



Hydrogeological Study 51-55 Hawkesville Road Proposed Residential Development

St. Jacobs, Township of Woolwich, Ontario

Submitted to:

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March 31, 2026
Project No. 2403070 / 421067



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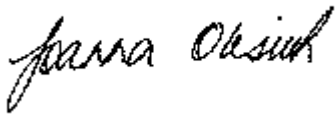
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Certification

PREPARED BY:

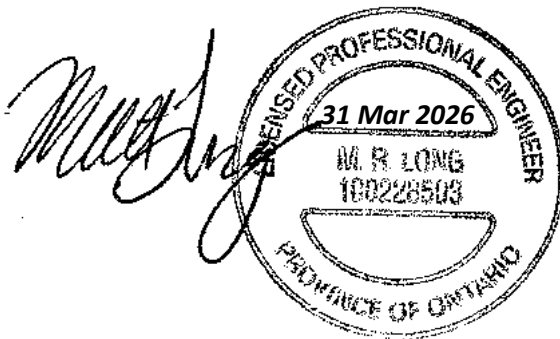
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The stamp is circular with the text "LICENSED PROFESSIONAL ENGINEER" around the top and "PROVINCE OF ONTARIO" around the bottom. In the center, it reads "31 Mar 2026", "M. R. LONG", and "100228503".

Matthew Long, M. Eng., P. Eng.
Senior Project Engineer

Record of Revisions

Identification	Date	Description of Issued and/or Revision
0	July 3, 2024	Draft for Project Team Review
1	January 20, 2025	Final issued for OPA, ZBA and Draft Plan of Condo.
2	December 15, 2025	Revision 2 for OPA, ZBA and Draft Plan of Subdivision Submission
3	March 31, 2026	Updated according to latest Draft Plan dated Feb 9, 2026

1. Introduction

GEI Consultants Limited (GEI) was retained by Polocorp Inc. (Client) to complete a hydrogeological study to support municipal approvals for a residential development proposed for the property occupying the civic addresses of 51-55 Hawkesville Road, St. Jacobs, Ontario, in the Township of Woolwich (hereafter referred to as the “Site”).

In particular, it is our understanding that this hydrogeological study report is intended to support the applications for Official Plan Amendment, Zoning By-Law Amendment, and Draft Plan of Subdivision regarding the proposed development.

The Site covers an approximate area of 6.85 ha (16.92 acres) and is located in the northwest portion of the settlement area of St. Jacobs in the Township of Woolwich, within the upper-tier municipality of the Region of Waterloo. Existing conditions plan of the Site is enclosed in Appendix A.

Based on a preliminary concept as illustrated in the Draft Plan of Subdivision (Polocorp Inc., February 9, 2026) enclosed in Appendix B, it is our understanding that the proposed development will consist of 17 single-family residential lots, 44-58 street fronting townhomes, 50-65 stacked townhomes, a potential sewage pumping station, open space, public roads and a stormwater management facility. It is our further understanding that the development will be serviced for water and sewage via a connection to the existing municipal sanitary sewer and municipal watermain connections.

The following report presents the findings of a hydrogeological study, which gathers data from review of background information and field investigation, to assess the potential impact that the proposed residential development may have on the local hydrogeological system, groundwater, and groundwater-interactions with nearby surface water features.

1.1. Purpose and Scope

This study was undertaken to address municipal requirements for a hydrogeological investigation and impact assessment in respect of the proposed development and approvals process for the proposed residential development. This study considered the nature of the local hydrogeology, identified key hydrogeological characteristics (e.g., groundwater flow patterns, soil types), and assessed the potential hydrogeological impacts introduced by this proposed development, including in relation to Sourcewater Protection. Moreover, this study includes a collection of information about the geology of the Site including the overburden soil characteristics (i.e., soil type, sequence, depth), as well as its hydrogeology (i.e., existing groundwater levels, quality and flow regime).

The scope of work for the study is as follows:

- Desktop Review, including:
 - Geologic, hydrogeologic, and topographic information for the Site as may be available from provincial mapping and site-specific reports.
 - Water well records (available from MECP Water Well Information System) for the area within 1,000 m of the Site.
- Field Investigation, including:
 - Reconnaissance of site to assess topography and evidence of interaction between surface water and groundwater (e.g., seepage features).
 - Installation of a shallow piezometer (i.e., manually by hand) at the pond feature in the northwest portion of the Site to confirm recharge/discharge function and its relation to the groundwater table.
 - Measurements of groundwater levels at six (6) on-site monitoring wells that have been installed as part of the geotechnical investigation for the proposed development.
 - Completion of single-well response testing at up to three (3) of the monitoring wells on-site, to characterize the hydraulic conductivity of the soil materials.
 - Procurement and installation of seven (7) datalogging pressure transducers to collect a continuous record of groundwater level data for a period of at least 12 months at all monitoring wells and piezometer.
 - Collection of groundwater samples from three (3) monitoring wells and submission of samples to an accredited laboratory for analysis, with comparison to the Provincial Water Quality Objectives (PWQO) and Region of Waterloo Sewer Use By-Law.
 - Completion of a scoped door-to-door water well survey and invitation to participate in monitoring program for properties within 250 m of the Site, though not extending to the opposite side of the Conestogo River, to identify nearby water well users who may be affected by potential construction dewatering activities on-site.
 - Topographic survey of boreholes/monitoring wells and piezometer to determine position and elevation.
- Groundwater Level Monitoring, including:
 - Routine visits to check dataloggers, download data, and take manual groundwater level measurements.
 - Management and analysis of collected data.
- Report Preparation, including:
 - Presentation of results of desktop study and field investigation.
 - General hydrogeological impact assessment, including the potential for the proposed development to cause water quality and/or quantity impacts with respect to nearby

- receptors such as nearby groundwater users (e.g., domestic wells) and surface water features.
- Integration of and/or collaboration with the stormwater management (SMW) design aspects of the project, including a pre-development and post-development feature-based water balance calculation to assess changes in run-off and infiltration (*to be completed after SWM report is available*).
 - Review of local Source Protection Policies regarding the presence of highly vulnerable aquifers, significant groundwater recharge areas and wellhead protection areas.
 - Preliminary construction dewatering assessment, including estimated construction dewatering rates and expected approvals requirements (i.e., Environmental Activity and Sector Registry).

2. Background

For the purposes of this report, the term “north” shall be taken to mean the northerly direction that is perpendicular to Hawkesville Road. Figure 1 shows the location of the Site on a regional scale.

2.1. Site Location and Setting

The Site is situated in the community of St. Jacobs, west of the developed settlement area, in the Township of Woolwich, within the upper-tier municipality of the Region of Waterloo (refer to Figure 1). The Site is also described as Part of Lot 37 in the Geographic Township of Woolwich.

The Site is bounded by Hawkesville Road to the north, existing residential properties to the east, Conestogo River to south and to the west by a railway (CN Rail). Enclosed within the northwestern portion of the Site is a separate parcel containing a Union Gas natural gas compound.

Surrounding land uses include residential, agricultural and institutional properties.

The Site is currently under mixed land-use as commercial and agricultural. The Site is currently developed with four structures: two storage buildings that are occupied by commercial tenants, a barn, and a silo structure located in the north-central portion of the property. The Site also consists of gravel surface areas for parking and driveways, as well as a pond located at the northwest portion of the property. The pond appears to have been dug sometime between 1963 and 2000 (CVD 2023).

A drainage feature consisting of sections of open channel, storm sewers, culverts and swales that convey flows southward, exists along the westerly property boundary. The southern portion of the site includes a forested area and steep slope and is located within the floodplain of the Conestogo River. South portion of the Site is located within regulatory floodplain under O. Reg. 150/06 (Grand River Conservation Authority (GRCA) 2024).

An aerial photograph of the layout of the Site under existing conditions is provided in Figure 2 and the Existing Conditions Plan of the Site is enclosed in Appendix A.

2.2. Proposed Development

Based on a preliminary concept as illustrated in the Draft Plan of Subdivision (Polocorp Inc., December 12, 2025), it is our understanding that the proposed development will consist of 17 single-family residential lots, 44-58 street fronting townhomes, 50-65 stacked townhomes, a potential sewage pumping station, parkette/servicing access, open space, public roads and a stormwater management facility. It is our further understanding that the development will be serviced for sewage via a connection to the existing municipal sanitary sewer. It is our understanding that two (2) options are currently being explored for the sanitary servicing options:

- Option A: Installation of a new sanitary main on Hawkesville Road. Flows from the Site would require a pumping station to discharge to the sanitary main, and,

- Option B: Installation of a new deep sanitary main from the Site to Chris Court. Flows from the Site would be serviced via gravity connection.

It is our understanding that the Owner is currently in the process of potentially acquiring the property located at 9 Chris Court. This property is shown on the Draft Plan in Appendix B as “Future Property Acquisition/Connection to Chris Court”. It is our understanding that the Chris Court connection is the servicing option that is preferred by Township of Woolwich Council.

The development will be serviced for water via a municipal watermain connection to an existing watermain on Hawkesville Road. There is an existing 150 mm diameter watermain along Hawkesville Road which currently terminates at the water service for 47 Hawkesville Road, located to the east of the Site. The existing watermain will be extended approximately 100 m west along Hawkesville Road to the proposed development.

The stormwater management facility is proposed to be constructed in the southwestern portion of the developed area, near the crest of the Conestogo River valley slope.

A passive recreation area is proposed to be located in the southern portion of the Site, within the floodplain of the Conestogo River.

2.3. Local Relief and Drainage

According to the existing conditions plan of the Site (Appendix A) and the topographic information available through GRCA online GIS watershed viewer, the ground surface elevation at the Site ranges from a topographic high of 347.5 metres above sea level (masl) in the northeast portion of the Site with a gradual slope throughout the northern portion of the property and a steep slope within the southern portion of the Site to 324 masl, towards the Conestogo River which flows easterly, along the south portion of the property.

Surface water runoff at the Site currently sheet flows overland toward the south portion of the Site, towards the Conestogo River. The Site lies within the Grand River watershed. The southern portion of the Site, along the Conestogo River is within GRCA regulated floodplain.

A drainage feature extends along the western property boundary. This drainage feature receives stormwater from roadside ditches along Hawkesville Road and from ditches along the CN Rail line right-of-way and conveys those flows southward to the Conestogo River. Prior reports note that some on-site segments of the drainage feature consist of ditches and culverts (CVD, 2023).

2.4. Physiography and Surficial Geology

The Site is located within the physiographic region known as the Oxford Till Plain. This region is characterized by its drumlinized upland surface with gentle slopes, ranging in elevation from 304 masl to 365 masl, and is crossed by three well-marked valleys cut by glacial meltwater streams (Chapman and Putnam 1985). The soils encountered in this region are till deposits (calcareous loam), with some parts of the old spillway system containing gravel deposits.

With respect to physiographic landforms, the Site is situated within a spillway (majority of Site) and a drumlinized till plain (northern portion of Site). Figures 3 and 4 display the physiographic region and landforms across the Site and study area, respectively.

The surficial materials on-site and vicinity are reported to consist of Tavistock Till across the northern portion of site, Catfish Creek Till within the central portion, and Stream Alluvium in the southern portion of site (Ontario Geological Survey 2010). Tavistock Till is described as clayey silt till, whilst the Catfish Creek Till consists of sandy to silty, stoney till. The Stream Alluvium is known to consist of gravel, sand, silt and clay (GRCA 2024) and appears to be associated with the depositional activity of the Conestogo River. The distribution of surficial geological materials is presented in Figure 5.

Shallow groundwater flow often correlates to topographical features and typically flows towards nearby lakes, streams, and wetland areas, except where modified by service trenches. Based on the topography of the Site, it is inferred that the shallow groundwater flow in the vicinity of the Site is generally southwesterly to southerly, toward the drainage feature along the westerly property and the Conestogo River which flows adjacent to the southern portion of the Site. While the shallow groundwater flow is inferred for the site and the vicinity, an accurate assessment of the shallow groundwater flow direction requires the installation of groundwater monitoring wells and water level measurements. Such installations and measurements have been completed as part of the fieldwork for this study and will be presented later.

Bedrock beneath the site is understood to be of the Silurian age Salina Formation, a grey-brown, argillaceous dolostone and shale deposit interbedded with nodules of gypsum and thick salt beds in the deep subsurface (Ontario Geological Survey 2011). According to water well records attributed to bedrock water supply wells to the north and east of the Site, the depth to bedrock may be about 40 to 46 m below ground surface (mbgs) in the vicinity of the site (MECP 2024). There are no MECP well records for water supply wells attributed to the Site itself.

2.5. Local Use of Groundwater and Source Protection

2.5.1. Source Protection

Review of mapping available through the Ministry of the Environment, Conservation and Parks indicates that the Site is within the Grand River Source Protection Area.

The intrinsic vulnerability of the Site is listed as “Low”, indicating that the surficial materials are of relatively low hydraulic conductivity and/or that there is substantial hydraulic separation between the surface and the municipal supply aquifer.

The Site does not intersect a Wellhead Protection Area (WHPA) for groundwater quality or quantity, surface water Intake Protection Zone (IPZ), an area of Groundwater under the Direct Influence of Surface Water (GUDI), nor an Issue Contributing Area (ICA).

A portion of the Site located along the crest of the Conestoga River valley slope has been identified as a Tier 2 Significant Groundwater Recharge Area (GRCA, 2024; see Appendix C).

