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February 26, 2024

PH4334-LET.02

Zena Investment Corporation
1200 Baseline Road, Unit 2
Ottawa, Ontario
K2C 0A6

Attention: David Johnston

Subject: **Hydrogeological Assessment**
Proposed Commercial Development
Intersection of Elijah Court and Bankfield Road, Ottawa, Ontario

Dear David Johnston,

Further to your request, Paterson has completed a Hydrogeological Assessment in support of a rezoning and site plan application for the proposed commercial development to be located at 1464 Bankfield Road in Ottawa, Ontario.

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

Introduction

Paterson was retained by Zena Investment Corporation to conduct a Hydrogeological Assessment in support of a rezoning and site plan application for the proposed commercial development to be located at the subject site. The subject site consists of the following municipal addresses:

- 1450 Bankfield Road
- 1454 Bankfield Road
- 1458 Bankfield Road
- 1464 Bankfield Road
- 1468 Bankfield Road
- 5479 Elijah Court
- 5485 Elijah Court

Please refer to the Key Plan attached for the approximate site location.

The purpose of this work has been to determine the suitability of the water supply aquifer underlying the site to support the proposed commercial development, which is a new automotive dealership.

The subject site is situated in the Village of Manotick and is serviced by private water supplies and private on-site sewage systems. The site is bordered to the north by Bankfield Road followed by residential properties and agricultural land, to the west by Elijah Court followed by Prince of Wales Drive and then agricultural land, and to the south and east by undeveloped lands.

Hydrogeological Pre-Consultation

The most recent hydrogeological pre-consultation was the City of Ottawa Phase 2 Pre-consultation which occurred on November 14, 2023. Additional discussions and consultations have occurred previously.

Description of Subject Site

The total site area is approximately 1.91 hectares (ha) in area and is made up of various smaller lots that are currently occupied by residential and commercial properties. The existing properties are surrounded by treed areas and are serviced with private water supply wells and private onsite sewage systems.

The rezoning and site plan application is for a proposed new commercial building, specifically an automotive dealership, and associated infrastructure. Please refer to Figure 1 - Key Plan attached for the proposed site location.

An approximate location of the proposed automotive dealership along with an approximate septic system location and water supply well location can be seen on Paterson Drawing PH4334-1(Rev.5) – Preliminary Site Servicing Plan (Tertiary Treatment), attached to this report.

Based on Paterson's review of the available topographic survey information, ground surface at the subject site slopes downward from west to east with an approximate differential of 6 m. Onsite overburden groundwater flows are anticipated to be to the southeastern direction. General groundwater flow direction is anticipated to be east towards Mud Creek which then flows into the Rideau River.

A drilled potable supply well with Well ID A395662 was installed on December 12, 2023, hereafter referred to as Test Well 1 (TW1). TW1 was installed by Air Rock Drilling Co. and has a 158.7 mm steel casing extending to 30.8 m below ground surface (bgs). TW1 extends to a total depth of 33.5 bgs. TW1 is the service well for the proposed commercial development.

Theoretical Sewage System and Grey Water Volumes

The theoretical sewage system volumes for the proposed commercial building are calculated using the Ontario Building Code (OBC) Section 8.2.1.3 - Sewage System Design Flows. The proposed automotive dealership is anticipated to have 40 (8-hour) employee shifts (or equivalent) and 28 customer visits per day. Based on the aforementioned OBC, the total daily sewage system volumes are as follows:

- 40 (8-hour) employee shifts/day x 75 L per 8-hour employee shift = 3,000 L/day
- 28 customer visits/day x 8 L per customer visit = 224 L/day
- Total daily volumes = 3,000 + 224 L/day = 3,224 L/day = 3.2 m^3/day

Please note that the OBC sewage system volumes are conservative flows and the actual daily flows are anticipated to be lower.

In addition to the sewage system volumes, grey water will be produced through car washing (manual wash/spray wash only). Approximately 20 such car washes are anticipated per day at a rate of 182 L/wash. Furthermore, the equivalent of 375 L/day can be assumed from snow melt through the floor drain during winter months. The expected daily grey water volumes are calculated as follows:

- 20 car washes/day x 182 L/car wash = 3,640 L/day
- Floor Drain = 375 L/day
- Grey water volume = 3,640 +375 L/day = 4,015 L/day = 4.0 m^3/d

Therefore, approximately 4,015 L/day of grey water will be produced. It should be noted that the grey water will be treated prior to discharge and the grey water discharge will be subject to an Environmental Compliance Approval (ECA).

MISSISSIPPI-RIDEAU SOURCE PROTECTION PLAN

The Mississippi-Rideau Source Protection Plan (MRSPP) provides guidance as to which policies apply to a given property, municipality or specific activity and if there are specific designations that apply to the area. The subject site and surrounding areas have been designated as a Significant Groundwater Recharge Area (SGRA) and a Highly Vulnerable Aquifer (HVA) within the MRSPP and are identified as two of four groundwater related vulnerable areas identified within the Clean Water Act (2006). The four vulnerable areas consist of SGRA, HVA, Intake Protection Zone (IPZ) and wellhead protection area (WHPA).

Based upon the designation of an SGRA and HVA, the MRSPP provides a list of activities that are prohibited, managed or encouraged to change dependent upon the vulnerable area type. There is no prohibition of land uses on the subject site based upon its proposed usage.

Therefore, there are no related requirements for an HVA or SGRA at this location.

Kars Esker

The subject site is mapped to be located on top of a small portion of the Kars Esker. The Kars Esker plays an important role in local groundwater supply. The primary concern regarding the Kars Esker is the protection of the esker as it relates to groundwater quality and quantity.

The Mud Creek Subwatershed Study (MCSS) completed by the City of Ottawa states that the significant groundwater recharge area (including the feature known as the Kars Esker) should be appropriately protected during the development review process. According to the MCSS this is *implemented through conditions of subdivision or site plan control approval under planning act application*.

The Village of Manotick Secondary Plan has identified the subject site as a Mixed Residential / Commercial area. It further notes that *for lands located at the south-west corner of Bankfield Road and First Line Road, a hydrogeological study must be submitted at the time of a development application. The study will identify the limit of the hydrogeological constraint area and the feasibility of development due to the presence of the Kars Esker. Public water and wastewater are not foreseen for this area of the village.*

Stormwater design and requirements are not addressed as part of this report, however will be treated appropriately as per the MCSS recommendations.

The proponent is proposing to use regulated monitoring tools such as an Environmental Compliance Approval (ECA) for the greywater treatment system and the Ottawa Septic System Office (OSSO) annual monitoring program for tertiary treatment systems. These tools will enforce safe practices on the subject site, rather than leave the potentially contaminating current uses in place.

Decommissioning of existing wells and septic systems

It is implied that each of the existing municipal addresses at the subject site are serviced with private services. As there are seven (7) municipal addresses which comprise the subject site, it is implied that there are a minimum of seven (7) existing private sewage systems and private drilled wells currently existing on the subject site. All of the existing sewage systems and wells which will not be used as part of the site plan application will need to be properly decommissioned as part of the site plan application. It is not anticipated that any of the existing sewage systems or wells will be used as part of the Site Plan application, and therefore must all be decommissioned. Sewage systems will need to be decommissioned in accordance with the Ontario Building Code (OBC) and wells will need to be decommissioned in accordance with O.Reg 903.

Fieldwork Program

As a means to demonstrate the adequacy of the aquifer underlying the subject lands, with respect to water quality and quantity, the new drilled well (TW1) on the subject site was tested. TW1 has a Water Well Record (WWR) Well ID of A395662. TW1 has a 158.7 mm diameter steel casing that extends to 30.8 m bgs with a 0.6 m stick up above ground surface. The well itself extends to a total depth of 33.5 m bgs.

Based on available geological mapping, the drift thickness at TW1 varies from 15 to 25 m. Refer to Paterson Drawing PH4334-1(rev.5) – Preliminary Site Servicing Plan (Tertiary Treatment), attached, for the approximate location of TW1.

As a means to evaluate the water supply aquifer intercepted by the well, the well was subjected to an 8-hour constant rate pumping test. The pumping test was conducted on January 16, 2024 under the full-time supervision of Paterson personnel. Prior to the pumping test, a datalogger was installed to monitor background groundwater levels and the well was disinfected by Air Rock Drilling Co. Ltd. (Air Rock) personnel.

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

The static water level was recorded manually and an electronic datalogger (VanEssen TD-Diver) was installed in the test well prior to the start of the pumping test. The datalogger recorded water levels at 30 second intervals. In addition, manual water level readings were taken at periodic intervals during the test.

The pumping test was carried out at a pumping rate of 76 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 pump rate.

The selected rate of 76 L/min provides approximately 5 times the design water taking volumes for the septic system and car washing (manual wash/spray wash only) during the 8-hour pumping test. The rate was determined to be representative of a flow rate which would be in excess of what the development would require.

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

Groundwater samples were collected at 4 hours and 8 hours after the start of pumping. Prior to collection of the groundwater samples, the free chlorine residual was verified as

non-detectable. The water samples were submitted for comprehensive testing of bacteriological, chemical, and physical water quality parameters consistent with the standard “Subdivision Supply” suite of parameters plus trace metals, Volatile Organic Compounds (VOC’s), and Petroleum hydrocarbons (PHC’s).

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 Eurofins 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.

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)	4925.1
Pumping Rate (L/min)	76
Pre-test Static Water Level (m btoc)	8.6
Drawdown (m)	0.2
Available Drawdown (m)	25.0
% Drawdown During Pump Test (%)	0.8
Specific Capacity (L/min/m drawdown)	380

The drawdown data was analyzed using the Theis and Cooper-Jacob methods of analysis. Aquifer transmissivity is estimated to be 4925.1 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 0.2 m at approximately 2 minutes into the pumping test (0.8 % of the available drawdown). The final drawdown at the end of the 8-hour pumping test was 0.2 m (0.8 % of the available drawdown). 100 % recovery was achieved approximately 1 minute after the end of pumping.

The total volume of water pumped during the 8-hour pumping event was approximately 36,480 L. This is approximately 5 times the design water taking volume for the septic system and car washing (manual wash/spray wash only).

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

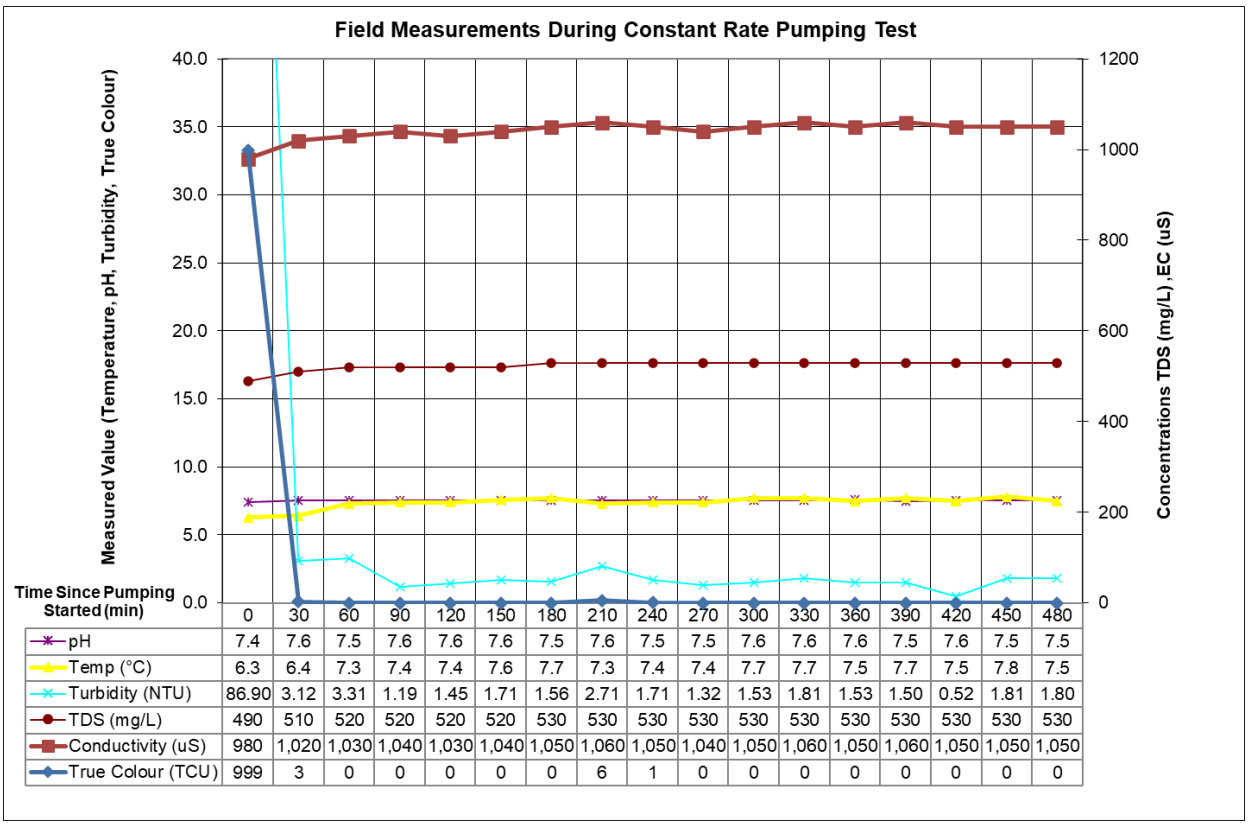
Based on the information summarized in Table 1, it is readily apparent that the water supply well has intercepted an adequately strong water supply aquifer which has sufficient quantity to service the proposed commercial development.

Given the analyses presented and summarized above, it is our opinion that there is an adequate supply of water to support the proposed commercial development. Available water well records (WWR) of the neighboring properties on the MECP Well Record mapping website indicated that the surrounding wells were screened in shale or grey limestone. Surrounding WWR's are attached to this report.

Water Quality

Field Data

Turbidity, electrical conductivity, total dissolved solids (TDS), pH, true colour and temperature were measured at the wellhead during the pumping test. The measurements and time intervals for each of these parameters are summarized on the graphical representation (Figure 2) 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	7.4	7.6	7.5	7.6	7.6	7.6	7.5	7.6	7.5	7.5	7.6	7.6	7.6	7.5	7.6	7.5	7.5
Temp (°C)	6.3	6.4	7.3	7.4	7.4	7.6	7.7	7.3	7.4	7.4	7.7	7.7	7.5	7.7	7.5	7.8	7.5
Turbidity (NTU)	86.90	3.12	3.31	1.19	1.45	1.71	1.56	2.71	1.71	1.32	1.53	1.81	1.53	1.50	0.52	1.81	1.80
TDS (mg/L)	490	510	520	520	520	520	530	530	530	530	530	530	530	530	530	530	530
Conductivity (uS)	980	1,020	1,030	1,040	1,030	1,040	1,050	1,060	1,050	1,040	1,050	1,060	1,050	1,060	1,050	1,050	1,050
True Colour (TCU)	999	3	0	0	0	0	0	6	1	0	0	0	0	0	0	0	0

Figure 2 – Field Measurements During Constant Rate Pumping Test

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 and PHC laboratory analytical testing (Table 2c and 2d) were completed and measured to be non-detect in the sample results. All laboratory test results can be found attached to this report.

TABLE 2a: GROUNDWATER MICROBIOLOGY & GENERAL GEOCHEMISTRY

PARAMETER	UNITS	ODWS		TW1	
		LIMIT	TYPE	GW1 (4 hr) 1/16/2024	GW2 (8 hr) 1/16/2024
MICROBIOLOGICAL					
Escherichia Coli (E.Coli)	ct/100mL	0	MAC	0	0
Total Coliforms	ct/100mL	0	MAC	0	0
GENERAL CHEMICAL - HEALTH RELATED					
Fluoride (F)	mg/L	1.5	MAC	<0.10	<0.10
Ammonia (N-NH_3)	mg/L	-	-	<0.020	<0.020
Nitrite (N-NO_2)	mg/L	1	MAC	<0.10	<0.10
Nitrate (N-NO_3)	mg/L	10	MAC	0.31	0.41
Total Kjeldahl Nitrogen	mg/L	-	-	0.202	0.23
Turbidity (Field)	NTU	1.0 (5.0)	MAC/AO	1.7	1.8
Turbidity (Laboratory)	NTU	1.0 (5.0)	MAC/AO	4.2	2.9
GENERAL CHEMICAL - AESTHETIC RELATED					
Alkalinity (as CaCO3)	mg/L	30-500	OG	306	317
Chloride (Cl)	mg/L	250	AO	146	134
Colour (Apparent)	TCU	5	AO	20	19
Colour (Field - True)	TCU	5	AO	1	0
Conductivity	uS/cm	-	-	1,000	994
Dissolved Organic Carbon	mg/L	5	AO	1.80	1.70
Hardness (as CaCO3)	mg/L	100	OG	430	430
Ion Balance	unitless	-	-	0.96	0.97
pH	unitless	6.5-8.5	AO	7.81	7.77
Phenols	mg/L	-	-	<0.001	<0.001
Sulphate (SO_4)	mg/L	500	AO	66	66
Sulphide (S_2^-)	mg/L	0.05	AO	<0.01	<0.01
Tannin & Lignin	mg/L	-	-	<0.1	<0.1
Total Dissolved Solids	mg/L	500	AO	650	646

