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REPORT ON

**HYDROGEOLOGICAL AND TERRAIN STUDY
STUDY
CHANGE OF USE
3250 OLD GEORGE STREET
OSGOODE WARD
CITY OF OTTAWA, ONTARIO**

Submitted to:

Suzanne Sinclair
3250 Old George Street
Ottawa, Ontario
K0A 2W0

DATE November 15, 2018

DISTRIBUTION

4 copies Suzanne Sinclair
1 copy Kollaard Associates Inc.

180472



November 15, 2018

180472

Suzanne Sinclair
3250 Old George Street
Ottawa, Ontario
K0A 2W0

RE: HYDROGEOLOGICAL AND TERRAIN STUDY
CHANGE OF USE
3250 OLD GEORGE STREET
OSGOODE WARD
CITY OF OTTAWA, ONTARIO

Kollaard Associates Inc. was retained by Suzanne Sinclair to undertake a hydrogeological and terrain study for a proposed change of use for an existing building located at 3250 Old George Street in the Village of Osgoode, Ontario (Key Plan, Figure 1).

It is understood that the existing building was formerly used as a church (Osgoode Bible Chapel). It is proposed to change the use of the existing building to a residential use and change the zoning from institutional to residential.

The property occupies an area of about 918 square metres (0.23 acres). The proposed use is for a three bedroom single family dwelling. A drilled well was constructed to service the proposed dwelling and to replace a previous sand point well which has been appropriately abandoned. It is understood that a new sewage system is to be constructed to service the dwelling. The attached Proposed Septic Design Plan, prepared by Kollaard Associates Inc., indicates the approximate location of the existing dwelling, existing well and sewage system and the proposed replacement sewage system location.

Kollaard Associates Inc. carried out a six hour pumping test on the existing well at the site and obtained two water samples that were tested for the subdivision list of parameters to confirm that there was sufficient water of acceptable quality to service the residential dwelling. Kollaard Associates Inc. put down two test pits in the area of the proposed sewage system to establish soil conditions with consideration for sewage system design and the potential for sewage system impacts.

This report consists of an evaluation of the water quality and quantity of the existing well at the subject site, and an assessment of the sewage system impact, to ensure that the water quality and quantity of the existing well is acceptable using the following guidelines; Ministry of the Environment, Conservation and Parks (MECP) Guideline D-5-5 and the Ontario Drinking Water Standards, Objectives and Guidelines (ODWSOG). Consideration has also been given to the groundwater impact assessment guidelines under MECP D-5-4.



HYDROGEOLOGICAL STUDY

Background

The *Township of Osgoode Well Construction Requirements*, Trow Associates, 1997, indicates minimum well construction requirements for wells within the Osgoode Ward of the City of Ottawa and is still applicable to date for wells. The requirements indicate that where there is at least 10 feet of overburden, a drilled well shall be cased and grouted using neat cement for at least 20 feet from surface or 5 feet into bedrock, whichever is greater.

A bedrock geology map for the site area indicates the bedrock at the site consists of dolomite and limestone of the Oxford Formation.

The surficial geology map indicates that Champlain sea sediments consisting of nearshore deposits of fine- to medium- grained sand.

Two test pits were put down at the site on June 28, 2018. The approximate locations of the test pits are shown on the attached site plan. The test pits encountered topsoil overlying red brown to grey sand. Water intrusion was observed at between 1.4 to 1.5 metres below existing ground surface. The test pits were terminated within the sand layer at depths of 1.5 to 1.6 metres below existing ground surface. The test pit logs are provided as Table 2.

A well record for the drilled bedrock well that was constructed to service the proposed dwelling at 3250 Old George Road and the Certificate of Well Compliance are provided herein (Attachment A). The well record indicates that the well was drilled in 1988 by Air Rock Drilling Co. Ltd. of Richmond, Ontario. The well was drilled to a depth of about 67 metres into a limestone and sandstone bedrock aquifer. The overburden indicated to consist of about 1.8 metres of silty clay overlying some 11.9 metres of sand and gravel. Bedrock was encountered at a depth of 13.7 metres below existing ground surface. The well was cased and grouted to a depth of 15.2 metres below existing ground surface. The well construction complies with the Township of Osgoode requirements.

Area Well Records

A review of five area well records was carried out. Four of the wells were indicated to be between about 27 to 49 metres in depth, obtaining water from a limestone aquifer. One well is indicated to be drilled to a depth of 61 metres, obtaining water from the limestone and underlying sandstone aquifer. Test pumping rates indicated on the well records were between 8 to 20 igpm (36 to 91 litres/minute) and well production rates were typically 5 to 20 igpm (23 to 91 litres/minute).

Water Quantity

A pumping test was carried out on June 21, 2018, at the recently constructed well on the subject site that will service the proposed dwelling at 3250 Old George Street (TW1).

The testing consisted of a 6 hour duration pumping test. During the pumping test, manual water level measurements were made on a regular basis to monitor the drawdown of the water level in the well in response to pumping and water levels were monitored at one minute intervals using a pressure transducer. Groundwater samples were collected from the well after three and six hours to characterize groundwater quality. Hourly field water quality readings were recorded for the water temperature, pH, total dissolved solids (conductivity) and turbidity. Chlorine residuals were



measured prior to obtaining water samples for lab submission and free chlorine was measured to be zero. After the pump was shut off, the recovery of the water level in the well was measured until 95% recovery of static water level had been achieved or for 24 hours, whichever was less.

Water was pumped from the well for about 360 minutes at a pumping rate of about 33.8 litres per minute. Over the course of the pumping test, the water level in the well dropped some 7.2 metres. At the end of pumping, over 98 percent recovery of the total drawdown in the static water level created during pumping was measured manually after about 20 minutes.

The pumping test drawdown and recovery data and plots for TW1 are provided as Attachment B. The drawdown and recovery data provided were measured with reference to the top of the well casing at the test well location.

The pumping test data for the test well was analyzed using the method of Cooper and Jacob (1946). Although the assumptions on which these equations are based are not strictly met, this method provides a reasonable estimate of the aquifer transmissivity.

Transmissivity was calculated using the following relationship:

$$T = \frac{2.3Q}{4\pi ds}$$

where Q is the pump rate, m³/day
 ds is the change in drawdown over one time log cycle, m
 T is the transmissivity, m²/day

Based on the pumping test drawdown data, the transmissivity of the aquifer is estimated to be about 25 m²/day. Based on the recovery data the transmissivity of the aquifer is estimated to be about 18 m²/day.

Based on the data obtained during the six hour pumping test, it can be concluded that the well is capable of sustaining a short term yield of at least 33.8 litres per minute (7.4 lpm). During the course of the six hour pumping period less than 20 percent of the available drawdown in the test well was utilized.

The expected water demand for the site was calculated using the total expected residential occupancy. It is understood that the proposed dwelling at the site will contain three bedrooms (obtained from Sewage Design information). THE MECP indicates that the number of occupants is the number of bedrooms plus one, in this case four occupants. The peak water demand (obtained from MECP D-5-5) is usually taken as 3.75 litres/person/minute, which is 15 litres/minute. This peak demand rate is assumed to occur for a period of two hours each day. The pump rate used for the test was well above the minimum test rate for a three bedroom home.

It is considered that sufficient available drawdown exists at the well for sustained pumping at 33.8 litres per minute without causing excessive drawdown at the well.

Water Quality

To determine the water quality of the groundwater supply, groundwater samples were obtained from the well after three and six hours during the pumping test and prepared/preserved in the field using appropriate techniques and submitted to Eurofins Environmental Testing in Ottawa, Ontario, for the



chemical, physical and bacteriological analyses listed in the Ministry of the Environment (MECP) guideline entitled Procedure D-5-5, Technical Guideline for Private Wells: Water Supply Assessment, August 1996. The results of the chemical, physical and bacteriological analyses of the water samples obtained from the test well are provided in Attachment C. A summary of the water quality measured in the field are provided as Table I, Water Quality Measurements for Test Well.

The water quality as determined from the results of the analyses is favourable. The water meets all the Ontario Drinking Water Standards, Objectives and Guidelines (ODWSOG) health and aesthetic parameters tested for at the test well except for hardness, iron and turbidity. Total dissolved solids were elevated after the three hour sample but were within the aesthetic objective of the ODWSOG after six hours.

The water is considered to be hard by water treatment standards. Water with hardness above 80 to 100 milligrams per litre as CaCO_3 is often softened for domestic use. The hardness at the well is 289 milligrams per litre. Water softening by conventional sodium ion exchange may introduce relatively high concentrations of sodium into the drinking water, which may contribute a significant percentage to the daily sodium intake for a consumer on a sodium restricted diet. Where ion exchange water softeners are used, a separate unsoftened water supply could be used for drinking and culinary purposes.

The iron level Iron was measured at levels of 0.34 to 0.38 mg/l, compared to the aesthetic objective of 0.3 mg/l. Manganese was present at levels of between 0.02 to 0.03 mg/l in the water samples compared to the aesthetic limit of 0.05 mg/l. Excessive iron and manganese levels may cause brown or black discolouration of laundry and fixtures, affect the taste and colour of water, and iron precipitation in pipes and hot water tank can also promote the growth of iron bacteria. Iron and manganese can be effectively removed using conventional ion exchange water softeners.

The lab based turbidity measurements for the water samples obtained after three and six hours of pumping were 14.9 NTU and 11.0 NTU, respectively. Field turbidity was measured during the pumping test at levels of >5.0 NTU but had decreased to about 3.5 NTU by the end of the pumping test. At the start of the pumping test, the water was observed to be visibly cloudy and it cleared with pumping. The cloudiness is considered to be due to well development as the well was newly constructed at the time of the pumping test. There were no bacteria present in either of the water samples and the field turbidity was below 5 NTU, which is considered acceptable for groundwater at the point of consumption.

GROUNDWATER IMPACT ASSESSMENT

The Ministry of the Environment, Conservation and Parks (MECP) in the MOE Procedure D-5-4 provides guidelines for evaluating "the ability of the lands identified by and restricted to the development to treat sewage effluent to meet acceptable limits". The guideline requires that the representative background nitrate levels in the receiving groundwater be determined. Where background levels are greater than 10 milligrams per litre the ministry indicates development of the site should not be supported unless it can be demonstrated that existing levels of nitrates are the results of historical agricultural practices on the site. In addition, the guideline requires demonstration that the site is not obviously hydrogeologically sensitive such as karstic areas, areas of fractured bedrock exposed at the surface, areas of thin soil cover or areas of highly permeable soils.



The above noted "predictive assessment" is typically done prior to development of the lot. In this case, there is an existing development at the site (former church) which it is understood was previously serviced by a sewage system.

Based on the information from the test pits and the well record for the site, there is sufficient overburden at the site to provide natural attenuation of the sewage effluent and to support that the site is not hydrogeologically sensitive.

The MECP D-5-4 document allows a monitoring-based assessment where there is existing development nearby. Provided that the existing development has been in place for a sufficient period of time and the proposed sewage system is in a similar hydrogeological environment, the information on existing groundwater quality could be used to demonstrate the combined effect of all available attenuative processes.

The MECP D-5-4 document also states the following.

The Ministry recognises that groundwater, infiltrating precipitation and sewage effluent will not be completely mixed at the property boundary. It is also recognised that processes such as absorption, denitrification, filtration and biodegradation may attenuate contaminants as the effluent passes down through the unsaturated zone and moves into the saturated zone.