These designations under the Sourcewater Protection Policies will be used to assess the proposed development for significant threats to drinking water and to determine, if required, suitable monitoring and/or mitigation activities for the protection of drinking water resources.

The community of St. Jacobs is part of Woolwich North distribution system and obtains its municipal water supply from the Waterloo Well Supply, which is part of the Integrated Urban System (Woolwich Township, 2024). There are no municipal water supply wells in the 1,000 m study area. The nearest of municipal water supply well is reported to be located approximately 2.6 km north of the Site (MECP Well ID 6504514, MECP 2024a).

2.5.2. Water Well Records

A desktop survey of water wells within 1,000 m of the Site boundary was conducted and a total of 122 well records (including cluster well records – one (1) well record for multiple wells installed during project) were reported in the study area (MECP 2024). Table 1 provides a summary of the well records and Figure 6 shows the locations of the wells/well records within 1000 m of the Site. Copies of the well records for wells within 500 m of the Site are included in Appendix D. A brief summary of information collected from the water well records review within 1,000 m of the Site is as follows:

- Among well records belonging to overburden wells (101 total records):
 - Average Static Water Level: 3.9 mbgs
 - Water supply by usage:
 - Domestic and domestic/livestock: 13 records
 - ❖ The nearest overburden water supply well is reported to be located approximately 300 m southeast of the Site, on the opposite side of the Conestogo River from the Site.
 - ❖ Remainder of the overburden water supply wells are located greater than 500 m from the Site (i.e. within 500 to 1,000 m of the Site).
 - Municipal: 4 records
 - Commercial: 1 record
 - Monitoring/observation/test hole: 40 records
 - Not Used: 2 records
 - Commercial: 1 record
 - Abandoned: 24 records
 - Irrigation: 1 record
 - Livestock: 1 record
 - Usage not specified: 14

- Among well records belonging to bedrock wells (21 total records):
 - Average Static Water Level: 10.9 mbgs
 - Depth to bedrock 23.8 to 51.2 mbgs
 - Average depth to bedrock: 42.1 mbgs
 - Water supply by usage:
 - Domestic and domestic/livestock: 15 records
 - Commercial and commercial/livestock: 2 records
 - Municipal: 2 records
 - Test Hole: 1 record
 - Industrial: 1 record

Copies of the well records within 500 m of the Site are provided in Appendix D.

2.6. Relevant Local and Site-Specific Reports

2.6.1. Preliminary Hydrogeological Assessment Proposed Development of 51 Hawkesville Rd., St. Jacobs (Township of Woolwich) (CVD 2023)

A preliminary hydrogeological assessment was prepared by Chung & Vander Doelen Engineering Ltd. (CVD) in 2023. The assessment included a general description of the local surficial geology, hydrogeology and commentary on the surface water features on site.

In their report, CVD indicates that Tavistock Till (a clayey silt till) predominates in the northern part of the Site, with Catfish Creek Till (a stoney sand/silt) occurring in the central portion of the property, with this unit also reported to underlie the Tavistock Till (based on mapping by P. F. Karrow (OGS 1993). The southern portion of the property is underlain by variably textured Modern Alluvium deposits. The clayey surficial deposits predominate across the site: they are expected to have very low permeability and are not expected to support large quantities of recharge from precipitation.

The assessment also included review of aerial photography from 1930, 1955, 1963 and 2000. Based on their review, CVD reported that the on-site pond was not evident in the aerial photographs prior to 2000, therefore it was reported that the pond is man-made and was dug sometime between 1963 and 2000. Based on its location and geological mapping, the pond is expected to have been dug into the shallow water table within the clayey till soils predominant at the site. Based on low permeability of the underlying soil deposits, CVD reported that the pond is not considered to be a source of significant groundwater discharge or recharge.

The assessment also refers to a “watercourse”, which traverses the site along the westerly property boundary. This feature was reported to originate from open ditches and culverts northwest of the property, along the adjacent railway line and Hawkesville Road. Based on historic aerial photograph review, CVD reported that it appears that the path of the watercourse may have been altered, as it appears that previously it extended through, and slightly east of the current pond location, before being directed to the

south toward Conestogo River. Based on clayey till soil deposits on site, the watercourse is unlikely to be a source of significant groundwater recharge or discharge.

2.6.2. *Geotechnical Investigation (GEI, 2024a)*

A geotechnical investigation was completed at the site by GEI in 2024 (GEI, 2024a). The field investigation involved the drilling of six (6) boreholes completed with monitoring wells to monitor groundwater levels. The boreholes were advanced to a depth of 5.2 metres below existing grade, except for boreholes 24-01 and 24-02 which were advanced to 9.8 m and 12.8 m depth, respectively. Borehole logs are provided in Appendix E and the borehole locations are shown on the site investigation plan in Figure 7. Select soil samples from select boreholes were collected for geotechnical testing, including grain size analyses (Appendix E).

Generally speaking, the stratigraphic sequence of the soil materials encountered is described as follows:

- Topsoil
 - Ranging from 305 to 455 mm in thickness, overlying,
- Fill
 - In borehole 24-01, underlying the topsoil, 8.7 m thick, consisting of sand with varying amounts of silt, gravel and cobbles, with trace organics and/or rootlets in the upper portion of the fill layer, extending to a depth of 9.1 m.
- Silty Sand to Sand and Silt
 - In borehole 24-02, silty sand with trace amounts of clay and gravel, 1.9 m thick, extending to a depth of 2.3 m below existing ground surface.
- Silty Clay
 - In borehole 23-03 and 24-05, silty clay with some sand and trace gravel. In borehole 23-03, the silty clay was 2.0 m thick and extended to a depth of 2.3 m. In borehole 24-05, the silty clay was 0.4 m thick and extended to a depth of 0.7 m.
- Glacial Till
 - Sandy silt to silty sand glacial till was encountered below the fill in borehole 24-01; below the silty sand in borehole 24-02; below the silty clay in boreholes 24-03 and 24-05, and below the topsoil in boreholes 24-04 and 24-06. The glacial till generally contained trace to some gravel and trace amounts of clay, although some plastic zones were encountered locally within the till. Glacial till inherently contains cobbles and boulders. The till deposit extended to end of borehole at each location, to depths of 5.2 m to 12.8 m below existing grade.

3. Field Investigation

In order to collect site-specific information about the hydrogeological conditions on-site, a field investigation was conducted as part of this hydrogeological study. This information was combined with the existing geotechnical and geological information to establish the site conceptual model.

3.1. Methodology

A subsurface (i.e., drilling) investigation was conducted in collaboration with the concurrent geotechnical investigation, which was also undertaken by GEI staff (see Section 2.6.2). On April 23, 2024, six (6) boreholes were advanced by a MECP licensed drilling subcontractor, London Soil Test Limited, with the oversight by GEI. Prior to the commencement of drilling activities, the borehole locations were staked in the field by GEI and cleared of underground utilities by utility locating contractors. Ground surface elevations of the boreholes and horizontal coordinates were surveyed by GEI (referencing NAD 83 geodetic datum).

The boreholes were advanced using a track-mounted drill rig and hollow stem augers. Sampling was conducted using a 51 mm O. D. split spoon (SS) sampler. Standard penetration test (SPT) “N” Values (N values) were recorded for the sampled intervals as the number of blows required to drive a SS sampler 305 mm into the soil using a 63.5 kg drop hammer falling 750 mm, in accordance with ASTM D1586. In each borehole soil sampling was conducted at 0.75 m intervals for the upper 3.0 m and at 1.5 m intervals thereafter. The subsurface soils were visually examined, logged and at select borehole locations and select depth intervals, soil samples were collected for grain-size analyses.

A monitoring well was installed in each of the six (6) boreholes to permit long-term groundwater monitoring and hydrogeological testing. Each monitoring well consisted of a 50 mm diameter PVC pipe with a 3.0 m long screen. The screen was surrounded with a sand filter pack and the annulus surrounding the pipe was backfilled to surface with bentonite pellets. Monitoring well construction details are shown on the borehole logs in Appendix E.

The GEI field staff examined, and classified characteristics of the soils encountered in the boreholes, including the presence of fill materials, groundwater observations during and upon completion of the drilling, recorded observations of borehole construction, and processed the recovered samples. All recovered soil samples were logged in the field, carefully packaged, and transported to GEI’s laboratory for more detailed examination and classification.

In GEI’s laboratory, the samples were classified based on their visual and textural characteristics. Five (5) soil samples were selected from the boreholes and submitted to our laboratory for grain size analysis. Two (2) soil samples were subjected to Atterberg Limits testing to assess plasticity. The grain size and Atterberg limits testing results are provided in Appendix E.

GEI staff, Mr. Mark Ongarato and Mr. Miad Meskar attended the Site on May 3 and May 13, 2024, to perform additional investigative work including:

- Installation of a shallow piezometer in the vicinity of the on-site pond and monitoring well 24-05;
- Water level observations in each of the six (6) monitoring wells and the shallow piezometer;
- Sampling of groundwater from select monitoring wells;
- Completion of single-well response testing at up to three of the monitoring wells to characterize the hydraulic conductivity of the soil materials;
- Installation of a datalogger in each monitoring well and the shallow piezometer to record continuous groundwater level data for a period of at least 12 months;
- Completion of a door-to-door water well survey to select properties in the vicinity of the site, to identify nearby water well users who may be affected by potential construction dewatering on-site.

Using industry-accepted practices, groundwater samples were collected from monitoring wells 24-01, 24-03 and 24-05 on May 13, 2024. Each well was first purged of at least three well-volumes of water or until dry, whichever occurred first. Water was withdrawn using new, well-dedicated Waterra® inertial pumps (foot valves) and low-density polyethylene (LDPE) tubing with an inside diameter of 12.7 mm (0.5 in). Groundwater samples were then collected into laboratory-supplied bottles appropriate to the selected analyses. Samples for metals analysis were laboratory filtered and preserved using laboratory prepared preservative. The samples were submitted to a laboratory accredited by the Canadian Association of Environmental Analytical Laboratories (CAEAL) for routine groundwater chemistry analyses including parameters such as metals, nutrients, physical properties (e.g., conductivity, colour), and petroleum hydrocarbons. The laboratory Certificate of Analysis of these samples is provided in Appendix F.

The shallow piezometer elevation was surveyed by GEI staff using rod and level surveying equipment to determine the vertical position (elevation).

3.2. Groundwater Levels

On May 3, May 13, September 3, and December 17, 2024 as well as on May 23, 2025 and December 9, 2025 GEI visited the Site to collect groundwater level measurements from the six (6) monitoring wells and from the shallow piezometer (after installation on May 13, 2024).

During the May 3 and May 13, 2024 site visits, GEI staff installed Solinst water level dataloggers in the monitoring wells and in the shallow piezometer. The dataloggers are intended to collect water level measurements electronically on a frequent basis to assist in the identification of seasonal groundwater level fluctuation at the Site. Water level data collected up to December 9, 2025, is presented on enclosed hydrographs (Charts 1 through 7).

The groundwater measurements collected at the Site via manual measurements are summarized in Table 3-1.

An interpreted groundwater contour plan is provided in Figure 8. The set of groundwater contours provided in Figure 8 is based on groundwater level observations on May 3, 2024. It is noted that in the vicinity of monitoring wells 24-01 and 24-02 the groundwater level indicated by the contours is higher than the actual recorded groundwater levels (see Table 3-1, or groundwater levels in corresponding labels

in Figure 8). This is because those monitoring wells are significantly deeper than the others and therefore, due to the Site being interpreted to exhibit groundwater recharge conditions (i.e., downward vertical gradient), it has been interpreted that the water levels in the monitoring wells are lower than the highest occurrence of saturated soil (i.e., the phreatic surface or “groundwater table”).

Based on the observed water level measurements, it is apparent that the groundwater flow regime within the till is influenced by the surface topography. Groundwater levels are expected to experience seasonal fluctuation and vary in response to prevailing climate conditions.

The Seasonal High Groundwater Level (SHGWL) contours based on water level data up to December 9, 2025, have been plotted in Figure 9. These contours have been determined through a numerical interpolation of the water level readings recorded at each of the monitoring wells. The contours do not account for other factors, such as ground topography, variation in soil types, or other conditions which may cause perturbations in the groundwater contours.

Table 3-1. Monitoring Well/Shallow Piezometer Details and Water Level Observations

Well ID	Ground Elev. (masl)	Depth to Water (mbgs)	GW Elev. (masl)	Depth to Water (mbgs)	GW Elev. (masl)	Depth to Water (mbgs)	GW Elev. (masl)	Depth to Water (mbgs)	GW Elev. (masl)	Depth to Water (mbgs)	GW Elev. (masl)	Depth to Water (mbgs)	GW Elev. (masl)
Date Measured		3-May-2024		13-May-2024		3-Sep-2024		17-Dec-2024		23-May-2025		9-Dec-2025	
24-01	338.22	3.6	334.62	4.29	333.94	5.95	332.28	6.52	331.71	4.82	333.41	6.55	331.67
24-02	339.17	4.15	335.02	4.21	334.96	5.42	333.75	6.40	332.78	4.59	334.59	6.71	332.46
24-03	340.13	0.93	339.20	1.13	339.01	2.49	337.64	1.91	338.23	0.64	339.50	2.52	337.62
24-04	346.38	4.00	342.38	3.55	342.83	1.38	345.00	2.11	344.27	0.91	345.48	2.16	344.22
24-05	338.62	0.23	338.39	0.27	338.35	0.41	338.21	0.83	337.79	0.28	338.35	0.36	338.26
24-06	345.06	3.18	341.88	2.33	342.73	1.22	343.84	0.28	344.68	0.49	344.58	0.55	344.51
PZ-01	338.60	- ²	-	0.34	338.26	0.54	338.06	0.28	338.33	0.33	338.27	0.49	338.12

Notes:

1. Elev. – elevation, masl – metres above sea level, mbgs – metres below ground surface, GW – groundwater.
2. No reading available: instrument not yet installed by this date.
3. Maximum values for manually measured water levels are depicted in **bold**.

