



Hydrogeological Assessment

62 McIntyre Road,
Ameliasburgh, ON

Prepared for:

Mr. Aaron Kavanaugh
62 McIntyre Road,
Ameliasburgh, ON K0K 1A0

Prepared by:

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1.0 INTRODUCTION

1.1 Initiation and Objective

ASC Environmental Inc. (ASC) was retained by Aaron Kavanaugh (Client) to conduct a hydrogeological assessment in support of a land severance application in accordance with The County of Prince Edward provision for consent. Based on correspondence with the client, ASC understands the proposed severed lot is to be improved with a rural residential building. The subject property encompasses approximately 18.7 hectares located along the east side of McIntyre Road, Prince Edward, Ontario. The proposed severed lot encompasses approximately 2 hectares with 98.5 metres of road frontage along the east side of McIntyre Road. A site location plan is shown on Drawing No. 1 in Appendix A.

The purpose of the hydrogeological study was to assess the viability of one dug well (TW1) to support the proposed severance. The study evaluated whether groundwater quality and quantity are sufficient to support the residential development without adversely impacting upon existing neighbouring wells.

One (1) newly dug well (MECP Tag #A358409) was advanced on October 8, 2024, on the severed portion of the subject property by Q-Logic Water Ltd. (Well Contractor's Licence # 7717).

1.2 Scope of Work

The agreed scope of work included the following efforts:

- Reviewing available Ministry of Environment, Conservation and Parks (MECP) well water records and historical data for the local area.
- Undertake a six-hour pumping test (with recovery) on the existing dug well located on the subject property.
- Monitor water levels in available neighbouring adjacent wells during pumping.
- Collect well water sample following zero chlorine residual and near the end of the pumping test (approximate 5.5-hour mark).
- Submit well water samples to a certified laboratory for the required suite of parameters, as indicated in the MECP D-5-5 Procedure.
- Prepare a hydrogeological assessment, in accordance with The County of Prince Edward's Comprehensive Zoning By-law, as amended, including assessment of water quality, water quantity, potential well interference, and evaluation of nutrient attenuation in support of the proposed second detached dwelling.
- Additional work included further well development and resampling for Bacteriological parameters.



2.0 BACKGROUND

2.1 Site Information

The subject property is an approximate 18.7-hectare parcel of land with approximately 460 metres of frontage along the east side of McIntyre Road in Prince Edward County. The proposed severed lot encompasses approximately 2 hectares with 98.5 metres of road frontage along the east side of McIntyre Road. The property is located approximately 2.2 kilometres northwest of the Village of Ameliasburgh. A site layout plan may be found in Drawing No. 2 in Appendix A.

Ground cover generally consists of open grass fields with coniferous and deciduous trees scattered across the lands. Surrounding land use within a 500-metre radius consists primarily of rural residential and forested areas.

2.2 Surficial Soil Conditions

The physiographic area is described as Limestone plains. The surficial geology consists of Paleozoic bedrock.^[1]

Review of local well records showed an overburden thickness of 0.3 to 1 m, overlying limestone bedrock. Records reported the local overburden consisted of topsoil, clay, gravel, sand, shale, and loam.

2.3 Background Geology

Bedrock geology in the study area consists of a stratigraphic sequence of Paleozoic bedrock comprised of limestone, dolostone, shale, arkose, sandstone from the Ottawa Group; Simcoe group and Shadow Lake Formations.^[2]

2.4 Local Hydrogeology

Seven (7) water well summary records of local wells (within a 500-metre radius of the subject property) were available for review from the MECP online database (see Appendix B). Review of the well records identified six (6) dug wells intended for domestic household water supply. One (1) drilled well was unfinished due to insufficient water supply. The dug wells were advanced to depths of approximately 6.1 to 6.5 metres below ground surface (mbgs) and completed within the limestone bedrock. Water was encountered at depths ranging from 1.5 to 3 mbgs. The drilled well was advanced to a depth of 37.8 metres below ground surface and no water was encountered. Copies of the well records identified in the MECP database can be seen in Appendix B.

Groundwater flow is typical through pores and seams in the overburden tills and through fractures and joints within the limestone bedrock. Water is typically encountered in fractures and bedding planes in the bedrock formation.

^[1] Chapman, L.J. and Putnam, D.F. 1972. Physiography of Southern Ontario. Map 2227.

^[2] Ontario Geological Survey. 1991: Bedrock Geology of Ontario, Southern Sheet. Map. 2544.



3.0 WELL CONSTRUCTION

Q Logic Water LTD. (Well Contractor's Licence # 7717) advanced TW1 on October 8, 2024. The well was dug for the purpose of domestic water supply in support of the proposed land severance. The well location is shown in Drawing No. 2 in Appendix A and the well record is included in Appendix B.

The well record for TW1 indicated that the annular space between the concrete casing and native materials was sealed with clay to a depth of approximately 2.4 m below ground surface. The well record for TW1 shows that the concrete casing extends to a depth of approximately 6.1 m. The well casing extends above ground surface approximately 0.91 m.

The well record for TW1 indicated topsoil/clay from surface to 0.61 m, underlain by limestone bedrock. The test well was completed in the limestone bedrock at a depth of approximately 6.1 m. Water was reportedly encountered at a depth of approximately 3.0 m in the limestone bedrock. The well record is in Appendix B.

Visual observations during field work indicated that the well was constructed and maintained to prevent surface water and other foreign materials from entering the well. The height of the casing above grade meets Ontario's Revised Regulation (RRO) 903, Wells, amended to Ontario Regulation (O Reg) 372/07, under the *Ontario Water Resources Act*. The test well location is shown on Drawing No. 2 in Appendix A.

No sources of potential contamination were evident during the site work on the subject property.

We understand that water will be supplied using submersible pump. Pump installation shall be undertaken in accordance with RRO 903 (Section 17).

Copy of the test well record is attached in Appendix B.



4.0 WATER QUANTITY

4.1 Background

The quantity of groundwater available for the test well was investigated through one (1) scheduled 6-hour pumping test in accordance with MECP Procedure D-5-5 and The County of Prince Edward's Comprehensive Zoning By-law, as amended. Referencing Government of Canada precipitation data (Belleville weather station), the final week of September and beginning of October leading up to the pumping test showed approximately 18.2 mm of rainfall. On this basis, the pumping test was not undertaken during a period of heavy precipitation (Appendix E).

Referencing MECP D-5-5 guidelines, the minimum pumping rate per person based on peak demand is 3.75 L/min. Therefore, considering a 3-bedroom home (3 + 1), the minimum pumping rate required would be 15 L/min (3.75 L/min * 4). On this basis, the test well could be pumped at rate 15 L/min for purposes of assessing peak demand and long term well yield. The pumping test was conducted at a rate of 20 L/min throughout the duration of the test.

Bedrock hydrogeological values of transmissivity were calculated from the pumping data by the Jacob method, which assumes the heterogeneous limestone bedrock aquifer is analogous to a homogeneous, confined, porous media aquifer of infinite horizontal extent. Recognizing that the limestone bedrock water bearing unit is likely unconfined, the Jacob method sufficiently estimates the aquifer parameters to assess well hydrogeological conditions.

4.2 Test Well TW1

Test well TW1 is approximately 6.42 metres deep (from top of casing). Prior to the initiation of pumping the static water level was measured to be approximately 3.12 metres from the top of the casing. The water in the well was pumped at a rate of 20 litres/min for a total of 360 minutes, yielding approximately 7200 litres of water. Maximum drawdown was manually measured at approximately 0.23 metres over the duration of the test. At the completion of the pumping test, approximately 93% of the total well supply was remaining. Specific capacity calculated over the final 60 minutes of the pumping test was found to be approximately 1000 litres/minute/metre. A plot of drawdown versus time shows a logarithmic relationship (see Figure 1 in Appendix C).

Section 4.3.1 of the Ministry of Environment, Conservation and Parks (MECP) (*previously known as the Ministry of Environment*) D-5-5 Procedure, Technical Guideline for Private Wells: Water Supply Assessment requires that water level recovery must be monitored in the test well for the lesser of 95% recovery or 24 hours. Total drawdown over the period of pumping was measured at approximately 0.23 m, recovery to 95% occurred between 24 – 48 hours following pump shutdown. Based on the minimal measured drawdown (0.23 m) and well supply remaining following pump shut down (93%), the well is sufficiently able to meet peak usage periods, recover and meet the daily requirement for the proposed severance.



The transmissivity (T) after approximately 100 minutes of pumping was calculated to be approximately 1.97×10^{-4} m²/s. Hydraulic Conductivity ($K = T/b$), where $b = 3.30$ m (represents approximate aquifer thickness at time of pumping), was determined to be approximately $K = 5.96 \times 10^{-5}$ m/s. The test well recovery and transmissivity data may be found in Appendix C.

As indicated above and based on the considered number of bedrooms expected (3 + 1), a minimum pumping rate of 15 L/min is required with a resulting water requirement of 1800 litres/day during peak demand. Peak demand (at pumping rate of 20 L/min) was reached approximately 90 minutes into the pumping test, with a measured drawdown of approximately 0.07 m. Additional drawdown recorded over the remainder of the pumping test was 0.16 m. This indicates that the well sufficiently met “peak demand” conditions.

Based on the observations from the drawdown versus time relationship, it is concluded that the long-term yield of TW1 is sufficient to meet normal domestic requirements in accordance with the MECP Procedure D-5-5 and The County of Prince Edward's Comprehensive Zoning By-law, as amended.

Drawdown and recovery measurements obtained during the pumping test are presented in Appendix C.



5.0 INTERFERENCE

The effects of interference were monitored during well development and pumping from the test well. Neighbouring observation wells were utilized during pumping to assess potential interference. Observation well locations are shown on Drawing No. 2.

5.1 Test Well TW1

Two (2) observation wells, located at 62 McIntyre Road (OW1), and north adjacent the subject property with no civic address (OW2) were utilized to assess potential interference during the TW1 pumping test. The observation wells were located approximately 215 and 180 metres horizontal distance from the subject test well. See Table 1 below, for observation well information.

Water levels measured in the observation wells during the TW1 pumping test did not show a significant positive response. No positive response was recorded in observation wells during pumping of the test well on October 24, 2024.

Table 1. Test Well – TW1 Neighbouring wells involved in hydrogeological assessment at the subject property.

Observation Well ID	Well type	Observation Well Address	Distance from Test Well (m)
OW1	Dug	62 McIntyre Road	215
OW2	Dug	North adjacent the subject property	180

5.2 Discussion of Results

Potential water quantity problems resulting from mutual well interference are not expected for the test well TW1. A maximum drawdown of 0.01 m was measured in OW1, located approximately 215 metres horizontal distance from the test well.

On this basis, ASC is of the opinion that the associated measured drawdown is an appropriate estimation of the influence. The minimal measured influence indicates potential well interference will not likely create adverse conditions to the existing neighbouring well supply. Copies of the residential water level measurements recorded during the pumping test are presented in Appendix C.

6.0 WATER QUALITY

A well water sample was collected from the test well on October 24, 2024, during the final hour of the pumping test and stored in a cooler with ice and transported to a Canadian Association of Laboratory Accreditation (CALA) certified laboratory in Kingston, Ontario. Chemical and bacteriological parameter analyses were undertaken in accordance with the MECP Procedure D-5-5 and compared to the Ontario Drinking Water Quality Objectives (ODWO).

Results of analyses for the test well (TW1) are presented in the following section.