The existing lot occupies an area of about 917 square metres (0.23 acres). The existing surrounding residential lots are all of similar size ranging from 917 to 1050 square metres (0.23 acres to 0.26 acres) for adjacent lots. The site had been previously serviced by a sewage system for the former church. While no information regarding the sewage flows generated by the former church could be reviewed, the existing residential development in the area is on lot sizes that are similar to the proposed use of this site.

All of the adjacent properties are serviced with drilled bedrock wells, similar to the subject site. The wells are indicated to be in the front yards for the two adjacent properties and the subject site. The water quality from the water samples obtained from the well had no bacterial issues and the nitrates and nitrites levels were negligible ($< 0.10 \text{ mg/l N-NO}_3$). This indicates that there are no significant impacts on the water supply from the existing development in the area. The reasonable use concept considers that nitrates levels of less than 2.5 mg/l are considered to be within an acceptable amount of impact. The proposed use of this site is unlikely to increase nitrate levels in the aquifer significantly, based on the existing background levels of nitrates which are well within the reasonable use limits.

The sewage system that is proposed is in a similar location to the previous leaching bed in the rear yard of the property. Down gradient of the sewage system (to the west) is the Osgoode Link Pathway (a former rail bed). Consequently, there are no down gradient wells within at least 70 metres or more of the proposed sewage system location.

Based on the above noted information, it is considered that there is very little potential for sewage impacts from the change of use of the subject property.



We trust this letter provides sufficient information for your purposes. If you have any questions concerning this letter, please do not hesitate to contact our office.

Yours truly,

Kollaard Associates Inc.



Colleen Vermeersch, P. Eng.

Attachments:	Table 1	Summary of Hourly Field Water Quality
	Table 2	Test Pit Logs
	Figure 1	Key Plan
	Figure 2	Sewage Design Plan, prepared by Kollaard Associates Inc.
	Attachment A	TW1-Well Record and Certificate of Well Compliance for Site and Area Well Records
	Attachment B	TW1-Pumping Test Data
	Attachment C	TW1-Laboratory Water Testing Results

TABLE I
FIELD WATER QUALITY MEASUREMENTS
FOR TEST WELL

Time Since Pumping Test Started (min)	Temp. (°C)	pH	Turbidity (NTU)	Total Dissolved Solids (ppm)	Conductivity (µS)	Free chlorine (ppm)
60	10.8	8.1	-	366	732	-
120	11.0	7.8	-	363	723	-
180	11.0	7.9	>5.0	363	727	0.0
240	11.0	7.9	-	365	727	-
300	11.0	7.9	-	366	733	-
360	11.0	7.8	3.5	368	733	0.0



TABLE II

TEST PIT LOGS
3250 OLD GEORGE STREET
OSGOODE WARD
CITY OF OTTAWA, ONTARIO

TEST PIT NUMBER	DEPTH (METRES)	DESCRIPTION
TP1	0.00 – 0.25	TOPSOIL
	0.25 – 0.70	Red brown fine to medium SAND
	0.70 – 1.40	Yellow brown fine to medium SAND
	1.40 – 1.60	Grey fine to medium SAND
	1.60	End of test pit

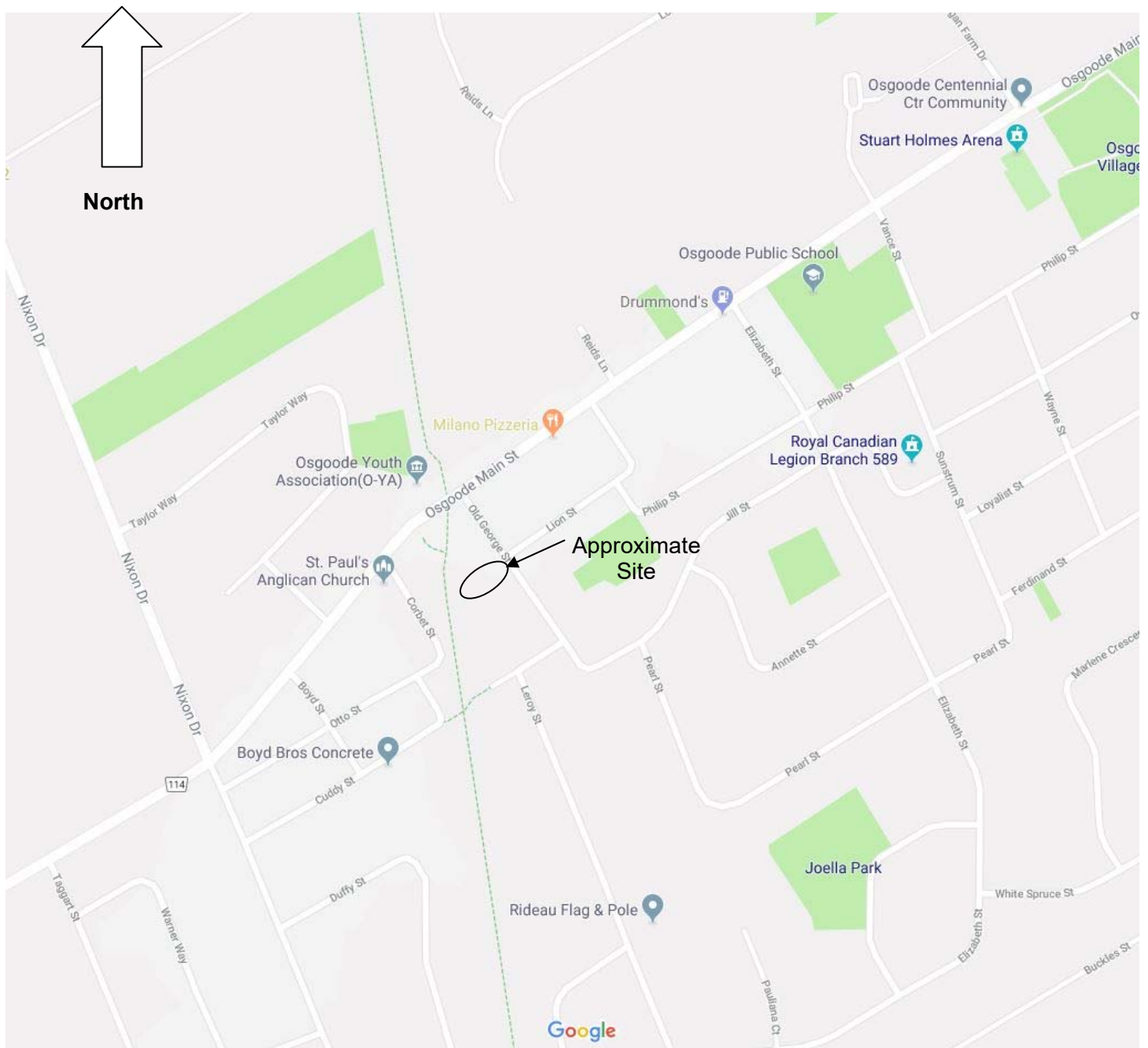
Water observed at about 1.5 metres below existing ground surface, June 28, 2018.

TP2	0.00 – 0.20	TOPSOIL
	0.20 – 1.20	Red brown fine to medium SAND
	1.20 – 1.50	Grey brown fine to medium SAND
	1.50	End of test pit

Water observed at about 1.4 metres below existing ground surface, June 28, 2018.

KEY PLAN

FIGURE 1



NOT TO SCALE



Kollaard Associates
Engineers


Project No. **180472**

Date **November 2018**

CONSTRUCTION NOTES:

1. All dimensions and elevations are in metres. Do not scale drawing.
2. This drawing is not a legal survey, a utility plan or a site plan and is for septic purposes only.
3. TBM = Top of existing drilled well, elevation = 500.00 metres (local).
4. This drawing cannot be accepted as acknowledging all of the utilities, and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
5. This drawing is not for construction until approved by the relevant authorities.
6. The sewage system envelope (leaching bed) as identified on this drawing must be maintained free of the deposit or disposal of any materials, structures, or equipment other than the material or equipment required for the construction of the leaching bed within the sewage system envelope.
7. Topsoil rootrot (organics) to be removed from bed area and exposed subgrade. No wheeled vehicles to be allowed in leaching bed area.
8. Percolation rate of any imported sand for bed to be 6 to 8 mm/cm, with < 5% passing the #200 (0.080 mm) sieve.
9. Stone layer to be washed septic stone, free of fine material, with gradation conforming to OBC Table 8.7.3.3.A.
10. The septic system leaching bed is to be graded to provide positive drainage away from the septic system and treated with 75 to 100 mm permeable topsoil and seed. Gross growth is to be established.
11. The following are not to be connected to the septic system: Water softener, swimming pool or filter system backwash; sump pump discharge.
12. Septic system to be installed in accordance with the OBC.
13. Septic tank to meet criteria described in the OBC.
14. No silty clay or clayey or silty material to be placed around or over leaching bed.
15. All changes to this design must be verified and approved by Kollaard Associates Incorporated.
16. Minimum clearance from treatment unit to:
 - * structure = 1.5m
 - * property line = 3m
 - * drilled well = 15m
17. Minimum clearance from distribution piping to:
 - * structure = 5.7m
 - * property line = 3.7m
 - * drilled well = 15.7m

