Scoped Hydrogeological Assessment
In Support of Severance Application
2026 Reidsville Road
Township of North Dumfries

Prepared for:
Mr. Ed Hesselink
2026 Reidsville Road
Ayr, ON N0B 1E0

Prepared by:
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Project Number: 240523
March 31, 2025

BluMetric.ca

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1 Introduction

BluMetric Environmental Inc. (BluMetric®) was retained by Mr. Ed Hesselink ("the client") to complete a scoped hydrogeological assessment required for the proposed severance application for a second residential lot on the property located at 2026 Reidsville Road, Township of North Dumfries. The objective of the investigation was to determine whether or not there are any current impacts to existing private water wells in the vicinity of the property and to assess the potential for impact from the addition of a new residence on the proposed severed lot.

The scoped hydrogeological assessment follows the approach outlined in the document provided to the client called *Hydrogeological Assessment Guidelines for Privately-Serviced Developments – Scoped Stage 2 Studies, revised August 30, 2023* (Region of Waterloo). The general approach involved the following phases:

Phase 1 – Preliminary Assessment of Groundwater Conditions

Task 1: Background review
Task 2: Groundwater sampling of existing private water wells for nitrate-nitrogen

Phase 2 – Scoped Hydrogeological Assessment

Task 1: Borehole and monitoring well installation, including one monitoring well installed for use as a future water supply well for the lot to be severed
Task 2: Aquifer test on future supply well
Task 3: Groundwater sampling and survey of new wells
Task 4: Assessment of additional sewage loading from proposed septic system
Task 5: Evaluation - Data analysis and report

2 Preliminary Assessment of Groundwater Conditions

2.1 Background Review

The residential property at 2026 Reidsville Road is located approximately 100 metres north of the Reidsville Road and Alps Road intersection as shown in Figure 1. The proposed severance involves retaining a parcel 3,960 square metres in area on the north side of the property where the existing house is located. The proposed severed lot on the south side of the property will be 4,149 square metres in area. These dimensions are shown on figures 2 and 3.

The subject property is serviced with a private well and onsite sewage system. It is not within an area containing municipal water supply or sanitary sewer services and is outside of municipal water

supply source water protection areas. The closest municipal water wells are in Ayr, approximately 3.6 km from the property. The property is not within a Wellhead Protection Area for Groundwater Under Direct Influence of Surface Water (WHPA-GUDI) Vulnerability area, or in a hydrologically sensitive area (GRCA on-line mapping).

A door-to-door survey was completed on December 6, 2024, to obtain information concerning neighboring wells and septic systems, and to collect groundwater samples from nearby wells where possible.

2.1.1 Physiography, Land Use and Topography

The ground surface of the property is relatively flat with a slight slope from a high of 303 metres above sea level (masl) at Reidsville Road to a low of 300 masl at the west site boundary. Reidsville road slopes down towards the south. There is an unnamed tributary of Cedar Creek (GRCA on-line mapping) located approximately 60 m west of the property, which connects to Reid's lake at its northern end. The surface elevation of the creek and lake is approximately 300 masl. Cedar Creek is approximately 745 m southeast the site with a surface elevation of approximately 295 masl. There are no other surface water features on or in the vicinity of the property.

The subsurface material of the property is defined as glaciofluvial outwash deposits: gravel and sand lacustrine and outwash sand (MNDM, 1987).

The lands surrounding the proposed severed lot are residential to the north and south, agricultural to the east, and residential/wetland to the west. The subject property is outside the floodplain and regulation limit of the Grand River Conservation Authority (GRCA).

2.1.2 Hydrogeology and Domestic Water Wells

At the time of the preliminary site visit on December 6, 2024, there was one domestic well on the property and five domestic wells in the immediate vicinity of the property. The available water well records are included in Appendix A.

The existing residence at 2026 Reidsville Road consists of one single story residential house towards the north and east side of the property, a shed close to and west of the house, and a barn near the southwest property corner. There is a dug well in the basement of the house installed to approximately 9 metres below ground surface (mbgs). There is no water well record for this well.

Of the five nearby domestic wells, four are dug wells installed within the surficial sand/gravel aquifer. These wells are located directly north of the site or between the site and Alps Road to the south (Figure 1). The details are as follows:

- 2036 Reidsville Road, record 6503570 (between house and road, installed to 9.1 mbgs in 1972);
- 2630 Alps Road, well tag A200115 (towards southeast corner of lot, installed to 6.7 mbgs in 2016);
- 2648 Alps Road, well tag A106244 (north of house and directly west of pool, installed to 6.4 m in 2010); and
- 2660 Alps Road, record 6503248 (directly north of house and patio, installed to 9.8 m in 1970).

The domestic well at 2680 Alps road was installed as a dug well in 1984 to 20 mbgs, and decommissioned in 2010 when a new drilled well was installed again to 20 mbgs. This well is approximately 185 m west-northwest of the site, and while this property borders on the site they are separated by a low-lying wetland containing the Cedar Creek tributary. The well records indicate that water was found at 18.9-19.8 mbgs within a sand layer starting at 18.3 mbgs, with sandy silt/clay above and clay below.

The hydrogeology at the property is a surficial sand aquifer down to approximately 12 mbgs underlain by an 8 m thick clay layer which is then underlain by sands and gravel. The surficial groundwater is approximately 2.5 mbgs.

2.1.3 Septic Systems

The existing onsite septic system at 2026 Reidsville Road consists of a septic tank directly west of the center of the house connected to a leaching bed approximately 20 m east of the existing house. A repair was done to the leaching bed in approximately 2018, during which time the septic tank was pumped out.

Information was collected on neighboring septic systems during a door-to-door survey conducted December 6, 2024. The four closest potentially downgradient properties from the site were selected for survey, along with the property immediately upgradient from the site.

The upgradient property at 2036 Reidsville Road was noted to have their domestic supply well in the front yard, but no-one could be reached at this property on December 6th or on subsequent site visits when other work was being completed. Mr. Hesselink reported that the septic system at 2036 Reidsville Road was replaced in 2024 and is located in the back yard, northwest of the house.

The house at 2630 Alps Road was built in 2016 and had their dug well and septic system installed in the same year. Their septic tank and weeping bed are located west of the house, and the septic tank was last pumped out in 2023. They did not report any issues with their septic system.

The house at 2648 Alps Road has their septic tank directly east of the house, with weeping lines towards the southeast. They did not report any issues with their septic system.

The house at 2660 Alps Road has their septic tank and bed in the raised portion adjacent to the northeast end of the house. No other information was available concerning the septic system.

The house at 2680 Alps Road has their septic tank immediately east of the house, with two 30 meter long weeping lines stretching to the southeast. They did not report any issues with their septic system.

2.2 Nitrate Concentrations in Domestic Wells

On December 6, 2024, BluMetric collected water samples from water supply wells on two properties: 2630 Alps Road (exterior dug well, sampled via garage tap) and 2680 Alps Road (exterior drilled well, sampled via kitchen tap). Sample locations are depicted on Figure 1. Water samples were collected from each well water system prior to any treatment and submitted to Maxxam Analytical in Mississauga for analysis of nitrate-nitrogen (also referred to as nitrate as N or nitrate (N)).

Results from samples of the domestic wells at 2026 Reidsville Road, 2648 Alps Road, and 2660 Alps Road were obtained by the client from routine sampling completed by the respective homeowners on July 29 and 30, 2024. Analytical results for both sets of nitrate-nitrogen testing are presented in Table 1. The laboratory analytical report for samples taken on December 6, 2024, is included in Appendix B, along with letters from the Region of Waterloo for the samples taken on July 29-30, 2024.

Table 1: Concentrations of Nitrate in Drinking Water Wells

Residence	Sample Date	Nitrate (N) Concentration (mg/L)
2630 Alps Road	December 6, 2024	1.08
2680 Alps Road	December 6, 2024	<0.10
2026 Reidsville Road	July 30, 2024	8.18
2648 Alps Road	July 30, 2024	<0.100
2660 Alps Road	July 29, 2024	<0.100

Note: **BOLD** - exceeds the 10 mg/L as N Ontario Drinking Water Standard (ODWS) for nitrate

All samples were below the 10 mg/L Ontario Drinking Water Standard (ODWS) for nitrate-nitrogen.

3 Scoped Hydrogeological Assessment

3.1 Well Installation

One borehole installed as a 6" production well (PW1-24) and two boreholes installed as 2" monitoring wells (MW2-24 and MW3-24) were advanced on January 31 to February 4, 2025, by Hopper Water Wells (Hopper) of St. Marys, Ontario under the supervision of BluMetric personnel. Hopper is licensed under Ontario Regulation 903 (O. Reg. 903) as amended to O. Reg. 128/04 (Wells). A Foremost DR-24 dual rotary drill rig was used to advance the boreholes. Borehole logs and well details are included in Appendix A.

The two monitoring wells were installed to approximately 7.5 mbgs with a 3.05m 010 slot PVC screens, while the 6" production well was installed to approximately 9.1 mbgs with a 1.22m steel screen. Soil removed during drilling was primarily sand, with some gravel and silt/clay. Bedrock was not reached during drilling.

One soil sample from MW3-24, near the proposed future septic leaching bed location, was sent to ALS Laboratories (ALS) for grain size analysis. The results showed that the soil sample was classified as coarse grained texture with 81.7% sand (>0.075 mm) and 18.3% fines (silt/clay; <0.075mm). The lab report is included in Appendix B.

3.2 4-hour Aquifer Test

A four-hour aquifer test was completed on February 5, 2025 by Hopper to demonstrate that a sufficient quantity of groundwater can be obtained with minimal impact on groundwater resources and nearby wells. The test was conducted on the proposed new supply well PW1-24, and loggers were placed in monitoring wells MW2-24, MW3-24, and the dug well on the subject property. None of the adjacent property owners agreed to have loggers installed in their wells for the duration of the test.

Loggers were installed in the four wells approximately an hour before start of the aquifer test. The test started at 09:50 and ended at 13:50, with a pump rate of 37.9 L/min (10 gal/min). Manual water levels were taken at PW1-24 by Hopper during the pumping test. Details can be found on the well record for PW1-24, well tag number A417728.

The water elevation data from the loggers are shown on Figure 4. A sharp 0.25m drop in water level at PW1-24 is visible at the start of the test, after which point the water level stayed consistent and slowly rose about 3cm over the course of the test. No change in water level was seen at MW2-24, MW3-24, or the onsite dug well. Two small dips in the water level at the dug well correspond with reports of the toilet being flushed inside the house. The water level at PW1-24 returned to static within two minutes of the end of the pumping test.

3.3 Groundwater Sampling, Elevation Survey, and Water Levels

The two monitoring wells were developed by purging five well volumes following well installation. The production well was developed during the four hour pumping test and the groundwater sample was collected after the pumping test ended. Groundwater samples from each newly installed well were collected and submitted to ALS for analysis of nitrate-nitrogen. The analytical results are presented in Table 2 and the laboratory analytical report is included in Appendix B.

Table 2: Concentrations of Nitrate in Monitoring Wells

Location	Sample Date	Nitrate (N) Concentration(mg/L)
PW1-24	2025 February 05	<0.020
MW2-24	2025 February 05	<0.020
MW3-24	2025 February 05	<0.020

An elevation survey was completed to determine the relative elevations of the newly installed wells compared to the existing dug well at 2026 Reidsville Road. The depth to static water level was measured in all available wells under non-pumping conditions.

The groundwater levels in the domestic water wells and monitoring wells are summarized in Table 3.

Table 3: Groundwater Elevations

Location of Drinking Water Well	Reference Elevation (m*)	Water Level (m bmp)	Water Elevation (m*)	Water Level (m bmp)	Water Elevation (m*)
		February 5, 2025		March 7, 2025	
2026 Reidsville Road (Dug well)	301.960	2.36	299.600	2.28	299.680
PW1-24	304.844	3.45	301.394	3.35	301.492
MW2-24	304.311	3.27	300.995	3.17	301.100
MW3-24	304.450	3.98	300.510	3.88	300.607

Notes:
m* - temporary benchmark – ground at window near dug well (304m)
bmp – below measuring point / reference elevation

Figure 2 shows the groundwater elevations on March 7, 2025. The groundwater flow direction is interpreted to be to the northwest, towards Reid's Lake. The water level in the dug well at 2026 Reidsville Road was not used for groundwater contours as it was considered anomalous. Surveyed elevation for this well may be off, as the well is located within the basement of the house.

3.4 Assessment Of Additional Sewage Loading

A water quality impact assessment following the Ministry of Environment, Parks and Conservation (MECP) *Guideline D-5-4 Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment* was completed to predict the potential nitrate-nitrogen concentration in the groundwater at the property boundary resulting from a new Class 4 sewage system (septic system) on the proposed lot to be severed. The input variables and results for the calculations are included in Appendix C.

The daily wastewater flow rate and nitrate-nitrogen concentration in the septic system effluent are prescribed in guideline D-5-4 at 1,000 L/d and 40 mg/L, respectively.

An annual infiltration (groundwater recharge) rate of 326 mm/yr was calculated for the site using a water balance calculation following Thornthwaite & Mather (1957) and Climate Normals Data from Environment Canada Roseville climate station. An infiltration factor of 0.9 was estimated based on the site topography (flat land), ground cover (tree cover), and soil type (silty sand). It is expected that a significant proportion of annual precipitation will infiltrate the soil, given that the subject property is located within a Significant Groundwater Recharge Area (MECP, 2025).

