

November 21, 2025



PH1525-LET.01

Hidden Pond Winery
4011 Vaughan Side Road
Ottawa (Carp), Ontario
K0A 1L0

Attention: **Andrew Horne**

Subject: **Hydrogeological Assessment and Terrain Analysis**
Proposed Commercial Development
Site Plan Control Application
4011 Vaughan Side Road Ottawa (Carp), Ontario

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INTRODUCTION

Further to your request, Paterson has conducted a Hydrogeological Assessment and Terrain Analysis in support of a Site Plan Control Application (SPA) for the proposed commercial development located at 4011 Vaughan Side Road in Ottawa (Carp). Please refer to the Figure 1 - 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 as well as determine the capacity of the site to attenuate the sewage system impacts in support of the Site Plan application.

The Subject Site consists of a 16.41 ha lot and is currently occupied by a residential dwelling, located centrally off of Vaughan Side Road. The south-western and central areas generally consist of agricultural fields and undeveloped areas, while the northeastern portion of the site generally consists of undeveloped land. The ground surface generally slopes towards the northeast. The southwestern portion of the site slopes from southwest to northeast with an elevation gradient of approximately 144 to 122 m (GeoOttawa), with a steep slope in the area where the dwelling is located and the location of the proposed commercial development. The area where the dwelling is located ranges from 136 to 126 m (GeoOttawa) from southwest to northeast. The northeastern portion of the site slopes towards the northeast with an elevation change of 128 to approximately 122 m (GeoOttawa). The overburden flow direction and general direction is anticipated to be towards the northeast.



The Subject Site is bordered on all sides by agricultural lands, with scattered dwellings located to the northeast, east, and south of the site. The site fronts onto Vaughan Side Road to the southeast.

According to GeoOttawa, the subject site and areas to the southeast are zoned as AG3 for Agricultural General Subzone 3. The areas to the north, northeast, and northwest are zoned as AG1 for Agricultural General Subzone 1. The area to the southwest is zoned as AG5 for Agricultural General Subzone 5 and the area to the south is zoned as RU for Rural Countryside Zone.

Hydrogeological Pre-consultation

A Hydrogeological pre-consultation was completed with a City of Ottawa Hydrogeologist on September 3, 2025. The City Hydrogeologist noted that it is important to ensure that the water supply well is safeguarded from potential septic impacts. Additionally, it was noted that the total discharge volume from the pumping test must be at least twice as much as the Total Daily Design Sanitary Septic Flow (TDDSSF) volume for the site.

Description of Subject Site

The subject site is an approximately 16.4 ha lot and is currently occupied by a residential dwelling and agricultural / undeveloped lands. The agricultural lands are located on the southwest portion of the site and undeveloped lands located to the northeast. Please refer to Figure-1 Key Plan, attached, for the proposed site location. The topography of the site has a > 20 m relief which drops from the southwest toward the northeast.

The residential dwelling is currently serviced by an onsite sewage system and an existing private drilled well. It is understood that the proposed commercial development will be serviced by the existing well and a separate already existing septic system.

The existing drilled well, hereafter referred to as Test Well 1 (TW1), is the well which is currently servicing the residential dwelling and will service the dwelling and proposed commercial development.

According to the owner, no water from the well will be used for irrigation or agricultural purposes.

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

MISSISSIPPI-RIDEAU SOURCE PROTECTION PLAN

The Mississippi-Rideau Source Protection Plan (MRSPP) provides guidance as to which policies apply to a given property, municipality or specific activity and if there are specific designations that apply to the area. The subject site and surrounding areas have been



designated as a Significant Groundwater Recharge Area (SGRA) and Highly Vulnerable Aquifer (HVA). The subject site is not located in a Wellhead Protection Area (WHPA) or Intake Protection Zone (IPZ).

Based on the designations of the subject site by the MRSPP and the proposed usage, there are no related requirements for this site.

Karst Mapping

Available Karst mapping (OGS GRS005) was reviewed as part of this assessment. The available mapping does not indicate the presence of any inferred or potential karstic features. Furthermore, no indication of karstic features was observed during the site visits completed by Paterson personnel.

Service Well (TW1)

The existing onsite well which currently services the existing dwelling is to be the service well for the proposed commercial development. The existing onsite supply well is hereafter referred to as TW1.

A review of the Ministry of the Environment, Conservation and Parks (MECP) Water Well Records (WWR) database showed no WWR associated with the subject site. TW1 was measured by Paterson personnel at the time of the pumping test. TW1 consists of a 152.4 mm diameter steel casing that extends to 6.7 m below ground surface (bgs) and has a 0.41 m stick-up. The well itself extends to a depth of 29.9 m bgs.

The septic system servicing the residential dwelling is currently in operation and was installed in 1984 when the house was built. The septic system that is to service the proposed commercial development was approved by the Ottawa Septic System Office (OSSO) and constructed prior to the requirement of the Site Plan Application. The septic system that services the house and the septic system that is to service the proposed commercial development are approximately 18 m south and 28 m north from TW1, respectively. Both septic systems are located cross-gradient to TW1.

The overburden and general ground water flow is inferred to be towards the easterly direction, due to an elevation change from 144 to 122 m asl (GeoOttawa). As there is significant change in elevation, the overburden water flow will be directed downgradient. The drilled well is located directly cross gradient from the two septic systems. Therefore the drilled well is not anticipated to be susceptible to impacts from the septic system discharge.

To corroborate our position in this matter, the water quality of the bedrock aquifer accessed by the onsite drilled potable supply well shows no indication of surface water or surface impacts from sewage system effluent (i.e nitrate concentration <0.5 mg/L, E.Coli and Total Coliforms were non-detect).



FIELDWORK PROGRAM

Well Inspection

A visual inspection of TW1 was performed by Paterson personnel which confirmed that the well casing and cap are in good condition. The stick-up was measured to be 0.41 m above ground surface, and the well casing was measured to extend to 6.7 m below ground surface (bgs). The well was measured to extend to a depth of 29.9 m bgs. Based on a visual inspection by Paterson personnel, the well was deemed to be in good condition.

Well Testing

As a means to evaluate the water supply aquifer intercepted by the well, TW1 was subjected to an 8-hour constant rate pumping test. The pumping test was conducted on September 25, 2025 under the full-time supervision of Paterson personnel.

The existing jet pump was used for the 8-hour pumping test. A discharge line was connected to the jet pump and was discharged to the front lawn. The discharge line was placed at a sufficient distance to ensure that the discharge water was being directed away from the well as well as any septic systems in the area. Upon completion of the test, the system was returned to its normal configuration.

The pumping test was carried out at a pumping rate of 20 L/min for a duration of 8 hours. During the pumping test, the pumping rate was periodically measured using the timed volume correlation method. The pumping rate was maintained within 5% of the selected pumping rate. The static water level was recorded manually and an electric datalogger (VanEssen TD-Diver) was installed in the test well prior to the start of the pumping test.

The selected rate of 20 L/min provides approximately 2.4 times (9,600 L) the Total Daily Design Sanitary Sewage Flow (TDDSSF) of 4,060 L/day for the subject site during the 8 hour pumping test. The TDDSSF for the proposed commercial development is 2,460 L/day according to the OSSO approved Sewage System Installation Permit while the TDDSSF for the dwelling has been calculated to be 1,600 L/day. The combined site wide TDDSSF for the Site Plan Application is a total of 4,060 L/day. The total volume discharged (9,600 L) provides greater than 2 times the TDDSSF proposed for the Site Plan Application.

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

Recovery data was collected from the well following the completion of the pumping. The well was noted to have achieved 95% recovery approximately 15 minutes 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 and Volatile Organic Compounds (VOC'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 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, hydrogen sulfide (olfactory only), and temperature. If hydrogen sulfide was detected olfactorily, then field testing of hydrogen sulfide would be completed. This is because the detection limit of the hydrogen sulfide test is the olfactory detection limit. Calibration / confirmation of calibration of all field-testing equipment was performed in Paterson's laboratory the day prior to the pumping test. Values are then confirmed again onsite prior to the start of the pumping test.

The following field equipment was used during the pumping test:

- Free Chlorine – HACH Pocket Colorimeter II;
- TDS/Conductivity/pH – Hanna Instruments 2328 BW combo pH/EC/TDS Tester;
- Colour – HACH DR 900 Colorimeter;
 - True Colour – Maple Lab Systems Nylon Syringe 0.45 µm Filter;
- Turbidity – Hanna Instruments HI98703 Turbidimeter
- Hydrogen Sulfide – HACH Hydrogen Sulfide Test Kit CAT. No. 2537800



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.

AQUIFER PARAMETER	RESULT OF ANALYSIS
Transmissivity (m ² /day)	106
Pumping Rate (L/min)	20
Pre-test Static Water Level (m)	16.5
Post-test Static Water Level (m)	17.9
Available Drawdown (m)	13.4
% Drawdown During Pumping Test (%)	10
Specific Capacity (L/min/m drawdown)	14.9

The drawdown data was analyzed using the Theis and Cooper Jacob methods of analysis. Aquifer transmissivity is estimated to be 106 m²/day. Refer to the Theis and Cooper Jacob methods of analysis data sheets attached to this report.

The pumping test results show that TW1 has a high yield to support the water demands that may be required. Overall maximum drawdown at a constant pumping rate for a period of 8 hours was approximately 1.3 m at approximately 8 hours into the pumping test (10% of the available drawdown). 95% recovery was achieved approximately 15 minutes after the end of pumping.

The total volume of water pumped during the 8-hour pumping event was approximately 9,600 L. This is approximately 2.4 times the total daily design volume of water (4,060 L/d) required to support the Site Plan Application for all uses on the property.

The suitability of the aquifer to support the proposed Site Plan Application for the proposed development was assessed using the methodology provided in the City of Ottawa HTAG. Based on the information summarized in Table 1, it is readily apparent that the water supply well has intercepted an adequately strong water supply aquifer which has sufficient quantity to service the maximum site requirements under OBC.

Given the analyses presented and summarized above, it is our opinion that there is an adequate supply of water to support the proposed Site Plan Application. Available WWR's of the neighboring properties on the MECP Well Record mapping website indicated that the wells were screened in limestone and/or sandstone. Surrounding WWR's are attached to this report.