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

TABLE 2b: GROUNDWATER GEOCHEMISTRY - METALS					
PARAMETER	UNITS	ODWS		TW1	
		LIMIT	TYPE	GW1 (4 hr) 1/16/2024	GW2 (8 hr) 1/16/2024
METALS					
Aluminum (Al)	mg/L	0.1	OG	<0.01	<0.01
Antimony (Sb)	mg/L	0.006	IMAC	0.0007	0.0005
Arsenic (As)	mg/L	0.01	IMAC	<0.001	<0.001
Barium (Ba)	mg/L	1.0	MAC	0.17	0.17
Beryllium (Be)	mg/L	-	-	<0.0005	<0.0005
Boron (B)	mg/L	5.0	IMAC	0.02	0.02
Cadmium (Cd)	mg/L	0.005	MAC	<0.0001	<0.0001
Calcium (Ca)	mg/L	-	-	111	111
Chromium (Cr)	mg/L	0.05	MAC	<0.001	<0.001
Cobalt (Co)	mg/L	-	-	0.0003	0.0002
Copper (Cu)	mg/L	1.0	AO	<0.001	<0.001
Iron (Fe)	mg/L	0.3	AO	0.43	0.30
Lead (Pb)	mg/L	0.01	MAC	<0.001	<0.001
Magnesium (Mg)	mg/L	-	-	37	37
Manganese (Mn)	mg/L	0.05	AO	0.02	0.02
Molybdenum (Mo)	mg/L	-	-	<0.005	<0.005
Nickle (Ni)	mg/L	-	-	<0.005	<0.005
Potassium (K)	mg/L	-	-	5	5
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	57	59
Strontium (Sr)	mg/L	-	-	0.336	0.327
Thallium (Tl)	mg/L	-	-	<0.0001	<0.0001
Uranium (U)	mg/L	0.02	MAC	0.002	0.002
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	GW1 (4 hr) 1/16/2024	GW2 (8 hr) 1/16/2024
VOCs Surrogates					
1,2-dichloroethane-d4	%	-	-		118
4-bromofluorobenzene	%	-	-		75
Toluene-d8	%	-	-		101
Volatiles					
1,1,1,2-tetrachloroethane	µg/L	-	-		<0.5
1,1,1-trichloroethane	µg/L	-	-		<0.4
1,1,2,2-tetrachloroethane	µg/L	-	-		<0.5
1,1,2-trichloroethane	µg/L	-	-		<0.4
1,1-dichloroethane	µg/L	-	-		<0.4
1,1-dichloroethylene	µg/L	14.0	MAC		<0.5
1,2-dichlorobenzene	µg/L	200.0	MAC		<0.4
1,2-dichloroethane	µg/L	5.0	IMAC		<0.2
1,2-dichloropropane	µg/L	-	-		<0.5
1,3,5-trimethylbenzene	µg/L	-	-		<0.3
1,3-dichlorobenzene	µg/L	-	-		<0.4
1,3-Dichloropropylene (cis+trans)	µg/L	-	-		<0.3
1,4-dichlorobenzene	µg/L	5.0	MAC		<0.4
Acetone	µg/L	-	-		<30
Benzene	µg/L	1.0	MAC		<0.5
Bromodichloromethane	µg/L	-	-		<0.3
Bromoform	µg/L	-	-		<0.4
Bromomethane	µg/L	-	-		<0.5
c-1,2-Dichloroethylene	µg/L	-	-		<0.4
c-1,3-Dichloropropylene	µg/L	-	-		<0.2
Carbon Tetrachloride	µg/L	2.0	MAC		<0.2
Chloroethane	µg/L	-	-		<0.2
Chloroform	µg/L	-	-		<0.5
Dibromochloromethane	µg/L	-	-		<0.3
Dichlorodifluoromethane	µg/L	-	-		<0.5
Dichloromethane	µg/L	50	MAC		<4.0
Ethylbenzene	µg/L	140	MAC		<0.5
Ethylene Dibromide	µg/L	-	-		<0.2
Hexane	µg/L	-	-		<5
m/p-xylene	µg/L	-	-		<0.4
Methyl Ethyl Ketone (MEK)	µg/L	-	-		<10
Methyl Isobutyl Ketone (MIBK)	µg/L	-	-		<10
Methyl Tert Butyl Ether (MTBE)	µg/L	15	AO		<2
Monochlorobenzene	µg/L	80	MAC		<0.5
o-xylene	µg/L	-	-		<0.4
Styrene	µg/L	-	-		<0.5
t-1,2-Dichloroethylene	µg/L	-	-		<0.4
t-1,3-Dichloropropylene	µg/L	-	-		<0.2
Tetrachloroethylene	µg/L	10	MAC		<0.3
Toluene	µg/L	60	MAC		<0.4
Trichloroethylene	µg/L	5	MAC		<0.3
Trichlorofluoromethane	µg/L	-	-		<0.5
Vinyl Chloride	µg/L	1	MAC		<0.2
Xylene; total	µg/L	90	MAC		<0.5

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

TABLE 2d: GROUNDWATER GEOCHEMISTRY - PETROLEUM HYDROCARBONS					
PARAMETER	UNITS	ODWS		TW1	
		LIMIT	TYPE	GW1 (4 hr) 1/16/2024	GW2 (8 hr) 1/16/2024
PHC Surrogate					
Alpha-androstrane	%	-	-		71
HYDROCARBONS					
F1 (C6-C10)	ug/L	-	-		<20
F2 (C10-C16)	ug/L	-	-		<20
F3 (C16-C50)	ug/L	-	-		<50
F4 (C34-C50)	ug/L	-	-		<50

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

The bacteriological test results (Certificate of Analysis – Report No. 3004563) 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.

- ❑ Colour
- ❑ Hardness (as $CaCO_3$)
- ❑ Iron
- ❑ Total Dissolved Solids (TDS)
- ❑ Turbidity

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

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). The City's annotated Procedure D-5-5 in the HTAG gives a maximum concentration considered reasonably treatable for colour as 7 TCU. As colour is a strictly aesthetic parameter, it can be reduced from the water supply, if desired, through the use of a manganese greensand treatment.

During the field pumping test, a DR900 colorimeter was used to measure true colour in the groundwater at regular intervals. True colour in the groundwater was measured as 0 TCU at the end of the pumping test, which is below the provincial aesthetic guidelines of 5 TCU. The elevated colour levels detected in the lab samples are attributed to the precipitation of iron, calcium, and magnesium out of the groundwater.

Hardness as $CaCO_3$

Hardness, expressed as calcium carbonate, is an operational guideline and has an Ontario Drinking Water Objective of 500 mg/L. Hardness appears in the Technical Support Documents for Ontario Drinking Water Standards, Objectives and Guidelines (ODWSOG) as a parameter with an operational guideline at 100 mg/L. At the measured concentrations of 430 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 City's annotated Procedure D-5-5 in the HTAG. The hardness concentration can be treated using conventional softening technologies.

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 0.43 and 0.3 mg/L at the 4-hour and 8-hour marks, respectively. It should be noted that the iron concentration decreased with time and may not exceed the aesthetic objective during normal operations. The concentration of iron in the groundwater in the test well is considered to be reasonably treatable in accordance with the annotated Procedure D-5-5 in the City's HTAG. It is recommended that an iron filter be used to reduce the levels of iron and reduce the potential for excessive precipitate occurring in the water supply system, if desired.

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 concentration was found to be 650 and 646 mg/L at the 4-hour and 8-hour marks, respectively, which is above the aesthetic objective of 500 mg/L. As the concentration is above the aesthetic objective, a point of use reverse osmosis unit may 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 0.6. Based on the evaluation of the result, the water is super saturated and tends to precipitate a scale layer of calcium carbonate (scale forming but non-corrosive). Based on the range of stability in the positive direction, there are no mitigative measures needed. See Langelier Saturation Index Calculation attached for calculation details.

Turbidity

Turbidity, which is generally an aesthetic parameter, was detected in the laboratory test samples at values of 4.2 and 2.9 NTU in the 4 and 8 hours tests, respectively. Field testing detected the samples at values of 1.7 and 1.8 NTU in the 4 and 8 hour field tests, respectively. Continued pumping showed a decrease towards the end of the test. It is expected that continued use of the well would further reduce turbidity values. The elevated turbidity in the laboratory analyzed samples is attributed to the precipitation of iron and manganese.

The annotated Procedure D-5-5 in the City's HTAG indicates that the 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. The field test parameters are below the 5 NTU objective. As turbidity was detected above 1 NTU, particular care must be taken during testing to ensure that the bacteria requirements of Table 1 are met. The bacteriological test results 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.

Sodium

Sodium (Na), an aesthetic parameter, was detected in the laboratory test samples at a concentration of 57 and 59 mg/L, which does not exceed the City's annotated Procedure D-5-5 in the HTAG 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.

Conclusions

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

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

2. The preferred water supply intercepted by TW1 contains a water supply that is potable and contains only elevated concentrations of hardness, and TDS. The iron concentration was elevated at the 4-hour mark however there was a decrease in concentration to below the limits by the end of the pumping test. The noted parameters can be treated with current readily available water conditioning equipment.

3. A standard commercial grade water softener is recommended to facilitate the reduction of the hardness concentration. 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.

4. The sodium concentration was measured to be above the 20 mg/L reporting limit and, as such, the Medical Officer of Health for the City of Ottawa should be informed to assist area physicians in the treatment of local residents on sodium reduced diets.

5. The results of the Hydrogeological Assessment have provided satisfactory evidence that the aquifer underlying the subject site can support the proposed commercial development with respect to water quality and quantity.

We trust that the current submission satisfies your immediate requirements.
Best Regards,

Paterson Group Inc.

Alex Schopf PhD, EIT

Erik Ardley, P.Geo

Attachments:

- ❑ Key Plan
- ❑ MECP Water Well Records
- ❑ Eurofins Certificate of Analysis
- ❑ AQTESOLV - Pumping Test Analysis Reports
- ❑ Langelier Saturation Index Calculation
- ❑ Paterson Drawing PH4334-1(Rev.5) – Preliminary Site Servicing Plan (Tertiary Treatment)

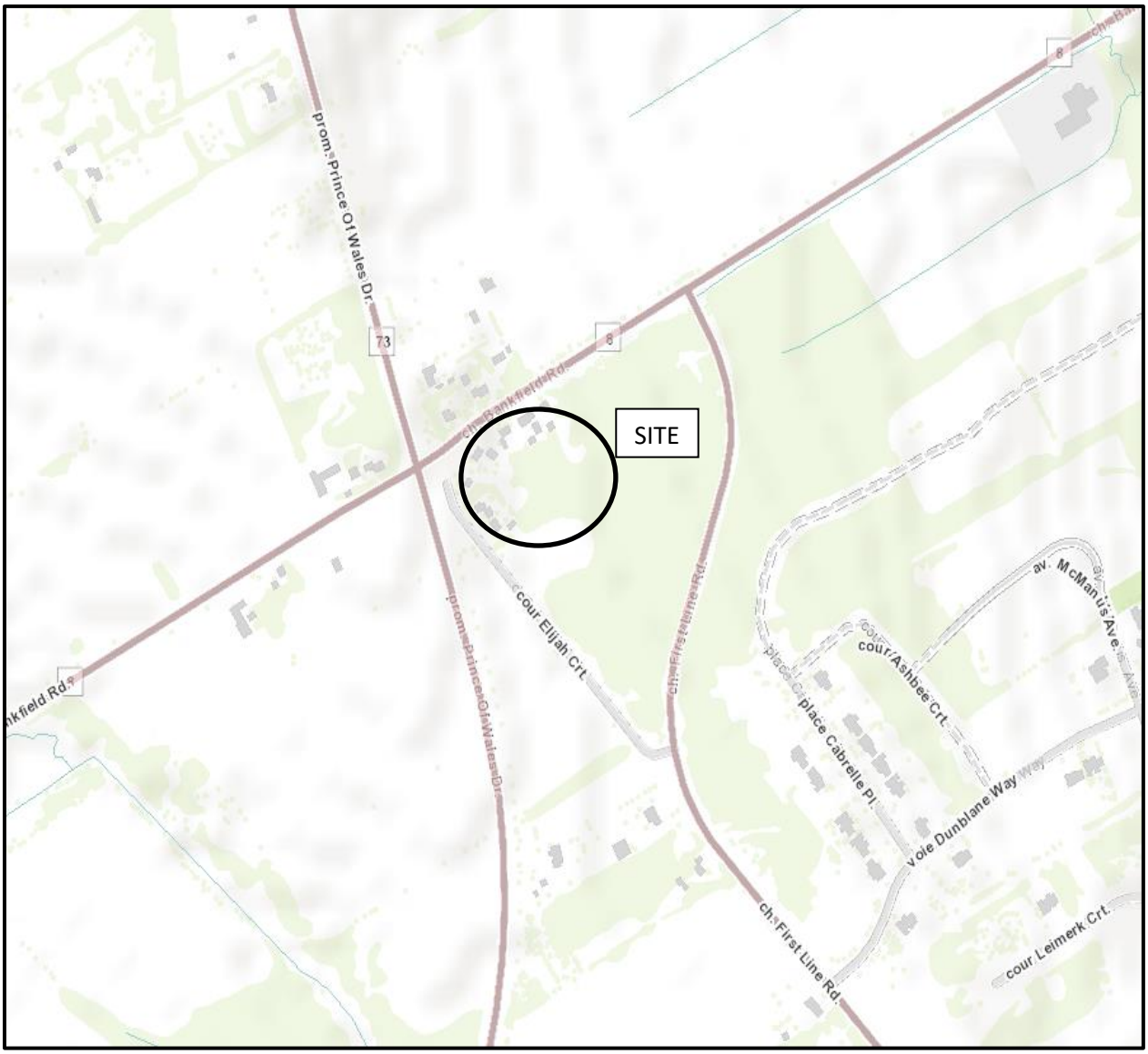


FIGURE 1

KEY PLAN

PATERSON GROUP

TW1

Ontario — Ministry of the Environment, Conservation and Parks

Tag#:A395662

A395662

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☒ Imperial

Page ____ of ____

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	BBS Construction (Ontario) Ltd		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
1805 Woodward Drive	Ottawa	ON	K2C 0P9	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5485 Elijah Court	Rideau	PT L 1	A B.F.

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Manotick	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	18	443898	5007345	4R-10152	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
	Sand	+ Gravel	+ Boulders	0'	91'
Black	Shale	(fractured)		91'	108'
Black	Shale	(fractured)		108'	110'

* ZENA INVESTMENT CORPORATION

* PO# 0000-539-003-525

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
~~0~~	~~91~~	~~Neat cement~~	~~12.48~~
101	91	Neat Cement Slurry	12.48
91	0	Bentonite Slurry	25.20

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☒ Air percussion
☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used
☒ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 1/4"	Steel	.188"	+2'	101'
6"	Open Hole		101'	110'

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth	Kind of Water	Hole Diameter Depth From	Depth To	Diameter (cm/in)
106 (m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify	0'	101'	9 3/4"
(m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify	101'	110'	6"
(m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify			

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, specify **Not tested**

If pumping discontinued, give reason: X

Pump intake set at (m/ft): 90

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 29.5'

If flowing give rate (l/min/GPM): X

Recommended pump depth (m/ft): 90'

Recommended pump rate (l/min/GPM): 20GPM

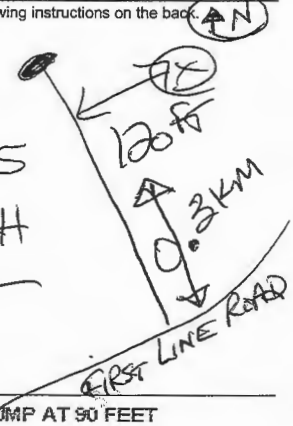
Well production (l/min/GPM): 20 GPM

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	28'6"		29.5'
1	29.2	1	28.9
2	29.2	2	28.6
3	29.2	3	28.6
4	29.3	4	28.6
5	29.3	5	28.6
10	29.4	10	28.6
15	29.4	15	28.6
20	29.5	20	28.6
25	29.5	25	28.6
30	29.5	30	28.6
40	29.5	40	28.6
50	29.5	50	28.6
60	29.5"	60	28.6'

Map of Well Location

Please provide a map below following instructions on the back.



Comments: 1 HP 20 GPM SET PUMP AT 90 FEET

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Air Rock Drilling Co. Ltd.	7681

Business Address (Street Number/Name)	Municipality
[illegible]	Richmond

Province	Postal Code	Business E-mail Address
ON	K0A 2Z0	air-rock@sympatico.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6138832170	Hanna, Jeremy

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
T3632		2023 12 31

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	2023 12 14	2023 12 12

Ministry Use Only

Audit No. Z408184

Received

UTM 1/18 Z 4 4 3 8 0 0 E
19 R 5 0 0 7 2 1 0 N
Elev. 19 R 0 3 3 0
Basin 25

31G4g

ONTARIO

The Water-well Drillers Act, 1954

Department of Mines

RECEIVED ... GEOLOGICAL BRANCH DEPARTMENT of MINES

15 No 6574

Water-Well Record

BW

County or Territorial District Carleton Township, ~~Village, Town or City~~ North Gower

[redacted] Village, Town or City)

Address Manotick

(day) (month) (year)

Pipe and Casing Record		Pumping Test	
Casing diameter(s)	5"	Static level	15'
Length(s)		Pumping rate	200 G.P.H.
Type of screen		Pumping level	~~200 G.P.H.~~ 22'
Length of screen		Duration of test	1 hr.