A mass balance calculation was utilized to estimate the potential nitrate-nitrogen concentration in the groundwater at the property boundary. Based on the proposed lot sizes for the retained and severed lots the resulting nitrate-nitrogen concentrations at the property boundaries are estimated at 9.2 and 9.6 mg/L, respectively, which are below the Ontario Drinking Water Standard for nitrate (10 mg/L). Lateral flow of groundwater through the site was not incorporated into the dilution calculation. The results indicate that the size of the severed lot and retained lot are large enough to effectively dilute the potential nitrate loadings from both septic systems.

Assuming a 3-bedroom residential dwelling will be proposed for the severed lot, the Ontario Building Code (OBC) specified daily wastewater flow rate is 1,600 L/d. Using an estimated soil percolation time (T-time) of 15 min/cm for silty sand, the size of the septic leaching bed of a Class 4 sewage system will require a footprint of approximately 160 m^2. This size of septic system can be accommodated on the proposed severed lot. An in-ground leaching bed system is considered to be feasible as there is sufficient depth (>1.8 m) of suitable unsaturated soil on the subject property.

The design and location of the proposed septic systems must meet all the construction requirements and clearances specified in the OBC. Note that any leaching bed system constructed on the retained or severed lot must be at least 30 m away from the existing dug well and 15 m away from the new drilled water supply well (watertight casing to depth of >6m). Both leaching beds must also be setback at least 3 m from the property boundaries. The septic system designer is responsible for more detailed soil characterization and system layout as required for the design and building permit application.

3.5 Evaluation

The concentrations of nitrate-nitrogen in all water samples taken were below the ODWS for nitrate (10 mg/L). As such, no impacts from nitrate were found.

Figure 3 shows the proposed locations for the septic leaching bed for the proposed severed lot, as well as the replacement septic leaching bed for the retained lot. It is recommended that the septic leaching bed be placed in the north corner of the severed lot to maximize the distance to any supply wells. Both the proposed lot to be retained and lot to be severed appear to have sufficient open area to accommodate new septic leaching beds to service the respective lots.

The new 6" well PW1-24 was installed to be used as the new domestic water supply well if approval is obtained. The location was chosen to be upgradient of any potential septic impacts. There is not a concern with interference with the existing dug well for 2026 Reidsville Road as the transmissivity of the aquifer is relatively high, with minimal impacts seen at the existing dug well or the nearby monitoring wells during the 4-hour pump test on PW1-24. The aquifer test had a maximum drawdown of 0.25 m at a pumping rate of 37.9 L/min.

The primary conclusion of the assessment is that the groundwater flow direction is to the northwest. This was determined with groundwater levels in the three new wells. The level in the dug well at 2026 Reidsville road was considered an outlier and not used.

The existing domestic wells for 2036 Reidsville Road and 2648 Alps Road are cross-gradient or upgradient if the proposed septic leaching bed is placed in the north end of the lot to be severed and therefore expected to have no impact on the neighbouring domestic wells.

4 Closing

The conclusions presented in this report represent our professional opinion and are based upon the work described in this report and any limiting conditions in the terms of reference, scope of work, or conditions noted herein. BluMetric makes no warranty as to the accuracy or completeness of the information provided by others, or of conclusions and recommendations predicated on the accuracy of that information.

This report has been prepared for Mr. Ed Hesselink. Any use a third party makes of this report, any reliance on the report, or decisions based upon the report, are the responsibility of those third parties unless authorization is received from BluMetric in writing. BluMetric accepts no responsibility for any loss or damages suffered by any unauthorized third party as a result of decisions made or actions taken based on this report.

If you have any questions or require further information do not hesitate to contact the undersigned at (877) 487-8436.

Respectfully submitted,
BluMetric Environmental Inc.

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5 References

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Figures

LEGEND

- Domestic Well
- Monitoring Well
- Proposed Domestic Well
- Parcel Address (Region of Waterloo, 2019)
- Proposed Severance Boundary
- Topographic Contours (OMAFRA Lidar 2017)
- Watercourse (GRCA, 2021)
- Building Footprints (BluMetric, 2025)
- Assement Parcels (Region of Waterloo, 2019)

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REFERENCES

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CLIENT

Mr. Ed Hesselink
2026 Reidsville Road,
Ayr, ON N0B 1E0

PROJECT

Scoped Hydrogeological Assessment - 2026 Reidsville Road, Township Of North Dumfries

TITLE

Site Plan

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Unit 3B - 209 Frederick St., Kitchener, Ontario, N2H 2M7
TEL: (519) 742-6685
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	*DATE*		
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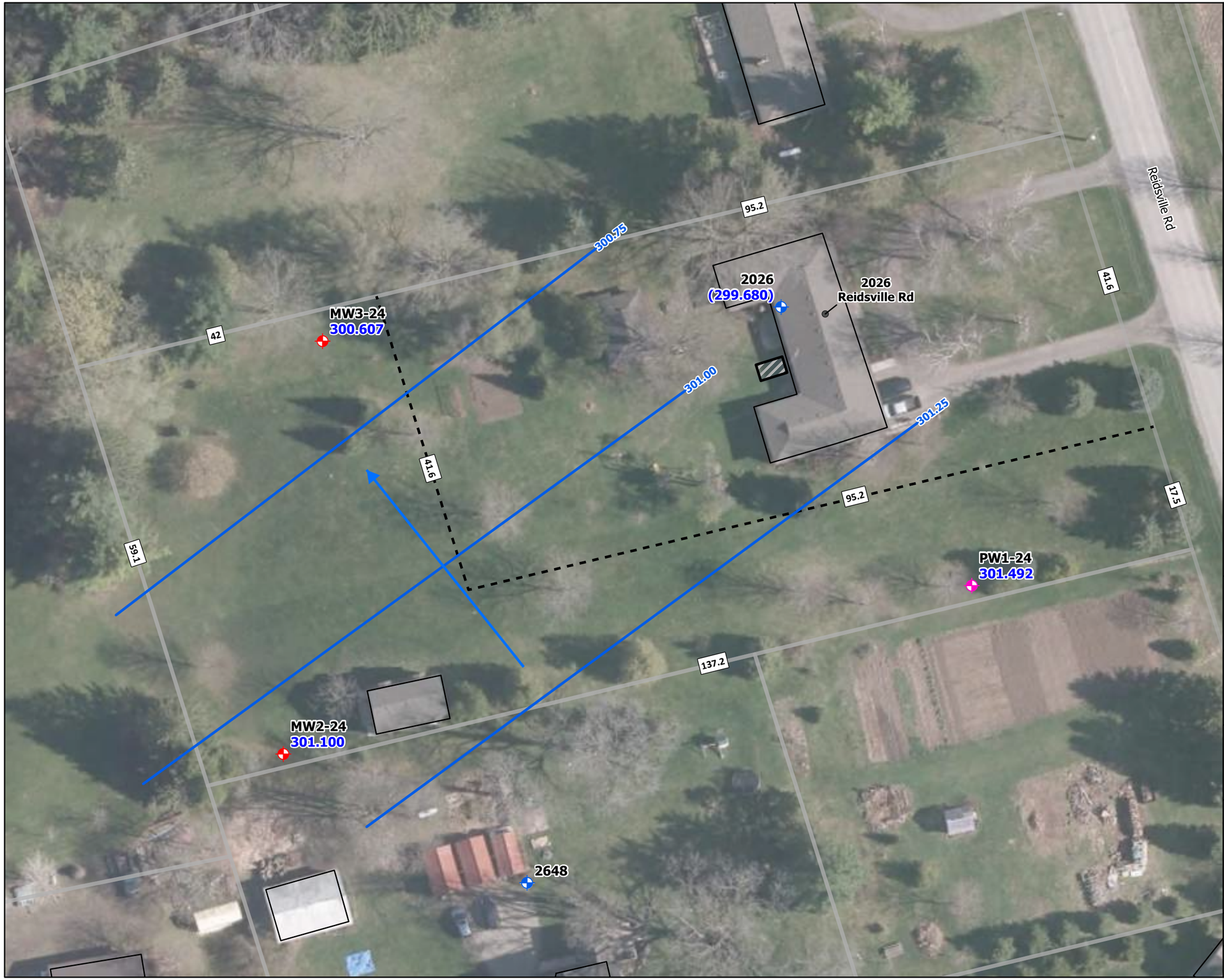

LEGEND

- Domestic Well
- Monitoring Well
- Proposed Domestic Well
- Parcel Address (Region of Waterloo, 2019)
- Groundwater Flow Direction
- Groundwater Contour Line
- Proposed Severance Boundary
- Septic Tank
- Building Footprints (BluMetric, 2025)
- Assement Parcels (Region of Waterloo, 2019)

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CLIENT

Mr. Ed Hesselink
2026 Reidsville Road,
Ayr, ON N0B 1E0

PROJECT

Scoped Hydrogeological Assessment - 2026 Reidsville Road, Township Of North Dumfries

TITLE

Groundwater Contours
March 7, 2025

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PROJECT #	*DATE*		
240523	**March 18, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
SJ	**DK**	**02**	**0**

LEGEND

- Domestic Well
- Monitoring Well
- Proposed Domestic Well
- Parcel Address (Region of Waterloo, 2019)
- Proposed Severance Boundary
- Septic Tank
- Proposed location for Septic Tile Bed
- Set-back Clearance from Domestic Well
- Building Footprints (BluMetric, 2025)
- Assement Parcels (Region of Waterloo, 2019)

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CLIENT

Mr. Ed Hesselink
2026 Reidsville Road,
Ayr, ON N0B 1E0

PROJECT

Scoped Hydrogeological Assessment - 2026 Reidsville Road, Township Of North Dumfries

TITLE

Proposed Areas for New Septic Leaching Beds

BluMetric Environmental
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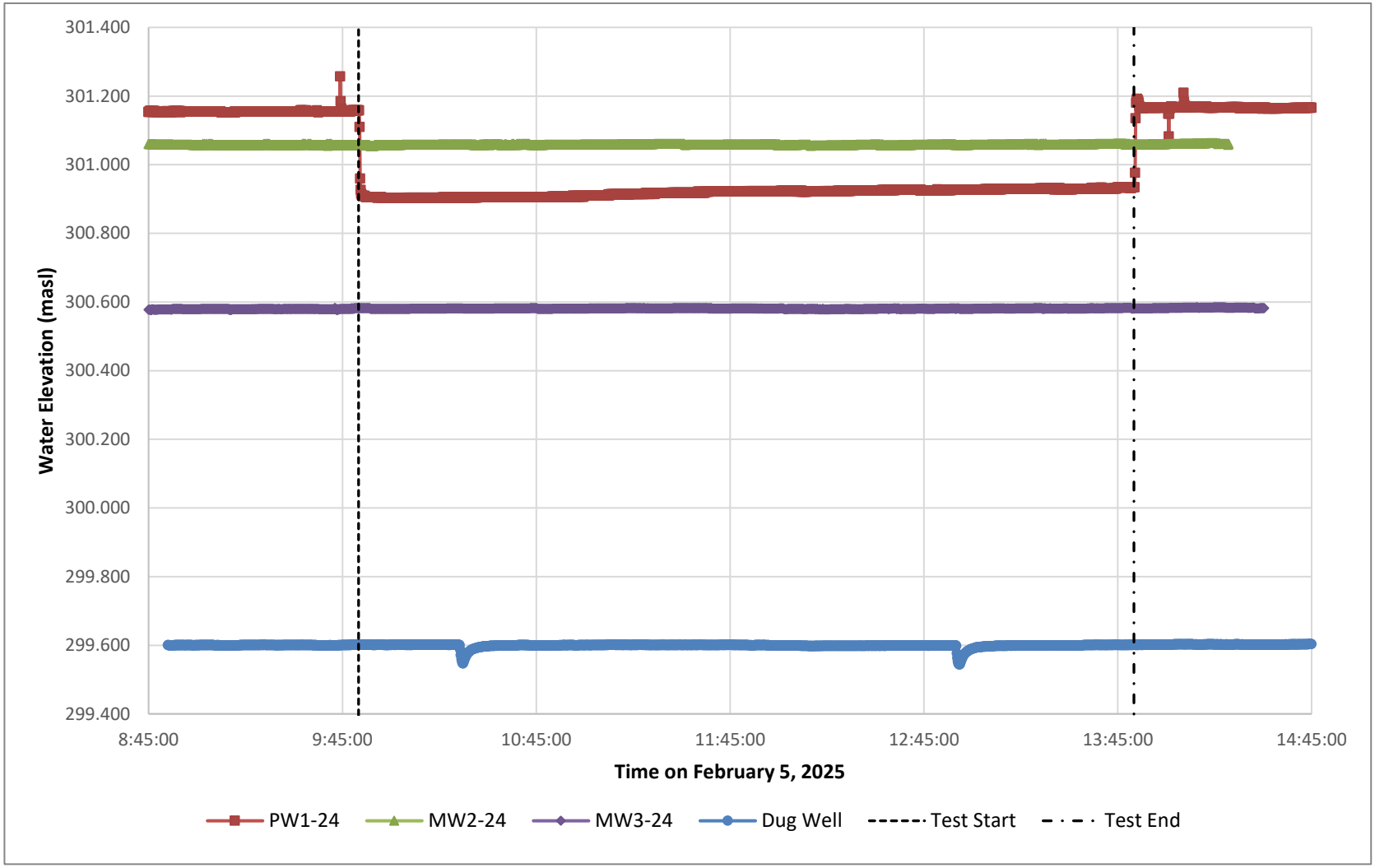
PROJECT #	*DATE*		
240523	**March 18, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
SJ	**DK**	**03**	**0**



