# TWP EC Ca

## AGENDA COMMITTEE OF ADJUSTMENT

# Wednesday, October 16, 2024, 4:00 PM Corporation of The Township of Edwardsburgh Cardinal Council Chambers, Spencerville Ontario

Indigenous Land Acknowledgement: The Township of Edwardsburgh Cardinal is situated on traditional territory of Indigenous peoples dating back countless generations, which is rich in history and home to many First Nations, Métis and Inuit people today.

As a Township, we have a responsibility for the stewardship of the lands on which we live, work and play, and today, this meeting place is still home to Indigenous people, and we are grateful to have the opportunity to work on and call this land home.

- 1. Welcome and Introductions
- 2. Disclosure of Pecuniary Interest or Conflict of Interest & the General Nature Thereof
- 3. Review and Discussion of Minor Variance for 27 David Street
  - a. Proposal Details
  - b. Public Comments
  - c. Committee Review and Decision
- 4. Decision on Minor Variance
- 5. Adjournment



# TOWNSHIP OF EDWARDSBURGH CARDINAL ACTION ITEM

Committee: Committee of Adjustments

Date: October 16, 2024

**Department:** Community Development

Topic: Application for Minor Variance A-02-24 (Broniszeski)

**Purpose and effect:** The purpose of the application is to obtain relief from the provisions of section 6.1.2 of the Township's Zoning Bylaw 2022-37 for two lots within the Residential Second Density (R2) zone. The application proposes to permit a reduced lot size of 0.094 hectares for the proposed severed and retained lots where the minimum lot size is 0.4 hectares. The effect of the application would be to fulfill a condition of consent B-38-23, which received conditional approval by the consent granting authority.

**Background:** The subject land is a 0.193 hectare through lot at 27 David Street in the Village of Spencerville. A severance application was conditionally approved by the consent granting authority on August 16, 2023. The application will create a new 0.094 ha lot with frontage on Charles Street and a 0.099 ha retained lot on David Street.

A hydrogeological study was submitted with the severance application to review water quality and quantity at the site in support of a reduced lot size in the R2 zone. As a condition of severance approval, the applicant must enter into a development agreement with the Township to implement the recommendations of the hydrogeological study for the new lot and obtain relief from the zoning bylaw to permit a smaller lot size.

The hydrogeological study was prepared by Kollaard Associates in October 2022. The study determines that a well constructed on the new lot will provide sufficient water quantity for domestic use for a residential dwelling. In regards to water quality, the study finds that the water is hard by water treatment standards; the total dissolved solids may be present above the aesthetic objective in the future well; and iron and sulphides also measured high. The report provides recommendations for treatment of each concern.

The study also recommends that future well construction should conform with the recommended construction in the Thomson report from 2005 that was supported through the MOE report from 2020;

- well should be cased to a depth of at least 25 to 32 metres; AND
- the annulus of the well shall be sealed using suitable grouting and sealant for its entire length to the ground surface.

Subject to Council approval, the development agreement will include the hydrogeological assessment report and require the property owner to comply with the report's recommendations. The agreement would be registered on title and apply to all future owners of the land.

**Policy Implications:** In considering an application for minor variance, the Committee must determine if the application meets the following 4 tests, as provided by section 45 (1) of the *Planning Act*.

## Is the application minor in nature?

The application proposes a lot size of 0.094 hectares where the minimum lot size for lots in the R2 zone on private or partial services is 0.4 hectares. The lot has a suitable building envelope for a dwelling on partial servicing and the size is consistent with the adjacent lots. Any impact to neighbouring properties and future development on the lot is expected to be minor.

# Is the application desirable for the appropriate development or use of the land, building or structure?

The proposal allows appropriate intensification within the Spencerville settlement area, allowing a future dwelling to be constructed on the land.

## Does the application maintain the general intent and purpose of the zoning bylaw?

A minimum lot size ensures that a property can be developed and used as intended with appropriate setbacks. Where development will be on private or partial services, the lot size needs to be large enough to provide appropriate servicing.

Future development will be on partial services with municipal sewer and private water. Available water quality and quantity has been assessed through a hydrogeological assessment. The lot is a sufficient size to support the existing dwelling on the retained land and future development on the severed lot while meeting required setbacks.

## Does the application maintain the general intent and purpose of the official plan?

In section 3.1 of our official plan, the Township seeks to encourage more concentrated residential and commercial growth and development in the Settlement Policy Areas. Further, the Plan tells us that the Township will promote intensification and redevelopment of vacant or underused sites within the Settlement Area.

Section 7.1.1.1 of our official plan gives a minimum lot size of 0.4ha but permits a smaller lot size for lands within the Settlement Policy Area. An amendment to the Plan approved in March this year added the following clause to section 7.1.1.1:

Notwithstanding the minimum lot area of generally 0.4 hectares, where any new lot is proposed to be less than 1.0 hectare and requires partial or private servicing, a hydrogeological assessment and terrain analysis may be required, to demonstrate that the lot can be adequately serviced for the long-term to the satisfaction of the Township.

The proposed reduced lot size meets the general intent and purpose of the official plan.

**Financial Considerations:** The applicant has submitted the required fee to the Township for the minor variance, in accordance with the Planning Fees Bylaw 2022-40.

**Recommendation:** That Committee approve minor variance application A-02-24 to permit a reduced lot size of 0.94ha for the severed and retained lots of consent application B-38-23.

Community Development Coordinator



File Number: A-02-24

# NOTICE OF APPLICATION FOR

 $\boxtimes$  Minor Variance –s. 45(1)  $\square$  Permission –s. 45(2)

Name of Committee: Township of Edwardsburgh Cardinal Committee of Adjustments Application Submitted by: Ed Broniszeski

Property Location: 27 David Street, Spencerville

LT 5 S/S DAVID ST, 5 N/S CHARLES ST PL 40 EXCEPT PT 3, 15R9446; PT BRUCE ST PL 40 CLOSED BY PR145570, PT 16 & 17, 15R9446;

# **PUBLIC HEARING - Committee of Adjustments**

Date: October 16, 2024 Time: 4:00 p.m. Place: Council Chambers, 18 Centre Street, Spencerville Ontario, K0E 1X0

## Purpose and Effect of the Proposed Application:

The purpose of the application is to obtain relief from the provisions of section 6.1.2 of the Township's Zoning Bylaw 2022-37 for two lots within the Residential Second Density (R2) zone. The application proposes to permit a reduced lot size of 0.097 hectares for the proposed severed and retained lots where the minimum lot size is 0.4 hectares. The effect of the application would be to fulfill a condition of consent B-38-23, which has received conditional approval by the consent granting authority on August 19, 2023.

Other Applications: Severance File No. B-38-23

**Additional information** regarding the application will be available to the public for inspection at the Township office Monday to Friday from 8:30 a.m. to 4:30 p.m.

**Public Hearing**: You are entitled to attend this public hearing in person or you may be represented by counsel or an agent to give evidence about this application. Signed, written submissions that relate to an application shall be accepted by the Secretary-Treasurer before or during the hearing of the application above and shall be available to any interested person for inspection at the hearing.

**Failure to Attend**: If you do not attend this public hearing it may proceed in your absence and, except as otherwise provided in the Planning Act, you will not be entitled to any further notice in the proceeding.

**Notice of Decision:** A certified copy of the Decision, together with a notice of the last day for appealing to the Ontario Land Tribunal shall be sent, not later than 10 days from the making of the decision, to the applicant, and to each person who filed with the Secretary-Treasurer a written request to receive notice of the Decision.

Dated at the Township of Edwardsburgh Cardinal this 3rd day of October, 2024.

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Wendy Van Keulen Secretary-Treasurer of the Committee of Adjustments Township of Edwardsburgh Cardinal PO Box 129 18 Centre Street Spencerville ON K0E 1X0 Tel: 613-658-3055 x 101

KEY MAP:



Subject Land

@Municipal World\* - Form 1050 Planning Act, R.S.O. 1990, c. P.13, s. 45 O.Reg. 200/96, Schedule **APPLICATION FOR** \* Reg. T.M. in Canada, Municipal World Inc. Multicopy Form – PRESS FIRMLY File No. -02-2 MINOR VARIANCE - s. 45 (1) PERMISSION - s. 45 (2) The undersigned hereby applies to the Committee of Adjustment for the . Township. of. Edwardsburgh. Cardina (name of municipality) ... under section 45 NAME OF OWNER NAME OF AGENT (if applicant is an agent authorized by the owner) Bronsizeski d ADDRESS ADDRESS Treet Box 5 pencerville, ON TELEPHONE OFFICIAL PLAN - current designation of the subject land: Settlement Polici Utal Settlement Area Area sidential ZONING BY-LAW - current zoning of the subject land: RZ: O. Alda Size In RELIEF - nature and extent of relief from the zoning by-law: Size Sma REASON why the proposed use cannot comply with the provisions of the zoning by-law: does not meet minimum size requirement LEGAL DESCRIPTION of subject land (such as the municipality, concession and lot numbers, registered plan and lot numbers, reference plan and part numbers and name of street and number): includes RP; 15R9446 Parts Note: See reverse of page 3 for details of sketch required. DIMENSIONS OF LAND affected: Severed - 32.52 0.097ha (24acres) 29.69 Frontage: Depth: Area: retained: 32-52 32 ACCESS - Access to the subject land is by: Municipal road - seasonal Provincial highway Right-of-way Municipal road - year round U Water Other public road (specify)

WATER ACCESS - Where access to the subje	ct land is by water only:			
Docking facilities (specify)		Parking facilities (sp	pecify)	
distance from subject land		distance from subje	ct land .	
distance from nearest public road		distance from neare	est public road .	
EXISTING USES of the subject land:		LENGTH OF TIME th	e existing uses of the	subject land have continued:
recidential	and the second			
TUSIMUTION				
EXISTING BUILDINGS - STRUCTURES - Wh	ere there are any buildings or	structures on the subject	t land, indicate for eac	h: `
TYPE-TESIGENTIAL NOME	Front lot line setback:		. Height in metres:	
	Rear lot line setback:		. Dimensions:	
DATE CONSTRUCTED	Side lot line setback:		. Floor area:	
	Side lot line setback:	10. Jm		
ТҮРЕ	Front lot line setback:		. Height in metres:	
DATE CONSTRUCTED	Side lot line setback:		Floor area:	
	Side lot line setback:			
			attac	h additional page if necessary
PROPOSED USES of the subject land:				
	and a state of the second			
residential				
	an and and a second of the second second			
PROPOSED BUILDINGS - STRUCTURES - V	Vhere any buildings or structu	ires are proposed to be b	uilt on the subject land	I, indicate for each:
ТҮРЕ	Front lot line setback:		Height in metres:	
	Rear lot line setback:		Dimensions: .	
	Side lot line setback:		Floor area:	
	Side lot line setback:			
ТҮРЕ•	Front lot line setback:		Height in metres:	
	Rear lot line setback:		Dimensions:	
	Side lot line setback:		Floor area:	
	Side lot line setback:			
			attac	h additional page if necessary
DATE - Subject land was acquired by current of	owner on:			
WATER is provided to the subject land by:		-		
Publicly-owned/operated piped water system	em	Lake or other w	ater body	
Privately-owned/operated individual well		Other means (s	specify)	
Privately-owned/operated communal well			and there we are	
SEWAGE DISPOSAL is provided to the subje	ct land by:			
Publicly-owned/onerated socitant sources	system	D Privately-owne	d/operated individual s	eptic system
	ic system			
Privately-owned/operated communal sept	is ayatem			

STORM DRAINAGE	E is provided to the subject la	nd by:	
Sewers	Ditches	Swales	Other means (specify)
OTHER APPLICATI	ONS - If known, indicate if th	e subject land is the subje	ect of an application under the Act for:
Approval of a pla	an of subdivision (under sect	ion 51) File #	Status
Consent (under	section 53)	File #	8-23 Status GRANTED
Previous applica	tion (under section 45)	File #	Status
		AUTH	
		DI	OWNER
, the undersigne	ed, being the owner of t	he subject land, here	by authorize
to be the applica	ant in the submission of	this application.	
t			Signature of owner
	Signature of v	vitness	Date
FJ	Bronsizes	DECLA OF API	RATION PLICANT
Edu	ardsburgh	Cardinal Cardinal	Province of Ontario
solemnly dec	clare that:		
All th	ne staitements containe	d in this application a	and provided by me are true and I make this solemn
decla	aration conscientiously	believing it to be true	e and knowing that it is of the same force and effect
as if	made under oath.		
DECLARED bef ofPre in the Prov this29.	fore me at the .F.O.C. SCOH INCC. of day of .F.U.Q Aure of commissioner,	JM ONTARIO US.H. 20 etc.	Signature of applicant Signature of Applicant Ashton Cynthia Mayes, a Commissioner, etc., Province of Ontario, for Tobin, Grenkie & Reynolds LLP Barristers & Solicitors. Expires November 1, 2024

Personal information contained on this form, collected pursuant to the *Planning Act*, will be used for the purpose of responding to the initial application. Questions should be directed to the Freedom of Information and Privacy Coordinator at the institution conducting the procedures under the Act.

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## PLANS REQUIRED

## IT WILL BE NECESSARY TO SUBMIT PRELIMINARY SITE PLANS FOR THE DEVELOPMENT AT THE TIME OF THE FILING OF THIS APPLICATION.

