Aug 15, 2024

PM15625-LET.01

1818 Farm & Cidery
1811 Richardson Side Road
Ottawa (Carp), Ontario
K0A 1L0

Attention: Ken Hoppner

Subject: **Hydrogeological Assessment and Terrain Analysis**
Zoning Bylaw Amendment
1811 Richardson Side Road
Ottawa (Carp), Ontario

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INTRODUCTION

Further to your request, Paterson has conducted a Hydrogeological Assessment and Terrain Analysis in support of a Re-Zoning Application for the proposed alteration to the usage for the existing commercial building located at 1811 Richardson Side Road in Ottawa (Carp), Ontario.

The purpose of this work has been to determine the suitability of the water supply aquifer underlying the site as well as determine the capacity of the site to attenuate the sewage system impacts to support the Re-Zoning Application for a zoning by-law amendment.

The Subject Site consists of a 11.68 ha lot and is currently occupied by a residential dwelling, located centrally near Bradley Side Road, a centrally located commercial building (Cidery), a commercial building to the south, and an agricultural area located on the northeastern portion of the property with an associated temporary tent-based greenhouse. The south-western portion of the site generally consists of treed areas. The ground surface generally slopes towards the east. There is a sharp slope from the central property to the northeastern agricultural area. The general direction of water flow is towards the Ottawa River to the north.

The Subject Site is bordered on all sides by agricultural lands, with a church and dwelling located to the south of the site. The site has frontage onto Bradley Side Road to the northwest, Huntmar Drive to the northeast and Richardson Side Road to the southeast. The subject site itself and the surrounding commercial areas are zoned AG3 for Agricultural General Subzone 3 (GeoOttawa).

Hydrogeological Pre-consultation

A Hydrogeological pre-consultation was completed with a City of Ottawa Hydrogeologist on June 23, 2024. The City Hydrogeologist noted that water quantity and quality may be an issue. Evidence was provided from the water well hydrofracking process to increase the quantity and was to be confirmed with the pumping test. An 8-hour pumping test with the standard Subdivision Package suite of parameters, trace metals and Volatile Organic Compounds (VOC's) required by the City of Ottawa Hydrogeological and Terrain Analysis Guidelines (HTAG) was determined to be acceptable.

DESCRIPTION OF SUBJECT SITE

The subject site is an approximately 11.68 ha lot and is currently occupied by a two-storey residential dwelling, a commercial building to the south with associated parking and storage, a commercial building (Cidery), and agricultural lands to the east, with an associated temporary tent-based greenhouse. The Re-zoning Application is for a zoning by-law amendment to increase the number of guests allowed at a new commercial building. Please refer to Figure-1 Key Plan, attached, for the proposed site location.

The residential dwelling is currently serviced by an onsite sewage system and an existing private drilled well. A newly drilled well was installed in 2022 to service the Cidery and a new sewage system will be required to service the proposed change of use . At this time no site plan has been completed.

The newly drilled well, hereafter referred to as Test Well 1 (TW1), is the well which is currently servicing the Cidery and will continue to service the building following the completion of construction. The property owner will need to ensure that protective measures are taken to protect the wellhead, such as the use of a barrier, during construction.

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

Based on available Ontario Geological Survey (OGS) mapping (GRS005), the subject site is not within an area of potential karst.

MISSISSIPPI-RIDEAU SOURCE PROTECTION PLAN

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

There are no related requirements for this site relative to the MRSPP.

FIELDWORK PROGRAM

Well Inspection

A visual inspection of TW1 was performed by Paterson personnel which confirmed that the well casing and cap are in good condition. The final grading around the well will be sufficiently graded to direct surface water away from the wellhead (as required by O.Reg 903) at the time of the new sewage system installation. The stick-up was measured to be 0.49 m above ground surface. Based on a visual inspection by Paterson personnel, the well was deemed to be in good condition.

Well Testing

As a means to demonstrate the adequacy of the aquifer underlying the subject lands, with respect to water quality and quantity, TW1 was tested. TW1 has a Water Well Record (WWR) Well ID of A342224 with a 152.4 mm diameter steel casing that extends to 20.1 m below ground surface (bgs) and a 0.49 m stick-up. The well itself extends to a depth of 121.9 m bgs. Based on available geological mapping, the drift thickness at TW1 varies from 15 to 25 m.

As a means to evaluate the water supply aquifer intercepted by the well, the well was subjected to an 8-hour constant rate pumping test. The pumping test was conducted on June 25, 2024 under the full-time supervision of Paterson personnel. Prior to the pumping test the well was disinfected as per the MECP Disinfection Instruction Sheet, and 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 as well as any septic systems in the area. Upon completion of the test, the system was returned to its normal configuration.

The pumping test was carried out at a pumping rate of 30 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 selected rate of 30 L/min provides approximately 1.4 times the maximum total daily design volume of 10,000 L/day for the subject site during the 8-hour pumping test. The total daily design sanitary sewage flows (TDDSSF) are proposed to remain below the limit of 10,000 L/day as set out by the Ontario Building Code (OBC) not require a large-scale subsurface sewage system.

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 95% recovery approximately 13 hours 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. VOCs were sampled 8 hours after the start of pumping.

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, true colour, and temperature. Calibration / confirmation of calibration of all field-testing equipment was performed in Paterson’s laboratory the day prior to the pumping test. Values are then confirmed again onsite prior to the start of the pumping test.

Due to elevated readings for turbidity, colour, and aluminum levels encountered during the pumping test, Paterson personnel returned to the site on July 19, 2024 to collect an additional untreated sample under normal operating conditions of TW1.

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)	1.68
Pumping Rate (L/min)	30
Pre-test Static Water Level (m)	4.25
Post-test Static Water Level (m)	19.47
Available Drawdown (m)	118.16
% Drawdown During Pumping Test (%)	13
Specific Capacity (L/min/m drawdown)	1.97

The drawdown data was analyzed using the Theis and Cooper Jacob methods of analysis. Aquifer transmissivity is estimated to be 1.68 m^2/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 15.22 m at approximately 8 hours into the pumping test (13% of the available drawdown). 95% recovery was achieved approximately 13 hours after the end of pumping.

The total volume of water pumped during the 8-hour pumping event was approximately 14,400 L. This is approximately 1.4 times the maximum total daily design volume of water (10,000 L/d) required to support the Re-Zoning Application for all uses on the property.

The suitability of the aquifer to supply the proposed Re-Zoning Application for the proposed commercial modification was assessed using the methodology provided in the City of Ottawa 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 maximum site requirements under OBC.

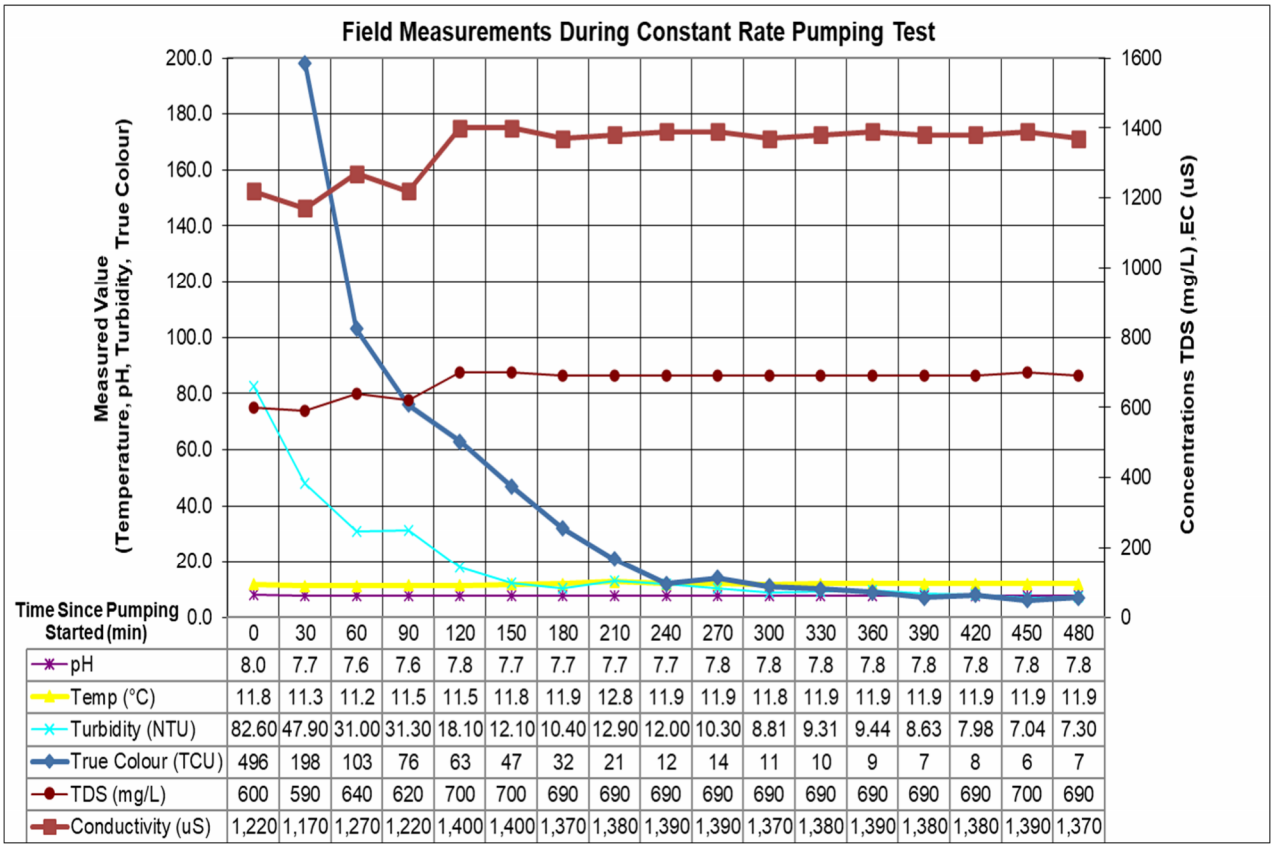
Given the analyses presented and summarized above, it is our opinion that there is an adequate supply of water to support the proposed Re-Zoning Application. Available water well records (WWR) of the neighboring properties on the MECP Well Record mapping

website indicated that the wells were screened in limestone. Surrounding WWR's are attached to this report.

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 in the graphical representation below. In addition, a HACH Pocket Colorimeter II chlorine reader was used to measure the free chlorine residual level. No chlorine residual was detected in the discharge water prior to the collection of the water samples.



Time Since Pumping Started (min)	0	30	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480
pH	8.0	7.7	7.6	7.6	7.8	7.7	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
Temp (°C)	11.8	11.3	11.2	11.5	11.5	11.8	11.9	12.8	11.9	11.9	11.8	11.9	11.9	11.9	11.9	11.9	11.9
Turbidity (NTU)	82.60	47.90	31.00	31.30	18.10	12.10	10.40	12.90	12.00	10.30	8.81	9.31	9.44	8.63	7.98	7.04	7.30
True Colour (TCU)	496	198	103	76	63	47	32	21	12	14	11	10	9	7	8	6	7
TDS (mg/L)	600	590	640	620	700	700	690	690	690	690	690	690	690	690	690	700	690
Conductivity (uS)	1,220	1,170	1,270	1,220	1,400	1,400	1,370	1,380	1,390	1,390	1,370	1,380	1,390	1,380	1,380	1,390	1,370

Figure 1: Field Testing Results

Laboratory Data

The Subdivision Package suite of parameters and trace metals laboratory water quality obtained from the pumping test of TW1 is provided in Table 2a and 2b below and the laboratory analyses reports can be found attached. VOC laboratory analytical testing was completed and measured to be non-detect in the sample results and is provided in Table 2c. All laboratory test results can be found attached to this report.

TABLE 2a: GROUNDWATER MICROBIOLOGY & GENERAL GEOCHEMISTRY

PARAMETER	UNITS	ODWS		TW1		
		LIMIT	TYPE	TW1 GW1 (4 hr) 6/25/2024	TW1 GW2 (8 hr) 6/25/2024	TW1 GW-3 7/19/2024
MICROBIOLOGICAL						
Escherichia Coli (E.Coli)	ct/100mL	0	MAC	0	0	-
Total Coliforms	ct/100mL	0	MAC	0	0	-
GENERAL CHEMICAL - HEALTH RELATED						
Fluoride (F)	mg/L	1.5	MAC	1.32	1.34	-
Ammonia ($N\text{-}NH_3$)	mg/L	-	-	0.259	0.263	-
Nitrite ($N\text{-}NO_2$)	mg/L	1	MAC	<0.5	<0.5	-
Nitrate ($N\text{-}NO_3$)	mg/L	10	MAC	<0.5	<0.5	-
Total Kjeldahl Nitrogen	mg/L	-	-	1.460	0.483	-
Turbidity (Field)	NTU	1.0 (5.0)	MAC/AO	12.00	7.30	0.56
Turbidity (Laboratory)	NTU	1.0 (5.0)	MAC/AO	11.5	7.1	3.3
GENERAL CHEMICAL - AESTHETIC RELATED						
Alkalinity (as CaCO3)	mg/L	30-500	OG	225	225	-
Chloride (Cl)	mg/L	250	AO	85	86	-
Colour (Apparent)	TCU	5	AO	10	10	12
Colour (Field - True)	TCU	5	AO	12	7	0
Conductivity	uS/cm	-	-	1,350	1,370	-
Dissolved Organic Carbon	mg/L	5	AO	1.3	1.0	-
Hardness (as CaCO3)	mg/L	100	OG	356	360	-
Ion Balance	unitless	-	-	1.01	1.02	-
pH	unitless	6.5-8.5	AO	7.97	8.04	-
Phenols	mg/L	-	-	<0.001	<0.001	-
Sulphate (SO_4)	mg/L	500	AO	388	394	-
Sulphide (S_2^-)	mg/L	0.05	AO	0.95	1.16	-
Tannin & Lignin	mg/L	-	-	0.20	0.30	-
Total Dissolved Solids	mg/L	500	AO	944	959	-

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

TABLE 2b: GROUNDWATER GEOCHEMISTRY - METALS						
PARAMETER	UNITS	ODWS		TW1		
		LIMIT	TYPE	TW1 GW1 (4 hr) 6/25/2024	TW1 GW2 (8 hr) 6/25/2024	TW1 GW-3 7/19/2024
METALS						
Aluminum (Al)	mg/L	0.1	OG	0.43	0.34	0.02
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	0.19	0.19	-
Beryllium (Be)	mg/L	-	-	<0.0005	<0.0005	-
Boron (B)	mg/L	5.0	IMAC	0.43	0.44	-
Cadmium (Cd)	mg/L	0.005	MAC	<0.0001	<0.0001	-
Calcium (Ca)	mg/L	-	-	74	75	-
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	0.68	0.44	-
Lead (Pb)	mg/L	0.01	MAC	<0.001	<0.001	-
Magnesium (Mg)	mg/L	-	-	42	42	-
Manganese (Mn)	mg/L	0.05	AO	0.02	0.02	-
Mercury (Hg)	mg/L	0.001	MAC	<0.0001	<0.0001	-
Molybdenum (Mo)	mg/L	-	-	<0.005	<0.005	-
Nickel (Ni)	mg/L	-	-	<0.005	<0.005	-
Potassium (K)	mg/L	-	-	6	6	-
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	181	186	-
Strontium (Sr)	mg/L	-	-	2.64	2.72	-
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:
   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

TABLE 2c: GROUNDWATER GEOCHEMISTRY - VOLATILES					
PARAMETER	UNITS	ODWS		TW1	
		LIMIT	TYPE	TW1 GW1 (4 hr) 6/25/2024	TW1 GW2 (8 hr) 6/25/2024
VOCs Surrogates					
1,2-dichloroethane-d4	%	-	-	122	109
4-bromofluorobenzene	%	-	-	71	72
Toluene-d8	%	-	-	110	113
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	-	-	<2	<2
Methyl Isobutyl Ketone (MIBK)	µg/L	-	-	<5	<5
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

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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

The bacteriological test results (Certificate of Analysis – Report No. 3966666) indicated that the test samples at the 4 and 8 hour interval were non-detect (0 ct/100 mL) for E.Coli and Total Coliforms.