Continuous water level data is available from May 2024 to December 9, 2025. A summary of the Seasonal High and Seasonal Low Groundwater Elevations measured at each instrument to date is provided in Table 3-2. Seasonal high groundwater elevations measured at the Site up to December 2025 are also shown in Figure 9.

Table 3-2. Seasonal High and Seasonal Low Groundwater Elevations 2024-05 to 2025-12

Well ID	Ground Elevation (masl)	Maximum ¹ Recorded Groundwater Elevation (masl)	Minimum Recorded Groundwater Elevation (masl)	Shallowest Depth to Groundwater (mbgs)	Date Recorded
24-01	338.22	335.19	331.64	3.03	4/7/2025
24-02	339.17	336.08	332.39	3.09	4/5/2025
24-03	340.13	339.88	337.08	0.25	4/3/2025
24-04	346.38	345.68	343.40	0.70	6/10/2025
24-05	338.62	338.71	337.67	-0.09	4/3/2025
24-06	345.06	345.05	340.66	0.01	3/5/2025
PZ-01	338.60	338.57	337.94	0.04	4/3/2025

Notes:

1. Highest groundwater elevation recorded to date (up to December 9, 2025).
2. Elev. – elevation, masl – metres above sea level, mbgs – metres below ground surface.
3. Minimum and Maximum value for logger measured water level is depicted in **bold**.

The highest groundwater level on-Site to date was observed in the northeast portion of the Site at monitoring well 24-04 (elevation 345.68 masl on June 10, 2025). The ground surface elevation at monitoring well 24-04 is also noted to be located at the highest ground elevation among the set of monitoring wells installed at the Site.

The lowest groundwater level was observed at monitoring well 24-01 (elevation 331.64 masl on December 6, 2024). This monitoring well is located in the southwest portion of the Site, in an area of relatively low ground surface elevation.

Among available readings, it is noted that five monitoring locations exhibited their maximum water levels in early April 2025 (monitoring wells 24-01, 24-02, 24-03, 24-05, and PZ-01) which is typically the case for till upland sites during the spring freshet.

3.3. Shallow Groundwater Quality

Groundwater samples were collected from monitoring wells 24-01, 24-03 and 24-05 on May 13, 2024 and on May 23, 2025. The results of water quality analyses of the shallow groundwater samples are summarized in Tables 2 to 5 (see end matter) and the laboratory Certificates of Analysis for the groundwater quality analyses are included in Appendix F. The results were compared to the Provincial Water Quality Objectives (PWQO) (see Tables 2 and 3) and the Region of Waterloo Sanitary Sewer Use Bylaw (21-036) (see Tables 4 and 5) to assess the suitability of the shallow groundwater for discharge to the surface during construction dewatering activities on-site.

Generally, the reported results indicate that the shallow groundwater on-site is considered to be moderately mineralized as indicated by the elevated concentrations of dissolved calcium and magnesium. The results are reflective of the geological environment within which the site is situated. The local overburden, which is largely derived from regional bedrock materials of the Salina Formation largely composed of sedimentary rock such as dolostone, contributing to elevated levels of alkalinity, magnesium and calcium.

Sodium (average 94 mg/L in 2024 and 70 mg/L in 2025) and chloride (average 120 mg/L in 2024 and 109 mg/L in 2025) concentrations from the three (3) sampled monitoring wells, indicate some slight influence from road salting activities.

As indicated in Table 2, exceedances of the PWQO value were reported for the metal parameter cobalt, at monitoring well 24-01 (0.00502 mg/L in 2024 and 0.00473 mg/L in 2025 compared to PWQO of 0.0009 mg/L in 2024). In addition, during the May 2025 sampling event, exceedance for the metal parameter iron (0.561 mg/L compared to PWQO of 0.3 mg/L) was reported at monitoring well 24-01.

Given the land use setting of the Site and adjacent properties, it is expected that the source of these exceedances is not due to an anthropogenic contaminating activity but rather due to natural occurrence. It is expected that this isolated instance of an elevated concentration of cobalt and iron would be unlikely to cause deleterious impacts to the environment during construction dewatering. As indicated in Tables 5 and 6, there were no exceedances identified in the groundwater at the sampled locations of the Region of Waterloo Sanitary Sewer Use Bylaw (21-036) standards.

At monitoring well 24-01, toluene, a BTEX compound, was reported to exceed the PWQO in groundwater (11.1 µg/L compared to Interim PWQO of 0.8 µg/L) during the May 2024 sampling event. The source of toluene at this location is unknown. It is recommended that the groundwater from monitoring well 24-01 be resampled for petroleum hydrocarbons and BTEX compounds to confirm groundwater quality at this location. If the follow-up sample confirms BTEX concentrations continue to be detected above PWQO, special provisions for construction dewatering (e.g., discharge to sanitary sewer) may be required during construction in this area.

3.4. Single-Well Response Testing

On May 3, 2024, GEI staff attended the Site to conduct single-well response tests on select monitoring wells present on the site – namely wells 24-01, 24-02, and 24-06. Monitoring wells 24-02 and 24-06 are screened entirely within the sandy silt to silty sand glacial till that is predominate across the Site; monitoring well 24-01 is screened in the sand fill with varying amounts of silt, gravel and cobbles.

A single well response test involves the measurement of the change in water level in a well after a rapid displacement (i.e., increase or decrease in water level) of the water column. For this project, the rapid displacement was conducted by withdrawing water from the well using new, well-dedicated Waterra® inertial pumps (foot valves) and low-density LDPE tubing, thus resulting in a rising-head test. Water level measurements were collected electronically using a Solinst datalogging pressure transducer that was installed in the monitoring well before the start of the test (i.e., before the imposition of the displacement). The water level data was then assessed using analytical methods to determine the hydraulic conductivity of the surrounding soils.

The Bouwer-Rice (1976) method was used to determine the hydraulic conductivity from the water level data that was collected during the single-well response tests. Please refer to Appendix G for the calculations and plots of data collected during the single-well response testing.

The results of the analyses from monitoring wells 24-02 and 24-06 provided an average hydraulic conductivity of approximately 1.6×10^{-8} m/s for the sandy silt to silty sand till (glacial till) unit. In the fill material consisting of sand with varying amounts of silt, gravel and cobbles, encountered at location 24-01, hydraulic conductivity of approximately 1.5×10^{-7} m/s was estimated.

3.5. Door to Door Well Survey

The Township of Woolwich *Engineering Development and Infrastructure Manual* typically requires the door-to-door well survey to be completed for all properties within 1,000 m of the proposed development site. However, it was considered that such an extensive well survey area would be excessive for this project for several reasons, including that:

- The Site is proposed to be serviced by municipal systems for water and sewage and therefore there will be no significant groundwater usage (i.e., by private wells) nor sewage disposal activities (i.e., septic systems) at the proposed development, which generally reduces the potential for impact that the proposed development may have on private wells;
- The Site is located adjacent to the Conestogo River, which serves as a groundwater divide for the shallow groundwater system, thus reasonably allowing for the exclusion of properties to the south of the River from the well survey area;
- The Site is located adjacent to the developed portion of the St. Jacobs settlement area, the properties within which are understood to be municipally serviced and therefore properties to the east of the Site can be excluded from the well survey area; and
- The hydrostratigraphy of the Site is dominated by a thick till overburden, which limits the potential for transport of contaminants between the proposed development and existing private wells, most of which are likely installed in the bedrock aquifer.

The door-to-door water well survey was therefore scoped to address properties within 250 m of the Site, excluding the developed areas within the St Jacobs settlement area and excluding areas south of the Conestogo River.

The addresses of the properties where the well survey was delivered and the findings from the survey are as follows:

- 47 Hawkesville Road
 - The resident provided a response via email on May 24, 2024, indicating that the property is not serviced with a private well.
- 52, 56, 60, 136 and 141 Hawkesville Road
 - No response was received.

4. Hydrogeological Conceptual Site Model

The information gathered from the desktop study and the observations from the field investigation were synthesized to produce a conceptual model of the hydrogeology of the Site.

The soils of the Site are relatively uniform in texture with sandy silt to silty sand till soils predominating throughout most of the Site area. Due to the fine texture of the soils and the results of testing in on-Site monitoring wells, the soils on-Site are interpreted to be of low hydraulic conductivity and are thus considered to form an aquitard. The on-site pond feature is interpreted to be an anthropogenic feature (i.e., dugout pond) with limited communication to the groundwater system due to the low hydraulic conductivity of the soils in the area.

Cross-sections identifying major hydrostratigraphic units have been prepared based on stratigraphic records available from subsurface investigation on-Site and from MECP water well records within the study area. Figure 9 shows the alignment of the section lines across the Site while the cross-sections themselves are plotted in Figures 10 (Section A-A', west-east) and 11 (Section B-B', north-south). The cross-sections indicate the dominance of clay and glacial till materials across the Site and nearby lands on the north side of the Conestogo River. However, it is also noted that a substantial volume of fill appears to occupy the southwesterly part of the developable area of the Site (see Figure 11, in vicinity of MW24-01).

The peak seasonal groundwater level (based on data collected to date) at the Site is near to at the ground surface at some locations, a phenomenon that is often observed in surficial aquitards (refer to Figure 9 and Charts 1 to 7). As the soils are "tight", groundwater flow through these soils occurs slowly. During periods of frequent precipitation or snow melt (e.g., late winter and spring), water infiltrates into the ground faster than it can be drained through the deeper strata and groundwater levels can rise substantially as a result. During the summer and fall, when evapotranspiration rates are high, groundwater levels decrease steadily: in some locations in southwestern Ontario these decreases may be as much as 3 to 4 metres. Beginning in late fall and extending through winter and early spring, groundwater levels begin to rise as evapotranspiration decreases and surplus moisture increases. This pattern typically results in seasonal high groundwater levels occurring in the springtime. Sustained periods where water levels remain near the seasonal high may occur due to irregular topography of the site (i.e., furrows from cultivation, disturbance due to historic earthworks) and the presence of closed depressions, which may prevent immediate runoff and encourage groundwater infiltration.

The distribution of groundwater levels as measured in the monitoring wells on-Site indicates horizontal gradients that generally support lateral groundwater flow in the southwesterly to southerly direction (refer to Figures 8 and 9). This corroborates the initial inference that shallow groundwater on-site flows towards the on-site drainage feature along the westerly property boundary, the on-site pond and ultimately to the Conestogo River. However, the rate of groundwater flow is expected to be limited due to the prevalence of soils of low hydraulic conductivity on-Site. The variable soil conditions in the vicinity of MW24-01 may be providing improved drainage in that area, resulting in the lower groundwater levels observed at that monitoring well.

5. Impact Assessment

Hydrogeological impacts generally concern either impacts to the quantity of groundwater or the quality of groundwater. Both of these types of impacts must be considered in the context of their sources (or stressors) and the potential receptors.

Receptors are those features or parties which may potentially be impacted by an activity. In the context of the present study, the following receptors have been identified:

- Municipal water wells / source water protection
- Private water wells
- Water bodies and related features associated with the GRCA regulated area
- Basements of the proposed residences

As previously mentioned, the community of St. Jacobs obtains its municipal water supply from the Waterloo Well Supply, part of the Integrated Urban System. Parts of the Site have been identified to be “Significant Groundwater Recharge Areas” under the local Source Protection Plan.

Some properties outside of the municipally serviced area of St. Jacobs, may also be serviced with private water supply wells.

Based on observed groundwater levels near ground surface at the subject Site, there is potential for interaction between groundwater and subsurface structures (e.g., seepage into basements).

Table 5-1 (below) provides the results of a screening assessment used to identify which types of impacts apply to which receptors. Potential impacts identified in the screening process will be discussed in greater detail in the following sections.

Table 5-1. Screening Assessment for Potential Hydrogeological Impacts

Receptor	Potential Impacts Related to:		Rationale
	Water Quantity	Water Quality	
Municipal Supply Wells / Source Protection	■		The Site does not overlap with WHPA. The Site does overlap a Significant Groundwater Recharge Area (SGRA), but the source protection plan does not identify any particular policies associated with development in SGRA.
Basements of Residences	■		Due to the seasonal fluctuation in the water table, groundwater levels rise toward ground surface. Steps should be taken to mitigate potential risks to basements due to groundwater seepage.
On-Site Pond and GRCA Regulated Area	■	■	The on-Site pond has been identified as a potential receptor. However, based on the

Receptor	Potential Impacts Related to:		Rationale
	Water Quantity	Water Quality	
			origin of this pond (anthropogenic) and its limited hydrogeological function, a case will be made for the removal of the pond. Similarly, parts of the Site are identified to overlap with GRCA regulated areas. GRCA policy permits development within regulated areas only where technical studies and/or site plans indicate a lack of impact by the development.
Private Water Wells	■	■	Several domestic water well records within the Study Area were identified. The records indicate that there are several bedrock water supply wells at properties within 125 m of the Site. There were no overburden well records identified in the MECP well records database within 125 m of the Site.
Groundwater Levels	■		Comments issued by Township of Woolwich requested an assessment of potential impacts to groundwater levels.