6.1 Test Well TW1

Bacteriological parameter analyses exceeded the MECP Procedure D-5-5 and ODWO for Fecal Coliform (4 cfu/100ml), E. Coli (3 cfu/100ml), and Total Coliform (4 cfu/100ml) in the sample collected on October 24, 2024. ASC revisited the Site on December 18, 2024, to further develop and resample the test well for bacteriological parameters. In the sample collected on December 18, 2024, bacteriological analyses met the MECP Procedure D-5-5 and ODWO for Fecal Coliform (0 cfu/100ml), E. Coli (0 cfu/100ml), and Total Coliform (0 cfu/100ml).

Elevated health parameter sodium was detected in the groundwater sample collected on October 24, 2024. The health-related limit for sodium is 20 mg/L and the aesthetic objective is 200 mg/L. The sample result for TW1 show a sodium concentration of 65.5 mg/L. The health-related limit for sodium is a “warning level” and where this level is exceeded the local Medical Health Officer shall be notified in order to alert individuals with relevant medical conditions. The measured sodium concentration in the test well is within the aesthetic objective of 200 mg/L.

Remaining health related parameters (nitrite, nitrate, and turbidity) met the MECP Procedure D-5-5 and ODWO.

The operational guideline for hardness is 80-100 mg/L and the ODWO level is 500 mg/L. Sample analyses for TW1 identified hardness of 350 mg/L. The ODWO level for Total Dissolved Solids (TDS) is 500 mg/L. The level for TDS was measured at 527 mg/L. Hardness and TDS in water usually occur when elevated concentrations of calcium, magnesium, and chlorides are present in water. Elevated concentrations of hardness and TDS may result in scale build-up and mineral deposits on hot water heaters and plumbing fixtures, corrosion or encrustation of metal fixtures or appliances. Hard water can be readily treated through ion exchange water softening.

Elevated manganese was detected in sample analyses above the aesthetic limit, yet below the MAC. Manganese is readily treated with greensand filtration.



To ensure safe drinking water is provided to future residents, we recommend contracting a professional water quality specialist to confirm health related and aesthetic treatment options. At a minimum, we recommend disinfection (i.e. UV light) of the water source to ensure bacteriological free groundwater for consumption purposes.

Results of laboratory sample analyses are presented in Appendix D.



7.0 SEPTIC SYSTEM SERVICES

We understand the retained property includes one (1) existing 3-bedroom rural residential dwelling with associated septic service. The original septic permit was not available for review. Referencing the Ontario Building Code (OBC), the typical daily sewage flow will be 1,600 litres per day. We understand the retained dwelling was constructed circa 2006 and current severance plans do not include modifications to the existing residence. Furthermore, the existing residential structure is located approximately 190 m cross gradient from TW1, and laboratory results showed a nitrate level of 0.08 mg/L. On this basis, ASC is of the opinion that the existing septic system will not impact the proposed severed lot.

ASC understands the proposed severed lot measures approximately 2-hectares in area. Referencing the Ontario Building Code (OBC), septic system setbacks include 3 m from the property line and 15 m from a water well. Given the setbacks, a remaining area of approximately 15725 m² is considered suitable for septic system construction, see Figure 3 Appendix A. Considering a design sewage flow of 1,600 litres per day and assuming clay soils (based on MECP well records for the area) with a percolation rate of 50 minutes/cm, a filter bed approximately 400 m² in area would be a viable option to service a 3-bedroom residential unit.

On this basis, the property has sufficient space to accommodate a viable septic system. To ensure the most optimal septic design is undertaken at the subject property, we recommend contracting a professional septic design specialist to confirm servicing options for the subject property.

In the case of Nitrate, the Ontario Drinking Water Standard of 10 mg/L of Nitrate-Nitrogen is used as an indicator of groundwater impact potential. We understand that the existing 3-bedroom residential home and private septic have been present for approximately 18 years and therefore, the background Nitrate chemistry result (0.08 mg/L) from test well TW1 is representative for demonstrating the existing septic system will not impact the proposed severed lot. Nitrate attenuation at the down gradient boundary would be calculated as follows:

$$I = \frac{(A_p)(i) \left(1000 \frac{L}{m^3}\right)}{365 \frac{days}{year}}$$
$$I = \frac{(20000)(0.25) \left(1000 \frac{L}{m^3}\right)}{365 \frac{days}{year}}$$
$$I = 13698.63$$
$$C = C_{BK} + \frac{40g_L}{1000L + I}$$
$$C = 0.08 \text{ mg/L} + \frac{40}{1000L + 13698.63}$$
$$C = 0.08 \text{ mg/L} + 2.72 \text{ mg/L}$$
$$C = 2.80 \text{ mg/L}$$



8.0 CONCLUSIONS AND RECOMMENDATIONS

- Based on the considered number of bedrooms expected (3 + 1), a minimum pumping rate of 15 L/min is required with a resulting water requirement of 1,800 litres/day during peak demand. Peak demand (20 L/min) was reached approximately 90 minutes into the pumping test with a measured drawdown of 0.07 m. Additional drawdown recorded over the remainder of the pumping test was 0.16 m. This indicates that the well sufficiently met “peak demand” conditions.
- The water in the well was pumped at a rate of 20 litres/min for a total of 360 minutes, yielding approximately 7200 litres of water. Maximum drawdown was manually measured at approximately 0.23 metres over the duration of the test. At the completion of the pumping test, approximately 93% of the total well supply was remaining indicating the well is sufficiently able to supply peak usage periods and meet the daily requirement for the proposed severance.
- Bacteriological parameter analyses in the sample collected on December 18, 2024, met the MECP Procedure D-5-5 and ODWO for Fecal Coliform (0 cfu/100ml), E. Coli (0 cfu/100ml), and Total Coliform (0 cfu/100ml).
- Elevated health parameter sodium was detected in the groundwater sample collected on October 24, 2024. The health-related limit for sodium is 20 mg/L and the aesthetic objective is 200 mg/L. The sample result for TW1 show a sodium concentration of 65.5 mg/L. The health-related limit for sodium is a “warning level” and where this level is exceeded the local Medical Health Officer shall be notified in order to alert individuals with relevant medical conditions. The measured sodium concentration in the test well is within the aesthetic objective of 200 mg/L.
- Results of the groundwater chemistry for the required chemical and bacteriological parameters identified elevated aesthetic parameter hardness, TDS and manganese in the test well. These are readily treatable.
- To ensure safe drinking water is provided to future residents, we recommend contracting a professional water quality specialist to confirm health related and aesthetic treatment options. At a minimum, we recommend disinfection (i.e. UV light) of the water source to ensure bacteriological free groundwater for consumption purposes.
- Based on results of the pumping tests and monitoring results of neighbouring residential well water supplies, water quantity problems resulting from mutual well interference is not expected.
- Based on field observation and visual inspection by ASC personnel, TW1 appears to meet the present requirements of O. Reg 903 in order to ensure continued good quality groundwater for consumption purposes.



- No land and water use conflicts were identified in an evaluation of the surrounding properties within 500 metres of the subject property. Surrounding land use within a 500-metre radius consists primarily of rural residential properties and forested lands.
- Nitrate concentration (2.8 mg/l) at the down gradient boundary meets the requirements of MECP D-5-4 Guideline.
- Reviewing the existing site and local lithology, and taking local hydrogeological characteristics into account, well construction details and the results from groundwater chemistry; the limestone bedrock groundwater resource has not been significantly impacted from surface infiltration sources. Results indicate that sufficient long-term water supply to support the proposed severance.



9.0 LIMITATIONS

ASC Environmental (ASC) was retained by Mr. *Aaron Kavanaugh* (Client) to undertake a Hydrogeological Assessment in support of a proposed land severance at the subject property, located at 62 McIntyre Road, Prince Edward, Ontario.

The scope of work for this assessment included:

- Undertaking a minimum six-hour pumping test, with recovery on the test well.
- Monitoring adjacent residential wells during pumping, to assess potential interference.
- Collection of well water samples, following field confirmation of zero residual chlorine and within the last hour of the pumping test.
- Submission of samples to a certified laboratory for the required suite of parameters.
- Additional well development and associated water sampling for bacteriological parameters.
- Preparation of a hydrogeological assessment report, addressing well construction, water quality and quantity, and potential interference.

The findings reported in this document are based on the tasks completed by ASC under the mutually agreed upon scope of work. Professional judgement, experience with similar investigations, and available data collected within the scope of work form the basis for this report. ASC has prepared this report using information understood to be factual and correct and shall not be responsible for conditions arising from information or facts that were inaccurate, concealed, or not fully disclosed at the time of investigation.

ASC Environmental Inc. makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time.

The nature of the investigation makes it possible that contrary conditions may be identified due to seasonal or meteorological changes that are beyond the control of ASC. Groundwater sampling results are current at the time of sampling only, seasonal conditions and future changes to the property may influence groundwater quality. The passage of time affects the information provided in the report. Environmental conditions of a Site can change. Opinions relating to the Site conditions are based upon information that existed at the time that the conclusions were formulated. ASC does not certify or warrant the future environmental/hydrogeological status of the property.

This document has been prepared by ASC Environmental Inc. for the sole use of *Mr. Aaron Kavanaugh* and *assignees* to assess hydrogeological conditions related to the subject property. Unauthorized reuse of this document for other purposes, or by any other



party, or any reliance on or decisions to be made based on it, are the responsibility of the third parties. If additional parties require reliance on this report, written authorization from ASC Environmental Inc. will be required. Such reliance will only be provided by ASC Environmental Inc. following written authorization from the Client. ASC Environmental Inc. disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed.

ASC Environmental Inc. will not be responsible for any consequential or indirect damages. ASC Environmental Inc. will only be liable for damages resulting from negligence of ASC Environmental Inc. ASC Environmental Inc. will not be liable for any losses or damage if the Client has failed, within a period of two years following the date upon which the claim is discovered (Claim Period), to commence legal proceedings against ASC Environmental Inc. to recover such losses or damage unless the laws of the jurisdiction which govern the Claim Period which is applicable to such claim provides that the application Claim Period is greater than two years and cannot be abridged by the contract between the Client and ASC Environmental Inc., in which case the Claim Period shall be deemed to be extended by the shortest additional period which results in this provision being legally enforceable.

Yours truly,
ASC Environmental Inc.