Water Quality

Field Data

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

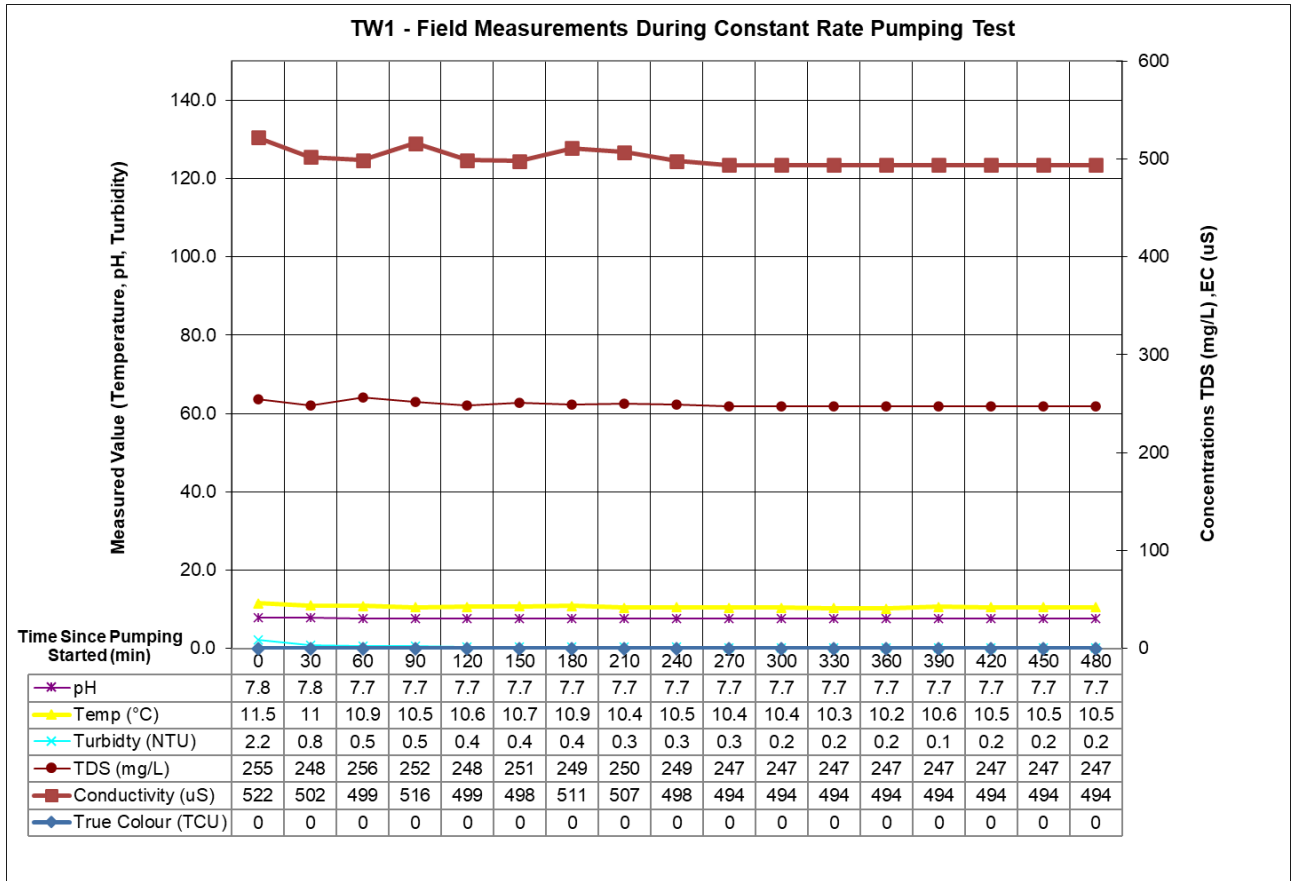


Figure 1: Field Testing Results



Laboratory Data

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

TABLE 2a: GROUNDWATER MICROBIOLOGY & GENERAL GEOCHEMISTRY					
PARAMETER	UNITS	ODWS		TW1	
		LIMIT	TYPE	TW1 GW1 (4 hr)	TW1 GW2 (8 hr)
				2025-09-25	2025-09-25
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	0.28	0.28
Ammonia (N-NH ₃)	mg/L	-	-	<0.02	<0.02
Nitrite (N-NO ₂)	mg/L	1	MAC	<0.1	<0.1
Nitrate (N-NO ₃)	mg/L	10	MAC	0.24	0.21
Total Kjeldahl Nitrogen	mg/L	-	-	0.165	0.132
Turbidity (Field)	NTU	1.0 (5.0)	MAC/AO	0.30	0.19
Turbidity (Laboratory)	NTU	1.0 (5.0)	MAC/AO	0.2	0.4
GENERAL CHEMICAL - AESTHETIC RELATED					
Alkalinity (as CaCO ₃)	mg/L	30-500	OG	247	243
Chloride (Cl)	mg/L	250	AO	53	53
Colour (Laboratory - True)	TCU	5	AO	2	<2
Colour (Field - True)	TCU	5	AO	0	0
Conductivity	uS/cm	-	-	644	652
Dissolved Organic Carbon	mg/L	5	AO	0.7	0.9
Hardness (as CaCO ₃)	mg/L	100	OG	315	309
Ion Balance	unitless	-	-	1.04	1.03
pH	unitless	6.5-8.5	AO	7.67	7.84
Phenols	mg/L	-	-	<0.001	<0.001
Sulphate (SO ₄)	mg/L	500	AO	35	36
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	419	424

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



TABLE 2b: GROUNDWATER GEOCHEMISTRY - METALS					
PARAMETER	UNITS	ODWS		TW1	
		LIMIT	TYPE	TW1 GW1 (4 hr)	TW1 GW2 (8 hr)
				2025-09-25	2025-09-25
METALS					
Aluminum (Al)	mg/L	0.1	OG	<0.01	<0.01
Antimony (Sb)	mg/L	0.006	IMAC	<0.0005	<0.0005
Arsenic (As)	mg/L	0.01	IMAC	<0.001	<0.001
Barium (Ba)	mg/L	1.0	MAC	0.14	0.14
Beryllium (Be)	mg/L	-	-	<0.0005	<0.0005
Boron (B)	mg/L	5.0	IMAC	0.07	0.07
Cadmium (Cd)	mg/L	0.005	MAC	<0.0001	<0.0001
Calcium (Ca)	mg/L	-	-	90	89
Chromium (Cr)	mg/L	0.05	MAC	<0.001	<0.001
Cobalt (Co)	mg/L	-	-	<0.0002	<0.0002
Copper (Cu)	mg/L	1.0	AO	<0.001	<0.001
Iron (Fe)	mg/L	0.3	AO	<0.03	<0.03
Lead (Pb)	mg/L	0.01	MAC	<0.001	<0.001
Magnesium (Mg)	mg/L	-	-	22	21
Manganese (Mn)	mg/L	0.05	AO	<0.01	<0.01
Mercury (Hg)	mg/L	0.001	MAC	<0.0001	<0.0001
Molybdenum (Mo)	mg/L	-	-	<0.005	<0.005
Nickel (Ni)	mg/L	-	-	<0.005	<0.005
Potassium (K)	mg/L	-	-	3	3
Selenium (Se)	mg/L	0.05	MAC	<0.001	<0.001
Silver (Ag)	mg/L	-	-	0.0001	0.0002
Sodium (Na)	mg/L	200	AO	25	25
Strontium (Sr)	mg/L	-	-	1.25	1.23
Thallium (Tl)	mg/L	-	-	<0.0001	<0.0001
Uranium (U)	mg/L	0.02	MAC	0.001	<0.001
Vanadium (V)	mg/L	-	-	<0.001	<0.001
Zinc (Zn)	mg/L	5.0	AO	<0.01	<0.01

- 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. 4483590) indicated that the test samples at the 4- and 8-hour interval were non-detect (0 ct/100 mL) for E.Coli and Total Coliforms.

The water quality of the subject water supply well meets all the Ontario Drinking Water Standards maximum acceptable concentrations (MAC). Furthermore, the water meets all



of the Aesthetic Objectives (AO) and Operational Guidelines (OG) with the exception of the following.

☐ Hardness (as CaCO_3)

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

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

Hardness as CaCO_3

Hardness, expressed as calcium carbonate, is an operation guideline and does not appear in the ODWS. Rather, it appears in the Technical Support Documents for Ontario Drinking Water Standards, Objectives and Guidelines as a parameter with an operational guideline at 100 mg/L. At the measured concentrations of 315 and 309 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 MECP Procedure D-5-5 (1996).

The Langelier calculation provided an LSI of 0.2. Based on the evaluation of the result, the water is super saturated and tends to precipitate a scale layer of calcium carbonate (slightly scale forming and mildly corrosive). Based on the range of stability, there are no mitigative measures needed. See Langelier Saturation Index Calculation attached for calculation details.

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

Sodium

Sodium (Na), an aesthetic parameter, was detected in the laboratory test sample at concentrations of 25 mg/L, which does not exceed the ODWS aesthetic objective of 200 mg/L. Although sodium is not toxic and no maximum acceptable concentration has been set, concentrations above 20 mg/L require that the Medical Officer of Health be notified of the water quality results, so that this information may be passed on to local physicians for use in treatment of those requiring a sodium-restricted diet. It should be noted that some water treatment technologies, such as water softeners, can increase the sodium concentration so care should be given if such treatment technologies are used.



Terrain Analysis

Surficial Geology

A field investigation was carried out on September 25, 2025 and consisted of advancing a total of three (3) hand auger holes. The hand augers holes were distributed in the area for general coverage, taking into account the existing site features. Refer to Paterson Drawing PH5125-1 Test Hole Location Plan, attached, for test hole locations.

The auger holes were advanced to a maximum depth of 0.7 m below ground surface (bgs).

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

Generally, the subsurface profile at the auger hole locations was observed to consist of a thin layer of topsoil which extends from surface to a maximum depth of 0.1 m bgs. The topsoil is underlain by either a brown sand which extends to a maximum depth of 0.7 m bgs, or brown sand with organics which extends to a maximum depth of 0.2 m bgs followed by brown sand with gravel that extends to a maximum depth of 0.6 m bgs. Practical refusal was encountered in each hand auger hole on inferred boulders or bedrock at depths ranging from 0.2 to 0.7 m bgs. Groundwater was not encountered at any hand auger hole locations. Reference should be made to Table 3 below for the subsurface soil profiles at each hand auger hole. It should be noted that groundwater levels can fluctuate both seasonally and in conjunction with precipitation events. Therefore, groundwater levels could vary at the time of construction.

Soil Type and Range (m bgs)	Hand Auger Hole ID		
	HA1-25	HA2-25	HA3-25
Topsoil (m bgs)	0-0.05	0-0.1	0-0.1
Brown Sand Some Organics (m bgs)	-	-	0.1-0.2
Brown Sand (m bgs)	0.05-0.2	0.1-0.7	-
Brown Sand Some Gravel (m bgs)	-	-	0.2-0.6
Auger Refusal (m bgs)	0.2	0.7	0.6
Groundwater Encountered (m bgs)	Dry	Dry	Dry



Drift thickness is mapped to be 0 to 5 m bgs, which coincides with neighbouring water well records.

Hydrogeological Sensitivity of the Site

The subject site currently contains a one-storey residential dwelling, and agricultural lands to the east and west. The subject site is bordered on all sides by agricultural lands, with scattered residential dwellings to the north, east, and south. The site fronts onto Vaughan Side Road to the southeast. All surrounding properties are on private services. The adjacent properties are serviced by private wells and septic systems.

According to the field investigation, the overburden thickness was observed to be less than 2 m. As the proposed site has inferred bedrock within 2 m of the ground surface, the site is considered hydrogeologically sensitive. Separation distances are recommended to be increased between any new septic components and onsite well(s). As the existing well and septic systems are already installed and TW1 shows no signs of sewage system impacts (i.e nitrate concentration <0.5 mg/L; E.Coli and Total Coliforms were non-detect), no further action is required at this time.

Impacts of Septic Systems on TW1

The septic system servicing the residential dwelling is currently in operation and was installed in 1984 when the house was built. The septic system that is to service the proposed commercial development was approved by the Ottawa Septic System Office (OSSO) and constructed prior to the requirement of the Site Plan Application. The septic system that services the house and the septic system that is to service the proposed commercial development are approximately 18 m south and 28 m north from TW1, respectively. Both septic systems are located cross-gradient to TW1.

The overburden and general ground water flow is inferred to be towards the easterly direction, due to an elevation change from 144 to 122 m asl (GeoOttawa). As there is significant change in elevation, the overburden water flow will be directed downgradient. The drilled well is located directly cross gradient from the two septic systems. Therefore the drilled well is not anticipated to be susceptible to impacts from the septic system discharge.

To corroborate our position in this matter, the water quality of the bedrock aquifer accessed by the onsite drilled potable supply well shows no indication of surface water or surface impacts from sewage system effluent (i.e nitrate concentration <0.5 mg/L, E.Coli and Total Coliforms were non-detect).



Conceptual Lot Development

This Terrain Analysis is completed to support a Site Plan Application. See the attached Site Plan titled “PH5125 - 1 - Test Hole Location Plan” by Paterson Group attached to this report.

Sewage System Design and Total Daily Design Sewage Flow

This Terrain Analysis has been completed to support a Site Plan Application. The associated Ontario Septic System Office permit and sewage treatment system design by Paterson Group has been included in the Site Plan application submission. The TDDSSF for the subject site was determined to be 4,060 L/day using Ontario Building Code (OBC) sec 8.2.1.3. As a sewage system installation permit could not be found for the existing sewage system serving the dwelling, the TDDSSF was calculated below:

- Residential Property
 - 3 bedrooms – 1,600 L/day
 - 2 bathrooms – Fixture Count of 12 (50 L per fixture over 20) = no additional flows
 - 149 m² floor area - (100 L per 10 m² greater than 200 m²) = no additional flows
 - Total flows = **1,600 L/day**
- Proposed Commercial Development
 - Based on OSSO approved Sewage System Installation Permit (Septic File number 22-190 approved on May 26, 2022) - **2,460 L/day**;
- Combined site-wide TDDSSF = 4,060 L/day (1,600 + 2,460 L/day)**

Predictive Nitrate Impact Assessment

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

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



assessment will be completed to support the Site Plan application. The values shown in the Predictive Nitrate Impact Assessment calculation attached to this report are summarized below:

<input type="checkbox"/> Site area	16.14 ha
<input type="checkbox"/> Impervious area (%)	1 %
<input type="checkbox"/> Concentration of nitrate in effluent (Value based on typical effluent concentration)	40 mg/L
<input type="checkbox"/> Surplus Water (The surplus water value was estimated based on Environment Canada Climate Office values with a soil type comprised of a fine sandy loam (Urban Lawn/ Shallow Rooted Crops) and anthropogenic sources.)	378 mm/yr
<input type="checkbox"/> Combined infiltration factor based on:	0.60
• Topography infiltration factor	0.10
• Soil texture infiltration factor	0.40
• Cover infiltration factor	0.10

The topography infiltration factor of 0.10 is based upon a hilly land with an average slope of 28 to 47 m/km. The soil texture infiltration factor was based upon “Fine Sandy Loam” with a value of 0.4 which is a reasonable generalization based upon the site investigations and available geological mapping. The “cover infiltration factor” was calculated at 0.10 based upon the cultivated land.