Client	*Project Name & No.*	*Title*
Mr. Ed Hesselink 2026 Reidsville Road Ayr, ON N0B 1E0	**Scoped Hydrogeological Assessment In Support Of Onsite Septic System 2026 Reidsville Road, Township Of North Dumfries**	**Pump Test on New Production Well (PW1-24)**
Date: March 17, 2025		*Figure No.* **4**

Appendix A

Borehole Logs and Well Records

Appendix A, Table 1
Well Construction Details
2026 Reidsville Road, North Dumfries

Monitoring Location	Installation Date	MECP Well Tag	Easting	Northing	Ground Elevation (m asl)	Reference Elevation (m asl)	Reference	Screen Interval (m bgs)		Screen Interval (m asl)		Well Depth (mbgs)	Stickup	Water Level (mbrp)	Water Level (masl)	Water Level (mbrp)	Water Level (masl)
								top	bottom	top	bottom			2/5/2025		3/7/2025	
PW1-24	2025-02-04	A417728	545583	4796402	304.270	304.844	top of casing	7.71	8.93	296.56	295.34	8.93	0.574	3.45	301.3940	3.35	301.4920
MW2-24	2025-01-31	A417726	545497	4796381	303.320	304.265	top of PVC	4.49	7.54	298.84	295.79	7.54	0.945	3.27	300.9950	3.17	301.1000
MW3-24	2025-02-03	A417727	545499	4796436	303.490	304.490	top of PVC	4.47	7.52	299.02	295.97	7.52	1	3.98	300.5100	3.88	300.6070
Dug well	--	none	545561	4796440	304.000	301.960	top of concrete	--	--	--	--	9.0	--	2.36	299.6000	2.28	299.6800

Notes:

-- no records available

m asl - metres above sea level based on ground level near dug well being 304masl

mbgs - metres below ground surface

m brp - metres below reference point

All survey data from BluMetric, February 5 2025

All wells with ABUS 403 locks

Well Record - Regulation 903

Ontario Water Resources Act

General Instructions and Explanations for completing a Well Record

A completed electronic Well Record Form must be delivered to the well purchaser and the owner of the land on which the well is situated within 14 days after the date on which the well's structural stage is complete. The electronic Well Record must also be forwarded within 30 days after the date on which the well's structural stage is complete to the ministry through email to the following email address: WellRecordSubmission@ontario.ca

False and Misleading Information

Subsection 98(2) of the *Ontario Water Resources Act*, R.S.O. 1990 c. O. 40, states that:

"No person shall orally, in writing or electronically, give or submit false or misleading information in any statement, document or data, to any provincial officer, the Minister, the Ministry or the Agency, any employee in or agent of the Ministry or the Agency, or any person involved in carrying out a program of the Ministry or the Agency in respect of any matter related to this Act or the regulations."

Further, subsection 98(3) of the Act states that:

"No person shall include false or misleading information in any document or data required to be created, stored or submitted under this Act."

Measurements

All measurements must be recorded in the specified unit, metric or imperial by checking off the applicable box on the top of the form. You must use the checked unit consistently throughout the well record. Measurements must be reported to 1/10th of a metre if the unit is a metre. All measurements of depth must be referenced to ground surface.

Well Owner's Information

A "well owner" means the owner of land upon which a well is situated and includes a tenant or lessee of the land and a well purchaser. If the "well owner" is an individual, record the owner's last name and first name or if the "well owner" is a business, government or other organization, record the name in the "organization" area.

Well Location

Street Number/Name and City/town/Village must be provided, if available.

Geographic Township, Concession and Lot must be reported if the well is located in an area where such information exists.

UTM Coordinates must be recorded each time a Well Record is completed. Click the button [Test UTM in Map] to use the UTM Coordinates to plot the location to Google map. This allows verification of the UTM Coordinates. This will also automatically populate the County/District.

Municipal Plan and Sublet Number may be provided, if available.

Overburden and Bedrock Materials

For each formation encountered during construction, choose words from the lists that best describe the formation on the basis of general colour, most common material, other materials, and general description of the formation.

General Colours are White, Yellow, Grey, Brown, Blue, Red, Green and Black.

Examples of Materials are: Fill, Silt, Top Soil, Coarse Sand, Slate, Muck, Gravel, Limestone, Dolomite, Quartzite, Peat, Stones, Fine Sand, Shale, Granite, Clay, Boulders, Medium Sand, Sandstone, and Greenstone.

Some definitions are as follows:

- Clay: Composed of very fine particles. Forms dense hard lumps or clods when dry and a very elastic putty-like mass when wet. It can be rolled between fingers to form a long, flexible ribbon.
- Silt: Grain size, midway between sand and clay. It may form clods which, when broken, feel soft and floury. When moist, it will form a cast that can be handled freely without breaking. Rolled between thumb and finger, it will not "ribbon" but will give a broken appearance.

- Sand: Grains are loose and granular and may be seen and felt readily. Squeezed in the hand when dry, it falls apart when the pressure is released. Squeezed when moist, it will form a cast that will crumble when touched. Should be listed as fine sand, medium sand or coarse sand.
- Gravel: Rock fragments greater than 0.3 cm in diameter.

Examples of General Descriptions are Loose, Cemented, Previously Dug or Bored, Porous, Layered, Previously Drilled, Dense, Soft, Wood Fragments, Packed, Hard.

Abandonment

To report abandonment of a well, check off the applicable box in Type on the top of the form. Details of abandonment must be recorded in the Abandonment and Sealing Section. Additional comments may be entered in the comments box under the Information section.

Annular Space

Record all material placed in the annular space around the single casing or around the permanent outer casing. If the well is a telescoped well [i.e., a well with an outer casing and inner casing(s)] or if the well is a multi-level nested test hole, report the depth from, depth to, material and volume placed for the annular space between two different sized casings or between the inner casing(s) and the side of the well in the “Comments” area of this electronic well record form.

Method of Construction

If the equipment used to construct the well is not on the list, check “Other (specify)” and record the type of equipment, check each equipment that applies.

Well Use

If the well’s use is not provided on the list, check “Other (specify)” and record the use of the well. If the well has multiple uses, check each use that applies.

Status of Well

If the well’s status is not provided on the list, check “Other (specify)” and record the use of the well. If the well has multiple statuses, check each use that applies.

Construction Record – Casing and Open Hole

Use negative values to report the top of casing above ground surface. For example, if the top of the casing is 0.4 metres above the ground surface and the bottom of the casing 6.0 metres below the ground surface, record the casing “Depth From” as -0.4.

If the top of casing is located below the ground surface (e.g., if a test hole is constructed and the top of casing is located below the ground surface in a flush mounted well vault), report the top of the casing from below ground surface. For example, if the top of the casing is 0.1 metres below the ground surface and the bottom of the casing is 6 metres below the ground surface, record the casing “Depth From” as 0.1.

Note: If a drive shoe is used, the shoe is considered casing and it must be reported if the shoe has a different inside diameter thickness.

If a portion of the well was created an open hole, record the location of the open hole on a separate row, including the diameter and the depth (top and bottom of open hole) from the ground surface.

Construction Record – Well Screen

A “well screen” means perforated pipe or tubing, unsealed concrete tiles or other material installed in a well to filter out particulate matter and form the water intake zone. Therefore, the length of a well screen includes any slotted or perforated area and unsealed area of pipe or tiles.

Water Details

- if groundwater was located, record the depth from the ground surface to the location of the groundwater resource, and
- record if the groundwater quality is “Untested,” “Fresh” (i.e., not salty), or “Other (specify).” If “Other (specify)” is recorded, use the “Other (specify)” dropdown list toselect the type of groundwater (e.g., salty, blackish water, yellowish water, mineralized, etc.).

Check off “Gas” if natural gas was encountered during well construction.

Note: Natural gas encounters need to be immediately reported to the ministry at 1-800-268-6060, well purchaser and the owner of the land.

Results of Well Yield Testing

Check off “Pumping Discontinued” if pumping was discontinued before 1 hour of continuous pumping. Explain the reason why pumping was discontinued or in some cases not performed (e.g., the well went dry, impossible to install pump in small diameter well, static water level from test hole or dewatering well was obtained and is reported instead of completing a yield test etc.).

Note: Equipment breakdown is not an acceptable reason for checking off “Pumping Discontinued” on the well record form. If groundwater in the well is flowing out of the well, provide the rate of flow, and check off “Flowing Well” (i.e., static water level above the ground surface).

In the “Results of Well Yield Testing” section of the well record form, record:

- the depth to the intake of the pump,
- the rate of pumping and duration of pumping period during the yield test,
- the final water level when pumping stops,
- water level measurements made during pumping (drawdown) and recovery. All water level measurements must be referenced from below the ground surface for each time interval specified in the drawdown and recovery boxes.

If the water level measurements remain the same over a period of time, continue to measure and report the same water level measurement for the remaining pumping or recovery time intervals.

If pumping continuously for at least 1 hour, but the design of the well does not allow for water level measurements (e.g., driven point well), the person constructing the well is not required to report drawdown or recovery water level measurements.

Map of Well Location

In the “Map of Well Location” section of the well record form, click the map area to attach a map of the well location. The map must show sufficient information to locate the well, including:

- a mark on the map showing the well,
- a scale on the map, and
- where available, the name of the structure, street or surface water body nearest to the well.

Note: More than one map can be added to the well record form by clicking on “Add Map (+)” to add an additional map.

Information

Record any additional information (e.g., observations, tests, additional licensed well technicians who worked on the well, additional annular space details for a telescoped well or a multi-level nested test hole, reasons for not providing a well owner information package) in the comments area.

Declaration

Check the declaration statement to confirm that the person constructing the well agrees with the following statement: “I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate”.

Validate

Click the validate button. If there is no missing information, you will be asked to enter the well tag again to make sure the well tag is entered correctly (only enter the numeric portion of the tag number). The audit number will then be changed from “**incomplete**” to an assigned audit number. The signature field will then be available. Click on “signature” to enter the well technician’s electronic signature. For instructions on how to create an electronic signature, please visit the Adobe Digital IDs website using the following link: https://helpx.adobe.com/acrobat/using/digital-ids.html

Ontario

Ministry of the Environment, Conservation and Parks

Well Record - Regulation 903

Ontario Water Resources Act

Notice of Collection of Personal Information

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

Fields marked with an asterisk (*) are mandatory.

Well Tag Number *
A417728

Type *

☑ Construction ☐ Abandonment

Measurement recorded in: *

☐ Metric ☑ Imperial

1. Well Owner's Information

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

Last Name	First Name
HESSELINK	E
Organization	**Email Address**

Current Address

Unit Number	Street Number *	Street Name *	City/Town/Village	
	2577	ALPS RD	AYR	
Country	**Province**	**Postal Code**	**Telephone Number**	
CANADA	ONTARIO	N0B1E0		

2. Well Location

Address of Well Location

Unit Number	Street Number *	Street Name *	Township
	2026	REIDSVILLE RD	Dumfries

Lot	Concession	County/District/Municipality	
PT 31	10	WATERLOO	
City/Town		**Province**	**Postal Code**
AYR		Ontario	N0B 1E0

UTM Coordinates	Zone *	Easting *	Northing *		Municipal Plan and Sublot Number
NAD 83	17	545583	4796402	Test UTM in Map	

Other

3. Overburden and Bedrock Material *

Well Depth * 35 (ft)

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

				(ft)	(ft)
Brown	Sand			0	6
Brown	Sand	Gravel		6	17
Brown	Sand			17	23
Brown	Sand	Coarse Gravel		23	30
Brown	Sand	Clay	Layered	30	35

4. Annular Space *

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	20	BENTONITE SLURRY	4
20	30	NATURAL PACK	

5. Method of Construction *

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

6. Well Use *

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

7. Status of Well *

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

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

Inside Diameter (in)	Open Hole **or** Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)
6.25	Steel	0.188	-2	24.5
5.1	Steel	0.188	22	26

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)
5.5	Stainless Steel	10	26	30

10. Water Details

Water found at Depth 23 (ft) ☐ Gas Kind of water ☑ Fresh ☐ Untested ☐ Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0	20	8.5
20	30	6.625

12. Results of Well Yield Testing

☐ Pumping Discontinued

Explain _____

If flowing give rate

☐ Flowing _____ (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)	9	10	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05

Recovery

Time (min)	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)	9.25	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2

After test of well yield, water was

☑ Clear and sand free ☐ Other (specify)

Pump intake set at	Pumping rate	Duration of pumping	Final water level end of pumping	Disinfected? *
28 (ft)	10 (GPM)	4 hrs + 0 min	10.05 (ft)	☑ Yes ☐ No

Recommended pump depth	Recommended pump rate	Well production
25 (ft)	10 (GPM)	30 (GPM)

13. Map of Well Location *

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

14. Information

Well owner's information package delivered	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
☑ Yes ☐ No	2025/02/19	2025/02/05

Comments

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *	Well Contractor's License Number *
SD HOPPER DRILLING	7643

Business Address

Unit Number	Street Number	Street Name *
	3014	RD 119

City/Town/Village *	Province	Postal Code *
ST MARYS	ONTARIO	N4X 1C9

Business Telephone Number	Business Email Address
519-271-7860	INFO@HOPPERWELLS.CA

Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *
HOPPER	DOUGLAS	2323

16. Declaration *

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

Last Name	First Name	Email Address
HOPPER	SHAWN	SHAWN@HOPPERWELLS.CA

Signature	Date Submitted (yyyy/mm/dd)
SHAWN HOPPER Digitally signed by SHAWN HOPPER DN: cn=SHAWN HOPPER, o=SD HOPPER DRILLING, ou, email=SHAWN@HOPPERWELLS.CA, c=CA Date: 2025.02.19 15:34:04 -05'00'	2025/02/19

17. Ministry Use Only

Audit Number

GL3U V7PD

Well Record - Regulation 903

Ontario Water Resources Act

General Instructions and Explanations for completing a Well Record

A completed electronic Well Record Form must be delivered to the well purchaser and the owner of the land on which the well is situated within 14 days after the date on which the well's structural stage is complete. The electronic Well Record must also be forwarded within 30 days after the date on which the well's structural stage is complete to the ministry through email to the following email address: WellRecordSubmission@ontario.ca

False and Misleading Information

Subsection 98(2) of the *Ontario Water Resources Act*, R.S.O. 1990 c. O. 40, states that:

"No person shall orally, in writing or electronically, give or submit false or misleading information in any statement, document or data, to any provincial officer, the Minister, the Ministry or the Agency, any employee in or agent of the Ministry or the Agency, or any person involved in carrying out a program of the Ministry or the Agency in respect of any matter related to this Act or the regulations."