#### Minimum requirements will be a sketch showing the following

- i. The boundaries and dimensions of the subject land.
- ii. The location, size and type of all existing and proposed buildings and structures on the subject land, indicating the distance of the buildings or structures from the front yard lot line, rear yard lot line and the side yard lot lines.
- iii. The approximate location of all natural and artificial features on the subject land and on land that is adjacent to the subject land that, in the opinion of the applicant, may affect the application. Examples include buildings, railways, roads, watercourses, drainage ditches, river or stream banks, wetlands, wooded areas, wells and septic tanks.
- iv. The current uses on land that is adjacent to the subject land.
- v. The location, width and name of any roads within or abutting the subject land, indicating whether it is an unopened road allowance, a public travelled road, a private road or a right-of-way.
- vi. If access to the subject land is by water only, the location of the parking and docking facilities to be used.
- vii. The location and nature of any easement affecting the subject land.

FOR OFFICE USE ONLY	
Name of Owner	Address
Name of Agent	Address
Date of receipt of completed application	Checked by
Zoning By-law No	Passed
As amended by By-law No.	Passed
And By-law No	Passed
Seictions	Zone
Official Plan Designation	
Agricultural Land Use Classification in Canada: Land Invento	ry
Agricultural Land Use Classification in Canada: Land Inventor Site visit carried out by staff or committee member:	ry YES D NO D
Agricultural Land Use Classification in Canada: Land Inventor Site visit carried out by staff or committee member: Authorization of owner received (if required)	YES I NO I YES I NO I
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210 Prescott Street, Unit 1 P.O. Box 189 Kemptville, Ontario K0G 1J0 Civil • Geotechnical • Structural • Environmental • Hydrogeology •

(613) 860-0923

FAX: (613) 258-0475

REPORT ON

#### HYDROGEOLOGICAL STUDY PROPOSED RESIDENTIAL LOT SEVERANCE 27 DAVID STREET SPENCERVILLE, ONTARIO

Submitted to:

Ed Broniszeski 27 David Street Spencerville, Ontario K0E 1X0

DATE October 28, 2022

DISTRIBUTION

1 digital copy Ed Broniszeski 1 digital copy Kollaard Associates Inc.

220996

Professional Engineers Ontario

Authorized by the Association of Professional Engineers of Ontario to offer professional engineering services. Kollaard Associates Engineers 210 Prescott Street, Unit 1 P.O. Box 189 Kemptville, Ontario K0G 1J0 Civil • Geotechnical • Structural • Environmental • Hydrogeology •

(613) 860-0923

FAX: (613) 258-0475

October 28, 2022

220996

Ed Broniszeski 27 David Street Spencerville, ON K0E 1X0

#### RE: HYDROGEOLOGICAL STUDY PROPOSED RESIDENTIAL LOT SEVERANCE 27 DAVID STREET SPENCERVILLE, ONTARIO

Kollaard Associates Inc. was retained by Mr. Ed Broniszeski to undertake a hydrogeological and terrain study for a proposed residential lot severance with frontage on Charles Street in Spencerville, Ontario (Key Plan, Figure 1).

It is understood that it is being proposed to sever one residential lot of 0.09 acres, which is currently vacant. The retained parcel consists of about 0.09 hectares and is occupied by a single residence. It is identified as 27 David Street. A Lot Development Plan is provided as Figure 2.

The purpose of the severance is to allow single family dwelling on the proposed severed lot that is to be serviced by a well and the existing municipal sewer. It is understood that all residential dwellings within 500 metres are serviced by sanitary sewer, with the exception of the rural properties that are located on the opposite side of the South Nation River.

This report consists of an evaluation of the water quality and quantity for the existing well on the property.

The assessment was carried out on an existing drilled well to ensure that the water quality and quantity 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).

## HYDROGEOLOGICAL STUDY

#### **Background**

A bedrock geology map for the site area indicates the bedrock at the site consists of dolostone and sandstone of the Beekmantown Group.

The surficial geology map indicates that the proposed severed lot is located within an area of glacial till. Most of the well records for the area wells indicate that there is between 0 and 2 metres of overburden, consisting of glacial till or sand and clay.

Professional Engineers Ontario

Authorized by the Association of Professional Engineers of Ontario to offer professional engineering services. A review of topographical information from the Province of Ontario online mapping indicates that the site topography is sloped towards the south of the proposed severed lot.

No well record was available for the existing drilled well at 27 David Street. The well depth was measured to be about 59.8 metres, and the casing was indicated by the owner to extend to about 30.5 metres deep. The static water level measured at the day of the test was about 7.43 metres.

The well record and Certificate of Well Compliance for the test well and area well records are provided herein as Attachment A.

#### Area Well Records

It is understood from information provided by the owner that the well that services the existing dwelling was installed when the municipal sanitary system was put into place. The well was constructed with recommendations from a private well and sewage system study completed by MS Thomson and Associates in 1984. A review of three other well records also installed at this time was carried out. The well records are provided (Attachment A). The depths of the wells are indicated to be between 61 and 70 metres, obtaining water from a dolomite aquifer. Test pumping rates were between 19 and 45 litres per minute. Recommended pumping rates were between 15 and 38 litres per minute. Overburden thickness was between 1.8 and 2.1 metres of sand or clay. The wells had 31.1 metres of casing. Specific capacity was between 0.3 and 0.8 litres per minute per metre of drawdown.

A review of eleven area well records constructed not due to the installation of the municipal sanitary system was also carried out. The well records are provided (Attachment A). The depths of the wells are indicated to be between 12 and 55 metres, obtaining water from a limestone aquifer. Test pumping rates for the area wells were 24 to 76 litres per minute. Recommended pumping rates were between 11 and 46 litres per minute. One well record indicated no overburden. In the other ten well records, overburden was identified as between 0.6 to 2.0 metres of till, topsoil, sand or clay. All area wells had between 4.0 to 9.5 metres of casing below the ground surface. Specific capacity for area wells is between 5 and 1050 litres per minute per metre of drawdown.

The test well is considered to be representative of the expected well yields based on other area wells, specifically those installed due to the municipal sanitary system.

#### Review of MECP Report

A review of the MECP Potable Well Water Quality Survey for the Village of Spencerville, dated November 6, 2020, was carried out as a part of this report. The MECP report details an investigation completed in 2020 regarding water quality and bacteria contamination in Spencerville, and focuses on a subject property at 32 David Street.

This report contains recommendations on well construction in Spencerville, based on a previous report from 1985, due to poor water quality (from shallow contamination sources) particularly with regards to bacteria and sewage impacts from the private sewage systems. The recommended well construction was that wells should be cased to depths exceeding 25 to 32 metres. The 2020 sampling by the MOE indicated that fewer of the deeper cased wells (2 of 9 wells) had adverse bacteria results compared to some 6 of 9 wells with short casing lengths where some 67% had adverse bacteria results. The MOE indicated the following based on their 2020 well water sampling results:



Well owners with wells not conforming to the recommendations provided by Thompson (1985) and with chronic adverse water quality issues could also consider obtaining the services of a licensed well contractor to replace their existing well with one that is cased into the deeper less vulnerable aquifer. It should be noted that this recommendation is not a guarantee that potable water will be obtained; however, it would be expected to reduce the vulnerability (magnitude and frequency of adverse water quality) of the water supply and those recommendations provide above should still be followed. It should also be noted that the deeper bedrock units may produce water with elevated concentrations of iron and/or sulphur and additional treatment may be required to address them.

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The well that was sampled does comply with the recommendations of the Thompson report. As such, it is highly recommended that the future well servicing the severed lot should also be constructed similarly.

#### Water Quantity

A pumping test was carried out on October 14, 2022, on the existing drilled well at the retained lot on the subject property (27 David Street).

The testing consisted of a 6 hour duration pumping test. During the pumping test, 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. Hourly field water quality readings were recorded for the water temperature, pH, total dissolved solids (conductivity) and turbidity. After the pump was shut off, the recovery of the water level in the well was measured until about 95% recovery of static water level had been achieved or for 24 hours.

The well was pumped for about 360 minutes at a pumping rate of about 30 litres per minute. Over the course of the pumping test, the water level in the well dropped 0.31 metres in response to that rate. At the end of pumping, 100 percent recovery of the total drawdown in the static water level created during pumping was measured after about 13 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, m<sup>3</sup>/day ds is the change in drawdown over one time log cycle, m T is the transmissivity, m<sup>2</sup>/day

Based on the pumping test drawdown data, the transmissivity of the aquifer is estimated to be about  $395 \text{ m}^2$ /day. Based on the recovery data from the pumping test, the transmissivity is

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estimated to be about 132 m<sup>2</sup>/day. The aquifer parameters, such as transmissivity, can be determined more accurately by using a higher flow rate and a longer duration to establish hydraulic boundaries for the aquifer. The pumping rate and duration that were used were sufficient to confirm that the well yield is sufficient for the proposed use.

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 30 litres per minute. During the course of the pumping period, less than 1 percent of the available drawdown in the test well was utilized, based on an estimated pump depth of 56 metres and the static water level recorded the day of the pumping test (7.43 metres). The specific capacity of the well based on the pumping rate used is 81 litres per minute per metre of drawdown.

The typical residential peak demand rate is 22.5 litres per minute for a five bedroom dwelling. It is considered that the pumping rate used was sufficient to meet peak residential demands.

Based on the above noted assessment of the test well and what is known about the aquifer from adjacent wells, it is considered that future wells constructed in the same aquifer (to similar depths) on the proposed severed lots will provide sufficient water for domestic use for a residential dwelling.

#### Water Quality

During the pumping test, hourly field readings of pH, temperature, turbidity and total dissolved solids (conductivity) were recorded.

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.

Groundwater samples were prepared and preserved in the field using appropriate techniques. Chlorine residuals were measured prior to obtaining water samples for lab submission and free chlorine was measured to be zero. The water samples were submitted to Eurofins Environmental Laboratory in Ottawa, Ontario, for the chemical, physical and bacteriological analyses listed in the MECP guideline entitled Procedure D-5-5, Technical Guideline for Private Wells: Water Supply Assessment, August 1996.

The water quality as determined from the results of the analyses is acceptable. 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, hydrogen sulphide, turbidity, iron and TDS. Sodium is above the medical advisory level of 20 milligrams per litre for those who require a sodium reduced diet. The sodium level is about 57 milligrams per litre. When sodium levels exceed 20 mg/l, the local Medical Officer of Health should be informed so that the information can be relayed to local physicians.

#### Hardness

The water is considered to be moderately 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 417 to 420 milligrams per litre, which is considered poor but tolerable. Treatment using ion exchange water softeners is effective to reduce hardness.

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.

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#### Iron

Iron was measured at a level of 2.20 to 2.28 mg/l, compared to the aesthetic objective of 0.3 mg/l. Excessive iron 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. For iron levels of up to 5.0 mg/L, a manganese greensand iron filters (or other proprietary iron filter) is effective in removing iron from the water supply.

#### Turbidity

Turbidity at the well was initially recorded at less than 5 NTU (during the first two hours of the pumping test), which is acceptable for groundwater at the point of consumption. However, turbidity became elevated and even increased between about three six hours (8.0 and 20.6 NTU). The elevated turbidity measured in the field during the test was likely due to the iron deposits in the well casing and the agitation of the well surfaces created during the pumping test. Given the depth of well casing, there is significant well surface and the iron in the water and in the casing could contribute to the turbidity.

The lab based turbidity measurements for the three and six hour samples were 14.6 and 24.8 NTU, respectively. This is consistent with the field readings and also higher due to the presence of iron which can cause turbidity to exceed due to precipitation that occurs as the water sample changes temperatures and is exposed to air during storage and transportation prior to the laboratory sampling.

Water treated through an iron filter is expected to meet the required turbidity levels of less than 5 NTU in the treated water. It is considered that the untreated water has a turbidity level of less than 5 NTU (based on the first two hours of water tested using field equipment) and that treatment to reduce iron will also cause the turbidity to be less than 5 NTU in the treated water.

#### Sulphide

Sulphide was measured at levels of 0.09 and 0.12 mg/L as hydrogen sulphide, compared to the aesthetic objective of 0.05 mg/L. Excessive sulphide levels may produce black deposits on pipes and fixtures and black stains on laundered items. The sulphide can be removed using the same manganese filter that is needed for iron reduction. Proprietary filters for iron and sulphide removal as well as manganese greensand filters are effective at reducing sulphide levels of up to 1.0 and 2.5 mg/L.

#### Total Dissolved Solids

Total dissolved solids (TDS) were elevated above the aesthetic objective of 500 mg/l, about 607 to 610 mg/l. The Ryznar Stability Index (RSI) and Langelier Saturation Index (LSI) were calculated for both water samples. The RSI values for the water samples were 6.81 and 6.67 for the three and six hour samples, respectively. The LSI values for the water samples were 0.32 and 0.44 for the three and six hour samples, respectively. RSI values less than 6 indicate that the scale potential increases and values greater than 7 indicate that a calcium carbonate formation does not lead to a protective corrosion inhibiting film. In this case, the water is mildly scale forming and not corrosive. Positive values close to zero indicate borderline scale potential. In this case, the LSI values are positive, indicating borderline scale potential. Combined with the RSI values, it is likely that the water is slightly scale forming and is not corrosive. According to the Support Document for the Ontario Drinking Water Standards, Objectives and Guidelines (ODWSOG), the palatability of drinking water with a TDS level less than 500 mg/l is generally considered to be good. The effect of

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elevated TDS levels on drinking water depends on the individual components, which are principally chlorides, sulphates, calcium, magnesium and bicarbonates. Depending on which parameters are elevated, TDS exceedances can include hardness, taste, mineral deposition or corrosion. In this case, the water samples had high hardness. Sodium and chloride are both well within the aesthetic objectives and are unlikely to significantly affect the taste of the water. Hardness generally increases the mineral deposition. However, in this case, the water is not indicated to be scale forming. Based on the above noted information, it is considered that treatment to reduce hardness will reduce the potential for scale forming as it affects TDS.