The predicted nitrate concentration calculation for a conventional sewage system (system without nitrate reduction), with a TDDSSF of **4.06 m³/day** results in a nitrate concentration of **1.54 mg/L** of nitrate at the property boundary using a nitrate concentration of 40 mg/L.

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





CONCLUSIONS

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

1. The water supply aquifer intercepted by the existing well is considered to be adequate to support the water quantity demands for the proposed building usage.
2. Based on a visual inspection performed by Paterson personnel of TW1, the well casing, stickup, and well cap are in compliance with O.Reg 903.
3. The preferred water supply intercepted by TW1 contains a water supply that is potable and contains only elevated concentrations of hardness. The noted parameters can be treated with current readily available water conditioning equipment. A water treatment specialist has been retained by the owner to provide treatment for the building water supply.
4. If desired by the property owner, a residential grade water softener can be used to facilitate the reduction of the hardness concentration and reduce scaling. If a water softener is used for the proposed development, the owner should be made aware that additional sodium will be added to the water to reduce hardness. If desired, a point-of-use reverse osmosis system can be used to provide a drinking tap source without increasing sodium levels.
5. The sodium concentration was measured to be above the 20 mg/L reporting limit and, as such, the Medical Officer of Health for the City of Ottawa should be informed to assist area physicians in the treatment of local residents on sodium reduced diets. It should be noted that some water treatment equipment may further increase the sodium concentration.
6. The predicted nitrate concentrations at the property boundary resulting from the existing sewage systems is calculated to be below the required 10 mg/L threshold.
7. A Building Permit need to be issued prior to the commencement of construction.
8. The results of the Hydrogeological Assessment and Terrain Analysis have provided satisfactory evidence that the subject site can support the proposed Site Plan Control Application with respect to water quality, quantity and sewage system effluent attenuation within the property boundary.



We trust that the current submission satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

Alexander Schopf, PhD, EIT



Erik Ardley, P. Geo.

Attachments:

- Key Plan
- MECP Water Well Records
- Eurofins Certificate of Analysis
- AQTESOLV - Pumping Test Analysis Reports
- Nitrate Impact Assessment Calculations
- Langelier Saturation Index (LSI) Calculation
- PH5125 - 1 – Test Hole Location Plan.



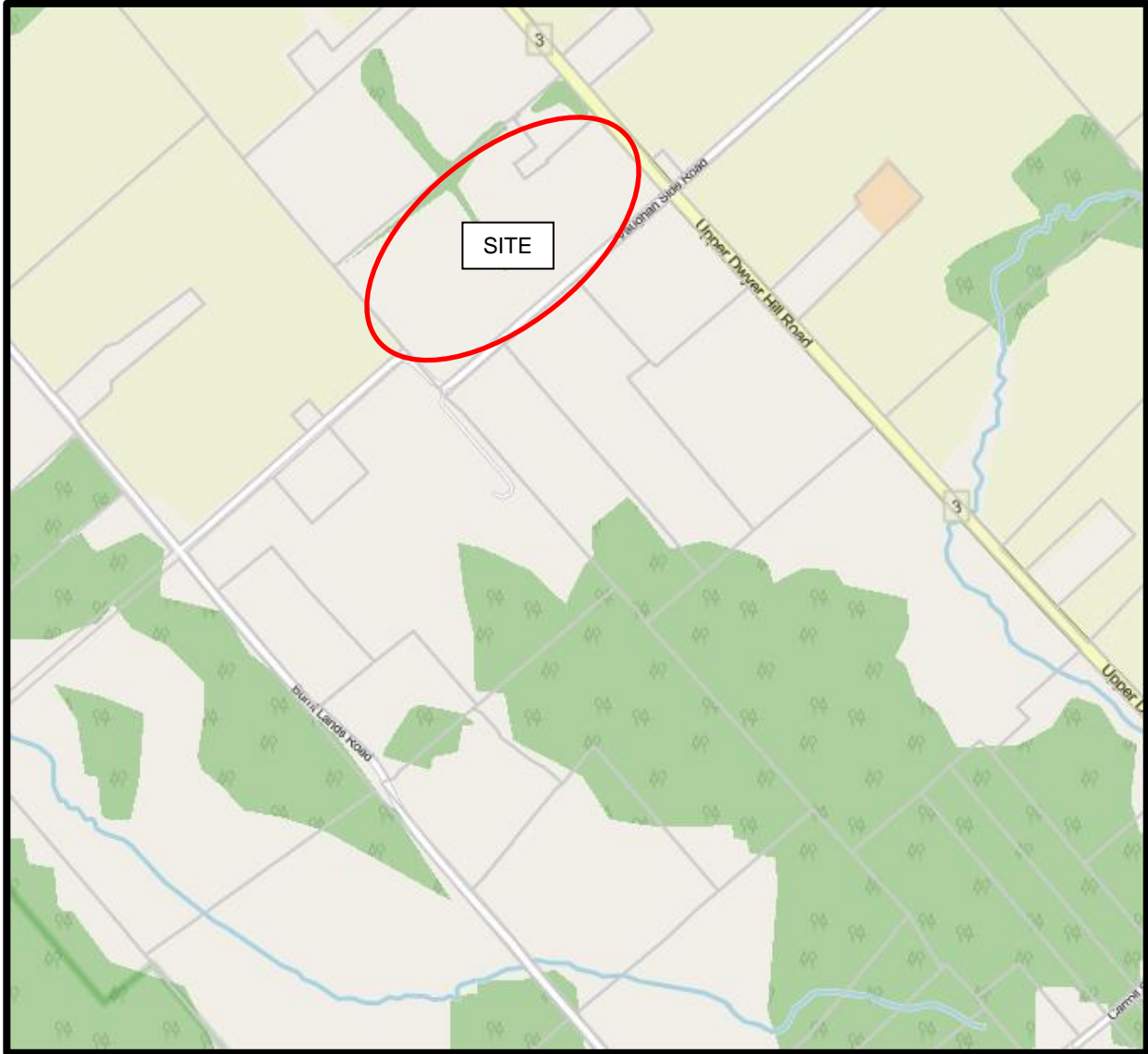


FIGURE 1

KEY PLAN

324
 UTM 18Z 409425E
 5R 5015150N
 Elev. 5R 0415
 Basin 25



ONTARIO
 The Well Drillers Act

Department of Mines, Province of Ontario

15 No 3262
RECEIVED
 OCT 13 1954
 GEOLOGICAL BRANCH
 DEPARTMENT of MINES

Water Well Record

County or Territorial District... Carleton ... Township, Village, Town or City... Huntley
 Con... 11 ... Lot... 20 ... Street and Number (if in Village, Town or City) ...
 Owner... [Redacted] ... Address... Conkery, Ont.
 Date Completed... 29 (day) Sept (month) 54 (year) ... Cost of Well (excluding pump) ...

Pipe and Casing Record

Pumping Test

Casing diameter(s) ... 2 inch ... Date... 29 Sept 19-54
 Length(s) of casing(s) ... 15 feet ... Static level... 3 feet
 Type of screen... [Redacted] ... Pumping level... 10 feet
 Length of screen... [Redacted] ... Pumping rate... 500 pounds g Ph
 Distance from top of screen to ground level... [Redacted] ... Duration of test... 2 hrs
 Is well a gravel-wall type? ... Distance from cylinder or bowls to ground level ...

Water Record

Kind (fresh or mineral)	Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
<u>fresh</u>	<u>57</u>	<u>good</u>	<u>54</u>
Quality (hard, soft, contains iron, sulphur, etc.) ... <u>soft</u>			
Appearance (clear, cloudy, coloured) ... <u>clear</u>			
For what purpose(s) is the water to be used? ... <u>house</u>			
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 ...			

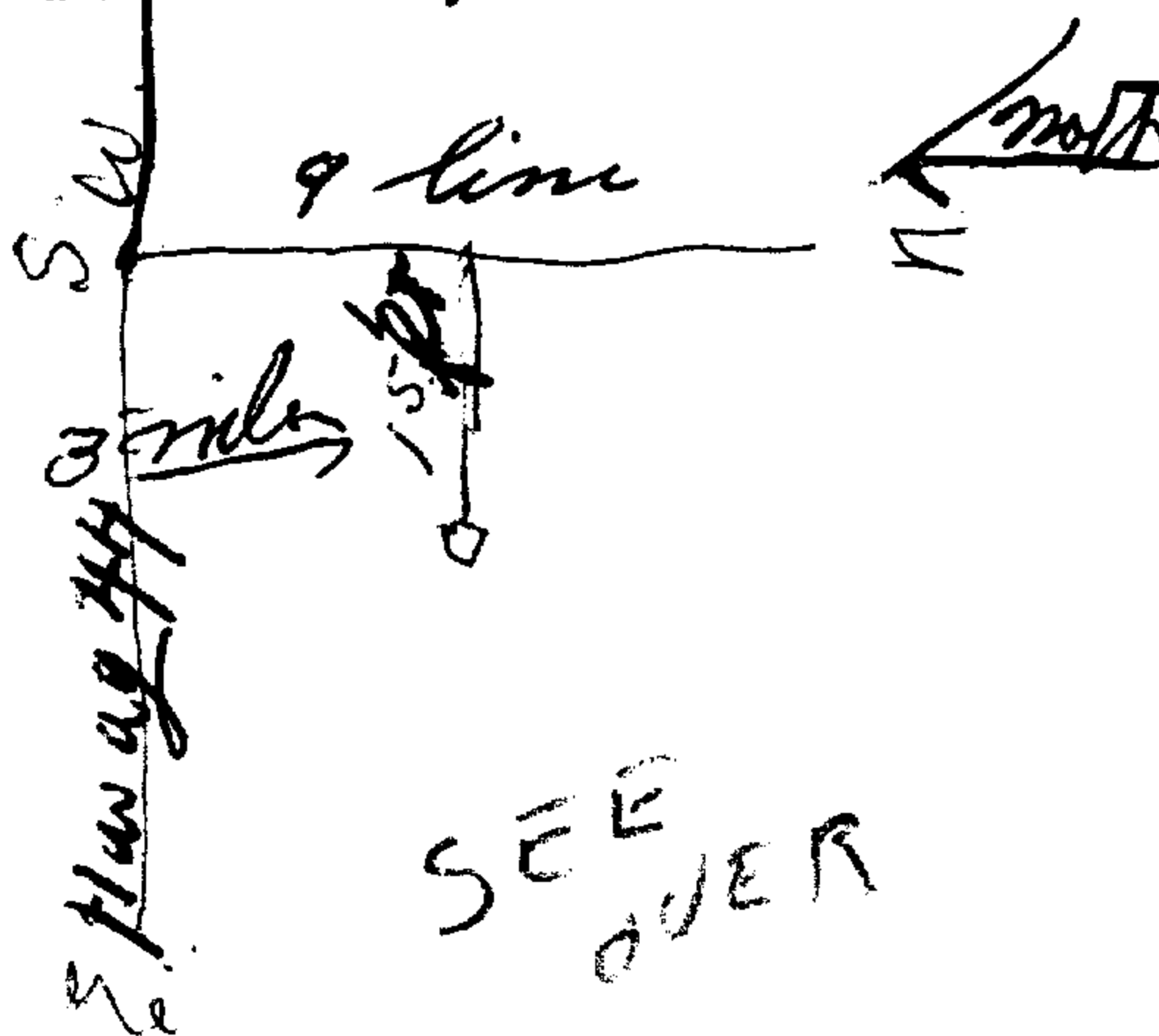
Well Log

Overburden and Bedrock Record

	From	To
<u>gravel and sand</u>	0 ft.	10 ft.
<u>Red granite and limestone</u>	10	57
<u>GRAVEL & SAND</u>	0	10
<u>LIMESTONE</u>	10	30
<u>RED GRANITE</u>	30	57