Well Log / **Water Record**

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
Clay	1'	22'			
Sand	22'	50'			
gravel	50'	60'			
			60'	45'	fresh

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

Is water clear or cloudy? clear

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

Drilling firm M. Meagher

Address 639 Ravenswood Ave

Name of Driller M. Meagher

Address

Licence Number 171

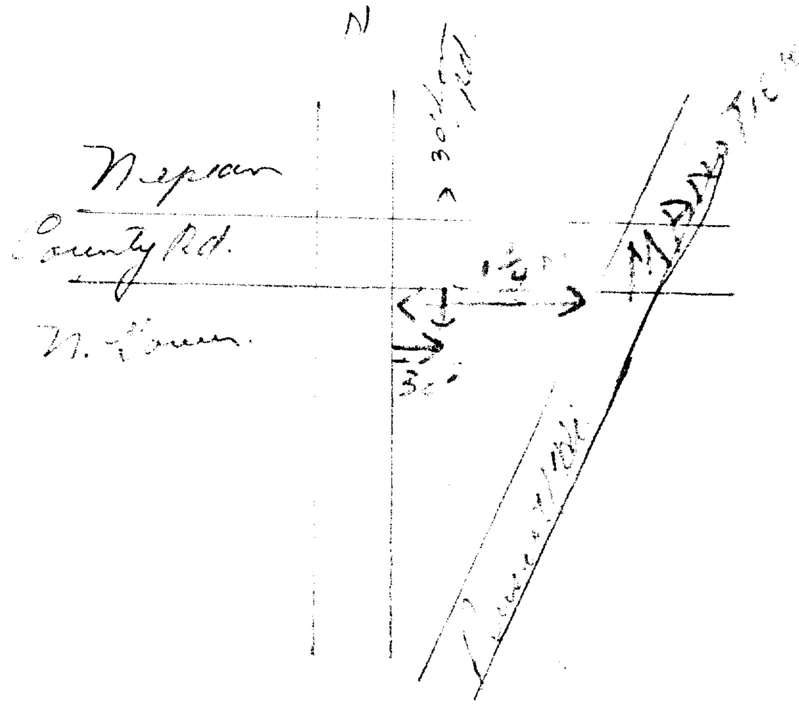
I certify that the foregoing statements of fact are true.

Date Feb 4 M. Meagher

Signature of Licensee

Location of Well

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



Form 5

UTM 0|1|8 Z 4|4|3|8|3|0 E 31G49

1|9 R 5|0|0|7|2|2|0 N

Elev. 1|9 R 0|3|3|0

Basin 2|5

RECEIVED
GEOLOGICAL BRANCH
DEPARTMENT OF MINES

15 No. 8575

The Water-well Drillers Act, 1954

Department of Mines

Water-Well Record

County or Territorial District Carleton Township, ~~Village, Town or City~~ North Gower

[redacted] Village, Town or City) ....

Address Manotick

(day) (month) (year)

Pipe and Casing Record		Pumping Test	
Casing diameter(s)	5"	Static level	10'
Length(s)		Pumping rate	225 G.P.H.
Type of screen		Pumping level	15'
Length of screen		Duration of test	1 h.

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
Clay	1	20'			
Sand	20'	45'			
Gravel	45'	55'			
			55'	45'	fresh.

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

Is water clear or cloudy? clear.

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

Drilling firm M. Meagher

Address 639 Rowanwood Ave.

Name of Driller M. Meagher

Address ....

Licence Number 121

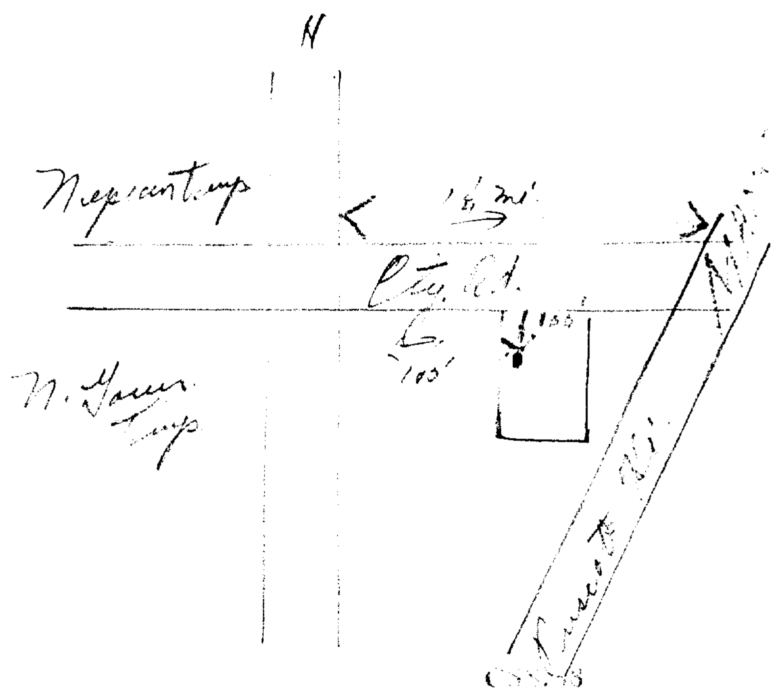
I certify that the foregoing statements of fact are true.

Date Feb 17 M. Meagher

Signature of Licensee

Location of Well

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



Form 5

UTM 18 Z 4438410 E

9 R 50071170 N

Elev. 9 01330

Basin 25 A

LOT 1

31G4g

ONTARIO

The Water-well Drillers Act, 1954

Department of Mines

Water-Well Record

County or Territorial District Carleton Township, Village, Town or City N. Gower

[redacted] in Village, Town or City)

Address Karo Ont

(day) (month) (year)

Pipe and Casing Record		Pumping Test	
Casing diameter(s)	3"	Static level	23
Length(s)	77 ft	Pumping rate	500 G.P.H
Type of screen		Pumping level	30 ft
Length of screen	Non	Duration of test	4 hrs

Well Log / **Water Record**

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
Bolders & sand	0	10	86	63	Fresh
Sand	10	75			
Broken Lime stone	75	86			

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

Is water clear or cloudy?

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

Drilling firm F.R. Cassette

Address 1652 BASELINE RD OTTAWA 5 ONT.

Name of Driller

Address SAME

Licence Number 395

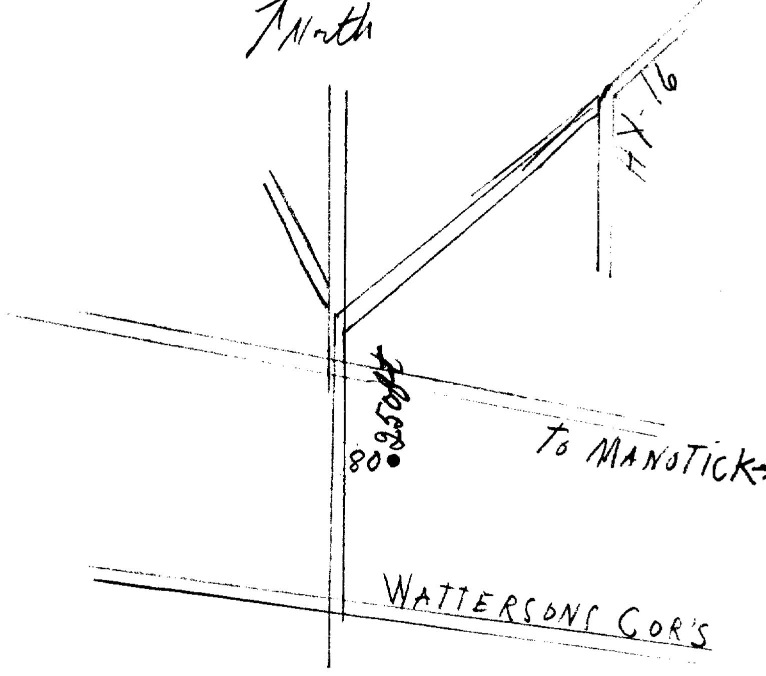
I certify that the foregoing statements of fact are true.

Date Oct 23/58 F R Cassette

Signature of Licensee

Location of Well

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



Form 5

31G49

UTM 18 Z 414318010 E
15 R 5010172110 N

Elev. 5 - 03310

Basin 25

The Ontario Water Resources Commission Act, 1957

15 No. 6585

GROUND WATER BRANCH
JUN 27 1960
ONTARIO WATER RESOURCES COMMISSION

WATER WELL RECORD

County or District Carleton
Township, Village, Town or City N. Gower
Con. A Lot 1
Date completed June 13/60 (day month year)
[redacted]ress

Casing and Screen Record

Inside diameter of casing 3"
Total length of casing 46'
Type of screen
Length of screen NONE
Depth to top of screen
Diameter of finished hole 3'

Pumping Test

Static level [redacted] 22'
Test-pumping rate 5 GPM G.P.M.
Pumping level 35'
Duration of test pumping 2 hrs
Water clear or cloudy at end of test Clear
Recommended pumping rate 5 GPM G.P.M.
with pumping level of 35'

Well Log

Overburden and Bedrock Record	From ft.	To ft.
Clay Boulders	0	20
Gravel Boulders	20	46

Water Record

Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, sulphur)
45	23	fresh

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

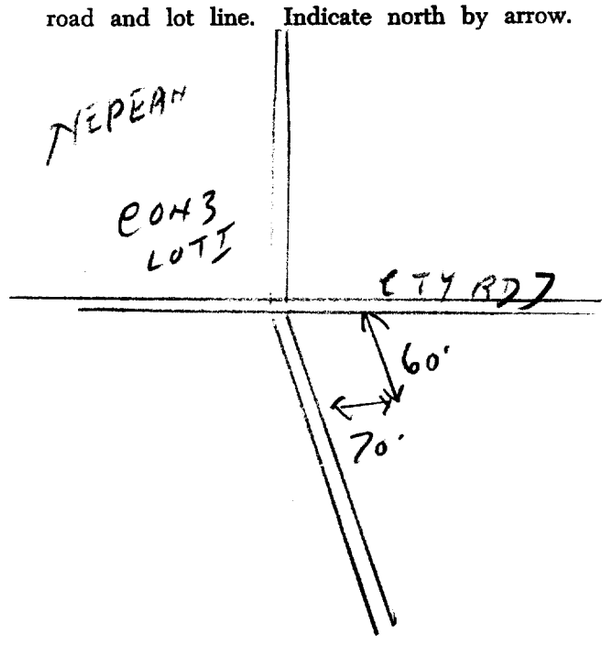
Is well on upland, in valley, or on hillside? Hillside

Drilling Firm J B Lapointe & Sons
Address 1014 Donnland
Ottawa
Licence Number 565
Name of Driller A Lapointe
Address 921 Gilmour Ottawa
Date June 20/60

J B Lapointe
(Signature of Licensed Drilling Contractor)

Location of Well

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



Form 5

316/49

The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

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

11 (1 2) | 1510581 | MUNICIP. 15004 (10 14) | CON. GON A (15 22 23 24)

COUNTY OR DISTRICT: CARLETON

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: NORTH GOWER

CON. | BLOCK, TRACT, SURVEY, ETC.: A

LOT (25-27): 001

[redacted] TILLBURY AVE. OTTAWA

DATE COMPLETED (48-53): DAY 05 MO. 05 YR. 70 (II III IV)

NG: 007260 (24) | RC. 4 (25) | ELEVATION: 0320 (26) | RC. 5 (30) | BASIN CODE: 25 (31) (47)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	DEPTH – FEET TO
	GRAVEL	SAND		0	76
GREY	LIMESTONE		HARD	76	87

31: 0076 11 09 | 0087 2 15

32: (1 2) (10) (14 15) (21) (32) (43) (54) (65) (75) (80)

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0085 (10-13)	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (14)
(15-18)	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (19)
(20-23)	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (24)
(25-28)	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (29)
(30-33)	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (34) (80)

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	DEPTH – FEET TO
(10-11) 06 ~~04~~	1 ☒ STEEL (12) 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	(13-16) 0076 ~~76~~ (20-23)
(17-18) 06 ~~04~~	1 ☐ STEEL (19) 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		76	0087 ~~82~~ (27-30)
(24-25)	1 ☐ STEEL (26) 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

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

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	DEPTH SET AT – FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
(10-13) 15	(14-17) 30	CEMENT GROUT
(18-21)	(22-25)	
(26-29)	(30-33)	(80)

71 PUMPING TEST

PUMPING TEST METHOD (10): 1 ☐ PUMP 2 ☒ BAILER

PUMPING RATE (11-14): 0005 GPM.

DURATION OF PUMPING (15-16 HOURS) 01 (17-18 MINS.) 00

STATIC LEVEL (19-21)	WATER LEVEL END OF PUMPING (22-24)	WATER LEVELS DURING (25) 15 MINUTES (26-28)	30 MINUTES (29-31)	45 MINUTES (32-34)	60 MINUTES (35-37)
020 FEET	045 FEET	030 FEET	026 FEET	024 FEET	023 FEET

1 ☐ PUMPING 2 ☒ RECOVERY

IF FLOWING, GIVE RATE (38-41) GPM.

PUMP INTAKE SET AT FEET

WATER AT END OF TEST (42): 1 ☐ CLEAR 2 ☒ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP

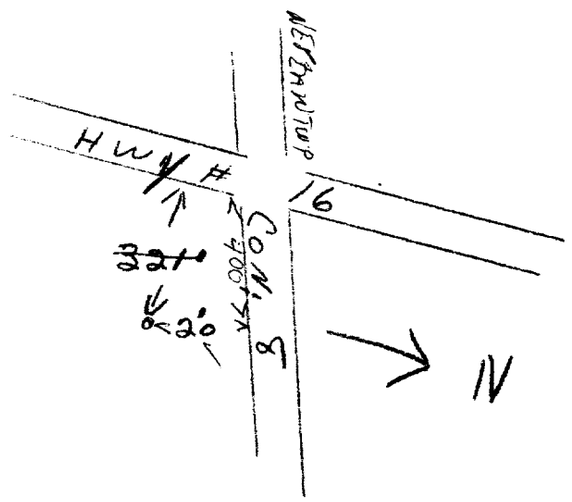
RECOMMENDED PUMP SETTING (43-45): 050 FEET

RECOMMENDED PUMPING RATE (46-49): 0005 GPM.

(50-53) 000.2 GPM./FT. SPECIFIC CAPACITY

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 (54)

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 ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING (57)

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: MCLEAN WATER SUPPLY LTD. | LICENCE NUMBER: 3504

ADDRESS: 1532 RAVEN AVE. OTTAWA 3.

NAME OF DRILLER OR BORER: W. GIBBONS | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: [signature] | SUBMISSION DATE: DAY 7 MO. 5 YR. 70

OFFICE USE ONLY

DATA SOURCE (58): 1 | CONTRACTOR (59-62): 3504 | DATE RECEIVED (63-68): 280570 (80)

DATE OF INSPECTION | INSPECTOR: S. Kim

REMARKS:

OWRC COPY

31G 4g

UTM 18 z 443800 E
R 5007260 N
Elev. R 0330
~~Rideau Front~~
Basin 25 ~~17~~
Lot - 1.

15 No. 5883

ONTARIO

The Well Drillers Act
Department of Mines, Province of Ontario

Water Well Record

[redacted]p, ~~Village, Town or City~~ Nepean
[redacted]Town or City)
[redacted]s. City View

Date Completed June 11 / 54 (day) (month) (year) Cost of Well (excluding pump)

Pipe and Casing Record		Pumping Test	
Casing diameter(s)	5"	Date	June 11
Length(s) of casing(s)	70'	Static level	30'
Type of screen		Pumping level	30'
Length of screen		Pumping rate	300 GPH
Distance from top of screen to ground level		Duration of test	1 hr
Is well a gravel-wall type?		Distance from cylinder or bowls to ground level	

Water Record

Kind (fresh or mineral) fresh
Quality (hard, soft, contains iron, sulphur, etc.) hard
Appearance (clear, cloudy, coloured) clear
For what purpose(s) is the water to be used? residential
How far is well from possible source of contamination? 40'
What is the source of contamination? septic
Enclose a copy of any mineral analysis that has been made of water

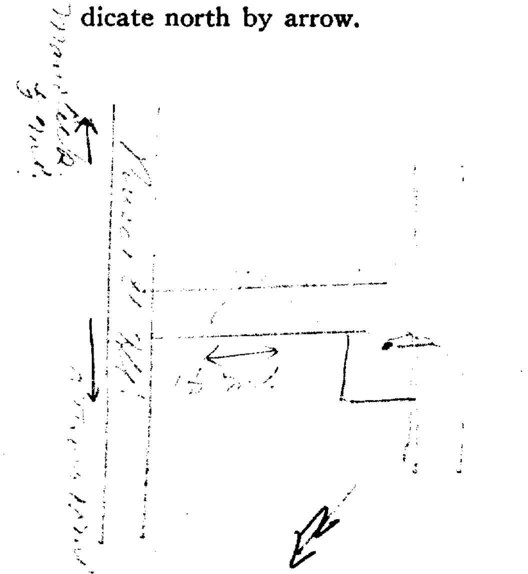
Depth(s) to Water Horizon(s)	Kind of Water	No. of F Water R
70'	good	40'

Well Log

Overburden and Bedrock Record	From	To
	0 ft.	....ft.
Clay	1'	60'
gravel	60'	70'

Location of Well

In diagram below show distan well from road and lot line. dicate north by arrow.



Situation: Is well on upland, in valley, or on hillside? hillside
Drilling Firm M. Meagher
Address B. Hampton hts
Name of Driller M. Meagher Address
Date June 12 / 54 Licence Number 171

M. Meagher
Signature of Licensee

Form 5

UTM 18 (Z) 443750 E

5 R 5007300 N

Elev. 4 R 0330

Basin 25

Con II

lot 1

31G 49

ONTARIO

15 № 5884

X

The Water-well Drillers Act, 1954

Department of Mines

Water-Well Record

County or Territorial District Carleton Township, ~~Village, Town or City~~ Nepean

[redacted] Village, Town or City) ....