-6-

#### Total Coliforms

The water samples obtained after 3 and 6 hours of pumping on October 14, 2022 both had total coliforms of 4 counts/ 100 mL with E. Coli and faecal coliforms absent.

MECP Procedure D-5-5 states the following with regards to total coliforms:

While the stated ODWS for Total Coliforms is 0 counts per 100 ml of sample, it is recognized that the objective had been set as an indicator of inadequate disinfection within the distribution systems associated with water works. For private water wells not subject to approval under the OWRA, the MOEE and Health Units have historically used the limit of <5 counts per 100 ml in the absence of a chlorine residual as indicating acceptable water quality.

As the total coliforms were within the wells allowed for existing wells and E. Coli was absent, the presence of total coliforms is considered acceptable. The owner was informed and recommendations were provided to test at least quarterly for bacteria through the public health unit.

#### RECOMMENDATIONS

The following is recommended for the construction of the future well to service the proposed severed lot with frontage on Charles Street:

- The well construction should conform with the recommended construction in the Thomson report from 2005 that was supported through the MOE report from 2020, as follows:
  - well should be cased to a depth of at least 25 to 32 metres; AND
  - the annulus of the well shall be sealed using suitable grouting and sealant for its entire length to the ground surface.

The following should be considered for expected water quality and well construction for the future well on the severed lot.

The water is considered to be hard by water treatment standards. Water with hardness above 80 to 100 milligrams per litre as CaC0<sub>3</sub> is often softened for domestic use. The hardness at the well is ~420 milligrams per litre. Treatment using ion exchange water softeners is effective to reduce hardness. 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. Sodium level in the untreated water is 57 mg/L, which is above the 20 mg/l medical advisory limit and well within the aesthetic objective of 200 mg/L. When sodium levels exceed 20 mg/l, the local Medical Officer of Health should be informed so that the information can be relayed to local physicians.

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 Total dissolved solids (TDS) may be present above the aesthetic objective of 500 mg/l in the future well. It is likely that the water is slightly scale forming. According to the Support Document for the Ontario Drinking Water Standards, Objectives and Guidelines (ODWSOG), the palatability of drinking water with a TDS level less than 500 mg/l is generally considered to be good. There is no treatment recommendation for TDS. Treatment to reduce hardness will reduce scale potential associated with elevated TDS.

-7-

Iron was measured at between 2.2 and 2.28 mg/L, compared to the aesthetic objective of 0.3 mg/L. Sulphide was measured at a level of 0.09 to 0.12 mg/L, compared to the aesthetic objective of 0.05 mg/L. Excess iron and sulphide levels may produce coloured deposits on pipes and fixtures and stains on laundered items. It also produces an unpleasant taste and odour. Both iron and sulphide may be reduced using manganese greensand filters or other proprietary filter at iron levels up to 5.0 mg/L and sulphide levels of up to 1.0 to 2.5 mg/L.

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.

#### Regards,

### Kollaard Associates Inc.



## Colleen Vermeersch, P. Eng.

Attachments:	Table I Figure 1 Figure 2 Attachment A	Summary of Hourly Field Water Quality Key Plan Site Plan Sketch Well Records TW1 Pumping Test Data
	Attachment B Attachment C	TW1-Pumping Test Data TW1-Laboratory Water Testing Results

#### TABLE I

## FIELD WATER QUALITY MEASUREMENTS FOR TEST WELL 1

<b>Time Since Pumping</b>	Temperature	рН	Turbidity	<b>Total Dissolved</b>	Conductivity	Free
Test Started	( <sup>0</sup> C)		(NTU)	Solids	(μS)	Chlorine
(min)				(ppm)		(ppm)
60	10.4	6.84	4.81	515	1034	0.00
120	10.8	7.18	4.61	498	996	-
180	11.3	7.35	8.05	488	966	-
240	11.8	7.43	15.0	476	950	-
300	11.4	7.60	13.2	481	960	-
360	12.1	7.58	20.6	490	978	-





Page 21 of 48



## ATTACHMENT A

## MECP AREA WELL RECORDS

UTM $                                     $	urces Commission	Act	WATER RESOU DIVISION 24 N JAN 191 ONTARIO WA	RCES 0 01066 965 ITER
Basin 25 dasherdala	L REU		Edward chu	MISSION
County or District - Grenville T	°ownship, Village, Τ	Cown or City		64
Con. C Lot 1.4. 9. S.		(day	month	year)
	iress Spend	erville,	Ontario.	
Casing and Screen Record		Pumping	g Test	
Inside diameter of casing 6 3/16"	Static level	20 feet		
Total length of casing 13 feet	Test-pumping r	ate 3½		G.P.M
Type of screen None	Pumping level	35 feet		
Length of screen	Duration of test	pumping	l hour	
Depth to top of screen	Water clear or cl	oudy at end of	test <b>cle</b> s	ar
Diameter of finished hole 6 <sup>th</sup>	Recommended	pumping rate	3	G.P.M
	with pump settin	ng of. 35	feet belo	w ground surfac
Well Log		<b></b>	Water	r Record
Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Grey limestone	0	40	38	fresh
For what purpose(s) is the water to be used? House Is well on upland, in valley, or on hillside? Hillside Drilling or Boring Firm J.B. Dufresne & Co. Ltd., 1014 Maitland Ave., Address OTTAWA 5, Ont. Licence Number 1307 Name of Driller or Borer R. Leniel Address Ironside, Cuebec. Date 5 October, 1964 (Signature of Licensed Driffing or Moring Contractor) Form 7 10M-62-1152	In diagra road and	Location m below show lot line. Ind 300 300 X Howe Brie grue	of Well distances of we liczte north by CTV AD CTV	Il from arroy 26 21 9
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107 20 V	™ Vater-	wwe	of Mines	1	
			nip, Village, Town or C n Village, Town or Cit Address	ity.la.du.a.a.d.s y)	drusg trær
Date completed	(month)	(year)	7		
Pipe and Casing	Record		]	Pumping Test	
Casing diameter(s) Length(s) Type of screen Length of screen	5. ind ; f.T.		Static level	gal p	
Well Log			١	Water Record	
Overburden and Bedrock Record	From ft.	To IL	Depth (s) at which water (s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
limestine rock	 	4 65	65	47	friech
For what purpose (s) is the water Null Is water clear or cloudy? Is well on upland, in valley, or on Drilling firm Address Name of Driller Address Licence Number I certify that the formula statements of fact DateGunl. 7	to be used?	and	Loc In diagram below road and lot line. // Of // // // // // // // // // // // // //	ation of Well show distances o Indicate north TH	den f well from by arrow. S PENOE AVILL.
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m Fresh Suphur		Concrete	·	Final water level end 3 4. 9 3 4. 5	1
Other	Galvanize	d		Recommended pump 4 - 4 (1, 5	-
m Fresh Sulphur	Steel	Fibreglass		Shallow Deep	4
Gas Salty Minerals	Galvanize	d		depth. 4 metres	_
Fresh Sulphur		Screen		Recommended pump 10 - 10 -	-
Gas Salty Minerals	Outside diam	Fibreglass Slot No.		(litres/min) 15 15	7
After test of well yield, water was	Plaslic C	Concrete		0 (litres/min) 25 7 25 ~	-
Clear and sediment free		Na Casisa sa Casas		If pumping discontin- ued, give reason. 30 ~ 30 ~	
		No Casing or Screen	1		-
Chlorinated A Yes No				60 60	
Plugging and Se	ealing Record	Annular space 🗌 Aban	donment	Location of Well	Ξ.
From To	pe (bentonite slurry, neat ce	ment slurry) etc. (cubic m	etres) Indicate north	by arrow.	
0 6.6 00	ich Gro	ut X		11,51,51	
		1340	21 /	Meter Meters	1
			/		
			/		
I	Method of Constructi	on			
Cable Tool Air per	(air)	Diamond Di	gging /		
Rolary (reverse) Boring		priving		Adventure	
	Water Use			( power of )	
Stock Comme	ercial	lot used	RO		
	Final Status of Well	cooling & air conditioning	Audit No.	55705 Date Well Completed	7
Water Supply Recharge w	ell 🔲 U	Infinished Abandone	d, (Olher) Was the well	owner's information Date Delivered YYYY MM DD	-
Observation well     Abandoned     Test Hole     Abandoned	poor quality	ewatering eplacement well	package delive	Pred? [Yes [No] 200/0706	
Well Con	tractor/Technician In	formation	Data Data	Ministry Use Only	
Name or Well Contractor	Drilling	C S G S	nce No. Data Source	Contractor	
Bosiness Address (street name, num	per, city etc.)	4	Date Repeived	H ANN DD Date of Inspection YYYY MM DD	Π
Name of Well Technician (last name,	(irst name)	Well Technician's Lice	nçe No. Remarks	Well Record Number	_
Sinnature at Technician Contractor	7	Dale Submitted	/		
X Acres	al	20070	m 0%		
0506E (08/2006)	4	Page	29 of 48	Cette formule est disponible en françai	is

🕅 Ontario	Ministry of Well Ta the Environment	A 052726	ver below)	Well Rec Regulation 903 Ontario Water Resource	es Act
Instructions for Completi	ng Form	405272	6	page	of
• For use in the Province	of Ontario only. This docum	nent is a permanent leg	al document. F	lease retain for future reference.	
<ul> <li>All Sections must be co</li> <li>Questions regarding con</li> </ul>	mpleted in full to avoid delay mpleting this application can	s in processing. Further be directed to the Wa	Instructions an ter Well Heln I	d explanations are available on the back of this Desk (Toll Free) at 1-888-396-9355	form.
All metre measuremen	ts shall be reported to 1/10	<sup>th</sup> of a metre.		Ministry Use Only	1
Vall Owner's Information	ue or black ink only.	MUN MUN			
wen owner's mormation					
	arma i mani ha indi			an ann a san an tarth ann an tha	
4A Chaile Sit	rect Spenceri	ville Golwan	dsburg	2 4	
HR#/Street Number/Name 54	veret Shencer	Ville Spen	Cervillage	Site/Compartment/Block/Tract etc.	
GPS Reading NAD Zo	Sturger Angle Mart	higg / Unit Make/M	Nodel Mod	e of Operation: Undifferentiated	
Log of Overburden and B	edrock Materials (see ins	$\frac{DX(A + C + A)}{\text{tructions}}$	<u>-,X</u>	Differentiated, specify	
General Colour Most common	material Other Ma	aterials	Genera	al Description Depth M	etres
Brain Dro Si	7		Gonon	From	To, 7
Pround Tap Son	Black	D.I. VL			7
Pray Umeror	ne place p	Janife		1. 0. 4.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Slay Linest	ST PLACH L	elimite_	•	6, 4 3	Bil
	I	<u> </u>			
Depth Metres Diameter	Cons	struction Record		Test of Well Yield	
From To Centimetres	lnside diam Material	Wall Depth thickness	Metres	Time Water Level Time W	ery er Level
0 6.6. 25.40	centimetres	centimetres From	То	min Metres min M	letres
0 010 2 11 4r		Casing		(metres) 40 Level 4, 6 5	
	X Steel Fibreglass			Pumping rate - 1 1 4	8
Water Record	15.2 V Plastic Concrete	0,48 0	6.6	Duration of pumping 2 (( ) 2 ()	-6-
Water found Kind of Water				hrs + min 2 4 r / 2 4	
m Fresh Sulphur				Final water level end 3 4, 3 3 4	.4
Gas Salty Minerals	Galvanized			Becommended pump	<u> </u>
I Im Eresh Sulphur	Steel Fibreglass			type.	~
Gas Salty Minerals	Plastic Concrete			Recommended pump 5 5, 1 5	
		Scroon		Becommended nump	
Gas Salty Migerals	Outside Steel	Clat Na	1	rate. (itres/m/n) 15 - 15	_
2 Olher:	diam Plastic Concrete			If flowing give rate - 20 - 20	-
After test of well yield, water was	Galvanized			C (litres/min) 25 - 25 -	-
Other, specify	No C	asing or Screen		ued, give reason. <u>30</u> <u>-</u> <u>30</u> <u>-</u> <u>30</u> <u>-</u>	
	Open hole	1	1	50 7 50 7	
V. (cs)		1	1	60 - 60 -	
Plugging and Se	aling Record Annula	r space Abandonment	In dia	Location of Well	
From To Material and typ	be (bentonite slurry, neat cement slurry	) etc. (cubic metres)	In diagram below Indicate north by	v snow distances of well from road, lot line, and building	
10 6.6 Q.	ich Grant	- 2	N	5 1 is we ILL &	
		Bass	N	U ter I TIO	<sup>s</sup> c
	and a second			· Moter	2
				$\Lambda$ $\Lambda$	
			1	L Y	
Cable Tool Cable Tool	lethod of Construction				
Rotary (conventional)	cussion Jetting	Other			
Rotary (reverse) Boring	Driving				
	Water Use	hu Dorra	0	(Dilloway)	
Stock Comme	rcial Not used	u Uther	Ra		
Irrigation Municip	al Cooling & ai	ir conditioning	Audit No.	55702 Date Well Completed	. 00
A Water Supply Recharge we		Abandoned, (Other)	Was the well on	vner's Information Date Delivered	00
Observation well Abandoned,	insufficient supply		package delivere	d? Yes No 2007 VA	00
Test Hole Abandoned,	poor quality Replacement	nt well	<b></b>	Ministry Use Only	
Name of Well Contractor		ell Contractor's Licence No.	Data Source	Contractor	
Daves uz 11	Pr. 11:15	6562	Data DIA H	C 2000	
K S V N + 5	AUCUST9	×.	Date Redelived	i ΥΛΥΥΙ MM DD Date of Inspection YYYY MM	DD
Name of Well Technician (last name, f	irst name)	Il Technician's Licence No.	Remarks	Well Record Number	1
Signal of Technician/Contractor	Dat	e Submitted			
x Jun Ti		2007 07/0%	I .		
0506E (08/2006)		Rade/30.0	48	Cette formule est disponible en fr	ançais