Tanner Cook, B.A.
Environmental Technical Specialist

Reviewed by:

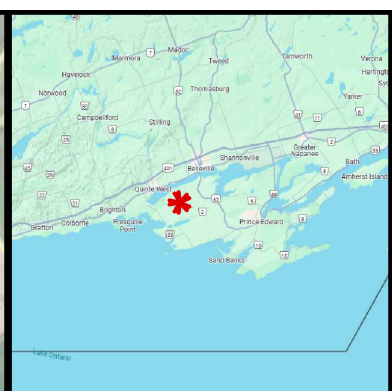


Paul Johnston, M.Sc., P. Eng. QP_{ESA}
President


APPENDIX A
Drawing No. 1 - 3




ASC Environmental Inc.
1305 Princess Street,
Kingston, ON K7M 3E3
Tel: (613) 634-5596



LEGEND

 SUBJECT PROPERTY LOCATION

 APPROXIMATE SUBJECT PROPERTY BOUNDARY

DRAWING TITLE
Site Location Plan

FIGURE NO.
01

DRAWN BY
T. Cook

PROJECT
Hydrogeological Assessment

CLIENT
Aaron Kavanaugh

LOCATION
62 McIntyre Road,
Ameliasburgh, ON

PROJECT NO.
ASC-979

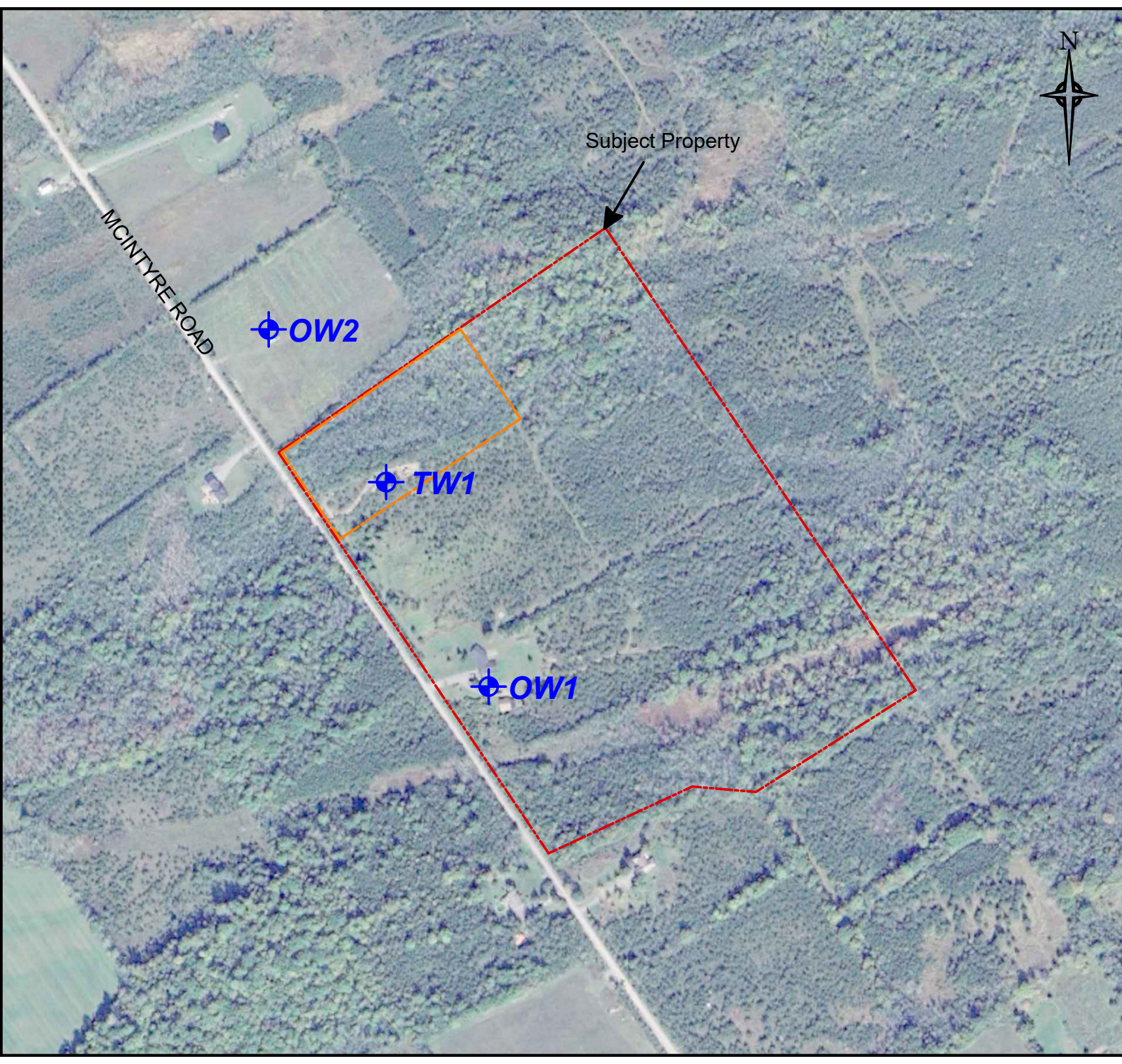
SCALE:
0 METRES 1037

DATE
6-Jan-2025



1305 Princess St
Kingston, ON, K7M 3E3

(613) 634-5596
www.ascenvironmental.ca



Subject Property



LEGEND	
	APPROXIMATE SUBJECT PROPERTY BOUNDARY
	APPROXIMATE SEVERED PROPERTY BOUNDARY
	APPROXIMATE LOCATION OF TEST WELL
	APPROXIMATE LOCATION OF OBSERVATION WELL

DRAWING TITLE
Site Layout Plan

FIGURE NO. 02	DRAWN BY T. Cook
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PROJECT
Hydrogeological Assessment

CLIENT
Aaron Kavanaugh

LOCATION
62 McIntyre Road,
Ameliasburgh, ON

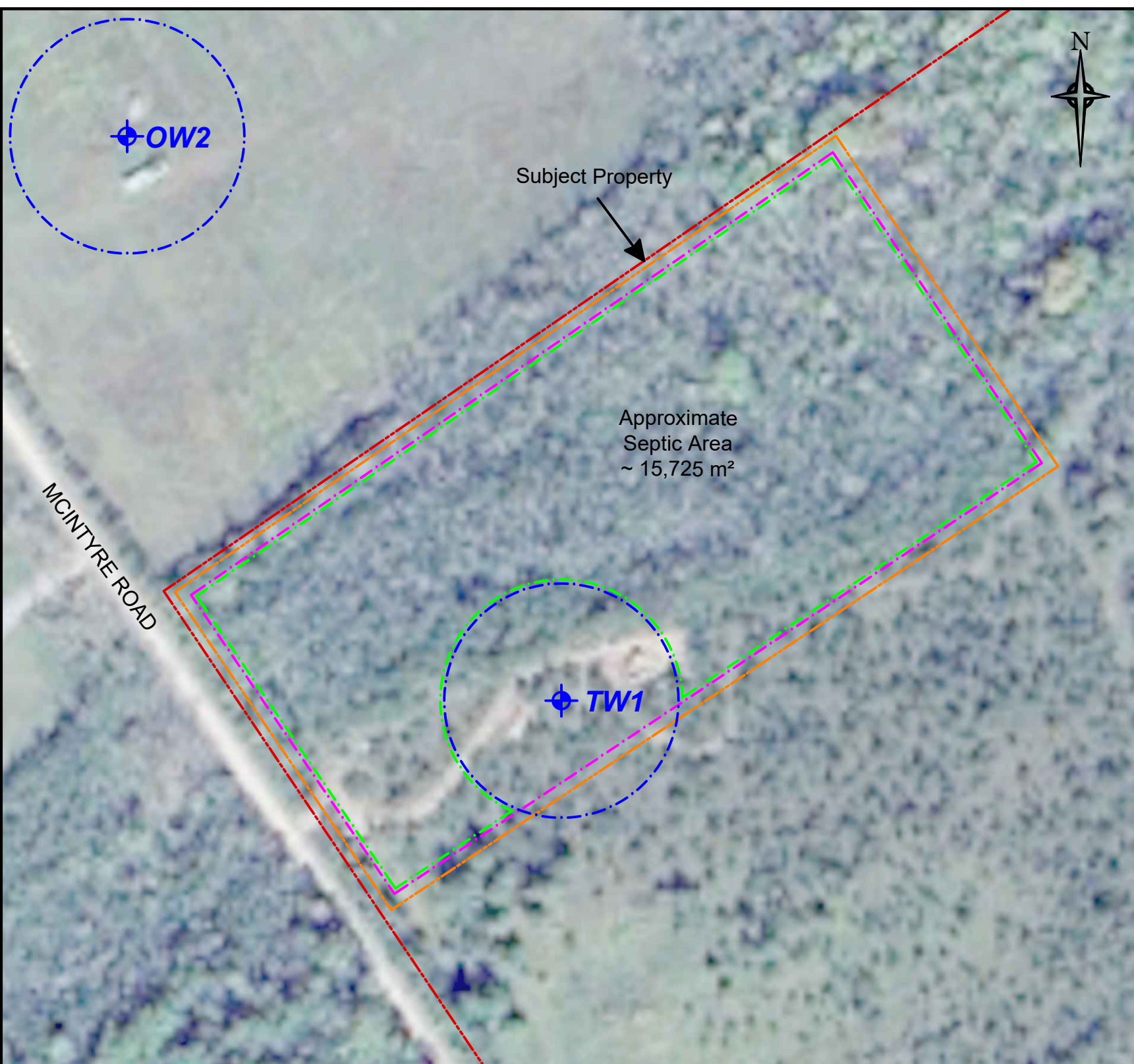
PROJECT NO. ASC-979	SCALE:
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DATE
6-Jan-2024



1305 Princess St
Kingston, ON, K7M 3E3

(613)634-5596
www.ascenvironmental.ca



LEGEND

- - - APPROXIMATE SUBJECT PROPERTY BOUNDARY
- - - APPROXIMATE SEVERED PROPERTY BOUNDARY
- - - APPROXIMATE 3 METRE PROPERTY LINE SETBACK PER OBC
- . - . - APPROXIMATE 30 METRE DUG WELL SETBACK PER OBC
- . - . - APPROXIMATE AREA AVAILABLE FOR SEPTIC SYSTEM
- ⊕ **TW1** APPROXIMATE LOCATION OF TEST WELL
- ⊕ **OW1** APPROXIMATE LOCATION OF OBSERVATION WELL

DRAWING TITLE
Septic Service Setbacks

FIGURE NO. 03	DRAWN BY T. Cook
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PROJECT
Hydrogeological Assessment

CLIENT
Aaron Kavanaugh

LOCATION
62 McIntyre Road,
Ameliasburgh, ON

PROJECT NO. ASC-979	SCALE:
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DATE 6-Jan-2024	
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1305 Princess St
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APPENDIX B
MECP Water Well Summary Records



ASC Environmental Inc.
1305 Princess Street,
Kingston, ON K7M 3E3
Tel: (613) 634-5596

Measurements recorded in: Metric Imperial

Well Owner's Information
First Name: Aaron, Last Name/Organization: CAVANAUGH, E-mail Address: aaronk308@gmail.com, Mailing Address: 62 MCINTYRE ROAD, Municipality: PRINCE EDWARD ONT, Province: ONT, Postal Code: K0K1A0, Telephone No.: 905 261 1717

Well Location
Address of Well Location: SAME AS ABOVE, Township: AMELIASBURGH, City/Town/Village: PRINCE EDWARD, Province: Ontario, Postal Code: K0K1A0, UTM Coordinates: NAD 83 18 30 2607 4881887

Overburden and Bedrock Materials/Abandonment Sealing Record table with columns: General Colour, Most Common Material, Other Materials, General Description, Depth (m/ft) From, To. Includes handwritten entries for Brown Topsoil/Clay and Gray Limestone.

Annular Space table with columns: Depth Set at (m/ft) From, To, Type of Sealant Used, Volume Placed (m³/ft³). Includes handwritten entry for Clay sealant at 0-8m depth.

Method of Construction and Well Use section with checkboxes for Cable Tool, Rotary, Boring, etc., and Public, Commercial, Domestic, etc. uses.

Construction Record - Casing table with columns: Inside Diameter, Open Hole OR Material, Wall Thickness, Depth (m/ft) From, To. Includes handwritten entry for 34" concrete casing from 0 to 20m.