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... C. Dupre
 Address... 103 Sweetland Ave Ottawa
 Name of Driller... C. Dupre ... Address... 103 Sweetland Ottawa
 Date... 29 Sept 54 ... Licence Number... 88
 Signature of Licensee... C. Dupre



GROUND WATER BRANCH
 15 N
 Act SEP 5 1962
 ONTARIO WATER RESOURCES COMMISSION

3213

UTM 18Z 409400E
 5R 5015350N
 Elev. 5R 04110

The Ontario Water Resources Commission

WATER WELL RECORD

Basin 25
 County or District Carleton Place
 Con. 11 Lot 21

Township, Village, Town or City Hamlet
 Date completed 20 June 1962
 (day month year)
 Address Corkery

Casing and Screen Record

Inside diameter of casing 2
 Total length of casing 16.2"
 Type of screen —
 Length of screen —
 Depth to top of screen —
 Diameter of finished hole 2

Pumping Test

Static level 28
 Test-pumping rate 8 G.P.M.
 Pumping level 35
 Duration of test pumping 1 hr
 Water clear or cloudy at end of test cloudy
 Recommended pumping rate same G.P.M.
 with pump setting of same feet below ground surface

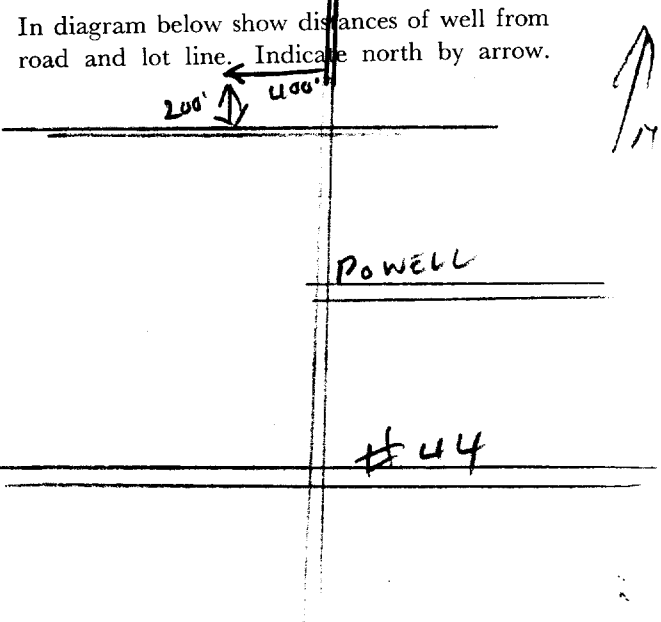
Well Log

Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
<u>Gravel</u>	<u>0</u>	<u>5</u>	<u>155</u>	<u>Fresh</u>
<u>Limestone</u>	<u>5</u>	<u>110</u>		
<u>sand stone</u>	<u>110</u>	<u>155</u>		

For what purpose(s) is the water to be used? Farming
 Is well on upland, in valley, or on hillside? Upland
 Drilling or Boring Firm F. R. Carsetto
 Address 1510 Baseline Rd. Ottawa
 Licence Number 615
 Name of Driller or Borer Same
 Address Same
 Date June 20-62
F. R. Carsetto
 (Signature of Licensed Drilling or Boring Contractor)

Location of Well





Ontario

WATER WELL RECORD

31 F/8

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

1513822-11
MUNICIPALITY 152005 CON. C/DN
22 23 24

COUNTY OR DISTRICT: Carleton Place TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Beeston CON., BLOCK, TRACT, SURVEY, ETC.: Con 11 LOT: 020

ADDRESS: Richmond Ont DATE COMPLETED: DAY 25 MO 08 YR 73

NORTHING: 1513822 18 ELEVATION: 399032 RC. BASIN CODE: 5001083 4 425 5 26 DATE RECEIVED: MAR 17, 1975 248

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
grey	gravel		shale	0	9
black	shale		soft	9	72.5 58
grey	limestone		hard	58	125
	A.M. CAMELON				

31 000921/11/7 005881/7 012521/5T
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
0125	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	14
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	19
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	24
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	29
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	34

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
05	1 <input checked="" type="checkbox"/> STEEL	188	0	2020
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			
17-18	1 <input type="checkbox"/> STEEL			20-23
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			
24-25	1 <input type="checkbox"/> STEEL			27-30
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			

SCREEN

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

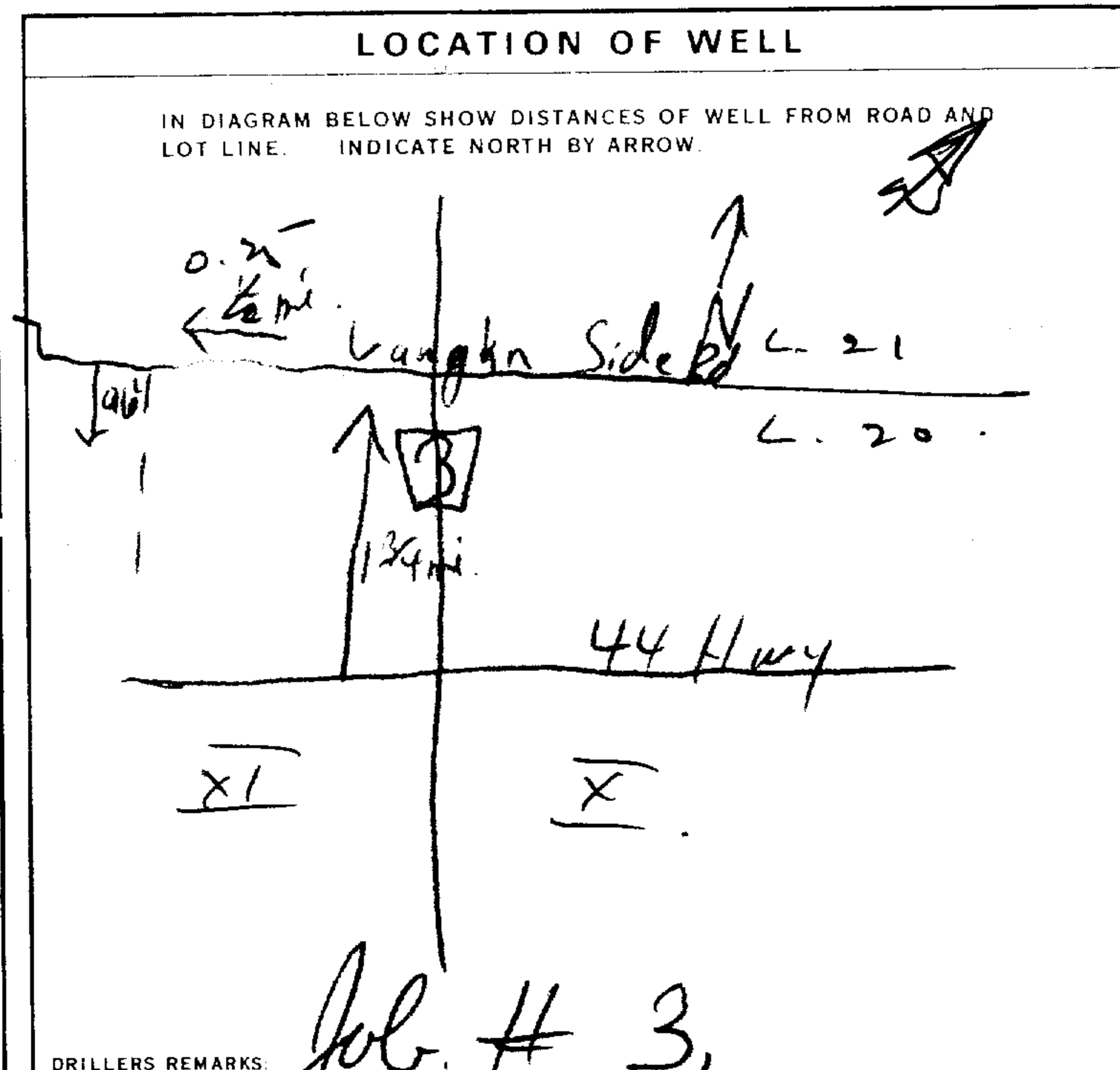
MATERIAL AND TYPE: _____ DEPTH TO TOP OF SCREEN: _____

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
FROM	TO	
10-12	14-17	
18-21	22-25	
26-29	30-33	

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input type="checkbox"/> PUMP 2 <input checked="" type="checkbox"/> BAILER	0005 GPM	01 15-16 HOURS 00 17-18 MINS
STATIC LEVEL: 035 FEET	WATER LEVEL END OF PUMPING: 100 FEET	WATER LEVELS DURING:
		15 MINUTES: 100 FEET
		30 MINUTES: 100 FEET
		45 MINUTES: 100 FEET
		60 MINUTES: 100 FEET
IF FLOWING, GIVE RATE: _____ GPM	PUMP INTAKE SET AT: _____ FEET	WATER AT END OF TEST: _____ FEET
RECOMMENDED PUMP TYPE: <input checked="" type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING: 100 FEET	RECOMMENDED PUMPING RATE: 0005 GPM



FINAL STATUS OF WELL

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

WATER USE

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

METHOD OF DRILLING

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

NAME OF WELL CONTRACTOR: Henry Mann Well Drilling LICENCE NUMBER: 3644

ADDRESS: Box 309 Richmond Ont

NAME OF DRILLER OR BORE: Henry Mann LICENCE NUMBER: _____

SIGNATURE OF CONTRACTOR: _____ SUBMISSION DATE: DAY 21 MO 08 YR 73

DATA SOURCE: 1 58 CONTRACTOR: 3644 59-62 DATE RECEIVED: 110274 63-68 80

DATE OF INSPECTION: _____ INSPECTOR: _____

REMARKS: _____



WATER WELL RECORD

31 Fg

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

11 1515014-15005 CON. 10 10

COUNTY OR DISTRICT: *11* TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: *Hambley* CON., BLOCK, TRACT, SURVEY, ETC.: *Con 10 HE* LOT 25-27: *021*

DATE COMPLETED: DAY *08* MO *09* YR *75*

1515014 17 409495 5015263 5 405 5 26 JUN 28, 1977 298

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
				0	35
			<i>Check well flow 5 gal per min.</i>	0	85
			<i>2 ha.</i>		

31 0.085 0.0

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13 <i>0075</i>	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input checked="" type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
16-18 <i>75</i>	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
06	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	.188	0	<i>0075</i>
06	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE		<i>25</i>	<i>0085</i>

SCREEN

SIZE(S) OF OPENING (SLOT NO.): 31-33 DIAMETER 34-38 LENGTH 39-40

MATERIAL AND TYPE: DEPTH TO TOP OF SCREEN 41-44 80

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD: 1 PUMP 2 BAILER

PUMPING RATE: 0007 GPM DURATION OF PUMPING: 02 HOURS 00 MINS

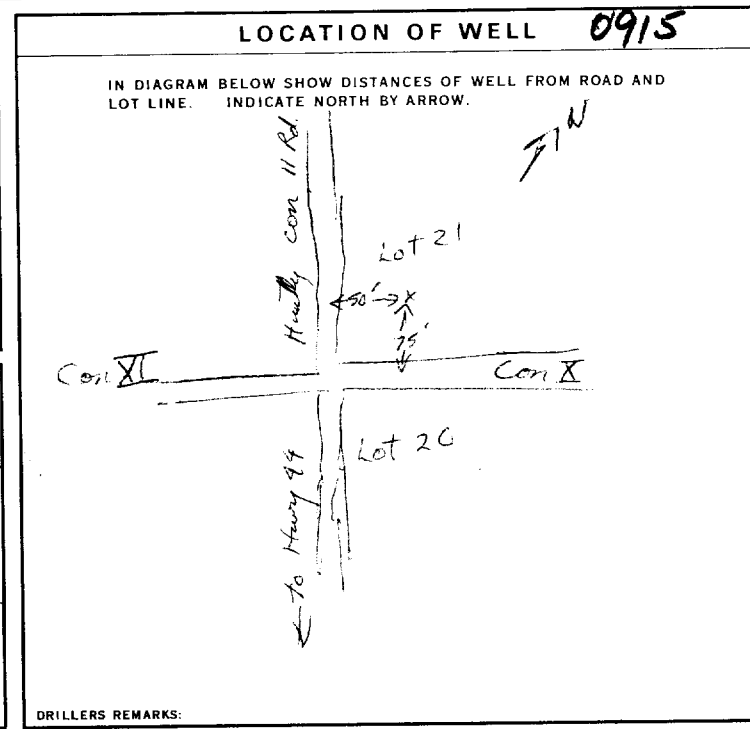
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING			
19-21	22-24	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
<i>005'</i>	<i>060</i>	<i>005'</i>	<i>005'</i>	<i>005'</i>	<i>005'</i>