REV.	NAME	DATE	DESCRIPTION



Kollaard Associates
Engineers

210 PRESCOTT STREET
PO BOX 189
KEMPVILLE ONTARIO
K0G 1J0

(613) 860-0923
FAX (613) 258-0475
www.kollaard.ca
info@kollaard.ca

CLIENT: MS. SUZANNE SINCLAIR

PROJECT: PROPOSED SEPTIC DESIGN PLAN

LOCATION: 3250 OLD GEORGE STREET
R1 PLAN 393, SUBLOT 18
LOT 28, CONC. 1,
OSGOODE,
CITY OF OTTAWA, ONTARIO

DESIGNED BY: PV	DATE: NOV 8, 2018
DRAWN BY: PV	SCALE: 1:250
KOLLAARD FILE NUMBER: 180472	

LEGEND

XXXXX+

EXISTING ELEVATIONS

XXXX

PROPOSED ELEVATIONS

■

TEST PIT LOCATION

SEPTIC BED OUTLINE

PERFORATED PVC PIPE

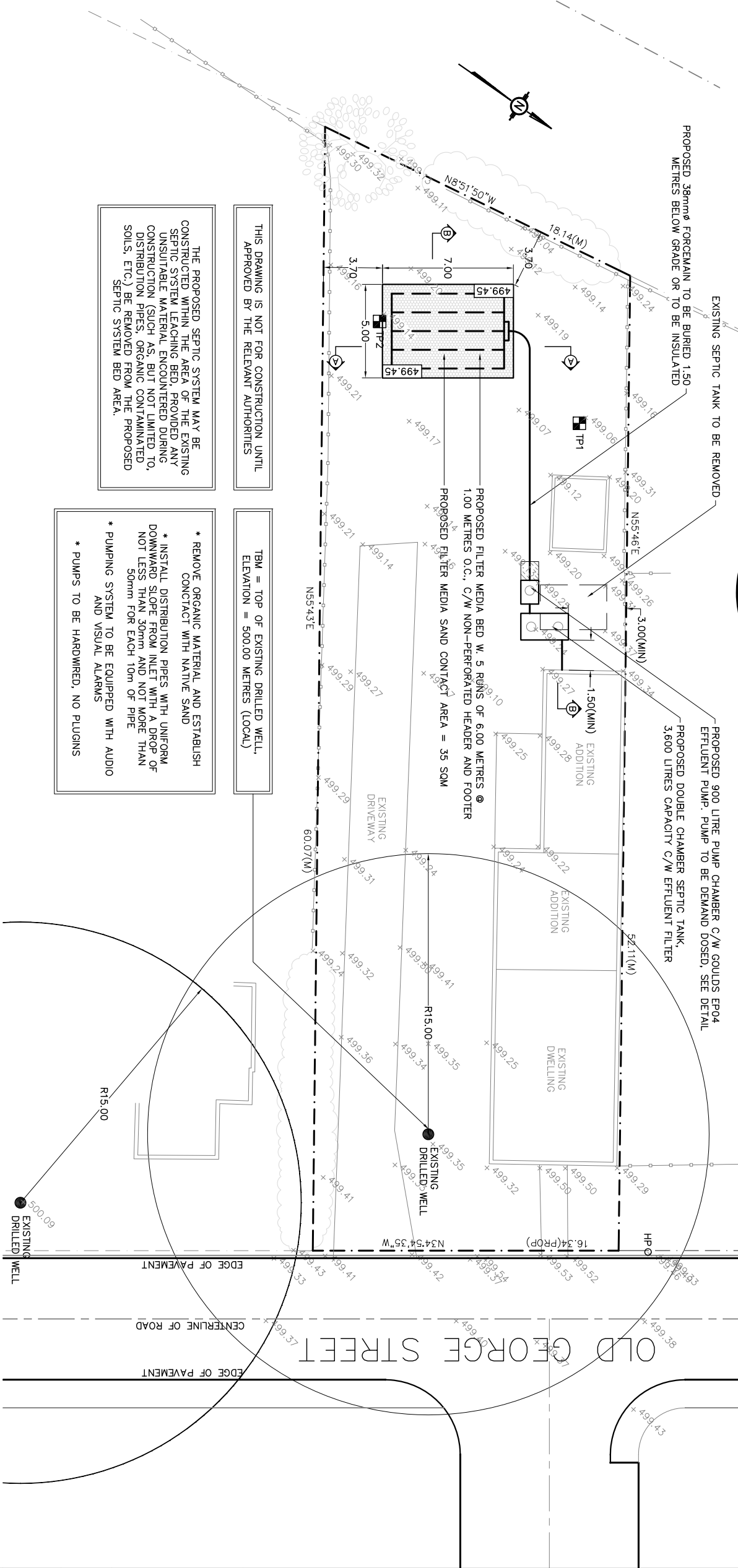
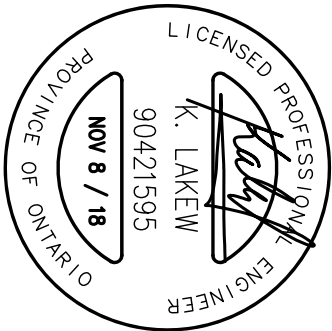
SOLID PVC PIPE

HP

HYDRO POLE

⊕

TEMPORARY BENCHMARK



THE PROPOSED SEPTIC SYSTEM MAY BE CONSTRUCTED WITHIN THE AREA OF THE EXISTING SEPTIC SYSTEM LEACHING BED, PROVIDED ANY UNSUITABLE MATERIAL ENCOUNTERED DURING CONSTRUCTION (SUCH AS, BUT NOT LIMITED TO, DISTRIBUTION PIPES, ORGANIC CONTAMINATED SOILS, ETC.) BE REMOVED FROM THE PROPOSED SEPTIC SYSTEM BED AREA.

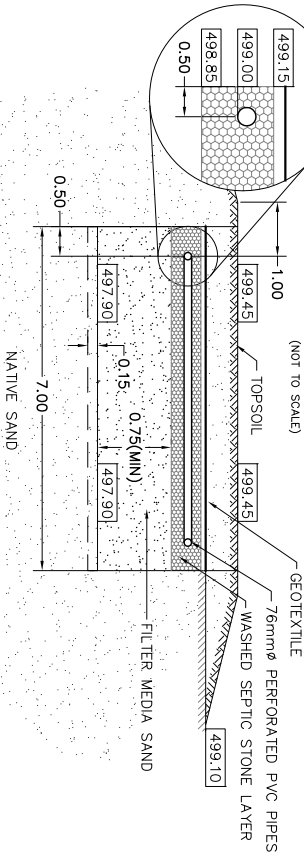
THIS DRAWING IS NOT FOR CONSTRUCTION UNTIL APPROVED BY THE RELEVANT AUTHORITIES

TBM = TOP OF EXISTING DRILLED WELL, ELEVATION = 500.00 METRES (LOCAL)

- * REMOVE ORGANIC MATERIAL AND ESTABLISH CONTACT WITH NATIVE SAND
- * INSTALL DISTRIBUTION PIPES WITH UNIFORM DOWNWARD SLOPE FROM INLET WITH A DROP OF NOT LESS THAN 30mm AND NOT MORE THAN 50mm FOR EACH 10m OF PIPE
- * PUMPING SYSTEM TO BE EQUIPPED WITH AUDIO AND VISUAL ALARMS
- * PUMPS TO BE HARDWIRED, NO PLUGS

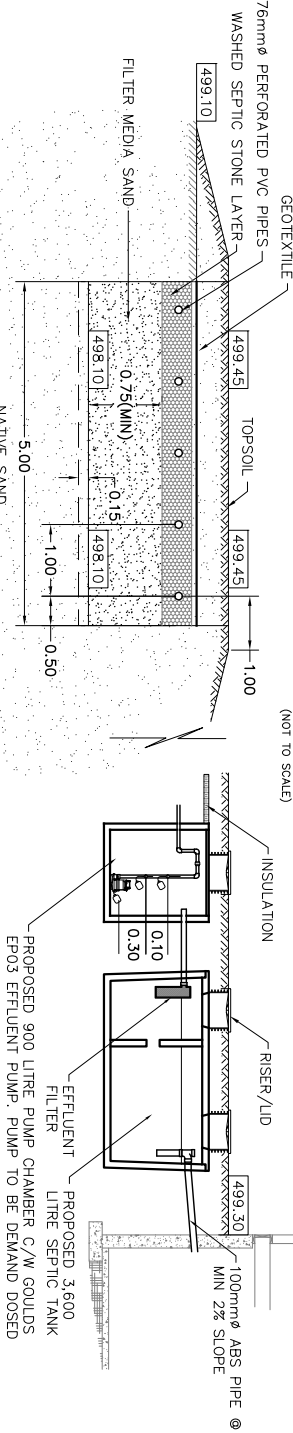
SECTION A-A

(NOT TO SCALE)



SECTION B-B

(NOT TO SCALE)





ATTACHMENT A
MOE WELL RECORD AND CERTIFICATE OF WELL COMPLIANCE
FOR TEST WELL
AND
MOE AREA WELL RECORDS



Ontario

Ministry of Environment
and Climate Change

Tag #: A 229151 (int Below)

Well Record

Measurements recorded in: ☐ Metric ☒ Imperial

A229151

Regulation 903 Ontario Water Resources Act

Page of

Well Owner's Information

First Name Last Name / Organization E-mail Address
Jamie Sinclair☐ Well Constructed
by Well OwnerMailing Address (Street Number/Name) Municipality Province Postal Code Telephone No. (inc. area code)
3250 Old George Road, Box 11 Osgoode ON K0A 2W0

Well Location

Address of Well Location (Street Number/Name) Township Lot Concession
3250 Old George Street Osgoode 24 1County/District/Municipality City/Town/Village Province Postal Code
Ottawa-Carleton Osgoode OntarioUTM Coordinates Zone Easting Northing Municipal Plan and Sublot Number Other
NAD 83 18 152018 1099011 # 393

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)
	Clay			0' 8'
	Sand & Gravel			8' 45'
	Sand & Gravel			42' 45'
Grey	Limestone			45' 151'
Grey	Sandstone			151' 153'
Grey	Sandstone			153' 201'
Grey	Sandstone			201' 220'

Annular Space			Results of Well Yield Testing	
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)	After test of well yield, water was:	Draw Down
50' 40'	Neat cement	10.9	<input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify Not tested	Time (min) Water Level (m/ft)
40' 0'	Bentonite slurry	16.8	If pumping discontinued, give reason:	Static Level 23.1" 86.5"
			Pump intake set at (m/ft)	1 35.4 1 80.6
			200	2 45.2 2 69.1
			Pumping rate (l/min / GPM)	3 51.7 3 58.7
			20	4 59.3 4 46.5
			Duration of pumping	5 71.8 5 38.7
			1 hrs + 0 min	10 82.7 10 27.3
			Final water level end of pumping (m/ft)	15 89.5 15 23.1
			96.5'	20 92.7 20 23.1
			If flowing give rate (l/min / GPM)	25 95.8 25 23.1
			Recommended pump depth (m/ft)	30 96.2 30 23.1
			140'	40 96.5 40 23.1
			Recomm. pump rate (l/min / GPM)	50 96.5 50 23.1
			20	60 96.5 60 23.1
			Well production (l/min / GPM)	
			20	
			Disinfected?	
			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

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

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	From	To
6 1/4"	Steel	.188"	+2'	50'	
6"	Open Hole		50'		220'

<input checked="" type="checkbox"/> Water Supply	<input type="checkbox"/> Replacement Well
<input type="checkbox"/> Test Hole	<input type="checkbox"/> Recharge Well
<input type="checkbox"/> Dewatering Well	<input type="checkbox"/> Observation and/or Monitoring Hole
<input type="checkbox"/> Alteration (Construction)	<input type="checkbox"/> Abandoned, Insufficient Supply
<input type="checkbox"/> Abandoned, Poor Water Quality	<input type="checkbox"/> Abandoned, other, specify
<input type="checkbox"/> Other, specify	

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

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input checked="" type="checkbox"/> Gas <input type="checkbox"/> Other, specify	Depth (m/ft)	Diameter (cm/in)
150'		0 50'	
153'		50 220'	
201'			

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)		
6138382170 Hanina, Jeremy		
Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
T3632		2018 08 30

0508E (2014/11)

Ministry's Copy

Map of Well Location			
Please provide a map below following instructions on the back.			
Osgoode Main Street			
0.1 km			
25'			
# 3250 OLD GEORGE STREET			

Comments:	
1/2 HP - 10 GPM SET @ 140 FT	

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Y 2018 M 08 D 30	7276696
Date Work Completed	Y 2018 M 08 D 30	

© Queen's Printer for Ontario, 2014



CERTIFICATE OF WELL COMPLIANCE

I, Ken Desaulniers DO HEREBY CERTIFY that I am licensed to drill wells in the Province of Ontario, and that I have supervised the drilling of a well on the property of JAMIE SINCLAIR located at # 3250 Old George Street, Osgoode Lot/Plan No.) in the City of Ottawa (Geographical Township of Osgoode).

LOT 24 CONC 1 PLAN# 393 S/L# X
CERTIFY FURTHER that, I am aware of the well drilling requirements, the guidelines, recommendations and regulations of the Ministry of the Environment governing well installations in the Province of Ontario, and the standards specified in any subdivision agreement and hydrogeological report applicable to this site and City Standards.

AND DO HEREBY CERTIFY THAT the said well has been drilled, cased, grouted (cement or bentonite) as applicable and constructed in strict conformity with the standards required.