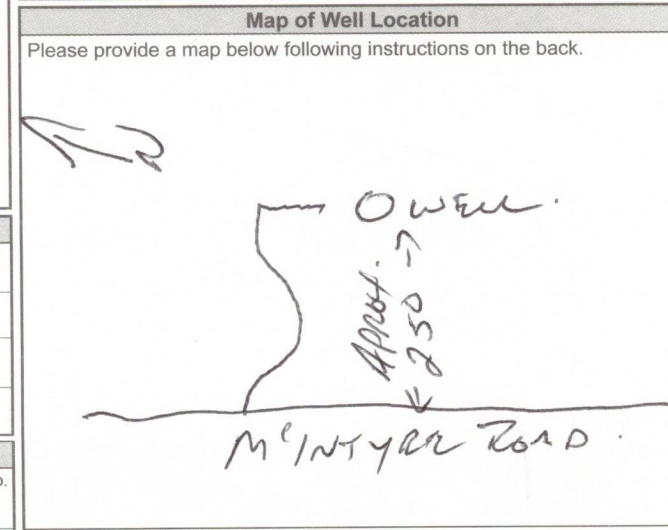
Construction Record - Screen table with columns: Outside Diameter, Material, Slot No., Depth (m/ft) From, To.

Water Details section with fields for Water found at Depth, Kind of Water (Fresh, Untested, Gas, Other).

Hole Diameter table with columns: Depth (m/ft) From, To, Diameter (cm/in).

Well Contractor and Well Technician Information section with fields for Business Name (Logic Water Ltd.), Address, Licence No., and Technician Name (Kim).

Results of Well Yield Testing table with columns: After test of well yield, water was; Draw Down (Time, Water Level); Recovery (Time, Water Level). Includes handwritten test results and a graph of drawdown.



Comments, Ministry Use Only (Audit No. 2422301), and Date Package/Work Completed fields.



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

11

5307131

Municipality 53001 Con. CON 02 PART 3

County/District, Township/Borough/City/Town/Village (AMELIASBURGH), Address of Well Location (MCINTYRE ROAD), Date completed (5 07 03)

Zone, Easting, Northing, RC, Elevation, RC, Basin Code, ii, iii, iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions). Table with columns: General colour, Most common material, Other materials, General description, Depth - feet (From, To). Includes handwritten entries: BLACK TOPSOIL, GREY LIMESTONE.

31, 32

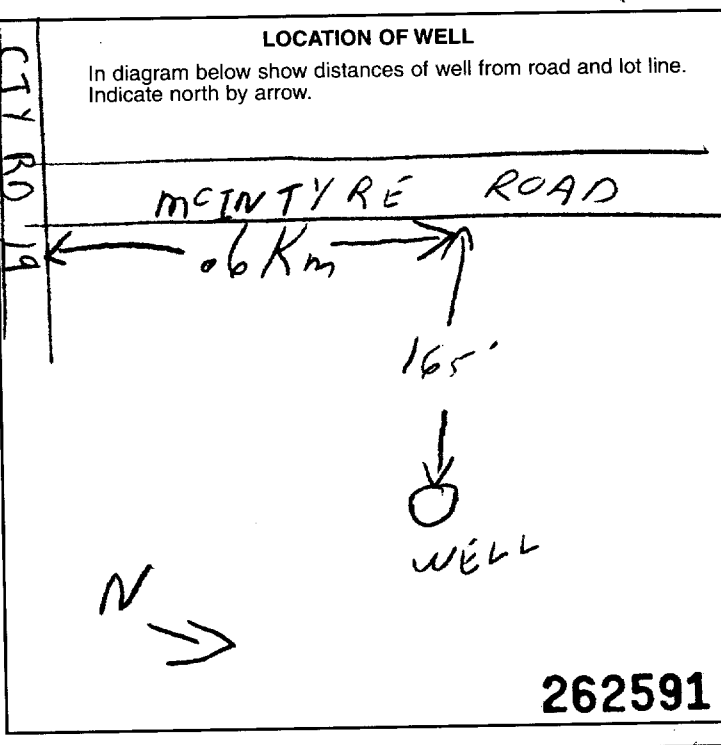
41 WATER RECORD. Table with columns: Water found at - feet, Kind of water (Fresh, Salty, Sulphur, Minerals, Gas).

51 CASING & OPEN HOLE RECORD. Table with columns: Inside diam inches, Material, Wall thickness inches, Depth - feet (From, To).

SCREEN. Table with columns: Sizes of opening (Slot No.), Diameter inches, Length feet, Material and type, Depth at top of screen feet.

61 PLUGGING & SEALING RECORD. Table with columns: Depth set at - feet (From, To), Material and type (Cement grout, bentonite, etc.). Includes handwritten entry: CLAY.

71 PUMPING TEST. Includes Pumping test method, Pumping rate (130 GPM), Duration of pumping (26 Hrs 26 Mins), Static level, Water level end of pumping, Water levels during, Pump intake set at, Water at end of test, Recommended pump type, Recommended pump setting, Recommended pump rate.



FINAL STATUS OF WELL, WATER USE, METHOD OF CONSTRUCTION. Includes checkboxes for various well types, uses, and construction methods.

Name of Well Contractor (FRANK'S DRILLING+BLASTING 6881), Well Contractor's Licence No. (6881), Address (BOX 100 NEWBURGH ONT), Name of Well Technician (WAYNE KENNEDY), Well Technician's Licence No. (T-2605), Signature of Technician/Contractor, Submission date (5 7 03).

MINISTRY USE ONLY. Includes Data source (6881), Date received (JUL 22 2003), Date of inspection, Inspector, Remarks (CSS.ES3).

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

11

5307058

Municipality 53001

Con. CON 02

County or District: PRINCE EDWARD
 Township/Borough/City/Town/Village: AMENASBURGH
 Con block tract survey, etc.: 2
 Lot: 86
 Address: [REDACTED]
 Date completed: 17 day, 12 month, 02 year

21 22 23 24
 10 12 17 18 24 25 26 30 31 47

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
BLACK	TOPSOIL			0	1
BROWN	LOAM			1	3 1/2
BLUE	LIMESTONE			3 1/4	20

31 32

41 WATER RECORD

Water found at - feet	Kind of water					
8	<input checked="" type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas
15-18	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas
20-23	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas
25-28	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas
30-33	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
3 1/2	Steel	3 1/2	0	20
17-18	Steel			20-23
24-25	Steel			27-30

SCREEN

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

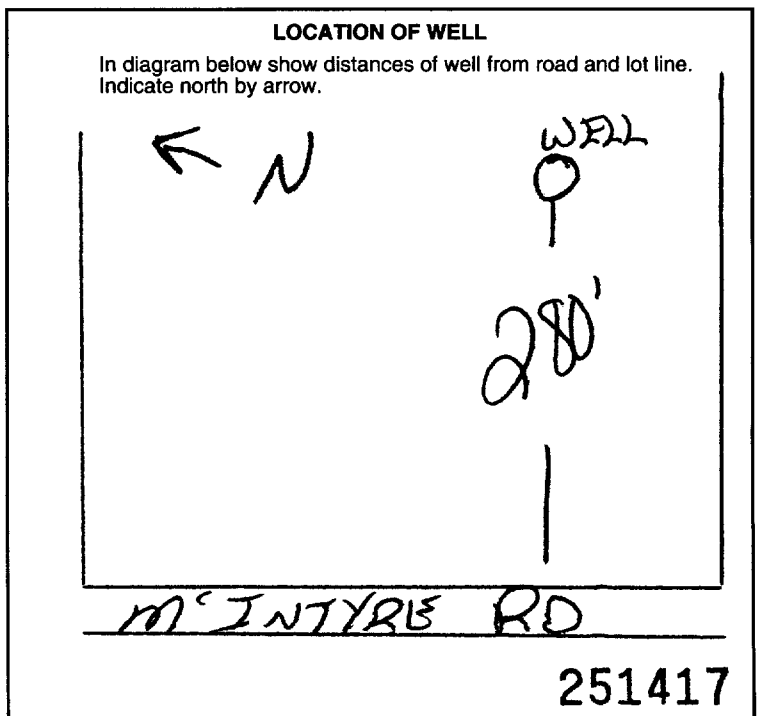
Material and type: [REDACTED]
 Depth at top of screen: [REDACTED] feet

61 PLUGGING & SEALING RECORD

Depth set at - feet		Material and type (Cement grout, bentonite, etc.)
From	To	
0	8	CLAY
18-21	22-25	
26-29	30-33	

71 PUMPING TEST

Pumping test method	Pumping rate	Duration of pumping
<input checked="" type="checkbox"/> Pump	130 GPM	25 Hours
Static level	Water level end of pumping	Water levels during
3 1/2 feet	16 feet	15 minutes: 10 feet, 30 minutes: 16 feet, 45 minutes: [REDACTED] feet, 60 minutes: [REDACTED] feet
If flowing give rate	Pump intake set at	Water at end of test
[REDACTED] GPM	16 feet	<input type="checkbox"/> Clear <input checked="" type="checkbox"/> Cloudy
Recommended pump type	Recommended pump setting	Recommended pump rate
<input checked="" type="checkbox"/> Shallow	20 feet	16 GPM



54 FINAL STATUS OF WELL

<input checked="" type="checkbox"/> Water supply	<input type="checkbox"/> Abandoned, insufficient supply	<input type="checkbox"/> Unfinished
<input type="checkbox"/> Observation well	<input type="checkbox"/> Abandoned, poor quality	<input type="checkbox"/> Replacement well
<input type="checkbox"/> Test hole	<input type="checkbox"/> Abandoned (Other)	
<input type="checkbox"/> Recharge well	<input type="checkbox"/> Dewatering	

55-56 WATER USE

<input type="checkbox"/> Domestic	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not use
<input type="checkbox"/> Stock	<input type="checkbox"/> Municipal	<input type="checkbox"/> Other
<input type="checkbox"/> Irrigation	<input type="checkbox"/> Public supply	
<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling & air conditioning	

57 METHOD OF CONSTRUCTION

<input type="checkbox"/> Cable tool	<input type="checkbox"/> Air percussion	<input checked="" type="checkbox"/> Driving
<input type="checkbox"/> Rotary (conventional)	<input type="checkbox"/> Boring	<input type="checkbox"/> Logging
<input type="checkbox"/> Rotary (reverse)	<input type="checkbox"/> Diamond	<input type="checkbox"/> Other
<input type="checkbox"/> Rotary (air)	<input type="checkbox"/> Jetting	

Name of Well Contractor: FRANK'S DRILLWELL & BLASTING
 Well Contractor's Licence No.: 6881
 Address: Box 100 NEWBURGH, KOK-250
 Name of Well Technician: GREG PARR
 Well Technician's Licence No.: T-2603
 Signature of Well Contractor: [Signature]
 Submission date: 20 12 02

MINISTRY USE ONLY

Data source	Contractor	Date received
	6881	JAN 31 2003
Date of inspection	Inspector	
Remarks		

CSS.ES3



A115434

Measurements recorded in: Metric Imperial

POULTRY FARMS LTD.