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

- ❑ Hardness (as $CaCO_3$)
- ❑ Total Dissolved Solids (TDS)
- ❑ Iron (Fe)
- ❑ Total Sulphides
- ❑ Aluminum (Al)
- ❑ Colour
- ❑ Turbidity

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

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

Hardness as $CaCO_3$

Hardness, expressed as calcium carbonate, is an operation guideline and does not appear in the ODWS. Rather, it appears in the Technical Support Documents for Ontario Drinking Water Standards, Objectives and Guidelines as a parameter with an operational guideline at 100 mg/L. At the measured concentrations of 356 and 360 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).

The Langelier calculation provided an LSI of 0.0. Based on the evaluation of the result, the water is saturated and tends to precipitate a scale layer of calcium carbonate (scale forming and mildly corrosive). Based on the range of stability, there are no mitigative measures needed. See Langelier Saturation Index Calculation attached for calculation details.

It is recommended that water hardness be treated using conventional technologies such as water softening or reverse osmosis, if desired by the owner. Without treating hardness, scaling can occur which can result in discolouration and residue build-up 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 944 and 959 mg/L, at the 4- and 8-hour points, respectively, exceeds the Aesthetic Objective of 500 mg/L. At concentrations above 500 mg/L, some consumers may find the taste objectionable, however, as the objective is an aesthetic objective, no treatment is required. It is recommended that a point of use reverse osmosis unit be installed, if the owner desires, for drinking purposes. As such, no taste problems will occur when the system is used.

The Langelier calculation provided an LSI of 0.0. Based on the evaluation of the result, the water is saturated and does not tend to precipitate a scale layer of calcium carbonate (non-scale forming and non-corrosive). Based on the range of stability in the positive direction, there are no mitigative measures needed. See Langelier Saturation Index Calculation attached for calculation details.

Iron

Concentrations of iron above 0.3 mg/L can contribute to staining of fixtures and a metallic taste at higher concentrations. Precipitation of iron can promote the growth of iron bacteria in pipes. The concentration of iron in the groundwater in TW1 was measured to be 0.68 and 0.44 mg/L. The concentration of iron in the groundwater in the test well is considered to be reasonably treatable in accordance with Procedure D-5-5. It is recommended that a water softener or manganese greensand filter be used to reduce the levels of iron and reduce the potential for excessive precipitate occurring in the water supply system, if desired by the property owner. If treatment is not used, negative impacts such as discolouration of water fixtures, precipitation of iron and staining may occur.

Total Sulphides

Total sulphides were reported to be present within the water supply aquifer at concentrations of 0.95 and 1.16 mg/L. These can present as compounds such as iron sulphide or hydrogen sulphide. The value noted is for the total sulphides within the sample as there is no laboratory test for only hydrogen sulphide. Hydrogen sulphide is a gas that is heavier than air and has a very distinct "rotten egg" odour. Through the latter portion of the test, a faint odour was detected periodically. The aesthetic objective for hydrogen sulphide, which is incidentally also the threshold of the average human olfactory detection, is 0.05 mg/L. Field testing noted values in the range of 0 to 0.1 mg/L, which is in line with the minor olfactory observation. MECP Procedure D-5-5 does not indicate a maximum treatable limit for sulphide. One method to remove hydrogen sulphide, if desired, is a chlorine feeder and filter through oxidation or equivalent method recommended by a water treatment professional.

Aluminum

Aluminum was reported to be present within the water supply aquifer at concentrations of 0.43 and 0.32 mg/L at the 4- and 8-hour marks, respectively. Aluminum has an OG of 0.1 mg/L where an exceedance may cause coating of pipes in the distribution system and flocculation in the distribution system. Aluminum has a federal health related guideline MAC of 2.9 mg/L, which was not exceeded. During a revisit to the subject site and resample, the aluminum concentration was 0.02 mg/L, indicating that TW1 operating under normal usage meets the required guidelines.

Colour

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

During the field pumping test, a DR900 colorimeter was used to measure true colour in the groundwater at regular intervals. Field testing for colour had values of 12 and 7 TCU. Laboratory testing showed colour values of 10 TCU during the field test and 12 TCU from the revisit. True colour in the groundwater was measured as 0 TCU during regular usage which is below the aesthetic objective of 5 TCU. The elevated apparent colour levels detected in the lab samples is attributed to the precipitation of iron and manganese out of the groundwater.

Turbidity

Turbidity, which is generally an aesthetic parameter, was detected in the laboratory test samples at values of 11.5 and 7.1 NTU at the 4 hour and 8 h mark of the pumping test, and at 3.3 NTU during regular usage. Field testing of turbidity showed values of 12, and 7.3 NTU at the 4- and 8-hour mark of the pumping test and 0.56 NTU during regular usage. The test during regular usage was completed during the resample visit. Continued pumping showed a gradual decrease towards the end of the pumping test. The rented pump would have disturbed any precipitate in the water column during its installation and removal of the existing pump. This is demonstrated by the reduction in turbidity and iron during the pumping test, further corroborated by the reduction in turbidity under normal usage.

The ODWS maximum acceptable concentration for turbidity in drinking water entering the distribution system is 1 NTU. The Aesthetic Objective for turbidity in drinking water reaching the consumer is 5 NTU. In accordance with Procedure D-5-5, Table 2 does not reflect a maximum concentration considered reasonably treatable for Turbidity. Rather,

Procedure D-5-5 indicated that “particular care must be taken during testing to ensure that the bacteria requirements of Table 1 are met.” Based on the test results, the bacteria requirements of Table 1 of D-5-5 have been met (E.Coli = 0 and Total Coliforms = 0).

Sodium

Sodium (Na), an aesthetic parameter, was detected in the laboratory test sample at concentrations of 181 and 186 mg/L, which does not exceed the ODWS aesthetic objective of 200 mg/L. Although sodium is not toxic and no maximum acceptable concentration has been set, concentrations above 20 mg/L require that the Medical Officer of Health be notified of the water quality results, so that this information may be passed on to local physicians for use in treatment of those requiring a sodium-restricted diet. It should be noted that some water treatment technologies, such as water softeners, can increase the sodium concentration so care should be given if such treatment technologies are used.

Terrain Analysis

Surficial Geology

The subsurface conditions are mapped to be fine-textured glaciomarine deposits, mainly consisting of silt and clay, underlying the eastern side of the property; while the western side of the property is mapped to be underlain by stone-poor sandy-silt to silty-sand textured till (OGS MRD218, 2022). The bedrock geology is mapped to be limestone and shale of the Verulam formation of the Simcoe Group (OGS MRD219).

Drift thickness is mapped to be 15 to 25 m bgs, which coincides with neighbouring water well records. The WWR for TW1 showed an overburden thickness of 18m.

Hydrogeological Sensitivity of the Site

The subject site currently contains a two-storey residential dwelling, a commercial building to the south with associated parking and storage, a commercial building (Cidery), and agricultural lands to the east. The subject site is bordered on all sides by agricultural lands, with a church and dwelling located to the south of the site. The site fronts onto Bradley Side Road to the north-west, Huntmar Drive to the north-east and Richardson Side Road to the south-east. All surrounding properties are on private services. The adjacent properties are serviced by private wells and septic systems.

According to available mapping and WWRs, the overburden thickness was observed to be greater than 2 m. As the proposed site does not have bedrock within 2 m of the ground surface, the site is not considered hydrogeologically sensitive. Separation distances are not required to be increased between the septic components and the onsite well.

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

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 that

include the existing residence. Any associated flows with the residence will be counted towards the total site capacity in the site plan application.

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

Predictive Nitrate Impact Assessment

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

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

- ❑ Site area — 11.68 ha
- ❑ Impervious area (%) — 7 %
- ❑ Concentration of nitrate in effluent — 40 mg/L
  (Value based on typical effluent concentration)
- ❑ Surplus Water — 329 mm/yr
  (The surplus water value was estimated based on Environment Canada Climate Office values with a soil type comprised of a mixture between clay loam (Urban Lawns), fine sandy loam (Mature Forest) and anthropogenic sources.)
- ❑ Combined infiltration factor based on: — 0.45
  - Topography infiltration factor — 0.10
  - Soil texture infiltration factor — 0.20
  - Cover infiltration factor — 0.15

The topography infiltration factor of 0.10 is based upon a hilly land with an average slope of 28 to 47 m/km. The soil texture infiltration factor was based upon “medium combinations of clay and loam” with a value of 0.2 which is a reasonable generalization based upon the site investigations and available geological mapping. The “cover

infiltration factor" was calculated at 0.15 based upon the mix of tree cover and cultivated land.

The predicted nitrate concentration calculation for a conventional sewage system (system without nitrate reduction) results in a maximum of **14.16 m^3/day** of an effluent using a nitrate concentration of 40 mg/L. This maximum is significantly more than the proposed maximum daily usage of 10 m^3/d.

Based on the results of the predicted nitrate impact assessment, it is our opinion that the property can adequately support the proposed re-zoning without having an adverse impact on the underlying bedrock aquifer.

CONCLUSIONS

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

1. The water supply aquifer intercepted by the existing well is considered to be adequate to support the water quantity demands for the proposed building addition.

2. Based on a visual inspection performed by Paterson personnel, the well casing, stickup, and well cap are in compliance with O.Reg 903. The final grading around the well will be sufficiently graded to direct surface water away from the wellhead at the time of the new sewage system installation.

3. The preferred water supply intercepted by TW1 contains a water supply that is potable, and contains only elevated concentrations of hardness, TDS, and iron. The noted parameters can be treated with current readily available water conditioning equipment.

4. Colour, turbidity, and aluminum were measured to be elevated in initial laboratory testing. A resample was completed at a later date. The field testing of the re-sample showed 0 TCU for colour and 0.56 NTU for turbidity. Laboratory testing for aluminum was under the operational guideline at the resample. These values represent typical usage of TW1.

5. If desired by the property owner, a residential grade water softener can be used to facilitate the reduction of the hardness concentration and reduce scaling. If a water softener is used for the proposed development, the owner should be made aware that additional sodium will be added to the water to reduce hardness. If desired, a point-of-use reverse osmosis system can be used to provide a drinking tap source without increasing sodium levels.

6. The sodium concentration was measured to be above the 20 mg/L reporting limit and, as such, the Medical Officer of Health for the City of Ottawa should be informed to assist area physicians in the treatment of local residents on sodium reduced diets. It should be noted that some water treatment equipment may further increase the sodium concentration.

7. The predicted nitrate concentrations at the property boundary is calculated to be below the required 10 mg/L threshold when a conventional treatment system is used for greater than 10,000 L/day.

8. A Sewage System Permit and Building Permit need to be issued prior to the commencement of construction.

9. The results of the Hydrogeological Assessment and Terrain Analysis have provided satisfactory evidence that the subject site can support the proposed re-zoning application with respect to water quality, quantity and sewage system effluent (>10k L/day) attenuation within the property boundary.

We trust that the current submission satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

Alexander Schopf, PhD, EIT

Michael S. Killam, P.Eng.

Attachments:

- ❑ Key Plan
- ❑ MECP Water Well Records
- ❑ Eurofins Certificate of Analysis
- ❑ AQTESOLV - Pumping Test Analysis Reports
- ❑ Nitrate Impact Assessment Calculations
- ❑ Langelier Saturation Index (LSI) Calculation

FIGURE 1

KEY PLAN

PATERSON GROUP

4 214

UTM 18 Z 425455 E
5 R 5017205 N
Elev. 4 R 0355
Basin 25

31 G S 2

The Ontario Water Resources Commission Act

WATER WELL RECORD

GROUND WATER BRANCH
No 3022
JUL 3 1962
ONTARIO WATER RESOURCES COMMISSION

County or District CARLETON Township, ~~Village, Town or City~~ Huntley.
Con. 1 ~~County Rd # 31~~ Lot N½ W½ Lot 5 Date completed 30th (day) June (month) 1962. (year)
[redacted] dress Carp Ont.

Casing and Screen Record

Inside diameter of casing 6¼"
Total length of casing 71'
Type of screen
Length of screen
Depth to top of screen
Diameter of finished hole 5 3/4

Pumping Test

Static level 30'
Test-pumping rate 15' G.P.M.
Pumping level 75'
Duration of test pumping 45 min.
Water clear or cloudy at end of test clear
Recommended pumping rate 5' G.P.M.
with pump setting of 95' feet below ground surface

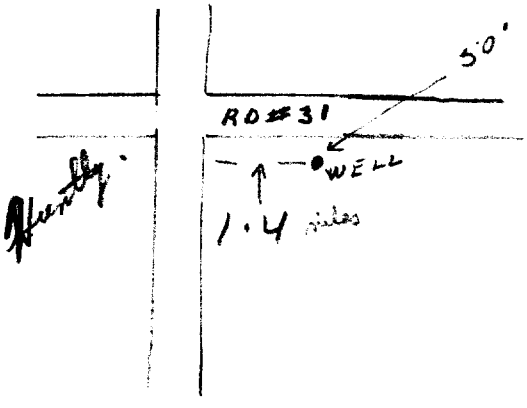
Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
clay.	0	15'		
gravel	15'	30		
sand & gravel	30	40		
quick sand.	40	55'		
limestone	55'	105'		fresh.
sandstone	105'	125'	100	

~~For~~ what purpose(s) is the water to be used?
house
Is well on upland, in valley, or on hillside? upland.
Drilling or Boring Firm Mel M° Laughlin
Address Ashton Ont.
Licence Number 593
Name of Driller or Borer Melville M° Laughlin
Address Ashton Ont
Date June 30 1962.
Melville M° Laughlin
(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.



6.6

Form 7 15M Sets 60-5930

OWRC COPY

UTM 18 Z 425460 E (215 written above)
5 R 5017460 N
Elev. 4 R 8345
Basin 25

31 G 5 d

GROUND WATER BRANCH
19 № 3023
DEC 7 1962
ONTARIO WATER RESOURCES COMMISSION

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District: Carleton
Township, ~~Village, Town or~~ City: Huntley
Con.: I
Lot: ~~SE ½~~ 6
Date completed: 7th (day) November (month) 1962 (year)

[redacted]dress: Carp. Ont.