Signed this 7th day of JUNE 2018
Kenny Desaulniers Air Rock Drilling Co. Ltd.
Well Driller/Company

The Engineer on behalf of the landowner set out above Certifies that he/she has inspected the well and it was constructed in accordance with the specifications in O.Reg.903, this report and the Hydrogeological Report with regards to casing length and grouting requirements.

Twp. of Osgoode Requirements, 1998

SIGNED this 30th day of July 2018
Chumey
Engineer



Kollaard Associates

Engineers
P.O. Box 189
210 Prescott Street, Unit 1
Kemptville, Ontario K0G 1J0

Shaping our future together
Ensemble, formons notre avenir

8243 Victoria Street
Ottawa, ON K0A 2P0

8243, rue Victoria
Ottawa, ON K0A 2P0

2018247
TAR A229151





Ministry of
the Environment

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

Tag #: A166288

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☒ Metric ☐ Imperial

Page 1 of 3

Address of Well Location (Street Number/Name) 5462, John Knox ST,				Township Osgoodes		Lot 98		Concession			
County/District/Municipality OTTAWA - City				City/Town/Village Osgoodes				Province Ontario		Postal Code K0A2W0	
UTM Coordinates NAD 83		Zone 18		Easting 452012		Northing 4998886		Municipal Plan and Sublot Number Plan No-393			

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
yellow	Sand		Soft	0	2.42
Grey	Sand	Gravel	Loose.	2.42	5.45
Grey	Gravel	SHALE	Loose.	5.45	15.15
Grey	limestone.	SHALE	Hard.	15.15	49.09

Annular Space			
Depth Set at (m/ft)	Type of Sealant Used	Volume Placed	
From	To	(Material and Type)	(m³/ft³)
0	6.06	Cement Grout	120kg.

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

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	From	To
25.40	Open Hole		0	2.42	
15.55	Steel	0.48	0.60	15.15	

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

Water Details				Hole Diameter		
Water found at Depth (m/ft)	Kind of Water:	<input type="checkbox"/> Fresh <input type="checkbox"/> Untested		Depth (m/ft)	Diameter (cm/in)	
17.57	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify	Self Per		From	To	

Well Contractor and Well Technician Information			
Business Name of Well Contractor		Well Contractor's Licence No.	
DAR-WATER-well-Drilling		6006	
Business Address (Street Number/Name)		Municipality	
1763- Route 900 west		NATION	
Province	Postal Code	Business E-mail Address	
ON	K0A3C0		
Bus.Telephone No. (inc. area code)		Name of Well Technician (Last Name, First Name)	
613 987-5598		Desnoyers Louis	
Well Technician's Licence No.		Signature of Technician and/or Contractor	
JG 25		20140602	

Results of Well Yield Testing			
After test of well yield, water was:		Draw Down	
<input checked="" type="checkbox"/> Clear and sand free		Time (min)	Water Level (m/ft)
<input type="checkbox"/> Other, specify		Static Level	
If pumping discontinued, give reason:		1	10.29
Pump intake set at (m/ft)		2	11.29
Pumping rate (l/min / GPM)		3	12.12
Duration of pumping		4	12.72
2 hrs + 00 min		5	13.27
Final water level end of pumping (m/ft)		10	14.60
If flowing give rate (l/min / GPM)		15	15.18
Recommended pump depth (m/ft)		20	15.35
30.30		25	15.52
Recommended pump rate (l/min / GPM)		30	15.59
45.00		40	15.61
Well production (l/min / GPM)		50	15.61
70.00		60	15.61
Disinfected?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			

Map of Well Location

Please provide a map below following instructions on the back.

Map showing well location relative to surrounding streets: Rue. Boyd St, Rue. Otter St, Rue. Paddy St, Rue. Knox St. The well is located near the intersection of Rue. Boyd St and Rue. Paddy St, approximately 10 metres from Rue. Knox St.

Comments:

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
<input checked="" type="checkbox"/> Yes	20140609	Audit No. Z190096
<input type="checkbox"/> No	Date Work Completed	JUL 10 2014
	20140609	

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

Address of Well Location (County/District/Municipality)

Township

Lot

Concession

RR#/Street Number/Name

City/Town/Village

Site/Compartment/Block/Tract etc.

GPS Reading

NAD

Zone

Easting

Northing

Unit Make/Model

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	Metres To
Brown	Sand		Loose	0	3.65
Grey	Sand		Packed	3.65	5.48
Grey	clay		thick	5.48	7.31
Grey	clay & stones		Packed	7.31	14.32
Grey	Limestone		MED HARD	14.32	24.38
15.54 meters of 15.87 cm casing					
1 Heavy DRIVE shoe & 1 well cap					
4 Bags of Bentonite Quick Grout					

Hole Diameter			Construction Record				Test of Well Yield			
Depth From	Metres To	Diameter Centimetres	Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Metres To	Pumping test method	Draw Down	Recovery
0	15.08	20.95						Pump	Time min	Water Level Metres
								Pump intake set at (metres)	Static Level	Time min
								Pumping rate (litres/min)	1	11.70
								Duration of pumping	2	10.72
								Final water level end of pumping	3	9.82
								Recommended pump type	4	9.24
								Recommended pump depth	5	8.71
								Recommended pump rate	10	7.56
								If flowing give rate	15	7.34
									20	7.31
									25	7.23
									30	7.21
									40	7.16
									50	7.16
									60	7.16

Water Record		
Water found at	Metres	Kind of Water
19.9	m	<input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Sulphur
		<input type="checkbox"/> Gas <input type="checkbox"/> Salty <input checked="" type="checkbox"/> Minerals
		<input type="checkbox"/> Other: Untested
		<input type="checkbox"/> m <input type="checkbox"/> Fresh <input type="checkbox"/> Sulphur
		<input type="checkbox"/> Gas <input type="checkbox"/> Salty <input type="checkbox"/> Minerals
		<input type="checkbox"/> Other:
After test of well yield, water was		
<input type="checkbox"/> Clear and sediment free		
<input type="checkbox"/> Other, specify _____		
Chlorinated <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Screen		
Outside diam	<input type="checkbox"/> Steel <input type="checkbox"/> Fibreglass	Slot No.
	<input type="checkbox"/> Plastic <input type="checkbox"/> Concrete	
	<input type="checkbox"/> Galvanized	

No Casing or Screen		
15.55	Open hole	15.08 24.38

Plugging and Sealing Record		
Depth set at - Metres	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0 15.08	Bentonite Quick Grout	30.16

Method of Construction			
<input checked="" type="checkbox"/> Cable Tool	<input type="checkbox"/> Rotary (air)	<input type="checkbox"/> Diamond	<input type="checkbox"/> Digging
<input type="checkbox"/> Rotary (conventional)	<input type="checkbox"/> Air percussion	<input type="checkbox"/> Jetting	<input type="checkbox"/> Other
<input type="checkbox"/> Rotary (reverse)	<input type="checkbox"/> Boring	<input type="checkbox"/> Driving	

Water Use			
<input checked="" type="checkbox"/> Domestic	<input type="checkbox"/> Industrial	<input type="checkbox"/> Public Supply	<input type="checkbox"/> Other
<input type="checkbox"/> Stock	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used	
<input type="checkbox"/> Irrigation	<input type="checkbox"/> Municipal	<input type="checkbox"/> Cooling & air conditioning	

Final Status of Well			
<input checked="" type="checkbox"/> Water Supply	<input type="checkbox"/> Recharge well	<input type="checkbox"/> Unfinished	<input type="checkbox"/> Abandoned, (Other)
<input type="checkbox"/> Observation well	<input type="checkbox"/> Abandoned, insufficient supply	<input type="checkbox"/> Dewatering	
<input type="checkbox"/> Test Hole	<input type="checkbox"/> Abandoned, poor quality	<input type="checkbox"/> Replacement well	

Well Contractor/Technician Information	
Name of Well Contractor	Well Contractor's Licence No.
B. MOORE Well Drilling	6455
Business Address (street name, number, city etc.)	
6490 2 nd Line RD Kans Ont. K0A 2E0	
Name of Well Technician (last name, first name)	Well Technician's Licence No.
MOORE Bob	T-0319
Signature of Technician/Contractor	Date Submitted
X Bob Moore	2005 6 9

Location of Well	
In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.	
Audit No.	Date Well Completed
Z 24159	2005 6 9
Was the well owner's information package delivered?	Date Delivered
<input type="checkbox"/> Yes <input type="checkbox"/> No	YYYY MM DD

Ministry Use Only	
Data Source	Contractor
Date Received	Date of Inspection
YYYY MM DD	YYYY MM DD
Remarks	Well Record Number
JUL 18 2007	

Print only in spaces provided.

Mark correct box with a checkmark, where applicable.

11

1532730

Municipality

15009

Con.

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County or District <i>O'Hara - Cact. A</i>	Township/Borough/City/Town/Village <i>Osgoode</i>	Con block tract survey, etc. <i>7 AHI</i>	Lot <i>22</i>
Address <i>1730 alder St m.H.C. 1k</i>		Date completed <i>5 April 02</i>	<i>48-53</i>

[illegible]**LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)**[illegible][illegible]

32

41 WATER RECORD				51 CASING & OPEN HOLE RECORD				61 SCREEN			
Water found at - feet		Kind of water		Inside diam inches		Material		Wall thickness inches		Depth - feet	
										From To	
10-13 90		1 <input checked="" type="checkbox"/> Fresh	3 <input type="checkbox"/> Sulphur	8 1/2	1 <input type="checkbox"/> Steel	2 <input type="checkbox"/> Galvanized	188	+2	22	13-16	
		2 <input type="checkbox"/> Salty	4 <input type="checkbox"/> Minerals								
15-18		1 <input type="checkbox"/> Fresh	3 <input type="checkbox"/> Sulphur	6 1/4	1 <input type="checkbox"/> Steel	2 <input type="checkbox"/> Galvanized	188	+2	22	20-23	
		2 <input type="checkbox"/> Salty	4 <input type="checkbox"/> Minerals								
20-23		1 <input type="checkbox"/> Fresh	3 <input type="checkbox"/> Sulphur	6 1/4	1 <input type="checkbox"/> Steel	2 <input type="checkbox"/> Galvanized	188	+2	22	27-30	
		2 <input type="checkbox"/> Salty	4 <input type="checkbox"/> Minerals								
25-28		1 <input type="checkbox"/> Fresh	3 <input type="checkbox"/> Sulphur	6 1/4	1 <input type="checkbox"/> Steel	2 <input type="checkbox"/> Galvanized	188	+2	22	27-30	
		2 <input type="checkbox"/> Salty	4 <input type="checkbox"/> Minerals								
30-33		1 <input type="checkbox"/> Fresh	3 <input type="checkbox"/> Sulphur	6 1/4	1 <input type="checkbox"/> Steel	2 <input type="checkbox"/> Galvanized	188	+2	22	27-30	
		2 <input type="checkbox"/> Salty	4 <input type="checkbox"/> Minerals								
		1 <input type="checkbox"/> Fresh	3 <input type="checkbox"/> Sulphur		1 <input type="checkbox"/> Steel	2 <input type="checkbox"/> Galvanized					
		2 <input type="checkbox"/> Salty	4 <input type="checkbox"/> Minerals		3 <input type="checkbox"/> Concrete	4 <input type="checkbox"/> Open hole					
			6 <input type="checkbox"/> Gas		5 <input type="checkbox"/> Plastic						

