | mg/L |
| Surplus Water (Environment Canada) | 378 | mm/yr |
| Factored Water Surplus = | 253 | mm/yr |
| Infiltration % due to stormwater management measures | - | % |
| Infiltration rate from stormwater management measures = | 0 | mm/yr |
| Infiltration Flow Entering the System (Q _i) = | 5 | 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 | 0.25 | mg/L |
| C _s = concentration of nitrates in the septic effluent | 17.2 | mg/L |
| Q _i = flow entering the system from infiltration | 5 | m^3/day |
| C _i = Concentration of nitrates in the infiltrate | 0 | mg/L |
| C_T = | 9.75 | mg/L |

Maximum Allowable Sewage Flow Volume

| | | |
|--------------------------------------|-------------|-------|
| Daily Sewage Flow (Q _s)= | 6.418279445 | m^3 |
|--------------------------------------|-------------|-------|

Notes: Site characteristic values were measured as approximate values from the available site plans and GeoOttawa.

PREDICTIVE NITRATE IMPACT ASSESSMENT

Infiltration Factors

| | |
|--------------|-------------|
| Topography | 0.25 |
| Soil | 0.30 |
| Cover | 0.12 |
| Total | 0.67 |

Site Characteristics

| | | |
|-------------------------------------|-------|-------|
| Area of Site : | 12832 | m^2 |
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| Roof + paved driveway areas | 5764 | m^2 |
| Impervious Area | 5764 | m^2 |
| Percent Impervious Area = | 45 | % |
| Infiltration Area = | 7068 | m^2 |

Septic Effluent

| | | |
|----------------------------------|----|------|
| Concentration of Effluent (Cs) = | 40 | mg/L |
|----------------------------------|----|------|

Infiltration Calculation

| | | |
|--|-----|-----------|
| Nitrate concentration in precipitation (C _i) = | 0 | mg/L |
| Surplus Water (Environment Canada) | 378 | mm/yr |
| Factored Water Surplus = | 253 | mm/yr |
| Infiltration % due to stormwater management measures | - | % |
| Infiltration rate from stormwater management measures = | 0 | mm/yr |
| Infiltration Flow Entering the System (Q _i) = | 5 | m^3/day |

Mass Balance Model (MOEE, 1995)