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Interpreter resulted in State:         Experiment         Provide Transmission         Provide T	Po	ntario	Ministr the En	y of vironment		Well Tag		1165 Decision	- 002 0	We	II R	lecord
Net Oversity Information         Description         Description <thdescriptio< td=""><td>Measurenh</td><td>ents recorded in</td><td>п: 🗵 М</td><td>etric 🗌 h</td><td>nperial</td><td></td><td>. 00</td><td></td><td>1 303 0</td><td>Page</td><td>1 1165</td><td>of</td></thdescriptio<>	Measurenh	ents recorded in	п: 🗵 М	etric 🗌 h	nperial		. 00		1 303 0	Page	1 1165	of
Term         Construction         Construction <thconstruction< th="">         Construction</thconstruction<>	Well Owr	ner's Informa	ition							1.1-1		
	First Name South Mailing Add	107 Onter Kwood B tress (Street Nur ) Toten	ice Sk Broth moor/Nan	est Name / ( Euso Co 10) unch F	nganization natru 22 W	ection N	unicipality Xford Hills	E-mail Address Province Postal Code O.N. K.O.G. (	07		Well ( by Wa o <i>fins</i>	Constructed all Owner area codel 4335
Bit Celebra Hamiltone     The Calances E Education Manual Structure Manual Structu	Address of	Well Location (S	itreet Nun	iber/Name)		T	ownship	Lot		Concession	L	
Construction     Note of a second secon	12 Cede	wS <del>L</del> trict/Municipality		七百	Ciedes	LOEST E	Edwardob	wig	Provin	38	Postal	) I Gode
Unit December Java Java Java Java Java Java Java Jav	Gre	nuille			a 8000		Spenceru	ille	Ont	ario	KOI	EIXO
Dereth rand Endrock Matandesmin Stalling Record pole Automotion on the during from the consult of the term         Dereth field         Dereth field         Dereth field         Dereth field         Dereth field         Dereth field         Offer Handes         Dereth field         Offer Handes         Dereth field         Offer Handes         Dereth field         Dereth fi	UTM Coord NAD	83184	1564	L74	965	1 FF86	Cat 3 co Pl	NUMBER	Uther			
Cancer Colum     Matter Common Material     Other Macrosh     General Exception     Interm Transmitter       Bic Curv     Linnustone     Soft I     Interm Transmitter     Soft I     Interm Transmitter       Chend Search     Linnustone     Soft I     Interm Transmitter     Soft I     Interm Transmitter       Deeph Search     Linnustone     Mathema Preset     Notem Preset     Soft I     Interm Transmitter       Control Construction     Transmitter     Mathema Preset     Soft I     Soft I     Soft I     Soft I       Construction     Interm Transmitter     Notem Preset     Soft I     Soft I     Soft I     Soft I       Construction     Interm Transmitter     Notem Preset     Soft I     Soft I     Soft I     Soft I       Construction     Interm Transmitter     Notem Preset     Soft I     Soft I     Soft I     Soft I       Construction Record - Cashing     Interm Transmitter     Notem Preset     Soft I     Soft I     Soft I     Soft I     Soft I       Construction Record - Soft I     Interm Transmitter     Notem Preset     Soft I     Soft I     Soft I     Soft I     Soft I       Construction Record - Soft I     Interm Transmitter     Notem Preset     Notem Preset     Soft I     Soft I     Soft I     Soft I	Overburde	en and Bedroc	k Materia	ils/Abando	nment Se	aling Reco	rd (see instructions on the	back of this form)			Det	sh (m#t
Stricturn     Count	General C	olour Me	ost Comm	on Material		Oth	er Materials	General Description			From	
Annular Space         Results of Well Yield Testing           Deeb Sci ((n)th Pen To         Mandar Space         Deab Sci ((n)th Maderia and Panel         Deab Sci ((n)th Maderia and Panel         Deab Sci ((n)th Pen To         Deab Sci ((n)th Maderia and Panel         Deab Sci ((n)th Pen To         Deab Sci ((n)th Maderia and Panel         Deab Sci ((n)th Pen To         Deab Sci ((n	Brow	SN (	Clai	Ċ				Jott			P T	011
Anoular Space         Results of Well Yield Testing           Depth Bits storth         Type of Sealart Load         Values Pread           Mart loc Order Job Lander was         Type of Sealart Load         Values Pread           6.35         Cervee A Pressource Group Cate Load         Type of Sealart Load           Mart loc Order Job Lander was         Type of Sealart Load         Type of Sealart Load           Mart loc Order Job Lander was         Done Job Society of Sealart Load         Type of Sealart Load           Mart loc Order Job Lander was         Done Job Society of Sealart Load         Type of Sealart Load           Mart loc Order Job Lander Was         Done Job Society of Loader Job Society Job Society of Loader Job Society Job Society of Loader	Grey	1 Lin	mast	rone				Mand		0	11	94.64
Annular Space     Results of Verify     Dead Status of Verify       Derify Status of Verify     Year 6 Status of Verify     Direct Status of Verify       No.35     Cenneral Ressource Count of Law     United Status of Verify       No.35     Cenneral Ressource Count of Law     United Status of Verify       National of Construction     Well Use     1     S. 04     S1.15       Match of Construction     Well Use     1     S. 04     S1.15       Calue Tool     During status as at roth     2     S. 04     S1.15       Rescription     During status as at roth     2     S. 04     S1.15       Rescription     During status as at roth     2     S. 04     S1.15       Rescription     During status as at roth     1     S. 0.10     4       Rescription     During status as at roth     1     S. 0.10     4       Rescription     During status as at roth     1     S. 0.10     4       Rescription     During status as at roth     1     S. 0.11     S. 0.10       Rescription     During status as at roth     1     S. 0.10     1       Rescription     During status as at roth     1     S. 0.10     1       Rescription     During status as at roth     1     S. 0.11     S. 0.11       Res												
Prime       Tory       Material and Type)       mmm         6,35       Cennerd Ressure Grout Lype)       mmm	Death Se	at at (m/H)		Annular	Space		Voluma Placed	Results of W After test of well weld, water was	ell Yiel	ld Testing aw Down	F	lecoverv
6.35       Ø       Cenned Pressure Groutskil and berneding for costs       State       St	From	To		(Material an	d Type)		(m?/ff*)	Clear and sand free	Time (min)	Water Lovel	Time	Water Level
Mathod of Construction     Well Use     5,07     5,13       Mathod of Construction     Demond     Recarding     Construction     3,5,10     3,5,10       Recard (Conventional)     Demond     Recarding     Demond     Recarding     Demond     4,5,10     4,5,10       Recard (Conventional)     Demond     Recarding     Demond     Recarding     Demond     4,5,10     4,5,10       Recard (Conventional)     Demond     Recarding     Demond     Recarding     Demond     5,11     5,00       Recard (New Conventional)     Demond     Recarding     Demond     Recarding     Demond     5,11     5,00       Recard (New Conventional)     Demond     Recarding     Status of Well     Status of Well     Demond     5,11     10,5,08       Chancer (Recard)     Demond     Recard (New Conventional)     Status of Well     Recard (New Conventional)     25,11     25,11     25,12     10,5,08       Demond     Construction Record - Series     The demond     Recard (New Conventional)     Recard (New Conventional)     25,11     25,11     25,11     25,11     25,12     10,5,00       Demond     Construction Record - Series     The demond (Record)     Recard (New Conventional)     New Conventional)     25,11     25,11     25,11     25	6.35	¢ Ce	ment	Pressi	ive Gr	outed	a16	If pumping discontinued, give reason:	Static	5.04	100005	5.15
Method of Construction       Well Use       01.3       25.10       35.11         Method of Construction       Well Overside       000000000000000000000000000000000000									1	5.07	1	5.13
Method of Construction       Well Use       01,34       3,1,0       3,1,10         Method of Construction       Dearborn       Commercial       Dearborn       Dearborn       S,1,0       4,5,1,0       4,5,1,0         Retary (Reversident)       Durate (Reversident)       Durate (Reversident)       Internation       Contractor       S,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       4,5,1,0       10,5,1,8       10,5,1,18       10,5,1,18       10,5,1,18       10,5,1,18       10,5,1,18       10,5,1,18       10,5,1,18       10,5,1,18       10,5,1,18       10,5,1,18       10,5,1,18								Pump intake set at (nv/fi)	2	5.09	2	5.12
Method of Construction         Well Use         (B) Method         <								Pumping rate (Vitrin / GPMI	3	5.10	3	5.11
Return (Convertional)       Justice of purphy         Betaury (Revendence)       Digging         Betaury (Revendence)       Digging     <	Meti	hod of Constru	Diamond	- Put	olic	Well Us	e rcia: 🗌 Not used	68.85	4	5.10	4	5,10
Burge       Depung       Industrial       Cooling & Air Conditioning       Final vessel tested and prumping cont       10       5,18       10       5,08         Cohen asserd?       Construction Record - Casing       Water Supprison       Depth (milt)       El Water Supprison       10       5,18       10       5,08         Derde asserd?       Construction Record - Casing       Water Supprison       Depth (milt)       El Water Supprison       10       5,18       10       5,08         S5,40       Open Hole Record - Screen       Construction Record - Screen       Recommended pump rate       30       5,114       20       5,115       50         S5,50       Open Hole Record - Screen       Construction       Recommended pump rate       30       5,114       30       5,115       50         S5,50       Open Hole Record - Screen       Construction Record - Screen       Construction       Asteration       Recommended pump rate       30       5,115       50       50       5,115       50       50       5,115       50       50       5,115       50       50       5,115       50       50       5,115       50       50       5,115       50       50       5,115       50       50       5,115       50       50       5,115<	Retary (	Conventional)	] Jetting ] Driving		nestic stuck	Municipa	sl  Dewatering Monitoring	$\int buration of pumping  \int brs + O min$	5	5.11	5	5.09
Dick genutation       Destination         Chain specify       Other specify         Chain specify       Other specify         Construction Record - Casing       Status of Well         Darket Rouge Music       Oppth fundly         Construction Record - Casing       Examples         Construction Record - Casing       Examples         Construction Record - Screen       Particles         Construction Record - Screen       Oppth fundly         Construction Record - Screen       Construction         Construction Record - Screen       Deck fundly         Construction Record - Screen       Construction         Construction Record - Screen       Construction         Construction Record - Screen       Construction Record - Screen         Construction Record - Screen       Contrel (mit)         Constructi	Boring	Ľ	Digging		ation	Cooling	& Air Conditioning	Final water level and of pumping (av/t	10	5.12	10	5.08
Construction Record - Casing         Derivative (email)       Depth (m/R)       Wate Support       Pram       To         35:40       Open Hole       0       <	Cther, s	ussion pecify			isinai et, specify			If flowing give rate (Imin / GPM)	15	5.12	15	5.04
Description       Contraction       They are solution       Contraction       They are solution       Contraction       Contr	teride.	Constru	uction Re	ecord - Cas	ing Dent	h (m/ft)	Status of Well	Deserves and a use doubt (w/h)	20	5.13	20	
35.40       Open Hole       9       6.35         35.88       Steel       9       6.35         15.88       Steel       9       6.35         15.55       Open Hole       6.35       94.69         16.3       Material       Naardored       90         17.14       Plaste Solution       Naardored       90         18.3       Open Hole       Fresh       Unitested       10         19.3       Gas       Other specify       Male of unitested       10         19.3       Gas       Other specify       <	Diameter (cm/in)	(Galvanized, Fit Concrete, Plast	Materiai bregiass, ic. Steeli	vvai Thickness Icovial	From	To	Replacement Web	al.34	25	5.14	25	
35.10       Operating Will         15.88       Steel       0.48       0.35         15.88       Steel       0.48       0.35         15.55       Operating Vill       0.35       0.35         15.66       Operating Vill       0.35       0.35         15.67       Operatin Vill       0.35       0.35	25 40	6	0 -	<u>.</u>	ch	1 25	Test Hole     Recharge Well	Recommended pump rate (Vmin / GPM)	30	5.14	30	
Dialo       Stell       0	15.00	Openno	0-CE	UQ	¢	6.00	Dewatering Well     Observation and/or	45,5 Well amountion (Vinie / GPM)	40	5.14	40	
DSSD_OPECHAIR       0:30       01.01       Construction         Dissol       Construction Record - Screen       Adardoned, Poor         Dissol       Material       Plastic Casvanized, Steely       Adardoned, Poor         Dissol       Material       Plastic Casvanized, Steely       Sor No       Double (m/R)         Dissol       Material       Plastic Casvanized, Steely       Sor No       Plastic Casvanized, Steely         Water found at Dopth Kind of Water       Freen       To       County Rd#31         Water found at Dopth Kind of Water       Freen       Dotto (m/R)       Diameter         Water found at Dopth Kind of Water       Freen       Dotto (m/R)       Diameter         Water found at Dopth Kind of Water       Freen       Untestee       Dotto (m/R)       Diameter         Water found at Dopth Kind of Water       Freen       Untestee       Dotto (m/R)       Diameter         Water found at Dopth Kind of Water       Freen       Untestee       Dotto (m/R)       Diameter         Business Address (Street NumberName)       Municipality       A B F F       Municipality       Diameter         Business Address (Street NumberName)       Municipality       A B F F       Diameter       Diameter         Provinco       Posta Code       Business	10:00	Steel		010	1 25	2010	Monitoring Hole		50	5.15	50	
Construction Record - Screen       Instificent Supply         Durstee       Material       Deciti (n/l)       Anandoneal, ether, specify         Darreter       Material       Stot No.       Deciti (n/l)       Anandoneal, ether, specify         Water found at Depth Kind of Water       Fresh       Mole Diameter       County Rd#31         Water found at Depth Kind of Water       Fresh       Untested       Deciti (n/l)       Deciti (n/l)       Deciti (n/l)       Deciti (n/l)         Water found at Depth Kind of Water       Fresh       Untested       Deciti (n/l)       Decit	12:22	OpenHo	16.		6.00	1911-10	(Construction)	Visintected?	60	5.15	60	*
Outstold Dameter (mixel)       Material (Plastic Gavanized, Steel)       Sot No.       Decth (m/l) From       Material To       Material (Plastic Gavanized, Steel)       Material Sot No.       Material From       Material (Plastic Gavanized, Steel)		Constr	ruction Re	ecord - Scre	en		Insufficient Supply	Map of V	lell Lo	cation		
Water Details       Hole Diameter         Water found at Dopth Kind of Water       Fresh & Untested         Depth Kind of Water       Fresh & Untested         Water found at Dopth Kind of Water       Fresh & Untested         Water found at Dopth Kind of Water       Fresh & Untested         All 3 (mith)       Gas       Other, specify         Water found at Dopth Kind of Water       Fresh & Untested         All 3 (mith)       Gas       Other, specify         Water found at Dopth Kind of Water       Fresh & Untested         All 3 (mith)       Gas       Other, specify         Water found at Dopth Kind of Water       Fresh & Untested         All 3 (mith)       Gas       Other, specify         Water found at Dopth Kind of Water       Fresh & Untested         Business Name of Well Contractor and Woll Technician Information       Well Contractor & Untested         Well Contractor       Well Contractor         Po Boox 1083       Prevince         Province       Pastar Cade       Business E-mail Address         On Stopphone No, tox, area cade!       Name of Well Technician and/or Contractor Date Submitted         Well Technician Submoton       Date Work Completed         Well Technician Submoton       Date Work Completed         Well Technician and/or Contracto	Outside Diameter	Materia (Plastic, Galvaniz	( ted, Steel)	Sict No.	Dept From	h ( <i>av/ll</i> ) — То	Water Quality Abandoned, other,	Please provide a map below following	) instruc	tons on the b	ack.	
Water found at Depth Kind of Water       Fresh KUnlested       Doth (m/tl)       Diameter         Water found at Depth Kind of Water       Fresh KUnlested       Doth (m/tl)       Grown       A         Water found at Depth Kind of Water       Fresh KUnlested       Doth (m/tl)       Grown       A         Water found at Depth Kind of Water       Fresh Kind of Water       Fresh Kind of Water       Fresh       Unlested         Water found at Depth Kind of Water       Fresh       Unlested       Go 5 34164       IS.55         (m/tl)       Gas       Other, specify       Well Contractor and Well Technician Information       Well Contractor S Upence No.         Business Name of Well Contractor       Well Contractor s Upence No.       A       B       F         Business Address (Street NumberName)       A       B       F       Municipality         PO BOX 1083       For Mane of Well Contractor Data       Municipality       Date Package Delivored       Ministry Use Only         Bus Tolognoone No, reare codel       Name of Well Contractor Data       Submitter       Date Vork Completed       Municipality         Well Exchange Street Name of Well Technician and/or Contractor Data Submitter       To Ad       No       Do 1 0 0 1 0 6       Add No         Page 31 of 4       Munupage 31 of 4       No       Do 1 0 0	lankan						specify	Court	D	1421		
Water Details       Hole Diameter         Water found at Depth Kind of Water       Fresh & Untestee       Depth (m/l)       Diameter         Water found at Depth Kind of Water       Fresh & Untestee       0.05 5 5.40         Al. 0.3 (m/l)       Gas       Other, specify       0.05 5 5.40         Water found at Depth Kind of Water       Fresh & Untestee       0.05 5 5.40         Al. 0.3 (m/l)       Gas       Other, specify       0.05 5 5.40         Water found at Depth Kind of Water       Fresh & Untestee       0.05 5 5.40         (m/l)       Gas       Other, specify       0.05 5 75.40         Water found at Depth Kind of Water       Fresh & Untestee       0.05 5 75.40         (m/l)       Gas       Other, specify       0.05 5 75.40         Well Contractor and Well Technician Information       0.05 7 75.55       0.05 7 75.55         (m/l)       Gas       Other, specify       0.00 1 8.5         Well Contractor       Well Contractor's Licence No.       0.00 1 8.5       0.00 1 8.5         Province       Postal Code       Business E-mail Address       Province       Date Package Delivered       Ministry Use Only         No       DI O O I 8.5       0.00 0 0 0 0 0       Ministry Use Only       Audit No       2.00 0 0 0 0 0       Audit No							Other, specify		146	<u>a ar</u>	T	
Water found at Depth Kind of Water       Fresh K Untested       Depth (m/ll)       Diameter         [4] (63 (m/th)       Gas       Other, specify       0       6.05       55,40         (m/th)       Gas       Other, specify       0       6.05       55,40         (m/th)       Gas       Other, specify       0       6.05       55,40         (m/th)       Gas       Other, specify       0       6.05       54,40       15,55         (m/th)       Gas       Other, specify       0       6.05       0       0       0         Water found at Depth Kind of Water       Fresh       Untested       6.05       0		N	Vater Det	ails	1999	L. Protocia	lole Diameter	A.				t
H. (b.3 (mith)       Gas       Other. specify         Water found at Depth Kind of Water       Fresh       Untested       Ø       6.05       05.40         Al. (b) (mith)       Gas       Other. specify       0.001 </td <td>Water four</td> <td>nd at Depth Kind</td> <td>t of Water</td> <td>Fresh (</td> <td>K Untested</td> <td>j Dep From</td> <td>th (m/ft) Diameter</td> <td>N</td> <td></td> <td></td> <td></td> <td>Y</td>	Water four	nd at Depth Kind	t of Water	Fresh (	K Untested	j Dep From	th (m/ft) Diameter	N				Y
Alog (mill)       Gas       Other. specify         Water found at Depth Kind of Water       Fresh       Untested         (mill)       Gas       Other. specify         Well Contractor and Well Technician Information       Well Contractor's Licence No.         Splach       Well Contractor       Well Contractor's Licence No.         Splach       Well Contractor       Well Contractor's Licence No.         Splach       Well Dr. 11 ing       A.B.F.F.         Business Address (Street Number/Name)       Municipality         PO       Box 1.0803         Province       Postal Code         Business E-mail Address       Well contractor/s Licence No.         Well connerts.       Well connerts.         Well connerts.       Well connerts.         Do N       K O E 1.TO         Business Address (Street Number/Name)       Todd         Well connerts.       Other of Well Technician (Last Name First Name)         G 13 99 5 4 8 05 Feer quarker       Todd         Well Technician s Licence No.       Signature of Technician and/or Contractor/Data Submitted         The Heat Manner       Other of the technician and/or Contractor/Data Submitted         Well technician t Licence No.       Signature of Technician and/or Contractor/Data Submitted         The Heat Manner <td>Water four</td> <td>nvft) Gas ( nd at Depth Kind</td> <td>Other, spe 1 of Water</td> <td>cify Fresh</td> <td>Untested</td> <td>Ø</td> <td>625 25.40</td> <td></td> <td></td> <td></td> <td></td> <td>FO</td>	Water four	nvft) Gas ( nd at Depth Kind	Other, spe 1 of Water	cify Fresh	Untested	Ø	625 25.40					FO
Water found at Depth Kind of Water. Fresh Untested Used Oriver found         (milt) Gas Other, specify         Well Contractor and Well Technician Information         Business Name of Well Contractor and Well Technician Information         Business Name of Well Contractor       Well Contractor's Licence No.         Splach Well Drilling       A B F F         Business Address (Street Number/Name)       Municipality         Po Box 1083       Province         Postal Code       Business E-mail Address         ON       K 0 E 1 TO         Bus Telaphone No. (and, area code)       Name of Well Technician (Last Name, First Name)         6 13 99 5 4 8 85 Fee quark Toodd       Toodd         Well contractor Success No.       Signature of Technician and/or Contractor/Data Submitted         Technician Success No.       Signature of Technician and/or Contractor/Data Submitted         Technician Success No.       Signature of Technician and/or Contractor/Data Submitted         Technician Success No.       Signature of Technician and/or Contractor/Data Submitted         Technician Success No.       Signature of Technician and/or Contractor/Data Submitted         Technician Success No.       Signature of Technician and/or Contractor/Data Submitted         Technician Success No.       Signature of Technician and/or Contractor/Data Submitted <t< td=""><td>21.030</td><td>n/lt) Gas [] (</td><td>Other, spe</td><td>city</td><td></td><td>625</td><td>24.69 15.55</td><td></td><td>1</td><td>1</td><td></td><td>Ļ.</td></t<>	21.030	n/lt) Gas [] (	Other, spe	city		625	24.69 15.55		1	1		Ļ.
Well Contractor and Well Technician Information         Business Name of Well Contractor       Well Contractor's Licence No.         Splach Well Drilling       A 8 7 7         Business Address (Street Number/Name)       Municipality         Po Box 1083       Province         Province       Postal Code         Business E-mail Address       Well contractor         Well connerts       Date Package Delivored         Ministry Use Only       Addt No.         Business For queers       Todd         Well Technician st licence No.       Yes         T Y 7 8       Mod Mark         Page 31 of 48       Page 31 of 48	Water four	nd at Depth Kind	d of Water Other isce	: Eresh cilv	Untested	(crac)	01101 15100		1	P		200
Business Name of Well Contractor       Well Contractor's Licence No.         Splach Well Drilling       4877         Business Address (Street Number/Name)       Municipality         Province       Fostal Code         Business Address       Province         ON       KOEITO         Business Address       Well contractor's Licence No.         Province       Fostal Code         Business E-mail Address       Well connerts.         ON       KOEITO         Business E-mail Address       Well connerts.         Well connerts.       Well connerts.         Well connerts.       Date Package Deliverod         Information       Book Lobrook         Well connerts.       Date Package Deliverod         Well connerts.       Z 104993         Well connerts.       Date Work Completed         Well connerts.       Date Work Completed </td <td>California.</td> <td>Well C</td> <td>ontracto</td> <td>r and Well</td> <td>Technicia</td> <td>an Informa</td> <td>tion</td> <td></td> <td>I</td> <td>100</td> <td>1</td> <td>Ů</td>	California.	Well C	ontracto	r and Well	Technicia	an Informa	tion		I	100	1	Ů
Business Address (Straet Number/Name) Municipality PO BOX 1083 Province Postal Code Business E-mail Address ON KOE 1 TO Bus Telephone No. (ms. area code) Name of Well Technician (Last Name. First Name) G 13 9 3 5 4 8 8 5 Fee quace Todd Well technician s License Na: Signature of Technician and/or Contractor Data Submitted T 4 8 Address (Straet Number/Name) Address Municipality Comments: Comment	Business N	lame of Well Con	itractor	11		We	H Contractor's Licence No. $1 \circ 7 = 7$		1	HSTH	-b	
Province Postal Code Business E-mail Address Process Address Province Postal Code Business E-mail Address Postal Code Business E-mail Addr	Business A	iddress (Street N	umber/Na	me)	)	M.	nicipality	Comments		.2014	10	
ON       KOEITO         Bus Telephone No. (ms. area code)       Name of Well Technician (Last Name, First Name)         61399354805       Fergue Xm, Todd         Well Technician S Licence No. Signature of Technician and/or Contractor Date Submitted       Date Package Delivered         THE       Odd Contractor Date Submitted         THE       Odd Contractor Date Submitted	Province	BOX 10	83 Code	Businass	E-mail Art	dress	hescott					
Bus Tolophone No. (and area code) Name of Well Technician (Last Name, First Name) 6:13/9.5548.05 Fergusch, Todd Well Technician Streens Nr. Signature of Technician and/or Contractor Data Submitted T. 4.76 Add Agg Pade 31 of 48	ON	KO	EIT	0	an order rate			Well owner's Date Package Delive	od	Minis	try Us	se Only
Well Technician's Licenson No: Signature of Technician and/or Contractor/Date Submitted	Bus Telephi [_: 1 72 k	one No. (me. area	codel Na	me of Well T	echnician (	Last Name	First Name)	package 201001	26	Audit No.	10	4993
14 to Todo per Pade 3 Por 48 20100121	Well Technic	cian's Licence No	Signature	of Technicia	n and/or C	ontractor Da	CA te Submitted	Ves Date Work Complete	1	Siles 1	2. 1	
CUBL 1220271 CEDIDATE CASE CONTRACTOR STRATEGIES 200	0506E (12.20	1 + 8	Cloc	1000	217-	9	Page 31 of	48 201001	91	Report	a Oraler	har Ontano 2010