Further, subsection 98(3) of the Act states that:

"No person shall include false or misleading information in any document or data required to be created, stored or submitted under this Act."

Measurements

All measurements must be recorded in the specified unit, metric or imperial by checking off the applicable box on the top of the form. You must use the checked unit consistently throughout the well record. Measurements must be reported to 1/10th of a metre if the unit is a metre. All measurements of depth must be referenced to ground surface.

Well Owner's Information

A "well owner" means the owner of land upon which a well is situated and includes a tenant or lessee of the land and a well purchaser. If the "well owner" is an individual, record the owner's last name and first name or if the "well owner" is a business, government or other organization, record the name in the "organization" area.

Well Location

Street Number/Name and City/town/Village must be provided, if available.

Geographic Township, Concession and Lot must be reported if the well is located in an area where such information exists.

UTM Coordinates must be recorded each time a Well Record is completed. Click the button [Test UTM in Map] to use the UTM Coordinates to plot the location to Google map. This allows verification of the UTM Coordinates. This will also automatically populate the County/District.

Municipal Plan and Sublet Number may be provided, if available.

Overburden and Bedrock Materials

For each formation encountered during construction, choose words from the lists that best describe the formation on the basis of general colour, most common material, other materials, and general description of the formation.

General Colours are White, Yellow, Grey, Brown, Blue, Red, Green and Black.

Examples of Materials are: Fill, Silt, Top Soil, Coarse Sand, Slate, Muck, Gravel, Limestone, Dolomite, Quartzite, Peat, Stones, Fine Sand, Shale, Granite, Clay, Boulders, Medium Sand, Sandstone, and Greenstone.

Some definitions are as follows:

- Clay: Composed of very fine particles. Forms dense hard lumps or clods when dry and a very elastic putty-like mass when wet. It can be rolled between fingers to form a long, flexible ribbon.
- Silt: Grain size, midway between sand and clay. It may form clods which, when broken, feel soft and floury. When moist, it will form a cast that can be handled freely without breaking. Rolled between thumb and finger, it will not "ribbon" but will give a broken appearance.

- Sand: Grains are loose and granular and may be seen and felt readily. Squeezed in the hand when dry, it falls apart when the pressure is released. Squeezed when moist, it will form a cast that will crumble when touched. Should be listed as fine sand, medium sand or coarse sand.
- Gravel: Rock fragments greater than 0.3 cm in diameter.

Examples of General Descriptions are Loose, Cemented, Previously Dug or Bored, Porous, Layered, Previously Drilled, Dense, Soft, Wood Fragments, Packed, Hard.

Abandonment

To report abandonment of a well, check off the applicable box in Type on the top of the form. Details of abandonment must be recorded in the Abandonment and Sealing Section. Additional comments may be entered in the comments box under the Information section.

Annular Space

Record all material placed in the annular space around the single casing or around the permanent outer casing. If the well is a telescoped well [i.e., a well with an outer casing and inner casing(s)] or if the well is a multi-level nested test hole, report the depth from, depth to, material and volume placed for the annular space between two different sized casings or between the inner casing(s) and the side of the well in the “Comments” area of this electronic well record form.

Method of Construction

If the equipment used to construct the well is not on the list, check “Other (specify)” and record the type of equipment, check each equipment that applies.

Well Use

If the well’s use is not provided on the list, check “Other (specify)” and record the use of the well. If the well has multiple uses, check each use that applies.

Status of Well

If the well’s status is not provided on the list, check “Other (specify)” and record the use of the well. If the well has multiple statuses, check each use that applies.

Construction Record – Casing and Open Hole

Use negative values to report the top of casing above ground surface. For example, if the top of the casing is 0.4 metres above the ground surface and the bottom of the casing 6.0 metres below the ground surface, record the casing “Depth From” as -0.4.

If the top of casing is located below the ground surface (e.g., if a test hole is constructed and the top of casing is located below the ground surface in a flush mounted well vault), report the top of the casing from below ground surface. For example, if the top of the casing is 0.1 metres below the ground surface and the bottom of the casing is 6 metres below the ground surface, record the casing “Depth From” as 0.1.

Note: If a drive shoe is used, the shoe is considered casing and it must be reported if the shoe has a different inside diameter thickness.

If a portion of the well was created an open hole, record the location of the open hole on a separate row, including the diameter and the depth (top and bottom of open hole) from the ground surface.

Construction Record – Well Screen

A “well screen” means perforated pipe or tubing, unsealed concrete tiles or other material installed in a well to filter out particulate matter and form the water intake zone. Therefore, the length of a well screen includes any slotted or perforated area and unsealed area of pipe or tiles.

Water Details

- if groundwater was located, record the depth from the ground surface to the location of the groundwater resource, and
- record if the groundwater quality is “Untested,” “Fresh” (i.e., not salty), or “Other (specify).” If “Other (specify)” is recorded, use the “Other (specify)” dropdown list toselect the type of groundwater (e.g., salty, blackish water, yellowish water, mineralized, etc.).

Check off “Gas” if natural gas was encountered during well construction.

Note: Natural gas encounters need to be immediately reported to the ministry at 1-800-268-6060, well purchaser and the owner of the land.

Results of Well Yield Testing

Check off “Pumping Discontinued” if pumping was discontinued before 1 hour of continuous pumping. Explain the reason why pumping was discontinued or in some cases not performed (e.g., the well went dry, impossible to install pump in small diameter well, static water level from test hole or dewatering well was obtained and is reported instead of completing a yield test etc.).

Note: Equipment breakdown is not an acceptable reason for checking off “Pumping Discontinued” on the well record form. If groundwater in the well is flowing out of the well, provide the rate of flow, and check off “Flowing Well” (i.e., static water level above the ground surface).

In the “Results of Well Yield Testing” section of the well record form, record:

- the depth to the intake of the pump,
- the rate of pumping and duration of pumping period during the yield test,
- the final water level when pumping stops,
- water level measurements made during pumping (drawdown) and recovery. All water level measurements must be referenced from below the ground surface for each time interval specified in the drawdown and recovery boxes.

If the water level measurements remain the same over a period of time, continue to measure and report the same water level measurement for the remaining pumping or recovery time intervals.

If pumping continuously for at least 1 hour, but the design of the well does not allow for water level measurements (e.g., driven point well), the person constructing the well is not required to report drawdown or recovery water level measurements.

Map of Well Location

In the “Map of Well Location” section of the well record form, click the map area to attach a map of the well location. The map must show sufficient information to locate the well, including:

- a mark on the map showing the well,
- a scale on the map, and
- where available, the name of the structure, street or surface water body nearest to the well.

Note: More than one map can be added to the well record form by clicking on “Add Map (+)” to add an additional map.

Information

Record any additional information (e.g., observations, tests, additional licensed well technicians who worked on the well, additional annular space details for a telescoped well or a multi-level nested test hole, reasons for not providing a well owner information package) in the comments area.

Declaration

Check the declaration statement to confirm that the person constructing the well agrees with the following statement: “I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate”.

Validate

Click the validate button. If there is no missing information, you will be asked to enter the well tag again to make sure the well tag is entered correctly (only enter the numeric portion of the tag number). The audit number will then be changed from “**incomplete**” to an assigned audit number. The signature field will then be available. Click on “signature” to enter the well technician’s electronic signature. For instructions on how to create an electronic signature, please visit the Adobe Digital IDs website using the following link: https://helpx.adobe.com/acrobat/using/digital-ids.html

Ontario

Ministry of the Environment, Conservation and Parks

Well Record - Regulation 903

Ontario Water Resources Act

Notice of Collection of Personal Information

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

Fields marked with an asterisk (*) are mandatory.

Well Tag Number *
A417726

Type *

☑ Construction ☐ Abandonment

Measurement recorded in: *

☐ Metric ☑ Imperial

1. Well Owner's Information

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

Last Name	First Name
HESSELINK	E
Organization	**Email Address**

Current Address

Unit Number	Street Number *	Street Name *	City/Town/Village	
	2577	ALPS RD	AYR	
Country	**Province**	**Postal Code**	**Telephone Number**	
CANADA	ONTARIO	N0B1E0		

2. Well Location

Address of Well Location

Unit Number	Street Number *	Street Name *	Township
	2026	REIDSVILLE RD	Dumfries
Lot	**Concession**	**County/District/Municipality**	
PT 31	10	WATERLOO	
City/Town	**Province**	**Postal Code**	
AYR	Ontario	N0B 1E0	

UTM Coordinates	Zone *	Easting *	Northing *		Municipal Plan and Sublot Number
NAD 83	17	545497	4796381	Test UTM in Map	

Other

3. Overburden and Bedrock Material *

Well Depth * 25 (ft)

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

				(ft)	(ft)
Brown	Sand	Medium Sand		0	10
Brown	Sand	Medium Gravel		10	12
Brown	Sand			12	25

4. Annular Space *

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	11	BENTONITE CHIPS	4
11	23	#2 SILICA SAND	4

5. Method of Construction *

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

6. Well Use *

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

7. Status of Well *

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

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

Inside Diameter (in)	Open Hole **or** Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)
2	Plastic	40	-3	14

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)
2.5	Plastic	10	14	24

10. Water Details

Water found at Depth 10 (ft)	☐ Gas	Kind of water ☑ Fresh	☐ Untested	☐ Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0	25	6.625

12. Results of Well Yield Testing

☑ Pumping Discontinued

Explain NOT TESTED - AIR DEVELOPMENT

If flowing give rate

☐ Flowing _____ (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)	7.8													

Recovery

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

After test of well yield, water was

☑ Clear and sand free ☐ Other (specify)

Pump intake set at (ft)	Pumping rate (GPM)	Duration of pumping hrs + min	Final water level end of pumping (ft)	Disinfected? * ☐ Yes ☑ No

Recommended pump depth (ft)	Recommended pump rate (GPM)	Well production (GPM)

13. Map of Well Location *

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

14. Information

Well owner's information package delivered	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
☑ Yes ☐ No	2025/02/19	2025/02/05

Comments
MONITORING WELL 1 OF 2, 10' NORTH OF LOT LINE, 440' WEST OF RD

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *	Well Contractor's License Number *
SD HOPPER DRILLING	7643

Business Address

Unit Number	Street Number	Street Name *
	3014	RD 119

City/Town/Village *	Province	Postal Code *
ST MARYS	ONTARIO	N4X 1C9

Business Telephone Number	Business Email Address
519-271-7860	INFO@HOPPERWELLS.CA

Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *
HOPPER	DOUGLAS	2323

16. Declaration *

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

Last Name	First Name	Email Address
HOPPER	SHAWN	SHAWN@HOPPERWELLS.CA

Signature	Date Submitted (yyyy/mm/dd)

17. Ministry Use Only

Audit Number

Incomplete Record

Well Record - Regulation 903

Ontario Water Resources Act

General Instructions and Explanations for completing a Well Record

A completed electronic Well Record Form must be delivered to the well purchaser and the owner of the land on which the well is situated within 14 days after the date on which the well's structural stage is complete. The electronic Well Record must also be forwarded within 30 days after the date on which the well's structural stage is complete to the ministry through email to the following email address: WellRecordSubmission@ontario.ca

False and Misleading Information

Subsection 98(2) of the *Ontario Water Resources Act*, R.S.O. 1990 c. O. 40, states that:

"No person shall orally, in writing or electronically, give or submit false or misleading information in any statement, document or data, to any provincial officer, the Minister, the Ministry or the Agency, any employee in or agent of the Ministry or the Agency, or any person involved in carrying out a program of the Ministry or the Agency in respect of any matter related to this Act or the regulations."

Further, subsection 98(3) of the Act states that:

"No person shall include false or misleading information in any document or data required to be created, stored or submitted under this Act."

Measurements

All measurements must be recorded in the specified unit, metric or imperial by checking off the applicable box on the top of the form. You must use the checked unit consistently throughout the well record. Measurements must be reported to 1/10th of a metre if the unit is a metre. All measurements of depth must be referenced to ground surface.

Well Owner's Information

A "well owner" means the owner of land upon which a well is situated and includes a tenant or lessee of the land and a well purchaser. If the "well owner" is an individual, record the owner's last name and first name or if the "well owner" is a business, government or other organization, record the name in the "organization" area.

Well Location

Street Number/Name and City/town/Village must be provided, if available.

Geographic Township, Concession and Lot must be reported if the well is located in an area where such information exists.

UTM Coordinates must be recorded each time a Well Record is completed. Click the button [Test UTM in Map] to use the UTM Coordinates to plot the location to Google map. This allows verification of the UTM Coordinates. This will also automatically populate the County/District.

Municipal Plan and Sublet Number may be provided, if available.

Overburden and Bedrock Materials

For each formation encountered during construction, choose words from the lists that best describe the formation on the basis of general colour, most common material, other materials, and general description of the formation.