Casing and Screen Record

- Inside diameter of casing: 6¼"
- Total length of casing: 74'
- Type of screen:
- Length of screen:
- Depth to top of screen:
- Diameter of finished hole: 6"

Pumping Test

- Static level: 24'
- Test-pumping rate: 10 G.P.M.
- Pumping level: 40'
- Duration of test pumping: 30 min
- 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 / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
clay & boulders.	0	20		
gravel	20	40		
gravel & sand	40	58		
limestone rock	58	120	98	fresh.

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

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

Drilling or Boring Firm: Mel McLaughlin

Address: Ashton Ont

Licence Number: 593

Name of Driller or Borer: Melville McLaughlin

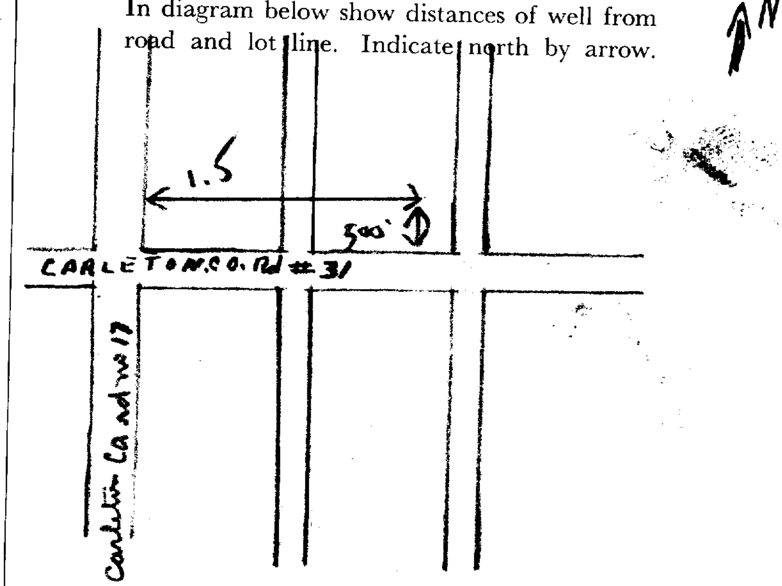
Address: Ashton Ont.

Date: November 7. 1962

Melville McLaughlin
(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.



Form 7 10M-62-1152

OWRC COPY

MINISTRY OF THE ENVIRONMENT

The Ontario Water Resources Act

WATER WELL RECORD

31 G/5D

Ontario

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11 | 1514699 | MUNICIP 15005 | CON. CDN | 01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
[redacted]	West Carleton Huntley	1	006

[redacted] R. # 3 Carp, Ontario

DATE COMPLETED: DAY 02 MO. 05 YR. 75

RING	RC.	ELEVATION	RC.	BASIN CODE	II	III	IV
1514699 18	425353	5017358	4	360	4	26	JUL 08, 1977 301

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
brown	sand	stones	packed	0	15
grey	harpen	boulders	packed	15	45
grey	sand	boulders	packed	45	64
grey	limestone		soft	64	80
	limestone		soft	80	94

31 | 00156281279 | 00452141379 | 00642281379 | 00802 1585 | 0094 1585

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0093	1 ☐ FRESH 3 ☒ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0066
06			66	80
06	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		80	0080
5			80	94
05	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE			0094

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER

PUMPING RATE: 0006 GPM. | DURATION OF PUMPING: 02 HOURS 00 MINS.

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
060 FEET	060 FEET	060 FEET	060 FEET	060 FEET	060 FEET

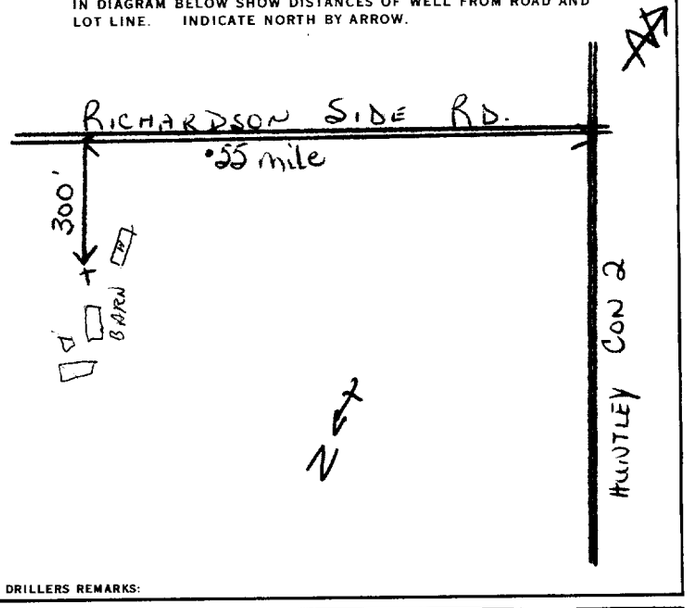
IF FLOWING, GIVE RATE: GPM. | PUMP INTAKE SET AT: FEET | WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING: 080 FEET | RECOMMENDED PUMPING RATE: 0005 GPM.

50-53 ——•—— GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL 2517

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



DRILLERS REMARKS:

FINAL STATUS OF WELL 54: 1

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

WATER USE 55-56: 01

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

METHOD OF DRILLING 57: 1

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

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd. | LICENCE NUMBER: 1558

ADDRESS: Box 490 Stittsville, Ontario

NAME OF DRILLER OR BORER: M. Hamilton | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: Walter Kawanagh | SUBMISSION DATE: DAY 8 MO. 5 YR. 75

OFFICE USE ONLY

DATA SOURCE 58: 1 | CONTRACTOR 59-62: 1558 | DATE RECD 63-68 80: 05 06 75

DATE OF INSPECTION: 9 Oct 74 | INSPECTOR: P/R. Doyle

REMARKS: CSS.68 | P | WI

FORM 7 MOE 07-091

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Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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11 1516709

MUNICIP. 15006 CON. CON 01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT 25-27
Carleton	March	1	006

[redacted] R.R. Stittsville Ont

DATE COMPLETED 48-53: DAY 21 MO. 09 YR. 78

[redacted] 17660 | RC 4 | ELEVATION 0325 | RC 4 | BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
Brown	clay	sand	loose	0	3
brown	clay		packed	3	20
grey	clay	stones		20	46
grey	sand	clay + boulders	packed	46	55
grey	limestone		med soft	55	200

31 | 0003605281 1 | 0020605 79 | 004629512 | 0055228 0513 | 02002 15 85

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
097	3 ☒ SULPHUR (slight)

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
06	☒ STEEL	188	0	0056
06	☒ OPEN HOLE		56	0200

SCREEN: SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET | MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER

PUMPING RATE: 0007 GPM

DURATION OF PUMPING: 01 HOURS 30 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
015 FEET	075 FEET	065 FEET	075 FEET	075 FEET	075 FEET

WATER LEVELS DURING: 1 ☒ PUMPING 2 RECOVERY

IF FLOWING, GIVE RATE: GPM

PUMP INTAKE SET AT: FEET

WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

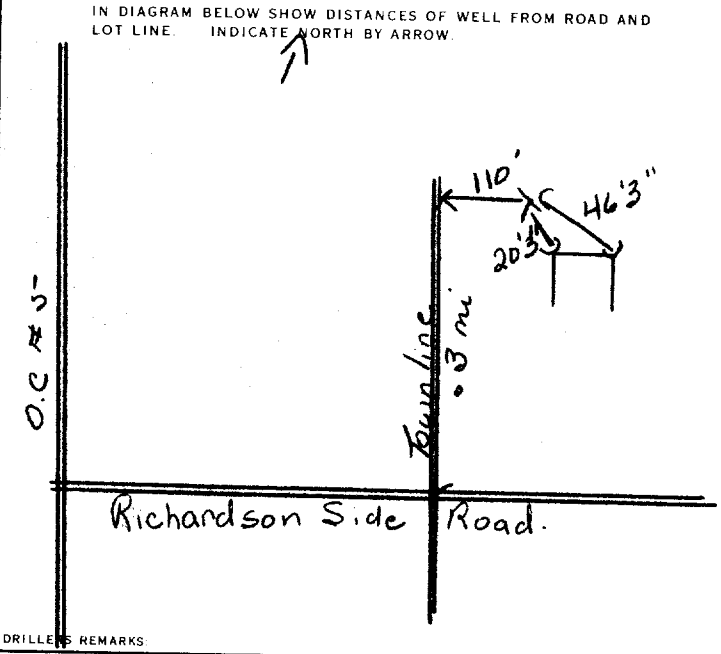
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP

RECOMMENDED PUMP SETTING: 080 FEET

RECOMMENDED PUMPING RATE: 0005 GPM

LOCATION OF WELL

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



DRILLERS REMARKS

FINAL STATUS OF WELL: 1 — 1 ☒ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED

WATER USE: 01 — 1 ☒ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; ☐ OTHER; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; 9 ☐ NOT USED

METHOD OF DRILLING: 1 — 1 ☒ CABLE TOOL; 2 ☐ ROTARY (CONVENTIONAL); 3 ☐ ROTARY (REVERSE); 4 ☐ ROTARY (AIR); 5 ☐ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd — LICENCE NUMBER: 1558

ADDRESS: Box 490, Stittsville Ont.

NAME OF DRILLER OR BORER: J. Moore — LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: H. Kavanagh — SUBMISSION DATE: DAY 27 MO. 9 YR. 78

OFFICE USE ONLY

DATA SOURCE: 1 — CONTRACTOR: 1558 — DATE RECEIVED: 301078 (~~301078~~)

DATE OF INSPECTION: 22/05/79 — INSPECTOR: [signature]

REMARKS:

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CSS.S8

FORM NO. 0506-4-77

31G5d

Ministry of the Environment

Ontario

The Ontario Water Resources Act

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1516743

MUNICIP 15005 CON. CON 01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
[redacted]	West Carleton (Huntley	1	009

[redacted] R 3 Carp Ont.

DATE COMPLETED: DAY 23 MO. 10 YR. 78

[redacted] 017160 | RC. 4 | ELEVATION 0355 | RC. 4 | BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Hardpan	boulders		0	21
Grey	Hardpan	boulders		21	32
Grey	Limestone		broken	32	34
Grey	Limestone		medium	34	115
Black	Limestone		medium	115	250
Black	Limestone		medium	250	260

31 | 0021 1413 | 0032 21413 | 0034 21571 | 0115215 | 0260 815

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0120	3 ☒ SULPHUR
0175	3 ☒ SULPHUR
0252	3 ☒ SULPHUR

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
~~6 1/4~~ 06	1 ☒ STEEL	188	0	~~34~~ 0034
06 (~~5 7/8~~)	4 ☒ OPEN HOLE		34	0250 / 250
06 (~~5 3/4~~)	4 ☒ OPEN HOLE		250	0260

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
2 ☒ BAILER	0024 GPM	01 HOURS 00 MINS

☒ PUMPING

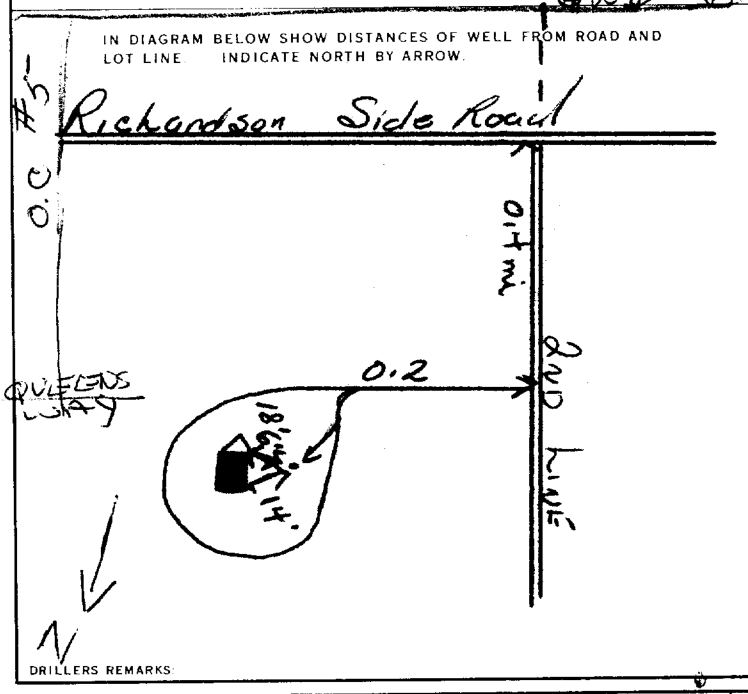
STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
020 FEET	050 FEET	050 FEET	050 FEET	050 FEET	050 FEET

IF FLOWING, GIVE RATE: GPM | PUMP INTAKE SET AT: FEET | WATER AT END OF TEST: 1 ☒ CLEAR

RECOMMENDED PUMP TYPE: ☒ DEEP | RECOMMENDED PUMP SETTING 060 FEET | RECOMMENDED PUMPING RATE 0005 GPM

LOCATION OF WELL

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



DRILLERS REMARKS

FINAL STATUS OF WELL	1 — 1 ☒ WATER SUPPLY
WATER USE	
METHOD OF DRILLING	1 — 1 ☒ CABLE TOOL 250-260; 5 ☒ AIR PERCUSSION

CONTRACTOR

NAME OF WELL CONTRACTOR: CAPITAL WATER SUPPLY LTD — LICENCE NUMBER 1558

ADDRESS: Box 490, STITTSVILLE ONT.

NAME OF DRILLER OR BORER: S Miller + J. Moore

SIGNATURE OF CONTRACTOR: Walter Kavanagh — SUBMISSION DATE DAY 26 MO. 10 YR. 78

OFFICE USE ONLY

DATA SOURCE 1 | CONTRACTOR 1558 | DATE RECEIVED 231178

DATE OF INSPECTION 17/05/79 | INSPECTOR Km

REMARKS

FORM NO. 0506-4-77

MINISTRY OF THE ENVIRONMENT COPY

Ministry of the Environment

Ontario

The Ontario Water Resources Act

WATER WELL RECORD

3165d

1. PRINT ONLY IN SPACES PROVIDED
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11 | 1516888 | MUNICIP 15006 | CON. CON 01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT 25-27
Carleton	March	1	006

[redacted] R. R. 2. Stittsville Ont.