The potential impacts that were identified in the screening are addressed in the following sections.

5.1. Municipal Wells – Source Protection

Under the Clean Water Act (2006) and its regulations regarding Source Protection programs, a set of activities identified as “drinking water threats” have been compiled in the Tables of Drinking Water Threats. The threat level associated with a particular activity at a particular site is based on the site’s setting, the applicable policy areas (e.g., Wellhead Protection Area, Intake Protection Zone) and the vulnerability scores assigned to the site.

On sites where an activity is identified as being a “Significant” threat, a Risk Management Plan is to be developed in coordination between the proponent or agent of that activity and the local Source Protection Risk Management Office.

5.1.1. Quantity

The Site overlaps a Significant Groundwater Recharge Area (“SGRA”, see Appendix C).

The local Source Protection Plan (LERSPC 2024) does not identify policies relevant to development occurring within SGRAs. As such, it is expected that no action is required to address this condition.

In addition, it is noted that this SGRA is a “Tier 2” SGRA which indicates that it was determined based on a watershed-scale water budget and primarily based on readily available data sources such as water well records and surficial geological mapping. Reviewing the surficial geological mapping it appears that the

SGRA was related to the apparent occurrence of a deposit of coarse alluvium located just north of the crest of the Conestogo River valley where it intersects the Site.

However, site-specific investigation conducted as part of the preparation of this report did not identify materials consistent with coarse alluvium. As such, the identification of this area as an SGRA may not be reflective of actual Site conditions.

Regardless, it is considered good practice to ensure that the proposed development will maintain pre-development recharge quantities, where feasible.

For the Site, it may not be feasible due to the relatively shallow groundwater table as well as the relatively low hydraulic conductivity of the soils. Therefore, though the pre-development target may not be achievable, it is recommended that some effort be taken to implement “Low Impact Development” structures (i.e., bioswales, infiltration galleries) and best management practices to minimize the change in recharge caused by development.

5.2. Private Water Wells

5.2.1. Quantity

Long-Term Subdivision Operation

As discussed in the preceding section on Source Protection, the hydraulic conductivity of the soils on-Site are relatively low, limiting the potential for groundwater recharge. The significance of the Site as a source of groundwater recharge is considered to be minimal. Therefore, the development of the Site is not expected to cause a decrease in the quantity of water available to private wells.

As noted in the preceding section, it is considered good practice that, where feasible, LID structures and best management practices be implemented to try to reduce the difference between post-development and pre-development recharge. However, the maintenance of recharge is not considered to be critical to preserve water supply for nearby private wells as they are mainly installed in the bedrock aquifer. Water supply in the bedrock aquifer is controlled by regional/subregional processes: the proposed development is not expected to affect the quantity of water supply available to private wells in the study area.

Construction Dewatering

Construction dewatering may be required to facilitate certain aspects of the construction process (i.e., construction of SWM pond, site servicing and basements) and it is expected to result in a temporary drawdown of the water table in the overburden aquitard.

This activity is not likely to affect wells that have been installed into the bedrock because of the depth to bedrock as well as a thick layer of till that creates substantial hydraulic separation between the surface and the bedrock.

Similarly, shallow wells are not expected to be affected because, due to the low permeability of on-Site soils and the relative size of the Site and locations of excavations requiring dewatering, the zone of influence of dewatering is not likely to extend to private wells off-Site.

However, it is noted that the evaluation of zone of influence has yet to be completed. This is because the zone of influence is determined in part by the estimation of the required amount of drawdown for dewatering but the drawdown cannot be estimated because the grading and servicing plan has not been completed in detail.

Should the zone of influence be identified to extend to off-site properties that are known or suspected to derive their water supply from private wells, then a well monitoring program is recommended to be implemented at those wells (pending well owner agreement).

Construction dewatering estimates will be prepared in detail once the design of the subdivision is completed and servicing depths are determined.

Additional discussion regarding dewatering is provided in Section 6.

5.2.2. Quality

Long-Term Subdivision Operation

Though the proposed subdivision is not expected to involve “Significant” drinking water threat activities per the *Tables of Drinking Water Threats*, it is recognized that stormwater management ponds have the potential to facilitate the infiltration of certain chemical constituents into the groundwater. Chemicals of concern are mainly sodium and chloride (i.e., constituents of road salt) and to a lesser extent other metals and organic chemicals (e.g., oil and grease, fuel and exhaust residues) which may be generated from roadway runoff. It is expected that deep (i.e., bedrock) wells will not be affected by these, but there is potential for shallow overburden wells to be susceptible.

To mitigate potential risk to private water wells, it is recommended that a well monitoring program be implemented for all residences that utilize an overburden well within 100 m of the proposed stormwater management pond.

It is also recommended that the SWM pond be constructed with a suitable liner (e.g., geomembrane, geosynthetic-clay, or compacted clay) to mitigate the entry of these constituents into the groundwater. Based on the hydraulic conductivity of the materials identified on-Site (as determined through single well response testing), the liner material could be derived from the sand-silt till available on-Site.

Construction Dewatering

For the same reasons discussed above (Section 5.2.1), the dewatering activity is not expected to affect drilled wells installed in the bedrock. Though dug overburden water supply wells are generally more susceptible to effects from surficial activities like shallow construction dewatering, the quality of water available to dug wells is not expected to be affected by the anticipated dewatering.

The discharge of water from the dewatering system is not expected to cause degradation of water quality available to local wells because discharge water released on-Site would be downgradient or cross-gradient of existing wells on-neighbouring properties. Furthermore, the local surficial materials (i.e., sand silt till) would provide substantial hydraulic separation to prevent measurable communication between the overland flow of construction dewatering discharge water and local water wells.

The act of pumping groundwater may in some cases cause changes to local groundwater gradients and can contribute to silting up of nearby overburden wells but this is a rare occurrence and generally does not occur in porous media except at locations very close to the pumping location where gradients and changes to seepage patterns would be highest. Wells servicing currently developed properties in the vicinity of the Site are considered far enough away from the proposed work area that the gradients will be substantially attenuated .

Impacts to the quality of groundwater available to local private well users are therefore not expected.

As a precautionary measure, it is recommended that should overburden water supply wells be identified as part of the well survey, a well monitoring program will be initiated (where Owners will permit access for monitoring) and would include the collection and analysis of a baseline (i.e., pre-construction) water quality sample(s) from dug wells identified in the door-to-door well survey in immediate site vicinity.

5.3. On-Site Pond and Regulated Areas

Based on the preliminary concept plan (see Appendix B), the proposed development is expected to involve:

- development within an anthropogenic wetland under 0.5 ha in size (i.e., the pond located in the northwesterly part of the Site) and
- development within GRCA regulated area (mainly along the westerly and southerly parts of the proposed development area).

It is our understanding that the development will not involve construction within the floodplain limit established by GRCA (see concept plan in Appendix B).

The GRCA *Policies for the Administration of the Prohibited Activities, Exemptions and Permits Regulation* (2024, the “GRCA Policies document”) lists a range of requirements that must be met before development can be permitted within an anthropogenic wetland (e.g., the on-Site pond) or within a regulated area.

In addition, in pre-consultation comments, the GRCA identified the on-Site pond as a wetland and that due process must be followed before it can be considered for removal.

5.3.1. Pond

The GRCA *Policies* document provides requirements that must be met before proceeding with development within anthropogenic wetlands under 2 hectares in size. Section 8.4.5 of that document specifically notes that development may be permitted only where:

- The wetland’s hydrologic functions can be maintained or enhanced elsewhere within the subwatershed or planning area;
- The wetland is not located within a floodplain or watercourse;
- There are no negative or adverse impacts on flooding or erosion, and
- Hazards related to unstable soils can be addressed.

A hydrogeological assessment completed by Chung and Vander Doelen Engineering Ltd (2023) noted that the pond is man-made and does not have significant hydrogeological function due to its geological setting (i.e., shallow depression in till overburden), which limits the potential quantity of recharge or discharge that could occur at the pond. The authors of this study agree with the conclusions made by Chung and Vander Doelen Engineering Ltd. and note that the additional investigation data (i.e., hydraulic conductivity of the till on the order of 10^{-7} m/s) supports that assessment.

Based on mapping provided by the GRCA, the pond is not within a floodplain. The pond is best described as an “offline” pond (does not receive flow from a watercourse). Though it has an overflow pipe to allow excess water to drain toward the drainage feature located along the west property line, it is considered that the pond is not within a watercourse.

It is considered that potential impacts associated with flooding or erosion regarding the pond would be addressed through the stormwater management design, the approach to which is described in greater detail in the Functional Servicing Report (GEI, 2024b).

The proposed Stormwater Management Facility would assist with the attenuation of stormwater flows and mitigation of erosion more effectively than the existing pond (which is offline from the existing drainage feature that passes along the westerly edge of the Site).

Unstable soils (such as may be related to compressible pond sediment) would be addressed through the provision of appropriate recommendations for engineered fill and compaction. These would be provided under separate cover in the project geotechnical report (GEI, 2024a).

5.3.2. Regulated Area

Development activities that occur within a regulated area may only be permitted if an Environmental Impact Study addresses potential impacts with respect to flooding, erosion, and hydrological function. An Environmental Impact Study is being prepared for the proposed development by Dougan and Associates (2024).

For development within a regulated area, policies under Section 7.1 of the GRCA *Policies* document must be addressed, including, but not necessarily limited to, providing “appropriate technical studies and/or assessments, site plans, and/or other plans” that demonstrate:

- susceptibility to natural hazards is not increased or new hazards created;
- there are no adverse hydraulic or fluvial impacts on rivers, creeks, streams, or watercourses; and
- sedimentation and erosion during construction and post construction is minimized using best management practices.

Items regarding natural hazards will be addressed through the Functional Servicing Report (GEI, 2024b; with respect to flooding and erosion) and slope stability assessment report (GEI, 2024c; with respect to stability of the Conestogo River valley slope). Based on the analyses in those reports, it is expected that natural hazards will not be created or exacerbated by the proposed development.

Items regarding hydraulic impacts on watercourses are addressed through the Functional Servicing Report (GEIb, 2024), which provides analysis to confirm that the stormwater management of the proposed development will effectively attenuate peak flows of stormwater runoff so as not to exacerbate flooding potential or cause fluvial impacts.

In terms of groundwater-related impacts, the prevalence of till soils on-Site causes the Site to be of limited significance in terms of groundwater recharge. As such, development of parts of the regulated area on-Site is not expected to have a significant adverse impact on hydrogeological conditions insofar as they may affect watercourses (i.e., the Conestogo River). Where feasible, LID structures and best management practices should be implemented to minimize the change in recharge caused by the development.

Details regarding sediment and erosion control will be provided in the site plan drawings. It is expected that the application of best management practices and implementation of erosion and sediment controls in accordance with OPSS.MUNI 805 *Construction Specification for Temporary Erosion and Sediment Control Measures* would effectively mitigate potential impacts related to erosion and sediment.

Based on the above, it is expected that the proposed development, insofar as it extends into the regulated area, would not cause natural hazards, adverse impacts to watercourses or negative impacts related to sediment transport and erosion.

5.4. Basements of Residences

Though the proposed development is expected to involve the placement of a significant volume of fill to raise grades across much of the Site area, the details of the grading plan have not been established at this time. Therefore, this assessment has been conducted on the assumption that post-development grades will be similar to existing grades.

The water levels measured during the site visits in May 2024 indicated groundwater levels within 0.23 to 4.29 mbgs. In local residential construction, basement floors are typically situated approximately 1.2 to 1.8 mbgs. As such, it appears that there is potential for basement floors to be set at elevations below the seasonal groundwater levels in those portions of the Site where water levels are within less than 2 mbgs.

The Township *Engineering Development and Infrastructure Manual* requires that dwellings with basements be constructed to meet a minimum clearance above seasonal high groundwater level (SHGWL). These clearances are measured from underside of foundation and are provided as follows:

- 0.6 m for conventional basements, and
- 0.8 m for walk-out basements.

It is recommended that, where feasible, the area grading design be adapted to raise basements to meet these clearance requirements.

It is expected that this will be feasible throughout much of the Site area because the proposed development will involve the placement of a substantial quantity of fill to raise grades.

However, in cases where grading is constrained by the existing adjacent developments and drainage features such that this clearance cannot be achieved, based on the prevalence of the sandy silt to silty

sand glacial till across the Site and the constraint such soil imposes on seepage rates, it is likely that foundation drains installed in accordance with the Ontario Building Code would be sufficient to address seepage and prevent ingress of moisture into basements.

The rate of drainage required to protect basements can be estimated by assuming steady-state flow conditions entering into the foundation drains. Typical flows were modeled as flow to a one-sided trench which has length equal to the perimeter of the house (a house with dimensions of 20 m by 20 m was assumed) using the equation below:

$$Q = \frac{xk(H^2 - h^2)}{R_0}$$

Where:

x is the total perimeter of the excavation (80 m, from a 20 m by 20 m excavation)

k is the hydraulic conductivity of the soil (1.6×10^{-8} m/s)

H is the initial height of the groundwater level above an impermeable layer at depth (assumed to be 3.6 m, two times the drawdown)

h is the target height of the groundwater level above an impermeable layer at depth (assumed to be 1.8 m)

R₀ is the radius of influence, determined using the Sichardt equation, $R_0 = 3000(H-h)(k^{0.5})$

The target drawdown (H-h) was taken as 1.8 m which reflects a condition in which the assumed groundwater level is at surface and the foundation drain is located at 1.8 mbgs. Because there is no well-defined depth to an impermeable boundary (i.e., silt till is extensive and predominant), and the silt till material forms a very thick layer, the height of groundwater H is taken to be twice the drawdown. The zone of influence was determined using the Sichardt equation and assumed a hydraulic conductivity of 1.6×10^{-8} m/s estimated based on data obtained with single-well response testing on-Site.