General Colours are White, Yellow, Grey, Brown, Blue, Red, Green and Black.

Examples of Materials are: Fill, Silt, Top Soil, Coarse Sand, Slate, Muck, Gravel, Limestone, Dolomite, Quartzite, Peat, Stones, Fine Sand, Shale, Granite, Clay, Boulders, Medium Sand, Sandstone, and Greenstone.

Some definitions are as follows:

- Clay: Composed of very fine particles. Forms dense hard lumps or clods when dry and a very elastic putty-like mass when wet. It can be rolled between fingers to form a long, flexible ribbon.
- Silt: Grain size, midway between sand and clay. It may form clods which, when broken, feel soft and floury. When moist, it will form a cast that can be handled freely without breaking. Rolled between thumb and finger, it will not "ribbon" but will give a broken appearance.

- Sand: Grains are loose and granular and may be seen and felt readily. Squeezed in the hand when dry, it falls apart when the pressure is released. Squeezed when moist, it will form a cast that will crumble when touched. Should be listed as fine sand, medium sand or coarse sand.
- Gravel: Rock fragments greater than 0.3 cm in diameter.

Examples of General Descriptions are Loose, Cemented, Previously Dug or Bored, Porous, Layered, Previously Drilled, Dense, Soft, Wood Fragments, Packed, Hard.

Abandonment

To report abandonment of a well, check off the applicable box in Type on the top of the form. Details of abandonment must be recorded in the Abandonment and Sealing Section. Additional comments may be entered in the comments box under the Information section.

Annular Space

Record all material placed in the annular space around the single casing or around the permanent outer casing. If the well is a telescoped well [i.e., a well with an outer casing and inner casing(s)] or if the well is a multi-level nested test hole, report the depth from, depth to, material and volume placed for the annular space between two different sized casings or between the inner casing(s) and the side of the well in the “Comments” area of this electronic well record form.

Method of Construction

If the equipment used to construct the well is not on the list, check “Other (specify)” and record the type of equipment, check each equipment that applies.

Well Use

If the well’s use is not provided on the list, check “Other (specify)” and record the use of the well. If the well has multiple uses, check each use that applies.

Status of Well

If the well’s status is not provided on the list, check “Other (specify)” and record the use of the well. If the well has multiple statuses, check each use that applies.

Construction Record – Casing and Open Hole

Use negative values to report the top of casing above ground surface. For example, if the top of the casing is 0.4 metres above the ground surface and the bottom of the casing 6.0 metres below the ground surface, record the casing “Depth From” as -0.4.

If the top of casing is located below the ground surface (e.g., if a test hole is constructed and the top of casing is located below the ground surface in a flush mounted well vault), report the top of the casing from below ground surface. For example, if the top of the casing is 0.1 metres below the ground surface and the bottom of the casing is 6 metres below the ground surface, record the casing “Depth From” as 0.1.

Note: If a drive shoe is used, the shoe is considered casing and it must be reported if the shoe has a different inside diameter thickness.

If a portion of the well was created an open hole, record the location of the open hole on a separate row, including the diameter and the depth (top and bottom of open hole) from the ground surface.

Construction Record – Well Screen

A “well screen” means perforated pipe or tubing, unsealed concrete tiles or other material installed in a well to filter out particulate matter and form the water intake zone. Therefore, the length of a well screen includes any slotted or perforated area and unsealed area of pipe or tiles.

Water Details

- if groundwater was located, record the depth from the ground surface to the location of the groundwater resource, and
- record if the groundwater quality is “Untested,” “Fresh” (i.e., not salty), or “Other (specify).” If “Other (specify)” is recorded, use the “Other (specify)” dropdown list toselect the type of groundwater (e.g., salty, blackish water, yellowish water, mineralized, etc.).

Check off “Gas” if natural gas was encountered during well construction.

Note: Natural gas encounters need to be immediately reported to the ministry at 1-800-268-6060, well purchaser and the owner of the land.

Results of Well Yield Testing

Check off “Pumping Discontinued” if pumping was discontinued before 1 hour of continuous pumping. Explain the reason why pumping was discontinued or in some cases not performed (e.g., the well went dry, impossible to install pump in small diameter well, static water level from test hole or dewatering well was obtained and is reported instead of completing a yield test etc.).

Note: Equipment breakdown is not an acceptable reason for checking off “Pumping Discontinued” on the well record form. If groundwater in the well is flowing out of the well, provide the rate of flow, and check off “Flowing Well” (i.e., static water level above the ground surface).

In the “Results of Well Yield Testing” section of the well record form, record:

- the depth to the intake of the pump,
- the rate of pumping and duration of pumping period during the yield test,
- the final water level when pumping stops,
- water level measurements made during pumping (drawdown) and recovery. All water level measurements must be referenced from below the ground surface for each time interval specified in the drawdown and recovery boxes.

If the water level measurements remain the same over a period of time, continue to measure and report the same water level measurement for the remaining pumping or recovery time intervals.

If pumping continuously for at least 1 hour, but the design of the well does not allow for water level measurements (e.g., driven point well), the person constructing the well is not required to report drawdown or recovery water level measurements.

Map of Well Location

In the “Map of Well Location” section of the well record form, click the map area to attach a map of the well location. The map must show sufficient information to locate the well, including:

- a mark on the map showing the well,
- a scale on the map, and
- where available, the name of the structure, street or surface water body nearest to the well.

Note: More than one map can be added to the well record form by clicking on “Add Map (+)” to add an additional map.

Information

Record any additional information (e.g., observations, tests, additional licensed well technicians who worked on the well, additional annular space details for a telescoped well or a multi-level nested test hole, reasons for not providing a well owner information package) in the comments area.

Declaration

Check the declaration statement to confirm that the person constructing the well agrees with the following statement: “I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate”.

Validate

Click the validate button. If there is no missing information, you will be asked to enter the well tag again to make sure the well tag is entered correctly (only enter the numeric portion of the tag number). The audit number will then be changed from “**incomplete**” to an assigned audit number. The signature field will then be available. Click on “signature” to enter the well technician’s electronic signature. For instructions on how to create an electronic signature, please visit the Adobe Digital IDs website using the following link: https://helpx.adobe.com/acrobat/using/digital-ids.html

Ontario

Ministry of the Environment, Conservation and Parks

Well Record - Regulation 903

Ontario Water Resources Act

Notice of Collection of Personal Information

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

Fields marked with an asterisk (*) are mandatory.

Well Tag Number *
A417727

Type *

☑ Construction ☐ Abandonment

Measurement recorded in: *

☐ Metric ☑ Imperial

1. Well Owner's Information

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

Last Name	First Name
HESSELINK	E
Organization	**Email Address**

Current Address

Unit Number	Street Number *	Street Name *	City/Town/Village	
	2577	ALPS RD	AYR	
Country	**Province**	**Postal Code**	**Telephone Number**	
CANADA	ONTARIO	N0B1E0		

2. Well Location

Address of Well Location

Unit Number	Street Number *	Street Name *	Township
	2026	REIDSVILLE RD	Dumfries
Lot	**Concession**	**County/District/Municipality**	
PT 31	10	WATERLOO	
City/Town	**Province**	**Postal Code**	
AYR	Ontario	N0B 1E0	

UTM Coordinates	Zone *	Easting *	Northing *		Municipal Plan and Sublot Number
NAD 83	17	545499	4796436	Test UTM in Map	

Other

3. Overburden and Bedrock Material *

Well Depth * 25 (ft)

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

				(ft)	(ft)
Brown	Sand	Medium Sand		0	8
Brown	Sand	Gravel		8	10
Brown	Sand			10	25

4. Annular Space *

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	11	BENTONITE CHIPS	4
11	25	#2 SILICA SAND	4

5. Method of Construction *

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

6. Well Use *

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

7. Status of Well *

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

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

Inside Diameter (in)	Open Hole **or** Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)
2	Plastic	40	-3	13

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)
2.5	Plastic	10	13	23

10. Water Details

Water found at Depth		Kind of water				
10 (ft)	☐ Gas	☑ Fresh	☐ Untested	☐ Other		

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0	25	6.625

12. Results of Well Yield Testing

☑ Pumping Discontinued

Explain NOT TESTED - AIR DEVELOPMENT

If flowing give rate

☐ Flowing _____ (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)	9.9													

Recovery

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

After test of well yield, water was

☑ Clear and sand free ☐ Other (specify)

Pump intake set at (ft)	Pumping rate (GPM)	Duration of pumping hrs + min	Final water level end of pumping (ft)	Disinfected? *
				☐ Yes ☑ No

Recommended pump depth (ft)	Recommended pump rate (GPM)	Well production (GPM)

13. Map of Well Location *

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

14. Information

Well owner's information package delivered	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
☑ Yes ☐ No	2025/02/19	2025/02/05

Comments
MONITORING WELL 2 OF 2, 10' SOUTH OF LOT LINE, 425' WEST OF RD

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *	Well Contractor's License Number *
SD HOPPER DRILLING	7643

Business Address

Unit Number	Street Number	Street Name *
	3014	RD 119

City/Town/Village *	Province	Postal Code *
ST MARYS	ONTARIO	N4X 1C9

Business Telephone Number	Business Email Address
519-271-7860	INFO@HOPPERWELLS.CA

Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *
HOPPER	DOUGLAS	2323

16. Declaration *

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

Last Name	First Name	Email Address
HOPPER	SHAWN	SHAWN@HOPPERWELLS.CA

Signature	Date Submitted (yyyy/mm/dd)
SHAWN HOPPER Digitally signed by SHAWN HOPPER DN: cn=SHAWN HOPPER, o=SD HOPPER DRILLING, ou, email=SHAWN@HOPPERWELLS.CA, c=CA Date: 2025.02.19 15:57:11 -05'00'	2025/02/19

17. Ministry Use Only

Audit Number
DLSY YAF5

The Ontario Water Resources Commission Act

WATER WELL RECORD

407/50

Water Management in Ontario

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

11 | 6503570 | 65901 | CON 10

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
WATERLOO	NORTH DUMFRIES	CON 10	031

[redacted] RR 1 AYR — DATE COMPLETED: DAY 20 MO. 04 YR. 72

796240 | 4 | 1000 | 5 | 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	TO
BROWN	TOP SOIL			0	6"
BROWN	SUB SOIL			6"	4'
BROWN	SAND		sugar sand	4'	20
GREY	SAND + small gravel			20	30'

WILL CLEAN OUT IF NECESSARY ONCE WITHOUT CHARGE UP TO APR. 1973 J. Butz

31 | 0006002 | 0004025 | 0020628 | 0030028

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0020	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	TO
36	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☒ CONCRETE 4 ☐ OPEN HOLE	3"	0	0030
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZES OF OPENING (SLOT NO.) | DIAMETER | LENGTH
MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☐ BAILER — PUMPING RATE — DURATION OF PUMPING

STATIC LEVEL: 019 — WATER LEVEL END OF PUMPING: ~~030~~ — WATER LEVELS DURING: 15 MINUTES, 30 MINUTES, 45 MINUTES, 60 MINUTES — 1 ☐ PUMPING 2 ☐ RECOVERY

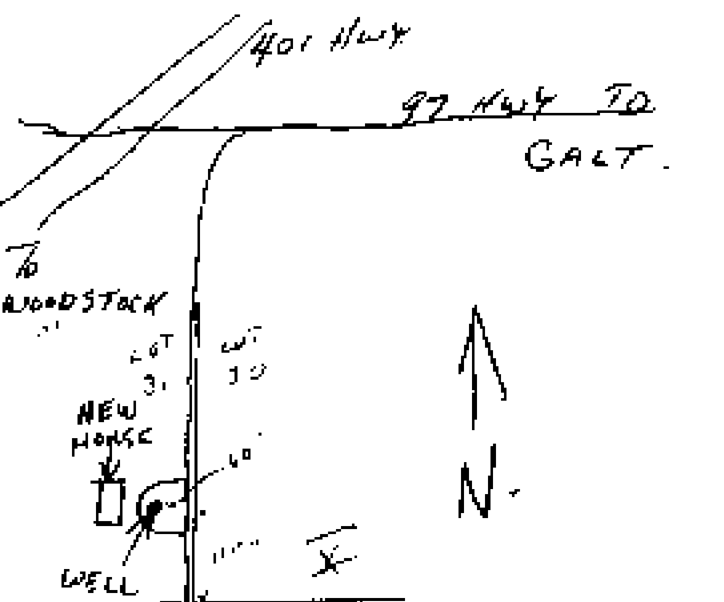
IF FLOWING GIVE RATE — PUMP INTAKE SET AT — WATER AT END OF TEST: ☐ CLEAR ☐ CLOUDY

RECOMMENDED PUMP TYPE: ✓ SHALLOW ☐ DEEP — RECOMMENDED PUMP SETTING: 0025 FEET — RECOMMENDED PUMPING RATE: 0008 G.P.M.