DATE COMPLETED 48-53: DAY 22 MO 12 YR 78

[redacted] 017680 | RC. 4 | ELEVATION 0325 | RC. 4 | BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
Brown	Hardpan	Boulders		0	10
Brown	Clay			10	25
Blue	Clay			25	29
Grey	Granite			29	90
Grey	Granite			90	130
White	+ green granite		med hard	130	175
grey	granite		very hard	175	200

31 | 00106 413 | 0025605 | 0029305 | 0130221 | 0175 2173 | 0200221 9073

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0125	☒ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
6 1/4	☒ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE	.188	0	0030
06 5 7/8	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☒ OPEN HOLE		30	0090
06 5 7/8	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☒ OPEN HOLE		90	0200

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: ☒ PUMP ☐ BAILER

PUMPING RATE: 0003 2 1/2 GPM

DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
012 FEET	175 FEET	175 FEET	175 FEET	175 FEET	175 FEET

WATER LEVELS DURING: ☒ PUMPING ☐ RECOVERY

IF FLOWING, GIVE RATE: GPM

PUMP INTAKE SET AT: FEET

WATER AT END OF TEST: ☒ CLEAR ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP

RECOMMENDED PUMP SETTING: 0190 FEET

RECOMMENDED PUMPING RATE: 0002 GPM

FINAL STATUS OF WELL: 1

☒ WATER SUPPLY ☐ OBSERVATION WELL ☐ TEST HOLE ☐ RECHARGE WELL ☐ ABANDONED, INSUFFICIENT SUPPLY ☐ ABANDONED, POOR QUALITY ☐ UNFINISHED

WATER USE: 02

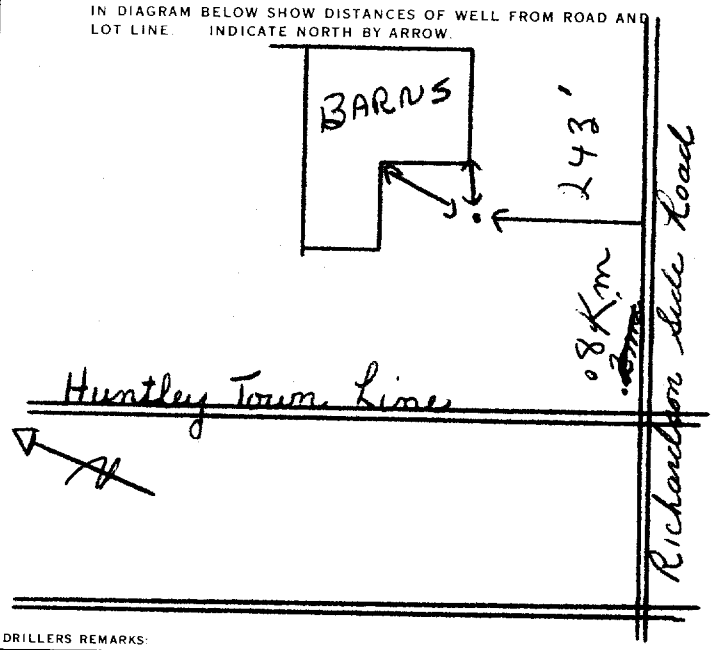
☐ DOMESTIC ☒ STOCK ☐ IRRIGATION ☐ INDUSTRIAL ☐ OTHER ☐ COMMERCIAL ☐ MUNICIPAL ☐ PUBLIC SUPPLY ☐ COOLING OR AIR CONDITIONING ☐ NOT USED

METHOD OF DRILLING: 1

☒ CABLE TOOL ☐ ROTARY (CONVENTIONAL) ☐ ROTARY (REVERSE) ☐ ROTARY (AIR) ☒ AIR PERCUSSION ☐ BORING ☐ DIAMOND ☐ JETTING ☐ DRIVING

LOCATION OF WELL

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



DRILLERS REMARKS:

CONTRACTOR

NAME OF WELL CONTRACTOR: CAPITAL WATER SUPPLY LTD | LICENCE NUMBER: 1558

ADDRESS: BOX 490 STITTSVILLE ONTARIO

NAME OF DRILLER OR BORER: S Miller - J Moore | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: H Kronenarl | SUBMISSION DATE: DAY 22 MO 12 YR 78

OFFICE USE ONLY

DATA SOURCE: 1 | CONTRACTOR: 1558 | DATE RECEIVED: 220179

DATE OF INSPECTION: 22/05/79 | INSPECTOR: K. S.

REMARKS:

CSS.58

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506-4-77

Ontario

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

31G5d

1. PRINT ONLY IN SPACES PROVIDED
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11 1516900

MUNICIP. 15005 CON. CON 01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
CARLETON	WEST CARLETON	1	NW 1/2 005

OWNER (SURNAME FIRST) [redacted] STWAY TANK) 1995 MERIVALE RD

DATE COMPLETED: DAY 25 MO 09 YR. 78

[redacted] 017140 4 OTTAWA 4 RC 0355 BASIN CODE 26 161

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BROWN	CLAY LOOM		LOOSE	0	8
BLUE	CLAY	MARINE CLAY	"	8	21
BLUE	CLAY	HARD PAN	PACKED	21	44
BROWN	GRAVEL	STONES	OVERBURDEN	44	58
BLUE	LIMESTONE		SHALEY	58	188

31 0008605027 7 | 0021305057 7 | 0044305147 9 | 0058611122 5 | 0188315 17

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0115	☐ FRESH ☐ SALTY ☒ SULPHUR ☐ MINERAL
0174	☒ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06 6 1/4	☒ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE	.188	0	0060 60
06 6 1/4	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☒ OPEN HOLE		60	0188
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE: | DEPTH TO TOP OF SCREEN: FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	☒ PUMP AIR ☐ BAILER
PUMPING RATE	0015 GPM
DURATION OF PUMPING	01 HOURS 00 MINS
STATIC LEVEL	018 FEET
WATER LEVEL END OF PUMPING	187 FEET
WATER LEVELS DURING (☒ PUMPING ☐ RECOVERY)	15 MINUTES 187; 30 MINUTES 187; 45 MINUTES 187; 60 MINUTES 187 FEET
IF FLOWING, GIVE RATE	GPM
PUMP INTAKE SET AT	187 FEET
WATER AT END OF TEST	☒ CLEAR ☐ CLOUDY
RECOMMENDED PUMP TYPE	☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING	180 FEET
RECOMMENDED PUMPING RATE	0010 GPM
GPM./FT. SPECIFIC CAPACITY	

FINAL STATUS OF WELL: 1

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

WATER USE: 01

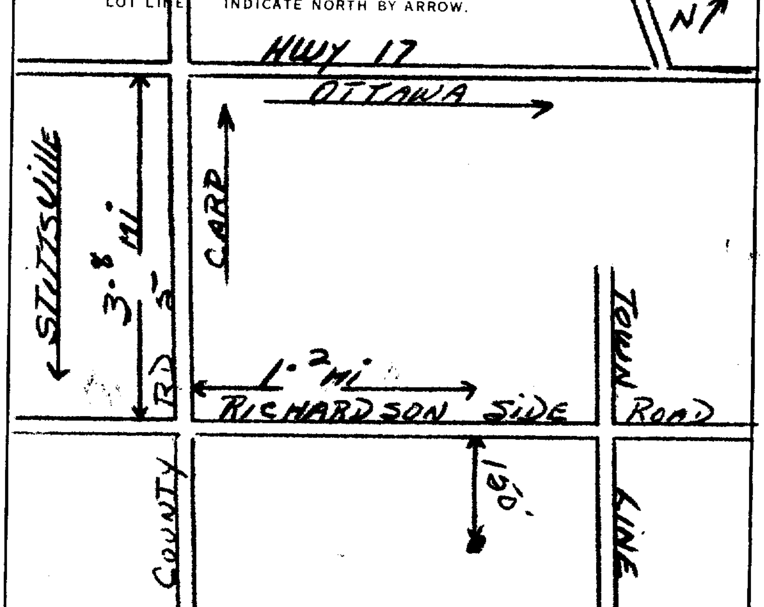
☒ 1 DOMESTIC ☐ 2 STOCK ☐ 3 IRRIGATION ☐ 4 INDUSTRIAL ☐ OTHER ☐ 5 COMMERCIAL ☐ 6 MUNICIPAL ☐ 7 PUBLIC SUPPLY ☐ 8 COOLING OR AIR CONDITIONING ☐ 9 NOT USED

METHOD OF DRILLING: 4

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

LOCATION OF WELL

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



DRILLERS REMARKS:

CONTRACTOR

NAME OF WELL CONTRACTOR	GIFFIN Well drilling LTD
LICENCE NUMBER	2307
ADDRESS	RR#2 RENFREW ONTARIO
NAME OF DRILLER OR BORER	Paul Daniels Jim Enright
LICENCE NUMBER	1746
SIGNATURE OF CONTRACTOR	[signature]
SUBMISSION DATE	DAY ___ MO. ___ YR. ___

OFFICE USE ONLY

DATA SOURCE	1
CONTRACTOR	2307
DATE RECEIVED	210279
DATE OF INSPECTION	17/05/79
INSPECTOR	JS
REMARKS	CSS.S8

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FORM 7 MOE 07-091

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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11 — 1522259 — MUNICIP — CON.

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. BLOCK, TRACT, SURVEY, ETC	LOT
[redacted]	West Carleton - Huntley	Conc. 1	6

R. # 3; Carp, Ontario. K0A 1L0

DATE COMPLETED: DAY 04 MO 02 YR 88

RING — RC — ELEVATION — RC — BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Clay	Boulders	Packed	0	20
Gray	Clay	Boulders	Packed	20	34
Gray	Sand	Clay and Boulders	Loose	34	55
Gray	Hardpan	Boulders, Sand	Packed	55	64 1/3
Gray	Limestone		Medium Hard	64 1/3	83

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
66	1 ☒ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
79	1 ☒ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	65
5 15/16	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		65	83
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER (INCHES)	LENGTH (FEET)

MATERIAL AND TYPE — DEPTH TO TOP OF SCREEN (FEET)

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

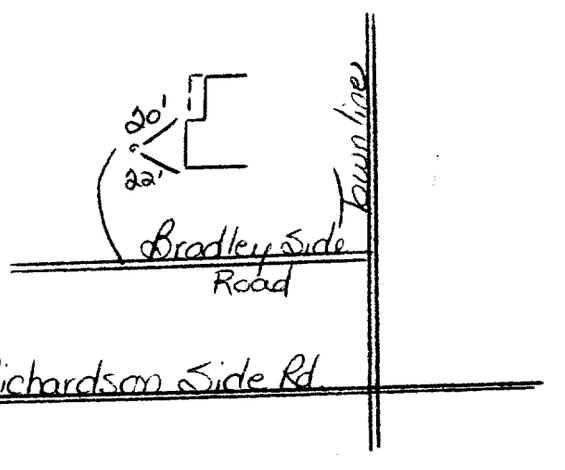
PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	8 GPM	16 HOURS ____ MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING (1 ☒ PUMPING 2 ☐ RECOVERY)	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
20 FEET	30 FEET		30 FEET	30 FEET	30 FEET	30 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST	RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
GPM	70 FEET	1 ☒ CLEAR 2 ☐ CLOUDY	☐ SHALLOW ☒ DEEP	60 FEET	5 GPM

LOCATION OF WELL

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



25060

DRILLERS REMARKS

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY — 2 ☐ OBSERVATION WELL — 3 ☐ TEST HOLE — 4 ☐ RECHARGE WELL — 8 ☐ ABANDONED, INSUFFICIENT SUPPLY — 6 ☐ ABANDONED, POOR QUALITY — 7 ☐ UNFINISHED — 9 ☐ DEWATERING

WATER USE

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

METHOD OF CONSTRUCTION

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

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd. — WELL CONTRACTOR'S LICENCE NUMBER: 1558

ADDRESS: Box 490; Stittsville, Ont. K0A 3G0

NAME OF WELL TECHNICIAN: J. Moore — WELL TECHNICIAN'S LICENCE NUMBER

SIGNATURE OF TECHNICIAN/CONTRACTOR — SUBMISSION DATE: DAY 04 MO 02 YR 88

OFFICE USE ONLY

DATA SOURCE — CONTRACTOR — DATE RECEIVED: APR 11 1988

DATE OF INSPECTION — INSPECTOR

REMARKS

CGS. ES

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FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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11 — 1526023 — MUNICIP 150,05 — CON. CON 01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. BLOCK, TRACT, SURVEY, ETC.	LOT
Ottawa Carleton	West Carleton	1	6

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Jacques Whitford Ltd.	C-20 2285 St.Laurent Blvd. Ottawa, Ontario K1G 4Z6	DAY 21 MO 10 YR 91

21 — ZONE — EASTING — NORTHING — RC — ELEVATION — RC — BASIN CODE — II — III — IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Clay			0	10
Gray	Clay	Stones & Gravel		10	33
Gray	Limestone			33	300

31 — 32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
243	1 ☐ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC	.188	0	34
6 1/16	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		34	200
6	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		200	300

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
Grouted		Cement

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	2.5 GPM	1 HOURS ___ MINS

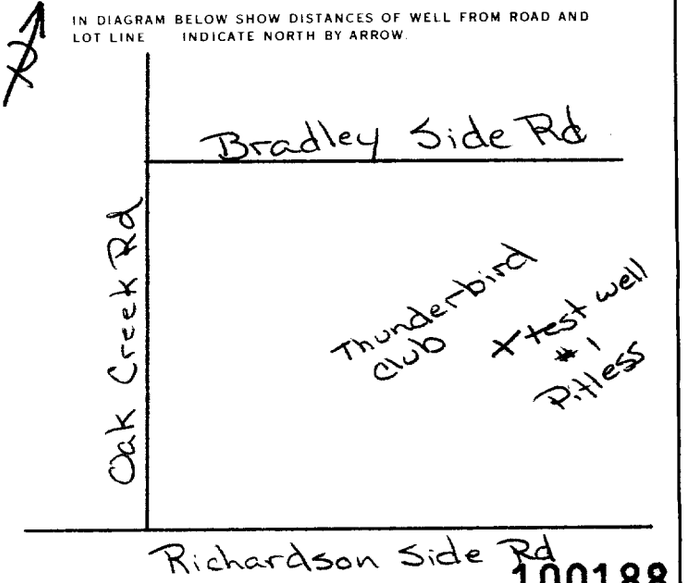
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
25 FEET	200 FEET	1 ☒ PUMPING 2 ☐ RECOVERY	200 FEET	200 FEET	200 FEET	200 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	1 ☐ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☐ DEEP	225 FEET	2.5 GPM

LOCATION OF WELL

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



DRILLERS REMARKS: 100188

FINAL STATUS OF WELL	WATER USE	METHOD OF CONSTRUCTION
1 ☒ WATER SUPPLY	1 ☒ DOMESTIC	1 ☐ CABLE TOOL
2 ☐ OBSERVATION WELL	2 ☐ STOCK	2 ☐ ROTARY (CONVENTIONAL)
3 ☐ TEST HOLE	3 ☐ IRRIGATION	3 ☐ ROTARY (REVERSE)
4 ☐ RECHARGE WELL	4 ☐ INDUSTRIAL	4 ☐ ROTARY (AIR)
5 ☒ ABANDONED, INSUFFICIENT SUPPLY	☐ OTHER	5 ☒ AIR PERCUSSION
6 ☐ ABANDONED, POOR QUALITY	5 ☐ COMMERCIAL	6 ☐ BORING
7 ☐ UNFINISHED	6 ☐ MUNICIPAL	7 ☐ DIAMOND
☐ DEWATERING	7 ☐ PUBLIC SUPPLY	8 ☐ JETTING
	8 ☐ COOLING OR AIR CONDITIONING	9 ☐ DRIVING
	9 ☐ NOT USED	☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR	WELL CONTRACTOR'S LICENCE NUMBER
Capital Water Supply Ltd.	1558
ADDRESS: Box 490 Stittsville, Ontario K2S 1A6	
NAME OF WELL TECHNICIAN: S. Miller	WELL TECHNICIAN'S LICENCE NUMBER: T0096
SIGNATURE OF TECHNICIAN/CONTRACTOR	SUBMISSION DATE: DAY 25 MO 10 YR 91