IF FLOWING, GIVE RATE: 75 GPM

RECOMMENDED PUMP TYPE: SHALLOW DEEP

RECOMMENDED PUMP SETTING: 075 FEET

RECOMMENDED PUMPING RATE: 0005 GPM



FINAL STATUS OF WELL 84

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

WATER USE 85-88

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

METHOD OF DRILLING 87

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

CONTRACTOR

NAME OF WELL CONTRACTOR: *George H. Law Son* LICENCE NUMBER: *3323*

ADDRESS: *Catalogie Ont*

NAME OF DRILLER OR BORE: *G.H. Law* LICENCE NUMBER: *3473*

SIGNATURE OF CONTRACTOR: *G.H. Law* SUBMISSION DATE: DAY *8* MO *9* YR *75*

OFFICE USE ONLY

DATA SOURCE: 1 58 CONTRACTOR: 3323 59-62 DATE RECEIVED: 081275 63-68 80

DATE OF INSPECTION: *June 29, 1976* INSPECTOR: *R. Bentley*

REMARKS: *P. Bentley*

WI



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

11

1531236

Municipality
15005

Con.
CON

County or District: Ottawa Carleton
Township/Borough/City/Town/Village: Ottawa Carleton
Con block tract survey, etc.: Con 11
Lot: 20
Address: 1 Colfax St. Alexan, Ont
Date completed: 21 day 06 month 00 year

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
brown	sand/gravel			0	6'
black	granite			6'	65'
white	limestone			65'	120'

31
32

41 WATER RECORD

Water found at - feet	Kind of water					
110	<input checked="" type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas
	<input type="checkbox"/> Salty	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
6 1/4	<input checked="" type="checkbox"/> Steel	.188	0	22
	<input type="checkbox"/> Galvanized			
	<input type="checkbox"/> Concrete			
	<input type="checkbox"/> Open hole			
	<input type="checkbox"/> Plastic			

SCREEN

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

Material and type: _____
Depth at top of screen: _____ feet

61 PLUGGING & SEALING RECORD

Annular space Abandonment

Depth set at - feet		Material and type (Cement grout, bentonite, etc.)
From	To	
22	0	Cement Grout

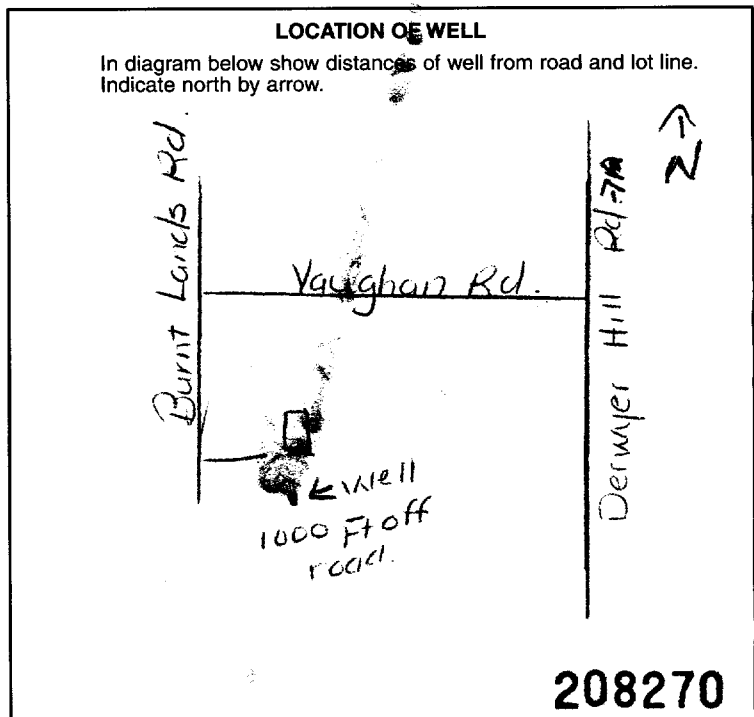
71 PUMPING TEST

Pumping test method: Pump Bailer
Pumping rate: 20 GPM
Duration of pumping: 1 Hours 0 Mins

Static level	Water level end of pumping	Water levels during			
25 feet	120 feet	15 minutes: 40 feet	30 minutes: 32 feet	45 minutes: 28 feet	60 minutes: 25 feet

If flowing give rate: _____ GPM
Pump intake set at: _____ feet
Water at end of test: Clear Cloudy

Recommended pump type: Shallow Deep
Recommended pump setting: 90 feet
Recommended pump rate: 20 GPM



81 FINAL STATUS OF WELL

Water supply
 Observation well
 Test hole
 Recharge well

Abandoned, insufficient supply
 Abandoned, poor quality
 Abandoned (Other)
 Dewatering

Unfinished
 Replacement well

82 WATER USE

Domestic
 Stock
 Irrigation
 Industrial

Commercial
 Municipal
 Public supply
 Cooling & air conditioning

Not use
 Other

83 METHOD OF CONSTRUCTION

Cable tool
 Rotary (conventional)
 Rotary (reverse)
 Rotary (air)

Air percussion
 Boring
 Diamond
 Jetting

Driving
 Digging
 Other

Name of Well Contractor: George H Law + Son Ltd
Well Contractor's Licence No.: 3323
Address: Box 155 Cubogue, Ont K0J-1H0
Name of Well Technician: AIF Law
Well Technician's Licence No.: T-0433
Signature of Technician/Contractor: _____
Submission date: day 8 mo 6 year 00

MINISTRY USE ONLY

Data source: 3323
Date received: JUL 21 2000
Date of inspection: _____
Inspector: _____
Remarks: _____
CSS.ESO

Notice of Collection of Personal Information

Personal information contained on this form is collected pursuant to sections 35-50 and 75(2) of the *Ontario Water Resources Act* and section 16.3 of the Wells Regulation. This information will be used for the purpose of maintaining a public record of wells in Ontario. This form and the information contained on the form will be stored in the Ministry's well record database and made publicly available. Questions about this collection should be directed to the Water Well Customer Service Representative at the Wells Help Desk, 125 Resources Road, Toronto Ontario M9P 3V6, at 1-888-396-9355 or wellshelpdesk@ontario.ca.

Fields marked with an asterisk (*) are mandatory.

Well Tag Number *
A352410

Type *

Construction Abandonment

Measurement recorded in: *

Metric Imperial

1. Well Owner's Information

Last Name and First Name, or Organization is mandatory. *

Last Name	First Name
[Redacted]	[Redacted]
Organization	Email Address
[Redacted]	[Redacted]

Current Address

Unit Number	Street Number *	Street Name *	City/Town/Village
[Redacted]	[Redacted]	[Redacted]	[Redacted]
Country	Province	Postal Code	Telephone Number
Canada	ON	[Redacted]	[Redacted]

2. Well Location

Address of Well Location

Unit Number	Street Number *	Street Name *	Township
	2041	Upper Dwyer Hill Road	Huntley
Lot	Concession	County/District/Municipality	
Pt. Lot 20	11	CITY OF OTTAWA	
City/Town	Province	Postal Code	
Carp	Ontario	K0A 1L0	
UTM Coordinates	Zone *	Easting *	Northing *
NAD 83	18	409553	5015223
			Municipal Plan and Sublot Number
			Test UTM in Map

Other

3. Overburden and Bedrock Material *

Well Depth *	155	(ft)			
General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

			(ft)	(ft)
	Sand		0	3
	Gravel	Stones	3	6
Grey	Sandstone		6	155

4. Annular Space *

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	10	Bentonite (Quick Grout)	1.24
10	20	Cement	1.24

5. Method of Construction *

- Cable Tool Rotary (Conventional) Rotary (Reverse) Boring Air percussion Diamond
 Jetting Driving Digging Rotary (Air) Augering Direct Push
 Other (specify) _____

6. Well Use *

- Public Industrial Cooling & Air Conditioning
 Domestic Commercial Not Used
 Livestock Municipal Monitoring
 Irrigation Test Hole Dewatering
 Other (specify) _____

7. 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) _____

8. Construction Record - Casing * (use negative number(s) to indicate depth above ground surface)

Inside Diameter (in)	Open Hole or Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)
6.25	Steel	0.188	-2	20

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)

10. Water Details

Water found at Depth 147 (ft)	<input type="checkbox"/> Gas	Kind of water	<input type="checkbox"/> Fresh	<input checked="" type="checkbox"/> Untested	<input type="checkbox"/> Other
Water found at Depth 150	<input type="checkbox"/> Gas	Kind of water	<input type="checkbox"/> Fresh	<input checked="" type="checkbox"/> Untested	<input type="checkbox"/> Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0	20	10
20	155	6

12. Results of Well Yield Testing

Pumping Discontinued

Explain _____

If flowing give rate

Flowing _____ (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)	16.9	18.4	18.4	18.4	18.4	18.5	18.6	18.7	18.7	18.7	18.7	18.7	18.7	18.7

Recovery

Time (min)	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)	17.1	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9

After test of well yield, water was

Clear and sand free Other (specify)

Pump intake set at 140 (ft)	Pumping rate 20 (GPM)	Duration of pumping 1 hrs + 0 min	Final water level end of pumping 18.7 (ft)	Disinfected? * <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Recommended pump depth 135 (ft)	Recommended pump rate 15 (GPM)	Well production 20 (GPM)		

13. Map of Well Location *

Map 1. Please Click the map area below to import an image file to use as the map. Make map area bigger

Well Record A3524102041 Upper Dwyer Hill Road
Carp, ON**14. Information**

Well owner's information package delivered <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered (yyyy/mm/dd) 2022/06/28	Date Work Completed (yyyy/mm/dd) * 2022/06/24
---	---	--

Comments

15. Well Contractor and Well Technician Information


Business Name of Well Contractor * Wilf Hall & Sons Well Drilling	Well Contractor's License Number * 2558
--	--

Business Address

Unit Number	Street Number 256	Street Name * Hall Shore Road
City/Town/Village * McDonalds Corners	Province ON	Postal Code * K0G 1M0
Business Telephone Number 613-278-0580	Business Email Address info@wilfhallandsons.com	
Last Name of Well Technician * Hall	First Name of Well Technician * Scott	Well Technician's License Number * 2760

16. Declaration *

I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate.