The resulting flow of water entering into the foundation drains was determined to be about 1,433 L/d. Assuming a sump pump output of 20 L/min, a sump pump would have to run approximately 3 minutes per hour during periods of high groundwater, which are most likely to occur in winter and spring. This is considered an upper estimate for sump pump running time, primarily because it represents the scenario in which groundwater levels are at their maximum, but also because in the post-development condition there are several factors which tend to reduce groundwater recharge and increase runoff at the lot level, such as the increase in impermeable surfaces (e.g., roads, rooftops) and the provision of consistent surface drainage by grading. These factors would provide further reduction of risk to basements. Furthermore, the equation above tends to yield an over-estimate when applied to sites with cohesive, fine-textured soils because it does not account for the development of capillary suction in the gravity drainage of fine-textured soils: such suction can significantly reduce seepage rates especially in unconfined conditions under low differential head.

Due to the potential for variability in soil conditions across the Site and the potential for more conductive/permeable soils to exist between investigated locations, it is recommended that an inspection be conducted at each basement excavation where the underside of foundation does not meet the specified clearance above SHGWL (0.8 m for walk-out basements, 0.6 m for others). This inspection is to be conducted by a professional engineer having a specialty in geotechnical or

groundwater/hydrogeological engineering and being licensed by Professional Engineers Ontario. In the event the inspection identifies a coarse, permeable soil layer within the excavation, then it is recommended that that basement be waterproofed according to the *Ontario Building Code*.

As previously noted, the details of the grading design of the proposed development have not been confirmed at this time. This analysis shall be revised following review of the proposed grades and in light of additional groundwater level data that may have been collected up to that time.

5.5. Groundwater Levels

Development may cause changes to groundwater levels for various reasons, such as:

- Construction of structures below the water table may require active dewatering for maintenance or operation considerations;
- Installation of services and other subsurface linear infrastructure may create preferential groundwater flow pathways and induce drainage; and
- An increase in impervious surfaces may decrease opportunities for groundwater infiltration and recharge.

The first item (i.e., active dewatering during construction) is considered not to be a factor in this case as the proposed structures will either be constructed above groundwater levels (i.e., basements) or will be constructed as waterproof structures (i.e., the wet well of the sewage pumping station). Dewatering during construction is expected not to cause negative impacts due the construction being temporary and also due to the hydrogeological conditions (i.e., soils of low hydraulic conductivity) which will result in the quantity of dewatering being relatively low. A more detailed assessment of construction dewatering is provided in Section 6 below.

Induced drainage by linear infrastructure can be avoided by constructing such infrastructure (e.g., watermain, sewers) with trench plugs to obstruct flow and minimize the development of preferential flow pathways. It is therefore recommended that trench plugs be constructed on all linear infrastructure that will be built below the seasonal high groundwater level.

The increase in impervious surfaces may decrease groundwater infiltration to some degree, but it is expected to be of limited consequence to the local and regional groundwater system as the hydrostratigraphy (i.e., prevalence of a thick till aquitard of low hydraulic conductivity) of the Site indicates poor conditions for groundwater recharge. Therefore, though infiltration may be reduced by the proposed development, the potential for impact on receptors is expected to be limited.

However, as a matter of best practice, it has been recommended above (see Section 5.1.1) that enhanced recharge facilities be provided where feasible to minimize reductions in infiltration that may be caused by the proposed development.

6. Construction Dewatering

Though the proposed development is expected to involve the placement of a significant volume of fill to raise grades across much of the Site area, the details of the grading plan have not been established at this time. Therefore, this assessment has been conducted on the assumption that post-development grades will be similar to existing grades.

Groundwater control is a key factor to consider when entering into the construction phase of any project as it can result in unforeseen project delays and substantial costs if not adequately addressed.

Based on single-well response testing completed by GEI on three (3) out of the six (6) monitoring wells on-Site, of which two (2) wells were screened within the sandy silt to silty sand glacial till soil, an average hydraulic conductivity (k) of 1.6×10^{-8} m/s was estimated. In the fill material consisting of sand with varying amounts of silt, gravel and cobbles encountered at the location 24-01 in the southwesterly portion of the site, hydraulic conductivity of 1.5×10^{-7} m/s was estimated.

Based on water level data collected up to December 9, 2025, seasonal groundwater levels on-site have been observed to be as shallow as at the ground surface at location 24-05 and may be expected to be at or near ground surface late Winter/early Spring at other locations. Seasonal high groundwater levels will be confirmed by additional water level data collection on site throughout Winter and Spring 2026. However, based on the characteristics and prevalence of the sandy silt to silty sand till material on-Site which is considered to be an aquitard (i.e., a unit that provides significant resistance to the movement of groundwater), and the shallow excavation depths required for the construction of the basements, it is not anticipated that extensive dewatering will be required.

Depending on the dewatering volumes that may be required, water-taking approvals may be required from the MECP i.e., an Environmental Activity Sector Registry (EASR) registration would apply where discharge flows are anticipated to be above 50,000 L/d. Due to new regulatory amendments to O.Reg. 63/16 (ERO number 019-6853, last updated May 27, 2025), the 400,000-L/d volumetric limit on construction dewatering activities conducted under EASR has been removed: construction dewatering activities are now eligible to be registered on the EASR regardless of the daily water-taking amounts.

Based on the data available at this time from field investigation and monitoring completed to date (i.e., water level data, hydraulic conductivity data) as well as typical depths for servicing and infrastructure, it is expected that construction dewatering may exceed 50,000 L/d and therefore the construction dewatering activity would be registered to EASR. Based on the characteristics of the soils to be excavated (i.e., sand and silt till) it is also expected that dewatering would mainly be managed by sump pumps, though wellpoint dewatering may be considered for deeper excavations (e.g., wet well of sewage pumping station) if it is desired to improve soil conditions prior to excavation to reduce slope lengths and excavation sizes.

It is noted that gravel and sand fill was identified between depths of about 2.2 and 4.4 mbgs at monitoring well 24-01, which lies in the southwesterly portion of the Site where the proposed sewage pumping station and stormwater management pond are proposed to be constructed. Though this gravel and sand fill lies mostly above the measured groundwater level, it is possible that seasonal fluctuation could lead to increased saturated thickness of this layer. The apparent history of earthwork in this area adds uncertainty

to the extent and consistency of this coarse fill stratum. These conditions may potentially result in significant dewatering during excavation in this area. It is recommended that additional investigation be conducted to confirm characteristics and potential dewatering requirements related to this sand and gravel fill.

Furthermore, investigation had identified that a groundwater sample from monitoring well 24-01 contained toluene in concentrations exceeding the Provincial Water Quality Objective (but not the sanitary sewer by-law). It is therefore recommended that dewatering from that area (e.g., for the Sewage Pumping Station excavation, for the SWM Pond excavation, as applicable) be discharged to Region of Waterloo sanitary sewer. Alternatively, discharge from this area could be managed via a contain-and-test protocol (i.e., contain all discharge water and have it tested to confirm its quality before deciding to release it to land or to dispose of it at a commercial sewage treatment facility) or via use of a mobile sewage treatment works to mitigate the potential for impacts to surface water or other discharge receivers.

Due to the presence of the surface water features on and in vicinity of the Site (i.e., the dug pond and the drainage feature flowing across the westerly portion of the property and the adjacent Conestogo River), it is recommended that a discharge plan be developed such that any discharge collected from excavations is released at a minimum distance of 30 m away from the drain or any surface water feature so as to prevent turbid discharge water entering directly into the drain or surface water feature.

Where this 30-m outlet buffer distance cannot be accommodated, it is recommended that turbidity to be monitored to confirm that the discharge water, measured at the outlet of the last erosion and sediment control structure, is no greater than 8 NTU above the background (i.e., upstream) turbidity of the surface water/drainage feature.

In all cases, the contractor shall provide suitable controls to prevent the construction dewatering discharge from causing erosion and/or the discharge of sediment to the drain and to ensure that the discharge water complies with the water quality requirements applicable to the receiver (e.g., Provincial Water Quality Objectives for discharges to land that may enter surface water; Region of Waterloo sewer use by-law for discharges to sanitary sewer).

Upon collection of 12 months of groundwater level data as well as finalization of grading and servicing design (i.e., elevations of piping, wet well depth), estimated dewatering rates can be provided. The appropriate approach to approvals would be confirmed at that time, and a monitoring and mitigation plan can be prepared according to the applicable regulatory framework (i.e., an EASR).

7. Summary

A hydrogeological study has been completed for the proposed residential development at 51-55 Hawkesville Road in St. Jacobs, Township of Woolwich, Ontario. The site is approximately 7.2 ha in size and is located in Part of Lot 37 in the Geographic Township of Woolwich. The study comprised several aspects, including desktop study of available geological and hydrogeological information, field activities such as subsurface investigation, monitoring well and shallow piezometer installation, groundwater level monitoring, groundwater sampling and groundwater quality analyses.

The findings of the study are as follows:

- The site is located west of the developed community of St. Jacobs, within the Township of Woolwich.
- The site is currently under mixed land-use as commercial and agricultural. The southern portion of the site includes a forested area and valley slope and is located within the floodplain of the Conestogo River.
- The Site is currently developed with two storage buildings that are occupied by commercial tenants, a barn, and a silo structure located in the north-central portion of the property. Surrounding land uses include residential, agricultural, and institutional properties.
- The development is proposed to accommodate 17 single-family residential lots, 44-58 street fronting townhomes, 50-65 stacked townhomes, open space, public roads and a stormwater management facility.
- The development will be serviced with municipal water distribution and wastewater collection systems via connections to Region of Waterloo infrastructure on Hawkesville Road (watermain) and on Hawkesville Road or Chris Court (sanitary).
 - In the event that the connection to the Chris Court sanitary sewer is not viable, an alternative sewage servicing option would involve the construction of a sewage pumping station to deliver flows to a sanitary sewer on the Hawkesville Road right-of-way.
- Topographically, the Site exhibits a topographic high of 347.5 metres above sea level (masl) in the northeast portion of the Site with a gradual slope throughout the northern portion of the property and a steep slope within the southern portion of the Site to 324 masl, towards Conestogo River.
- The stratigraphy of the soils on and beneath the site roughly follows this sequence:
 - Topsoil, ranging from 0.30 to 0.45m thick, overlying,
 - Fill (sand with varying amounts of silt, gravel and cobbles) 8.7 m thick, extending to a depth of 9.1 mbgs in borehole 24-01, and,
 - Silty Sand to Sand and Silt, 1.9 m thick, extending to a depth of 2.3 mbgs, and
 - Silty Clay 2.0 m thick in borehole 23-03 and 0.4 m thick in borehole 24-05, overlying,
 - Sandy Silt to Silty Sand Glacial Till extending to end of borehole at each location, to depths of 5.2 m to 12.8 m below existing grade.
- Based on information from MECP water well records near the site, bedrock was estimated to be approximately 40 to 46 m below ground surface.
- The nearest municipal water supply well is located approximately 2.6 km north of the site.
- With respect to Source Protection, the entire Site is overlapped by a WHPA-Q zone.
- For the WHPA-Q attributed to the Site and noting that the proposed development is for residential use, it is anticipated that the development will host no “Significant” threat activities as defined under the *Clean Water Act*. It is anticipated that a Risk Management Plan for Source Protection will not be required for the proposed development.