[redacted] Address 9 Balsam St Ottawa

Date completed .... (day) (month) (year)

Pipe and Casing Record		Pumping Test	
Casing diameter(s)	4" well	Static level	22'
Length(s)	65' of 4" with 9' of 5" at rock	Pumping rate	360 GPH.
Type of screen	nil	Pumping level	25'
Length of screen		Duration of test	½ hour

Well Log			Water Record		
Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
Clay	0'	38'			
Boulder	38'	60'			
Gravel	60'	80'	80'	58'	fresh

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

Domestic

Is water clear or cloudy? clear

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

Upland

Drilling firm Blais Phillips

Address 1119 Falaise Rd

Ottawa 5 Ont

Name of Driller Leo Vachon

Address Montreal Rd

Ottawa 5 Ont

Licence Number 1209

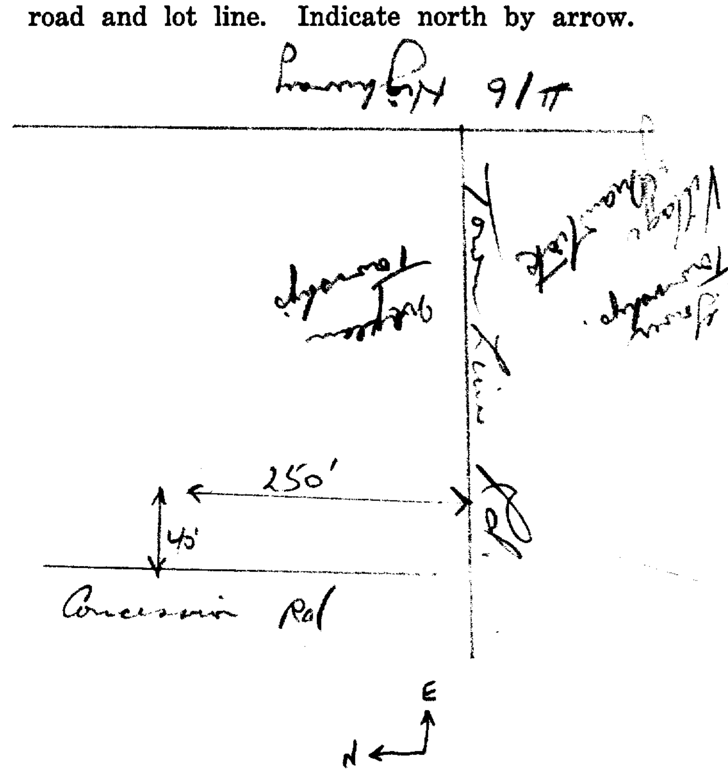
I certify that the foregoing statements of fact are true.

Date 15 March 57 J. Y. Vachon

Signature of Licensee

Location of Well

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



Form 5

UTM | 18 | Z | 4413717 | 10 | E
| 5 | R | 5010172510 | N
Elev. | 14 | R | 03301
Basin | 25 |

JIG 4g

ONTARIO

The Water-well Drillers Act, 1954
Department of Mines

15 No 5885

GROUND WATER BRANCH
DEC 16 1957
ONTARIO WATER RESOURCES COMMISSION

Water-Well Record

[redacted] ...ip, Village, Town or City ...NEPEAN
...n Village, Town or City) .....
...Address ...MANOTICK

Date completed ...1... (day) ...SEPT... (month) ...1957... (year)

Pipe and Casing Record

Casing diameter(s) ...5"...
Length(s) ...38'...
Type of screen ...NONE...
Length of screen .....

Pumping Test

Static level ...40'...
Pumping rate ...400 G.P.H....
Pumping level ...50'...
Duration of test ...1 HOUR...

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
BOULDERS + HARD PAN	0	32	50	30	FRESH
HARD GREY LIMESTONE	32	89	89	49	"

Water Record

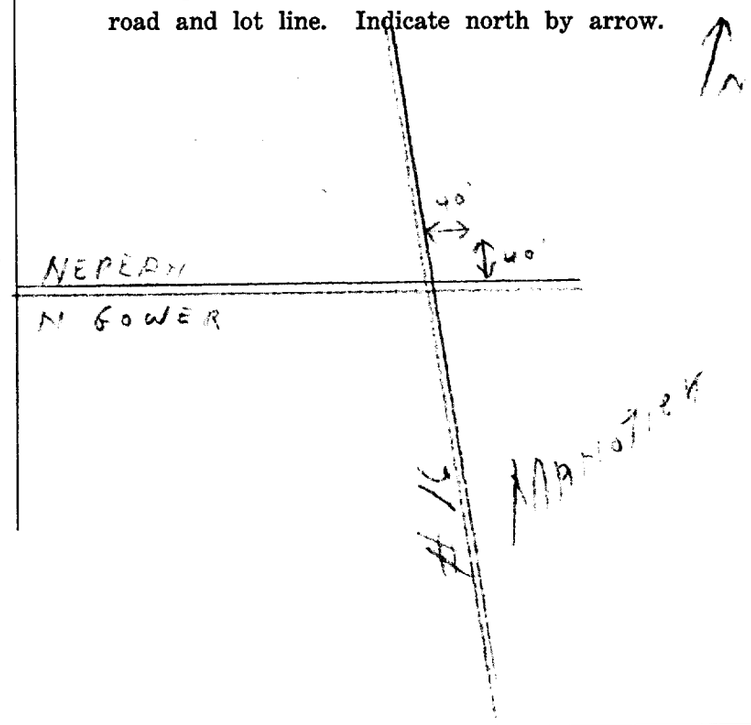
For what purpose(s) is the water to be used?
...HOUSE...
Is water clear or cloudy? ...CLEAR...
Is well on upland, in valley, or on hillside? ...UPLAND...
.....
Drilling firm ...MAHONEY...
Address ...51 McEWAN AVE OTTAWA...
.....
Name of Driller ...W. GUAY...
Address .....
.....
Licence Number.....

I certify that the foregoing statements of fact are true.

Date ...Sept 1/57... ...W. D. Mahoney...
Signature of Licensee

Location of Well

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



Form 5

UTM 1/8 | 4 4 4 0 8 0 | E   31G4g

15   5 0 0 0 7 3 6 0 | N

Elev 4   0 3 0 5

Basin | 2 5 |

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District: Carleton   Township, Village, ~~Town or City~~: North Gower

Con: 4   Lot: W½ 4(1)   Date completed: 28th (day) August (month) 1961 (year)

[redacted]dress: Kars Ont.

Casing and Screen Record

Inside diameter of casing	6¼"
Total length of casing	52'
Type of screen	red brass.
Length of screen	4'
Depth to top of screen	48'
Diameter of finished hole	6¼"

Pumping Test

Static level	18'
Test-pumping rate	15 G.P.M.
Pumping level	26'
Duration of test pumping	20 min.
Water clear or cloudy at end of test	clear
Recommended pumping rate	5 G.P.M.
with pump setting of	45' feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
clay loam	0	15'		
gravel	15'	58	45'	fresh

(Water Record: Depth(s) at which water(s) found; Kind of water)

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

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

Drilling or Boring Firm: Mel McLaughlin

Address: Ashton Ont

Licence Number: 223

Name of Driller or Borer: Melville McLaughlin

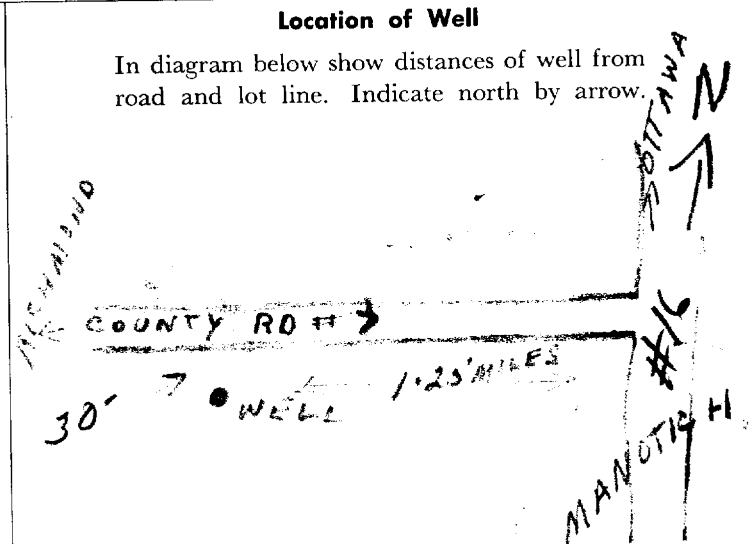
Address: Ashton Ont.

Date: Aug. 25/61

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 15M Sets 60-5930

OWRC COPY

UTM 18 Z 443785 E
19 R 5007000 N
Elev. 9 R 0320
Basin 25

1st 1

31G4g

ONTARIO

RECEIVED
APR - 3 1956
GEOLOGICAL BRANCH
DEPARTMENT of MINES

15 № 6699

The Water-well Drillers Act, 1954
Department of Mines

Water-Well Record

County or Territorial District Carleton Township, Village, Town or City N. Gower

[redacted] n Village, Town or City)

Address

(day) (month) (year)

Pipe and Casing Record

Casing diameter(s) 4"
Length(s) 24'
Type of screen
Length of screen

Pumping Test

Static level 10'
Pumping rate 230 GPH
Pumping level 14'
Duration of test 1 h.

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
Loam	1	20	42'	32'	fresh
Gravel	20	24'			
Limestone	24	42'			

For what purpose(s) is the water to be used? Residential
Is water clear or cloudy? clear
Is well on upland, in valley, or on hillside? hillside

Drilling firm M Meagher
Address 639 Redwood Ave
Ottawa
Name of Driller M Meagher
Address

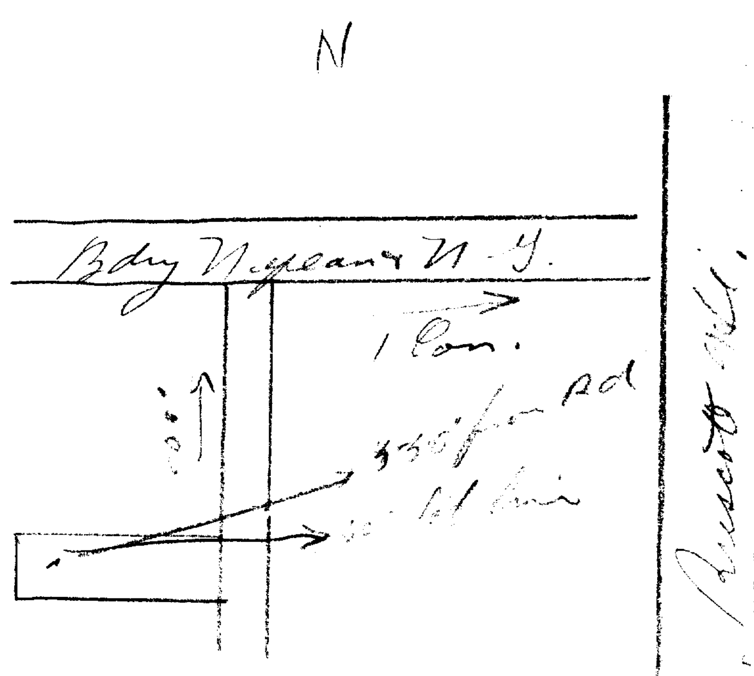
Licence Number 171

I certify that the foregoing statements of fact are true.

Date Fred M Meagher
Signature of Licensee

Location of Well

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



CSS.58

UTM 1|18 Z 4|4|4|0|6|0 E

5 R 5|0|0|6|8|4|5 N

Elev. 4 R 0|3|2|0

Basin 2|5 | | | |

31G49

ONTARIO

The Well Drillers Act

Department of Mines, Province of Ontario

15 No 6702

RECEIVED
OCT 14 1952
GEOLOGICAL BRANCH
DEPARTMENT of MINES

Water Well Record

[redacted] Township, ~~Village, Town or City~~ North Gower

[redacted]own or City) ....

[redacted] Watersons Corners

Date Completed Sept 3 52 (day) (month) (year) Cost of Well (excluding pump)...........................

MACE GOLDEN

Pipe and Casing Record	**Pumping Test**
Casing diameter(s) 3"	Date Sept 3/52
Length(s) of casing(s) 63	Static level 21 ft
Type of screen	Pumping level 28 ft
Length of screen	Pumping rate 500 gls
Distance from top of screen to ground level	Duration of test 2 hrs
Is well a gravel-wall type? Rock	Distance from cylinder or bowls to ground level

Water Record

Kind (fresh or mineral) fresh

Quality (hard, soft, contains iron, sulphur, etc.) soft

Appearance (clear, cloudy, coloured) clear

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

How far is well from possible source of contamination?

What is the source of contamination?

Enclose a copy of any mineral analysis that has been made of water

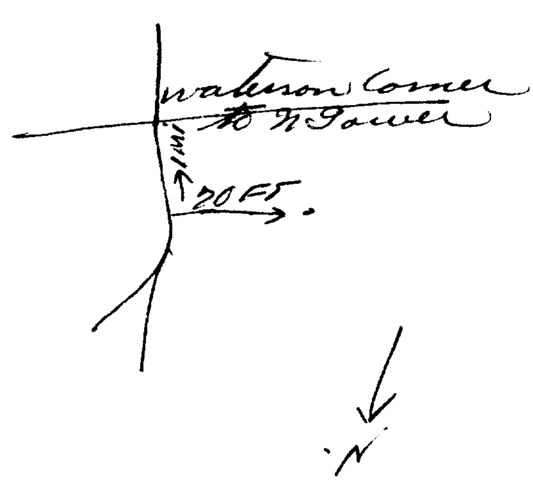
Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
65	fresh	34

Well Log

Overburden and Bedrock Record	From	To
	0 ft.	....ft.
Gravel	0	63
Limestone	63	70

Location of Well

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



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

Drilling Firm J. B. Dupuy

Address 1870 Carling

Name of Driller F. Gossetter Address

Date Sept 3/52 Licence Number 89

J. B. Dupuy
Signature of Licensee

FORM 5

CON T

UTM 18 Z 4 4 3 8 2 5 E 31649

15 R 5 0 0 6 7 6 5 N

Elev. 14 R 0 3 1 5

Basin 25 1

15 No. 6704

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District: Carleton Township, Village, Town or City: N. Gower

Date completed: 24 (day) Aug (month) 1964 (year)

[redacted] ress 19 Gould St. Ottawa

Casing and Screen Record	
Inside diameter of casing	6 1/4"
Total length of casing	51'
Type of screen	none
Length of screen	—
Depth to top of screen	—
Diameter of finished hole	6 1/4

Pumping Test	
Static level	8'
Test-pumping rate	20 G.P.M.
Pumping level	40'
Duration of test pumping	1 hr
Water clear or cloudy at end of test	clear
Recommended pumping rate	10 G.P.M.
with pump setting of	40' feet below ground surface

Well Log: Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
clay	0	20		
sandy clay	20	48		
limestone	48	65	65	fresh

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: McLEAN WATER Supply LTD

Address: 1532 RAVEN AVE. OTTAWA 3

Licence Number: 1328

Name of Driller or Borer: SCHARF & SMART

Address:

Date: AUG. 24, 1964

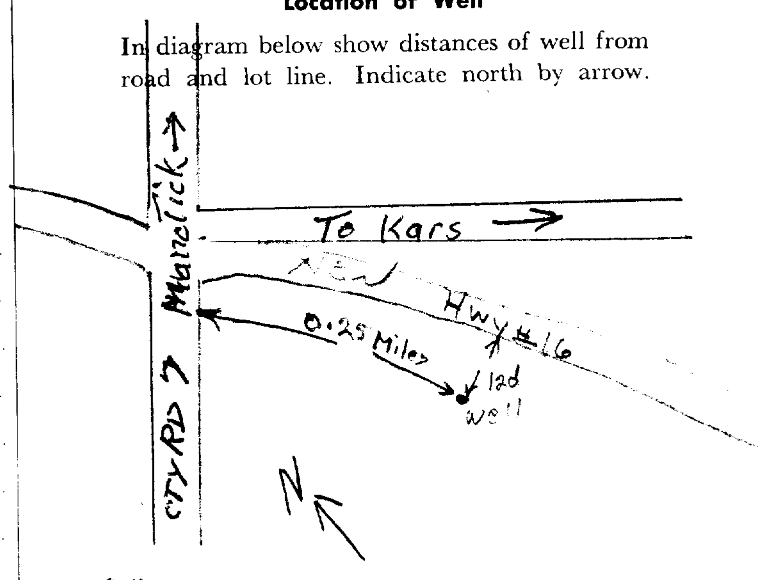
(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

OWRC COPY

Location of Well

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



MINISTRY OF THE ENVIRONMENT

The Ontario Water Resources Act

WATER WELL RECORD

31G/4

Ontario

1. PRINT ONLY IN SPACES PROVIDED
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11

1513828

MUNICIP. 15004 CON. CON 01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Carleton	North Gower	1	001

[redacted] 596, Parkview Rd. Ottawa

DATE COMPLETED: DAY 18 MO. 10 YR. 73

UTM ... 07066 RC. 4 ELEVATION 0325 RC. 5 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	Sand			0	65
Brown	Sand	Gravel		65	74
Grey	limestone			74	83

31 00656 08 00746 08 11 00832 15

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0079	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
06	1 ☒ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE	.188	0	0076
06	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☒ OPEN HOLE		76	~~83~~ 0083
	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ 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	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE: 0030 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
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 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP

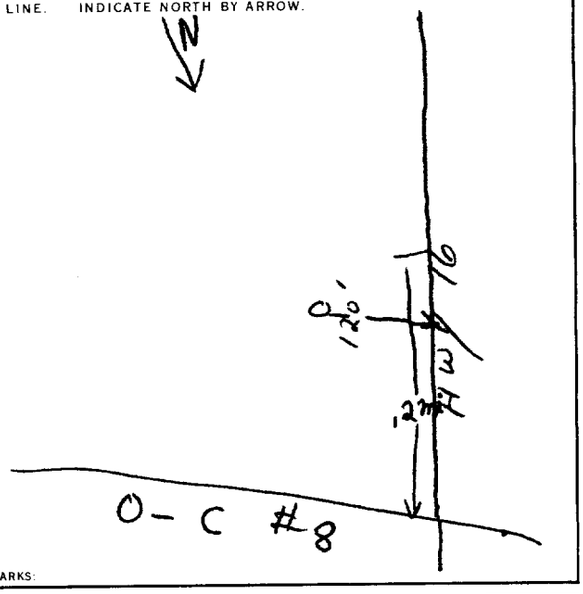
RECOMMENDED PUMP SETTING: 050 FEET

RECOMMENDED PUMPING RATE: 0005 GPM

50-53: 001.0

LOCATION OF WELL 4307

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



DRILLERS REMARKS:

FINAL STATUS OF WELL 54: 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: 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 57: 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: Henry Mains Well Drilling — LICENCE NUMBER: 3644

ADDRESS: Box 326, Richmond Ont.