POntario	Ministry of the Environment	Well Ta	g No. (f	nq	1166	Regulation	1 903 C	We Intario Wate	II R er Res	ecord
Measurements recorded	in: 🔀 Metric 🗌 In	nperial	1	00				Page_		af
Well Owner's Inform	ation				17 1 A		10			
Hist Name Source Control A Lock Wook Maring Address (Street Ni	d Brothers imberiName)	construi	etiwo Aunicipality		E-mail Address Province	Postal Code	T-X	Telephone N	Well ( by We n (ins	Constructed ell Owner area obdei
Well Location	o Ranch Rd	weat a	DX tord PI	1115	010	KOG I	101	6130	2.0	1000
Address of Well Location (	Street Number/Name)	T	ownship	1		Lot		Concession	(	
County/District/Municipalit	edan Otre	2 CT	LLLCU Town/Vitage	wata.			Provin	çe.	Posta	Code
Grenwill	e astad Ned	In na K	Spenc	er o Ind Subin	Number		Ont	ario	KO	EIXO
NAD 8 3 1 8 4	15646049	9653017	Parta	m Ple	an 15R - 10	11480	Saus.			
Overburden and Bedroo	ck Materials/Abandon	ment Sealing Reco	rd (see instructio	ns on the	back of this form)	Description			Der	th (四/代)
General Colour N	lost Common Material	Oth	er Materials		Gen	ieral Description			From	Te
Drown (	-lay	The second second second second			JC L	170			07	-24 19
Grey	-Incesting.				I. J.	ana			01	91.01
	ar sinta et									1
				()						
and the second s										
		1								
						a an	72			
	Annular S	Space				Results of We	ell Yiel	d Testing		1999 and 19
From To	Type of Seals (Material and	ant Used 1 Type)	Volume Pla (m <sup>1</sup> /ft <sup>3</sup> )	aced	Clear and sand	i, water was. Tree	Time	Water Level	Time	Water Level
6.25 ¢ G	ement Pressu	and Grouterd	016		Other, specify	nod alus reason	(mm) Static	(mit)	(min)	(80%)
					Tri tranibu di creconco	una, give reason.	Level	0.01	-	5.335
					Pump intake set at	(m/ft)	-	5.29		5.31
					a1.34	4	2	2.94	2	5,30
Method of Constr	ruction	Well Us	e		Pumping rate (Vinin	/ GPMI	3	5.295	3	5.245
Cable Tool [ K Retacy (Conventional) [	Dramond Public P	ic 🗌 Comme restic 🗍 Municin	reial 🗌 Net al 🗌 Des	t used watering	Duration of pumpin	9-2	4	5,30	4	5.29
Rotary (Reverse)	Driving	stock	le 🚺 Mo	initoring	L hrs + Q	min of pumping (co.@)	ð	5.30	5	2.9
Air percussion	Ungging Indus	strial	a All Gozal(IO(a)	9	5.33	35	10	5.31	10	5:985
Other, specify	Othe	ir, specify	Chattan at	10/-11	If flowing give rate (	i/min / GPM)	15	5.32	15	5.28
Inside Open Hole OR	Material Wall	Depth (nx/l)	Water Supr	ply	Recommended pur	np depth (m/it)	20	5.32	20	5.275
(Galvaozed, Fi (Galvaozed, Fi Concrete, Plas	tic, Steel) (cavin)	From To	Replaceme	int Well	<u>a</u> 1.3	34	25	5.32	25	5.27
25.40 Opent	tole	\$ 6.25	Recharge V	Nell	(Vinin / GPM)	C_	30	5.335	30	
15,88 Steel	.48	\$ 6.25	C Dewatering	1 and/or	Well production (th	iin / GPM)	40	5.33	40	
15.55 Goen H	ole (	6.35 24.69	Alteration	TURE	Disinfected?		50	5.33	50	
-Size - Star			Abandoned	t,	X Yes No		60	5.335	60	4
Const	ruction Record - Scree	n	Abandoned	i, Poor	Please provide a ma	Map of W	ell Loo	cation	ark	
Diameter (cmsh) (Plastic, Galvani	ai zed. Steel) Slot No.	From To	Abandoned	i, otner	r course province in the	ih round tourneid	C .	or star	21t	191
			specary					o cuory		T
			Other, spec	cify		4	1			L
v	Vater Details	H	lole Diameter	1941		/	10			18
Water found at Depth Kin	d of Water: Fresh 😡	Untested Dep From	th ( <i>m/ft</i> ) D	iameter (crivin)						FS
Water found at Depth Kin	other, specify d of Water: Fresh 📈		6.25 2	540			1,	.sa] @ 31	5.48	1 3
19-20(m/ft) Gas	Other, specify	6.25	24.69 19	5.55			16	10	1	• 5
(m/ft) Gas	d of Water.  Fresh   Other. soecify	Untested	o no ju				í.			Ů
Well C	Contractor and Well T	echnician Informa	tion	Sana a			1			
Business Name of Well Co	ntractor	We	Il Contractor's Libe	ence No.			1	L	1	
Business Address (Street N	Jumber/Name)	ng Mu	nicipality		Comments	and the second state of th	1			1
PO BOX 10	83 Code Business	F-mail Address	resco	77						
ON KO	EITO	-mail mulless			Well owner's Date	Package Deliver	ed	Minis	try Us	e Only
Bus Telephone No (inc. area	code) Name of Well Te	chnician (Last Name.	First Name)		package 2.	10010	56	Audit No.	10.	4994
Well Technician's Licence No.	Signature of Technician	and/or Contractor Da	A te Submitted		X Yes	Work Completed				1004
T478	Jodd Her	yen 2	Pade	2 df	48 a (	10010	91	MAR	22	2010
0009# ((202007)		<i>~</i>	Ministry	s Copy				© Galeen s	Phnter	Int Cotario (2007