- A scoped door-to-door well survey was conducted at rural properties located in the vicinity of the Site, on the outskirts of St. Jacobs developed area. Most properties in the vicinity of the Site are municipally serviced for water and sewage. Due to the large distance between the Site and the probable location of the nearest private well and the nature of the proposed development (i.e., municipally serviced, shallow excavations for construction dewatering works), the potential for the project to impact private wells on neighbouring properties is expected to be low.
- Monitoring of the groundwater elevations on-site indicated that the lateral component of shallow groundwater flow is generally southwest to south across the Site. Groundwater level measurements indicate groundwater levels vary depending on location on-Site, with the shallowest groundwater levels observed at monitoring well 24-04 (in the northeasterly portion of the Site) and the deepest groundwater levels observed at monitoring wells 24-01 and 24-02, which are located in the southerly portion of the Site.
- The highest groundwater level on-Site to date was observed in the northeast portion of the Site at monitoring well 24-04 (elevation 345.68 masl on June 10, 2025). The ground surface elevation at monitoring well 24-04 is also noted to be located at the highest ground elevation among the set of monitoring wells installed at the Site.
- An impact assessment was completed and given the proposed land use, the proposed stormwater management plan, and the hydrogeological setting, it was identified that the potential for impacts to municipal wells (i.e., Source Protection) is low. No Risk Management Plans are recommended.
- The proposed development plan has been identified to involve development within an anthropogenic wetland (i.e., manmade pond) and within part of the GRCA regulation area on-Site. Appropriate plans to address erosion and flooding are recommended to be provided in the stormwater management design and plans to address potential unstable/compressible soils are recommended to be provided in the project geotechnical report. The hydrological function of the wetland and the portions of the regulated area that are proposed to be developed are not considered to be significant and the proposed development is not expected to cause adverse hydrological impacts.
- Due to the site's soils constituting a surficial aquitard, the potential for groundwater seepage to affect basements is considered to be low. It is expected that the potential for occurrence of hydrostatic pressures at basement walls would be sufficiently mitigated by standard foundation drainage as per the Ontario Building Code.
- Some construction dewatering may be required. Based on available data, construction dewatering rates may be more than 50,000 L/day in which case it is recommended that the dewatering activity be registered to EASR. Construction dewatering estimates will be prepared following completion of the preliminary design of the subdivision once the servicing depths and area grading are determined.
- Additional investigation in the vicinity of monitoring well 24-01 has been recommended to confirm soil conditions (i.e., extent, hydraulic conductivity) of the gravel and sand fill soils in that area. The characteristics of this fill and its relation to excavations and groundwater levels have implications for construction dewatering approaches and approvals. It is also recommended that this investigation include groundwater quality sampling due to the detection of toluene in a sample taken from 24-01. These investigations may occur following issue of draft plan approval but should occur prior to site alteration.
- It is recommended, especially during construction dewatering, that erosion and sediment control practices be implemented to limit potential impacts (e.g., sediment accumulation) to the receiving waterbody. If the outlet of the dewatering discharge line is less than 30 m away from the on-site drainage feature or the Conestogo River, it is recommended that turbidity monitoring be undertaken daily to ensure that turbidity of the discharge remains no more than 8 NTU above the

background turbidity of the water in the waterbody. Additional monitoring and mitigation plans will be forthcoming upon the completion of further groundwater level monitoring and additional investigation in the vicinity of monitoring well 24-01.

8. Conclusions and Recommendations

Based on the information collected during this investigation and subsequent analysis and assessment, the proposed residential subdivision is not anticipated to cause hydrogeological impacts. The assessment has identified no significant obstacles that should preclude the proposed development.

The following conclusions and recommendations are made with respect to the proposed development:

1. That groundwater levels continue to be monitored at the monitoring wells on-site until final approval is issued and that monitoring include the following:
 - Annual sampling and analysis of groundwater quality, and,
 - Continuous groundwater level monitoring with dataloggers installed in each monitoring well and set to record water levels at least once a day.
2. That the Township consider approving Draft Plan of Subdivision on the basis of the 18-month period of groundwater monitoring data provided herein and consider issuing final approval based on a total of two years of groundwater monitoring data.
 - Monitoring will continue during the development application review process. Additional data collected during this continued monitoring will be submitted in an updated hydrogeological study report or in a hydrogeological study addendum letter, as appropriate.
3. That additional investigation be undertaken in the vicinity of monitoring well 24-01 to confirm soil and groundwater conditions (i.e., extent, hydraulic conductivity, groundwater quality) in the fill soils identified in that area.
 - As these investigations are intended to determine practical matters with respect to details for construction dewatering, it is considered that these investigations may be deferred until after draft plan approval is issued.
4. That, following the completion of the groundwater level monitoring and additional investigation recommended in item 3 above, a detailed construction dewatering assessment be prepared including recommendations for construction dewatering monitoring and mitigation (e.g., discharge management).
5. That, should the detailed construction dewatering assessment recommended in item 4 above indicate a requirement to register the construction dewatering activity to the Environmental Activity and Sector Registry, appropriate steps be taken to ensure compliance with O.Reg. 63/16, including preparation of water-taking and discharge reports by a Qualified Person (such as a P.Eng. or P.Geo.) and the undertaking of dewatering activities in accordance with those reports.
6. That, especially during construction dewatering, suitable erosion and sediment controls be implemented by the contractor to protect the receiving drainage feature(s) from potential impacts (e.g., sediment accumulation, turbidity).
7. That if, during construction dewatering, the outlet of the dewatering discharge line is less than 30 m from a municipal drain or watercourse, then daily monitoring of turbidity be undertaken according to Section 6 of this report.

8. That the stormwater management plan ensure that the development of the existing pond and select parts of the GRCA regulated area on-Site will not result in negative impacts such as flooding or erosion.
9. That the geotechnical report for the project provide appropriate plans (e.g., engineered fill, compaction procedures) to address potential for unstable soils where development is proposed at the existing pond.
10. That all proposed dwellings with basements be constructed with foundation drains according to the Ontario Building Code.
11. That, noting the prevalence of fine-textured soils on-site and the expected effectiveness of foundation drains in protecting basements against basement seepage,
 - Where feasible, basements shall be constructed meeting the required clearance between seasonal high groundwater levels and underside of footing, which (as specified in the Township *Engineering Development and Infrastructure Manual*) is 0.8 m for walk-out basements and 0.6 m for other basements, or
 - For any basement not meeting the specified clearance, a geotechnical or groundwater engineer (licensed by Professional Engineers Ontario) conduct an inspection of the excavation and confirm the absence of coarse, permeable soil layers. In the event that a coarse, permeable soil layer is identified during the inspection, that basement shall be “waterproofed” in accordance with the requirements of the *Ontario Building Code*.
12. That all subsurface linear infrastructure (e.g., storm sewers, sanitary sewers, watermains) be constructed with trench plugs to minimize the potential for development of preferential groundwater flow pathways and minimize induced groundwater drainage.
13. That, when no longer required for the purpose of monitoring to satisfy municipal approval requirements, wells on-site be decommissioned by a licensed water well driller as per Ontario Regulation 903.
14. That a well monitoring program be developed and conducted during construction dewatering and for an appropriate period (e.g., 3 years) following 95% build-out of the subdivision, to monitor water quality at overburden wells within 100 m of the proposed SWM pond.
15. That the stormwater management facility be constructed with an appropriate impermeable liner.

9. Statement of Limitations

The information in this report is intended for the sole use of Polocorp Inc. GEI Consultants Canada Ltd. accept no liability for use of this information by third parties. Any decisions made by third parties on the basis of information provided in this report are made at the sole risk of the third parties.

GEI Consultants Canada Ltd. cannot guarantee the accuracy or reliability of information provided by others. GEI Consultants Canada Ltd. do not accept liability for unknown, unidentified, undisclosed, or unforeseen surface or sub-surface conditions that may be later identified.

The conclusions pertaining to the condition of soils and/or groundwater identified at the site are based on the visual observations at the locations of the investigative boreholes/monitoring wells and on the reported laboratory results for the select groundwater samples. GEI Consultants Canada Ltd. cannot guarantee the condition of soil and/or groundwater that may be encountered at the Site in locations that were not specifically investigated as part of this investigation. This report is considered to be representative of the condition of the Site as of December 9, 2025.