Address of Well Location (Street Number/Name) **RR#1** Township **Ameliasburgh** Lot **86** Concession **2**
 County/District/Municipality **Prince Edward County** City/Town/Village **Ameliasburgh** Province **Ontario** Postal Code **K0K1A0**
 UTM Coordinates Zone **18** Easting **302400** Northing **4882198** Municipal Plan and Sublot Number **B 58-12**

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From To
Black	Topsoil			0 .6
Grey	Limestone			.6 6.1

Annular Space

Depth Set at (m/ft) From To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0 2.5	Clay	6.1

Results of Well Yield Testing

After test of well yield, water was:		Draw Down		Recovery	
<input type="checkbox"/> Clear and sand free	<input type="checkbox"/> Other, specify	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:		Static Level	1.4		2.6
Pump intake set at (m/ft)		1		1	
Pumping rate (l/min / GPM)		2	THIS IS A DUG		
Duration of pumping		3	WELL WITH		
hrs + 60 min		4	A RESERVE		
Final water level end of pumping (m/ft)		5	OF	5	
If flowing give rate (l/min / GPM)		10	7700	10	6ALS
Recommended pump depth (m/ft)		15	AND A		
Recommended pump rate (l/min / GPM)		20	RECOVERY		
Well production (l/min / GPM)		25	OF	25	
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		30	13	30	6PM
		40		40	
		50		50	
		60	2.6	60	2.5

Method of Construction

Cable Tool Diamond Public Commercial Not used
 Rotary (Conventional) Jetting Domestic Municipal Dewatering
 Rotary (Reverse) Driving Livestock Test Hole Monitoring
 Boring Digging Irrigation Cooling & Air Conditioning
 Air percussion Industrial Other, specify
 Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
90	Concrete	.3	0	6.1	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify <input type="checkbox"/> Other, specify

Construction Record - Screen

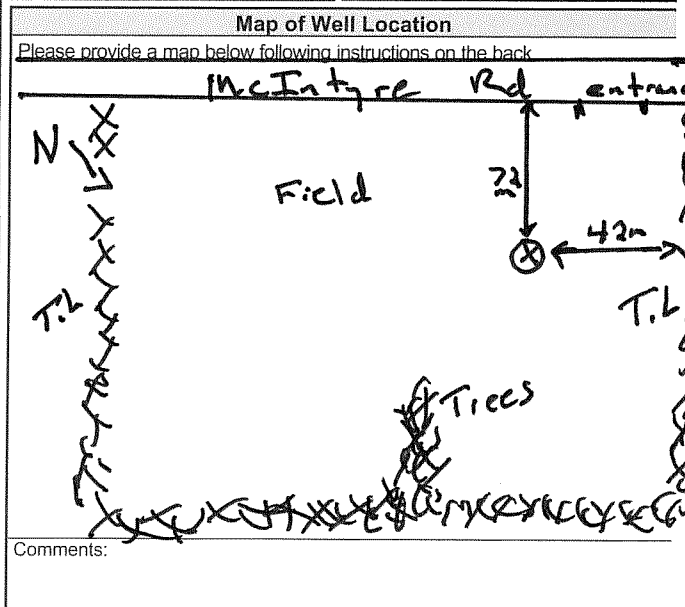
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		Status of Well
			From	To	
					<input type="checkbox"/> Other, specify

Water Details

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

Well Contractor and Well Technician Information

Business Name of Well Contractor **Frank's Drilling & Blasting** Well Contractor's Licence No. **6881**
 Business Address (Street Number/Name) **Box 100** Municipality **Newburgh**
 Province **Ontario** Postal Code **K0K2S0** Business E-mail Address **info@fdb1td.com**
 Bus. Telephone No. (inc. area code) **6133782178** Name of Well Technician (Last Name, First Name) **Parr, Greg**
 Well Technician's Licence No. **2603** Signature of Technician and/or Contractor **[Signature]** Date Submitted **20130313**



Ministry Use Only

Well owner's information package delivered Yes No
 Date Package Delivered **20130311**
 Date Work Completed **20130311**
 Audit No. **2165828**
 Received **APR 25 2013**



Measurements recorded in: Metric Imperial

POULTRY FARM LTD.

Address of Well Location (Street Number/Name) **RR #1** Township **Ameliasburgh** Lot **86** Concession **2**
 County/District/Municipality **Prince Edward County** City/Town/Village **Ameliasburgh** Province **Ontario** Postal Code **K0K1A0**
 UTM Coordinates Zone **18** Easting **3024884882042** Northing **357-12** Municipal Plan and Sublot Number **B57-12** Other

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
Black	Topsoil			0	0.3
Grey	Limestone			0.3	6.1

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From 0 To 2.5	Clay	6.1

Results of Well Yield Testing

Time (min)	Draw Down		Recovery	
	Water Level (m/ft)	Time (min)	Water Level (m/ft)	Time (min)
Static Level	1.0		2.3	
1	THIS IS A DUB			
2	WELL WITH			
3	A RESERVE			
4	OF			
5	7700	5	60	4
10	AND 1A			
15	RECOVERY OF			
20	20+	20	60	20
25				25
30				30
40				40
50				50
60	2.3	60	1.8	

After test of well yield, water was:
 Clear and sand free
 Other, specify _____
 If pumping discontinued, give reason: _____
 Pump intake set at (m/ft) **6.1**
 Pumping rate (l/min / GPM) **585**
 Duration of pumping **60** hrs + **60** min
 Final water level end of pumping (m/ft) **2.3**
 If flowing give rate (l/min / GPM) **90+**
 Recommended pump depth (m/ft) _____
 Recommended pump rate (l/min / GPM) _____
 Well production (l/min / GPM) **90+**
 Disinfected? Yes No

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
90	Concrete	0.3	0	6.1	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____

Construction Record - Screen

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

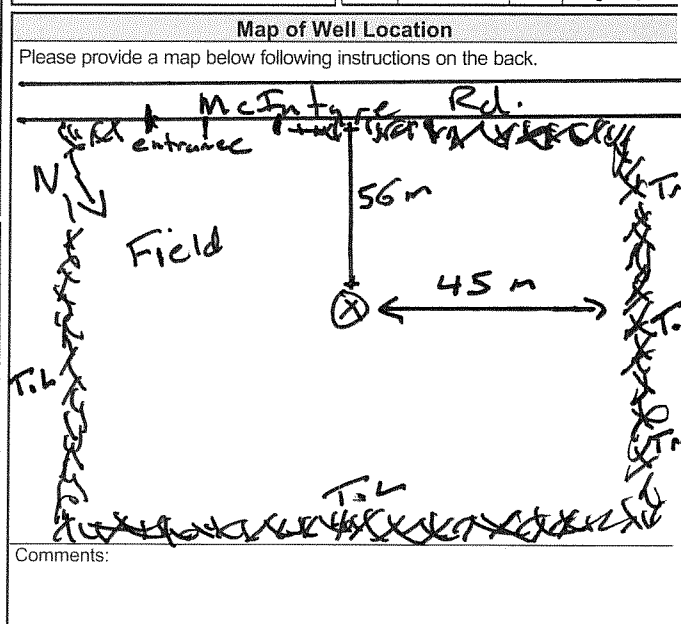
Water Details

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

Well Contractor and Well Technician Information

Business Name of Well Contractor **Frank's Drilling & Blasting** Well Contractor's Licence No. **5881**
 Business Address (Street Number/Name) **Box 100** Municipality **Newburgh**
 Province **Ontario** Postal Code **K0K2S0** Business E-mail Address **info@fdbltd.com**

Bus. Telephone No. (inc. area code) **6133782178** Name of Well Technician (Last Name, First Name) **Paul Grey**
 Well Technician's Licence No. **2603** Signature of Technician and/or Contractor **[Signature]** Date Submitted **20130313**



Well owner's information package delivered Yes No

Date Package Delivered **20130311**
 Date Work Completed **20130311**

Ministry Use Only
 Audit No. **2165827**
 Received **APR 25 2013**

Measurements recorded in: Metric Imperial

A129965

Page _____ of _____

Address of Well Location (Street Number/Name) **261 McIntyre Rd** Township **Ameliasburgh** Lot **Pt 87** Concession **2**
 County/District/Municipality **Prince Edward County** City/Town/Village **Ameliasburgh** Province **Ontario** Postal Code **K0K1A0**
 UTM Coordinates Zone Easting Northing Municipal Plan and Sublot Number Other
 NAD **83** **183024014881966** **47R 3040 Pt 2**

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
Brown	Shale			0	7
Grey	Limestone			7	6.5

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0 to 2.5	Clay	6.5

Method of Construction

Cable Tool Diamond Rotary (Conventional) Jetting Rotary (Reverse) Drilling Boring Digging Air percussion Other, specify _____

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
90	Concrete	3	0	6.5	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____

Construction Record - Screen

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

Water Details

Water found at Depth (m/ft)	Kind of Water:
	<input checked="" type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____
	<input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____
	<input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____

Hole Diameter

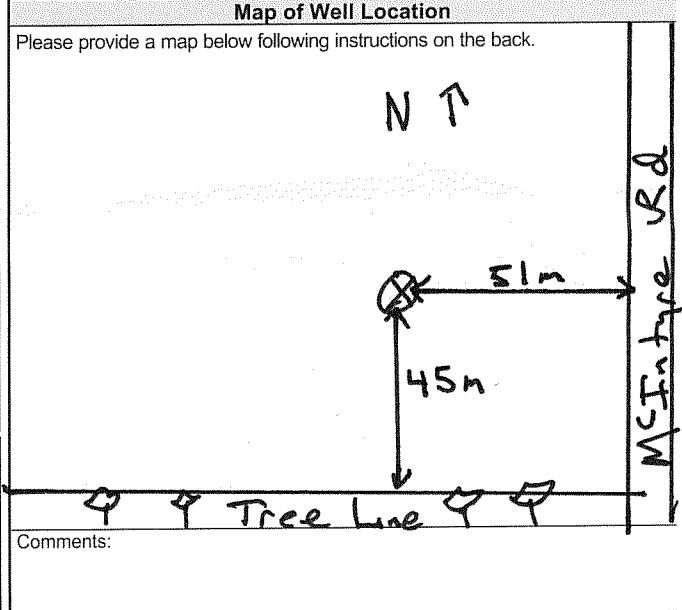
Depth (m/ft)	Diameter (cm/in)
From To	

Well Contractor and Well Technician Information

Business Name of Well Contractor: **Franks Drilling & Blasting** Well Contractor's Licence No.: **6881**
 Business Address (Street Number/Name): **Box 100** Municipality: **Newburgh**
 Province: **Ontario** Postal Code: **K0K2S0** Business E-mail Address: **info@rdb1td.com**
 Bus. Telephone No. (inc. area code): **6133792178** Name of Well Technician (Last Name, First Name): **Parr, Greg**
 Well Technician's Licence No.: **2603** Signature of Technician: _____ Date Submitted: **20120807**

Results of Well Yield Testing

After test of well yield, water was:	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
<input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____				
If pumping discontinued, give reason:	Static Level	3.7		6.0
Pump intake set at (m/ft): 6.5	1	THIS IS A DUG WELL WITH A RESERVE OF 3800 GALS AND A RECOVERY OF 25 OF 30 GPM	2	
Pumping rate (l/min / GPM): 585	3		5	
Duration of pumping: 30 hrs +	4			
Final water level end of pumping (m/ft): 6.0	5		10	6.0
If flowing give rate (l/min / GPM): 38	10		15	
Recommended pump depth (m/ft):	15		20	
Recommended pump rate (l/min / GPM):	20		25	
Well production (l/min / GPM): 38	25		30	6.0
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	30		40	
	40		50	
	50		60	5.7



Ministry Use Only

Well owner's information package delivered: Yes No
 Date Package Delivered: **20120802**
 Date Work Completed: **20120802**
 Audit No.: **Z149486**
 Receive: **AUG 10 2012**

Measurements recorded in: Metric Imperial

A129979

Page _____ of _____

Address of Well Location (Street Number/Name) 261 McIntyre Rd		Township Ameliasburgh	Lot P+87	Concession 2
County/District/Municipality Prince Edward County		City/Town/Village Ameliasburgh	Province Ontario	Postal Code K0K1A0
UTM Coordinates NAD 83	Zone 18	Easting 3023954881931	Northing 47R 3040 P+1	Municipal Plan and Sublot Number 47R 3040 P+1

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)				
General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From To
Brown	Shale			0 .7
Grey	Limestone			.7 6.5