Ontario Ministry of the Environment	Well Tag No. (Place Sticker and for Print Relow) Tag#: A133708	Well Record Regulation 903 Ontario Water Resources Act
Measurements recorded in: 📋 Metric 🛛 🖄 Imperial		
Address of Well Location (Street Number/Name)	Township	Lot Concession
County/District/Municipality	City/Town/Village	Province Postal Code
UTM Coordinates Zone, Easting Northing	Municipal Plan and Sublot Number	Officiario COELIZO
NAD 8 3 1845657114365	1891 Plan 40	
Overburden and Bedrock Materials/Abandonment Se General Colour Most Common Material	aling Record (see instructions on the back of this form) Other Materials Ge	neral Description Depth ( <i>mlft</i> ) From L To
Rad Sand Fill		Soft Ø 5'
Brown Sandy Clay	Pa	ided 51661
Grey Limestone	Broke	m Soft 66" 25'
Grey Limestone	Ha	rd 25' 101'
1		
Depth Set at ( <i>m/ft</i> ) Type of Sealant Used	Volume Placed After test of well yiel	d, water was: Draw Down Recovery
From To (Material and Type)	(m³/ft³) Declear and san	d free Time Water Level Time Water Level (min) (m/ft) (min) (m/ft)
31 9 Cement Pressure	Grande d 20,5   If pumping discontin	nued, give reason: Static 7,8 23,4
		1 15 1 14
	Pump intake set at	(m/ft) 2 18 2 10.7
	Pumping rate (#mir	+1 GPM) 3 19.7 3 9.4
Method of Construction	Well Use 30	4 2017 4 8.8
Rotary (Conventional)     Jetting     Livestock	Municipal     Dewatering     Devatering     Test Hole     Monitoring     hrs + O	min 5 214 5 8.5
Boring     Digging     Irrigation	Cooling & Air Conditioning	d of pumping (m/ft) 10 22, 6 10 8, 1
Other, specify Other, specify	If flowing give rate	(Ilmin I GPM) 15 22, 9 15 9
Construction Record - Casing	Status of Well	20 23 20 7,9
Diameter (Galvanized, Fibreglass, Thickness (cm/in) Concrete Plastic Steel) (cm/in) From	To Replacement Well	25 23, 2 25 7,9
	Test Hole Recommended pu	mp rate 30 23,3 30 7,9
IV I'M I LOG d	Dewatering Well	40 23, 4 40
14 steel olo p		50 23, 4 50
618 Upen Mole 31	(Construction) Disinfected?	60 23,4 60
Construction Record - Screen	Insufficient Supply	Map of Well Location
Outside Material Diameter (Plantic Columpted Start) Slot No.	n (m/ft) Water Quality Please provide a ma	ap below following instructions on the back.
(cm/in) (Fibilit, Garvanized, Gleck) From	specify	County Rd#21
	Other, specify	A]
		t
Water Details Water found at Depth Kind of Water: Fresh K Untested	Depth ( <i>mlft</i> ) Diameter	
	$rac{1}{10}$	22
Water found at Depth Kind of Water: ☐ Fresh ∑Ontested	\$ 31 10 21' 101' 1 Vo''	
Water found at Depth Kind of Water: Fresh Untested	31 101 618	З <sup>р</sup>
(m/ft) Gas Other, specify	n Information	
Business Name of Well Contractor	Well Contractor's Licence No.	4 1-1 <sup>40</sup>
Jusiness Address (Street Number/Name)	Municipality Comments:	
POBOX 1083	Prescott 160chl	orine after Drilling +
Province Postal Code Business E-mail Add		Package Delivered Ministry Use Only
Bus. Telephone No. (inc. area code) Name of Well Technician (L	ast Name, First Name) package	Audit No.
Vall Technician's Liganze Ma Signature of Technician and the	Todd delivered Date	Work Completed Z 167094
THIP TO HARD	201 BOH 20 No 20	BOHID Receiver 2 0 0000
Not for the second seco		174 14 6 2 2013

Ministry's Copy Page 33 of 48

1000 TW1-WELL DRAWDOWN VS. TIME-KOLLAARD FILE 220996 Q = 43.2 m³/day (30 LPM) T = 2.3Q / 4pi(ds) ds = 0.02 m T = 395.3 m²/day 100 TIME LAPSED (minutes) ds = 0.02 m10 Pump Rate adjusted 13 0.0 0.6 -0.1 0.5 0.7 0.1 0.3 0.4 0.2 (zenterne) HT9AD NWODWAAD

Page 34 of 48

Fime Lapsed	Abs Pres	Temp	Water Level	Drawdowr
(minutes)	(kPa)	(°C)	(m)	(m)
1	397.844	9.275	-7.412	-0.01
2	391.342	9.275	-8.065	0.65
3	393.618	9.275	-7.833	0.42
4	394.658	9.275	-7.727	0.32
5	393.405	9.176	-7.855	0.30
7	394.12	9.176	-7.782	0.37
8	394.38	9.176	-7.755	0.34
9	394.38	9.176	-7.755	0.34
10	394.478	9.176	-7.755	0.33
12	394.363	9.077	-7.757	0.35
13	394.363	9.077	-7.757	0.35
14	394.265	9.077	-7.767	0.36
15	394.038	9.077	-7.79	0.38
10	394.005	9.077	-7.793	0.39
18	394.005	9.077	-7.793	0.38
19	394.135	9.077	-7.78	0.37
20	394.233	9.077	-7.77	0.36
21	394.395	9.077	-7.754	0.34
22	394.525	9.077	-7.74	0.33
24	394.46	9.077	-7.747	0.34
25	394.493	9.077	-7.744	0.33
26	394.525	9.077	-7.74	0.33
27	394.33	9.077	-7.76	0.35
28	394.428	9.077	-7.75	0.34
30	394.363	9.077	-7.757	0.35
31	394.363	9.077	-7.757	0.35
32	394.363	9.077	-7.757	0.35
33	394.395	9.077	-7.754	0.34
34	394.525	9.077	-7.74	0.33
35	394.428	9.077	-7 754	0.34
37	394.395	9.077	-7.754	0.34
38	394.493	9.077	-7.744	0.33
39	394.59	9.077	-7.734	0.32
40	394.59	9.077	-7.734	0.32
41	394.688	9.077	-7.724	0.31
42	394.655	9.077	-7.727	0.32
44	394.33	9.077	-7.76	0.35
45	394.33	9.077	-7.76	0.35
46	394.428	9.077	-7.75	0.34
47	394.558	9.077	-7.737	0.33
40	394.558	9.077	-7.73	0.33
50	394.655	9.077	-7.727	0.32
51	394.623	9.077	-7.73	0.32
52	394.688	9.077	-7.724	0.31
53	394.655	9.077	-7.727	0.32
55	394.655	9.077	-7.737	0.32
56	394.655	9.077	-7.727	0.32
57	394.688	9.077	-7.724	0.31
58	394.655	9.077	-7.727	0.32
59	394.655	9.077	-7.727	0.32
61	394.688	9.077	-7.724	0.32
62	394.72	9.077	-7.721	0.31
63	394.623	9.077	-7.73	0.32
64	394.493	9.077	-7.744	0.33
65	394.428	9.077	-7.75	0.34
67	394.493	9.077	-7.744	0.33
68	394.59	9.077	-7.734	0.32
69	394.623	9.077	-7.73	0.32
70	394.655	9.077	-7.727	0.32
71	394.655	9.077	-7.727	0.32
72	394.72	9.077	-7.721	0.31
74	394.623	9.077	-7.73	0.32
75	394.655	9.077	-7.727	0.32
76	394.688	9.077	-7.724	0.31
77	394.688	9.077	-7.724	0.31
78	394.688	9.077	-7.724	0.31
80	394.72	9.077	-7.721	0.31
81	394.688	9.077	-7.724	0.31
82	394.655	9.077	-7.727	0.32
83	394.655	9.077	-7.727	0.32
84	394.655	9.077	-7.727	0.32
85	394.623	9.077	-7.73	0.32
85 87	394.753	9.077	-7./1/	0.31
	534.010	2.011	7.711	0.30