OFFICE USE ONLY

DATA SOURCE	CONTRACTOR	DATE RECEIVED
	1558	JAN 13 1992
DATE OF INSPECTION	INSPECTOR	
REMARKS: CSSIED		

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Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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11 — 1526122 — MUNICIP. 15005 — CON. CON 01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Ottawa Carleton	west Carleton - Huntley	1	6

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Jacques Whitford Ltd.	C-20 2285 St. Laurent Blvd Ottawa, Ontario K1G 4J6	DAY 19 MO 11 YR 91

21 — UTM ZONE — EASTING — NORTHING — RC. — ELEVATION — RC. — BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Clay	Stones		0	14
Gray	Clay	Stones		14	24
Gray	Limestone			24	175
Gray	Limestone			175	205

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
60	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
195	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	26
6 1/8	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		26	205
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☒ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE — DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	20 GPM	1 HOURS ___ MINS

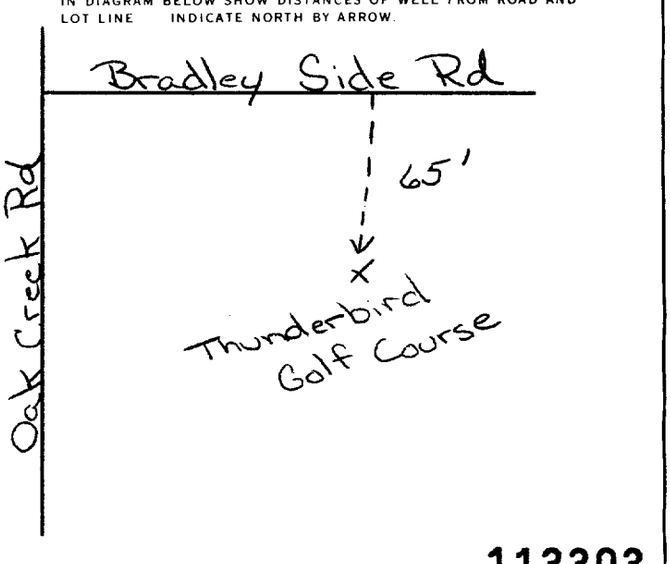
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
18 FEET	45 FEET	1 ☒ PUMPING 2 ☐ RECOVERY	45 FEET	45 FEET	45 FEET	45 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	45 FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	100 FEET	5 GPM

LOCATION OF WELL

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



DRILLERS REMARKS 113303

FINAL STATUS OF WELL

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

WATER USE

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

METHOD OF CONSTRUCTION

1 ☒ CABLE TOOL 175-205 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 0-175 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd. — WELL CONTRACTOR'S LICENCE NUMBER: 1558

ADDRESS: Box 490 Stittsville, Ontario K2S 1A6

NAME OF WELL TECHNICIAN: S. Miller/ J. Moore — WELL TECHNICIAN'S LICENCE NUMBER: T0097/T0096

SIGNATURE OF TECHNICIAN/CONTRACTOR: W. Kumm A — SUBMISSION DATE: DAY 28 MO 11 YR 91

OFFICE USE ONLY

DATA SOURCE — CONTRACTOR 1558 — DATE RECEIVED APR 30 1992

DATE OF INSPECTION — INSPECTOR

REMARKS

CSS.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 — 1527008 — MUNICIP 15005 — CON. CON 01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. BLOCK, TRACT, SURVEY, ETC.	LOT
Ottawa Carleton	West Carleton - Huntley	1	6

OWNER (SURNAME FIRST): [redacted]

ADDRESS: c/o Thunderbird Golf & Athletic Club Carp, Ontario

DATE COMPLETED: DY 14 MO 01 YR 93

21 — UTM ZONE — EASTING — NORTHING KOA 1L) — RC — ELEVATION — RC — BASIN CODE I II III IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Clay	Sand and Stones	Packed	0	8
Brown	Sand	Stones	Loose	8	13
Gray	Hardpan	Boulders	HArd	13	36
Gray	Limestone	Black Layers	Medium	36	90

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
54	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
66	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
NOT TESTED	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	40
6 1/8	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		40	90
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
40	2	Grouted Cement (7)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER

PUMPING RATE: 5 GPM

DURATION OF PUMPING: 1 HOURS ____ MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
20 FEET	70 FEET		55 FEET	70 FEET	70 FEET	70 FEET

IF FLOWING, GIVE RATE: ____ GPM

PUMP INTAKE SET AT: ____ FEET

WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY

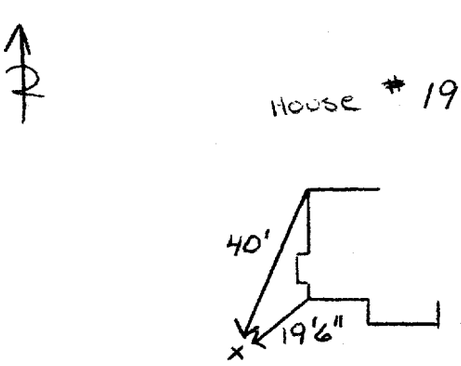
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP

RECOMMENDED PUMP SETTING: 80 FEET

RECOMMENDED PUMPING RATE: 5 GPM

LOCATION OF WELL

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



Richardson Side Rd

DRILLERS REMARKS: 130012

FINAL STATUS OF WELL

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

WATER USE

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

METHOD OF CONSTRUCTION

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

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd. — WELL CONTRACTOR'S LICENCE NUMBER: 1559

ADDRESS: Box 490 Stittsville, Ontario K2S 1A6

NAME OF WELL TECHNICIAN: J. Moore — WELL TECHNICIAN'S LICENCE NUMBER: T0096

SIGNATURE OF TECHNICIAN/CONTRACTOR: [signature]

SUBMISSION DATE: DAY 20 MO 01 YR 93

OFFICE USE ONLY

DATA SOURCE — CONTRACTOR: 1558 — DATE RECEIVED: MAR 04 1993

DATE OF INSPECTION — INSPECTOR

REMARKS

CSS-ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ontario Ministry of the Environment

Well Tag Number (Place sticker and print number below): A054566 / A 054566

Well Record

Regulation 903 Ontario Water Resources Act

page 2 of 3

Instructions for Completing Form

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

Ministry Use Only: MUN | CON | LOT

Well Owner's Information and Location of Well Information

First Name	Last Name	Mailing Address (Street Number/Name, RR, Lot, Concession)
	TRINITY PRESBYTERIAN CHURCH	110 McCURDY DR.

County/District/Municipality	Township/City/Town/Village	Province	Postal Code	Telephone Number (include area code)
OTTAWA CARELTON	OTTAWA	Ontario	K2L2Z6	613-836-1429

Address of Well Location (County/District/Municipality)	Township	Lot	Concession
OTTAWA CARELTON	WEST CARELTON	PT LT 6	1

RR#/Street Number/Name	City/Town/Village	Site/Compartment/Block/Tract etc.
1817 RICHARDSON SIDE RD.	OTTAWA	

GPS Reading	NAD	Zone	Easting	Northing	Unit Make/Model	Mode of Operation
	83	18	425510	5017649	MAGELLAN	☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To (Metres)
BROWN	SAND	CLAY, STONES, BOULDERS		0	2.43
GREY	CLAY	SAND, STONES, BOULDERS		2.43	15.84
GREY	LIMESTONE	BROWN LIMESTONE		15.84	46.63

Hole Diameter

Depth From	Metres To	Diameter Centimetres
0	16.91	24.77
16.91	46.63	15.23

Water Record

Water found at Metres	Kind of Water
22.8	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other: UNTESTED
26.8 m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other: UNTESTED
43.6 m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other: UNTESTED

After test of well yield, water was: ☐ Clear and sediment free ☐ Other, specify CLEARING

Chlorinated ☒ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth To (Metres)
Casing				
15.87	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.48	0 + 1.52	16.91
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen				
	☒ Open hole		16.91	46.63

Test of Well Yield

Pumping test method: SUB. PUMP

Pump intake set at (metres): 43.5

Pumping rate - (litres/min): 36.4

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping: 18.47 metres

Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump depth: 43.5 metres

Recommended pump rate: 36.4 (litres/min)

If flowing give rate - (litres/min): /

If pumping discontinued, give reason: /

	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Static Level		0		
1	2.09		1	16.91
2	3.96		2	15.94
3	5.27		3	14.96
4	6.33		4	14.08
5	7.31		5	13.16
10	10.82		10	9.07
15	12.58		15	6.96
20	14.38		20	5.51
25	16.0		25	3.50
30	17.03		30	2.62
40	18.44		40	1.37
50	18.47		50	1.03
60	18.47		60	.88

Plugging and Sealing Record

☒ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	16.91	BENTONITE SLURRY	1.15

Method of Construction

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

Water Use

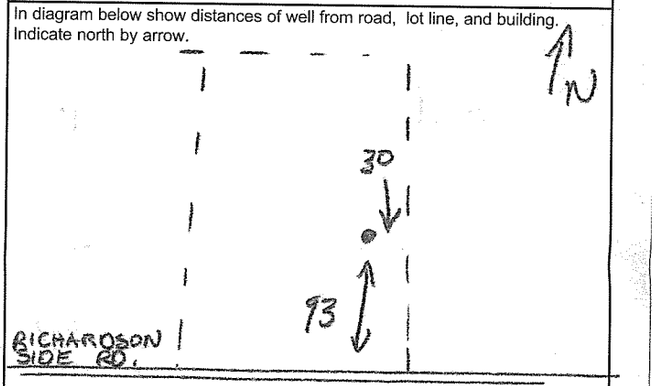
☐ Domestic ☐ Industrial ☒ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

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

Location of Well

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



Audit No. Z 44855

Date Well Completed: YYYY 06 MM 12 DD 19

Was the well owner's information package delivered? ☒ Yes ☐ No

Date Delivered: YYYY 06 MM 12 DD 19

Well Contractor/Technician Information

Name of Well Contractor	Well Contractor's Licence No.
T. SAUNDERS DRILLING LTD	4879

Business Address (street name, number, city etc.)		
RR#1	BRAESIDE ONT.	K0A 1G0

Name of Well Technician (last name, first name)	Well Technician's Licence No.
SAUNDERS TROY	T-517

Signature of Technician/Contractor: X Troy Saun

Date Submitted: YYYY 07 MM 1 DD 19

Ministry Use Only

Data Source	Contractor
	4879
Date Received: FEB 21 2007	Date of Inspection: YYYY MM DD
Remarks	Well Record Number

0506E (09/03)

Contractor's Copy ☐ Ministry's Copy ☐ Well Owner's Copy ☑

Cette formule est disponible en français

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

OFFICIAL CERTIFICATE OF ANALYSIS : 3966666

WORK REQUEST : 100292480

Report Date : 2024-07-03

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

Reception Date : 2024-06-26
Project : PM15625
Sampler : NA
PO Number : 60535
Temperature : 6 °C

Analysis	Quantity	External Method
Alkalinity (Water, Automated)	2	Modified from SM 2320 B
Ammonia, Total (Water, Colorimetry)	2	Modified from EPA 350.1
Chloride (Water, IC)	2	Modified from SM 4110 B and C
Colour, Apparent (Water, Spectrophotometry)	2	Modified from SM 2120 C
Conductivity (Water, Automated)	2	Modified from SM 2510 B
DOC (Water, IR)	2	Modified from SM 5310 B
Escherichia coli (DC Plate)	2	Modified from MECP E3407
Fluoride (Water, Auto/ISE)	2	Modified from SM 4500-F A and 4500-F C
Hardness (Water, Calculation Only)	2	SM 2340 B
Ion Balance (Water, Calculation)	2	Modified from SM1030 E
Metals Scan (Water, ICP/MS)	2	Modified from EPA 200.8
Metals Scan (Water, ICP/OES)	2	Modified from SM 3120 B
Nitrate (Water, IC)	2	Modified from SM 4110 B and C
Nitrite (Water, IC)	2	Modified from SM 4110 B and C
pH (25°C) (Water, Automated)	2	Modified from SM 4500-H+ B
Phenols (Water, Colorimetry)	2	Modified from EPA 420.2
Sulphate (Water, IC)	2	Modified from SM 4110 B and C
Sulphide (Water, Colorimetry)	2	Modified from SM 4500-S2 D
Tannin and Lignin (Water, Spec)	2	Modified from SM 5550 B
TDS (Estimated)	2	Modified from SM 2510 A
Total Coliforms (DC Plate)	2	Modified from MECP E3407
Total Kjeldahl Nitrogen (Water, Colorimetry)	2	Modified from EPA 351.2
Turbidity (Water, Turbidimeter)	2	Modified from SM 2130 B
VOCs (Water, GC/MS)	2	Modified from EPA 8260

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

Sample status upon receipt :
7802343 7802344
Compliant

Certificate Comments :
7802344
Anions MRL increase due to matrix interference. B spike not available due to high native analyte concentration in the mother sample. B results were verified for this sample. DOC analyzed from plastic sample bottle.
7802343
Anions MRLs increased due to matrix interferences. B spike not available due to high native analyte concentration in the mother sample. B results were verified for this sample.

Notes :
- All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated.