Annular Space			
Depth Set at (m/ft) From To		Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
0	2.5	Clay	6.5

Method of Construction		Well Use	
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input checked="" type="checkbox"/> Domestic	<input type="checkbox"/> Municipal
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input type="checkbox"/> Test Hole
<input type="checkbox"/> Boring	<input checked="" type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning
<input type="checkbox"/> Air percussion		<input type="checkbox"/> Industrial	
<input type="checkbox"/> Other, specify		<input type="checkbox"/> Other, specify	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify <input type="checkbox"/> Other, specify
			From	To	
90	Concrete	0.3	0	6.5	

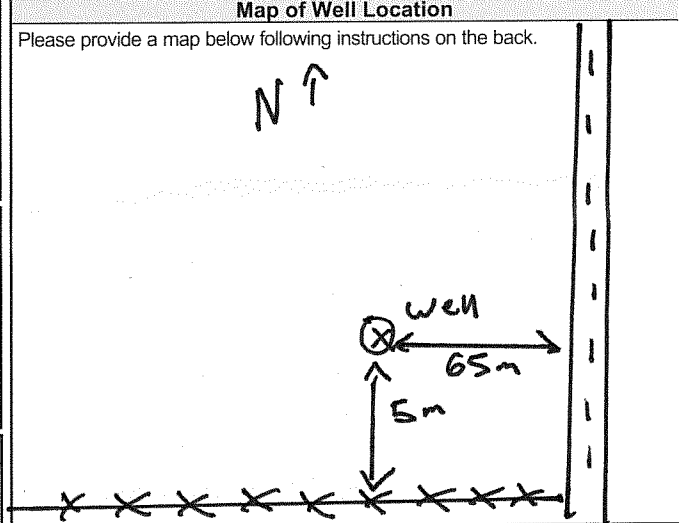
Construction Record - Screen				
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To

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

Well Contractor and Well Technician Information	
Business Name of Well Contractor Frank's Drilling & Blasting	Well Contractor's Licence No. 6881
Business Address (Street Number/Name) Box 100	Municipality Newburgh
Province Ontario	Postal Code K0K2S0

Bus. Telephone No. (inc. area code) 6133782178	Name of Well Technician (Last Name, First Name) Parr, Greg
Well Technician's Licence No. 2603	Signature of Technician and/or Contractor <i>[Signature]</i>
	Date Submitted 20120806

Results of Well Yield Testing					
After test of well yield, water was:		Draw Down		Recovery	
<input type="checkbox"/> Clear and sand free	<input type="checkbox"/> Other, specify	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:		Static Level	3.4		5.7
Pump intake set at (m/ft) 6.5		1	THIS IS A		
Pumping rate (l/min / GPM) 585		2	DUG WELL		
Duration of pumping hrs + 60 min		3	WITH A		
Final water level end of pumping (m/ft) 5.7		4	RESERVE		
If flowing give rate (l/min / GPM)		5	5	5	
Recommended pump depth (m/ft)		10	7700	10	6als
Recommended pump rate (l/min / GPM)		15	AND A		
Well production (l/min / GPM)		20	RECOVERY		
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		25	25	25	
		30	25	30	GPN
		40	40	40	
		50	50	50	
		60	5.7	60	5.3



Comments:

Well owner's information package delivered <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered 20120808	Ministry Use Only Audit No. 2149485 AUG 10 2012
	Date Work Completed 20120730	

APPENDIX C
Test Well Drawdown and Recovery Data



ASC Environmental Inc.
1305 Princess Street,
Kingston, ON K7M 3E3
Tel: (613) 634-5596

Table 1. Water Quality Field Measurements.



		Field Water Quality Analysis			Test Well:	TW1		
		Project No.:	ASC-979	Date:	24-Oct-24			
		Client:	Aaron Kavanaugh		Recorded By:	T.C.		
		Location:	62 McIntyre Road, Prince Edward County, ON					
Started pumping 20 L/min at 8:00 am								
Pumping Test Elapsed Time (min)	Odour	Temperature (°C)	pH	Conductivity (µS)	Total Dissolved Solids (ppm)	Turbidity NTU	Chlorine (Total) (mg/L)	
5	Sl. Chlorine	12.9	8.04	1416	702	11	50-100	
30	Sl. Chlorine	13.9	8.10	1170	583	8	50-100	
60	Sl. Chlorine	15.4	7.47	1214	591	8	25	
90	None	13.8	7.40	1053	524	5	>2.2	
120	None	13.8	7.30	1100	546	3	0.19	
150	None	14.2	7.31	985	491	2	0.15	
180	None	14.4	7.28	977	487	3	0.08	
210	None	13.8	7.26	960	482	3	0.07	
240	None	13.9	7.20	950	478	2	0.00	
270	None	14.8	7.19	943	471	2	0.00	
300	None	14.8	7.90	939	468	0	0.00	
330	None	14.8	7.18	936	469	0	0.00	
340	None	14.8	7.19	934	468	0	0.00	
360	None	PUMP OFF						
Notes	1. Test well water circulated at 350 ppm chlorine residual for 45 minutes prior to pumping 2. Water was primarily clear with no odour							
Field Analysis Equipment								
Chlorine :		Hach DR 900 Colorimeter						
Temp./pH/Cond./TDS :		Hanna Instruments HI98129						
Turbidity :		Hach DR 900 Colorimeter						

Table 2. Test Well drawdown during pumping test.

	Pumping Test - Drawdown			Test Well: TW1	
	Project No.:	ASC-979	Date:	24-Oct-2024	
	Client:	Aaron Kavanaugh	Recorded By:	T.C.	
	Location:	62 McIntyre Road, Prince Edward County, ON			
Pumping Rate (Q) (L/min)	Elapsed Time (ET) (min)	Well Level (WL) (m)	Drawdown (DD) (m)		
20	0	3.12	0.00		
20	1	3.12	0.00		
20	2	3.12	0.00		
20	3	3.12	0.00		
20	4	3.13	0.01		
20	5	3.13	0.01		
20	6	3.13	0.01		
20	7	3.13	0.01		
20	8	3.13	0.01		
20	9	3.14	0.02		
20	10	3.14	0.02		
20	15	3.14	0.02		
20	20	3.14	0.02		
20	25	3.15	0.03		
20	30	3.15	0.03		
20	35	3.15	0.03		
20	40	3.16	0.04		
20	45	3.16	0.04		
20	50	3.16	0.04		
20	60	3.17	0.05		
20	70	3.18	0.06		
20	80	3.18	0.06		
20	90	3.19	0.07		
20	100	3.20	0.08		
20	120	3.21	0.09		
20	140	3.23	0.11		
20	160	3.25	0.13		
20	180	3.26	0.14		
20	200	3.27	0.15		
20	225	3.29	0.17		
20	250	3.31	0.19		
20	275	3.32	0.20		
20	300	3.33	0.21		
20	350	3.36	0.24		
20	360	3.37	0.25		
TW1	(m)		L/min	m ³ /day	
Δs_{0-1min}	3.12	Q_{0-1min}	20.00	28.8	
$\Delta s_{1-10min}$	0.02	$Q_{1-10min}$	20.00	28.8	
$\Delta s_{10-100min}$	0.45	$Q_{10-100min}$	20.00	28.8	
$\Delta s_{100-1000min}$	0.31	$Q_{100-1000min}$	20.00	28.8	
	m ² /day	m ² /s			
T_{0-1min}	1.69	1.95E-05			
$T_{1-10min}$	336.60	3.90E-03			
$T_{10-100min}$	11.76	1.36E-04			
$T_{100-1000min}$	16.99	1.97E-04			
Notes					
1			Δs	Drawdown over one Log Cycle based on Trend Line	
Q	Volumetric Flow Rate		L/min	Litres per Minute	
T	Coefficient of Transmissivity		gpm	Gallon per Minute	

ASC Environmental Inc.
ASC-979, Aaron Kavanaugh, 62 McIntyre Road,
Prince Edward County, ON
Figure 1. TW1 Pumping Test Drawdown

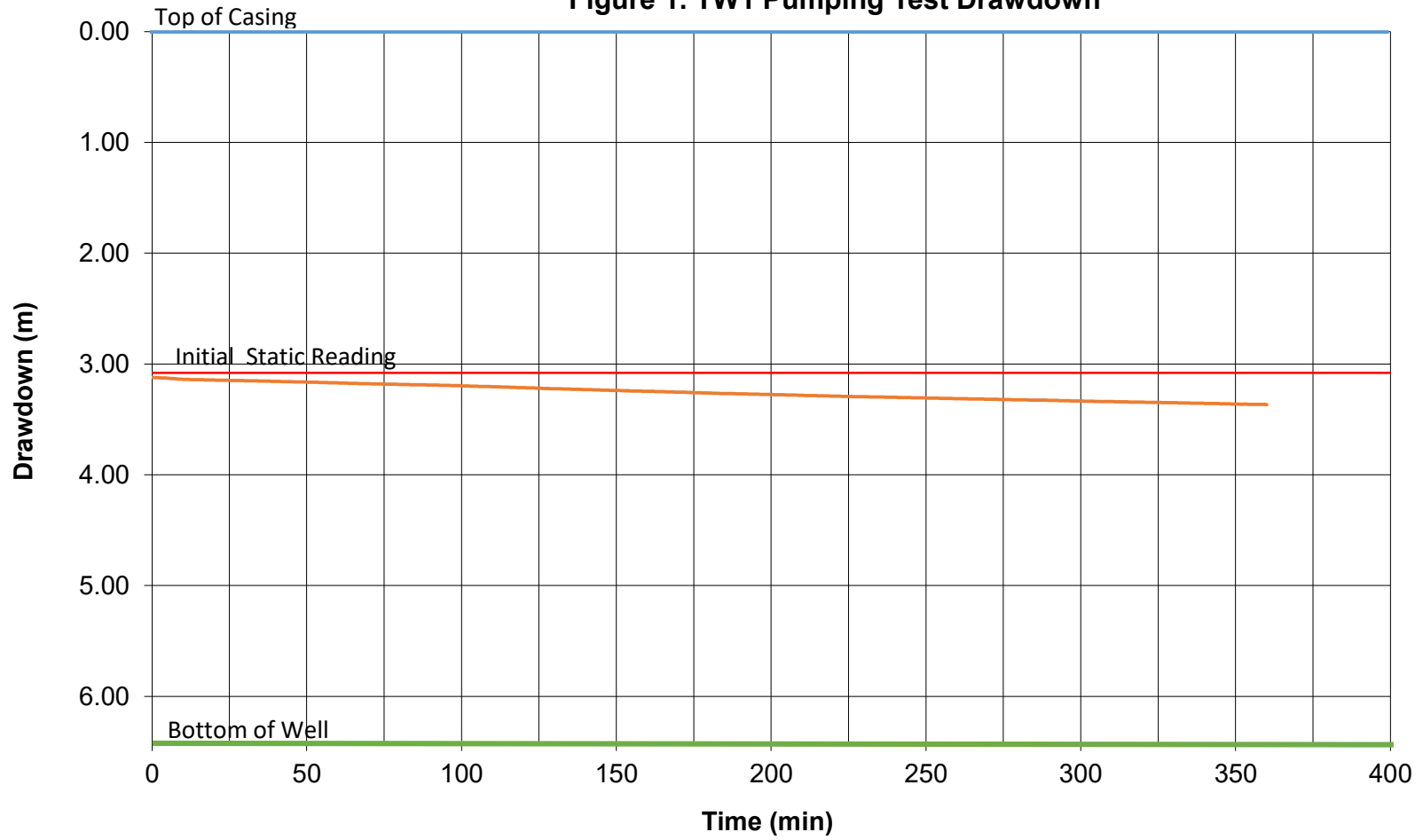



Table 3. Observation well drawdown during pumping test.													
			Pumping Test - Drawdown						Test Well:	TW1			
			Project No.:			ASC-979			Date:	24-Oct-2024			
			Client:			Aaron Kavanaugh						Pumping start time	
			Location:			62 McIntyre Road, Prince Edward County, ON			8 0	AM			
62 McIntyre Road (OW1)					Vacant lot north adjacent subject property (OW2)								
WL	WL	DD	Time	ET	WL	WL	DD	Time	ET				
(ft)	(m)	(m)	H:Min	(min)	(ft)	(m)	(m)	H:Min	(min)				
6.332	1.93	0.000	7 50	0	5.807	1.77	0.000	7 55	0				
6.332	1.93	0.000	9 13	73	5.807	1.77	0.000	9 10	70				
6.365	1.94	0.010	10 13	133	5.807	1.77	0.000	10 10	130				
6.365	1.94	0.010	11 13	193	5.807	1.77	0.000	11 10	190				
6.365	1.94	0.010	12 13	253	5.807	1.77	0.000	12 10	250				
6.365	1.94	0.010	13 13	313	5.807	1.77	0.000	13 10	310				
6.365	1.94	0.010	14 20	380	5.807	1.77	0.000	14 23	383				
Distance to Observation Wells (metres)													
62 McIntyre Road (OW1)					215								
Vacant lot north adjacent subject property (OW2)					180								