10. References

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Charts

Chart 1. Hydrograph of Monitoring Well 24-01

Chart 2. Hydrograph of Monitoring Well 24-02

Chart 3. Hydrograph of Monitoring Well 24-03

Chart 4. Hydrograph of Monitoring Well 24-04

Chart 5. Hydrograph of Monitoring Well 24-05

Chart 6. Hydrograph of Monitoring Well 24-06

Chart 7. Hydrograph of Piezometer PZ-01

Chart 1. Hydrograph of 24-01

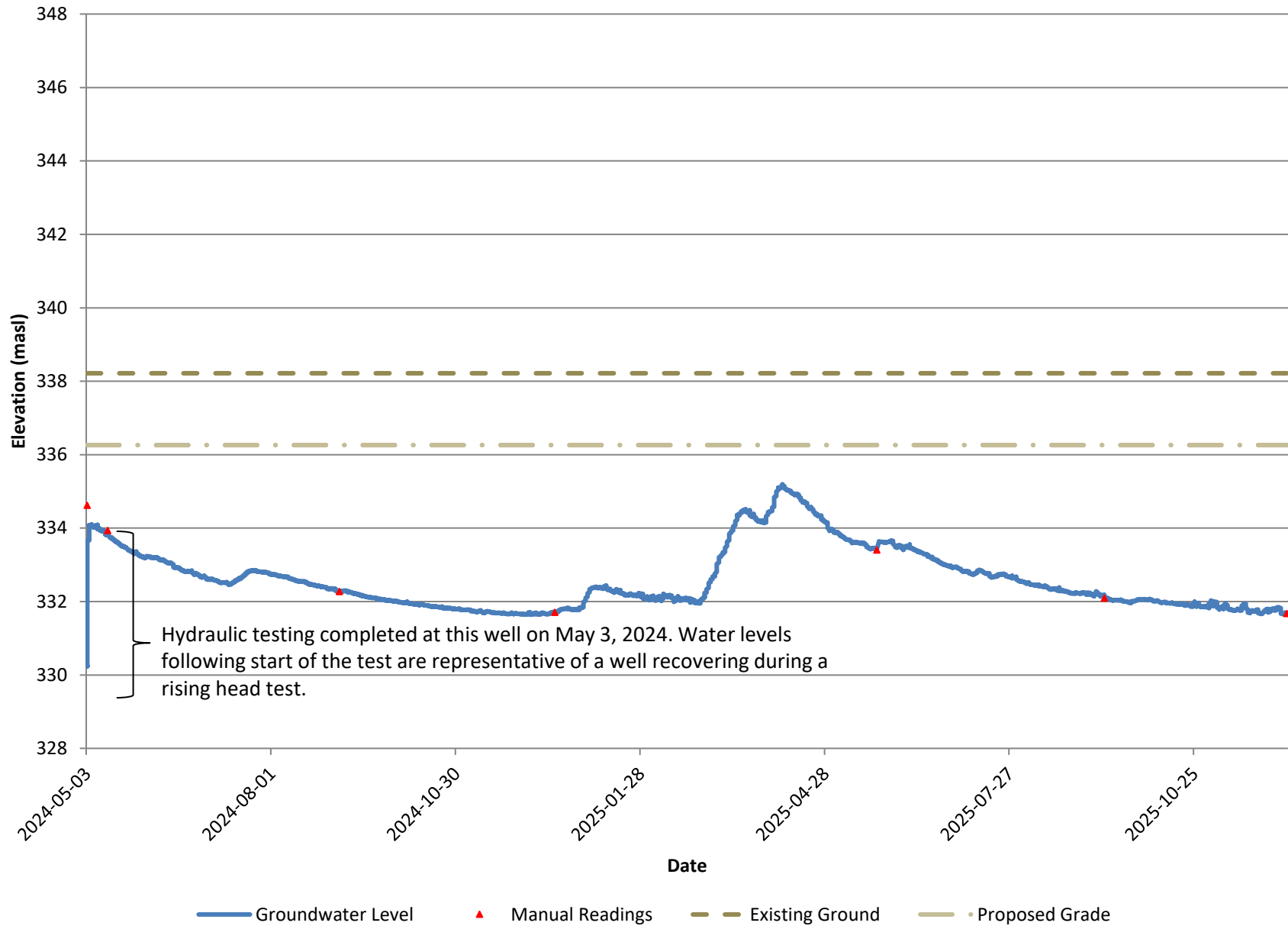


Chart 2. Hydrograph of 24-02

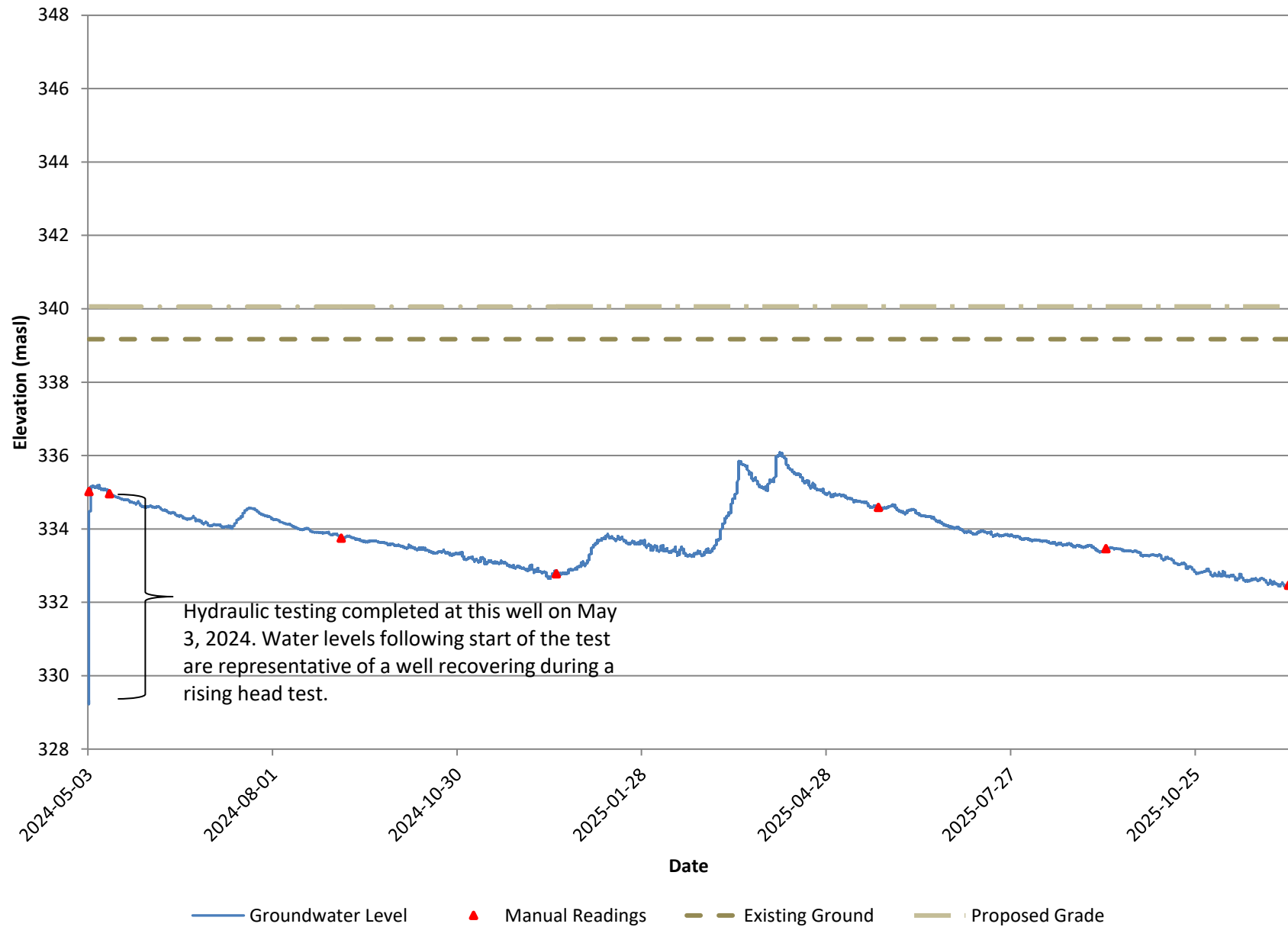


Chart 3. Hydrograph of 24-03

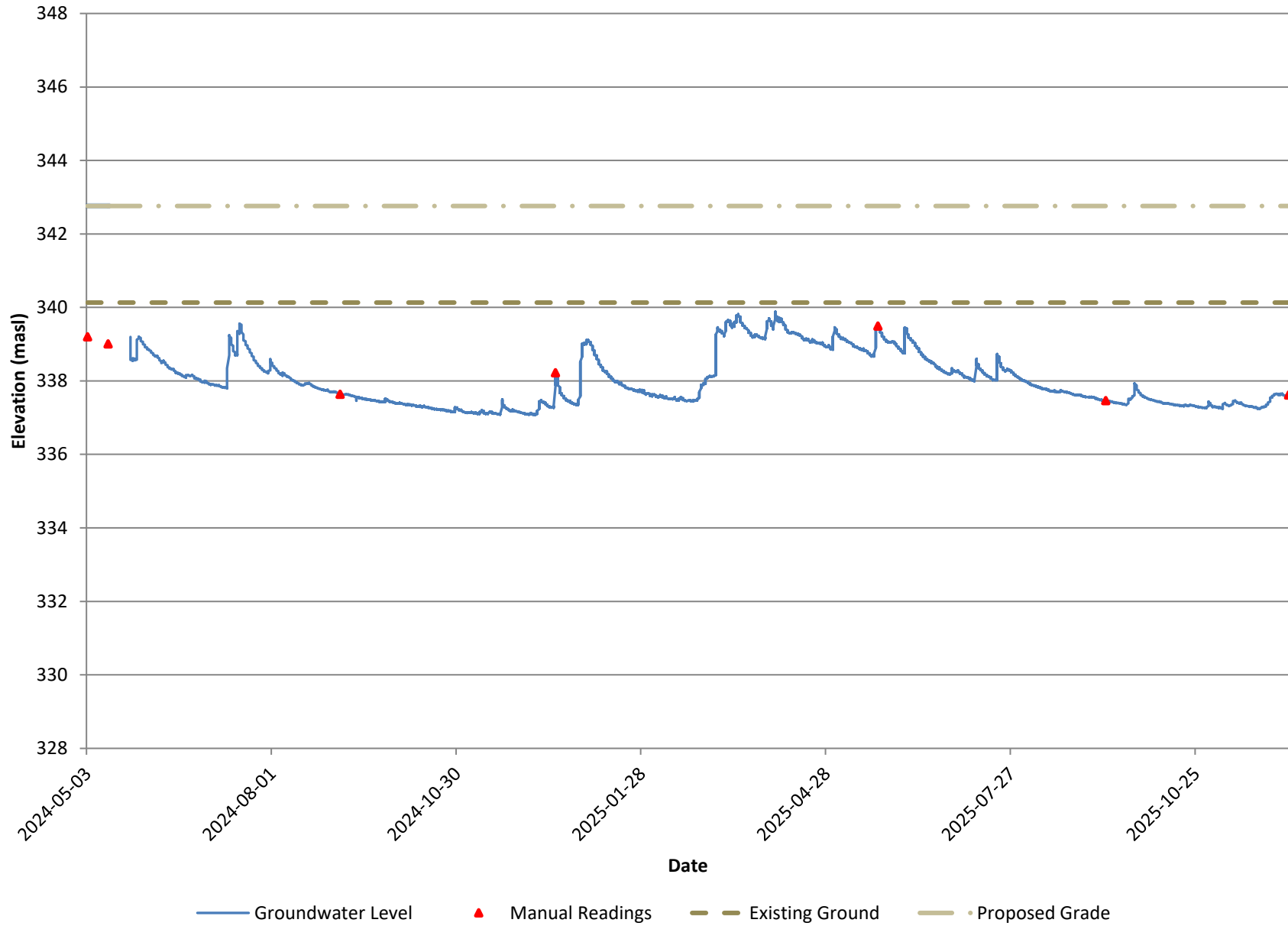


Chart 4. Hydrograph of 24-04

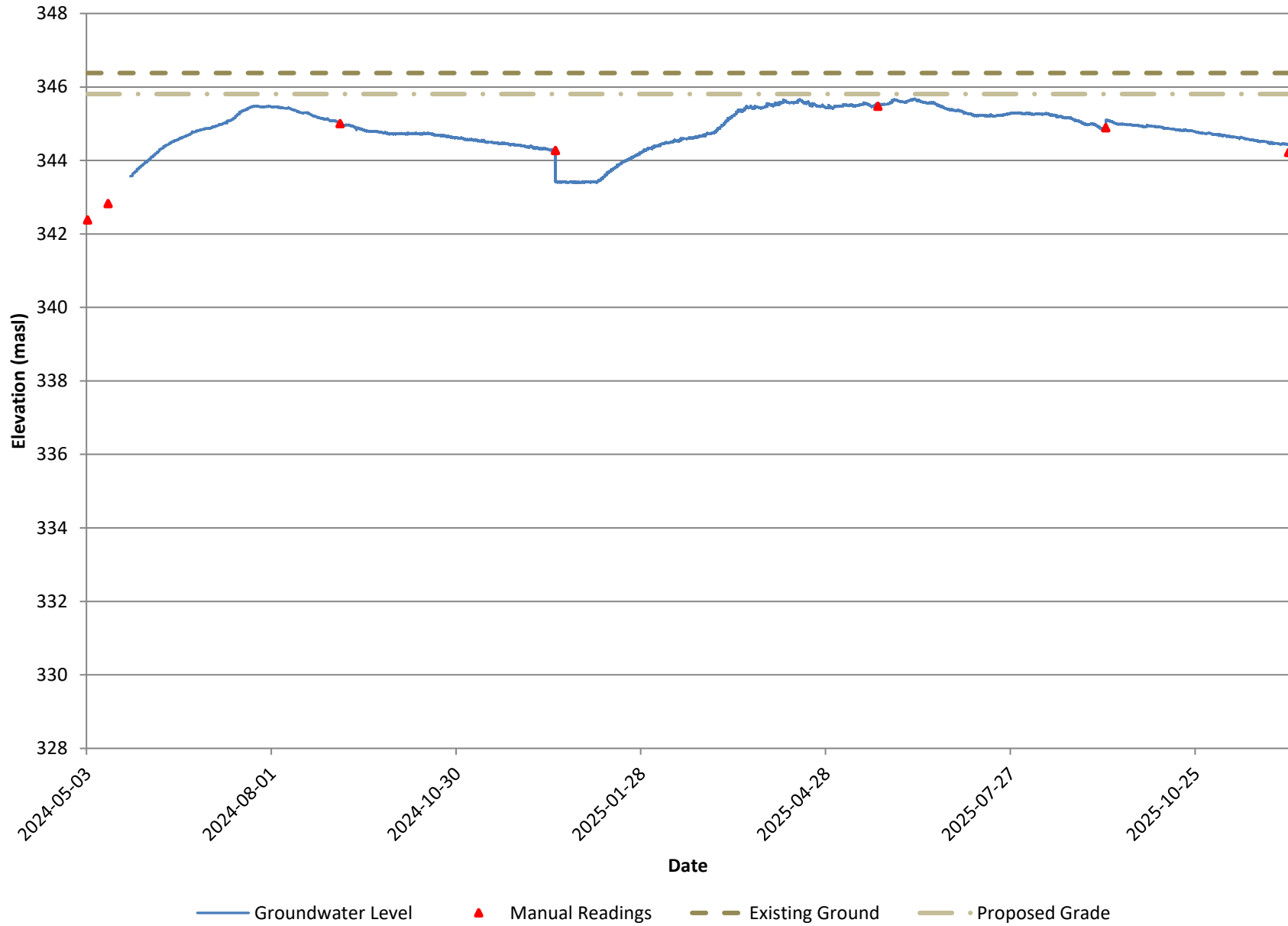


Chart 5. Hydrograph of 24-05

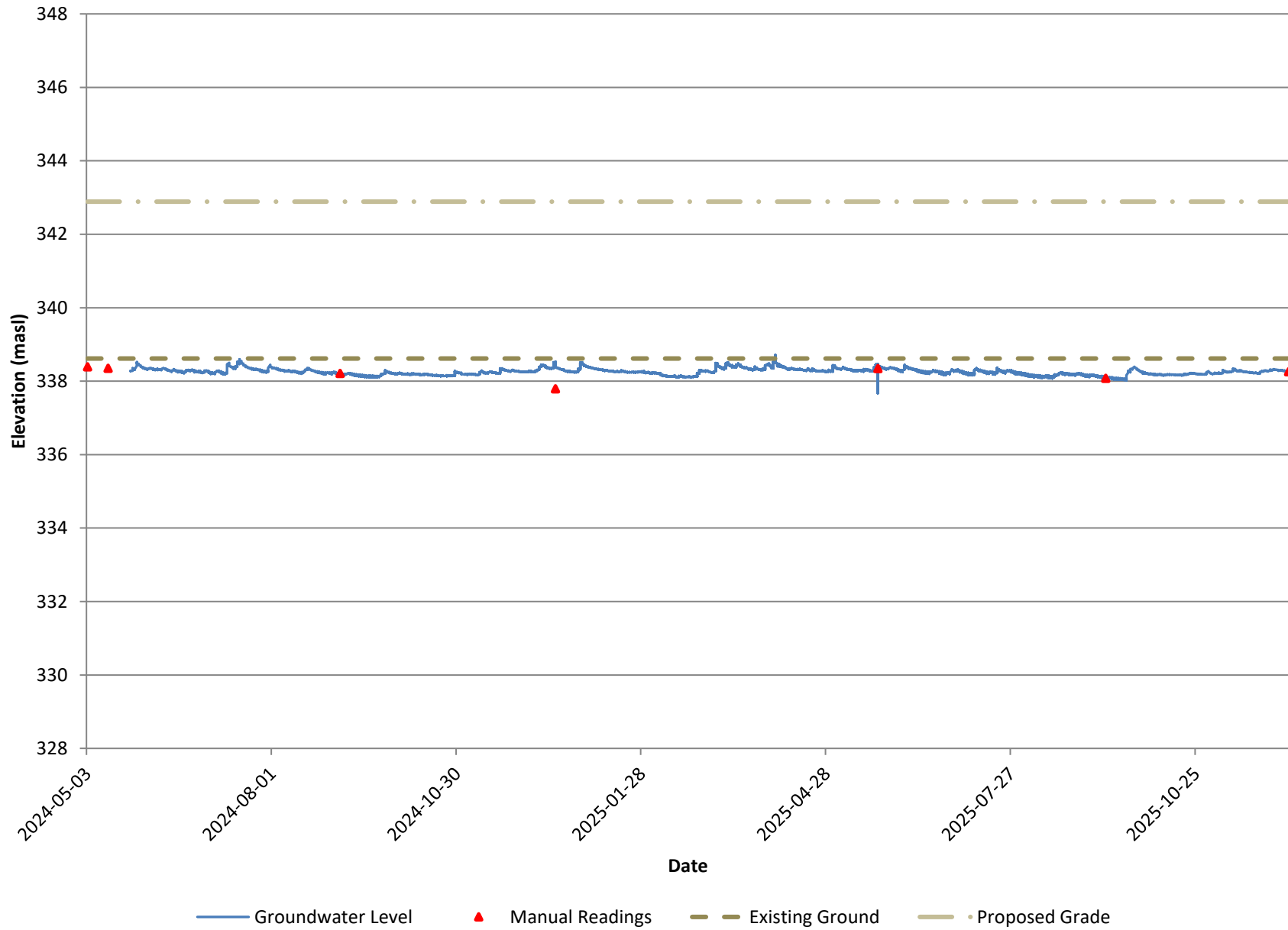


Chart 6. Hydrograph of 24-06

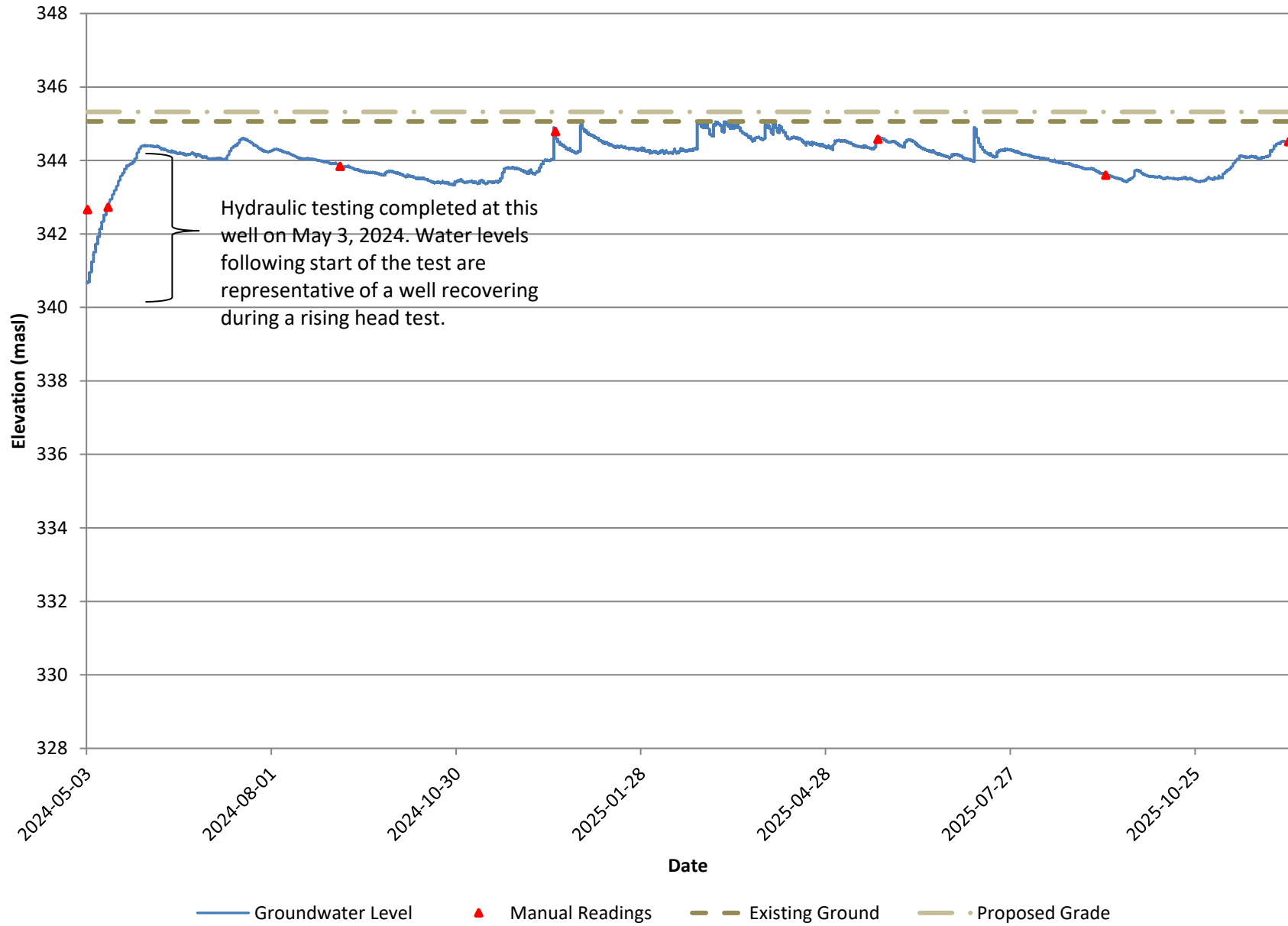
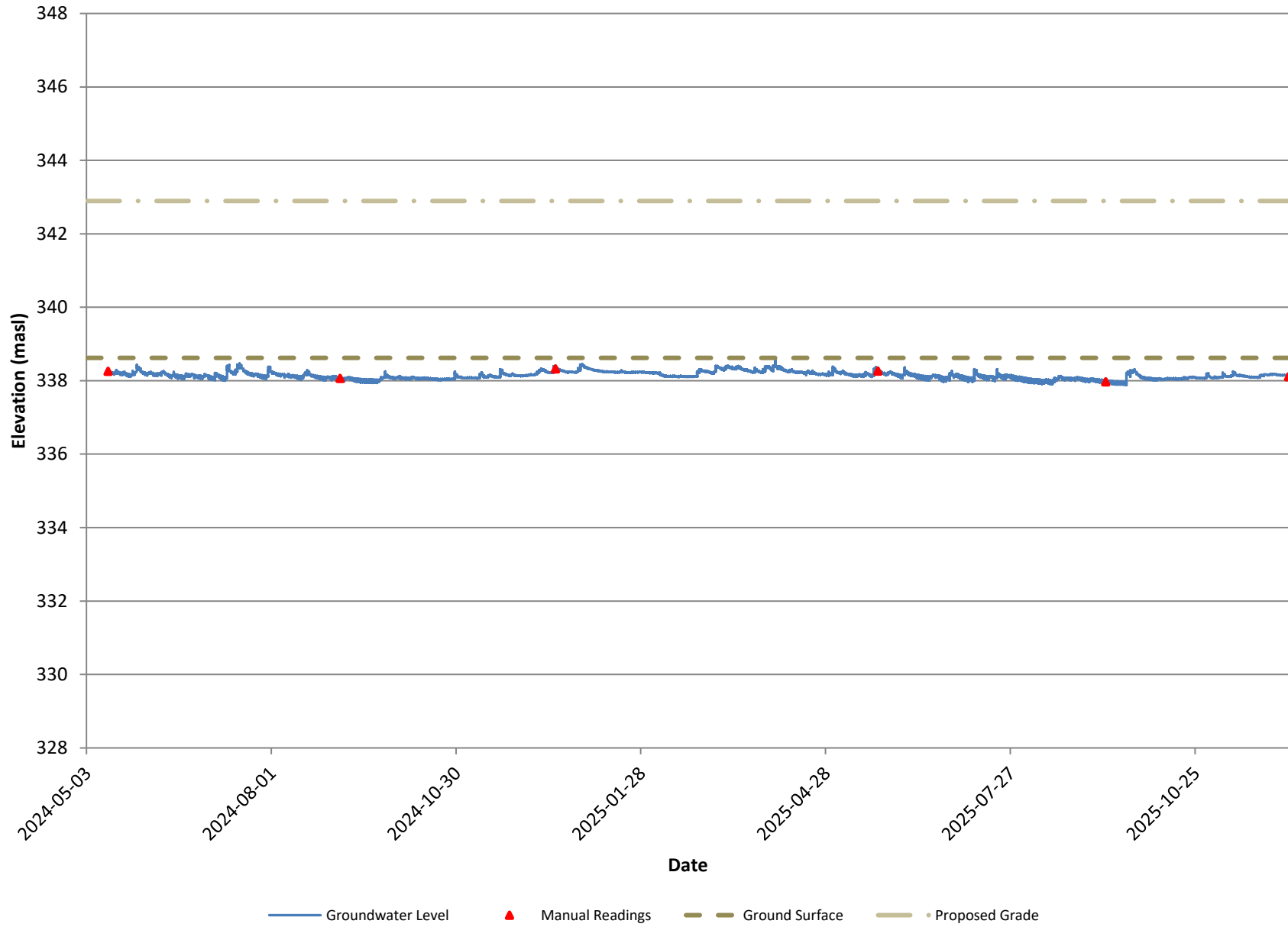


Chart 7. Hydrograph of PZ-01



Tables

Table 1. MECP Well Records

**Table 2. Metals and Inorganics in Groundwater with Comparison to MECP
PWQOs**

**Table 3. Petroleum Hydrocarbons in Groundwater with Comparison to MECP
PWQOs**

**Table 4. Metals and Inorganics in Groundwater with Comparison to ROW Sewer
Use Bylaw (21-036)**

**Table 5. Petroleum Hydrocarbons in Groundwater with Comparison to ROW
Sewer Use Bylaw (21-036)**

Table 1. MECP Well Records

MECP Well ID	Lot	Township	Well Use	Depth to Bedrock (m)	Well Depth (m)	Static Water Level (m)	Date Completed	Abandonment Record (Y/N)
On-Site								
7398389		WOOLWICH	Observation/ Monitoring		15.24		21-Jul-27	
Off-Site								
6504481	007	WOOLWICH	Test Hole	51.2	53.6		16-Jun-76	
6502701	045	WOOLWICH	Domestic	50.9	62.8	19.8	21-Apr-55	
6502600	008	WOOLWICH	Domestic	48.8	52.7	9.4	24-Aug-48	
6502669	037	WOOLWICH	Livestock/ Domestic	46.6	55.5	14.6	08-Sep-51	
7160933		WOOLWICH	Domestic/ Livestock	46.0	53.0	9.4	29-Sep-10	
6503243	037	WOOLWICH	Domestic	45.7	48.8	12.2	04-Jun-70	
6502665	036	WOOLWICH	Commercial	45.7	51.2	14.0	11-Mar-52	
6503543	037	WOOLWICH	Municipal	45.7	58.2	15.5	15-Aug-66	
6502668	037	WOOLWICH	Livestock/ Domestic	45.1	52.4	14.0	23-Dec-49	
6502672	037	WOOLWICH	Domestic	44.5	46.6	15.8	03-Jul-64	
6503453	008	WOOLWICH	Domestic	44.5	52.1	11.0	21-Apr-71	
6502670	037	WOOLWICH	Domestic	42.7	51.8	16.8	17-May-56	
6502610	008	WOOLWICH	Domestic	42.4	50.3	12.2	04-Aug-66	
6502664	036	WOOLWICH	Domestic	42.1	50.0	13.1	22-Oct-51	
6503542	037	WOOLWICH	Municipal	42.1	63.1	10.4	12-Jul-66	