Last Name Hall	First Name Scott	Email Address info@wilfhallandsons.com
Signature Scott Hall	 Digitally signed by Scott Hall Date: 2022.06.30 11:30:16 -04'00'	Date Submitted (yyyy/mm/dd) 2022/06/30

17. Ministry Use Only

Audit Number
SM7E 7PE6

OFFICIAL CERTIFICATE OF ANALYSIS - EXCEEDENCE SUMMARY

Client : Paterson Group
 Project : PH5125

Reception Date : 2025-09-26

Eurofins Sample No	Client Sample Identification	Analyte	Result	Units	Exceeded Criteria		
					A	B	C
Hardness (Water, Calculation Only)							
9065526	TW1 - GW1	Hardness as CaCO3 (Calculation)	315	mg/L	80-100		
9065527	TW1 - GW2	Hardness as CaCO3 (Calculation)	309	mg/L	80-100		

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH5125

Reception Date: 2025-09-26

				Eurofins Sample No :		9065526	9065527			
				Matrix :		Groundwater	Groundwater			
				Sampling Date :		2025-09-25	2025-09-25			
				Client Sample Identification :		TW1 - GW1	TW1 - GW2			
Anions	RL	Unit	Criteria							
			A	B	C					
Chloride	0.5	mg/L	250			52.5	52.6			
Sulphate	1	mg/L	500			35	36			

				Eurofins Sample No :		9065526	9065527			
				Matrix :		Groundwater	Groundwater			
				Sampling Date :		2025-09-25	2025-09-25			
				Client Sample Identification :		TW1 - GW1	TW1 - GW2			
Calculations	RL	Unit								
Ion Balance (Calculation)^	0.1		1.04			1.03				

				Eurofins Sample No :		9065526	9065527			
				Matrix :		Groundwater	Groundwater			
				Sampling Date :		2025-09-25	2025-09-25			
				Client Sample Identification :		TW1 - GW1	TW1 - GW2			
General Chemistry	RL	Unit	Criteria							
			A	B	C					
Alkalinity (as CaCO3)	5	mg/L	500			247	243			
Colour (Apparent)	2	TCU	5			5	3			
Colour (True)	2	TCU				2	<2			
Conductivity @ 25°C	5	µS/cm				644	652			
Dissolved Organic Carbon	0.5	mg/L	5			0.7	0.9			
Fluoride	0.1	mg/L	1.5			0.28	0.28			
Hardness as CaCO3 (Calculation)	1	mg/L	80-100			315	309			
pH @ 25°C	1		6.5-8.5			7.67	7.84			
Phenols-4AAP	0.001	mg/L				<0.001	<0.001			
Sulphide (S2-)	0.01	mg/L	0.05			<0.01	<0.01			
Tannin and Lignin	0.1	mg/L				<0.1	<0.1			
TDS (Estimated)^	5	mg/L	500			419	424			
Turbidity	0.1	NTU	5			0.2	0.4			

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH5125

Reception Date: 2025-09-26

						Eurofins Sample No :		9065526	9065527			
						Matrix :		Groundwater	Groundwater			
						Sampling Date :		2025-09-25	2025-09-25			
						Client Sample Identification :		TW1 - GW1	TW1 - GW2			
Metals	RL	Unit	Criteria									
			A	B	C							
Metals Scan (Water, ICP/MS)												
Aluminum	0.01	mg/L	0.1					<0.01	<0.01			
Antimony	0.0005	mg/L	0.006					<0.0005	<0.0005			
Arsenic	0.001	mg/L	0.01					<0.001	<0.001			
Barium	0.001	mg/L	1					0.139	0.138			
Beryllium	0.0005	mg/L						<0.0005	<0.0005			
Boron	0.01	mg/L	5					0.07	0.07			
Cadmium	0.0001	mg/L	0.005					<0.0001	<0.0001			
Chromium	0.001	mg/L	0.05					<0.001	<0.001			
Cobalt	0.0002	mg/L						<0.0002	<0.0002			
Copper	0.001	mg/L	1					<0.001	<0.001			
Iron	0.03	mg/L	0.3					<0.03	<0.03			
Lead	0.001	mg/L	0.01					<0.001	<0.001			
Manganese	0.01	mg/L	0.05					<0.01	<0.01			
Mercury	0.0001	mg/L	0.001					<0.0001	<0.0001			
Molybdenum	0.005	mg/L						<0.005	<0.005			
Nickel	0.005	mg/L						<0.005	<0.005			
Selenium	0.001	mg/L	0.05					<0.001	<0.001			
Silver	0.0001	mg/L						0.0001	0.0002			
Strontium	0.001	mg/L						1.25	1.23			
Thallium	0.0001	mg/L						<0.0001	<0.0001			
Uranium	0.001	mg/L	0.02					0.001	<0.001			
Vanadium	0.001	mg/L						<0.001	<0.001			
Zinc	0.01	mg/L	5					<0.01	<0.01			
Metals Scan (Water, ICP/OES)												
Calcium	1	mg/L						90	89			
Magnesium	1	mg/L						22	21			
Potassium	1	mg/L						3	3			
Sodium	1	mg/L	200					25	25			
						Eurofins Sample No :		9065526	9065527			
						Matrix :		Groundwater	Groundwater			
						Sampling Date :		2025-09-25	2025-09-25			
						Client Sample Identification :		TW1 - GW1	TW1 - GW2			
Microbiology	RL	Unit	Criteria									
			A	B	C							
Escherichia coli (DC)	0	CFU/100mL	0					0	0			
Total Coliforms (DC)	0	CFU/100mL	0					0	0			

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
 Project : PH5125

Reception Date: 2025-09-26

			Eurofins Sample No :		9065526	9065527			
			Matrix :		Groundwater	Groundwater			
			Sampling Date :		2025-09-25	2025-09-25			
			Client Sample Identification :		TW1 - GW1	TW1 - GW2			
Nutrients	RL	Unit	Criteria						
			A	B	C				
Ammonia (Total, as Nitrogen)	0.02	mg/L				<0.020	<0.020		
Nitrate (as Nitrogen)	0.1	mg/L	10.0			0.24	0.21		
Nitrite (as Nitrogen)	0.1	mg/L	1.0			<0.1	<0.1		
Total Kjeldahl Nitrogen	0.1	mg/L				0.165	0.132		

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH5125

Reception Date: 2025-09-26

			Eurofins Sample No : 9065527						
			Matrix : Groundwater						
			Sampling Date : 2025-09-25						
			Client Sample Identification : TW1 - GW2						
Volatile Organic Compounds	RL	Unit	Criteria						
			A	B	C				
VOCs (Water, GC/MS)									
1,1,1,2-Tetrachloroethane	0.5	ug/L				<0.5			
1,1,1-Trichloroethane	0.4	ug/L				<0.4			
1,1,2,2-Tetrachloroethane	0.5	ug/L				<0.5			
1,1,2-Trichloroethane	0.4	ug/L				<0.4			
1,1-Dichloroethane	0.4	ug/L				<0.4			
1,1-Dichloroethene	0.5	ug/L	14			<0.5			
1,2,4-Trichlorobenzene	0.5	ug/L				<0.5			
1,2-Dibromoethane	0.2	ug/L				<0.2			
1,2-Dichlorobenzene	0.4	ug/L	200			<0.4			
1,2-Dichloroethane	0.2	ug/L	5			<0.2			
1,2-dichloroethene, cis + trans^	0.5	ug/L				<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-Dichloropropene, cis + trans	0.5	ug/L				<0.5			
1,4-Dichlorobenzene	0.4	ug/L	5			<0.4			
Acetone	5	ug/L				<5			
Benzene	0.5	ug/L	1			<0.5			
Bromodichloromethane	0.3	ug/L				<0.3			
Bromoform	0.4	ug/L				<0.4			
Bromomethane	0.5	ug/L				<0.5			
Carbon tetrachloride	0.2	ug/L	2			<0.2			
Chloroethane	0.5	ug/L				<0.5			
Chloroform	0.5	ug/L				<0.5			
Chloromethane	0.2	ug/L				<0.2			
cis-1,2-Dichloroethene	0.4	ug/L				<0.4			
cis-1,3-Dichloropropene	0.5	ug/L				<0.5			
Dibromochloromethane	0.3	ug/L				<0.3			
Dichlorodifluoromethane	0.5	ug/L				<0.5			
Dichloromethane	4	ug/L	50			<4			
Diethyl ether	5	ug/L				<5			
Ethylbenzene	0.5	ug/L	140			<0.5			
Hexane	5	ug/L				<5			
m/p-Xylene	0.4	ug/L				<0.4			
Methyl butyl ketone (MBK)	5	ug/L				<5			
Methyl ethyl ketone (MEK)	2	ug/L				<2			
Methyl isobutyl ketone (MIBK)	5	ug/L				<5			
Methyl tert-butyl ether (MTBE)	2	ug/L				<2			
Monochlorobenzene	0.5	ug/L	80			<0.5			
o-Xylene	0.4	ug/L				<0.4			
Styrene	0.5	ug/L				<0.5			
Tetrachloroethylene (PCE)	0.3	ug/L	10			<0.3			
Toluene	0.4	ug/L	60			<0.4			
trans-1,2-dichloroethene	0.4	ug/L				<0.4			
trans-1,3-dichloropropene	0.5	ug/L				<0.5			

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

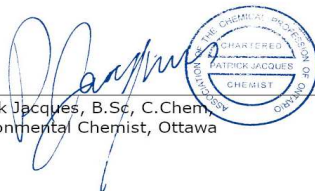
Client : Paterson Group
Project : PH5125

Reception Date: 2025-09-26

			Eurofins Sample No :		9065527				
			Matrix :		Groundwater				
			Sampling Date :		2025-09-25				
			Client Sample Identification :		TW1 - GW2				
Volatile Organic Compounds	RL	Unit	Criteria						
			A	B	C				
Trichloroethylene (TCE)	0.3	ug/L	5			<0.3			
Trichlorofluoromethane	0.5	ug/L				<0.5			
Vinyl chloride	0.2	ug/L	1			<0.2			
Xylene (Total)	0.5	ug/L	90			<0.5			
1,2-dichloroethane-d4 (surrogate)	0	%				85			
4-bromofluorobenzene (surrogate)	0	%				96			
Toluene-d8 (surrogate)	0	%				103			

Approved by :

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



Approved by :

Jason Kennedy,
Project Manager



OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PH5125

Reception Date: 2025-09-26

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Alkalinity (Water, Automated)									
<i>Method : Alkalinity (water, titration to pH 4.5, automated). Internal method: OTT-I-AT-WI45398.</i>									
Alkalinity (as CaCO ₃)	mg/L	5	<5	98	95-105				-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-30 Analysis Date: 2025-10-01	
Ammonia, Total (Water, Colorimetry)									
<i>Method : Ammonia (Water, Colorimetry). Internal method: OTT-I-NUT-WI46201.</i>									
Ammonia (Total, as Nitrogen)	mg/L	0.02	<0.020	113	80-120		-		-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-29 Analysis Date: 2025-09-29	
Chloride (Water, IC)									
<i>Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.</i>									
Chloride	mg/L	0.5	<0.5	102	80-120		-		-
Associated Samples : 9065526								Prep Date: 2025-09-29 Analysis Date: 2025-09-30	
<i>Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.</i>									
Chloride	mg/L	0.5	<0.5	102	80-120		-		-
Associated Samples : 9065527								Prep Date: 2025-09-29 Analysis Date: 2025-09-30	
Colour, Apparent (Water, Spectrophotometry)									
<i>Method : Colour (Water, Spectrophotometric). Internal method: OTT-I-SPEC-WI45980.</i>									
Colour (Apparent)	TCU	2	<2	98	78-116				-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-30 Analysis Date: 2025-10-01	
Colour, True (Water, Spectrophotometry)									
<i>Method : Colour (Water, Spectrophotometric). Internal method: OTT-I-SPEC-WI45980.</i>									
Colour (True)	TCU	2	<2	98	78-116				-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-30 Analysis Date: 2025-10-01	
Conductivity (Water, Automated)									
<i>Method : Conductivity (Water, Autotitrator). Internal Method: OTT-I-AT-WI45398.</i>									
Conductivity @ 25°C	uS/cm	5	<5	99	98-102				-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-30 Analysis Date: 2025-10-01	
DOC (Water, IR)									
<i>Method : Organic carbon (water, IR, combustion). Internal method: OTT-I-DEM-WI46148.</i>									
Dissolved Organic Carbon	mg/L	0.5	<0.5	95	88-112		-		-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-29 Analysis Date: 2025-09-30	
Escherichia coli (DC Plate)									
<i>Method : Total Coliforms and E.Coli by MF (Water, DC plate). Internal method: OTT-M-BAC-WI45296.</i>									
Escherichia coli (DC)	CFU/100mL	0	0						-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-26 Analysis Date: 2025-09-27	
Fluoride (Water, Auto/ISE)									
<i>Method : Fluoride by autotitrator, ion selective electrode. Internal method: OTT-I-AT-WI45398.</i>									
Fluoride	mg/L	0.1	<0.10	99	90-110				-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-30 Analysis Date: 2025-10-01	

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PH5125

Reception Date: 2025-09-26

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Metals Scan (Water, ICP/MS)									
<i>Method : Metals (Water, ICP/MS). Internal method: AMMTFQE1.</i>									
Aluminum	mg/L	0.01	<0.01	100	80-120		-		-
Antimony	mg/L	0.0005	<0.0005	86	80-120		-		-
Arsenic	mg/L	0.001	<0.001	100	80-120		-		-
Barium	mg/L	0.001	<0.001	100	80-120		-		-
Beryllium	mg/L	0.0005	<0.0005	102	80-120		-		-
Bismuth	mg/L	0.002	<0.002	90	80-120		-		-
Boron	mg/L	0.01	<0.01	100	80-120		-		-
Cadmium	mg/L	0.0001	<0.0001	107	80-120		-		-
Chromium	mg/L	0.001	<0.001	110	80-120		-		-
Cobalt	mg/L	0.0002	<0.0002	111	80-120		-		-
Copper	mg/L	0.001	<0.001	110	80-120		-		-
Iron	mg/L	0.03	<0.03	100	80-120		-		-
Lead	mg/L	0.001	<0.001	110	80-120		-		-
Lithium	mg/L	0.001	<0.001	100	80-120		-		-
Manganese	mg/L	0.01	<0.01	100	80-120		-		-
Mercury	mg/L	0.0001	<0.0001	99	80-120		-		-
Molybdenum	mg/L	0.005	<0.005	100	80-120		-		-
Nickel	mg/L	0.005	<0.005	110	80-120		-		-
Phosphorus	mg/L	0.002	<0.002	101	80-120		-		-
Selenium	mg/L	0.001	<0.001	100	80-120		-		-
Silicon	mg/L	0.1	<0.1	100	80-120		-		-
Silver	mg/L	0.0001	<0.0001	86	80-120		-		-
Strontium	mg/L	0.001	<0.001	100	80-120		-		-
Tellurium	mg/L	0.001	<0.001	100	80-120		-		-
Thallium	mg/L	0.0001	<0.0001	109	80-120		-		-
Tin	mg/L	0.001	<0.001	100	80-120		-		-
Titanium	mg/L	0.01	<0.01	100	80-120		-		-
Tungsten	mg/L	0.002	<0.002	100	80-120		-		-
Uranium	mg/L	0.001	<0.001	100	80-120		-		-
Vanadium	mg/L	0.001	<0.001	100	80-120		-		-
Zinc	mg/L	0.01	<0.01	110	80-120		-		-
Zirconium	mg/L	0.001	<0.001	90	80-120		-		-

Associated Samples : 9065526, 9065527

Prep Date: 2025-09-29
Analysis Date: 2025-09-30

Metals Scan (Water, ICP/OES)

Method : Metals (Water, ICP/OES). Internal method: OTT-I-MET-WI48491.