ASC Environmental Inc.
ASC-979, Aaron Kavanaugh, 62 McIntyre Road
Prince Edward County, ON
Figure 2. Pumping Test Influence on Neighbouring Wells
TW1 Pumping Test Zone of Influence

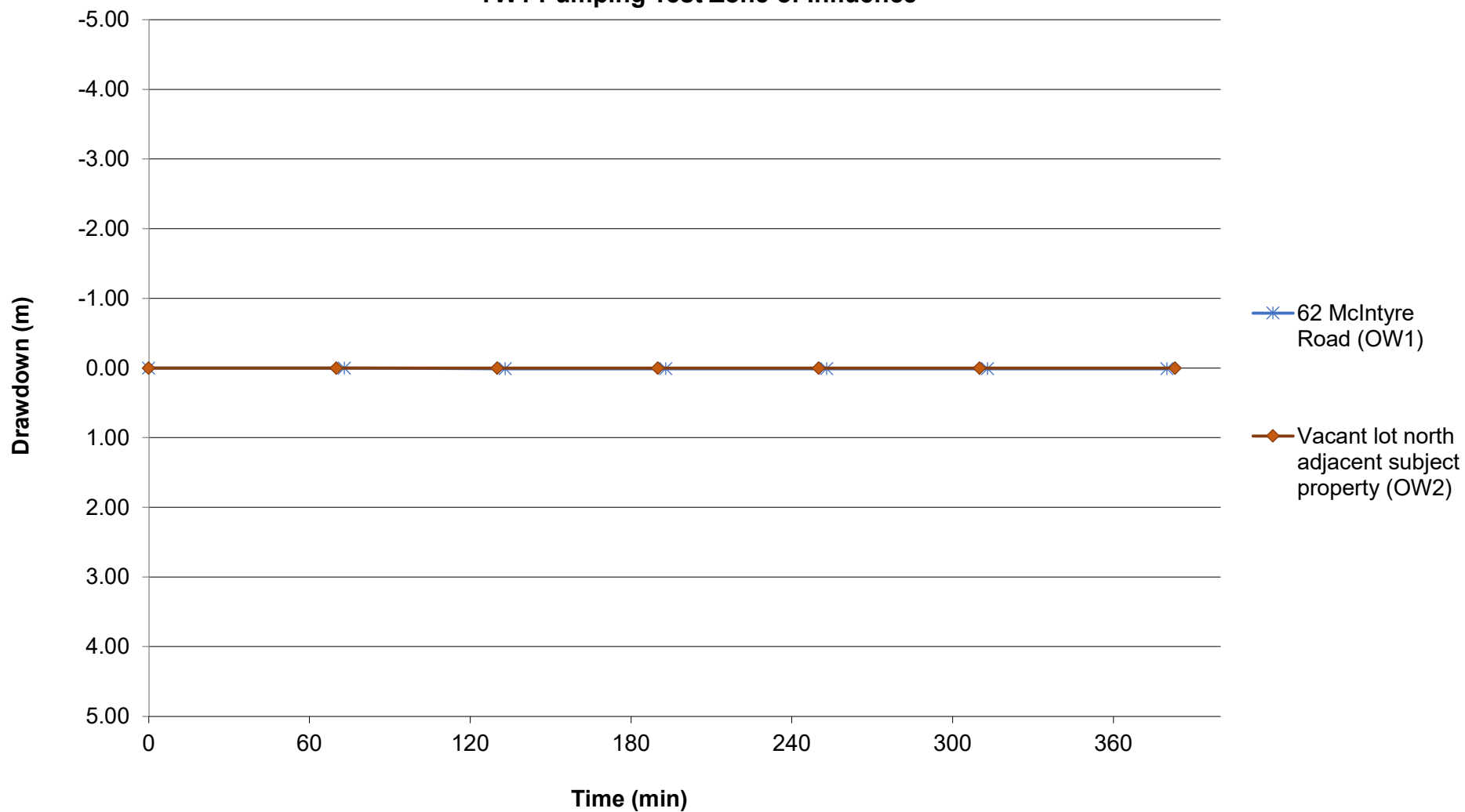

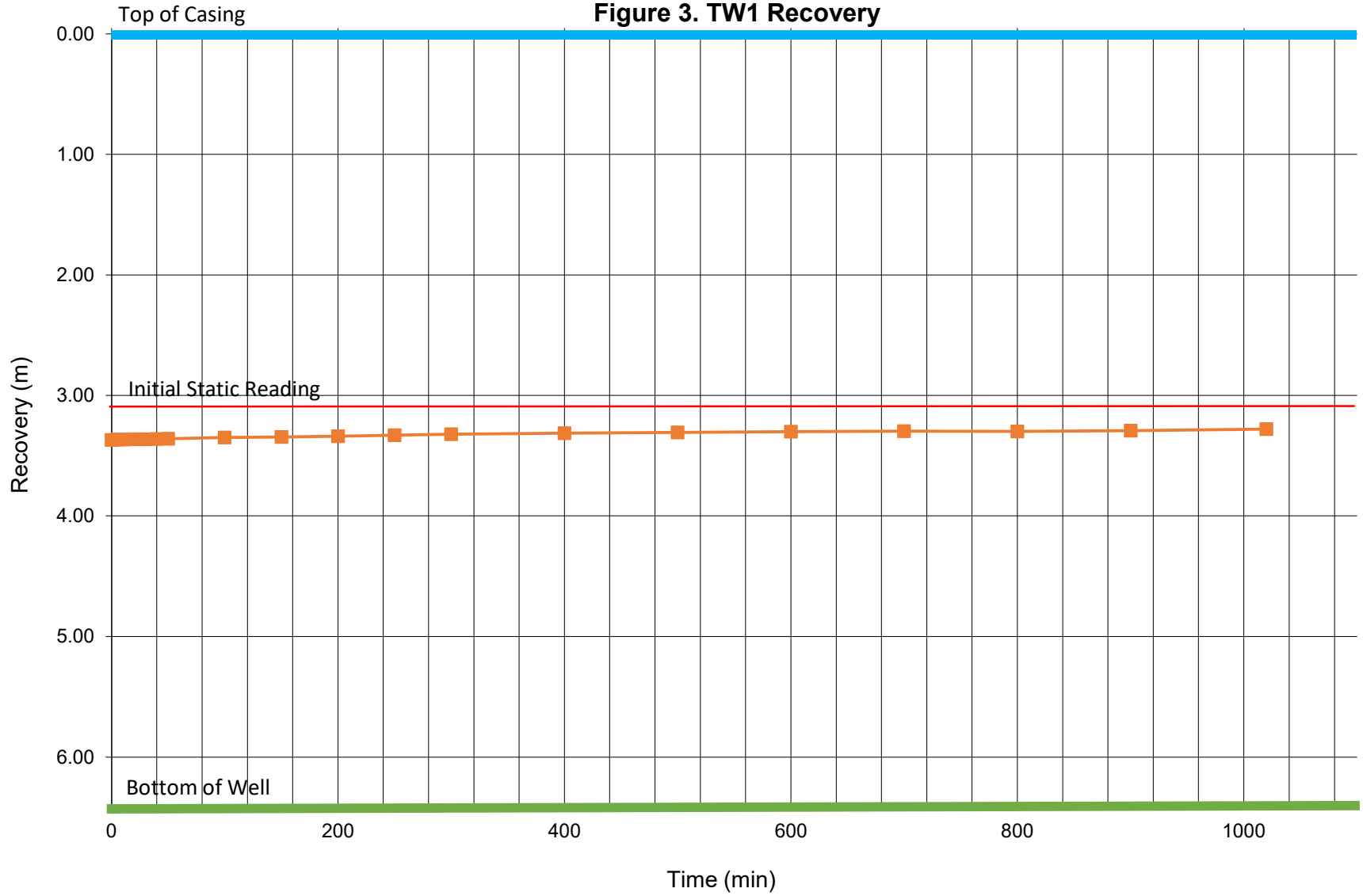


Table 4. Test well recovery after pumping test.

		Pumping Test - Recovery		Test Well:	TW1	
		Project No.:	ASC-979	Date:	24-Oct-24	
		Client:	Aaron Kavanaugh		Recorded By: T.C.	
		Location:	62 McIntyre Road, Prince Edward County, ON			
Pumping	Elapsed Time (min)	Well Level (WL) (m)	Drawdown (m)			
0	0	3.37	0.25			
0	5	3.37	0.25			
0	10	3.37	0.25			
0	20	3.36	0.24			
0	30	3.36	0.24			
0	40	3.36	0.24			
0	50	3.36	0.24			
0	100	3.35	0.23			
0	150	3.34	0.22			
0	200	3.34	0.22			
0	250	3.33	0.21			
0	300	3.32	0.20			
0	400	3.31	0.19			
0	500	3.31	0.19			
0	600	3.30	0.18			
0	700	3.30	0.18			
0	800	3.30	0.18			
0	900	3.29	0.17			
0	1020	3.28	0.16			

ASC Environmental Inc.
ASC-979, Aaron Kavanaugh, 62 McIntyre Road,
Prince Edward County, ON
Figure 3. TW1 Recovery



APPENDIX D
Laboratory Analytical Certificates



ASC Environmental Inc.
1305 Princess Street,
Kingston, ON K7M 3E3
Tel: (613) 634-5596