61 PLUGGING & SEALING RECORD			
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
From	To		
10-13	14-17	0 22 cement grout	
18-21	22-25		
26-29	30-33	80	

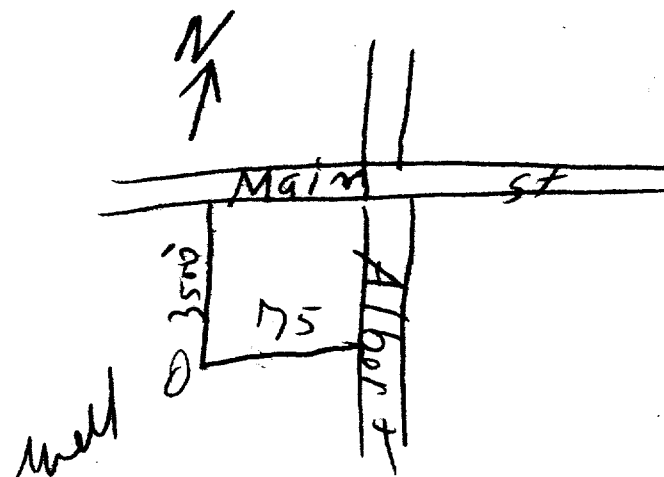
PUMPING TEST	Pumping test method ¹⁰ 1 <input checked="" type="checkbox"/> Pump 2 <input type="checkbox"/> Bailer		Pumping rate ¹¹⁻¹⁴ 7 GPM		Duration of pumping ¹⁵⁻¹⁶ 1 Hours 0 Mins	
	Static level ¹⁹⁻²¹ 12 feet	Water level end of pumping ²²⁻²⁴ 80 feet	Water levels during ²⁵ 15 minutes ²⁶⁻²⁸ 25 feet 30 minutes ²⁹⁻³¹ 19 feet		1 <input type="checkbox"/> Pumping 2 <input checked="" type="checkbox"/> Recovery	
			45 minutes ³²⁻³⁴ 12 feet		60 minutes ³⁵⁻³⁷ 12 feet	
	If flowing give rate ³⁸⁻⁴¹ GPM		Pump intake set at ⁴² feet		Water at end of test <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Cloudy	
	Recommended pump type <input type="checkbox"/> Shallow <input checked="" type="checkbox"/> Deep		Recommended pump setting ⁴³⁻⁴⁵ 90 feet		Recommended pump rate ⁴⁶⁻⁴⁹ 5 GPM	
	50-53					

FINAL STATUS OF WELL		54
1 <input checked="" type="checkbox"/> Water supply	5 <input type="checkbox"/> Abandoned, insufficient supply	9 <input type="checkbox"/> Unfinished
2 <input type="checkbox"/> Observation well	6 <input type="checkbox"/> Abandoned, poor quality	10 <input type="checkbox"/> Replacement well
3 <input type="checkbox"/> Test hole	7 <input type="checkbox"/> Abandoned (Other)	
4 <input type="checkbox"/> Recharge well	8 <input type="checkbox"/> Dewatering	
<hr/>		
WATER USE		55-56
1 <input type="checkbox"/> Domestic	5 <input type="checkbox"/> Commercial	9 <input type="checkbox"/> Not use
2 <input type="checkbox"/> Stock	6 <input type="checkbox"/> Municipal	10 <input type="checkbox"/> Other
3 <input type="checkbox"/> Irrigation	7 <input type="checkbox"/> Public supply	
4 <input type="checkbox"/> Industrial	8 <input type="checkbox"/> Cooling & air conditioning	
<hr/>		
METHOD OF CONSTRUCTION		57
1 <input type="checkbox"/> Cable tool	5 <input type="checkbox"/> Air percussion	9 <input type="checkbox"/> Driving
2 <input type="checkbox"/> Rotary (conventional)	6 <input type="checkbox"/> Boring	10 <input type="checkbox"/> Digging
3 <input type="checkbox"/> Rotary (reverse)	7 <input type="checkbox"/> Diamond	11 <input type="checkbox"/> Other
4 <input checked="" type="checkbox"/> Rotary (air)	8 <input type="checkbox"/> Jetting	

Name of Well Contractor Gilles Bourgeois	Well Contractor's Licence No. 1414
Address St Albans	
Name of Well Technician S Arme	Well Technician's Licence No. 0-193
Signature of Technician/Contractor Gilles Bourgeois	Submission date 5 day 7 mo 02 yr

LOCATION OF WELL

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



240280

MINISTRY USE ONLY	Data source	58	Contractor	59-62	Date received	63-66	67-70
			1414		APR 24 2002		
	Date of inspection		Inspector				
	Remarks						
	CSS.ES2						

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

1529556

Municipality
15009

Con.
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County or District	Township/Borough/City/Town/Village OSGOODE	Con block tract survey, etc. 1 Part	Lot 67
Address 5515 Lion St. OSGOODE ON		Date completed 23 day 7 month 97	

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
BROWN	Sand		Packed	0	15
GREY	Sand		Packed	15	18
GREY	Clay		Runny	18	26
GREY	Clay & Stones		HARD PAN	26	52
GREY	Limestone		MED HARD	52	88

41 WATER RECORD Water found at - feet 85 Kind of water 1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty 3 <input type="checkbox"/> Sulphur 4 <input checked="" type="checkbox"/> Minerals 5 <input type="checkbox"/> Gas 15-18 1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty 3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 5 <input type="checkbox"/> Gas 20-23 1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty 3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 5 <input type="checkbox"/> Gas 25-28 1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty 3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 5 <input type="checkbox"/> Gas 30-33 1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty 3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 5 <input type="checkbox"/> Gas	51 CASING & OPEN HOLE RECORD Inside diam inches 6 1/4 6" Material 1 <input checked="" type="checkbox"/> Steel 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input checked="" type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic Wall thickness inches 1.88 Depth - feet From 0 53 To 53 88	61 PLUGGING & SEALING RECORD SIZES OF OPENING (Slot No.) 31-33 Diameter 34-38 Length 39-40 Material and type Depth at top of screen 30 feet feet feet Annular space Abandonment Depth set at - feet From 0 To 21 Material and type (Cement grout, bentonite, etc.) Cement Grout
--	--	---

71 PUMPING TEST Pumping test method 1 <input type="checkbox"/> Pump 2 <input checked="" type="checkbox"/> Bailer Pumping rate 12 GPM Duration of pumping 12 Hours 15 Mins Static level 21 feet Water level end of pumping 40 feet Water levels during 15 minutes 30 minutes 45 minutes 60 minutes 30 feet 40 feet 40 feet 40 feet If flowing give rate 38-41 GPM Pump intake set at feet Water at end of test 42 <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Cloudy Recommended pump type K Shallow <input type="checkbox"/> Deep Recommended pump setting 35 feet Recommended pump rate 6 GPM

FINAL STATUS OF WELL 1 <input checked="" type="checkbox"/> Water supply 2 <input type="checkbox"/> Observation well 3 <input type="checkbox"/> Test hole 4 <input type="checkbox"/> Recharge well 5 <input type="checkbox"/> Abandoned, insufficient supply 6 <input type="checkbox"/> Abandoned, poor quality 7 <input type="checkbox"/> Abandoned (Other) 8 <input type="checkbox"/> Dewatering 9 <input type="checkbox"/> Unfinished 10 <input type="checkbox"/> Replacement well	WATER USE 1 <input checked="" type="checkbox"/> Domestic 2 <input type="checkbox"/> Stock 3 <input type="checkbox"/> Irrigation 4 <input type="checkbox"/> Industrial 5 <input type="checkbox"/> Commercial 6 <input type="checkbox"/> Municipal 7 <input type="checkbox"/> Public supply 8 <input type="checkbox"/> Cooling & air conditioning 9 <input type="checkbox"/> Not used 10 <input type="checkbox"/> Other	METHOD OF CONSTRUCTION 1 <input checked="" type="checkbox"/> Cable tool 2 <input type="checkbox"/> Rotary (conventional) 3 <input type="checkbox"/> Rotary (reverse) 4 <input type="checkbox"/> Rotary (air) 5 <input type="checkbox"/> Air percussion 6 <input type="checkbox"/> Boring 7 <input type="checkbox"/> Diamond 8 <input type="checkbox"/> Jetting 9 <input type="checkbox"/> Driving 10 <input type="checkbox"/> Digging 11 <input type="checkbox"/> Other
---	--	---

LOCATION OF WELL In diagram below show distances of well from road and lot line. Indicate north by arrow. Main St. Rg. RD. #114 Village of OSGOODE GEORGE ST. LION ST. 180' Phillip St. "Pumped WELL FOR 12 HRS With shallow well jet pump - water clear Pumping level 28' 176425

Name of Well Contractor B. MOORE WELL DRILLING 6455 Address Main St. Box 436 OSGOODE ON Name of Well Technician Bob MOORE Signature of Technician/Contractor Bob Moore	Well Contractor's Licence No. 6455 Well Technician's Licence No. T-0319 Submission date 24 mo 7 yr 97	MINISTRY USE ONLY Data source Contractor 6455 Date received AUG 11 1997 Date of inspection Inspector Remarks X
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A079368

Address of Well Location (Street Number/Name) #3254 Old George St			Township Osgoode	Lot 24	Concession 1
County/District/Municipality Ottawa - Carleton			City/Town/Village Osgoode	Province Ontario	Postal Code
UTM Coordinates NAD 83		Zone 18	Easting 452050	Northing 4999003	Municipal Plan and Sublot Number PLAN 393
				Other S/L19	

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

[illegible]

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
49 1/2	39 1/2	Neat Cement Slurry	7.8
39 1/2	0	Bentonite Slurry	16.8

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		
			From	To	
6" Steel		.188"	+2'	49 1/2'	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply
6" Openhole			49 1/2'	200'	

Construction Record - Screen

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

Water Details

Water found at Depth	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	Depth (m/ft)		Diameter (cm/in)
		From	To	
81 (m/ft) <input checked="" type="checkbox"/> Gas <input type="checkbox"/> Other, <i>specify</i> _____		0'	200'	6 1/8"
153 (m/ft) <input checked="" type="checkbox"/> Gas <input type="checkbox"/> Other, <i>specify</i> _____				
194 (m/ft) <input checked="" type="checkbox"/> Gas <input type="checkbox"/> Other, <i>specify</i> _____				

Hole Diameter

Water found at Depth	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	Depth (m/ft)		Diameter (cm/in)
		From	To	
81 (m/ft) <input checked="" type="checkbox"/> Gas <input type="checkbox"/> Other, <i>specify</i> _____		0'	200'	6 1/8"
153 (m/ft) <input checked="" type="checkbox"/> Gas <input type="checkbox"/> Other, <i>specify</i> _____				
194 (m/ft) <input checked="" type="checkbox"/> Gas <input type="checkbox"/> Other, <i>specify</i> _____				

Well Contractor and Well Technician Information

Business Name of Well Contractor AIR ROCK DRILLING CO LTD 1119		Well Contractor's Licence No.	
Business Address (Street Number/Name) Rd 1		Municipality Richmond	
Province ONT	Postal Code K0A2Z0	Business E-mail Address	
Bus. Telephone No. (inc. area code) 6138382170		Name of Well Technician (Last Name, First Name) GRADAM RYAN	
Well Technician's Licence No. T3484	Signature of Technician and/or Contractor <i>[Signature]</i>		Date Submitted 20090525

Results of Well Yield Testing

After test of well yield, water was:		Draw Down		Recovery	
<input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify:		Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:		Static Level	27'3"		87'9"
<div style="text-align: center;">X</div>		1	37'	1	64'
Pump intake set at (m/ft)		2	43'2"	2	54'
180		3	48'1"	3	46'4"
Pumping rate (l/min / GPM)		4	52'4"	4	40'8"
20		5	55'9"	5	36'
Duration of pumping		10	67'3"	10	28'5"
1 hrs + 0 min		15	73'	15	21'5"
Final water level end of pumping (m/ft)		20	76'5"	20	↓
87'9"		25	78'	25	
If flowing give rate (l/min / GPM)		30	79'5"	30	
<div style="text-align: center;">X</div>		40	82'3"	40	
Recommended pump depth (m/ft)		50	85'1"	50	
(12HP) 140'		60	87'9"	60	
Recommended pump rate (l/min / GPM)					
20					
Well production (l/min / GPM)					
20					
Disinfected?					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					

Map of Well Location

Please provide a map below following instructions on the back.