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

Legend :

RL : Reporting limit
QC : Reference material (QC)
N/A : Not applicable
1 : Results in annex
* : Analysis conducted by external subcontracting
^ : Analysis not accredited

OFFICIAL CERTIFICATE OF ANALYSIS - EXCEEDENCE SUMMARY

Client : Paterson Group
Project : PM15625

Reception Date : 2024-06-26

Eurofins Sample No	Client Sample Identification	Analyte	Result	Units	Exceeded Criteria		
					A	B	C
Colour, Apparent (Water, Spectrophotometry)							
7802343	TW1 - GW1	Colour (Apparent)	10	TCU	5		
7802344	TW1 - GW2	Colour (Apparent)	10	TCU	5		
Hardness (Water, Calculation Only)							
7802343	TW1 - GW1	Hardness as CaCO3 (Calculation)	356	mg/L	80-100		
7802344	TW1 - GW2	Hardness as CaCO3 (Calculation)	360	mg/L	80-100		
Metals Scan (Water, ICP/MS)							
7802343	TW1 - GW1	Aluminum	0.43	mg/L	0.1		
7802344	TW1 - GW2	Aluminum	0.34	mg/L	0.1		
7802343	TW1 - GW1	Iron	0.68	mg/L	0.3		
7802344	TW1 - GW2	Iron	0.44	mg/L	0.3		
Sulphide (Water, Colorimetry)							
7802343	TW1 - GW1	Sulphide (S2-)	0.95	mg/L	0.05		
7802344	TW1 - GW2	Sulphide (S2-)	1.16	mg/L	0.05		
TDS (Estimated)							
7802343	TW1 - GW1	TDS (Estimated)^	944	mg/L	500		
7802344	TW1 - GW2	TDS (Estimated)^	959	mg/L	500		
Turbidity (Water, Turbidimeter)							
7802343	TW1 - GW1	Turbidity	11.5	NTU	5		
7802344	TW1 - GW2	Turbidity	7.10	NTU	5		

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OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PM15625

Reception Date: 2024-06-26

					Eurofins Sample No :	**7802343**	**7802344**			
					Matrix :	Drinking water	Drinking water			
					Sampling Date :	2024-06-25	2024-06-25			
					Client Sample Identification :	TW1 - GW1	TW1 - GW2			
Anions	**RL**	**Unit**	**Criteria A**	**Criteria B**	**Criteria C**					
Chloride	0.5	mg/L	250			84.9	86.4			
Nitrate (as Nitrogen)	0.1	mg/L	10.0			<0.5	<0.5			
Nitrite (as Nitrogen)	0.1	mg/L	1.0			<0.5	<0.5			
Sulphate	1	mg/L	500			388	394			

			Eurofins Sample No :	**7802343**	**7802344**				
			Matrix :	Drinking water	Drinking water				
			Sampling Date :	2024-06-25	2024-06-25				
			Client Sample Identification :	TW1 - GW1	TW1 - GW2				
Calculations	**RL**	**Unit**							
Ion Balance (Calculation)^	0.1		1.01	1.02					

					Eurofins Sample No :	**7802343**	**7802344**			
					Matrix :	Drinking water	Drinking water			
					Sampling Date :	2024-06-25	2024-06-25			
					Client Sample Identification :	TW1 - GW1	TW1 - GW2			
General Chemistry	**RL**	**Unit**	**Criteria A**	**Criteria B**	**Criteria C**					
Alkalinity (as CaCO3)	5	mg/L	500			225	225			
Colour (Apparent)	2	TCU	5			10	10			
Conductivity @ 25°C	5	µS/cm				1350	1370			
Dissolved Organic Carbon	0.5	mg/L	5			1.3	1.0			
Fluoride	0.1	mg/L	1.5			1.32	1.34			
Hardness as CaCO3 (Calculation)	1	mg/L	80-100			356	360			
pH @ 25°C	1		6.5-8.5			7.97	8.04			
Phenols-4AAP	0.001	mg/L				<0.001	<0.001			
Sulphide (S2-)	0.01	mg/L	0.05			0.95	1.16			
Tannin and Lignin	0.1	mg/L				0.2	0.3			
TDS (Estimated)^	5	mg/L	500			944	959			
Turbidity	0.1	NTU	5			11.5	7.10			

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OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PM15625

Reception Date: 2024-06-26

						Eurofins Sample No :	**7802343**	**7802344**		
						Matrix :	Drinking water	Drinking water		
						Sampling Date :	2024-06-25	2024-06-25		
						Client Sample Identification :	TW1 - GW1	TW1 - GW2		
Metals			**Criteria**							
	RL	**Unit**	**A**	**B**	**C**					
Metals Scan (Water, ICP/MS)										
Aluminum	0.01	mg/L	0.1				0.43	0.34		
Antimony	0.0005	mg/L	0.006				<0.0005	<0.0005		
Arsenic	0.001	mg/L	0.01				<0.001	<0.001		
Barium	0.001	mg/L	1				0.191	0.190		
Beryllium	0.0005	mg/L					<0.0005	<0.0005		
Boron	0.01	mg/L	5				0.43	0.44		
Cadmium	0.0001	mg/L	0.005				<0.0001	<0.0001		
Chromium	0.001	mg/L	0.05				0.001	<0.001		
Cobalt	0.0002	mg/L					0.0002	<0.0002		
Copper	0.001	mg/L	1				<0.001	<0.001		
Iron	0.03	mg/L	0.3				0.68	0.44		
Lead	0.001	mg/L	0.01				<0.001	<0.001		
Manganese	0.01	mg/L	0.05				0.02	0.02		
Mercury	0.0001	mg/L	0.001				<0.0001	<0.0001		
Molybdenum	0.005	mg/L					<0.005	<0.005		
Nickel	0.005	mg/L					<0.005	<0.005		
Selenium	0.001	mg/L	0.05				<0.001	<0.001		
Silver	0.0001	mg/L					<0.0001	<0.0001		
Strontium	0.001	mg/L					2.64	2.72		
Thallium	0.0001	mg/L					<0.0001	<0.0001		
Uranium	0.001	mg/L	0.02				<0.001	<0.001		
Vanadium	0.001	mg/L					0.001	<0.001		
Zinc	0.01	mg/L	5				<0.01	<0.01		
Metals Scan (Water, ICP/OES)										
Calcium	1	mg/L					74	75		
Magnesium	1	mg/L					42	42		
Potassium	1	mg/L					6	6		
Sodium	1	mg/L	200				181	186		

						Eurofins Sample No :	**7802343**	**7802344**		
						Matrix :	Drinking water	Drinking water		
						Sampling Date :	2024-06-25	2024-06-25		
						Client Sample Identification :	TW1 - GW1	TW1 - GW2		
Microbiology			**Criteria**							
	RL	**Unit**	**A**	**B**	**C**					
Escherichia coli (DC)	0	CFU/100mL	0				0	0		
Total Coliforms (DC)	0	CFU/100mL	0				0	0		

eurofins | Environment Testing
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OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PM15625

Reception Date: 2024-06-26

Eurofins Sample No :			**7802343**	**7802344**					
Matrix :			Drinking water	Drinking water					
Sampling Date :			2024-06-25	2024-06-25					
Client Sample Identification :			TW1 - GW1	TW1 - GW2					
Nutrients	**RL**	**Unit**							
Ammonia (Total, as Nitrogen)	0.02	mg/L	0.259	0.263					
Total Kjeldahl Nitrogen	0.1	mg/L	1.46	0.483					

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PM15625

Reception Date: 2024-06-26

					Eurofins Sample No :	**7802343**	**7802344**			
					Matrix :	Drinking water	Drinking water			
					Sampling Date :	2024-06-25	2024-06-25			
					Client Sample Identification :	TW1 - GW1	TW1 - GW2			
Volatile Organic Compounds	**RL**	**Unit**	**Criteria**							
			A	**B**	**C**					
VOCs (Water, GC/MS)										
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-Dichloroethene	0.4	ug/L	14			<0.4	<0.4			
1,2-Dibromoethane	0.2	ug/L				<0.2	<0.2			
1,2-Dichlorobenzene	0.4	ug/L	200			<0.4	<0.4			
1,2-Dichloroethane	0.2	ug/L	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			
1,4-Dichlorobenzene	0.4	ug/L	5			<0.4	<0.4			
Acetone	5	ug/L				<5.0	<5.0			
Benzene	0.5	ug/L	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			
Carbon tetrachloride	0.2	ug/L	2			<0.2	<0.2			
Chloroethane	0.2	ug/L				<0.2	<0.2			
Chloroform	0.5	ug/L				<0.5	<0.5			
Chloromethane	0.2	ug/L				<0.2	<0.2			
cis-1,2-Dichloroethene	0.4	ug/L				<0.4	<0.4			
cis-1,3-Dichloropropene	0.2	ug/L				<0.2	<0.2			
Dibromochloromethane	0.3	ug/L				<0.3	<0.3			
Dichloromethane	4	ug/L	50			<4.0	<4.0			
Diethyl ether	5	ug/L				<5	<5			
Ethylbenzene	0.5	ug/L	140			<0.5	<0.5			
m/p-Xylene	0.4	ug/L				<0.4	<0.4			
Methyl ethyl ketone (MEK)	2	ug/L				<2.0	<2.0			
Methyl isobutyl ketone (MIBK)	5	ug/L				<5.0	<5.0			
Methyl tert-butyl ether (MTBE)	2	ug/L				<2	<2			
Monochlorobenzene	0.5	ug/L	80			<0.5	<0.5			
o-Xylene	0.4	ug/L				<0.4	<0.4			
Styrene	0.5	ug/L				<0.5	<0.5			
Tetrachloroethylene (PCE)	0.3	ug/L	10			<0.3	<0.3			
Toluene	0.4	ug/L	60			<0.4	<0.4			
trans-1,2-dichloroethene	0.4	ug/L				<0.4	<0.4			
trans-1,3-dichloropropene	0.2	ug/L				<0.2	<0.2			
Trichloroethylene (TCE)	0.3	ug/L	5			<0.3	<0.3			
Trichlorofluoromethane	0.5	ug/L				<0.5	<0.5			

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OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PM15625

Reception Date: 2024-06-26

						Eurofins Sample No :	**7802343**	**7802344**			
						Matrix :	Drinking water	Drinking water			
						Sampling Date :	2024-06-25	2024-06-25			
						Client Sample Identification :	TW1 - GW1	TW1 - GW2			
Volatile Organic Compounds	**RL**	**Unit**	**Criteria**								
			A	**B**	**C**						
Vinyl chloride	0.2	ug/L	1				<0.2	<0.2			
Xylene (Total)	0.5	ug/L	90				<0.5	<0.5			
1,2-dichloroethane-d4 (surrogate)	0	%					122	109			
4-bromofluorobenzene (surrogate)	0	%					71	72			
Toluene-d8 (surrogate)	0	%					110	113			

Approved by : _____
Emma-Dawn Ferguson, M.Sc.
Environmental Chemist

Approved by : _____
Jason Kennedy,
Project Manager

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OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PM15625

Reception Date: 2024-06-26

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Alkalinity (Water, Automated)									
Method : Alkalinity (water, titration to pH 4.5, automated). Internal method: OTT-I-AT-WI45398.									
Alkalinity (as CaCO3)	mg/L	5	<5	100	95-105			-	0-20
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-28 Analysis Date: 2024-07-02	
Ammonia, Total (Water, Colorimetry)									
Method : Ammonia (Water, Colorimetry). Internal method: OTT-I-NUT-WI46201.									
Ammonia (Total, as Nitrogen)	mg/L	0.02	<0.020	104	80-120	112	80-120	3	0-20
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-27 Analysis Date: 2024-06-27	
Chloride (Water, IC)									
Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.									
Chloride	mg/L	0.5	<0.5	96	80-120	101	80-120	-	0-20
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-27 Analysis Date: 2024-06-28	
Colour, Apparent (Water, Spectrophotometry)									
Method : Colour (Water, Spectrophotometric). Internal method: OTT-I-SPEC-WI45980.									
Colour (Apparent)	TCU	2	<2	110	39-159			2	0-40
Associated Samples : 7802343, 7802344								Prep Date: 2024-07-03 Analysis Date: 2024-07-03	
Conductivity (Water, Automated)									
Method : Conductivity (Water, Autotitrator). Internal Method: OTT-I-AT-WI45398.									
Conductivity @ 25°C	uS/cm	5	<5	98	98-102			2	0-20
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-28 Analysis Date: 2024-07-02	
DOC (Water, IR)									
Method : Organic carbon (water, IR, combustion). Internal method: OTT-I-DEM-WI46148.									
Dissolved Organic Carbon	mg/L	0.5	<0.5	89	84-116	99	80-120	-	0-15
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-28 Analysis Date: 2024-07-02	
Escherichia coli (DC Plate)									
Method : Total Coliforms and E.Coli by MF (Water, DC plate). Internal method: OTT-M-BAC-WI45296.									
Escherichia coli (DC)	CFU/100mL	0	0					-	0-30
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-26 Analysis Date: 2024-06-27	
Fluoride (Water, Auto/ISE)									
Method : Fluoride by autotitrator, ion selective electrode. Internal method: OTT-I-AT-WI45398.									
Fluoride	mg/L	0.1	<0.10	100	90-110				
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-28 Analysis Date: 2024-07-02	

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PM15625

Reception Date: 2024-06-26

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Metals Scan (Water, ICP/MS)									
Method : Metals (Water, ICP/MS). Internal method: AMMTFQE1.									
Aluminum	mg/L	0.01	<0.01	100	80-120	-	70-130	-	0-20
Antimony	mg/L	0.0005	<0.0005	89	80-120	95	70-130	-	0-20
Arsenic	mg/L	0.001	<0.001	100	80-120	100	70-130	-	0-20
Barium	mg/L	0.001	<0.001	100	80-120	-	70-130	-	0-20
Beryllium	mg/L	0.0005	<0.0005	112	80-120	113	70-130	-	0-20
Boron	mg/L	0.01	<0.01	110	80-120	119	70-130	-	0-20
Cadmium	mg/L	0.0001	<0.0001	103	80-120	-	70-130	-	0-20
Chromium	mg/L	0.001	<0.001	110	80-120	-	70-130	-	0-20
Cobalt	mg/L	0.0002	<0.0002	105	80-120	-	70-130	-	0-20
Copper	mg/L	0.001	<0.001	110	80-120	-	70-130	-	0-20
Iron	mg/L	0.03	<0.03	90	80-120	101	70-130	-	0-20
Lead	mg/L	0.001	<0.001	100	80-120	-	70-130	-	0-20
Manganese	mg/L	0.01	<0.01	100	80-120	-	70-130	-	0-20
Mercury	mg/L	0.0001	<0.0001	110	80-120	-	70-130	-	0-20
Molybdenum	mg/L	0.005	<0.005	100	80-120	95	70-130	-	0-20
Nickel	mg/L	0.005	<0.005	110	80-120	-	70-130	-	0-20
Selenium	mg/L	0.001	<0.001	105	80-120	114	70-130	-	0-20
Silver	mg/L	0.0001	<0.0001	113	80-120	-	70-130	-	0-20
Strontium	mg/L	0.001	<0.001	100	80-120	-	70-130	-	0-20
Thallium	mg/L	0.0001	<0.0001	99	80-120	-	70-130	-	0-20
Uranium	mg/L	0.001	<0.001	90	80-120	90	70-130	-	0-20
Vanadium	mg/L	0.001	<0.001	100	80-120	-	70-130	-	0-20
Zinc	mg/L	0.01	<0.01	110	80-120	-	70-130	-	0-20
Associated Samples : 7802343								Prep Date: 2024-07-02 Analysis Date: 2024-07-03	
Method : Metals (Water, ICP/MS). Internal method: AMMTFQE1.									
Aluminum	mg/L	0.01	<0.01	100	80-120	117	70-130	8	0-20
Antimony	mg/L	0.0005	<0.0005	89	80-120	-	70-130	-	0-20
Arsenic	mg/L	0.001	<0.001	100	80-120	104	70-130	-	0-20
Barium	mg/L	0.001	<0.001	100	80-120	83	70-130	1	0-20
Beryllium	mg/L	0.0005	<0.0005	112	80-120	-	70-130	-	0-20
Boron	mg/L	0.01	<0.01	110	80-120			1	0-20
Cadmium	mg/L	0.0001	<0.0001	103	80-120	-	70-130	-	0-20
Chromium	mg/L	0.001	<0.001	110	80-120	99	70-130	-	0-20
Cobalt	mg/L	0.0002	<0.0002	105	80-120	103	70-130	-	0-20
Copper	mg/L	0.001	<0.001	110	80-120	93	70-130	-	0-20
Iron	mg/L	0.03	<0.03	90	80-120	100	70-130	4	0-20
Lead	mg/L	0.001	<0.001	100	80-120	89	70-130	-	0-20
Manganese	mg/L	0.01	<0.01	100	80-120	103	70-130	-	0-20
Mercury	mg/L	0.0001	<0.0001	110	80-120	103	70-130	-	0-20
Molybdenum	mg/L	0.005	<0.005	100	80-120	109	70-130	-	0-20
Nickel	mg/L	0.005	<0.005	110	80-120	101	70-130	-	0-20
Selenium	mg/L	0.001	<0.001	105	80-120	-	70-130	-	0-20
Silver	mg/L	0.0001	<0.0001	113	80-120	-	70-130	-	0-20
Strontium	mg/L	0.001	<0.001	100	80-120	73	70-130	1	0-20
Thallium	mg/L	0.0001	<0.0001	99	80-120	-	70-130	-	0-20
Uranium	mg/L	0.001	<0.001	90	80-120	94	70-130	-	0-20