G.P.M./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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



DRILLERS REMARKS

FINAL STATUS OF WELL	1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED
WATER USE 01	1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED
METHOD OF DRILLING 6	1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☒ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Johnson + Butz Wellboring — LICENCE NUMBER: 3030

ADDRESS: 240 King Geo Rd Brantford

NAME OF DRILLER OR BORER: Rick Smith — LICENCE NUMBER

SIGNATURE OF CONTRACTOR: J. Butz — SUBMISSION DATE: DAY 4 MO. 5 YR. 72

OFFICE USE ONLY

DATA SOURCE: 1 — CONTRACTOR: 3030 — DATE RECEIVED: 290572

DATE OF INSPECTION: 6.12.72 — INSPECTOR

REMARKS: CSS.SR P W1

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☑ Imperial

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

Tag#: A200115

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
2648 Alps Rd RR#1	North Dumfries	31	10

County/District/Municipality	City/Town/Village	Province	Postal Code
Waterloo	Ayr	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	17	562247	4796319		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Top Soil			0	1
Brown	Sand		Packed	1	4
Brown	Sand		Loose	4	17
Grey	Gravel		Loose	17	21

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	9	3/8 Bentonite Chips	
9	21	Filter Sand	

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
36"	Concrete	3"	+1½	21

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	21	48"

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft): 18

Pumping rate (l/min / GPM): 10 Gpm

Duration of pumping: 1 hrs + 00 min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft): 18

Recommended pump rate (l/min / GPM): 10 Gpm

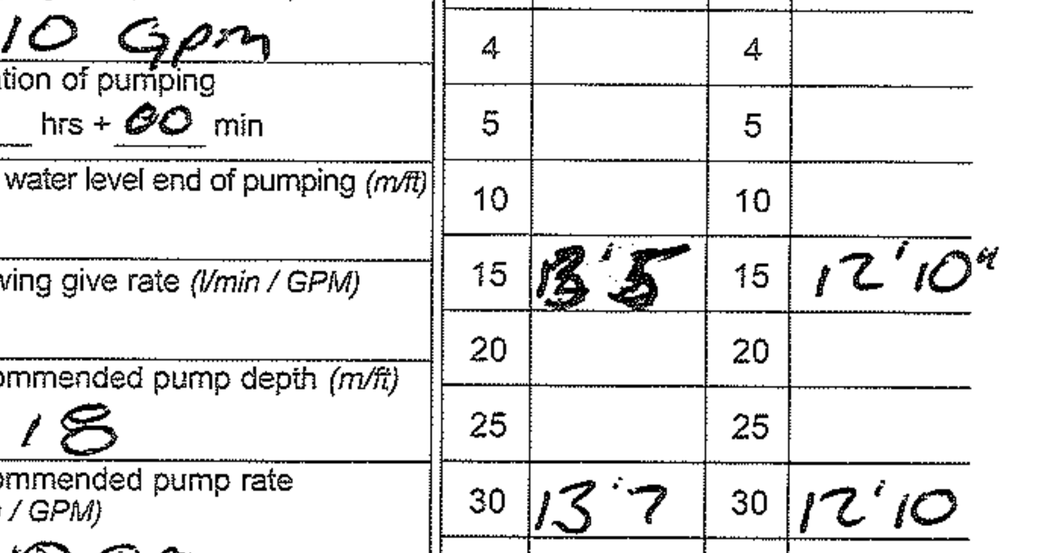
Well production (l/min / GPM): 10 Gpm

Disinfected? ☑ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	12'10"		13'7
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15	13'5	15	12'10"
20		20	
25		25	
30	13'7	30	12'10
40		40	
50		50	
60	13'7	60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Johnson & Back Well Boring	7492

Business Address (Street Number/Name)	Municipality
52 Church Rd RR#1	Waterford

Province	Postal Code	Business E-mail Address
On	N0E1Y0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5194430045	Avey Darcy

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
2988		20160826

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☑ No		20160826

Ministry Use Only

Audit No. Z243211

DEC 28 2016 Received

0506E (2014/11)

Ministry's Copy

Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. (Place Sticker and/or Print Below): A106244

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
2648 ALPS RD	N. DUMFRIES	31	10

County/District/Municipality	City/Town/Village	Province	Postal Code
WATERLOO	AYR	Ontario	N0B1E0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	545529	4796365		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
BROWN	TOP-SOIL			0	1
BROWN	SAND	ROOTS		1	8
BROWN	SAND		LOOSE	8	11
BROWN	SAND	FINE	TIGHT	11	12
BROWN	SAND		COARSE	12	20
~~BRO~~ GREY	SAND & GRAVEL		COARSE	20	23½

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	8½	BENTINITE CHIPS	
8½	23½	FILTER SAND	

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
3	CONCRETE	3	0	23½

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	23½	48

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ____ hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft): 19

Recommended pump rate (l/min / GPM): 10

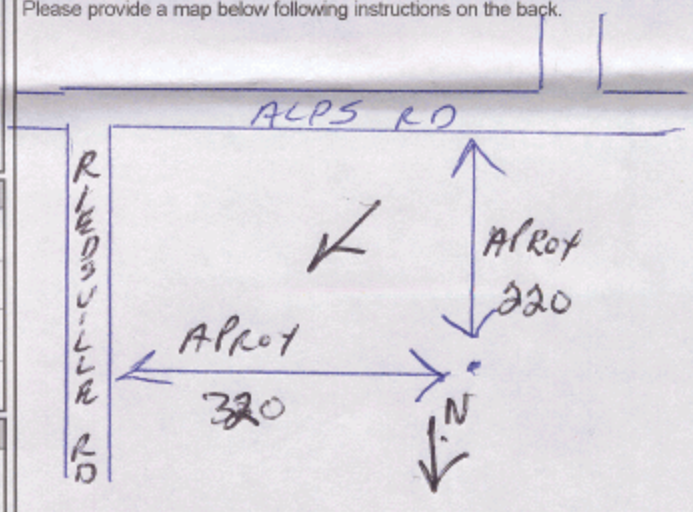
Well production (l/min / GPM)

Disinfected? ☑ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
JOHNSON & BAETZ	3030

Business Address (Street Number/Name)	Municipality
112 MCGUINESS DRIVE	BRANTFORD

Province	Postal Code	Business E-mail Address
ONT	N3T6R4	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5197720041	BAETZ JOHN

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3333	J Baetz	2010 10 06

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No	Y Y Y Y M M D D	Y Y Y Y M M D D

Ministry Use Only

Audit No. z122316

Received NOV 10 2010

0506E (2007/12)

Ministry's Copy

The Ontario Water Resources Commission Act

WATER WELL RECORD

40f8d

Water management in Ontario
1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 6503248 | 65001 | CON | V9

COUNTY OR DISTRICT: Waterloo
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: N. Dumfries
CON., BLOCK, TRACT, SURVEY, ETC.: X
LOT: 031

[redacted]

Ayr

DATE COMPLETED: DAY 04 MO 06 YR 70

1196100 | 4 | 129921 | 4 | 251

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
		Old pit		0	7
brown	sandy clay			7	31
grey	gravel	med.		31	32

31 | 0007 | 43 | 0031 | 4509 | 0032 | 11

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
031	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
05	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.219	4	0032
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SLOT NO. / DIAMETER / LENGTH
MATERIAL AND TYPE / DEPTH TO TOP OF SCREEN

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE	(CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE: 0005 GPM
DURATION OF PUMPING: 08 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
007 FEET	028 FEET		028 FEET	028 FEET	028 FEET

WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY
IF FLOWING GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☒ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING: 030 FEET
RECOMMENDED PUMPING RATE: 0005 GPM
0002 GPM/FT. SPECIFIC CAPACITY

LOCATION OF WELL

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

LOT 31 | LOT 30 | X | 150 | 100 | IX

DRILLERS REMARKS:

FINAL STATUS OF WELL: 1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 01: 1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING: 1 ☒ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: V. Koldyrev — LICENCE NUMBER: 1905
ADDRESS: 123 Fourth St. Preston
NAME OF DRILLER OR BORER: same — LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: V. Koldyrev — SUBMISSION DATE: DAY 23 MO 7 YR 70

OFFICE USE ONLY

DATA SOURCE: 1 — CONTRACTOR: 1905 — DATE RECEIVED: 280770
DATE OF INSPECTION: 17. 9. 71 — INSPECTOR:
REMARKS:
P 7
WI 7

OWRC COPY

Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. *(Place Sticker and/or Print Below)* **A 098944**

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
2680 Alps Rd.	North Dumfries	31	10

County/District/Municipality	City/Town/Village	Province	Postal Code
Waterloo/N.Dumfries	.	Ontario	N0B 1E0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	545283	4796463	.	.

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
brown	fine sand	silt		0 ft.	25 ft.
brown	silt	clay		25 ft	60 ft.
brown	sand			60 ft.	67 ft
.	.			.	.
.	.			.	.

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0 ft.	20 ft.	Bentonite	10 cu.ft.
.	.	.	.
.	.		

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6.25 in.	steel	188	+2ft.	57 ft.
5.125	Screen & fittings	188	57 ft	67 ft
.	.		.	.

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
5.5	stainless steel	12	60 ft	65 ft.

Status of Well

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

Water Details

Water found at Depth	Kind of Water	Hole Diameter Depth From	Hole Diameter Depth To	Hole Diameter (cm/in)
45 ft (m/ft) ☐ Gas	☐ Fresh ☑ Untested ☐ Other, *specify*	+2 ft.	57 ft	6.25
— (m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*	57 ft	67 ft	5.125
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*	.	.	.

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft): 15 ft.

Pumping rate (l/min / GPM): 12 gpm.

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): +3 ft.

If flowing give rate (l/min / GPM): 20 gpm

Recommended pump depth (m/ft): 30 fft.

Recommended pump rate (l/min / GPM): 10 gpm.

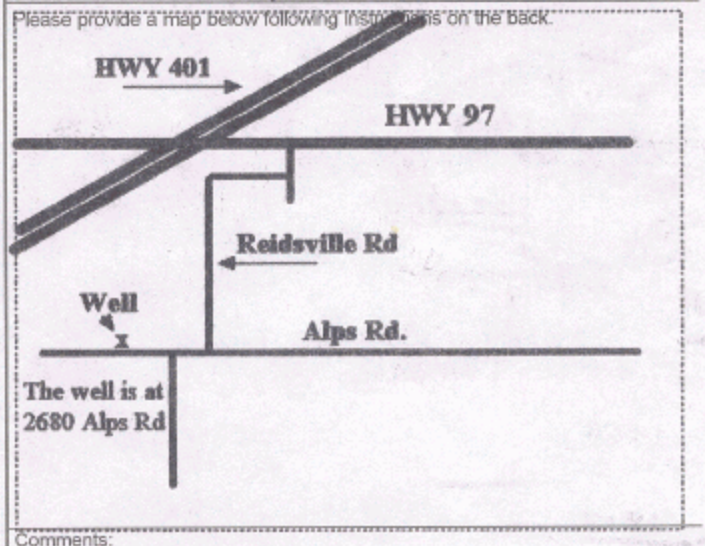
Well production (l/min / GPM): 30 gpm.

Disinfected? ☐ Yes ☑ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	+7 ft.		Flowing
1	+5 ft.	1	+6 ft.
2	+3 ft.	2	+6 ft.
3	+3 ft.	3	+7 ft.
4	+3 ft.	4	+7 ft.
5	+3 ft.	5	+7 ft.
10	+3 ft.	10	+7 ft.
15	+3 ft.	15	+7 ft.
20	+3 ft.	20	+7 ft.
25	+3 ft.	25	+7 ft.
30	+3 ft.	30	+7 ft.
40	+3 ft.	40	+7 ft.
50	+3 ft.	50	+7 ft.
60	+3 ft.	60	+7 ft.

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Packham Well Drilling Inc.	4207

Business Address (Street Number/Name)	Municipality	Province	Postal Code	Business E-mail Address
1235 Trinity Road	Ancaster	Ontario	L9G3L1	packhamwelldrilling@gmail.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)	Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
905 648 2909	Packham Mervyn	0058	Mervyn Packham	2010 09 13

Well owner's information package delivered ☑ Yes ☐ No

Date Package Delivered: 2010 09 13

Date Work Completed: 2010 09 13

Ministry Use Only

Audit No. Z113526

Received OCT 08 2010

0506E (2007/12)

Ministry's Copy

Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☐ Imperial

Well Tag No. *(Place Sticker and/or Print Below)* **A 098945**

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Well Owner's Information

[redacted]

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
2680 Alps Rd.	North Dumfries	31	10

County/District/Municipality	City/Town/Village	Province	Postal Code
Waterloo/N.Dumfries	·	Ontario	N0B 1E0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	545283	4796461	·	·

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
,	,	,Abandonment of well drilled June 14 1984			· ·
·	·	.The well was drilled for [redacted]			· ·
·	·			·	·
·	·			·	--
·	·			·	·

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0 ft.	10 ft	cement	4 cu ft.
10 ft	67 ft	clean fill & bentonite	15 cu ft.
·	·		

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
·	·		·	·

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
+2 ft.	57 ft	6.25
57 ft	67 ft	5.125
·	·	·

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping ____ hrs + ____ min

Final water level end of pumping *(m/ft)*

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

Recommended pump depth *(m/ft)*

Recommended pump rate *(l/min / GPM)*

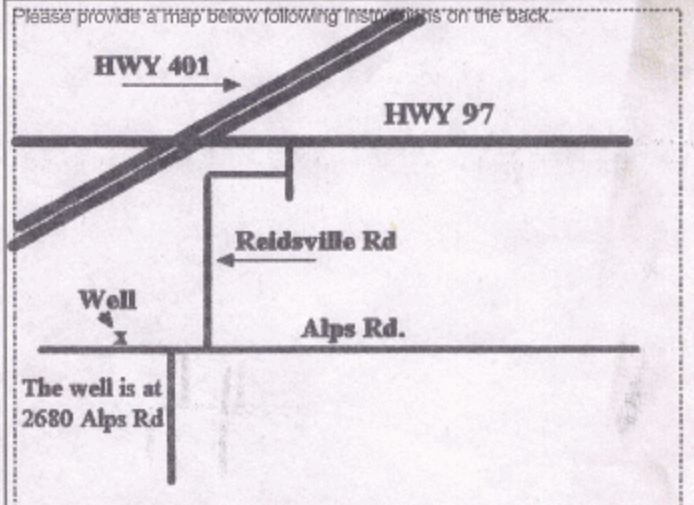
Well production *(l/min / GPM)*

Disinfected? ☑ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				·
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor: Packham Well Drilling Inc.