Osage Main Street

80'

15'

#3254
Old George
Street

Lion Street

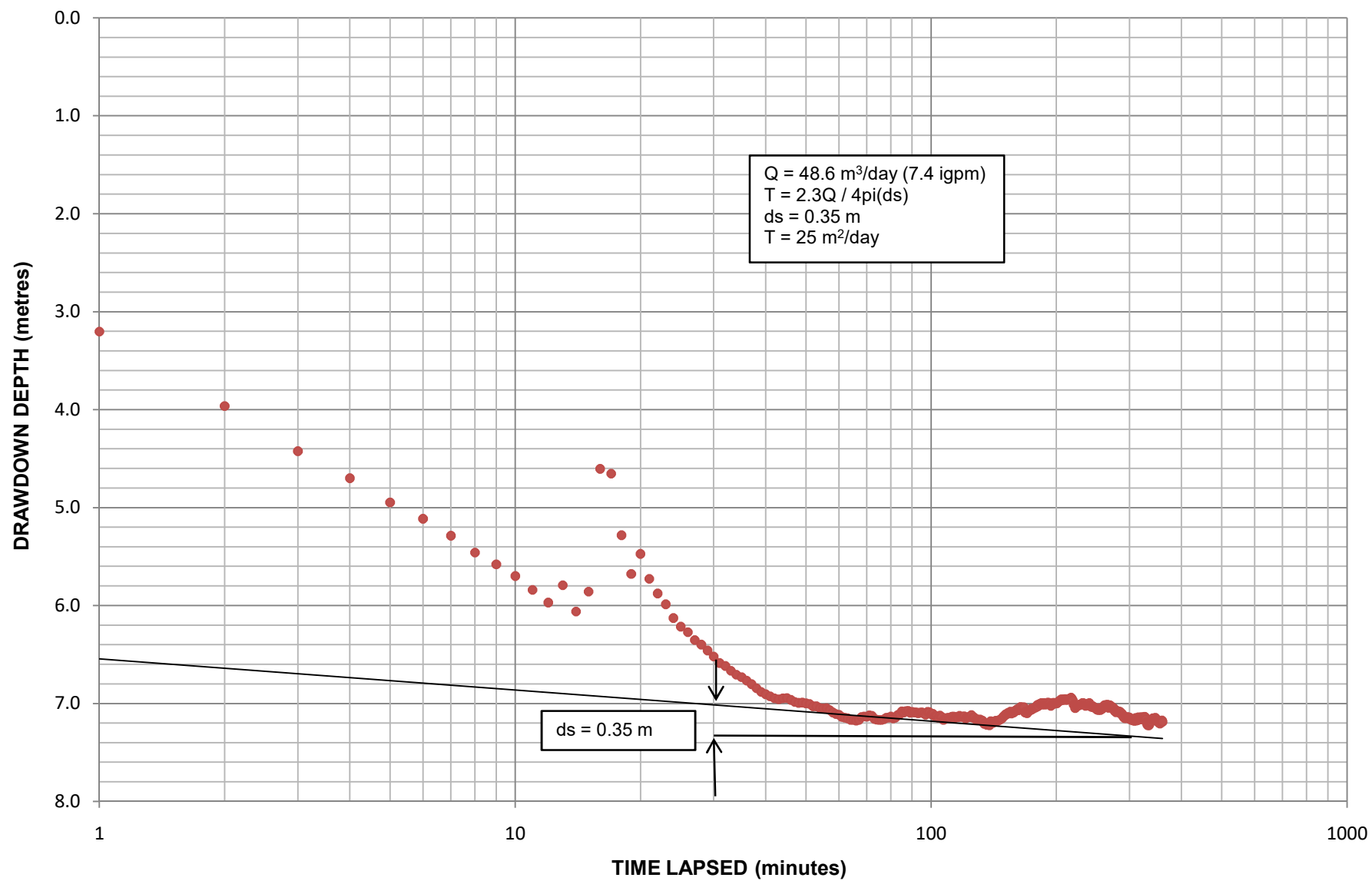
Comments:

Well owner's information package delivered <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered 20090314	Ministry Use Only Audit No. Z 94605 JUN 03 2009 Received
	Date Work Completed 20090313	



ATTACHMENT B
PUMPING TEST DATA

TW1-WELL DRAWDOWN VS. TIME-KOLLAARD FILE 180472



DRAWDOWN DATA TW-1

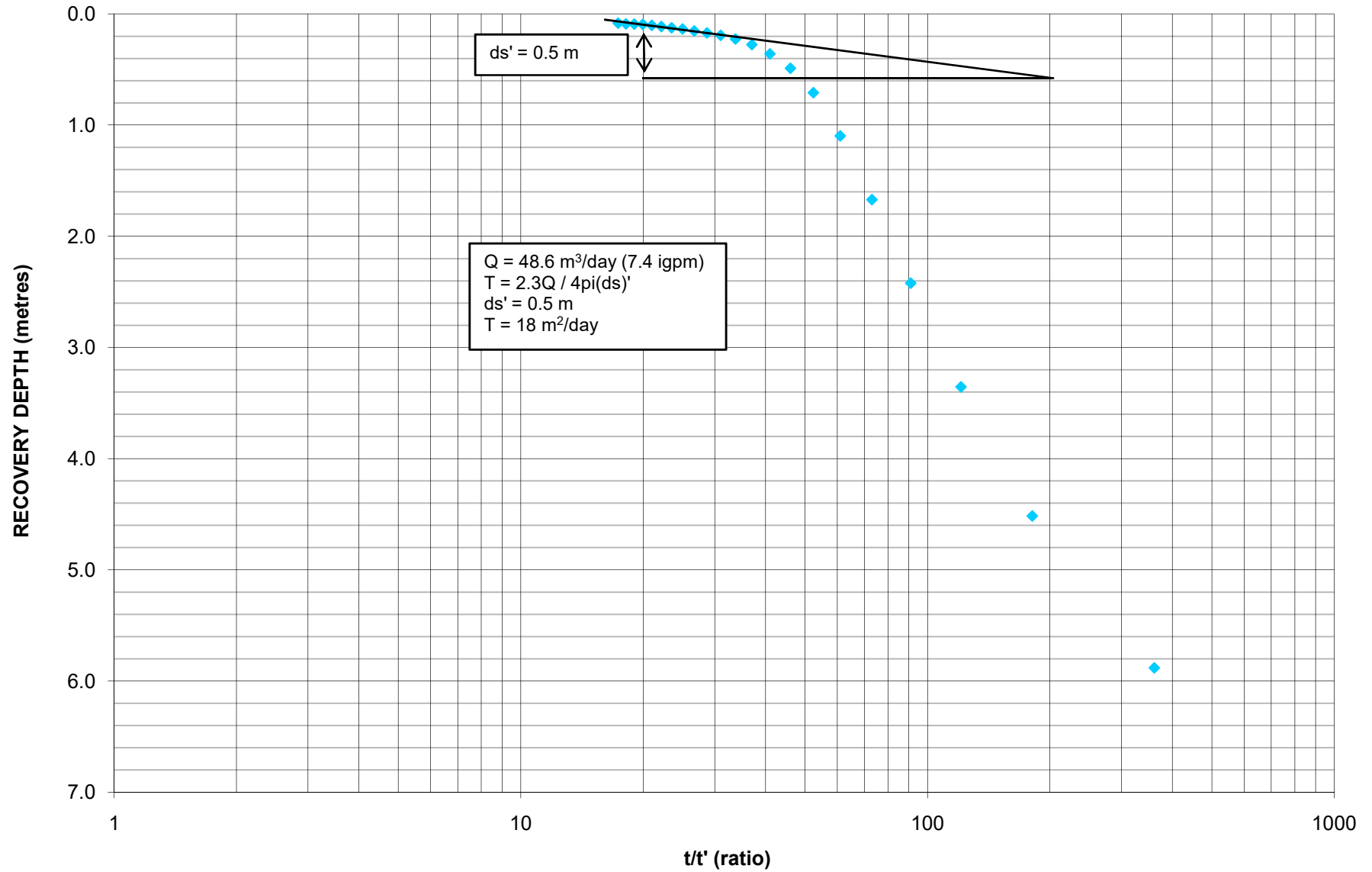
Time Lapsed (minutes)	Abs Pres (kPa)	Temp (°C)	Water Level (m)	Drawdown (m)
0	319.188	11.041	-7.27	-
1	287.778	10.553	-10.473	3.20
2	280.324	10.259	-11.233	3.96
3	275.805	10.063	-11.694	4.42
4	273.092	9.965	-11.97	4.70
5	270.674	9.866	-12.217	4.95
6	269.033	9.768	-12.384	5.11
7	267.345	9.768	-12.557	5.29
8	265.658	9.768	-12.729	5.46
9	264.48	9.768	-12.849	5.58
10	263.302	9.768	-12.969	5.70
11	261.909	9.768	-13.111	5.84
12	260.646	9.669	-13.24	5.97
13	262.386	9.669	-13.062	5.79
14	259.736	9.669	-13.332	6.06
15	261.743	9.669	-13.128	5.86
16	274.039	9.669	-11.874	4.60
17	273.551	9.571	-11.924	4.65
18	267.387	9.571	-12.552	5.28
19	263.504	9.571	-12.948	5.68
20	265.513	9.571	-12.743	5.47
21	263.023	9.571	-12.997	5.73
22	261.55	9.571	-13.147	5.88
23	260.48	9.571	-13.257	5.99
24	259.088	9.571	-13.398	6.13
25	258.232	9.571	-13.486	6.22
26	257.67	9.571	-13.543	6.27
27	256.894	9.571	-13.622	6.35
28	256.439	9.571	-13.669	6.40
29	255.851	9.571	-13.729	6.46
30	255.236	9.571	-13.791	6.52
31	254.588	9.472	-13.857	6.59
32	254.299	9.571	-13.887	6.62
33	253.813	9.472	-13.936	6.67
34	253.412	9.472	-13.977	6.71
35	253.171	9.472	-14.002	6.73
36	252.823	9.472	-14.037	6.77
37	252.476	9.472	-14.073	6.80
38	252.075	9.472	-14.114	6.84
39	251.7	9.472	-14.152	6.88
40	251.46	9.472	-14.176	6.91
41	251.246	9.472	-14.198	6.93
42	251.059	9.472	-14.217	6.95
43	250.952	9.472	-14.228	6.96
44	251.059	9.472	-14.217	6.95
45	251.085	9.472	-14.215	6.95
46	250.898	9.472	-14.234	6.96
47	250.684	9.472	-14.255	6.99
48	250.604	9.472	-14.264	6.99
49	250.631	9.472	-14.261	6.99
50	250.551	9.472	-14.269	7.00
51	250.497	9.472	-14.275	7.01
52	250.257	9.472	-14.299	7.03
53	250.257	9.472	-14.299	7.03
54	250.07	9.472	-14.318	7.05
55	250.043	9.472	-14.321	7.05
56	250.07	9.472	-14.318	7.05
57	249.883	9.472	-14.337	7.07
58	249.642	9.472	-14.362	7.09
59	249.482	9.472	-14.378	7.11
60	249.401	9.472	-14.386	7.12
61	249.188	9.472	-14.408	7.14
62	249.107	9.472	-14.416	7.15
63	249.054	9.472	-14.422	7.15
64	248.894	9.472	-14.438	7.17
65	248.894	9.472	-14.438	7.17
66	248.813	9.472	-14.446	7.18
67	248.894	9.472	-14.438	7.17
68	249.188	9.472	-14.408	7.14
69	249.241	9.472	-14.403	7.13
70	249.214	9.472	-14.405	7.14
71	249.348	9.472	-14.392	7.12
72	249.295	9.472	-14.397	7.13
73	249.001	9.472	-14.427	7.16
74	248.92	9.472	-14.435	7.17
75	248.894	9.472	-14.438	7.17
76	248.894	9.472	-14.438	7.17
77	248.974	9.472	-14.43	7.16
78	249.107	9.472	-14.416	7.15
79	249.134	9.472	-14.414	7.14
80	249.241	9.472	-14.403	7.13
81	249.054	9.472	-14.422	7.15
82	249.134	9.472	-14.414	7.14
83	249.375	9.472	-14.389	7.12
84	249.455	9.472	-14.381	7.11
85	249.749	9.472	-14.351	7.08
86	249.642	9.472	-14.362	7.09
87	249.776	9.472	-14.348	7.08
88	249.802	9.472	-14.345	7.08