NAME OF DRILLER OR BORER: Robert Bisson — LICENCE NUMBER:

SIGNATURE OF CONTRACTOR:

SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE 58: 1 — CONTRACTOR 59-62: 3644 — DATE RECEIVED 63-68: 110274

DATE OF INSPECTION: — INSPECTOR: K.

REMARKS: CS253

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 07-091

Ministry of the Environment
Ontario

316-49

The Ontario Water Resources Act

WATER WELL RECORD

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

11 1517482 MUNICIP. 15004 CON. CON A

COUNTY OR DISTRICT: Ottawa Carleton
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Gower
CON. BLOCK, TRACT, SURVEY, ETC: A
LOT: 001
[redacted]
Manotick Ont
DATE COMPLETED: DAY 15 MO 10 YR 80
UTM ZONE: 18 NORTHING: 5006999 RC: 4 ELEVATION: 0320 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
	clay & boulders			0	62
grey	limestone			62	110
"	sandstone			110	160

31 0062 0513 0110215 0160218

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0160	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0065
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ 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

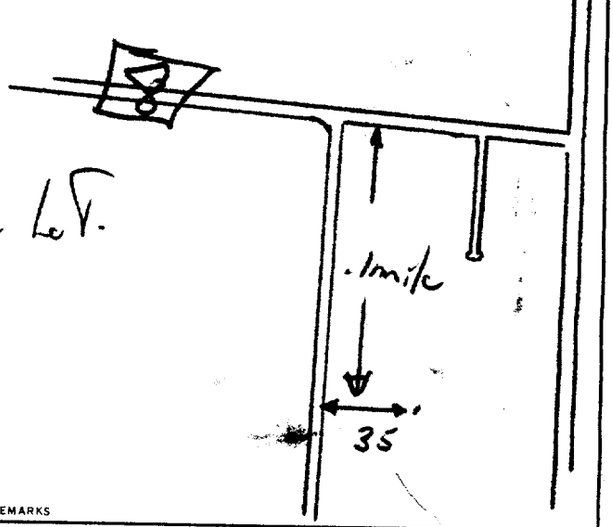
PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE: 0012 GPM
DURATION OF PUMPING: 00 HOURS 30 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
055 FEET	070 FEET		070 FEET	070 FEET	FEET	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: 0012 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 2
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: Air-Rock Drilling Ltd. LICENCE NUMBER: 1119
ADDRESS: RR #2 Jasper Ont
NAME OF DRILLER OR BORER: Wallace Desautniers LICENCE NUMBER: 1119
SIGNATURE OF CONTRACTOR: Wallace Desautniers SUBMISSION DATE: 30 MO 1 YR 81

MINISTRY OF THE ENVIRONMENT COPY

OFFICE USE ONLY

DATA SOURCE 1 | CONTRACTOR 1119 | DATE RECEIVED 020281
DATE OF INSPECTION | INSPECTOR
REMARKS

CSS, EC

FORM NO. 0506-4-77

316 49

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) 1517483 MUNICIP. 15004 CON. CON A

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Ottawa Carleton	N. Gower	A	001

[redacted] Manotick Ont.

DATE COMPLETED: DAY 10 MO 12 YR 80

NORTHING 0.06999 RC 4 ELEVATION 0320 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
	clay stone & boulders			0	90
grey	Limestone			90	160

(31) 0090 05 1213 0160 215

(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0155	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
06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0094
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ 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: 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE: 0015 GPM

DURATION OF PUMPING: 00 HOURS 30 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
050 FEET	070 FEET	070 FEET	070 FEET	FEET	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: 0015 GPM

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

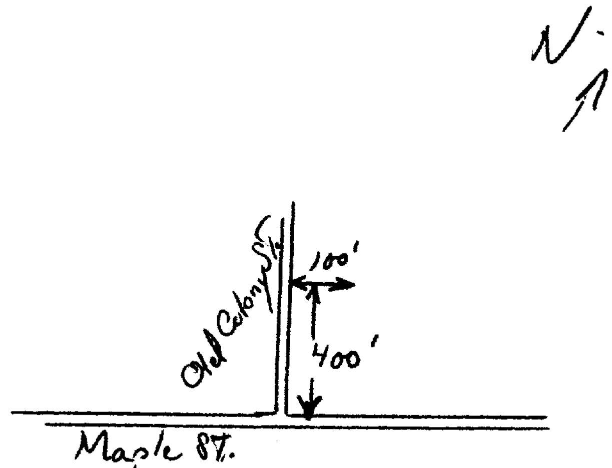
1 ☒ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF DRILLING: 2

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: Air-Rock Drilling Co. Ltd. LICENCE NUMBER: 1119

ADDRESS: RR # 2 Jasper Ont.

NAME OF DRILLER OR BORER: Wallace Desaulniers LICENCE NUMBER: 1119

SIGNATURE OF CONTRACTOR: Wallace Desaulniers

SUBMISSION DATE: DAY 30 MO. 1 YR. 81

OFFICE USE ONLY

DATA SOURCE: 1 CONTRACTOR: 1119 DATE RECEIVED: 020281

DATE OF INSPECTION | INSPECTOR

REMARKS: CSS.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77 FORM 7

Ontario Ministry of the Environment

Well Tag Number (Place sticker and print number below)
A006946
A006946

Well Record
Regulation 903 Ontario Water Resources Act

page ___ of ___

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

[redacted]

Address of Well Location (County/District/Municipality): Ottawa Carleton
Township: Rideau North Gower
Lot: 1/2
Concession: A
RR#/Street Number/Name: Test Well #5, First Line Road
City/Town/Village: Manotick
Site/Compartment/Block/Tract etc.:
GPS Reading: NAD 83 | Zone 18 | Easting 44 44 29 | Northing 50 07 44 6
Unit Make/Model: Garmin
Mode of Operation: Undifferentiated [X] 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	Clay		Packed	0	3.65
Gray	Clay		Stickey	3.65	12.19
Gray	Sandy Soil	Stones		12.19	18.28
Gray	Limestone			18.28	25.90

Hole Diameter

Depth From	Metres To	Diameter Centimetres
0	19.20	22.53
19.20	25.90	15.23

Water Record

Water found at ___ Metres	Kind of Water
20.72	[ ] Fresh [ ] Sulphur [ ] Gas [ ] Salty [ ] Minerals [ ] Other:
22.25	[ ] Fresh [ ] Sulphur [ ] Gas [ ] Salty [ ] Minerals [ ] Other:
m	[ ] Fresh [ ] Sulphur [ ] Gas [ ] Salty [ ] Minerals [ ] Other:

After test of well yield, water was
[ ] Clear and sediment free
[ ] Other, specify

Chlorinated [ ] Yes [ ] No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth To (Metres)
Casing				
15.81	[X] Steel [ ] Fibreglass [ ] Plastic [ ] Concrete [ ] Galvanized	0.48	+ 0.45	19.20
	[ ] Steel [ ] Fibreglass [ ] Plastic [ ] Concrete [ ] Galvanized			
	[ ] Steel [ ] Fibreglass [ ] Plastic [ ] Concrete [ ] Galvanized			
Screen				
Outside diam	[ ] Steel [ ] Fibreglass [ ] Plastic [ ] Concrete [ ] Galvanized	Slot No.		
No Casing or Screen				
15.23	[X] Open hole		19.20	25.90

Test of Well Yield

Pumping test method: submersible

	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres)	Static Level	.58		
Pumping rate - (litres/min) 12 45	1	.58	1	.38
Duration of pumping 1 hrs + ___ min	2	.60	2	.37
Final water level end of pumping .69 metres	3		3	.36
Recommended pump type. [ ] Shallow [ ] Deep	4	.60	4	.36
Recommended pump depth 15.24 metres	5	.61	5	.35
Recommended pump rate. 45 (litres/min)	10	.63	10	.33
If flowing give rate - (litres/min)	15	.64	15	.31
If pumping discontinued, give reason.	20	.64	20	.30
	25	.65	25	.30
	30	.66	30	.29
	40	.66	40	.28
	50	.68	50	.28
	60	.69	60	.27

Plugging and Sealing Record

[X] Annular space [ ] Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
19.20	0	Grouted - Bentonite Slurry	0.986m3

Method of Construction

[ ] Cable Tool [X] Rotary (mud) [ ] Diamond [ ] Digging
[ ] Rotary (conventional) [X] Air percussion [ ] Jetting [ ] Other
[ ] Rotary (reverse) [ ] Boring [ ] Driving

Water Use

[X] Domestic [ ] Industrial [ ] Public Supply [ ] Other
[ ] Stock [ ] Commercial [ ] Not used
[ ] Irrigation [ ] Municipal [ ] Cooling & air conditioning

Final Status of Well

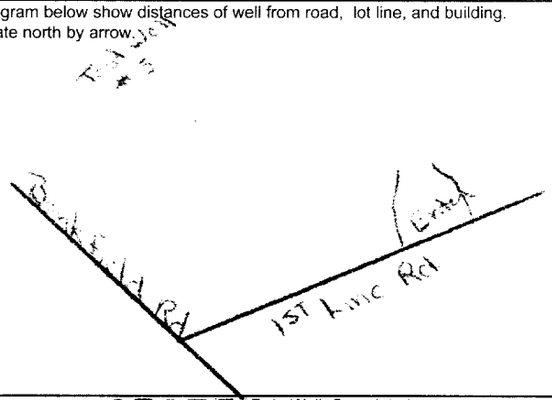
[X] Water Supply [ ] Recharge well [ ] Unfinished [ ] Abandoned, (Other)
[ ] Observation well [ ] Abandoned, insufficient supply [ ] Dewatering
[ ] Test Hole [ ] Abandoned, poor quality [ ] Replacement well

Well Contractor/Technician Information

Name of Well Contractor: Capital Water Supply Ltd.
Well Contractor's Licence No.: 1558
Business Address (street name, number, city etc.): P.O. Box 490 Stittsville, Ontario K2S 1A6
Name of Well Technician (last name, first name): Miller; Stephen
Well Technician's Licence No.: T0097
Signature of Technician/Contractor: X [signature]
Date Submitted: YYYY 2004 | MM 3 | DD 26

Location of Well

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



Audit No. Z 07077
Was the well owner's information package delivered? [ ] Yes [X] No
Date Well Completed: YYYY 2004 | MM 3 | DD 18
Date Delivered: YYYY 2004 | MM 3 | DD 25

Ministry Use Only

Data Source
Contractor: 1558
Date Received: JUN 24 2004
Date of Inspection: YYYY | MM | DD
Remarks: CSS
Well Record Number: 1534670

Ontario Ministry of the Environment

Well Tag N A043525 below)

A043525

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

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 Help Desk (Toll Free) at 1-888-396-9355.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only

[redacted]

Address of Well Location (County/District/Municipality): Ottawa - Carleton | Township: Rideau | Lot: 2 | Concession: 1

RR#/Street Number/Name: #5548 First Line Road | City/Town/Village: Manotick | Site/Compartment/Block/Tract etc.:

GPS Reading: NAD 83 | Zone 18 | Easting 444121 | Northing 5006934 | Unit Make/Model: Mogelbn | Mode of Operation: ☐ 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
	Sand, Gravel, Boulders			0	20.42
	Sand & Gravel			20.42	24.38
	Limestone			24.38	30.48

Hole Diameter

Depth From	Depth To	Diameter Centimetres
0	30.48	14.91

Water Record

Water found at Metres	Kind of Water
27.43	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other: NOT TESTED
___ m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
___ m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

After test of well yield, water was: ☐ Clear and sediment free ☐ Other, specify NOT TESTED

Chlorinated ☐ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth To
Casing				
15.88	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☒ Galvanized	.48	0	26.21
	☐ 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		25.60	30.48

Test of Well Yield

Pumping test method: Submp

Pump intake set at (metres): 24.38

Pumping rate (litres/min): 91

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping: 8.39 metres

Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump depth: 24.38 metres

Recommended pump rate: 91 (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		7.97		8.39
1	8.27	1	7.97	
2	8.29	2		
3	8.32	3		
4	8.34	4		
5		5		
10		10		
15		15		
20		20		
25		25		
30		30		
40		40		
50		50		
60	8.37	60		

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)
25.60	22.55	Neat Cement Slurry	.2724
22.55	0	Bentonite Slurry	.981

Method of Construction

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

Water Use

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

Final Status of Well

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

Well Contractor/Technician Information

Name of Well Contractor: AIR ROCK DRILLING CO LTD | Well Contractor's Licence No.: 1119

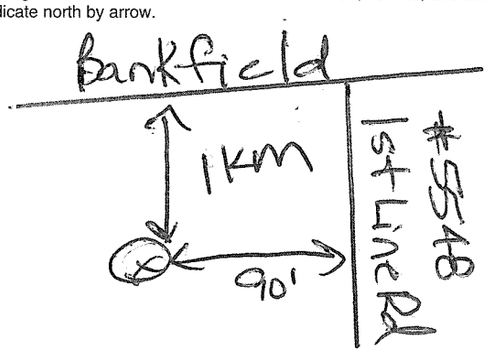
Business Address (street name, number, city etc.): RR#1 RICHMOND ONT K0A2Z0

Name of Well Technician (last name, first name): PURCELL SHANNON | Well Technician's Licence No.: 2122

Signature of Technician/Contractor: X [signature] | Date Submitted: 2007 01 22

Location of Well

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



Audit No. Z 55539 | Date Well Completed: 2006 11 20

Was the well owner's information package delivered? ☒ Yes ☐ No | Date Delivered: 2006 11 21

Ministry Use Only

Data Source | Contractor: 1119

Date Received: FEB 12 2007 | Date of Inspection

Remarks | Well Record Number

0506E (08/2006)

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Cette formule est disponible en français

Ontario — Ministry of the Environment

Well Record

Regulation 903 Ontario Water Resources Act

Well Tag No. (Place Sticker and/or Print Below): A102416 **A102416**

Page ____ of ____

Measurements recorded in: [X] Metric [ ] Imperial

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	[ ] Well Constructed by Well Owner
	Uniform Urban Developments		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
117 Centrepoint Dr., Suite 300	Nepean	Ontario	K2G 5X3	613 225 0770

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
Lot 37 Maple Creek	Rideau		

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Manotick	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	444275	5007075		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sandy Soil			0	3.35
Grey	Sand & Gravel			3.35	10.35
Grey	Till			10.35	16.76
Grey	Limestone			16.76	37.48

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
18.59	0	Grouted Bentonite Slurry	.69m^3

Method of Construction

[ ] Cable Tool [ ] Diamond
[X] Rotary (Conventional) Mud [ ] Jetting
[ ] Rotary (Reverse) [ ] Driving
[ ] Boring [ ] Digging
[X] Air percussion
[ ] Other, specify

Well Use

[ ] Public [ ] Commercial [ ] Not used
[X] Domestic [ ] Municipal [ ] Dewatering
[ ] Livestock [ ] Test Hole [ ] Monitoring
[ ] Irrigation [ ] Cooling & Air Conditioning
[ ] Industrial
[ ] Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
15.86	Steel	.48	+.45	18.59

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth	Kind of Water	
27.43 (m/ft) [ ] Gas	[ ] Fresh [X] Untested [ ] Other, specify	
34.40 (m/ft) [ ] Gas	[ ] Fresh [X] Untested [ ] Other, specify	
(m/ft) [ ] Gas	[ ] Fresh [ ] Untested [ ] Other, specify	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	18.59	15.86
18.59	37.48	15.23

Results of Well Yield Testing

After test of well yield, water was:
[X] Clear and sand free
[ ] Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 30.47

Pumping rate (l/min / GPM): 54.6

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 4.89

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft): 22.85

Recommended pump rate (l/min / GPM): 45.5

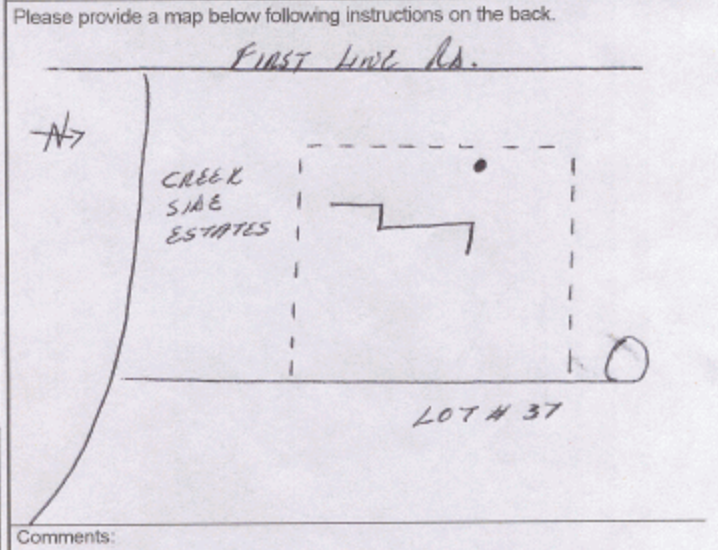
Well production (l/min / GPM):

Disinfected? [X] Yes [ ] No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	3.72		
1	4.18	1	4.27
2	4.29	2	3.90
3	4.38	3	3.82
4	4.44	4	3.76
5	4.50	5	
10	4.68	10	
15	4.72	15	
20	4.79	20	
25	4.83	25	
30	4.85	30	
40	4.88	40	
50	4.89	50	
60	4.89	60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558

Business Address (Street Number/Name)	Municipality
Box 490	Stittsville

Province	Postal Code	Business E-mail Address
Ontario	K2S 1A6	office@capitalwater.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
613 836 1766	Miller, Stephen

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
0097		2011 06 03

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
[X] Yes [ ] No	2011 06 03	Audit No. z115717
	Date Work Completed: 2011 06 01	Received AUG 05 2011