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OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PM15625

Reception Date: 2024-06-26

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Metals Scan (Water, ICP/MS)									
Method : Metals (Water, ICP/MS). Internal method: AMMTFQE1.									
Vanadium	mg/L	0.001	<0.001	100	80-120	100	70-130	-	0-20
Zinc	mg/L	0.01	<0.01	110	80-120	-	70-130	-	0-20
Associated Samples : 7802344								Prep Date: 2024-07-02 Analysis Date: 2024-07-03	
Metals Scan (Water, ICP/OES)									
Method : Metals (Water, ICP/OES). Internal method: OTT-I-MET-WI48491.									
Calcium	mg/L	1	<1	107	86-115	100	70-130	0	0-20
Magnesium	mg/L	1	<1	105	91-109	104	70-130	0	0-20
Potassium	mg/L	1	<1	106	87-113	116	70-130	-	0-20
Sodium	mg/L	1	<1	104	85-115	108	70-130	0	0-20
Associated Samples : 7802343, 7802344								Prep Date: 2024-07-02 Analysis Date: 2024-06-26	
Nitrate (Water, IC)									
Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.									
Nitrate (as Nitrogen)	mg/L	0.1	<0.1	97	80-120	101	80-120		
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-27 Analysis Date: 2024-06-28	
Nitrite (Water, IC)									
Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.									
Nitrite (as Nitrogen)	mg/L	0.1	<0.1	93	80-120	100	80-120		
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-27 Analysis Date: 2024-06-28	
pH (25°C) (Water, Automated)									
Method : pH (Water, Automated Meter). Internal method: OTT-I-AT-WI45398.									
pH @ 25°C		1	5.78	100	97-103			0	0-20
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-28 Analysis Date: 2024-07-02	
Phenols (Water, Colorimetry)									
Method : Phenols (Water, Colorimetry). Internal method: OTT-I-4AAP-WI46150.									
Phenols-4AAP	mg/L	0.001	<0.001	114	75-125	111	70-130	-	0-20
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-28 Analysis Date: 2024-07-02	
Sulphate (Water, IC)									
Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.									
Sulphate	mg/L	1	<1	95	90-110	95	80-120		
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-27 Analysis Date: 2024-06-28	
Sulphide (Water, Colorimetry)									
Method : Sulphide, S2- (Water, Colorimetry). Internal method: OTT-I-SPEC-WI45931.									
Sulphide (S2-)	mg/L	0.01	<0.01	96	80-120			-	0-20
Associated Samples : 7802343, 7802344								Prep Date: 2024-07-02 Analysis Date: 2024-07-02	
Tannin and Lignin (Water, Spec)									
Method : Tannin and Lignin (Water, Spec), Internal method: OTT-I-SPEC-WI57693.									
Tannin and Lignin	mg/L	0.1	<0.1	96	80-120			-	0-20
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-27 Analysis Date: 2024-06-28	

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OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PM15625

Reception Date: 2024-06-26

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Total Coliforms (DC Plate)									
Method : Total Coliforms and E.Coli by MF (Water, DC plate). Internal method: OTT-M-BAC-WI45296.									
Total Coliforms (DC)	CFU/100mL	0	0					-	0-30
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-26 Analysis Date: 2024-06-27	
Total Kjeldahl Nitrogen (Water, Colorimetry)									
Method : TKN (Water, colorimetry). Internal method: OTT-I-NUT-WI46201.									
Total Kjeldahl Nitrogen	mg/L	0.1	<0.100	95	70-130	102	70-130	1	0-20
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-27 Analysis Date: 2024-06-28	
Turbidity (Water, Turbidimeter)									
Method : Turbidity (Water, Turbidimeter). Internal method: OTT-I-TUR-WI46288.									
Turbidity	NTU	0.1	<0.1	100	80-120			2	0-30
Associated Samples : 7802343, 7802344								Prep Date: 2024-06-27 Analysis Date: 2024-06-28	

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OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PM15625

Reception Date: 2024-06-26

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
VOCs (Water, GC/MS)									
Method : Volatile Organic Compounds (Water, GC/MS). Internal method: AMVOMSE8.									
1,1,1,2-Tetrachloroethane	ug/L	0.5	<0.5	109	70-130	91	70-130	-	0-30
1,1,1-Trichloroethane	ug/L	0.4	<0.4	92	70-130	114	70-130	-	0-30
1,1,2,2-Tetrachloroethane	ug/L	0.5	<0.5	119	70-130	86	70-130	-	0-30
1,1,2-Trichloroethane	ug/L	0.4	<0.4	118	70-130	104	70-130	-	0-30
1,1-Dichloroethane	ug/L	0.4	<0.4	97	70-130	110	70-130	-	0-30
1,1-Dichloroethene	ug/L	0.4	<0.4	99	70-130	113	70-130	-	0-30
1,2-Dibromoethane	ug/L	0.2	<0.2	96	70-130	108	70-130	-	0-30
1,2-Dichlorobenzene	ug/L	0.4	<0.4	111	70-130	87	70-130	-	0-30
1,2-Dichloroethane	ug/L	0.2	<0.2	106	70-130	100	70-130	-	0-30
1,2-Dichloropropane	ug/L	0.5	<0.5	100	70-130	94	70-130	-	0-30
1,3,5-Trimethylbenzene	ug/L	0.3	<0.3	111	70-130	103	70-130	-	0-30
1,3-Dichlorobenzene	ug/L	0.4	<0.4	110	70-130	104	70-130	-	0-30
1,4-Dichlorobenzene	ug/L	0.4	<0.4	110	70-130	107	70-130	-	0-30
Acetone	ug/L	5	<5.0	74	70-130	114	70-130	-	0-30
Benzene	ug/L	0.5	<0.5	97	70-130	107	70-130	-	0-30
Bromodichloromethane	ug/L	0.3	<0.3	96	70-130	106	70-130	-	0-30
Bromoform	ug/L	0.4	<0.4	96	70-130	106	70-130	-	0-30
Bromomethane	ug/L	0.5	<0.5	104	70-130	83	70-130	-	0-30
Carbon tetrachloride	ug/L	0.2	<0.2	97	70-130	105	70-130	-	0-30
Chloroethane	ug/L	0.2	<0.2	100	70-130	97	70-130	-	0-30
Chloroform	ug/L	0.5	<0.5	83	70-130	91	70-130	-	0-30
Chloromethane	ug/L	0.2	<0.2	83	70-130	91	70-130	-	0-30
cis-1,2-Dichloroethene	ug/L	0.4	<0.4	97	70-130	105	70-130	-	0-30
cis-1,3-Dichloropropene	ug/L	0.2	<0.2	79	70-130	119	70-130	-	0-30
Dibromochloromethane	ug/L	0.3	<0.3	95	70-130	100	70-130	-	0-30
Dichloromethane	ug/L	4	<4.0	90	70-130	91	70-130	-	0-30
Diethyl ether	ug/L	5	<5	100	70-130	100	70-130	-	0-30
Ethylbenzene	ug/L	0.5	<0.5	117	70-130	117	70-130	-	0-30
m/p-Xylene	ug/L	0.4	<0.4	94	70-130	98	70-130	-	0-30
Methyl ethyl ketone (MEK)	ug/L	2	<2.0	74	70-130	93	70-130	-	0-30
Methyl isobutyl ketone (MIBK)	ug/L	5	<5.0	90	70-130	119	70-130	-	0-30
Methyl tert-butyl ether (MTBE)	ug/L	2	<2	90	70-130	90	70-130	-	0-30
Monochlorobenzene	ug/L	0.5	<0.5	104	70-130	100	70-130	-	0-30
o-Xylene	ug/L	0.4	<0.4	117	70-130	96	70-130	-	0-30
Styrene	ug/L	0.5	<0.5	107	70-130	100	70-130	-	0-30
Tetrachloroethylene (PCE)	ug/L	0.3	<0.3	95	70-130	112	70-130	-	0-30
Toluene	ug/L	0.4	<0.4	109	70-130	92	70-130	-	0-30
trans-1,2-dichloroethene	ug/L	0.4	<0.4	90	70-130	104	70-130	-	0-30
trans-1,3-dichloropropene	ug/L	0.2	<0.2	83	70-130	113	70-130	-	0-30
Trichloroethylene (TCE)	ug/L	0.3	<0.3	102	70-130	104	70-130	-	0-30
Trichlorofluoromethane	ug/L	0.5	<0.5	97	70-130	117	70-130	-	0-30
Vinyl chloride	ug/L	0.2	<0.2	83	70-130	117	70-130	-	0-30
Xylene (Total)	ug/L	0.5	<0.5				-		-

Associated Samples : 7802343, 7802344

Prep Date: 2024-07-02
Analysis Date: 2024-07-03

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

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STANDARD CHAIN-OF-CUSTO[DY]

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fa[x]

Eurofins Workorder #:

100292480

Printed On : 2024-06-26 17:07:06

CLIENT INFORMATION

Company:	Paterson Group
Contact:	Alex Schopf
Address:	9 Auriga Drive
Telephone:	613-218-3444
Cell:	
Email: #1:	eardley@patersongroup.ca, mlaflamme@patersongroup.ca
Email: #2:	aschopf@patersongroup.ca;
Project:	PM15625
Quote #:	

INVOICE INF[ORMATION]

[CONFI]RMATION: YES ☑ NO ☐)

Company:	
Contact:	
Address:	
Telephone:	
PO #:	60535

TURN-AROUND TIME (Business Days)

☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☑ 5-7 Days (Standard)

Please contact Lab in advance to determine rush availability.

*For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.

**For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

REGULATION/GUIDELINE REQUIRED

- ☐ Sanitary Sewer, City: Ottawa
- ☐ Storm Sewer, City: Ottawa
- ☑ ODWSOG
- ☐ PWQO
- ☐ O. Reg 347/558
- ☐ Other:
- ☐ None
- ☐ O. Reg 153

Table # ___, Course / Fine, Surface / subsurface.

Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment

☐ Excess Soil, Table: ________ Type: ________

The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04 ☐ Yes ☐ No

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this COC is not to be used for drinking water samples. The COC must be complete upon submission of the samples, there will be a $25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details / Sample Analysis Required (O.Reg.153 parameters: PHC F1 - F4, BTEX, VOCs, PAHs, PCBs, Metals + Inorganics, Metals only)

Sample ID	Date/Time Collected	Sample Matrix	# of Containers	PHC F1 - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganics	Metals only	See attached paper	Subdivision Supply Bacti 2 (Ec/TC only)	TSS	pH	Total Metals	Hg				RN# (Lab Use Only)
Field Filtered -->																				
TW1-GW1	June 25, 2024	GW	10	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	☑	☐	☐	☐	☐	7802343
TW1-GW2	June 25, 2024	GW	10	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	☑	☐	☐	☐	☐	44

Hg bottle no DOC bottle. DOC to be run from Genchem - [initials] 06/26/24 confirmed w/ Client.

PRINT		SIGN	DATE/TIME	TEMP (°C)
Sampled By:	Alex Schopf	[signature]	June 25, 2024	
Relinquished By:	Alex Schopf	[signature]	June 26, 2024	
Received By:		[signature]	June 26/24 @ 830	6.2

COMMENTS: Total and Trace Metals

CUSTODY SEAL: ☐ YES ☐ NO Ice packs submitted: ☐ Yes ☐ No

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Page ___ of ___

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Copies: White - Laboratory, Yellow - Sampler

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

OFFICIAL CERTIFICATE OF ANALYSIS : 3991228

WORK REQUEST : 100298583

Report Date : 2024-07-22

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

Reception Date :	2024-07-19
Project :	PM15625
Sampler :	NA
PO Number :	60753
Temperature :	14 °C

Analysis	Quantity	External Method
Colour, Apparent (Water, Spectrophotometry)	1	Modified from SM 2120 C
Turbidity (Water, Turbidimeter)	1	Modified from SM 2130 B

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

Sample status upon receipt :
7872590
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	N/A : Not applicable	* : Analysis conducted by external subcontracting
QC : Reference material (QC)	1 : Results in annex	^ : Analysis not accredited

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OFFICIAL CERTIFICATE OF ANALYSIS - EXCEEDENCE SUMMARY

Client : Paterson Group
Project : PM15625

Reception Date : 2024-07-19

Eurofins Sample No	Client Sample Identification	Analyte	Result	Units	Exceeded Criteria		
					A	B	C
Colour, Apparent (Water, Spectrophotometry)							
7872590	TW1 - GW - 3	Colour (Apparent)	12	TCU	5		

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OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PM15625

Reception Date: 2024-07-19

						Eurofins Sample No :	**7872590**			
						Matrix :	Groundwater			
						Sampling Date :	2024-07-19			
						Client Sample Identification :	TW1 - GW - 3			
General Chemistry			**Criteria**							
	RL	**Unit**	**A**	**B**	**C**					
Colour (Apparent)	2	TCU	5			12				
Turbidity	0.1	NTU	5			3.29				

Approved by : _____
Emma-Dawn Ferguson, M.Sc.
Environmental Chemist

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

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PM15625

Reception Date: 2024-07-19

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Colour, Apparent (Water, Spectrophotometry)									
Method : Colour (Water, Spectrophotometric). Internal method: OTT-I-SPEC-WI45980.									
Colour (Apparent)	TCU	2	<2	102	39-159			-	0-40
Associated Samples : 7872590								Prep Date: 2024-07-22 Analysis Date: 2024-07-22	
Turbidity (Water, Turbidimeter)									
Method : Turbidity (Water, Turbidimeter). Internal method: OTT-I-TUR-WI46288.									
Turbidity	NTU	0.1	<0.1	102	80-120			2	0-30
Associated Samples : 7872590								Prep Date: 2024-07-20 Analysis Date: 2024-07-20	

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

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STANDARD CHAIN-OF-CUSTODY

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

order #:

100298583

Printed On : 2024-07-19 17:13:38

CLIENT INFORMATION		INVOICE INFORMATIO[N]	
Company:	Paterson Group	Company:	
Contact:	Alex Schopf	Contact:	
Address:	9 Auriga Drive	Address:	
Telephone:	613-218-3444 Cell:	Telephone:	PO #: 60753
Email: #1:	eardley@patersongroup.ca, mkillam@patersongroup.ca		
Email: #2:	aschopf@patersongroup.ca;		
Project:	PM15625 Quote #:		

[...]N: YES ✓ NO ☐)

TURN-AROUND TIME (Business Days)

☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☑ 5-7 Days (Standard)

Please contact Lab in advance to determine rush availability.
*For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.