89	249.615	9.472	-14.364	7.09
90	249.695	9.472	-14.356	7.09
91	249.642	9.472	-14.362	7.09
92	249.642	9.472	-14.362	7.09
93	249.562	9.472	-14.37	7.10
94	249.615	9.472	-14.364	7.09
95	249.642	9.472	-14.362	7.09
96	249.535	9.472	-14.373	7.10
97	249.401	9.472	-14.386	7.12
98	249.695	9.472	-14.356	7.09
99	249.669	9.472	-14.359	7.09
100	249.455	9.472	-14.381	7.11
101	249.508	9.472	-14.375	7.11
102	249.268	9.472	-14.4	7.13
103	249.268	9.472	-14.4	7.13
104	249.107	9.472	-14.416	7.15
105	249.321	9.472	-14.394	7.12
106	249.188	9.472	-14.408	7.14
107	248.894	9.472	-14.438	7.17
108	249.001	9.472	-14.427	7.16
109	249.081	9.472	-14.419	7.15
110	249.107	9.472	-14.416	7.15
111	249.054	9.472	-14.422	7.15
112	249.214	9.472	-14.405	7.14
113	249.241	9.472	-14.403	7.13
114	249.081	9.472	-14.419	7.15
115	249.214	9.472	-14.405	7.14
116	249.161	9.472	-14.411	7.14
117	249.295	9.472	-14.397	7.13
118	249.188	9.472	-14.408	7.14
119	249.214	9.472	-14.405	7.14
120	249.268	9.472	-14.4	7.13
121	249.027	9.472	-14.424	7.15
122	249.161	9.472	-14.411	7.14
123	249.188	9.472	-14.408	7.14
124	249.161	9.472	-14.411	7.14
125	249.375	9.472	-14.389	7.12
126	249.134	9.472	-14.414	7.14
127	249.134	9.472	-14.414	7.14
128	248.947	9.472	-14.433	7.16
129	248.947	9.472	-14.433	7.16
130	248.894	9.472	-14.438	7.17
131	248.947	9.472	-14.433	7.16
132	248.867	9.472	-14.441	7.17
133	248.813	9.472	-14.446	7.18
134	248.493	9.472	-14.479	7.21
135	248.573	9.472	-14.471	7.20
136	248.413	9.472	-14.487	7.22
137	248.439	9.472	-14.484	7.21
138	248.359	9.472	-14.493	7.22
139	248.76	9.472	-14.452	7.18
140	248.626	9.472	-14.465	7.20
141	248.6	9.472	-14.468	7.20
142	248.707	9.472	-14.457	7.19
143	248.813	9.472	-14.446	7.18
144	248.76	9.472	-14.452	7.18
145	248.84	9.472	-14.443	7.17
146	248.894	9.472	-14.438	7.17
147	248.974	9.472	-14.43	7.16
148	249.054	9.472	-14.422	7.15
149	249.241	9.472	-14.403	7.13
150	249.295	9.472	-14.397	7.13
151	249.455	9.472	-14.381	7.11
152	249.455	9.472	-14.381	7.11
153	249.589	9.472	-14.367	7.10
154	249.562	9.472	-14.37	7.10
155	249.722	9.472	-14.354	7.08
156	249.535	9.472	-14.373	7.10
157	249.642	9.472	-14.362	7.09
158	249.642	9.472	-14.362	7.09
159	249.802	9.472	-14.345	7.08
160	249.883	9.472	-14.337	7.07
161	249.963	9.472	-14.329	7.06
162	249.856	9.472	-14.34	7.07
163	249.963	9.472	-14.329	7.06
164	250.203	9.472	-14.305	7.04
165	249.936	9.472	-14.332	7.06
166	250.15	9.472	-14.31	7.04
167	250.177	9.472	-14.307	7.04
168	249.642	9.472	-14.362	7.09
169	249.722	9.472	-14.354	7.08
170	249.562	9.472	-14.37	7.10
171	249.722	9.472	-14.354	7.08
172	249.829	9.472	-14.343	7.07
173	249.856	9.472	-14.34	7.07
174	250.016	9.472	-14.324	7.05
175	249.963	9.472	-14.329	7.06
176	250.043	9.472	-14.321	7.05
177	250.096	9.472	-14.315	7.05
178	250.123	9.472	-14.313	7.04
179	250.203	9.472	-14.305	7.04
180	250.39	9.472	-14.285	7.02
181	250.283	9.472	-14.296	7.03
182	250.497	9.472	-14.275	7.01
183	250.497	9.472	-14.275	7.01

184	250.578	9.472	-14.266	7.00
185	250.417	9.472	-14.283	7.01
186	250.551	9.472	-14.269	7.00
187	250.578	9.472	-14.266	7.00
188	250.417	9.472	-14.283	7.01
189	250.524	9.472	-14.272	7.00
190	250.471	9.472	-14.277	7.01
191	250.631	9.472	-14.261	6.99
192	250.524	9.472	-14.272	7.00
193	250.578	9.472	-14.266	7.00
194	250.31	9.472	-14.294	7.02
195	250.417	9.472	-14.283	7.01
196	250.444	9.472	-14.28	7.01
197	250.604	9.472	-14.264	6.99
198	250.578	9.472	-14.266	7.00
199	250.551	9.472	-14.269	7.00
200	250.551	9.472	-14.269	7.00
201	250.578	9.472	-14.266	7.00
202	250.684	9.472	-14.255	6.99
203	250.791	9.472	-14.245	6.98
204	250.791	9.472	-14.245	6.98
205	250.925	9.472	-14.231	6.96
206	250.952	9.472	-14.228	6.96
207	250.898	9.472	-14.234	6.96
208	250.898	9.472	-14.234	6.96
209	250.952	9.472	-14.228	6.96
210	250.979	9.472	-14.225	6.96
211	250.925	9.472	-14.231	6.96
212	250.898	9.472	-14.234	6.96
213	250.952	9.472	-14.228	6.96
214	250.979	9.472	-14.225	6.96
215	251.032	9.472	-14.22	6.95
216	250.979	9.472	-14.225	6.96
217	251.139	9.472	-14.209	6.94
218	251.032	9.472	-14.22	6.95
219	250.845	9.472	-14.239	6.97
220	250.417	9.472	-14.283	7.01
221	250.364	9.472	-14.288	7.02
222	250.07	9.472	-14.318	7.05
223	250.337	9.472	-14.291	7.02
224	250.364	9.472	-14.288	7.02
225	250.364	9.472	-14.288	7.02
226	250.337	9.472	-14.291	7.02
227	250.417	9.472	-14.283	7.01
228	250.39	9.472	-14.285	7.02
229	250.444	9.472	-14.28	7.01
230	250.471	9.472	-14.277	7.01
231	250.578	9.472	-14.266	7.00
232	250.578	9.472	-14.266	7.00
233	250.497	9.472	-14.275	7.01
234	250.524	9.472	-14.272	7.00
235	250.31	9.472	-14.294	7.02
236	250.497	9.472	-14.275	7.01
237	250.524	9.472	-14.272	7.00
238	250.471	9.472	-14.277	7.01
239	250.524	9.472	-14.272	7.00
240	250.578	9.472	-14.266	7.00
241	250.39	9.472	-14.285	7.02
242	250.23	9.472	-14.302	7.03
243	250.283	9.472	-14.296	7.03
244	250.177	9.472	-14.307	7.04
245	250.257	9.472	-14.299	7.03
246	250.177	9.472	-14.307	7.04
247	250.123	9.472	-14.313	7.04
248	250.07	9.472	-14.318	7.05
249	250.07	9.472	-14.318	7.05
250	249.936	9.472	-14.332	7.06
251	249.963	9.472	-14.329	7.06
252	249.883	9.472	-14.337	7.07
253	250.07	9.472	-14.318	7.05
254	249.936	9.472	-14.332	7.06
255	249.883	9.472	-14.337	7.07
256	250.016	9.472	-14.324	7.05
257	250.016	9.472	-14.324	7.05
258	250.016	9.472	-14.324	7.05
259	250.123	9.472	-14.313	7.04
260	250.257	9.472	-14.299	7.03
261	250.364	9.472	-14.288	7.02
262	250.23	9.472	-14.302	7.03
263	250.39	9.472	-14.285	7.02
264	250.337	9.472	-14.291	7.02
265	250.417	9.472	-14.283	7.01
266	250.39	9.472	-14.285	7.02
267	250.096	9.472	-14.315	7.05
268	250.31	9.472	-14.294	7.02
269	250.364	9.472	-14.288	7.02
270	250.283	9.472	-14.296	7.03
271	250.257	9.472	-14.299	7.03
272	250.096	9.472	-14.315	7.05
273	250.15	9.472	-14.31	7.04
274	250.043	9.472	-14.321	7.05
275	250.07	9.472	-14.318	7.05
276	249.802	9.472	-14.345	7.08
277	249.883	9.472	-14.337	7.07
278	249.669	9.472	-14.359	7.09