Calcium	mg/L	1	<1	101	86-115		-		-
Magnesium	mg/L	1	<1	98	91-109		-		-
Potassium	mg/L	1	<1	100	87-113		-		-
Sodium	mg/L	1	<1	102	85-115		-		-

Associated Samples : 9065526, 9065527

Prep Date: 2025-10-02
Analysis Date: 2025-09-26

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PH5125

Reception Date: 2025-09-26

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Nitrate (Water, IC)									
<i>Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.</i>									
Nitrate (as Nitrogen)	mg/L	0.1	<0.1	106	80-120		-		-
Associated Samples : 9065526								Prep Date: 2025-09-29 Analysis Date: 2025-09-30	
<i>Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.</i>									
Nitrate (as Nitrogen)	mg/L	0.1	<0.1	106	80-120		-		-
Associated Samples : 9065527								Prep Date: 2025-09-29 Analysis Date: 2025-09-30	
Nitrite (Water, IC)									
<i>Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.</i>									
Nitrite (as Nitrogen)	mg/L	0.1	<0.1	106	80-120		-		-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-29 Analysis Date: 2025-09-30	
pH (25°C) (Water, Automated)									
<i>Method : pH (Water, Automated Meter). Internal method: OTT-I-AT-WI45398.</i>									
pH @ 25°C		1	7.36	100	97-103				-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-30 Analysis Date: 2025-10-01	
Phenols (Water, Colorimetry)									
<i>Method : Phenols (Water, Colorimetry). Internal method: OTT-I-4AAP-WI46150.</i>									
Phenols-4AAP	mg/L	0.001	<0.001	109	75-125		-		-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-29 Analysis Date: 2025-09-29	
Sulphate (Water, IC)									
<i>Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.</i>									
Sulphate	mg/L	1	<1	105	90-110		-		-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-29 Analysis Date: 2025-09-30	
Sulphide (Water, Colorimetry)									
<i>Method : Sulphide, S2- (Water, Colorimetry). Internal method: OTT-I-SPEC-WI45931.</i>									
Sulphide (S2-)	mg/L	0.01	<0.01	80	80-120				-
Associated Samples : 9065526, 9065527								Prep Date: 2025-10-02 Analysis Date: 2025-10-02	
Tannin and Lignin (Water, Spec)									
<i>Method : Tannin and Lignin (Water, Spec), Internal method: OTT-I-SPEC-WI57693.</i>									
Tannin and Lignin	mg/L	0.1	<0.1	100	80-120				-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-30 Analysis Date: 2025-09-30	
Total Coliforms (DC Plate)									
<i>Method : Total Coliforms and E.Coli by MF (Water, DC plate). Internal method: OTT-M-BAC-WI45296.</i>									
Total Coliforms (DC)	CFU/100mL	0	0						-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-26 Analysis Date: 2025-09-27	
Total Kjeldahl Nitrogen (Water, Colorimetry)									
<i>Method : TKN (Water, colorimetry). Internal method: OTT-I-NUT-WI46201.</i>									
Total Kjeldahl Nitrogen	mg/L	0.1	<0.100	99	70-130		-		-
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-29 Analysis Date: 2025-09-29	

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
 Project : PH5125

Reception Date: 2025-09-26

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Turbidity (Water, Turbidimeter)									
<i>Method : Turbidity (Water, Turbidimeter). Internal method: OTT-I-TUR-WI46288.</i>									
Turbidity	NTU	0.1	<0.1	114	80-120				
Associated Samples : 9065526, 9065527								Prep Date: 2025-09-26 Analysis Date: 2025-09-30	

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PH5125

Reception Date: 2025-09-26

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
VOCs (Water, GC/MS)									
<i>Method : Volatile Organic Compounds (Water, GC/MS). Internal method: AMVOMSE8.</i>									
1,1,1,2-Tetrachloroethane	ug/L	0.5	<0.5	119	70-130		-		-
1,1,1-Trichloroethane	ug/L	0.4	<0.4	123	70-130		-		-
1,1,2,2-Tetrachloroethane	ug/L	0.5	<0.5	130	70-130		-		-
1,1,2-Trichloroethane	ug/L	0.4	<0.4	115	70-130		-		-
1,1-Dichloroethane	ug/L	0.4	<0.4	105	70-130		-		-
1,1-Dichloroethene	ug/L	0.5	<0.5	89	70-130		-		-
1,2,4-Trichlorobenzene	ug/L	0.5	<0.5				-		-
1,2-Dibromoethane	ug/L	0.2	<0.2	94	70-130		-		-
1,2-Dichlorobenzene	ug/L	0.4	<0.4	85	70-130		-		-
1,2-Dichloroethane	ug/L	0.2	<0.2	89	70-130		-		-
1,2-dichloroethene, cis + trans ^A	ug/L	0.5	<0.5				-		-
1,2-Dichloropropane	ug/L	0.5	<0.5	116	70-130		-		-
1,3,5-Trimethylbenzene	ug/L	0.3	<0.3	121	70-130		-		-
1,3-Dichlorobenzene	ug/L	0.4	<0.4	82	70-130		-		-
1,3-Dichloropropene, cis + trans	ug/L	0.5	<0.5				-		-
1,4-Dichlorobenzene	ug/L	0.4	<0.4	115	70-130		-		-
Acetone	ug/L	5	<5	130	70-130		-		-
Benzene	ug/L	0.5	<0.5	120	70-130		-		-
Bromodichloromethane	ug/L	0.3	<0.3	118	70-130		-		-
Bromoform	ug/L	0.4	<0.4	105	70-130		-		-
Bromomethane	ug/L	0.5	<0.5	79	70-130		-		-
Carbon tetrachloride	ug/L	0.2	<0.2	91	70-130		-		-
Chloroethane	ug/L	0.5	<0.5	94	70-130		-		-
Chloroform	ug/L	0.5	<0.5	86	70-130		-		-
Chloromethane	ug/L	0.2	<0.2	123	70-130		-		-
cis-1,2-Dichloroethene	ug/L	0.4	<0.4	109	70-130		-		-
cis-1,3-Dichloropropene	ug/L	0.5	<0.5	117	70-130		-		-
Dibromochloromethane	ug/L	0.3	<0.3	121	70-130		-		-
Dichlorodifluoromethane	ug/L	0.5	<0.5	102	70-130		-		-
Dichloromethane	ug/L	4	<4	130	70-130		-		-
Diethyl ether	ug/L	5	<5	89	70-130		-		-
Ethylbenzene	ug/L	0.5	<0.5	91	70-130		-		-
Hexane	ug/L	5	<5	130	70-130		-		-
m/p-Xylene	ug/L	0.4	<0.4	99	70-130		-		-
Methyl butyl ketone (MBK)	ug/L	5	<5	122	70-130		-		-
Methyl ethyl ketone (MEK)	ug/L	2	<2	76	70-130		-		-
Methyl isobutyl ketone (MIBK)	ug/L	5	<5	96	70-130		-		-
Methyl tert-butyl ether (MTBE)	ug/L	2	<2	121	70-130		-		-
Monochlorobenzene	ug/L	0.5	<0.5	112	70-130		-		-
o-Xylene	ug/L	0.4	<0.4	121	70-130		-		-
Styrene	ug/L	0.5	<0.5	98	70-130		-		-
Tetrachloroethylene (PCE)	ug/L	0.3	<0.3	130	70-130		-		-
Toluene	ug/L	0.4	<0.4	89	70-130		-		-
trans-1,2-dichloroethene	ug/L	0.4	<0.4	89	70-130		-		-
trans-1,3-dichloropropene	ug/L	0.5	<0.5	99	70-130		-		-
Trichloroethylene (TCE)	ug/L	0.3	<0.3	102	70-130		-		-
Trichlorofluoromethane	ug/L	0.5	<0.5	113	70-130		-		-

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
 Project : PH5125

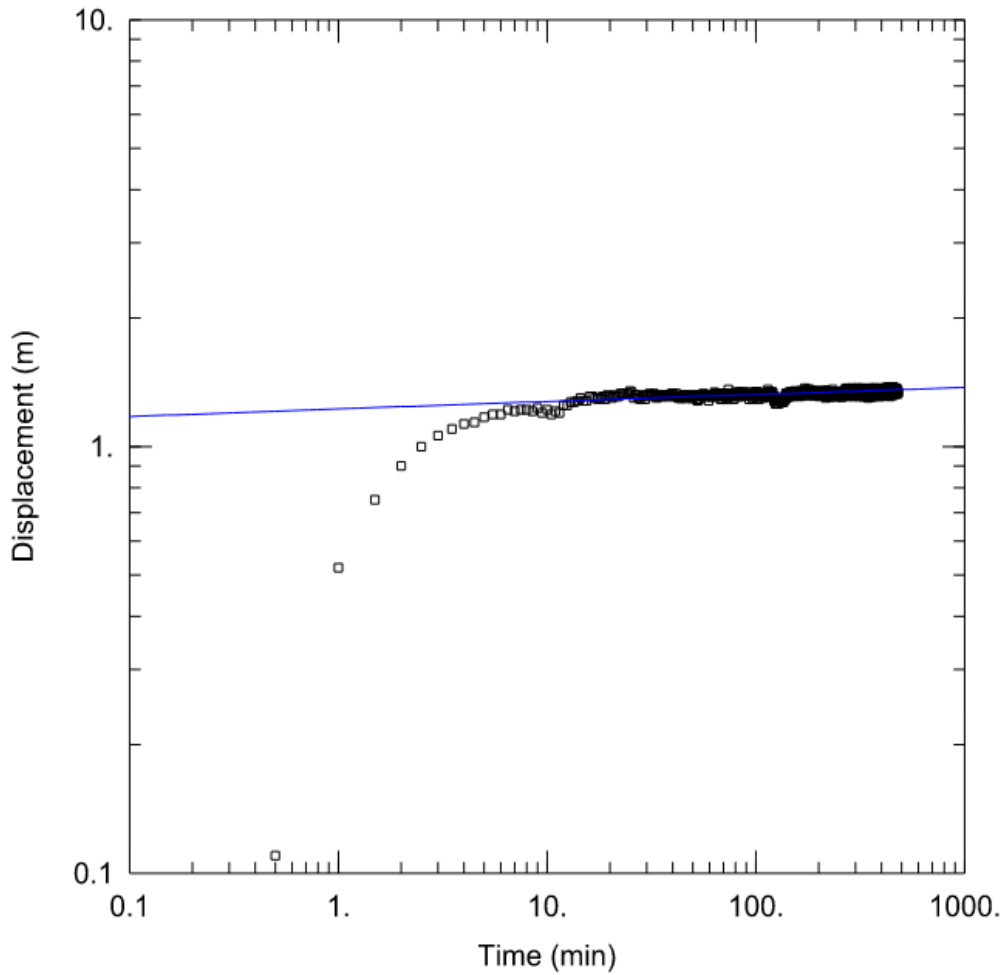
Reception Date: 2025-09-26

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
VOCs (Water, GC/MS)									
<i>Method : Volatile Organic Compounds (Water, GC/MS). Internal method: AMVOMSE8.</i>									
Vinyl chloride	ug/L	0.2	<0.2	121	70-130		-		-
Xylene (Total)	ug/L	0.5	<0.5				-		-
Associated Samples : 9065527								Prep Date: 2025-09-30 Analysis Date: 2025-10-01	