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Ontario — Ministry of the Environment

Well Record

Regulation 903 Ontario Water Resources Act

Well Tag No. (Place Sticker and/or Print Below): A102457 A102457

Measurements recorded in: [X] Metric [ ] Imperial

Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	
	Uniform Urban Developments		[ ] Well Constructed by Well Owner

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
117 Centrepointe Dr. Suite 300	Nepean	Ontario	K2G 5X3	613 225 0770

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
Lot 33 Maple Creek	Rideau	3	A

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Manotick	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	444301	5007152		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Soil	Stones		0	3.04
Grey	Sand		Packed	3.04	8.83
Grey	Till			8.83	17.67
Grey	Limestone	Sandstone Layer	Hard	17.67	45.10

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
19.50	0	Grouted Bentonite Slurry	.69m^3

Method of Construction

[ ] Cable Tool [ ] Diamond
[X] Rotary (Conventional) Mud [ ] Jetting
[ ] Rotary (Reverse) [ ] Driving
[ ] Boring [ ] Digging
[X] Air percussion
[ ] Other, specify

Well Use

[ ] Public [ ] Commercial [ ] Not used
[X] Domestic [ ] Municipal [ ] Dewatering
[ ] Livestock [ ] Test Hole [ ] Monitoring
[ ] Irrigation [ ] Cooling & Air Conditioning
[ ] Industrial
[ ] Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
15.86	Steel	.48	+.45	19.50

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth (m/ft)	Gas	Kind of Water	Other, specify
41.75	[ ]	[ ] Fresh [X] Untested	
	[ ]	[ ] Fresh [ ] Untested	
	[ ]	[ ] Fresh [ ] Untested	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	19.50	15.86
19.50	45.10	15.23

Results of Well Yield Testing

After test of well yield, water was:
[X] Clear and sand free
[ ] Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 15.23

Pumping rate (l/min / GPM): 54.6

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 3.17

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft): 15.23

Recommended pump rate (l/min / GPM): 45.5

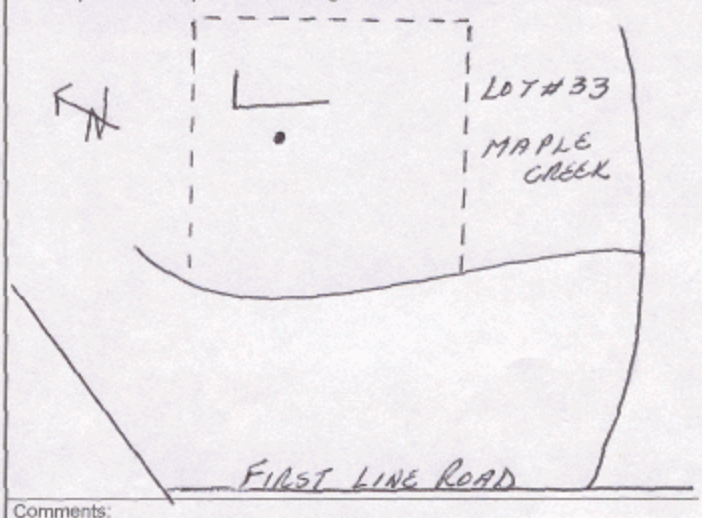
Well production (l/min / GPM):

Disinfected? [X] Yes [ ] No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	2.20		
1	2.96	1	2.23
2	3.05	2	2.21
3	3.05	3	2.21
4	3.06	4	2.20
5	3.07	5	
10	3.11	10	
15	3.12	15	
20	3.13	20	
25	3.14	25	
30	3.15	30	
40	3.16	40	
50	3.17	50	
60	3.17	60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558

Business Address (Street Number/Name)	Municipality
Box 490	Stittsville

Province	Postal Code	Business E-mail Address
Ontario	K2S 1A6	office@capitalwater.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
613 836 1766	Miller, Stephen

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
0097		2011 07 18

Well owner's information package delivered	Date Package Delivered	Date Work Completed
[X] Yes [ ] No	2011 07 18	2011 07 14

Ministry Use Only

Audit No. Z115743

Received NOV 02 2011

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Ontario — Ministry of the Environment

Measurements recorded in: ☑ Metric ☐ Imperial

Well Tag No. A116286 (A116286)

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
3680 Bankefield Rd.	Nepean / Ottawa	1	2

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa	Kars	Ontario	K0A2E0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	443858	5007532	1RP 5R5205 2RF	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Coarse Sand	Stone, gravel	Hard	0	7.9
Grey	Course Sand	Stone, gravel	Hard	7.9	18.4
Grey	Medium Sand	gravel, stone	Hard	18.4	21.7
Grey	gravel	Medium Sand	packed	21.7	25.9

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	6	cimant grout	.2 m³

Method of Construction

☐ Cable Tool ☐ Diamond ☐ Rotary (Conventional) ☐ Jetting ☐ Rotary (Reverse) ☐ Driving ☐ Boring ☐ Digging ☐ Air percussion ☑ Other, specify Air Rotary

Well Use

☐ Public ☐ Commercial ☐ Not used ☑ Domestic ☐ Municipal ☐ Dewatering ☐ Livestock ☐ Test Hole ☐ Monitoring ☐ Irrigation ☐ Cooling & Air Conditioning ☐ Industrial ☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
15.55	Steel	.48	+.6	25.9

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth (m/ft)	Gas	Kind of Water	Other, specify
25.9	☐	☐ Fresh ☑ Untested	
	☐	☐ Fresh ☐ Untested	
	☐	☐ Fresh ☐ Untested	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	6	24.7
6	25.9	15.55

Results of Well Yield Testing

After test of well yield, water was: ☑ Clear and sand free ☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 22

Pumping rate (l/min / GPM): 68

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 8.36

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft): 22

Recommended pump rate (l/min / GPM): 68

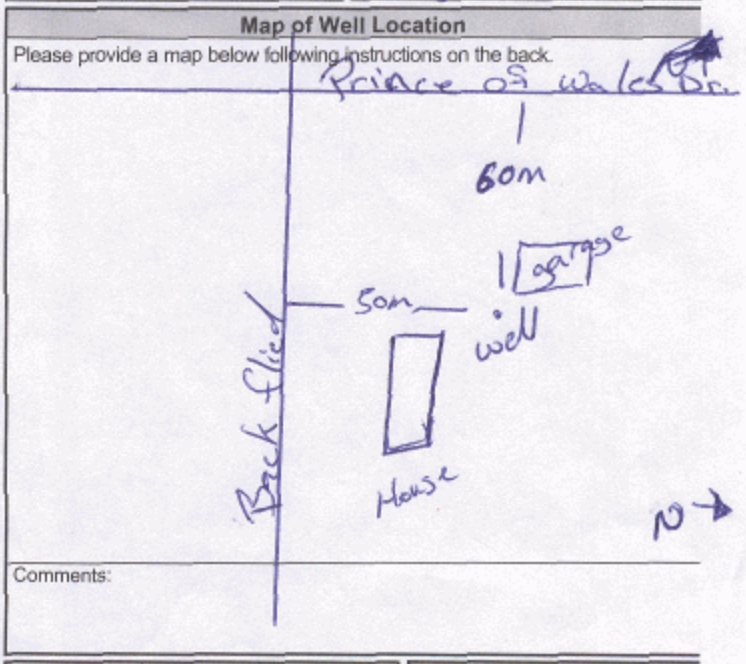
Well production (l/min / GPM):

Disinfected? ☑ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	6.85		8.36
1	7.22	1	7.28
2	7.21	2	7.26
3	7.22	3	7.24
4	7.22	4	6.93
5	7.22	5	6.87
10	7.52	10	6.86
15	7.47	15	6.86
20	7.42	20	6.86
25	7.42	25	6.85
30	7.40	30	6.85
40	7.40	40	6.85
50	7.49	50	6.85
60	8.36	60	6.85

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Bourgeois Well Drilling	7117

Business Address (Street Number/Name)	Municipality
151 Montee D'Haut	Nation

Province	Postal Code	Business E-mail Address
On	K0A3C0	N/A

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6139875291	BENIER, MICHAEL

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3493		2011/10/30

Well owner's information package delivered ☑ Yes ☐ No

Date Package Delivered: 2011/10/25

Date Work Completed: 2011/10/25

Ministry Use Only

Audit No. Z140777

Received NOV 17 2011

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Ontario — Ministry of the Environment

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

Measurements recorded in: [X] Metric [ ] Imperial

Well Tag No. *(Place Sticker and/or Print Below)*

A165049

Tag #: A165049

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	[ ] Well Constructed by Well Owner
	Phoenix Homes		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
18 Bentley Ave.	Ottawa	Ontario	K2E 6T8	613 723 9227

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
Lot 35 Cabrelle - Maple Creek	Rideau		

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Manotick	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	442562	5007131		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sand	Gravel & Stones	Loose	0	7.61
Grey	Sand & Gravel	Large Boulders		7.61	15.84
Grey	Limestone		Medium Hard	15.84	45.71

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
18.28	0	Grouted Bentonite Slurry	.69m^3

Method of Construction

[ ] Cable Tool [ ] Diamond
[X] Rotary (Conventional) Mud [ ] Jetting
[ ] Rotary (Reverse) [ ] Driving
[ ] Boring [ ] Digging
[X] Air percussion
[ ] Other, *specify*

Well Use

[ ] Public [ ] Commercial [ ] Not used
[X] Domestic [ ] Municipal [ ] Dewatering
[ ] Livestock [ ] Test Hole [ ] Monitoring
[ ] Irrigation [ ] Cooling & Air Conditioning
[ ] Industrial
[ ] Other, *specify*

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
27.31	Open		0	18.28
15.86	Steel	.48	+1.82	18.28

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth	Kind of Water	
37.18 (m/ft)	[ ] Fresh [X] Untested	[ ] Gas [ ] Other, *specify*
44.49 (m/ft)	[ ] Fresh [X] Untested	[ ] Gas [ ] Other, *specify*
(m/ft)	[ ] Fresh [ ] Untested	[ ] Gas [ ] Other, *specify*

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	18.28	15.86
18.28	45.71	15.55

Results of Well Yield Testing

After test of well yield, water was:
[X] Clear and sand free
[ ] Other, *specify*

If pumping discontinued, give reason:

Pump intake set at (m/ft): 22.85

Pumping rate (l/min / GPM): 54.6

Duration of pumping: 1 hrs + _____ min

Final water level end of pumping (m/ft): 5.39

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft): 22.85

Recommended pump rate (l/min / GPM): 45.5

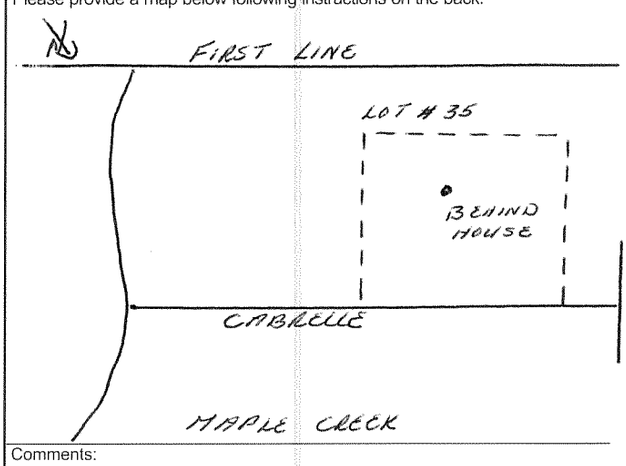
Well production (l/min / GPM)

Disinfected? [X] Yes [ ] No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	5.30		
1	5.33	1	5.33
2	5.33	2	5.31
3	5.34	3	5.29
4	5.34	4	5.30
5	5.34	5	5.30
10	5.35	10	5.30
15	5.36	15	5.30
20	5.36	20	5.30
25	5.37	25	5.30
30	5.37	30	5.30
40	5.38	40	5.30
50	5.38	50	5.30
60	5.39	60	5.30

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558

Business Address (Street Number/Name)	Municipality
Box 490	Stittsville

Province	Postal Code	Business E-mail Address
Ontario	K2S1A6	office@capitalwater.ca

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
6138361766	Miller, Stephen

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
0097		2015 06 09

Well owner's information package delivered	Date Package Delivered	Date Work Completed
[X] Yes [ ] No	2015 06 05	2015 06 03

Ministry Use Only

Audit No Z 188496

JUN 25 2015 Received

Ministry's Copy

Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☒ Imperial

We Tag#: A199917 Below)

A199917

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
232 Cabrelle Place	Rideau	4	A

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa-Carleton	Manotick	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	18	444222	5007163	4M-1407	S/L 34

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
	Sand	& Boulders		0	29
	Gravel	& Boulders		29	64
Grey	Limestone			64	133
Grey	Limestone			133	152
Grey	Limestone			152	160

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/yd³)
74	0	Neat cement	37.4

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☒ Air percussion
☐ Other, *specify*

Well Use

☐ Public ☐ Commercial ☐ Not used
☒ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify*

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 1/4"	Steel	.188"	+2	74
6"	Open Hole		74	160

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth	Kind of Water	
133 (m/ft) ☐ Gas	☐ Fresh ☒ Untested ☐ Other, *specify*	
152 (m/ft) ☐ Gas	☐ Fresh ☒ Untested ☐ Other, *specify*	
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	74	9 3/4"
74	160	6"

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, *specify* **Not tested**

If pumping discontinued, give reason: X

Pump intake set at (m/ft): 140

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 43.4"

If flowing give rate (l/min / GPM): X

Recommended pump depth (m/ft): 180'

Recommended pump rate (l/min / GPM): 20

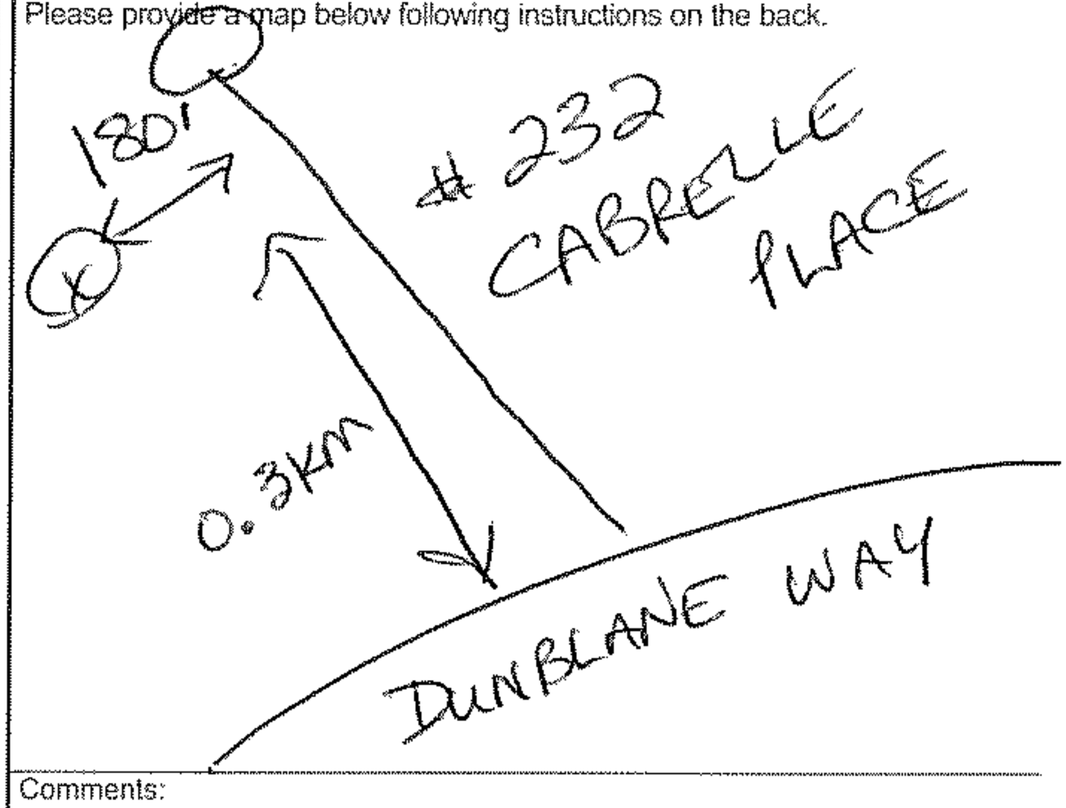
Well production (l/min / GPM): 20

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	11'3"		43'4"
1	21.5	1	23.6
2	26.6	2	18.4
3	30.4	3	15.7
4	33.5	4	12.9
5	35.7	5	11.3
10	42.3	10	11.3
15	43.2	15	11.3
20	43.3	20	11.3
25	43.4	25	11.3
30	43.4	30	11.3
40	43.4	40	11.3
50	43.4	50	11.3
60	43.4	60	11'3"

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

1 HP - 20 GPM SET @ 100 FT

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Air Rock Drilling Co. Ltd.	1119

Business Address (Street Number/Name)	Municipality
6659 Franktown Road, RR#1	Richmond

Province	Postal Code	Business E-mail Address
ON	K0A 2Z0	air-rock@sympatico.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6138882170	Hanna, Jeremy

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
T3632		2016 06 30

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
☒ Yes ☐ No	2016 06 09	Audit No. Z 202844
	Date Work Completed: 2016 06 03	AUG 10 2016 Received

Ministry's Copy

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. **Tag#: A 207712**

A207712

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
225 Cabrelle Place	Rideau	4	A

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Manotick	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	18	444323	5007151	PL 4M-1407	SIL 32

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
	Sand y	Clay		0	5'
	Sand	and Gravel	and boulders	5'	52'
Grey	Limestone			52'	131'
Grey	Limestone			131'	150'
Grey	Limestone			150'	153'
Grey	Limestone			153'	180'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
62'	0	Neat cement	31.2

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☑ Air percussion
☐ Other, *specify* _____