279	249.749	9.472	-14.351	7.08
280	249.802	9.472	-14.345	7.08
281	249.749	9.472	-14.351	7.08
282	249.749	9.472	-14.351	7.08
283	249.722	9.472	-14.354	7.08
284	249.615	9.472	-14.364	7.09
285	249.695	9.472	-14.356	7.09
286	249.482	9.472	-14.378	7.11
287	249.482	9.472	-14.378	7.11
288	249.508	9.472	-14.375	7.11
289	249.321	9.472	-14.394	7.12
290	249.188	9.472	-14.408	7.14
291	249.134	9.472	-14.414	7.14
292	249.081	9.472	-14.419	7.15
293	249.107	9.472	-14.416	7.15
294	249.081	9.472	-14.419	7.15
295	249.107	9.472	-14.416	7.15
296	249.161	9.472	-14.411	7.14
297	249.188	9.472	-14.408	7.14
298	249.107	9.472	-14.416	7.15
299	249.027	9.472	-14.424	7.15
300	249.134	9.472	-14.414	7.14
301	248.974	9.472	-14.43	7.16
302	248.92	9.472	-14.435	7.17
303	248.92	9.472	-14.435	7.17
304	248.974	9.472	-14.43	7.16
305	248.84	9.472	-14.443	7.17
306	248.894	9.472	-14.438	7.17
307	248.867	9.472	-14.441	7.17
308	248.787	9.472	-14.449	7.18
309	248.894	9.472	-14.438	7.17
310	249.081	9.472	-14.419	7.15
311	248.813	9.472	-14.446	7.18
312	249.027	9.472	-14.424	7.15
313	249.081	9.472	-14.419	7.15
314	248.867	9.472	-14.441	7.17
315	249.161	9.472	-14.411	7.14
316	249.054	9.472	-14.422	7.15
317	249.027	9.472	-14.424	7.15
318	248.947	9.472	-14.433	7.16
319	249.107	9.472	-14.416	7.15
320	249.161	9.472	-14.411	7.14
321	249.161	9.472	-14.411	7.14
322	249.054	9.472	-14.422	7.15
323	248.974	9.472	-14.43	7.16
324	249.161	9.472	-14.411	7.14
325	249.081	9.472	-14.419	7.15
326	249.214	9.472	-14.405	7.14
327	249.188	9.472	-14.408	7.14
328	248.947	9.472	-14.433	7.16
329	248.68	9.472	-14.46	7.19
330	248.573	9.472	-14.471	7.20
331	248.413	9.472	-14.487	7.22
332	248.359	9.472	-14.493	7.22
333	248.519	9.472	-14.476	7.21
334	248.359	9.472	-14.493	7.22
335	248.573	9.472	-14.471	7.20
336	248.653	9.472	-14.463	7.19
337	248.68	9.472	-14.46	7.19
338	248.707	9.472	-14.457	7.19
339	248.92	9.472	-14.435	7.17
340	248.947	9.472	-14.433	7.16
341	249.054	9.472	-14.422	7.15
342	249.001	9.472	-14.427	7.16
343	249.001	9.472	-14.427	7.16
344	249.054	9.472	-14.422	7.15
345	248.974	9.472	-14.43	7.16
346	249.107	9.472	-14.416	7.15
347	249.001	9.472	-14.427	7.16
348	248.867	9.472	-14.441	7.17
349	248.787	9.472	-14.449	7.18
350	248.867	9.472	-14.441	7.17
351	248.707	9.472	-14.457	7.19
352	248.813	9.472	-14.446	7.18
353	248.626	9.472	-14.465	7.20
354	248.573	9.472	-14.471	7.20
355	248.519	9.472	-14.476	7.21
356	248.733	9.472	-14.454	7.18
357	248.68	9.472	-14.46	7.19
358	248.76	9.472	-14.452	7.18
359	248.84	9.472	-14.443	7.17
360	248.707	9.472	-14.457	7.19

TW1- WELL RECOVERY VS. TIME - KOLLAARD FILE 180472



RECOVERY DATA TW-1

t'	t / t'	Abs Pres (kPa)	Temp (°C)	Water Level (m)	Drawdown (m)	Recovery (%)
1	361.0	261.518	9.472	-13.151	5.88	18%
2	181.0	274.912	9.472	-11.785	4.52	37%
3	121.0	286.287	9.472	-10.625	3.36	53%
4	91.0	295.446	9.472	-9.691	2.42	66%
5	73.0	302.813	9.472	-8.94	1.67	77%
6	61.0	308.437	9.472	-8.366	1.10	85%
7	52.4	312.233	9.472	-7.979	0.71	90%
8	46.0	314.388	9.472	-7.759	0.49	93%
9	41.0	315.654	9.472	-7.63	0.36	95%
10	37.0	316.489	9.472	-7.545	0.28	96%
11	33.7	316.974	9.472	-7.496	0.23	97%
12	31.0	317.298	9.472	-7.463	0.19	97%
13	28.7	317.513	9.472	-7.441	0.17	98%
14	26.7	317.702	9.472	-7.422	0.15	98%
15	25.0	317.863	9.472	-7.405	0.14	98%
16	23.5	317.971	9.472	-7.394	0.12	98%
17	22.2	318.079	9.472	-7.383	0.11	98%
18	21.0	318.187	9.472	-7.372	0.10	99%
19	19.9	318.268	9.472	-7.364	0.09	99%
20	19.0	318.295	9.472	-7.361	0.09	99%
21	18.1	318.322	9.472	-7.358	0.09	99%
22	17.4	318.375	9.472	-7.353	0.08	99%
23	16.7	319.723	9.472	-7.215	-0.05	101%



Suzanne Sinclair
November 15, 2018

Hydrogeological and Terrain Study
3250 Old George Street, Osgoode, Ontario
180472

ATTACHMENT C
WATER QUALITY RESULTS

Client: Kollaard Associates Inc.
210 Prescott St., Box 189
Kemptville, ON
K0G 1J0
Attention: Ms. Colleen Vermeersch
PO#: 180472
Invoice to: Kollaard Associates Inc.

Report Number: 1810352
Date Submitted: 2018-06-21
Date Reported: 2018-06-28
Project: 180472
COC #: 197974

Page 1 of 6

Dear Colleen Vermeersch:

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:

APPROVAL: _____

Addrine Thomas, Inorganics Supervisor

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Eurofins Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at <http://www.cala.ca/scopes/2602.pdf>.

Eurofins(Ottawa) is certified and accredited for specific parameters by OMAFRA, Ontario Ministry of Agriculture, Food and Rural Affairs (for farm soils). Licensed by Ontario MOE for specific tests in drinking water.

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Certificate of Analysis

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					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1367287 Water 2018-06-21 TW1-3hr	1367288 Water 2018-06-21 TW1-6hr
Group	Analyte	MRL	Units	Guideline			
Anions	Cl	1	mg/L	AO 250		30	30
	N-NO2	0.10	mg/L	MAC 1.0		<0.10	<0.10
	N-NO3	0.10	mg/L	MAC 10.0		<0.10	<0.10
	SO4	1	mg/L	AO 500		9	9
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 500		134	135
	Colour	2	TCU	AO 5		3	3
	Conductivity	5	uS/cm			795	711
	F	0.10	mg/L	MAC 1.5		0.19	0.21
	pH	1.00		6.5-8.5		8.09	8.09
	S2-	0.01	mg/L	AO 0.05		0.02	0.01
	TDS (COND - CALC)	1	mg/L	AO 500		517*	462
	Turbidity	0.1	NTU	AO 5.0		14.9*	11.0*
	Hardness as CaCO3	1	mg/L	OG 100		289*	289*
Hardness	Hardness as CaCO3	1	mg/L	OG 100		289*	289*
Indices/Calc	Ion Balance	0.01				2.08	2.04
Metals	Ca	1	mg/L			68	68
	Fe	0.03	mg/L	AO 0.3		0.38*	0.34*
	K	1	mg/L			3	3
	Mg	1	mg/L			29	29
	Mn	0.01	mg/L	AO 0.05		0.03	0.02
	Na	2	mg/L	AO 200		43	41
Subcontract-Inorg	DOC	0.5	mg/L	AO 5		2.9	2.4
	N-NH3	0.01	mg/L			0.19	0.19
	Phenols	0.001	mg/L			<0.001	<0.001
	Tannin & Lignin	0.1	mg/L			0.1	0.2
	Total Kjeldahl Nitrogen	0.1	mg/L			0.3	0.3

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

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 347938 Analysis/Extraction Date 2018-06-22 Analyst SKH Method M SM3120B-3500C			
Calcium	<1 mg/L	96	90-110
Potassium	<1 mg/L	98	87-113
Magnesium	<1 mg/L	94	76-124
Sodium	<2 mg/L	103	82-118
Run No 347951 Analysis/Extraction Date 2018-06-22 Analyst YH Method C SM2130B			
Turbidity	<0.1 NTU	102	73-127
Run No 348006 Analysis/Extraction Date 2018-06-22 Analyst AET Method C SM4500-S2-D			
S2-	<0.01 mg/L	74	
Run No 348031 Analysis/Extraction Date 2018-06-22 Analyst SKH Method EPA 200.8			
Iron	<0.03 mg/L	97	91-109
Manganese	<0.01 mg/L	102	92.9-107
Run No 348152 Analysis/Extraction Date 2018-06-25 Analyst AET Method SM2320,2510,4500H/F			
Conductivity	<5 uS/cm	101	90-110

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
pH		99	90-110
Run No 348171 Analysis/Extraction Date 2018-06-26 Analyst YH Method C SM2120C			
Colour	<2 TCU	100	80-120
Run No 348227 Analysis/Extraction Date 2018-06-25 Analyst AET Method SUBCONTRACT P-INORG			
DOC	<0.5 mg/L	107	
N-NH3	<0.01 mg/L	96	
Phenols	<0.001 mg/L	92	69-132
Tannin & Lignin	<0.1 mg/L	90	
Total Kjeldahl Nitrogen	<0.1 mg/L	118	81-126
Run No 348250 Analysis/Extraction Date 2018-06-27 Analyst H_F Method SM 4110			
Chloride	<1 mg/L		90-110
N-NO2	<0.10 mg/L	6	90-110
N-NO3	<0.10 mg/L	7	90-110
SO4	<1 mg/L	5	90-110
Run No 348287 Analysis/Extraction Date 2018-06-27 Analyst AET Method SM2320,2510,4500H/F			

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
F	<0.10 mg/L	91	90-110
Run No 348368 Analysis/Extraction Date 2018-06-28 Analyst AET Method SM2320,2510,4500H/F			
Alkalinity (CaCO ₃)	<5 mg/L	98	90-110
Run No 348400 Analysis/Extraction Date 2018-06-28 Analyst AET Method C SM2340B			
Hardness as CaCO ₃			
Ion Balance			
TDS (COND - CALC)			

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Sample Comment Summary

Sample ID: 1367287	TW1-3hr	The Ion Balance is outside Eurofins acceptable tolerance levels. All results have been confirmed.
Sample ID: 1367288	TW1-6hr	The Ion Balance is outside Eurofins acceptable tolerance levels. All results have been confirmed.

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Page 1 of 2

Dear Colleen Vermeersch:

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:

APPROVAL:

Dragana Dzeletovic, Team Leader

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					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1367289 Water 2018-06-21 TW1-3hr	1367290 Water 2018-06-21 TW1-6hr
Group	Analyte	MRL	Units	Guideline			
Microbiology	Heterotrophic Plate Count	0	ct/1mL			27	40
Others	Escherichia Coli	0	ct/100mL	MAC 0		0	0
	Faecal Coliforms	0	ct/100mL			0	0
	Total Coliforms	0	ct/100mL	MAC 0		0	0

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Analytical Method: AMBCOLM1

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