89	394.72	9.077	-7.721	0.31
90	394.753	9.077	-7.717	0.31
91	394.72	9.077	-7.721	0.31
97	394 655	9.077	-7 727	0.32
02	204 77	9.077	7 721	0.31
04	204 795	9.077	7 714	0.30
05	204 72	9.077	-7 771	0.30
95	394.72	9.077	-7.721	0.31
96	394.72	9.077	-7.721	0.51
97	394.753	9.077	-/./1/	0.31
98	394.785	9.077	-7.714	0.30
99	394.785	9.077	-7.714	0.30
100	394.785	9.077	-7.714	0.30
101	394.655	9.077	-7.727	0.32
102	394.688	9.077	-7.724	0.31
103	394.72	9.077	-7.721	0.31
104	394.753	9.077	-7.717	0.31
105	394.753	9.077	-7.717	0.31
106	394.785	9.077	-7.714	0.30
107	394.85	9.077	-7.707	0.30
108	394,785	9.077	-7.714	0.30
109	394,818	9.077	-7.711	0.30
110	394,785	9.077	-7.714	0.30
111	39/ 72	9.077	-7 721	0.31
117	204 655	D.077	7.721	0.32
112	394.033	9.077	-7.727	0.32
115	394.033	9.077	-7.727	0.32
114	394.72	9.077	-7.721	0.31
115	394.72	9.077	-7.721	0.31
116	394.818	9.077	-7.711	0.30
117	394.785	9.077	-7.714	0.30
118	394.818	9.077	-7.711	0.30
119	394.785	9.077	-7.714	0.30
120	394.72	9.077	-7.721	0.31
121	394.818	9.077	-7.711	0.30
122	394.818	9.077	-7.711	0.30
123	394.85	9.077	-7.707	0.30
124	394.883	9.077	-7.704	0.29
125	394.85	9.077	-7.707	0.30
126	394.883	9.077	-7.704	0.29
127	394,948	9.077	-7.697	0.29
128	394.85	9.077	-7.707	0.30
129	394 785	9.077	-7.714	0.30
120	394.85	9.077	-7 707	0.30
121	304.049	9.077	7.697	0.30
131	304.940	0.077	7.704	0.25
132	394.885	9.077	-7.704	0.29
133	394.85	9.077	-7.707	0.30
134	394.818	9.077	-7.711	0.30
135	394.85	9.077	-7.707	0.30
136	394.818	9.077	-7./11	0.30
137	394.85	9.077	-7.707	0.30
138	394.753	9.077	-7.717	0.31
139	394.785	9.077	-7.714	0.30
140	394.85	9.077	-7.707	0.30
141	394.818	9.077	-7.711	0.30
142	394.818	9.077	-7.711	0.30
143	394.818	9.077	-7.711	0.30
144	394.85	9.077	-7.707	0.30
145	394.85	9.077	-7.707	0.30
146	394.85	9.077	-7.707	0.30
147	394.948	9.077	-7.697	0.29
148	394.818	9.077	-7.711	0.30
149	394,818	9.077	-7.711	0.30
150	394,915	9.077	-7.701	0.29
151	394.85	9.077	-7 707	0.30
157	394.915	9.077	-7 701	0.30
152	204 992	0.077	7.701	0.25
155	394.003	9.077	-7.704	0.29
154	394.865	9.077	-7.704	0.29
122	304.785	9.077	-7.714	0.30
156	394.753	9.077	-7.717	0.31
15/	394./53	9.077	-7./1/	0.31
158	394.72	9.077	-7.721	0.31
159	394.72	9.077	-7.721	0.31
160	394.753	9.077	-7.717	0.31
161	394.818	9.077	-7.711	0.30
162	394.818	9.077	-7.711	0.30
163	394.688	9.077	-7.724	0.31
164	394.753	9.077	-7.717	0.31
165	394.785	9.077	-7.714	0.30
166	394.85	9.077	-7.707	0.30
167	394.753	9.077	-7.717	0.31
168	394.753	9.077	-7.717	0.31
169	394.623	9.077	-7.73	0.32
170	394.688	9.077	-7.724	0.31
171	394.72	9.077	-7.721	0.31
177	394 753	9,077	-7,717	0.31
173	394.85	9.077	-7.707	0.30
174	394 819	9.077	-7 711	0.30
175	39/ 85	9 077	-7 707	0.30
175	39/ 015	9,077	-7 701	0.50
177	394.015	9.077	.7 701	0.25
170	334.915	9.077	-7.701	0.29
178	394.785	9.0//	-7./14	0.30
1/9	394.818	9.077	-7.711	0.30
180	394.85	9.077	-7.707	0.30
181	394.883	9.077	-7.704	0.29
182	394.883	9.077	-7.704	0.29
183	394.883	9.077	-7.704	0.29

184	394.85	9.077	-7.707	0.30
195	30/ 85	9.077	-7 707	0.30
105	334.05	5.077	7.707	0.30
186	394.85	9.077	-7.707	0.30
187	394.948	9.077	-7.697	0.29
188	394.883	9.077	-7.704	0.29
189	394.915	9.077	-7.701	0.29
190	394 785	9.077	.7 714	0.30
101	304.705	0.077	7.714	0.30
191	354.65	9.077	7.707	0.30
192	394.753	9.077	-/./1/	0.31
193	394.818	9.077	-7.711	0.30
194	394.72	9.077	-7.721	0.31
195	394.883	9.077	-7.704	0.29
196	39/ 818	9.077	.7 711	0.30
107	204 992	0.077	7 704	0.29
197	354.003	5.077	7.704	0.25
198	394.915	9.077	-7.701	0.29
199	394.883	9.077	-7.704	0.29
200	394.915	9.077	-7.701	0.29
201	394.818	9.077	-7.711	0.30
202	394,818	9.077	-7.711	0.30
202	204.95	0.077	7 707	0.30
205	394.03	9.077	-7.707	0.30
204	394.85	9.077	-7.707	0.50
205	394.785	9.077	-7.714	0.30
206	394.753	9.077	-7.717	0.31
207	394.753	9.077	-7.717	0.31
208	394 753	9.077	-7 717	0.31
200	204 785	9.077	-7 714	0.30
203	304.705	0.077	7.714	0.30
210	394.688	9.077	-7.724	0.51
211	394.753	9.077	-7.717	0.31
212	394.753	9.077	-7.717	0.31
213	394.818	9.077	-7.711	0.30
214	394,785	9.077	-7.714	0.30
215	394 785	9.077	.7 714	0.30
215	394.703	9.077	7.714	0.30
216	394.655	9.077	-1.121	0.32
217	394.59	9.077	-7.734	0.32
218	394.525	9.077	-7.74	0.33
219	394.623	9.077	-7.73	0.32
220	394,655	9.077	-7.727	0.32
221	304 77	9.077	-7 721	0.31
221	304.72	0.077	7,721	0.31
222	394.72	9.077	-7.721	0.31
223	394.753	9.077	-7.717	0.31
224	394.785	9.077	-7.714	0.30
225	394.753	9.077	-7.717	0.31
226	394.818	9.077	-7.711	0.30
222	394 655	9.077	-7 777	0.32
227	304.305	0.077	7.727	0.30
228	394.785	9.077	-7.714	0.30
229	394.753	9.077	-7.717	0.31
230	394.753	9.077	-7.717	0.31
231	394.785	9.077	-7.714	0.30
232	394.818	9.077	-7.711	0.30
223	394 818	9.077	-7 711	0.30
233	304.010	0.077	7.711	0.30
234	594.616	9.077	-7.711	0.30
235	394.883	9.077	-7.704	0.29
236	394.72	9.077	-7.721	0.31
237	394.72	9.077	-7.721	0.31
238	394,785	9.077	-7.714	0.30
239	394.85	9.077	-7.707	0.30
235	204 795	0.077	7 714	0.30
240	594.765	9.077	-7.714	0.30
241	394.818	9.077	-7.711	0.30
242	394.85	9.077	-7.707	0.30
243	394.85	9.077	-7.707	0.30
244	394.883	9.077	-7.704	0.29
245	394 785	9 077	-7 714	0.30
245	204 753	9.077	7 717	0.31
246	594.755	5.077	-7.717	0.31
247	394.85	9.077	-7.707	0.30
248	394.85	9.077	-7.707	0.30
249	394.85	9.077	-7.707	0.30
250	394.818	9.077	-7.711	0.30
251	394.948	9.077	-7.697	0.29
252	394.818	9.077	-7.711	0.30
252	394 883	9.077	-7 704	0.29
255	204.005	9.077	7 707	0.20
234	354.65	5.077	-7.707	0.30
255	394.688	9.077	-1.124	0.31
256	394.72	9.077	-7.721	0.31
257	394.753	9.077	-7.717	0.31
258	394.818	9.077	-7.711	0.30
259	394.785	9.077	-7.714	0.30
250	20/ 90	0.077	-7 707	0.20
200	334.03	0.077	7.707	0.30
261	394.85	9.077	-7.707	0.30
262	394.85	9.077	-7.707	0.30
263	394.85	9.077	-7.707	0.30
264	394.72	9.077	-7.721	0.31
265	394.72	9.077	-7.721	0.31
266	394 818	9.077	-7 711	0 30
200	204.010	0.077	7.711	0.30
267	594.72	9.077	-7.721	0.51
268	394.46	9.077	-7.747	0.34
269	394.558	9.077	-7.737	0.33
270	394.72	9.077	-7.721	0.31
271	394.818	9.077	-7.711	0.30
272	394 818	9 077	-7.711	0.30
272	204 77	9.077	.7 731	0.30
273	394.72	9.077	-7.721	0.31
274	394.72	9.077	-7.721	0.31
275	394.818	9.077	-7.711	0.30
276	394.818	9.077	-7.711	0.30
277	394.85	9.077	-7.707	0.30
278	394,785	9.077	-7.714	0.30
				9. Constants

1	279	394.883	9.077	-7.704	0.29
	280	394 818	9.077	-7.711	0.30
	200	204 95	9.077	.7 707	0.30
	201	394.85	5.077	7.707	0.30
	282	394.85	9.077	-7.707	0.50
	283	394.785	9.077	-7.714	0.30
	284	394.818	9.077	-7.711	0.30
	285	394.818	9.077	-7.711	0.30
	286	394.883	9.077	-7.704	0.29
	200	204 95	0.077	7 707	0.30
	207	204.007	0.077	7.704	0.30
	288	394.885	9.077	-7.704	0.29
	289	394.85	9.077	-7.707	0.30
	290	394.915	9.077	-7.701	0.29
	291	394.883	9.077	-7.704	0.29
	292	394.72	9.077	-7.721	0.31
	293	394.818	9.077	-7.711	0.30
	204	204 85	9.077	-7 707	0.30
	204	304.05	0.077	7.707	0.30
	295	594.72	9.077	-7.721	0.31
	296	394.558	9.077	-1./3/	0.33
	297	394.558	9.077	-7.737	0.33
	298	394.818	9.077	-7.711	0.30
	299	394.818	9.077	-7.711	0.30
	300	394,493	9.077	-7.744	0.33
	301	30/ /03	9.077	.7 744	0 33
	303	304.455	0.077	7.744	0.32
	302	304.000	0.077	7 774	0.31
	303	394.688	9.077	-7.724	0.31
	304	394.655	9.077	-7.727	0.32
	305	394.525	9.077	-7.74	0.33
	306	394.623	9.077	-7.73	0.32
	307	394.72	9.077	-7.721	0.31
	308	394.85	9.077	-7.707	0.30
	300	39/ 59	9.077	-7 734	0.32
	310	304.55	9.077	-7 724	0.32
	510	394.59	5.077	-7.734	0.32
	311	394.655	9.077	-1.121	0.32
	312	394.753	9.077	-7.717	0.31
	313	394.818	9.077	-7.711	0.30
	314	394.883	9.077	-7.704	0.29
	315	394.85	9.077	-7.707	0.30
	316	394.883	9.077	-7.704	0.29
	317	394.915	9.077	-7.701	0.29
	318	394.85	9.077	-7.707	0.30
	319	394.818	9.077	-7.711	0.30
	320	396 378	9.077	-7.551	0.14
	321	396 541	9.077	-7 535	0.12
	321	206 606	9.077	7.528	0.12
	322	390.000	5.077	7.520	0.12
	323	396.476	9.077	-7.541	0.13
	324	396.541	9.077	-7.535	0.12
	325	396.833	9.077	-7.505	0.09
	326	396.638	9.077	-7.525	0.11
	327	396.671	9.077	-7.522	0.11
	328	396.703	9.077	-7.518	0.11
	329	396.573	9.077	-7.532	0.12
	330	396.703	9.077	-7.518	0.11
	331	396.736	9.077	-7.515	0.10
	332	396 736	9,077	-7.515	0.10
	322	396 736	9.077	-7 515	0.10
	224	306 769	9.077	.7 517	0.10
	334	206 671	5.077	7 533	0.10
	222	350.071	0.077	7.522	0.10
	336	390.730	9.077	-7.515	0.10
	337	396.768	9.077	-7.512	0.10
	338	396.768	9.077	-7.512	0.10
	339	396.768	9.077	-7.512	0.10
	340	396.801	9.077	-7.508	0.10
	341	396.606	9.077	-7.528	0.12
	342	396.541	9.077	-7.535	0.12
	343	396,703	9.077	-7.518	0.11
	344	396 605	9.077	-7.528	0.12
	345	396.671	9,077	-7.522	0.11
	346	396 736	9.077	-7.515	0.10
	247	306 736	9.077	-7 515	0.10
	547	350.750	0.077	7 513	0.10
	348	396.768	9.077	-7.512	0.10
	349	396.736	9.077	-7.515	0.10
	350	396.768	9.077	-7.512	0.10
	351	396.736	9.077	-7.515	0.10
	352	396.606	9.077	-7.528	0.12
	353	396.541	9.077	-7.535	0.12
	354	396.606	9.077	-7.528	0.12
	355	396.736	9.077	-7.515	0.10
	356	396.768	9.077	-7.512	0.10
	357	396.801	9.077	-7.508	0.10
	358	396 801	9,077	-7,508	0.10
	350	396 933	9.077	-7 505	0.09
	350	396,033	9.077	-7 505	0.09
		330.033	5.077	-7.505	0.05