C.O.C.: G 112978

REPORT No: 24-033587 - Rev. 0

Report To:
 ASC Environmental
 1305 Princess St.
 Kingston, ON K7M 3E3

CADUCEON Environmental Laboratories
 285 Dalton Ave
 Kingston, ON K7K 6Z1

Attention: Tanner Cook

DATE RECEIVED: 2024-Oct-25
 DATE REPORTED: 2024-Oct-30
 SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: ASC-979
 P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	1	OTTAWA	PCURIEL	2024-Oct-28	A-IC-01	SM 4110B
Colour (Liquid)	1	OTTAWA	STAILLON	2024-Oct-30	A-COL-01	SM 2120C
Cond/pH/Alk Auto (Liquid)	1	OTTAWA	SBOUDREAU	2024-Oct-28	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
Coliforms - DC Media (Liquid)	1	KINGSTON	BBURTCH	2024-Oct-25	ECTC-001	MECP E3407
DOC/DIC (Liquid)	1	OTTAWA	SLOZO	2024-Oct-29	C-OC-01	EPA 415.2
Fecal Coliforms (Liquid)	1	KINGSTON	BBURTCH	2024-Oct-25	FC-001	SM 9222D
HPC MF (Liquid)	1	KINGSTON	BBURTCH	2024-Oct-25	HPC-001	SM 9215D
Ion Balance (Calc.)	1	OTTAWA	ASCHNEIDER		CP-028	MECP E3196
ICP/OES (Liquid)	1	OTTAWA	APRUDYVUS	2024-Oct-29	D-ICP-01	SM 3120B
Ammonia & o-Phosphate (Liquid)	1	KINGSTON	KDIBBITS	2024-Oct-28	NH3-001	SM 4500NH3
Phenols (Liquid)	1	KINGSTON	EHINCH	2024-Oct-29	PHEN-01	MECP E3179
Sulphide (Liquid)	1	KINGSTON	EHINCH	2024-Oct-29	H2S-001	SM 4500-S2
Tannins (Liquid)	1	KINGSTON	KDIBBITS	2024-Oct-29	TAN-001	SM 5550
TP & TKN (Liquid)	1	KINGSTON	YLIEN	2024-Oct-29	TPTKN-001	MECP E3516.2
Turbidity (Liquid)	1	OTTAWA	PLUSSIER	2024-Oct-29	A-TURB-01	SM 2130B

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *



Michelle Dubien
Data Specialist

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-033587 - Rev. 0

Parameter	Units	R.L.	Client I.D.
			Sample I.D.
			Date Collected
			-
Total Coliform (DC Media)	CFU/100mL	1	TW1-1
E coli (DC Media)	CFU/100mL	1	24-033587-1
Background (DC Media)	CFU/100mL	1	2024-10-24
Heterotrophic Plate Count	CFU/1mL	10	
Fecal Coliform	CFU/100mL	1	
Alkalinity(CaCO3) to pH4.5	mg/L	5	
TDS (Calc. from Cond.)	mg/L	3	
Conductivity @25°C	uS/cm	1	
pH @25°C	pH units	-	
Colour	TCU	2	
Turbidity	NTU	0.1	
Fluoride	mg/L	0.1	
Chloride	mg/L	0.5	
Nitrate (N)	mg/L	0.05	
Nitrite (N)	mg/L	0.05	
Sulphate	mg/L	1	
Phosphorus (Total)	mg/L	0.01	
Total Kjeldahl Nitrogen	mg/L	0.1	
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	
Dissolved Organic Carbon	mg/L	0.2	
Tannin & Lignin	mg/L	0.5	



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-033587 - Rev. 0

Parameter	Units	R.L.	Client I.D.
			TW1-1
			Sample I.D.
			24-033587-1
			Date Collected
			2024-10-24
Parameter	Units	R.L.	-
Sulphide	mg/L	0.01	<0.01
Phenolics	mg/L	0.001	0.003
Hardness (as CaCO3)	mg/L as CaCO3	0.02	350
Calcium	mg/L	0.02	103
Iron	mg/L	0.005	0.030
Magnesium	mg/L	0.02	22.5
Manganese	mg/L	0.001	0.266
Potassium	mg/L	0.1	10.9
Sodium	mg/L	0.2	65.5
Anion Sum	meq/L	-	9.89
Cation Sum	meq/L	-	10.3
% Difference	%	-	2.14
Ion Ratio	-	-	0.958
Sodium Adsorption Ratio	-	-	1.53
TDS (Ion Sum Calc)	mg/L	1	527
TDS(calc.)/EC(actual)	-	-	0.538
Conductivity Calc	µmho/cm	-	954
Conductivity Calc / Conductivity	-	-	0.974
Langelier Index(25°C)	-	-	1.13
Saturation pH (25°C)	-	-	6.91



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: G130481

REPORT No: 24-038920 - Rev. 0

Report To:
 ASC Environmental
 1305 Princess St.
 Kingston, ON K7M 3E3

CADUCEON Environmental Laboratories
 285 Dalton Ave
 Kingston, ON K7K 6Z1

Attention: Tanner Cook

DATE RECEIVED: 2024-Dec-18
 DATE REPORTED: 2024-Dec-23
 SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: ASC-979
 P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Coliforms - DC Media (Liquid)	1	KINGSTON	TSUNNY	2024-Dec-18	ECTC-001	MECP E3407
Fecal Coliforms (Liquid)	1	KINGSTON	TSUNNY	2024-Dec-18	FC-001	SM 9222D

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *

Client I.D.	Sample I.D.	Date Collected	Parameter	Total Coliform (DC Media)	E coli (DC Media)	Fecal Coliform
			Units	CFU/100mL	CFU/100mL	CFU/100mL
			R.L.	1	1	1
				-	-	-
TW1-2	24-038920-1	2024-Dec-18		0	0	0



Brandon Burch
Microbiology Supervisor

APPENDIX F Precipitation Data



***ASC Environmental Inc.
1305 Princess Street,
Kingston, ON K7M 3E3
Tel: (613) 634-5596***



Government of Canada

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Home > Environment and natural resources > Weather, Climate and Hazard > Past weather and climate > Historical Data

Daily Data Report for October 2024

BELLEVILLE ONTARIO Current Station Operator: CCN

Latitude: 44°09'02.052" N
Longitude: 77°23'41.046" W
Elevation: 76.20 m
Climate ID: 6150689
WMO ID:
TC ID:

Table with 12 columns: DAY, Max Temp, Min Temp, Mean Temp, Heat Deg Days, Cool Deg Days, Total Rain, Total Snow, Total Precip, Snow on Grnd, Dir of Max Gust, Spd of Max Gust. Rows 01 to 24.

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
25 †	13.0	0.5	6.8	11.2	0.0	0.0	0.0	0.0	0		
26 †	14.0	4.0	9.0	9.0	0.0	0.0	0.0	0.0	0		
27 †	12.0	5.5	8.8	9.2	0.0	0.0	0.0	0.0	0		
28 †	10.0	2.0	6.0	12.0	0.0	0.0	0.0	0.0	0		
29 †	14.5	3.5	9.0	9.0	0.0	9.8	0.0	9.8	0		
30 †	22.0	12.0	17.0	1.0	0.0	0.0	0.0	0.0	0		
31											
Sum				179.9 [^]	0.3 [^]	23.4 [^]	0.0 [^]	23.4 [^]			
Avg	17.2 [^]	6.4 [^]	11.8 [^]								
Xtrm	24.0 [^]	0.5 [^]				9.8 [^]	0.0 [^]	9.8 [^]		M	M
Summary, average and extreme values are based on the data above.											

Legend

- A = Accumulated
- C = Precipitation occurred, amount uncertain
- E = Estimated
- F = Accumulated and estimated
- L = Precipitation may or may not have occurred
- M = Missing
- N = Temperature missing but known to be > 0
- S = More than one occurrence
- T = Trace
- Y = Temperature missing but known to be < 0
- [empty] = Indicates an unobserved value
- ^ = The value displayed is based on incomplete data
- † = Data that is not subject to review by the National Climate Archives

Date modified:

2024-10-01



Government of Canada

Gouvernement du Canada

[Home](#) > [Environment and natural resources](#) > [Weather, Climate and Hazard](#) > [Past weather and climate](#) > [Historical Data](#)

Daily Data Report for September 2024

**BELLEVILLE
ONTARIO**
Current Station Operator: CCN

Latitude: 44°09'02.052" N
Longitude: 77°23'41.046" W
Elevation: 76.20 m
Climate ID: 6150689
WMO ID:
TC ID:

DAY	Max Temp °C °F	Min Temp °C °F	Mean Temp °C °F	Heat Deg Days °C	Cool Deg Days °C	Total Rain mm mm	Total Snow cm cm	Total Precip mm mm	Snow on Grnd cm cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h km/h
01											
02 †	22.5	12.0	17.3	0.7	0.0	0.0	0.0	0.0	0		
03 †	25.5	10.0	17.8	0.2	0.0	0.0	0.0	0.0	0		
04 †	25.0	11.0	18.0	0.0	0.0	0.0	0.0	0.0	0		
05 †	24.0	13.5	18.8	0.0	0.8	0.0	0.0	0.0	0		
06 †	23.5	17.5	20.5	0.0	2.5	33.2	0.0	33.2	0		
07 †	17.5	11.0	14.3	3.7	0.0	0.4	0.0	0.4	0		
08 †	17.5	7.0	12.3	5.7	0.0	0.0	0.0	0.0	0		
09 †	18.0	12.0	15.0	3.0	0.0	5.4	0.0	5.4	0		
10 †	22.0	8.0	15.0	3.0	0.0	0.3	0.0	0.3	0		
11 †	25.0	10.0	17.5	0.5	0.0	0.0	0.0	0.0	0		
12 †	26.0	13.0	19.5	0.0	1.5	0.0	0.0	0.0	0		
13 †	27.5	14.5	21.0	0.0	3.0	0.0	0.0	0.0	0		
14 †	28.0	16.0	22.0	0.0	4.0	0.0	0.0	0.0	0		
15 †	28.5	15.5	22.0	0.0	4.0	0.0	0.0	0.0	0		
16 †	29.0	15.5	22.3	0.0	4.3	0.0	0.0	0.0	0		
17 †	27.5	15.5	21.5	0.0	3.5	0.0	0.0	0.0	0		
18 †	27.0	15.0	21.0	0.0	3.0	0.0	0.0	0.0	0		
19 †	28.5	14.0	21.3	0.0	3.3	0.0	0.0	0.0	0		
20 †	26.5	14.5	20.5	0.0	2.5	0.0	0.0	0.0	0		
21 †	25.5	19.0	22.3	0.0	4.3	0.0	0.0	0.0	0		
22 †	26.0	16.0	21.0	0.0	3.0	12.8	0.0	12.8	0		
23 †	19.5	17.0	18.3	0.0	0.3	0.4	0.0	0.4	0		
24 †	19.0	16.0	17.5	0.5	0.0	8.0	0.0	8.0	0		

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
25 †	20.0	16.0	18.0	0.0	0.0	4.6	0.0	4.6	0		
26 †	25.0	17.0	21.0	0.0	3.0	0.0	0.0	0.0	0		
27 †	24.0	12.0	18.0	0.0	0.0	0.0	0.0	0.0	0		
28 †	25.5	13.0	19.3	0.0	1.3	0.0	0.0	0.0	0		
29 †	23.0	13.0	18.0	0.0	0.0	0.0	0.0	0.0	0		
30											
Sum				17.3 [^]	44.3 [^]	65.1 [^]	0.0 [^]	65.1 [^]			
Avg	24.2 [^]	13.7 [^]	19.0 [^]								
Xtrm	29.0 [^]	7.0 [^]				33.2 [^]	0.0 [^]	33.2 [^]		M	M
Summary, average and extreme values are based on the data above.											

Legend

- A = Accumulated
- C = Precipitation occurred, amount uncertain
- E = Estimated
- F = Accumulated and estimated
- L = Precipitation may or may not have occurred
- M = Missing
- N = Temperature missing but known to be > 0
- S = More than one occurrence
- T = Trace
- Y = Temperature missing but known to be < 0
- [empty] = Indicates an unobserved value
- ^ = The value displayed is based on incomplete data
- † = Data that is not subject to review by the National Climate Archives

Date modified:

2024-10-01