Well Contractor's Licence No.: 4207

Business Address (Street Number/Name): 1235 Trinity Road

Municipality: Ancaster

Province: Ontario

Postal Code: L9G3L1

Business E-mail Address: packhamwelldrilling@gmail.com

Bus. Telephone No. *(inc. area code)*: 905 648 2909

Name of Well Technician (Last Name, First Name): Packham, Mervyn

Well Technician's Licence No.: 0058

Signature of Technician and/or Contractor: Mervyn Packham

Date Submitted: 2010/09/13

Well owner's information package delivered: ☑ Yes ☐ No

Date Package Delivered: 2010/09/13

Date Work Completed: 2010/09/13

Ministry Use Only

Audit No. z113527

Received OCT 08 2010

0506E (2007/12)

Ministry's Copy

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

11 — 6505532

County or District	Township, Borough, City, Town, Village	Con., Block, Tract, Survey, etc. / Lot
[redacted]	North Dumfries	Lot 31 Conc. 10

[redacted] Walker St. Cambridge — Date completed: day 14, mo. June, yr. 84

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	To
Brown	Sandy loam			0	25
Brown	Sandy clay			25	60
Brown	Sand		come with water	60	65
Grey	clay			65	62

31

32

41 WATER RECORD

Water found at – feet	Kind of water
62-65	☒ Fresh ☐ Sulphur ☐ Salty ☐ Minerals

51 CASING & OPEN HOLE RECORD

Inside diam. inches	Material	Wall thickness inches	Depth – feet From	To
6 1/4	☒ Steel	188	0	60
5	☒ Steel	188	52	67

SCREEN

Slot no.: 12 — Length: 6 inches — Diameter: 3 inches
Material and type: Stainless Steel — Depth to top of screen: 62 feet

61 PLUGGING & SEALING RECORD

71 PUMPING TEST

Pumping test method: air — Pumping rate: 150 GPM (Galvanized 50) — Duration of pumping: 1/4 hrs

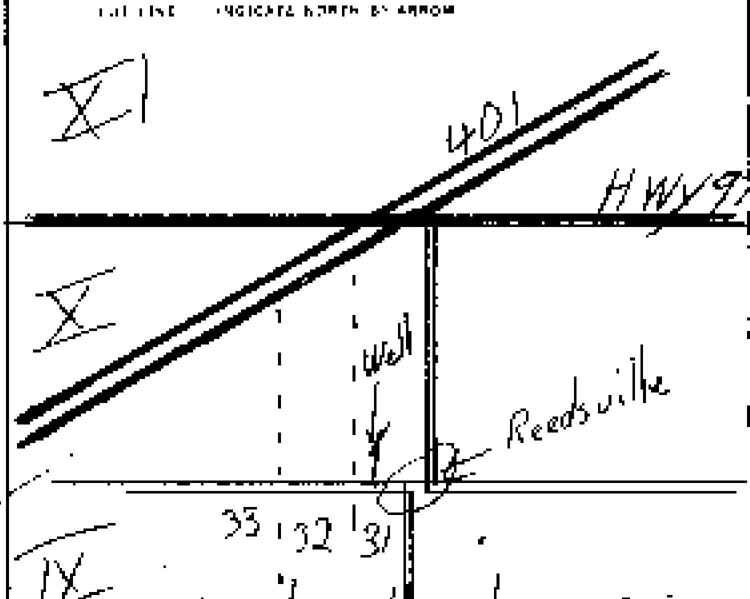
Static level	Water level end of pumping	15 minutes	30 minutes	45 minutes	60 minutes
9 flowing +6 ft	60	+6	+6	+6	+6

☒ Pumping ☒ Recovery — ☒ Clear ☐ Cloudy
Recommended pump type: ☒ Shallow ☐ Deep — Recommended pump setting: 20 feet — Recommended pumping rate: 20 GPM

LOCATION OF WELL

2619

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



Long Lane through swamp

FINAL STATUS OF WELL

☒ Water supply ☐ Observation well ☐ Test hole ☐ Recharge well ☐ Abandoned, insufficient supply ☐ Abandoned, poor quality ☐ Unfinished

WATER USE

☒ Domestic ☒ Stock ☐ Irrigation ☐ Industrial ☐ Other ☐ Commercial ☐ Municipal ☐ Public supply ☐ Cooling or air conditioning ☐ Not used

METHOD OF DRILLING

☐ Cable tool ☐ Rotary (conventional) ☐ Rotary (reverse) ☒ Rotary (air) ☐ Air percussion ☐ Boring ☐ Diamond ☐ Jetting ☐ Driving

Contractor: ...ley Packham — Licence number: 4218
Address: Ancaster
Name of well technician: ... Packham — Licence number: 4208
Signature of contractor: Packham — Submission date: day 14, mo. June, yr. 84

OFFICE USE ONLY — 250185 — CSS.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506

Appendix B

Laboratory Certificates of Analysis

Region of Waterloo

PUBLIC HEALTH AND PARAMEDIC SERVIC
Health Protection and Investigation

99 Regina Street South 3rd Floor
P.O. Box 1633
Waterloo, Ontario N2J 4V3 Canada
Telephone: 519-575-4400
TTY: 519-575-4608
Fax: 519-883-2226
www.regionofwaterloo.ca

150 Main Street
Cambridge, Ontario
N1R 6P9 Canada
Telephone: 519-575-44
TTY: 519-575-4608
Fax: 519-622-1235
www.regionofwaterloo.

August 7, 2024

Janet Hesselink
2026 Reidsville Rd
Ayr, ON N0B 1E0

Dear Janet:

The results of the drinking water sample for nitrate taken on July 30, 2024 from your kitchen faucet located at the above mentioned address, indicated a level of **8.18 mg/L** nitrate.

Interpretation:

☒ Meets Ontario Drinking Water Quality Chemical Standards of 10 mg/L nitrate.

☐ Exceeds Ontario Drinking Water Quality Chemical Standards of 10 mg/L nitrate.

For your information, I have enclosed a nitrate fact sheet. If you have any further questions or concerns please contact me at (519)505-7601.

Sincerely,

Breanna Badea, BEPH, CPHI(C)
Public Health Inspector
Health Protection and Investigation
Region of Waterloo Public Health and Emergency Services
99 Regina St. S., 3rd Floor, Waterloo, ON N2J 4V3
Cell: 519-505-7601
BBadea@regionofwaterloo.ca

1204151

Region of Waterloo

PUBLIC HEALTH AND PARAMEDIC SERVICES
Health Protection and Investigation

99 Regina Street South 3rd Floor
P.O. Box 1833
Waterloo, Ontario N2J 4V3 Canada
Telephone: 519-575-4400
TTY: 519-575-4606
Fax: 519-883-2226
www.regionofwaterloo.ca

150 Main Street
Cambridge, Ontario
N1R 6P9 Canada
Telephone: 519-575-4400
TTY: 519-575-4606
Fax: 519-622-1235
www.regionofwaterloo.ca

August 7, 2024

Jeremy Ludwig
2648 Alps Road
Ayr, ON N0B 1E0

Dear Jeremy Ludwig:

The results of the drinking water sample for nitrate taken on July 30, 2024 located at the above mentioned address, indicated a level of <0.100 **mg/L** nitrate.

Interpretation:

X Meets Ontario Drinking Water Quality Chemical Standards of 10 mg/L nitrate.

☐ Exceeds Ontario Drinking Water Quality Chemical Standards of 10 mg/L nitrate.

For your information, I have enclosed a nitrate fact sheet. If you have any further questions or concerns, please contact me at 226-753-2237.

Yours truly,

Adam Domenichini, Bsc., BASc., CPHI©
Public Health Inspector

Document Number: 1204151

1204151 v1

Region of Waterloo

PUBLIC HEALTH AND EMERGENCY SERVICES
Health Protection and Investigation

99 Regina Street South 3rd Floor
P.O. Box 1633
Waterloo Ontario N2J 4V3 Canada
Telephone: 519-575-4400
TTY: 519-575-4608
Fax: 519-883-2226
www.regionofwaterloo.ca

150 Main Street
Cambridge Ontario N1R 6P9 Canada
Telephone: 519-575-4400
TTY: 519-575-4608
Fax: 519-622-1235
www.regionofwaterloo.ca

August 7, 2024

Michael Burns
2660 Alps Rd
Ayr, ON
N0B 1E0

Dear Michael:

The results of the drinking water sample for nitrate analysis taken on July 29, 2024 at the above address location indicated a level of <0.100 mg/L nitrate.
Interpretation:

☒	Meets Ontario Drinking Water Quality Chemical Standards of 10 mg/L nitrate.
☐	Exceeds Ontario Drinking Water Quality Chemical Standards of 10 mg/L nitrate.

For your information, I have enclosed a nitrate fact sheet. If you have any questions or concerns please contact me at 226-753-0042.

Sincerely,

Amanda Demaree BSc, CPHI(C)
Public Health Inspector

Encl.

Your Project #: 240523
Site Location: REIDSVILLE
Your C.O.C. #: N/A

Attention: Melanie Bombini

BluMetric Environmental Inc
209 Frederick St
Unit 3B
Kitchener, ON
CANADA N2H 2M7

Report Date: 2024/12/10
Report #: R8440082
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4AY987
Received: 2024/12/06, 13:13

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Nitrate & Nitrite as Nitrogen in Water (1)	2	N/A	2024/12/09	CAM SOP-00440	SM 24 4500-NO3I/NO2B

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Your Project #: 240523
Site Location: REIDSVILLE
Your C.O.C. #: N/A

Attention: Melanie Bombini

BluMetric Environmental Inc
209 Frederick St
Unit 3B
Kitchener, ON
CANADA N2H 2M7

Report Date: 2024/12/10
Report #: R8440082
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4AY987
Received: 2024/12/06, 13:13

Encryption Key

Elora Di Bratto
Project Manager
11 Dec 2024 16:38:24

Please direct all questions regarding this Certificate of Analysis to:
Elora Di Bratto, Project Manager
Email: Elora.Di-Bratto@bureauveritas.com
Phone# (905) 817-5700

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4AY987
Report Date: 2024/12/10

BluMetric Environmental Inc
Client Project #: 240523
Site Location: REIDSVILLE
Sampler Initials: DK

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		ALAZ80	ALAZ81		
Sampling Date		2024/12/06 11:40	2024/12/06 12:20		
COC Number		N/A	N/A		
	UNITS	**2630**	**2680**	**RDL**	**QC Batch**
Inorganics					
Nitrite (N)	mg/L	<0.010	<0.010	0.010	9813714
Nitrate (N)	mg/L	1.08	<0.10	0.10	9813714
Nitrate + Nitrite (N)	mg/L	1.08	<0.10	0.10	9813714

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4AY987
Report Date: 2024/12/10

BluMetric Environmental Inc
Client Project #: 240523
Site Location: REIDSVILLE
Sampler Initials: DK

TEST SUMMARY

Bureau Veritas ID: ALAZ80
Sample ID: 2630
Matrix: Water

Collected: 2024/12/06
Shipped:
Received: 2024/12/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate & Nitrite as Nitrogen in Water	LACH	9813714	N/A	2024/12/09	Chandra Nandlal

Bureau Veritas ID: ALAZ81
Sample ID: 2680
Matrix: Water

Collected: 2024/12/06
Shipped:
Received: 2024/12/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate & Nitrite as Nitrogen in Water	LACH	9813714	N/A	2024/12/09	Chandra Nandlal

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.0°C

Results relate only to the items tested.

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Bureau Veritas Job #: C4AY987
Report Date: 2024/12/10

QUALITY ASSURANCE REPORT

BluMetric Environmental Inc
Client Project #: 240523
Site Location: REIDSVILLE
Sampler Initials: DK

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9813714	Nitrate (N)	2024/12/09	98	80 - 120	101	80 - 120	<0.10	mg/L	1.4	20
9813714	Nitrite (N)	2024/12/09	107	80 - 120	110	80 - 120	<0.010	mg/L	2.3	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

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Bureau Veritas Job #: C4AY987
Report Date: 2024/12/10

BluMetric Environmental Inc
Client Project #: 240523
Site Location: REIDSVILLE
Sampler Initials: DK

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Louise Harding, Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

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C4AY987
2024/12/06 13:13

Bureau Veritas

RECD IN WATERLOO **CHAIN OF CUSTODY RECORD**

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:
Company Name:	#1192 BluMetric Environmental Inc	Company Name:	#5637 BluMetric Environmental Inc	Quotation #:	PSA	Bureau Veritas Job #:
Attention:	Accounts Payable	Attention:	[illegible]	P.O. #:		
Address:	1682 Woodward Drive	Address:	209 Frederick St Unit 3B	Project:	240523	COC #:
	Ottawa ON K2C 3R8		Kitchener ON N2H 2M7	Project Name:	Reidsville	Project Manager:
Tel:	(613) 839-3053 Fax: (613) 839-5376	Tel:	(519) 742-6685 Ext. 218 Fax:	Site #:		
Email:	ap@blumetric.ca	Email:	[illegible]@blumetric.ca, mbombini@blumetric.ca, dkava	Sampled By:	DK, EL	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Analysis requested: Nitrate

Turnaround Time (TAT) Required: Regular (Standard) TAT: X

#	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Nitrate	# of Bottles	Comments
1		2630	2024/12/06	11:40	DW	X	1	
2		2640	" "	12:20	DW	X	1	
3								
4								
5								
6								
7								
8								
9								
10								

NONT-2024-12-1713

RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time
[signature] Dave Kavanagh	24/12/06		[signature] YOGI YA	2024/12/06	13:13
				2024/12/06	19:10

Laboratory Use Only — Temperature (°C) on Receipt: 6/6/6

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

ALS Canada Ltd.