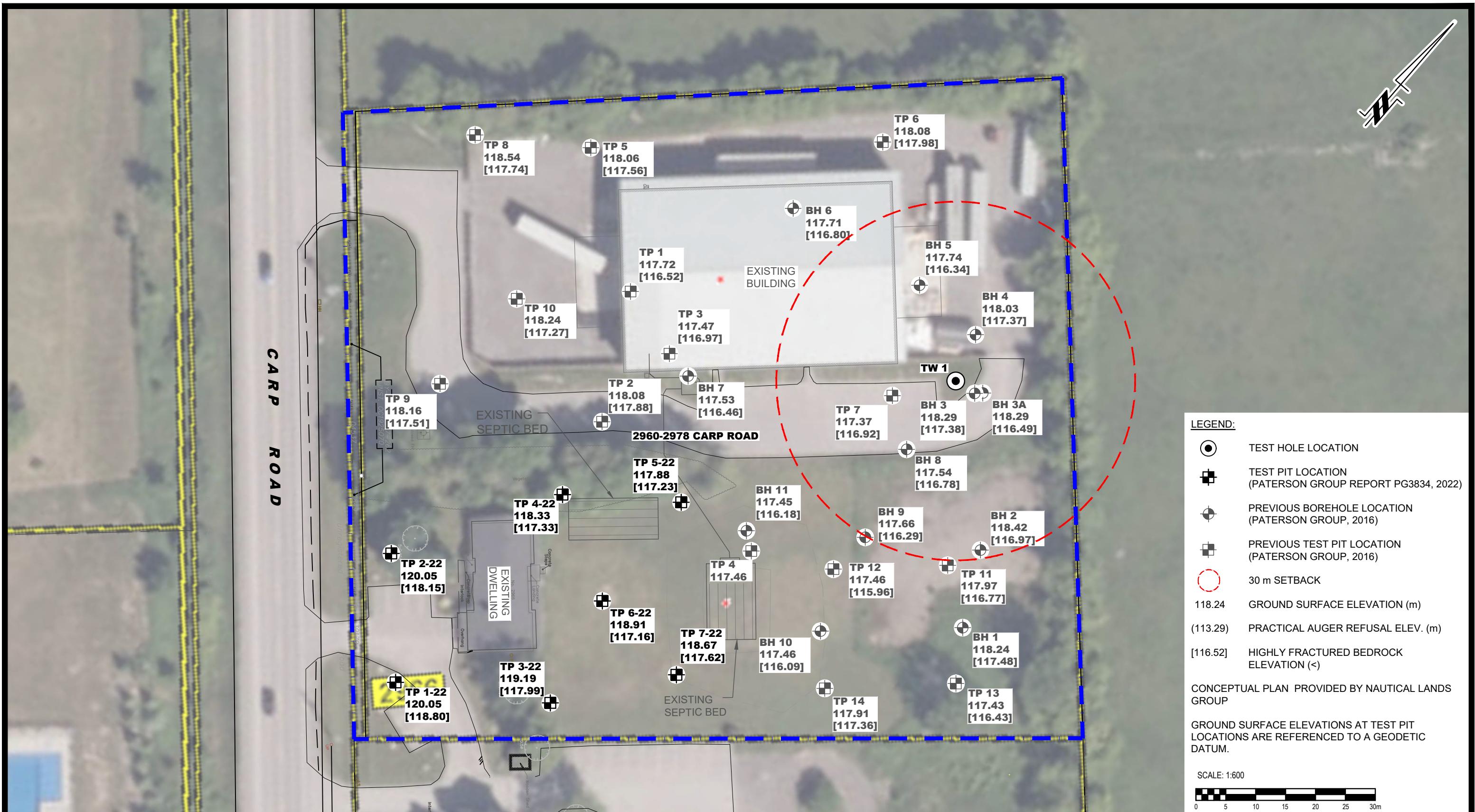
$$C_T = (Q_b C_b + Q_e C_e + Q_i C_i) / (Q_b + Q_e + Q_i) = \text{Cumulative Nitrate Concentration}$$

| | | |
|--|-------------|-----------|
| Q _b = flow entering the system across the upgradient area | 0 | m^3/day |
| C _b = background nitrate concentration | 0.25 | mg/L |
| C _s = concentration of nitrates in the septic effluent | 40 | mg/L |
| Q _i = flow entering the system from infiltration | 5 | m^3/day |
| C _i = Concentration of nitrates in the infiltrate | 0 | mg/L |
| C_T = | 9.75 | mg/L |

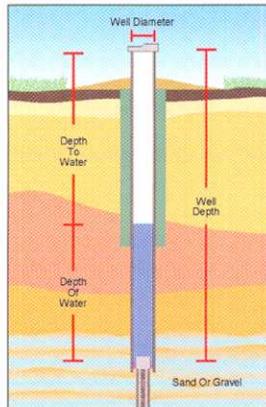
Maximum Allowable Sewage Flow Volume

| | | |
|--------------------------------------|-------------|-------|
| Daily Sewage Flow (Q _s)= | 1.580700227 | m^3 |
|--------------------------------------|-------------|-------|

Notes: Site characteristic values were measured as approximate values from the available site plans and GeoOttawa.



Disinfection Instruction Sheet



If your drinking water continues to test positive on repeated submissions, consult your local health unit, which can help you interpret the results of your tests and provide you with advice on what measures you can take to safeguard your drinking water.

The first step in identifying the reason for repeated adverse water quality is to conduct a visual inspection of your well. Start with a close look at your well. The area around it should be

clear of any potential contaminant sources, such as pets, lawn care products, and gardens. Once you're satisfied that the area around your well is okay, take a good, close look at the well itself. If you have an older well, make sure that the cap and the sealant around the well casing isn't cracked or damaged. If it is, you need to fix or replace it right away. If the source of the problem can't be detected, consult a licensed well contractor right away to identify the source of the problem and eliminate it. You can save yourself a lot of money by doing this instead of rushing out to buy a home treatment device that may be expensive to install, operate, and maintain. And it may not eliminate the source of your trouble.