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

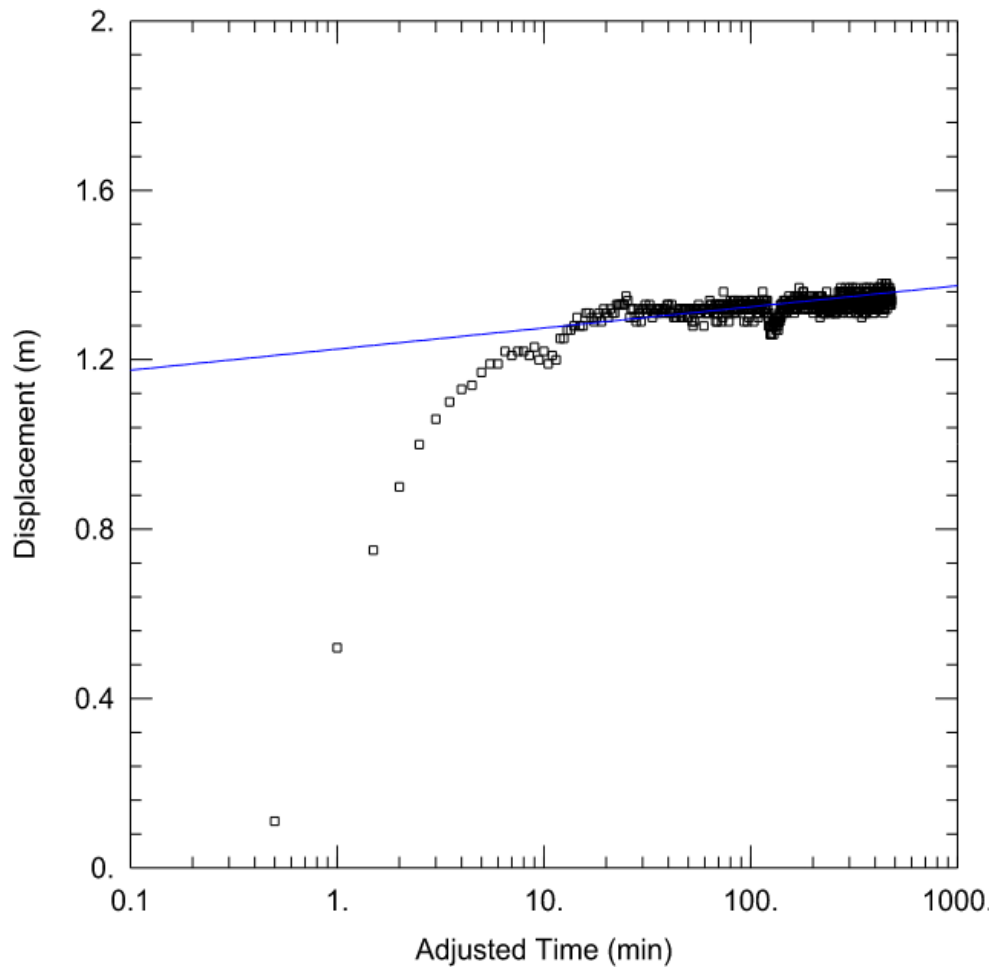
Pumping Test Analysis Report

File No.	PH5125	Well ID:	TW1
Date:	September 25, 2025	Solution Method:	Theis
Client:	Hidden Pond Winery	Transmissivity (m ² /day):	105.8
Site Address:	4011 Vaughan Side Road	Discharge Rate (L/min)	20
Project:	Site Plan Control	Analysis performed by:	AS



Pumping Test Analysis Report

File No.	PH5125	Well ID:	TW1
Date:	September 25, 2025	Solution Method:	Cooper-Jacob
Client:	Hidden Pond Winery	Transmissivity (m ² /day):	105.8
Site Address:	4011 Vaughan Side Road	Discharge Rate (L/min)	20
Project:	Site Plan Control	Analysis performed by:	AS



Pumping Test Analysis Report

File No. PH5125
Date: September 25, 2025
Client: Hidden Pond Winery
Site Address: 4011 Vaughan Side Road
Project: Site Plan Control

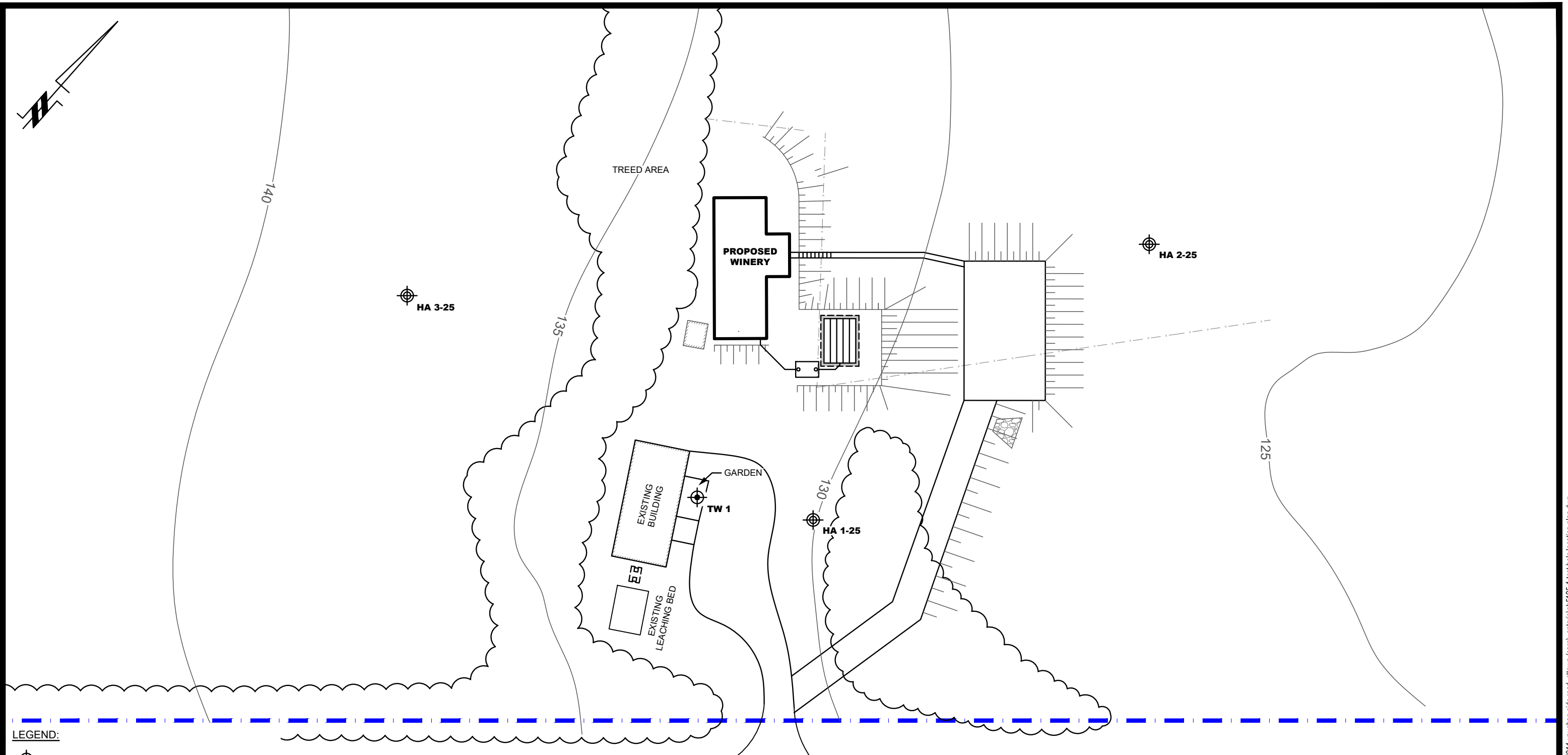
Summary Table:		
Solution Method:	Well ID:	Transmissivity (m ² /day):
Theis	TW1	105.8
Cooper-Jacob	TW1	105.8
Average:		105.80

PREDICTIVE NITRATE IMPACT ASSESSEMENT




Infiltration Factors		
Topography	0.10	
Soil	0.40	
Cover	0.10	
Total	0.60	
Site Characteristics		
Area of Site :	164100	m ²
Total of roof areas:	365	m ²
Total area of paved driveway areas:	1000	m ²
Roof + paved driveway areas	1365	m ²
Impervious Area	1365	m ²
Percent Impervious Area =	1	%
Infiltration Area =	162735	m ²
Septic Effluent		
Concentration of Effluent (Cs) =	40	mg/L
Daily Sewage Flow (Qs)=	4.06	m ³
See Notes below.		
Infiltration Calculation		
Nitrate concentration in precipitation (C _i) =	0	mg/L
Surplus Water (Environment Canada)	378	mm/yr
Factored Water Surplus =	227	mm/yr
Infiltration % due to stormwater management measures	-	%
Infiltration rate from stormwater management measures =	0	mm/yr
Infiltration Flow Entering the System (Q _i) =	101	m ³ /day
Mass Balance Model (MOEE, 1995)		
$C_T = (Q_b C_b + Q_e C_e + Q_i C_i) / (Q_b + Q_e + Q_i)$ = Cumulative Nitrate Concentration		
Q _b = flow entering the system across the upgradient area	0	m ³ /day
C _b = background nitrate concentration	0	mg/L
Q _e = flow entering the system from the septic drainfield	4.06	m ³ /day
C _e = concentration of nitrates in the septic effluent	40	mg/L
Q _i = flow entering the system from infiltration	101	m ³ /day
C _i = Concentration of nitrates in the infiltrate	0	mg/L
C_T =	1.54	mg/L
<i>Notes: Site characteristic values were measured as approximate values from the available site plan. Daily Sewage Flow volume was calculated by Paterson Group as a preliminary design flow.</i>		

MW1 inputs			
pH	7.68	A	0.16
TDS	424	B	2.37
Calcium	89	C	1.95
Alkalinity	243	D	2.39
Temp.	10.5		
		pHs =	7.50


Langelier Saturation Index (LSI) Calculation		(Langelier, 1936)
LSI = pH - pHs	A = (Log10 [TDS] - 1) / 10	
pHs = (9.3 + A + B) - (C + D)	B = -13.12 x Log10 (oC + 273) + 34.55	
Where:	C = Log10 [Ca2+ as CaCO3] - 0.4	
	D = Log10 [alkalinity as CaCO3]	
	LSI =	0.2
LSI	Effect	
0.5 to 2	Water is super saturated and tends to precipitate a scale layer of calcium carbonate (scale forming but non-corrosive)	
0 to 0.5	Water is super saturated and tends to precipitate a scale layer of calcium carbonate (slightly scale forming and corrosive).	
0	Water is saturated (in equilibrium) with calcium carbonate. A scale layer of calcium carbonate is neither precipitated nor dissolved.	
0 to -0.5	Water is under saturated and tends to dissolve solid calcium carbonate (slightly corrosive but non-scale forming).	
-0.5 to -2	Water is under saturated and tends to dissolve solid calcium carbonate (seriously corrosive).	



LEGEND:

-  TEST WELL LOCATION
-  HAND AUGER HOLE LOCATION
-  CONTOURS (m)

SCALE: 1:600



VAUGHAN SIDE ROAD



PATERSON GROUP
 9 AURIGA DRIVE
 OTTAWA, ON
 K2E 7T9
 TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

**HIDDEN POND WINERY
 SITE PLAN CONTROL APPLICATION
 PROPOSED COMMERCIAL DEVELOPMENT
 4011 VAUGHAN SIDE ROAD**

OTTAWA (CARP), ONTARIO

Title: **TEST HOLE LOCATION PLAN**

Scale:	1:600	Date:	10/2025
Drawn by:	GK	Report No.:	PH5125-LET.01
Checked by:	AS	Dwg. No.:	PH5125-1
Approved by:	EA	Revision No.:	