CERTIFICATE OF ANALYSIS

Work Order	: **WT2502259**		
Client	: **BluMetric Environmental Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Kimberly Carlton	Account Manager	: Emily Smith
Address	: 209 Frederick St. Kitchener Ontario Canada N2H 2M7	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 240523	Date Samples Received	: 06-Feb-2025 09:45
PO	: ----	Date Analysis Commenced	: 06-Feb-2025
C-O-C number	: 23-1119324	Issue Date	: 12-Feb-2025 16:55
Sampler	: KC		
Site	: ----		
Quote number	: 2024 Price List		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key: CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
mg/L	milligrams per litre

<: less than.
>: greater than.
Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	PW1-24	MW2-24	MW3-24	----	----
					Client sampling date / time	05-Feb-2025 13:55	05-Feb-2025 15:30	05-Feb-2025 15:00	----	----
						WT2502259-001	WT2502259-002	WT2502259-003	----	----
						Result	Result	Result	----	----
Anions and Nutrients										
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L		<0.020	<0.020	<0.020	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Analytical Results

Sub-Matrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW3-24	----	----	----	----
					Client sampling date / time	03-Feb-2025 13:00	----	----	----	----
						WT2502259-004	----	----	----	----
						Result	----	----	----	----
Particle Size										
Sand (>0.075mm)	----	E178/SK	1.0	%		81.7	----	----	----	----
Fines (<0.075mm)	----	E178/SK	1.0	%		18.3	----	----	----	----
Texture class	----	E178/SK	-	-		Coarse	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2502259**	Page	: 1 of 5
Client	: **BluMetric Environmental Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Kimberly Carlton	Account Manager	: Emily Smith
Address	: 209 Frederick St. Kitchener ON Canada N2H 2M7	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 240523	Date Samples Received	: 06-Feb-2025 09:45
PO	: ----	Issue Date	: 12-Feb-2025 16:54
C-O-C number	: 23-1119324		
Sampler	: KC		
Site	: ----		
Quote number	: 2024 Price List		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid** Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Particle Size : CCME fine/coarse Particle Size Analysis by wet sieve										
LDPE bag MW3-24	E178	03-Feb-2025	----	----	----		10-Feb-2025	180 days	7 days	✓

Matrix: **Water** Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] PW1-24	E235.NO3	05-Feb-2025	06-Feb-2025	7 days	1 days	✓	07-Feb-2025	7 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] MW2-24	E235.NO3	05-Feb-2025	10-Feb-2025	7 days	5 days	✓	11-Feb-2025	7 days	6 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] MW3-24	E235.NO3	05-Feb-2025	10-Feb-2025	7 days	5 days	✓	11-Feb-2025	7 days	6 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
CCME fine/coarse Particle Size Analysis by wet sieve	E178	1868568	1	4	25.0	5.0	✓
Laboratory Control Samples (LCS)							
CCME fine/coarse Particle Size Analysis by wet sieve	E178	1868568	1	4	25.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Nitrate in Water by IC	E235.NO3	1865751	2	20	10.0	5.0	✓
Laboratory Control Samples (LCS)							
Nitrate in Water by IC	E235.NO3	1865751	2	20	10.0	5.0	✓
Method Blanks (MB)							
Nitrate in Water by IC	E235.NO3	1865751	2	20	10.0	5.0	✓
Matrix Spikes (MS)							
Nitrate in Water by IC	E235.NO3	1865751	2	20	10.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
CCME fine/coarse Particle Size Analysis by wet sieve	E178 ALS Environmental - Saskatoon	Soil/Solid	CCME Vol 4 Analytical Methods	An air-dried sample is reduced to < 2 mm size and mixed with a dispersing agent (sodium hexametaphosphate). The sample is washed through a 200 mesh (0.075 mm) sieve. The retained mass of sample is used to determine % sand fraction. If the percentage of sand is >50%, the soil is considered to be coarse textured soil. If the percentage of sand is <50%, the soil is considered to be fine textured.
Nitrate in Water by IC	E235.NO3 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dry and Grind in Soil/Solid <60°C	EPP442 ALS Environmental - Saskatoon	Soil/Solid	Soil Sampling and Methods of Analysis, Carter 2008	After removal of any coarse fragments and reservation of wet subsamples a portion of homogenized sample is set in a tray and dried at less than 60°C until dry. The sample is then particle size reduced with an automated crusher or mortar and pestle, typically to <2 mm. Further size reduction may be needed for particular tests.

BC - 526

Chain of Custody (COC) / Analytical Request Form

COC Number: 23 - 1119324

Page 1 of 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Environmental Division
Waterloo
Work Order Reference
WT2502259

Telephone : +1 519 886 6910

Report To	Contact and company name below will appear on the final report
Company:	BluMetric Environmental
Contact:	Kim CARLTON
Phone:	519-496-8734
	Company address below will appear on the final report
Street:	209 Frederick St - Unit 3B
City/Province:	Kitchener, ON
Postal Code:	
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	BluMetric Envio
Contact:	Accounts Payable

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: mac@blumetric.ca
Email 2: dkavanagh@blumetric.ca
Email 3: Kcarlton@blumetric.ca

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: ap@blumetric.ca
Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] If received by 3pm M-F - no surcharges apply
☐ 4 day [P4] If received by 3pm M-F - 25% rush surcharge may apply
☐ 3 day [P3] If received by 3pm M-F - 50% rush surcharge may apply
☐ 2 day [P2] If received by 3pm M-F - 100% rush surcharge may apply
☐ 1 day [E] If received by 3pm M-F - 200% rush surcharge may apply
☐ Same day [S2] If received by 10am M-S - 300% rush surcharge may apply

Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests.

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information		Oil and Gas Required Fields (client use)	
ALS Client Code / QUOTE #:		AFE/Cost Center:	PO#:
Job / Project #:	240523	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (ALS use only): WT2502259 FH

ALS Contact: Emily Smith

Sampler: KC

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Nitrate	Grain Size	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	PW1-24	05/02/25	13:55	GW	1	✓				
	MW2-24	05/02/25	15:30	GW	1	✓				
	MW3-24	05/02/25	15:00	GW	1	✓				
	MW24-3	03/02/25	13:00	SOIL	1		✓			

Analysis: Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO	Please report SOIL sample as MW3-24.
Are samples for human consumption/ use? ☐ YES ☐ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☒ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
							1.1

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: K CARLTON	Date: 06/02/25	Time:	Received by:	Date:	Time:	Received by: RJ	Date: Feb 6/25	Time: 945

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Appendix C

Supporting Documentation

Mass Balance Calculation to Determine Nitrate Concentration at the Property Boundary

Parameters	Lands to be Severed	Lands to be Retained	Units	Information Source/Calculation
Wastewater Flow				
Number of residential units =	1	1	units	3 bedroom dwelling
Wastewater volume per 3 bedroom residential unit =	1600	1600	L/day	Ontario Building Code, Table 8.2.1.3.A.
Daily Wastewater Flow Rate (Q_{ef}) =	1,000	1,000	L /day	Maximum permissible as per MOE Procedure D-5-4
Annual Wastewater Volume =	365	365	m^3/year	
Climate				
Annual Precipitation (P) =	0.9187	0.9187	m/year	Environment Canada Climate Normals 1981-2010 Roseville Station Data
Infiltration Factor =	0.9	0.9		based on topography, ground cover and soil type
Annual Infiltration (n) =	0.326	0.326	m/year	moisture surplus calculated by water balance following Thornthwaite & Mather (1957)
Site Data				
Lot Size =	4149	3960	m^2	specific to lot; areas on proposed lot severance sketch from Ed Hesselink
Percent Imperviousness =	10%	10%	%	assumed proportion of roof tops and paved areas
Area of Control Volume (A_{inf}) =	3734.1	3564	m^2	area supporting groundwater recharge
Ground Cover	mature trees / residential	residential with mature trees		
Slope	0.02	0.02	m/m	flat land
Soil Classification	silty sand	silty sand		soil grain size analysis results of 81.7 % sand, 18.3 % fines
Soil Classification	SM	SM		
Infiltration Flux, Q_{inf}	1219.12	1163.59	m^3/year	$Q_{inf} = nA_{inf}$
	3,340	3,188	L/day	
Mass Loading - Septic Effluent				
Daily Mass Loading of Nitrogen =	40	40	g/day	daily mass loading per lot per residential dwelling unit, as per MOE Procedure D-5-4
Concentration of Total Nitrogen =	40.0	40.0	mg/L	critical contaminant
Concentration of Nitrate (C_{ef}) =	40.0	40.0	mg/L	assuming all available N converted to Nitrate within the leaching bed of standard Class 4 septic system
Concentrations at Downgradient Property Boundary				
Concentration of Nitrate (C_{out}) =	9.2	9.6	mg/L	$C_{out} = (C_{ef}Q_{ef})/(Q_{ef} + Q_{inf})$; groundwater through flow not considered

Calculation of Evaporatranspiration and Water Balance

Instructions and Tables for Computing Potential Evapotranspiration and the Water Balance (Thornthwaite & Mather, 1957)

Site Specific Variables

		Data Source / Comments
Latitude:	43°N	
Soil:	silty SAND (81.7 % sand, 18.3 % fines)	soil grain size analysis of sample from MW3-24
Vegetation Cover:	pasture, shrubs (mature)	Google earth
Water Holding Capacity in Root Zone of Soil:	100 mm	Table 10. Provisional Water Holding Capacities with Different Combinations of Soil and Vegetation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	
Daily Average Temperature (°C)	-6.5	-5.4	-1.0	6.5	12.7	18.2	20.5	19.5	15.2	8.7	2.6	-3.5		Climate Normals 1981-2010, Roseville Station 6147188, Environment Canada 2018
Heat Index, I	0	0	0	1.49	4.1	7.07	8.47	7.85	5.38	2.31	0.37	0	**37.04**	Table 2. Monthly Values of I Corresponding to Monthly Mean Temperatures (°C); I = zero when the mean temperature is 0°C or less; Annual I = sum of monthly values
Unadjusted Daily Potential Evapotranspiration, Unadj PE (mm)	0	0	0	1.0	2.0	3.0	3.4	3.2	2.5	1.3	0.3	0		Table 4. Values of Unadjusted Daily Potential Evapotranspiration (mm) for Different Mean Temperatures (°C) and (Annual) I Values; PE = zero at temperatures below 0°C
Monthly Correction Factors for Latitude of 43°N	24.3	24.6	30.6	33.6	37.8	38.4	38.7	36.0	31.2	28.5	24.3	23.1		Table 6. Mean Possible Monthly Duration of Sunlight in the Northern Hemisphere Expressed in Units of 12 Hours
Adjusted Daily Potential Evapotranspiration, Adj PE (mm)	0	0	0	33.6	75.6	115.2	131.58	115.2	78	37.05	7.29	0	593.52	calculated as Unadj PE x Monthly Correction Factor for Latitude
Precipitation, P (mm)	68.1	54.6	55	77.2	87.9	76.3	98.2	83.9	85.4	75.3	88.4	68.5	918.7	Climate Normals 1981-2010, Roseville Station 6147188, Environment Canada 2018
Precipitation Minus the Potential Evapotranspiration, P-PE (mm)	68.1	54.6	55	43.6	12.3	-38.9	-33.38	-31.3	7.4	38.25	81.11	68.5	325.18	
Accumulated Potential Water Loss, Acc Pot WL (mm)						**-38.9**	**-72.28**	**-103.58**						since the sum of P-PE values is positive, the value of accumulated potential water loss with which to start accumulating the negative values of P-PE is 0
Storage, ST (mm)	236.6	291.2	346.2	100	100	67	48	34	41.4	79.65	100	168.5		Table 26. Soil Moisture Retention Table - 100mm; water holding capacity of soil is 100mm (temp > -1°C); for temp ≤ -1°C soil is considered to be frozen with no percolation of water through the soil, precipitation accumulates as snow
Change in Soil Moisture, ΔST (mm)	0	0	0	0	0	-33	-19	-14	7.4	38.25	20.35	0		difference in soil moisture storage from one month to the next; if ST≥ soil water holding capacity then ΔST=0 although there may be a change in above surface storage
Actual Evapotranspiration, AE (mm)	0	0	0	33.6	75.6	109.3	117.2	97.9	78	37.05	7.29	0	**555.94**	when precipitation is greater than the potential evapotranspiration, the soil remains full of water and the actual ET = potential ET; when precipitation drops below the potential ET the soil begins to dry out and actual ET < potential ET, where actual ET = precipitation + water drawn from the soil moisture storage (ΔST)

Pre-development

Infiltration Factors		
Topography	0.3	Table 3.1 Hydrologic Cycle Component Values (MOE SWM Planning & Design Manual, 2003) flat land, average slope < 0.6 m/km
Soil	0.4	open sandy loam
Cover	0.2	woodland
Cumulative Infiltration Factor	0.9	
Precipitation (mm/y)	918.7	Climate Normals 1981-2010, Roseville Station 6147188, Environment Canada 2018
Evapotranspiration (mm/y)	555.9	calculated using Thornthwaite & Mather, 1957
Surplus Water (mm/y)	362.8	calculated as Precipitation - Evapotranspiration
Infiltration (mm/y)	**326.5**	calculated as Surplus Water x Infiltration Factor
Runoff (mm/y)	36.3	calculated as Surplus Water - Infiltration

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