TW1- WELL RECOVERY VS. TIME - KOLLAARD FILE 220996



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## Kollaard File 220996 RECOVERY DATA TW-1

ť'	t/ť	Abs Pres	Temp	Water Level	Drawdown	Recovery
		(kPa)	(°C)	(m)	(m)	(%)
1	361	397.061	9.077	-7.482	0.07	25%
2	181.0	397.158	9.077	-7.472	0.06	35%
3	121.0	397.321	9.077	-7.455	0.04	54%
4	91.0	397.516	9.077	-7.435	0.02	75%
5	73.0	397.516	9.077	-7.435	0.02	75%
6	61.0	397.581	9.077	-7.429	0.02	82%
7	52.4	397.516	9.077	-7.435	0.02	75%
8	46.0	397.646	9.077	-7.422	0.01	89%
9	41.0	397.581	9.077	-7.429	0.02	82%
10	37.0	397.646	9.077	-7.422	0.01	89%
11	33.7	397.581	9.077	-7.429	0.02	82%
12	31.0	397.581	9.077	-7.429	0.02	82%
13	28.7	397.776	9.077	-7.409	0.00	103%



## ATTACHMENT C

## WATER QUALITY RESULTS

Civil • Geotechnical • Structural • Environmental • Hydrogeology

ear Colleen Vermeersch: lease find attached the analytical results for your samples. If you have any qui sport Comments:
fins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian editation. The scope is available at: <u>https://directory.cala.ca/</u> .
reditation. The scope is available at: <u>https://directory.cala.ca/</u> . ofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry 18). A copy of the license is available upon request. ofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Minist ase note: Field data, where presented on the report, has been provided by the client and is p

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Environment Testing

210 Prescott St., Box 189

Kemptville, ON

Kollaard Associates Inc.

Client:

K0G 1J0 Ms. Colleen Vermeersch

Kollaard Associates Inc.

Invoice to: Attention: PO#:

**Certificate of Analysis** 

1988079	2022-10-14	2022-10-21	220996	901489	
Report Number:	Date Submitted:	Date Reported:	Project:	COC #:	

1656461 Water

1656460 Water

1656461 Water 2022-10-14 TW1-6 hrs		0.159	0.508	1.0
1656460 Water 2022-10-14 TW1-3 hrs		0.153	0.260	1.0
Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	Guideline			
	Units	mg/L	mg/L	mg/L
	MRL	0.020	0.100	0.1
	Analyte	N-NH3	Total Kjeldahl Nitrogen	Tannin & Lignin
	Group	Nutrients		Subcontract

\* = Guideline Exceedence Guideline = ODWSOG

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

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Page 3 of 7

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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**Certificate of Analysis** 

Environment Testing

2022-10-14 2022-10-21 1988079

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Report Number: Date Submitted: Date Reported: Project: COC #:

220996 901489

210 Prescott St., Box 189 Kollaard Associates Inc. Kemptville, ON K0G 1J0 Attention: Client: PO#:

Ms. Colleen Vermeersch

Kollaard Associates Inc. Invoice to: QC Summary

Ar	nalyte	Blank		QC % Rec	QC Limits
Run No 431422 Method AMBCOLM1	Analysis/Extraction Date 20	22-10-16	Analyst	L V	
Escherichia Coli					
Heterotrophic Pla	Ite Count				
Total Coliforms					
Run No 431424 Method C SM2130B	Analysis/Extraction Date 20	22-10-15	Analyst	ĊĶ	
Turbidity		<0.1 NTU		100	70-130
Run No 431472 Method EPA 200.8	Analysis/Extraction Date 20	22-10-17	Analyst	SD	
Iron		<0.03 mg/L		107	80-120
Manganese		<0.01 mg/L		104	80-120
Run No 431474 Method C SM4500-S2	Analysis/Extraction Date 20 2-D	22-10-17	Analyst	ACG	
S2-		<0.01 mg/L		101	80-120
Run No 431497 Method SM 4110	Analysis/Extraction Date 20	22-10-18	Analyst	AaN	
N-NO2		<0.10 mg/L		98	90-110
N-NO3		<0.10 mg/L		98	90-110

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

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

\* = Guideline Exceedence

Guideline = ODWSOG

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Page 4 of 7

	onment Testing		89
ofins		Kollaard Associates Inc	210 Prescott St., Box 1
🐝 euro		Client:	

Ms. Colleen Vermeersch

Attention: PO#: Invoice to:

Kemptville, ON K0G 1J0 Kollaard Associates Inc.

**Certificate of Analysis** 

 Report Number:
 1988079

 Date Submitted:
 2022-10-14

 Date Reported:
 2022-10-21

 Project:
 202096

 COC #:
 901489

QC Summary

SO4SO4 $< 1 m g/L$ $= 95$ Run No $< 31504$ Analysis/Extraction Date $< 1 m g/L$ $= 95$ MethodC SM2120C $< 2 m alysis/Extraction Date$	Analyte	Blank	QC % Rec	QC Limits
Run No431504Analysis/Extraction Date $2022-10-18$ Analysis/A	S04	<1 mg/L	95	90-110
Colour (True)       <2 TCU	Run No 431504 Analysis/Extraction Date 2 Method C SM2120C	022-10-18 Ani	alyst ACG	
Run No         431520         Analysis/Extraction Date         2022-10-18         Analysi         Z         S           Method         MSM3120B-3500C         <1 mg/L	Colour (True)	<2 TCU	100	90-110
Calcium $<1 mg/L$ $104$ Potassium $<1 mg/L$ $110$ Nagnesium $<1 mg/L$ $110$ Magnesium $<1 mg/L$ $107$ Sodium $<1 mg/L$ $107$ Nethod SM 4110 $<1 mg/L$ $107$ Chloride $<5 mg/L$ $Analysis/Extraction DateChloride<1004<5 mg/L98Run No 431558Analysis/Extraction Date2022-10-18AnalysiRun No 431558Analysis/Extraction Date2022-10-18AnalysiRun No 431558Analysis/Extraction Date2022-10-18AnalysiRun No 431558Analysis/Extraction Date2022-10-18AnalysiRun No 431558Analysis/Extraction Date<5 mg/L98Alkalinity (CaCO3)<5 mg/L<0.10 mg/L100F<0.10 mg/L<0.10 mg/L100$	Run No 431520 Analysis/Extraction Date 2 Method M SM3120B-3500C	022-10-18 Ani	alyst Z S	
Potassium<1 mg/L11Magnesium<1 mg/L	Calcium	<1 mg/L	104	90-110
Magnesium       <1 mg/L	Potassium	<1 mg/L	110	87-113
Sodium       <1 mg/L	Magnesium	<1 mg/L	102	76-124
Run No         431556         Analysis/Extraction Date         2022-10-19         Analysi         Aan           Method         SM 4110         <5 mg/L	Sodium	<1 mg/L	107	82-118
Chloride       <5 mg/L         Run No       431558       Analysis/Extraction Date       2022-10-18       Analysi       ACG         Method       SM2320,2510,4500H/F       Analysis/Extraction Date       2022-10-18       Analysis       ACG         Method       SM2320,2510,4500H/F       Analysis/Extraction Date       26 mg/L       98	Run No 431556 Analysis/Extraction Date 2 Method SM 4110	022-10-19 An	alyst AaN	
Run No         431558         Analysis/Extraction Date         2022-10-18         Analysi         AGG           Method         SM2320,2510,4500H/F         <5 mg/L	Chloride	<5 mg/L		90-110
Alkalinity (CaCO3)         <5 mg/L         98           Conductivity         <5 uS/cm	Run No         431558         Analysis/Extraction Date         2           Method         SM2320,2510,4500H/F	022-10-18 An	alyst ACG	
Conductivity <5 uS/cm 100 F <0.10 mg/L 104	Alkalinity (CaCO3)	<5 mg/L	98	90-110
F <	Conductivity	<5 uS/cm	100	90-110
98	Ŀ	<0.10 mg/L	104	90-110
5	Hq		66	90-110

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

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

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

\* = Guideline Exceedence

Guideline = ODWSOG

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**Certificate of Analysis** 

Environment Testing

Kollaard Associates Inc. Kemptville, ON K0G 1J0 Attention: PO#: Client:

210 Prescott St., Box 189 Ms. Colleen Vermeersch

2022-10-21 220996 901489 2022-10-14 1988079

Report Number: Date Submitted: Date Reported: Project: COC #:

Kollaard Associates Inc. Invoice to: QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 431595 Analysis/Extraction Date 2 Method EPA 350.1	022-10-19 Ana	lyst SKH	
N-NH3	<0.020 mg/L	111	80-120
Run No         431627         Analysis/Extraction Date         2           Method         C SM5310C	022-10-18 Ana	lyst ACG	
DOC	<0.5 mg/L	102	84-116
Run No 431628 Analysis/Extraction Date 20 Method EPA 351.2	022-10-19 Ana	lyst ML	
Total Kjeldahl Nitrogen	<0.100 mg/L	110	70-130
Run No 431652 Analysis/Extraction Date 20 Method C SM2340B	22-10-20 Ana	lyst AET	
Hardness as CaCO3			
Ion Balance			
TDS (COND - CALC)			
Run No 431683 Analysis/Extraction Date 20 Method SUBCONTRACT-A	)22-10-19 Ana	lyst AET	
Tannin & Lignin	<0.10 mg/L	102	
Run No 431738 Analysis/Extraction Date 20 Method SM5530D/EPA420.2	22-10-21 Ana	lyst IP	

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

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

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210 Prescott St., Box 189

Kemptville, ON K0G 1J0

Kollaard Associates Inc.

Client:

Ms. Colleen Vermeersch

Attention:

PO#:

Kollaard Associates Inc.

Invoice to:

**Certificate of Analysis** 

2022-10-14 2022-10-21 1988079 220996 901489 Report Number: Date Submitted: Date Reported: Project: COC #:

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Phenols	<0.001 mg/L	104	50-120

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

\* = Guideline Exceedence

Guideline = ODWSOG

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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## **Ryznar Stability Index**

### $RSI = 2(pH_s) - pH$

RSI << 6 → the scale tendency increases as the index decreases RSI >> 7 → the calcium carbonate formation probably does not lead to a protective corrosion inhibitor film RSI >> 8 → mild steel corrosion becomes an increasing problem

#### Langelier Saturation Index

### $LSI = pH - pH_s$

If LSI is negative  $\rightarrow$  no potential to scale, the water will dissolve CaCO<sub>3</sub>

If LSI is positive  $\rightarrow$  scale can form and CaCO<sub>3</sub> precipitation may occur

If LSI is close to zero  $\rightarrow$  borderline scale potential, water quality or temperature change or evaporation could change the index

#### where pH measured from sample

pH<sub>s</sub> = pH at saturation in calcite or calcium carbonate

$$pH_{s} = (9.3 + A + B) - (C + D)$$

$$A = \frac{\log_{10}[TDS] - 1}{10}$$

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

$$C = \log_{10}[Ca^{2+}asCaCO_{3}] - 0.4$$

$$D = \log_{10}[alkalinityasCaCO_{3}]$$

pH hardness [mg/l as  $CaCo_3$ ] Alkalinity [mg/l as  $CaCo_3$ ] total dissolved solids [mg/l] temperature (°C)  $\rightarrow \rightarrow$  RSI

 $\rightarrow \rightarrow$  LSI

TW1-3hr	TW1-6hr
7.45	7.55
417	420
304	307
607	610
11.3	12.1
6.81	6.67
0.32	0.44