**For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

REGULATION/GUIDELINE REQUIRED

- ☐ Sanitary Sewer, City: Ottawa
- ☐ Storm Sewer, City: Ottawa
- ☑ ODWSOG
- ☐ PWQO
- ☐ O. Reg 347/558
- ☐ Other: ____
- ☐ None
- ☐ O. Reg 153
  - Table # ___, Course / Fine, Surface / subsurface.
  - Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment
- ☐ Excess Soil, Table: ____ Type: ____

The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04 ☐ Yes ☐ No

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this COC is not to be used for drinking water samples. The COC must be complete upon submission of the samples, there will be a $25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details / Sample Analysis Required / Field Filtered --> / O.Reg.153 parameters

Sample ID	Date/Time Collected	Sample Matrix	# of Containers	PHC F1 - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganics	Metals only	See attached paper	Subdivision Supply Bach 2 (Ec/TC only)	TSS	pH	Total Metals	Hg	Turbidity	Colour	Aluminum	RN# (Lab Use Only)
TW1 - GW - 3	July 19, 2024	GW	1														✓	✓		7872590

	PRINT	SIGN	DATE/TIME	TEMP (°C)
Sampled By:	Alex Schopf	[signature]	July 19, 2024	
Relinquished By:	Alex Schopf	[signature]	July 19, 2024	
Received By:		[signature]	July 19/24	14

COMMENTS:

CUSTODY SEAL: ☐ YES ☐ NO Ice packs submitted: ☐ Yes ☐ No

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Copies: White - Laboratory, Yellow - Sampler

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

OFFICIAL CERTIFICATE OF ANALYSIS : 3993095

WORK REQUEST : 100298584

Report Date : 2024-07-24

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

Reception Date :	2024-07-19
Project :	PM15625
Sampler :	NA
PO Number :	60753
Temperature :	14 °C

Analysis	Quantity	External Method
Metals Scan (Water, ICP/MS)	1	Modified from EPA 200.8

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

Sample status upon receipt :
7872596
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	N/A : Not applicable	* : Analysis conducted by external subcontracting
QC : Reference material (QC)	1 : Results in annex	^ : Analysis not accredited

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OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PM15625

Reception Date: 2024-07-19

					Eurofins Sample No :	**7872596**				
					Matrix :	Groundwater				
					Sampling Date :	2024-07-19				
					Client Sample Identification :	TW1 - GW - 3				
Metals	**RL**	**Unit**	**Criteria**							
			A	**B**	**C**					
Aluminum	0.01	mg/L	0.1			0.02				

Approved by : _____
Emma-Dawn Ferguson, M.Sc.
Environmental Chemist

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

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PM15625

Reception Date: 2024-07-19

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Metals Scan (Water, ICP/MS)									
Method : Metals (Water, ICP/MS). Internal method: AMMTFQE1.									
Aluminum	mg/L	0.01	<0.01	100	80-120	106	70-130	0	0-20
Associated Samples : 7872596								Prep Date: 2024-07-21 Analysis Date: 2024-07-23	

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

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STANDARD CHAIN-OF-CUSTODY

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

100298584

Printed On : 2024-07-19 17:15:49

CLIENT INFORMATION		INVOICE INFORMATION (S... YES ☑ NO ☐)	
Company:	Paterson Group	Company:	
Contact:	Alex Schopf	Contact:	
Address:	9 Auriga Drive	Address:	
Telephone:	613-218-3444 Cell:	Telephone:	PO #: 60753
Email: #1:	eardley@patersongroup.ca, mkillam@patersongroup.ca		
Email: #2:	aschopf@patersongroup.ca;		
Project:	PM15625 Quote #:		

TURN-AROUND TIME (Business Days)

☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☑ 5-7 Days (Standard)

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**For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

REGULATION/GUIDELINE REQUIRED

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- ☐ Storm Sewer, City: Ottawa
- ☑ ODWSOG
- ☐ PWQO
- ☐ O. Reg 347/558
- ☐ Other: ____
- ☐ None
- ☐ O. Reg 153
  - Table #___, Course / Fine, Surface / subsurface.
  - Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment
- ☐ Excess Soil, Table: ____ Type: ____

The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04 ☐ Yes ☐ No

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this COC is not to be used for drinking water samples. The COC must be complete upon submission of the samples, there will be a $25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details / Sample Analysis Required (Field Filtered -->; O.Reg.153 parameters: PHC F1 - F4, BTEX, VOCs, PAHs, PCBs, Metals + Inorganics, Metals only)

Sample ID	Date/Time Collected	Sample Matrix	# of Containers	PHC F1 - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganics	Metals only	See attached paper	Subdivision Supply Bacti 2 (Ec/TC only)	TSS	pH	Total Metals	Hg	Turbidity	Colour	Aluminum	RN# (Lab Use Only)
TW1 - GW - 3	July 19, 2024	GW	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	7872596

PRINT		SIGN	DATE/TIME	TEMP (°C)	COMMENTS:
Sampled By:	Alex Schopf	[signature]	July 19, 2024		
Relinquished By:	Alex Schopf	[signature]	July 19, 2024		
Received By:		[signature]	July 19/24	14	CUSTODY SEAL: ☐ YES ☐ NO; Ice packs submitted: ☐ Yes ☐ No

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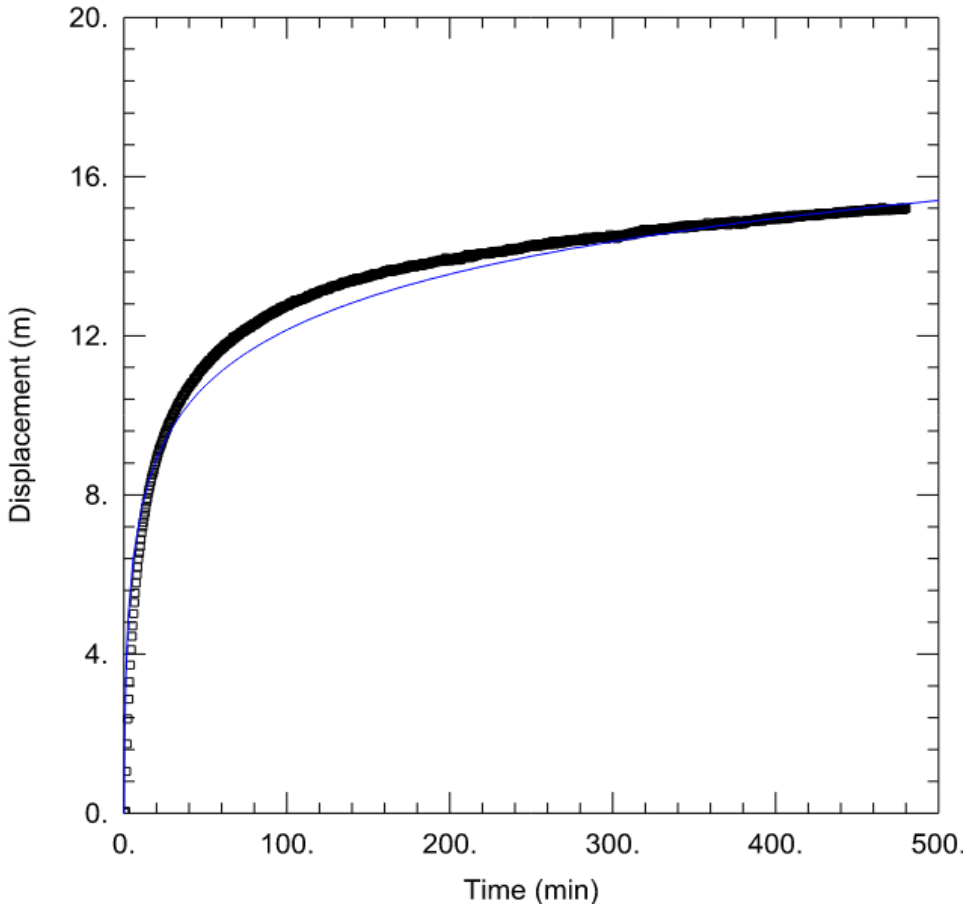
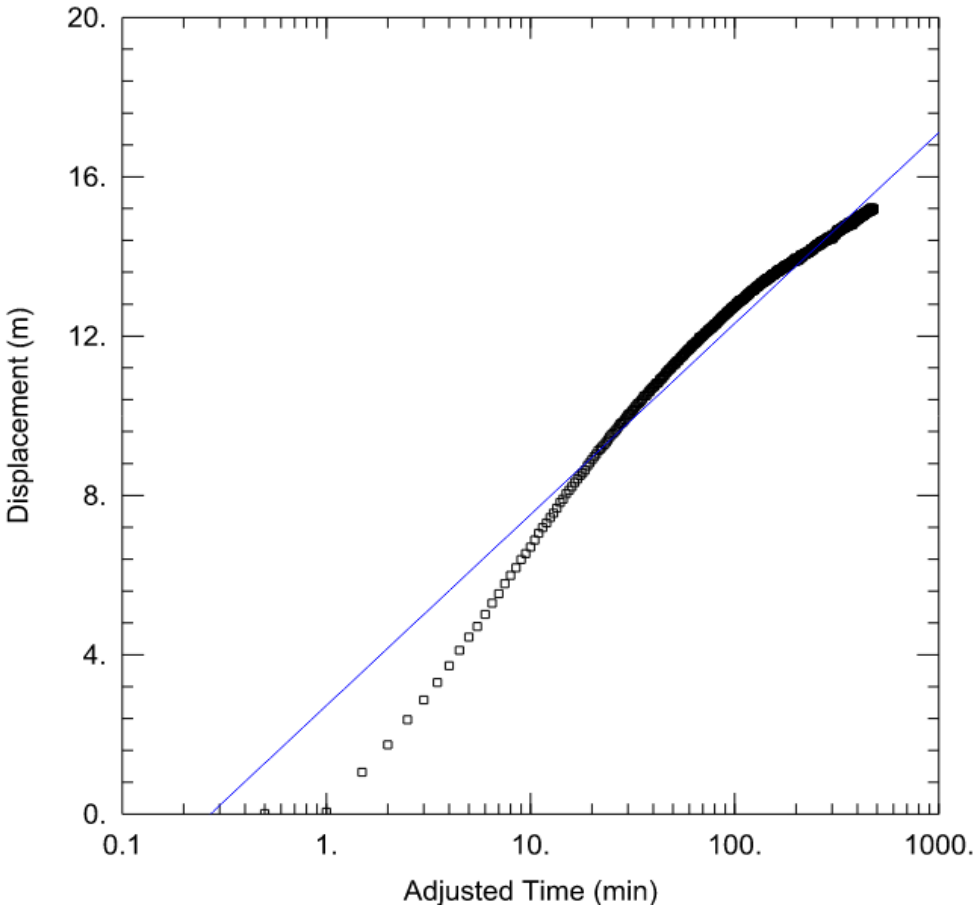
Pumping Test Analysis Report

File No.	PM15625	Well ID:	TW1
Date:	Tuesday, June 25, 2024	Solution Method:	**Theis**
Client:	Ken Hoppner	Transmissitivity (m2/day):	1.7
Site Address:	1811 Richardson Side Road	Discharge Rate (L/min)	30
Project:	Re-zoning Application	Analysis performed by:	AS



Pumping Test Analysis Report

File No.	PM15625	Well ID:	TW1
Date:	Tuesday, June 25, 2024	Solution Method:	**Cooper-Jacob**
Client:	Ken Hoppner	Transmissitivity (m2/day):	1.65
Site Address:	1811 Richardson Side Road	Discharge Rate (L/min)	30
Project:	Re-zoning Application	Analysis performed by:	AS



Pumping Test Analysis Report

File No.	PM15625
Date:	Tuesday, June 25, 2024
Client:	Ken Hoppner
Site Address:	1811 Richardson Side Road
Project:	Re-zoning Application

Summary Table:

Solution Method:	Well ID:	Transmissitivity (m2/day):
Theis	TW1	1.7
Cooper-Jacob	TW1	1.65
Average:		**1.68**

PATERSON GROUP

patersongroup JOB NO. PM15625

1811 Richardson Side Road

PREDICTIVE NITRATE IMPACT ASSESSEMENT

Infiltration Factors		
Topography	0.10	
Soil	0.20	
Cover	0.15	
Total	**0.45**	
Site Characteristics		
Area of Site :	116782	m^2
Total of roof areas:	2500	m^2
Total area of paved driveway areas:	6215	m^2
Roof + paved driveway areas	8715	m^2
Impervious Area	8715	m^2
Percent Impervious Area =	7	%
Infiltration Area =	108067	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)	329	mm/yr
Factored Water Surplus =	148	mm/yr
Infiltration % due to stormwater management measures	-	%
Infiltration rate from stormwater management measures =	0	mm/yr
Infiltration Flow Entering the System (Q_i) =	44	m^3/day
Mass Balance Model (MOEE, 1995)		
$C_T = (Q_bC_b+Q_eC_e+Q_iC_i)/(Q_b+Q_e+Q_i)$ = Cumulative Nitrate Concentration		
Q_b = flow entering the system across the upgradient area	0	m^3/day
C_b = background nitrate concentration	0	mg/L
Cs = concentration of nitrates in the septic effluent	40	mg/L
Q_i = flow entering the system from infiltration	44	m^3/day
C_i = Concentration of nitrates in the infiltrate	0	mg/L
C_T =	**10.00**	**mg/L**
Maximum Allowable Sewage Flow Volume		
Daily Sewage Flow (Qs)=	**14.61122351**	**m^3**

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

patersongroup

1811 Richardson Side Road
PM15625

MW1	inputs		
pH	8	A	0.20
TDS	952	B	2.36
Calcium	75	C	1.48
Alkalinity	225	D	2.35
Temp.	11		
		pHs =	8.03

Langelier Saturation Index (LSI) Calculation

(Langelier, 1936)

LSI = pH - pHs

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

Where:

A = (Log10 [TDS] - 1) / 10

B = -13.12 x Log10 (oC + 273) + 34.55

C = Log10 [Ca2+ as CaCO3] - 0.4

D = Log10 [alkalinity as CaCO3]

LSI =	0.0

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 corrosivebut non-scale forming).
-0.5 to -2	Water is under saturated and tends to dissolve solid calcium carbonate (seriously corrosive).