Well Use

☐ Public ☐ Commercial ☐ Not used
☑ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify* _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 1/4"	Steel	.188	+2'	62'
6"	Open Hole		62'	160'

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth (m/ft)		Kind of Water	
131'	☐ Gas	☐ Fresh ☑ Untested	☐ Other, *specify* _____
150'	☐ Gas	☐ Fresh ☑ Untested	☐ Other, *specify* _____
153'	☐ Gas	☐ Fresh ☑ Untested	☐ Other, *specify* _____

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
		9 3/4"
0	62'	
62'	160'	6"

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, *specify* Not tested

If pumping discontinued, give reason: /

Pump intake set at (m/ft): 120'

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 96'

If flowing give rate (l/min / GPM): /

Recommended pump depth (m/ft): 120'

Recommended pump rate (l/min / GPM): 20

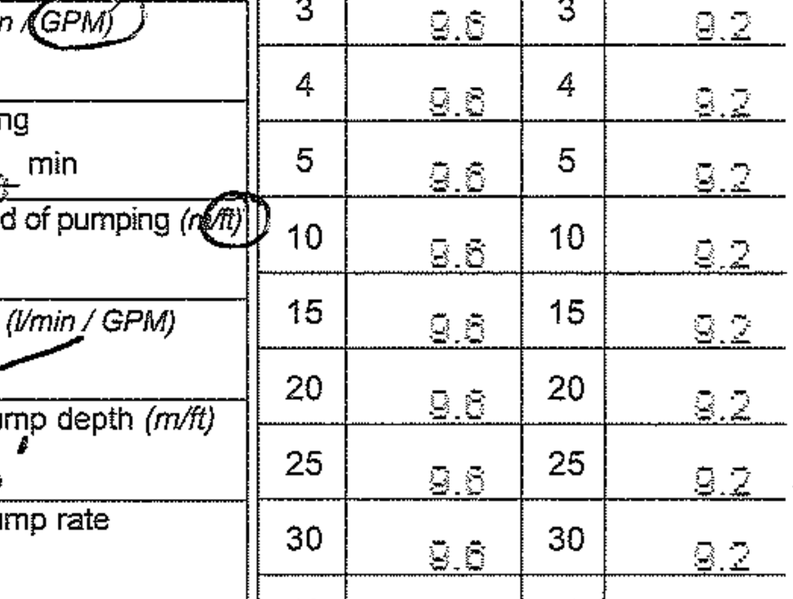
Well production (l/min / GPM): 20

Disinfected? ☑ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	9'2"		9'6"
1	9.6	1	9.4
2	9.6	2	9.3
3	9.6	3	9.2
4	9.6	4	9.2
5	9.6	5	9.2
10	9.6	10	9.2
15	9.6	15	9.2
20	9.6	20	9.2
25	9.6	25	9.2
30	9.6	30	9.2
40	9.6	40	9.2
50	9.6	50	9.2
60	9'6"	60	9'2"

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

1HP 20GPM Pump Set @ 100' Recommended

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
☑ Yes ☐ No	2016 M 11 D 28	Audit No. Z237097
	Date Work Completed: 2016 M 10 D 25	NOV 28 2016 Received

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Air Rock Drilling Co. Ltd.	1119

Business Address (Street Number/Name)	Municipality
6859 Franktown Road, RR#1	Richmond

Province	Postal Code	Business E-mail Address
ON	K0A 2T0	air-rock@sympatico.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
8138882170	Hance, Jeremy

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
T8632		2016 M 11 D 28

Certificate of Analysis

Client: Paterson Group
9 Auriga Dr
Nepean, ON
K2E 7T9
Attention: Mr. Alex Schopf
PO#: 59243
Invoice to: Paterson Group

Report Number: 3004563
Date Submitted: 2024-01-17
Date Reported: 2024-01-23
Project: PH4334
COC #: 912648

Dear Alex Schopf:

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

Report Comments:

Emma-Dawn Ferguson
2024.01.23 11:42:01
-05'00'

APPROVAL: _____
Emma-Dawn Ferguson, Chemist

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

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: https://directory.cala.ca/.

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

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

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

Certificate of Analysis

eurofins | Environment Testing

Client: Paterson Group
9 Auriga Dr
Nepean, ON
K2E 7T9
Attention: Mr. Alex Schopf
PO#: 59243
Invoice to: Paterson Group

Report Number: 3004563
Date Submitted: 2024-01-17
Date Reported: 2024-01-23
Project: PH4334
COC #: 912648

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1716148 GW 2024-01-16 TW1-GW1	1716149 GW 2024-01-16 TW1-GW2
Anions	Cl	1	mg/L	AO 250		146	134
	F	0.10	mg/L	MAC 1.5		<0.10	<0.10
	N-NO2	0.10	mg/L	MAC 1.0		<0.10	<0.10
	N-NO3	0.10	mg/L	MAC 10.0		0.31	0.41
	SO4	1	mg/L	AO 500		66	66
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500		306	317
	Colour (Apparent)	2	TCU	AO 5		20*	19*
	Conductivity	5	uS/cm			1000	994
	DOC	0.5	mg/L	AO 5		1.8	1.7
	pH	1.00		6.5-8.5		7.81	7.77
	Phenols	0.001	mg/L			<0.001	<0.001
	S2-	0.01	mg/L	AO 0.05		<0.01	<0.01
	Tannin & Lignin	0.1	mg/L			<0.1	<0.1
	TDS (COND - CALC)	1	mg/L	AO 500		650*	646*
	Turbidity	0.1	NTU	AO 5		4.2	2.9
Hardness	Hardness as CaCO3	1	mg/L	OG 80-100		430*	430*
Hydrocarbons	F1 (C6-C10)	20	ug/L				<20
	F1-BTEX (C6-C10)	20	ug/L				<20
	F2 (C10-C16)	20	ug/L				<20
	F3 (C16-C34)	50	ug/L				<50
	F4 (C34-C50)	50	ug/L				<50
Indices/Calc	Ion Balance	0.01				0.96	0.97
Metals	Ag	0.0001	mg/L			<0.0001	<0.0001
	Al	0.01	mg/L	OG 0.1		<0.01	<0.01
	As	0.001	mg/L	IMAC 0.01		<0.001	<0.001

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

Certificate of Analysis

eurofins | Environment Testing

Client: Paterson Group
9 Auriga Dr
Nepean, ON
K2E 7T9
Attention: Mr. Alex Schopf
PO#: 59243
Invoice to: Paterson Group

Report Number: 3004563
Date Submitted: 2024-01-17
Date Reported: 2024-01-23
Project: PH4334
COC #: 912648

Group	Analyte	MRL	Units	Guideline	1716148 GW 2024-01-16 TW1-GW1	1716149 GW 2024-01-16 TW1-GW2
	Lab I.D.				1716148	1716149
	Sample Matrix				GW	GW
	Sample Type					
	Sampling Date				2024-01-16	2024-01-16
	Sample I.D.				TW1-GW1	TW1-GW2
Metals	B	0.01	mg/L	IMAC 5.0	0.02	0.02
	Ba	0.01	mg/L	MAC 1.0	0.17	0.17
	Be	0.0005	mg/L		<0.0005	<0.0005
	Ca	1	mg/L		111	111
	Cd	0.0001	mg/L	MAC 0.005	<0.0001	<0.0001
	Co	0.0002	mg/L		0.0003	0.0002
	Cr	0.001	mg/L	MAC 0.05	<0.001	<0.001
	Cu	0.001	mg/L	AO 1	<0.001	<0.001
	Fe	0.03	mg/L	AO 0.3	0.43*	0.30
	Hg	0.0001	mg/L	MAC 0.001	<0.0001	<0.0001
	K	1	mg/L		3	3
	Mg	1	mg/L		37	37
	Mn	0.01	mg/L	AO 0.05	0.02	0.02
	Mo	0.005	mg/L		<0.005	<0.005
	Na	1	mg/L	AO 200	57	59
	Ni	0.005	mg/L		<0.005	<0.005
	Pb	0.001	mg/L	MAC 0.010	<0.001	<0.001
	Sb	0.0005	mg/L	IMAC 0.006	0.0007	0.0005
	Se	0.001	mg/L	MAC 0.05	<0.001	<0.001
	Sr	0.001	mg/L		0.336	0.327
	Tl	0.0001	mg/L		<0.0001	<0.0001
	U	0.001	mg/L	MAC 0.02	0.002	0.002
	V	0.001	mg/L		<0.001	<0.001
	Zn	0.01	mg/L	AO 5	<0.01	<0.01
Microbiology	Escherichia Coli	0	ct/100mL	MAC 0	0	0

Guideline = ODWSOG *** = Guideline Exceedence**

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Certificate of Analysis

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Client: Paterson Group
9 Auriga Dr
Nepean, ON
K2E 7T9
Attention: Mr. Alex Schopf
PO#: 59243
Invoice to: Paterson Group

Report Number: 3004563
Date Submitted: 2024-01-17
Date Reported: 2024-01-23
Project: PH4334
COC #: 912648

Group	Analyte	MRL	Units	Guideline	1716148 GW 2024-01-16 TW1-GW1	1716149 GW 2024-01-16 TW1-GW2
	Lab I.D.				1716148	1716149
	Sample Matrix				GW	GW
	Sample Type					
	Sampling Date				2024-01-16	2024-01-16
	Sample I.D.				TW1-GW1	TW1-GW2
Microbiology	Total Coliforms	0	ct/100mL	MAC 0	0	0
Nutrients	N-NH3	0.020	mg/L		<0.020	<0.020
	Total Kjeldahl Nitrogen	0.100	mg/L		0.202	0.225
PHC Surrogate	Alpha-androstrane	0	%			71
VOCs Surrogates	1,2-dichloroethane-d4	0	%			118
	4-bromofluorobenzene	0	%			75
	Toluene-d8	0	%			101
Volatiles	1,1,1,2-tetrachloroethane	0.5	ug/L			<0.5
	1,1,1-trichloroethane	0.4	ug/L			<0.4
	1,1,2,2-tetrachloroethane	0.5	ug/L			<0.5
	1,1,2-trichloroethane	0.4	ug/L			<0.4
	1,1-dichloroethane	0.4	ug/L			<0.4
	1,1-dichloroethylene	0.5	ug/L	MAC 14		<0.5
	1,2-dichlorobenzene	0.4	ug/L	MAC 200		<0.4
	1,2-dichloroethane	0.5	ug/L	IMAC 5		<0.5
	1,2-dichloropropane	0.5	ug/L			<0.5
	1,3,5-trimethylbenzene	0.3	ug/L			<0.3
	1,3-dichlorobenzene	0.4	ug/L			<0.4
	1,3-Dichloropropylene (cis+trans)	0.5	ug/L			<0.5
	1,4-dichlorobenzene	0.4	ug/L	MAC 5		<0.4
	Acetone	5	ug/L			<5
	Benzene	0.5	ug/L	MAC 1		<0.5
	Bromodichloromethane	0.3	ug/L			<0.3
	Bromoform	0.4	ug/L			<0.4
	Bromomethane	0.5	ug/L			<0.5

Guideline = ODWSOG *** = Guideline Exceedence**

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Report Number: 3004563
Date Submitted: 2024-01-17
Date Reported: 2024-01-23
Project: PH4334
COC #: 912648

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1716148 GW 2024-01-16 TW1-GW1	1716149 GW 2024-01-16 TW1-GW2
Volatiles	c-1,2-Dichloroethylene	0.4	ug/L				<0.4
	c-1,3-Dichloropropylene	0.5	ug/L				<0.5
	Carbon Tetrachloride	0.2	ug/L	MAC 2			<0.2
	Chloroethane	0.5	ug/L				<0.5
	Chloroform	0.5	ug/L				<0.5
	Dibromochloromethane	0.3	ug/L				<0.3
	Dichlorodifluoromethane	0.5	ug/L				<0.5
	Dichloromethane	4.0	ug/L	MAC 50			<4.0
	Ethylbenzene	0.5	ug/L	MAC 140			<0.5
	Ethylene Dibromide	0.2	ug/L				<0.2
	Hexane	5	ug/L				<5
	m/p-xylene	0.4	ug/L				<0.4
	Methyl Ethyl Ketone (MEK)	2	ug/L				<2
	Methyl Isobutyl Ketone (MIBK)	5	ug/L				<5
	Methyl Tert Butyl Ether (MTBE)	2	ug/L	AO 15			<2
	Monochlorobenzene	0.5	ug/L	MAC 80			<0.5
	o-xylene	0.4	ug/L				<0.4
	Styrene	0.5	ug/L				<0.5
	t-1,2-Dichloroethylene	0.4	ug/L				<0.4
	t-1,3-Dichloropropylene	0.5	ug/L				<0.5
	Tetrachloroethylene	0.3	ug/L	MAC 10			<0.3
	Toluene	0.4	ug/L	MAC 60			<0.4
	Trichloroethylene	0.3	ug/L	MAC 5			<0.3
	Trichlorofluoromethane	0.5	ug/L				<0.5
	Vinyl Chloride	0.2	ug/L	MAC 1			<0.2

Guideline = ODWSOG *** = Guideline Exceedence**

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Report Number: 3004563
Date Submitted: 2024-01-17
Date Reported: 2024-01-23
Project: PH4334
COC #: 912648

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1716148 GW 2024-01-16 TW1-GW1	1716149 GW 2024-01-16 TW1-GW2
Volatiles	Xylene; total	0.5	ug/L	MAC 90			<0.5

Guideline = ODWSOG *** = Guideline Exceedence**

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PO#: 59243
Invoice to: Paterson Group

Report Number: 3004563
Date Submitted: 2024-01-17
Date Reported: 2024-01-23
Project: PH4334
COC #: 912648

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 454854 **Analysis/Extraction Date** 2024-01-18 **Analyst** DRA **Method** AMBCOLM1			
Escherichia Coli			
Total Coliforms			
Run No 454855 **Analysis/Extraction Date** 2024-01-17 **Analyst** AsA **Method** C SM2130B			
Turbidity	<0.1 NTU	101	70-130
Run No 454889 **Analysis/Extraction Date** 2024-01-18 **Analyst** AsA **Method** C SM2120C			
Colour (Apparent)	<2 TCU	119	90-110
Run No 454896 **Analysis/Extraction Date** 2024-01-18 **Analyst** Z S **Method** M SM3120B-3500C			
Calcium	<1 mg/L	100	90-110
Potassium	<1 mg/L	96	87-113
Magnesium	<1 mg/L	96	76-124
Sodium	<1 mg/L	95	82-118
Run No 454898 **Analysis/Extraction Date** 2024-01-18 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	95	70-130

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Date Submitted: 2024-01-17
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Project: PH4334
COC #: 912648

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 454909 **Analysis/Extraction Date** 2024-01-18 **Analyst** AsA **Method** C SM5550B			
Tannin & Lignin	<0.1 mg/L	90	80-120
Run No 454910 **Analysis/Extraction Date** 2024-01-18 **Analyst** AsA **Method** C SM4500-S2-D			
S2-	<0.01 mg/L	108	80-120
Run No 454912 **Analysis/Extraction Date** 2024-01-18 **Analyst** AaN **Method** SM 4110			
N-NO2	<0.10 mg/L	103	90-110
N-NO3	<0.10 mg/L	104	90-110
SO4	<1 mg/L	100	90-110
Run No 454913 **Analysis/Extraction Date** 2024-01-18 **Analyst** SS **Method** EPA 8260			
Tetrachloroethane, 1,1,1,2-	<0.5 ug/L	122	60-130
Trichloroethane, 1,1,1-	<0.4 ug/L	115	60-130
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	119	60-130
Trichloroethane, 1,1,2-	<0.4 ug/L	121	60-130
Dichloroethane, 1,1-	<0.4 ug/L	117	60-130
Dichloroethylene, 1,1-	<0.5 ug/L	108	60-130

Guideline = ODWSOG *** = Guideline Exceedence**

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Date Submitted: 2024-01-17
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Project: PH4334
COC #: 912648

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Dichlorobenzene, 1,2-	<0.4 ug/L	120	60-130
Dichloroethane, 1,2-	<0.5 ug/L	121	60-130
Dichloropropane, 1,2-	<0.5 ug/L	124	60-130
1,3,5-trimethylbenzene	<0.3 ug/L	115	60-130
Dichlorobenzene, 1,3-	<0.4 ug/L	120	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	121	60-130
Acetone	<5 ug/L	120	60-130
Benzene	<0.5 ug/L	113	60-130
Bromodichloromethane	<0.3 ug/L	120	60-130
Bromoform	<0.4 ug/L	118	60-130
Bromomethane	<0.5 ug/L	105	60-130
Dichloroethylene, 1,2-cis-	<0.4 ug/L	121	60-130
Dichloropropene,1,3-cis-	<0.5 ug/L	118	60-130
Carbon Tetrachloride	<0.2 ug/L	115	60-130
Chloroethane	<0.5 ug/L	99	60-130
Chloroform	<0.5 ug/L	121	60-130
Dibromochloromethane	<0.3 ug/L	120	60-130
Dichlorodifluoromethane	<0.5 ug/L	114	60-130

Guideline = ODWSOG *** = Guideline Exceedence**

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Report Number: 3004563
Date Submitted: 2024-01-17
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Project: PH4334
COC #: 912648

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Methylene Chloride	<4.0 ug/L	102	60-130
Ethylbenzene	<0.5 ug/L	116	60-130
Ethylene dibromide	<0.2 ug/L	120	60-130
Hexane (n)	<5 ug/L	110	60-130
m/p-xylene	<0.4 ug/L	119	60-130
Methyl Ethyl Ketone	<2 ug/L	120	60-130
Methyl Isobutyl Ketone	<5 ug/L	120	60-130
Methyl tert-Butyl Ether (MTBE)	<2 ug/L	120	60-130
Chlorobenzene	<0.5 ug/L	115	60-130
o-xylene	<0.4 ug/L	117	60-130
Styrene	<0.5 ug/L	117	60-130
Dichloroethylene, 1,2-trans-	<0.4 ug/L	120	60-130
Dichloropropene,1,3-trans-	<0.5 ug/L	119	60-130
Tetrachloroethylene	<0.3 ug/L	119	60-130
Toluene	<0.4 ug/L	115	60-130
Trichloroethylene	<0.3 ug/L	115	60-130
Trichlorofluoromethane	<0.5 ug/L	116	60-130
Vinyl Chloride	<0.2 ug/L	106	60-130