(If you have a cistern, please talk to your public health unit about disinfection requirements.)

1. Measure the diameter of the well.
2. Measure the well depth and the static or resting water level, then calculate the depth of water in the well.
3. Using the table on this sheet, measure out the amount of bleach needed. (The table gives the volume of bleach needed for different well sizes.) Then, pour the mixture into your well.
4. If possible, mix the water in the well. This can be accomplished by attaching a hose to a tap, running water from the well, through the hose and back into the well.
5. After adding chlorine to the well, remove or bypass any carbon filters that are in the system for water treatment. If you don't, these filters will remove the chlorine from the water, and any pipes beyond the filter will not get disinfected. Replace with new filters after chlorination to avoid reintroducing bacteria into the system.
6. Run water at every faucet in the house (and barn, if you have one) until a strong chlorine odour is detected. Be aware that your nose may lose its ability to detect chlorine.
7. If there is no chlorine smell or it is very weak, add more bleach to the well and repeat Step 6 above.
8. Drain the water heater and fill with chlorinated water.
9. Backflush the water softener and all water filters (except carbon filters).

10. Let the chlorinated water stand in the system for at least 12 hours.

11. Clear chlorine from the well by running an outside hose to the ground surface. Then, run clear water through the faucets until the water no longer smells of chlorine.

12. Avoid putting too much chlorine into the septic system because the bacteria needed for septic decomposition may be killed.

13. Do not drink the water without boiling it until test results show the water is safe to drink.

**Volume of Bleach to Add for Every 3 Metres
(10 Feet) of Water in the Well***

| Casing Diameter | | Volume of Unscented Bleach (5.25% solution) |
|-----------------|--------|--|
| Millimetres | Inches | |
| 50 | 2 | 6 |
| 100 | 4 | 30 |
| 150 | 6 | 60 |
| 200 | 8 | 100 |
| 250 | 10 | 200 |
| 300 | 12 | 250 |
| 400 | 16 | 400 |
| 500 | 20 | 650 |
| 600 | 24 | 900 |
| 900 | 36 | 2000 (2 litres) |
| 1200 | 48 | 3600 (3.6 litres) |

For example: If you have 6 metres (20 feet) of water in your well and it has a casing diameter of 100 mm or 4 inches, you would add 60 mm or 2 fluid ounces of bleach.

* For questions or more information on how to disinfect your well, contact your local health unit.

For more information

Ontario Government Ministry Abbreviations

Ministry of Health and Long-Term Care

MOHLTC (also MOH)

Ministry of the Environment

MOE (also MOEE)

Ontario Ministry of Agriculture and Food

OMAF (also OMAFRA)

Ontario Government Information Lines

MOE Public Information Centre: 1-800-565-4923

MOE Water Well Records: 1-888-396-9355

MOHLTC INFOline: 1-800-268-1154

OMAF Agricultural Information Contact Centre: 1-877-424-1300

Ontario Government Web Sites

MOE: www.ene.gov.on.ca

MOHLTC: www.health.gov.on.ca

OMAF: www.gov.on.ca/omaf

Publications available on-line

Health Canada: www.hc-sc.gc.ca

- *A Guide to Well Water Treatment and Maintenance;*
- *Water treatment devices for disinfection of drinking water.*

MOHLTC: www.health.gov.on.ca

- *How to use water safely during a "Boil Water Advisory";*
- *E. coli Bacteria;*
- List of Public Health Units in Ontario.

OMAF: www.gov.on.ca/omaf

- *Assessing the Potential for Ground Water Contamination on Your Farm, Publication 97-017;*
- *Best Management Practices: Water Wells, OMAFRA and Agriculture and Agri-Food Canada, 2003 (to order).*

MOE: www.ene.gov.on.ca

- *Important Facts About Water Well Construction, Publication 3788;*
- *Water Wells and Groundwater Supplies: The Protection of Water Quality in Bored and Dug Wells, Information Sheet PIB 601b;*
- *Water Wells and Groundwater Supplies: The Protection of Water Quality in Drilled Wells, Information Sheet PIB 602b.*