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9 Auriga Dr
Nepean, ON
K2E 7T9
Attention: Mr. Alex Schopf
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Report Number: 3004563
Date Submitted: 2024-01-17
Date Reported: 2024-01-23
Project: PH4334
COC #: 912648

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 454931 **Analysis/Extraction Date** 2024-01-19 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.020 mg/L	97	80-120
Run No 454939 **Analysis/Extraction Date** 2024-01-18 **Analyst** AaN **Method** EPA 200.8			
Silver	<0.0001 mg/L	119	80-120
Aluminum	<0.01 mg/L	100	80-120
Arsenic	<0.001 mg/L	94	80-120
Boron (total)	<0.01 mg/L	104	80-120
Barium	<0.01 mg/L	92	80-120
Beryllium	<0.0005 mg/L	105	80-120
Cadmium	<0.0001 mg/L	95	80-120
Cobalt	<0.0002 mg/L	97	80-120
Chromium Total	<0.001 mg/L	110	80-120
Copper	<0.001 mg/L	97	80-120
Iron	<0.03 mg/L	92	80-120
Mercury	<0.0001 mg/L	101	80-120
Manganese	<0.01 mg/L	98	80-120

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Molybdenum	<0.005 mg/L	86	80-120
Nickel	<0.005 mg/L	92	80-120
Lead	<0.001 mg/L	94	80-120
Antimony	<0.0005 mg/L	86	80-120
Selenium	<0.001 mg/L	100	80-120
Strontium	<0.001 mg/L	93	80-120
Thallium	<0.0001 mg/L	95	80-120
Uranium	<0.001 mg/L	89	80-120
Vanadium	<0.001 mg/L	95	80-120
Zinc	<0.01 mg/L	100	80-120
Run No 454945 **Analysis/Extraction Date** 2024-01-19 **Analyst** SS **Method** CCME O.Reg 153/04			
Petroleum Hydrocarbons F1	<20 ug/L	95	60-140
Run No 454950 **Analysis/Extraction Date** 2024-01-19 **Analyst** SS **Method** EPA 8260			
Xylene Mixture			
Run No 454951 **Analysis/Extraction Date** 2024-01-19 **Analyst** SS **Method** EPA 8260			
Dichloropropene,1,3-			

Guideline = ODWSOG *** = Guideline Exceedence**

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 454952 **Analysis/Extraction Date** 2024-01-19 **Analyst** SS **Method** CCME O.Reg 153/04			
Petroleum Hydrocarbons F1-BTEX			
Run No 454970 **Analysis/Extraction Date** 2024-01-19 **Analyst** AET **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
N-NO2	<0.10 mg/L		90-110
N-NO3	<0.10 mg/L	104	90-110
SO4	<1 mg/L	100	90-110
Run No 454987 **Analysis/Extraction Date** 2024-01-19 **Analyst** AsA **Method** SM 5310B			
DOC	<0.5 mg/L	100	80-120
Run No 455011 **Analysis/Extraction Date** 2024-01-22 **Analyst** PJ **Method** CCME O.Reg 153/04			
Petroleum Hydrocarbons F2	<20 ug/L	108	60-140
Petroleum Hydrocarbons F3	<50 ug/L	108	60-140
Petroleum Hydrocarbons F4	<50 ug/L	108	60-140
Run No 455033 **Analysis/Extraction Date** 2024-01-22 **Analyst** IP **Method** SM5530D/EPA420.2			

Guideline = ODWSOG *** = Guideline Exceedence**

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COC #: 912648

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Phenols	<0.001 mg/L	112	50-120
Run No 455054 **Analysis/Extraction Date** 2024-01-22 **Analyst** AsA **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	103	90-110
Conductivity	<5 uS/cm	99	90-110
F	<0.10 mg/L	102	90-110
pH		100	90-110
Run No 455056 **Analysis/Extraction Date** 2024-01-23 **Analyst** IP **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
Run No 455066 **Analysis/Extraction Date** 2024-01-23 **Analyst** AET **Method** C SM2340B			
Hardness as CaCO3			
Ion Balance			
TDS (COND - CALC)			

Guideline = ODWSOG *** = Guideline Exceedence**

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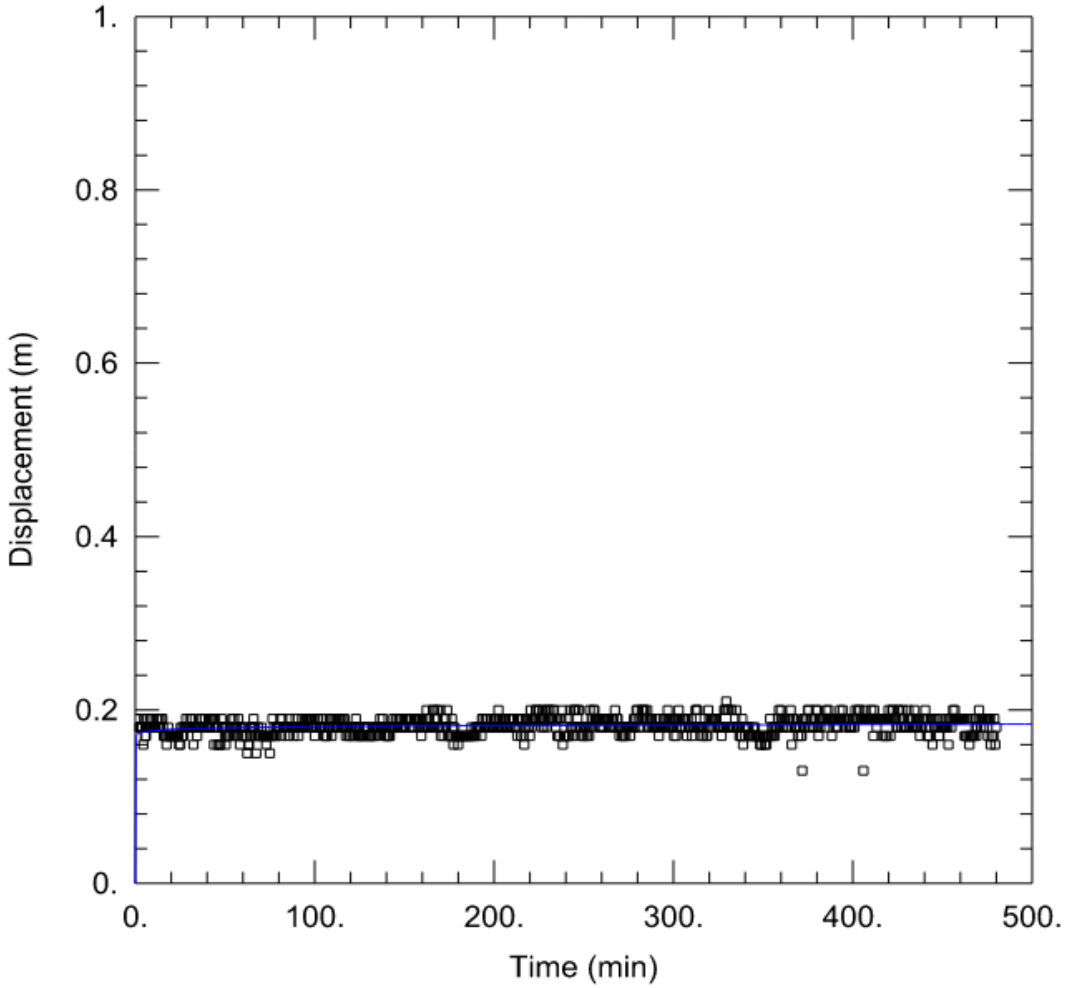
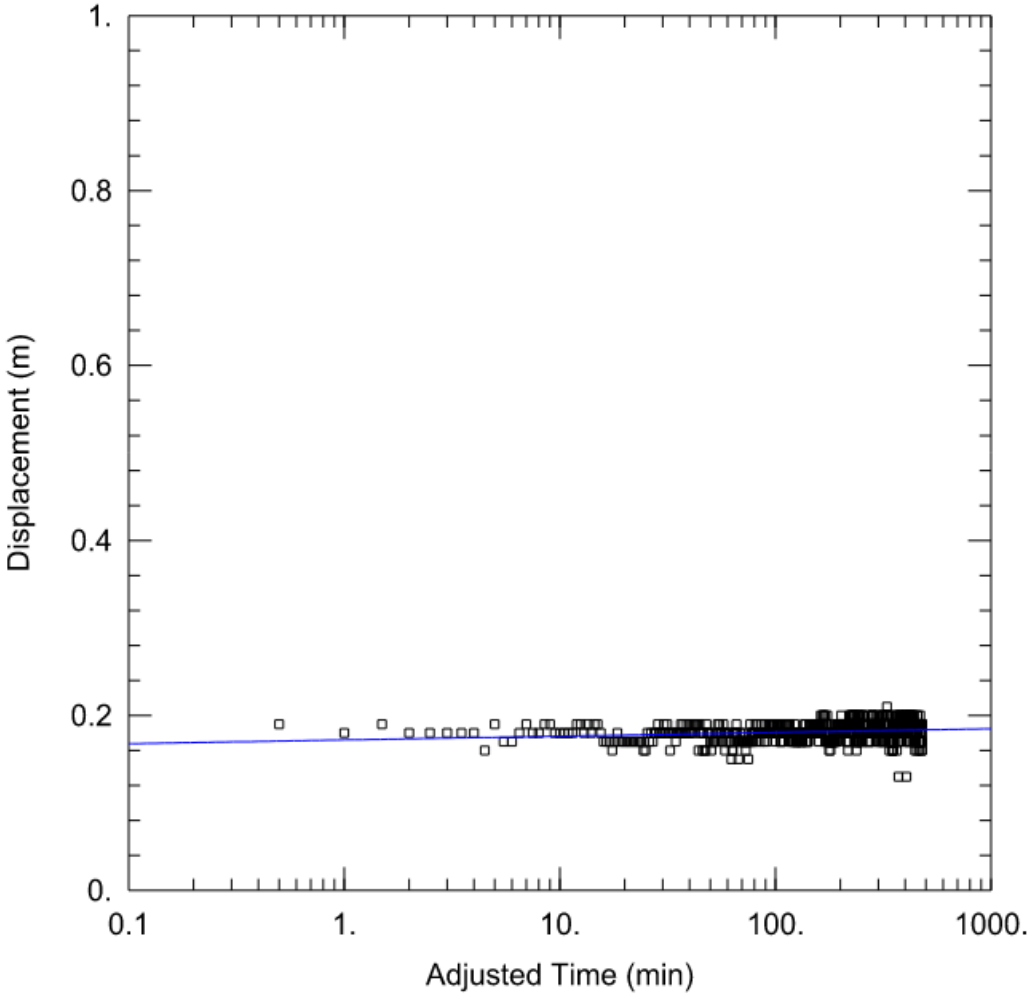
Pumping Test Analysis Report

File No.	PH4334	Well ID:	TW1
Date:	Tuesday, January 16, 2024	Solution Method:	**Theis**
Client:	Myers Automotive Group	Transmissitivity (m2/day):	4925.1
Site Address:	1468 Bankfield Road	Discharge Rate (L/min)	76
Project:	Re-zoning and Site Plan Control Application	Analysis performed by:	AS



Pumping Test Analysis Report

File No.	PH4334	Well ID:	TW1
Date:	Tuesday, January 16, 2024	Solution Method:	**Cooper-Jacob**
Client:	Myers Automotive Group	Transmissitivity (m2/day):	4925.1
Site Address:	1468 Bankfield Road	Discharge Rate (L/min)	76
Project:	Re-zoning and Site Plan Control Application	Analysis performed by:	AS



Pumping Test Analysis Report

File No. PH4334
Date: Tuesday, January 16, 2024
Client: Myers Automotive Group
Site Address: 1468 Bankfield Road
Project: Re-zoning and Site Plan Control Application

Summary Table:

Solution Method:	Well ID:	Transmissitivity (m2/day):
Theis	TW1	4925.1
Cooper-Jacob	TW1	4925.1
Average:		**4925.10**

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1468 Bankfield Road
PH4334

TW1 Inputs

pH	7.77	A	0.18
TDS	646	B	2.43
Hardness	430	C	2.23
Alkalinity	317	D	2.50
Temp.	7.5		
		pHs =	7.179616337

Langelier Saturation Index (LSI) Calculation

(Langelier, 1936)

LSI = pH - pHs

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

Where:

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

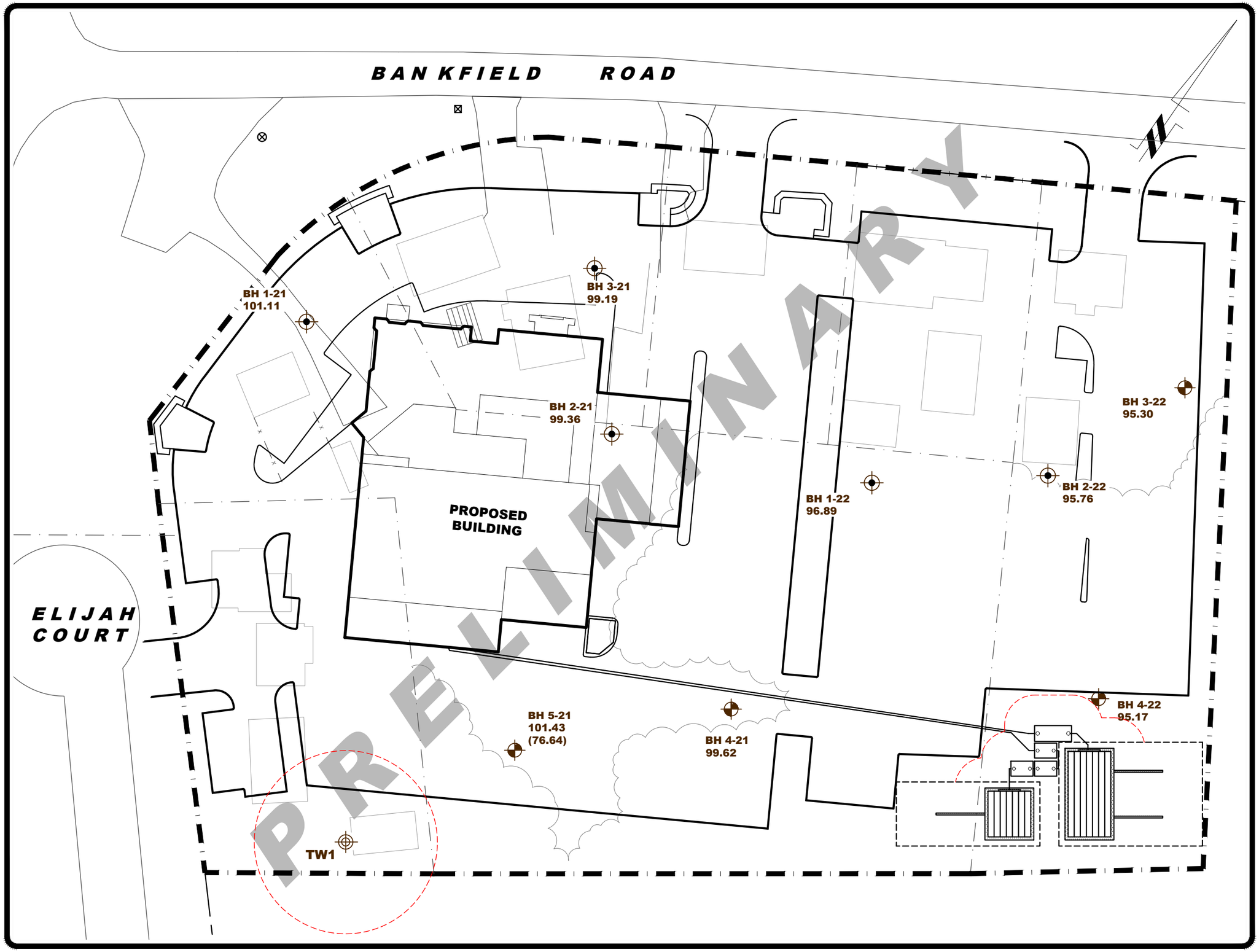
B = -13.12 x Log10 (oC + 273) + 34.55

C = Log10 [Ca2+ as CaCO3] - 0.4

D = Log10 [alkalinity as CaCO3]

LSI =	0.6

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).



LEGEND:

- Test Well Location
- Proposed Sand Mantle
- Proposed Tertiary Treatment Unit
- 15m Radius Offset
- Borehole Completed as Part of Geotechnical Investigation PG5937-1
- Borehole With Monitoring Well Completed as Part of Geotechnical Investigation PG5937-1

DD/MM/YY	DESCRIPTION	REV.
30/01/24	Added TW1 Test Well location	5
29/09/23	Issued with Report No. PH4334-LET.01	4
12/09/23	Issued for Review	3B
22/08/23	Issued for Review	2
20/07/22	Issued for Review	1

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Client:

MYERS AUTOMOTIVE GROUP

Project:

PROPOSED COMMERCIAL DEVELOPMENT

1468 BANKFIELD
OTTAWA, ONTARIO

Drawing:

PRELIMINARY SITE SERVICING PLAN (TERTIARY TREATMENT)

Scale:	Drawn by:
1:600	HV
Date: 09/2023	Checked by: EA

Drawing No.:

PH4334-1(Rev.5)

p:\autocad drawings\hydrogeology\ph43xx\ph4334 - myers automotive group - 1464 bankfield\ph4334-1(rev.5).dwg