6504243	036	WOOLWICH	Livestock/ Domestic	40.2	49.4	12.2	24-Dec-74	
7319135	036	WOOLWICH	Domestic	40.2	44.8	13.53	19-Sep-18	
6507700	008	WOOLWICH	Domestic/ Commercial	39.3	51.5	11.0	15-Nov-94	
6502593	007	WOOLWICH	Domestic	29.9	38.1	0.0	03-Sep-57	
6502666	036	WOOLWICH	Domestic	26.2	32.0	0.0	20-Dec-56	
6502594	007	WOOLWICH	Industrial	23.8	27.4	-6.7	04-Oct-57	
6502591	007	WOOLWICH	Not Used		36.9	13.7	28-Feb-55	
6502592	007	WOOLWICH	Domestic		36.6	13.7	01-Mar-55	
6502596	007	WOOLWICH	Domestic		12.5	1.2	08-Jan-63	
6502599	007	WOOLWICH	Not Used		16.8	3.7	25-Apr-66	
6502603	007	WOOLWICH	Irrigation		16.8	3.7	19-Jul-66	
6502606	008	WOOLWICH	Domestic		6.7	4.0	12-Oct-60	
6502607	008	WOOLWICH	Domestic		21.9	19.5	03-Jan-63	
6502609	008	WOOLWICH	Domestic		8.2	5.5	07-Aug-64	
6502667	036	WOOLWICH	Domestic		7.3	3.0	18-Apr-61	
6503070	009	WOOLWICH	Livestock		15.2	19.2	10-Sep-69	
6503087	036	WOOLWICH	Livestock/ Domestic		6.1	2.4	01-Oct-69	
6503127	036	WOOLWICH	Domestic		15.2	9.1	16-Dec-69	
6503174	007	WOOLWICH	Domestic		12.5	5.5	20-Feb-70	
6505173	036	WOOLWICH	Domestic		9.1	5.8	03-Sep-80	
6508461	006	WOOLWICH	Municipal		21.0	-0.6	20-May-99	
6508571	006	WOOLWICH	Commercial		20.1	0.0	06-Jan-00	
6508573	006	WOOLWICH	Municipal		20.7	0.3	06-Dec-99	
6508574	006	WOOLWICH	Municipal		22.3	0.0	03-Dec-99	
6508575	006	WOOLWICH	Municipal		21.9	0.0	02-Dec-99	
6508773	006	WOOLWICH				0.0	07-Nov-00	
6508774	006	WOOLWICH				0.0	07-Nov-00	
6508775	006	WOOLWICH				0.0	07-Nov-00	
6508776	006	WOOLWICH				0.0	07-Nov-00	
6508777	006	WOOLWICH				0.0	07-Nov-00	
6509413	037	WOOLWICH	Domestic		47.9	12.5	05-Feb-03	
6510077	009	WOOLWICH				0.0	07-Mar-05	Y
6510456		WOOLWICH WATERLOO			9.5	0.0	10-Jan-06	
7034252	007	WOOLWICH			7.1	0.0	07-Sep-06	
7042372	006	WELLESLEY TOWNSHIP				0.0	11-May-06	Y
7102478	036	WOOLWICH	Domestic		24.0	2.2	30-Sep-07	
7102479	036	WOOLWICH WATERLOO				0.0	30-Sep-07	Y
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.0	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.0	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	

Table 1. MECP Well Records

MECP Well ID	Lot	Township	Well Use	Depth to Bedrock (m)	Well Depth (m)	Static Water Level (m)	Date Completed	Abandonment Record (Y/N)
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.0	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.0	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.0	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.0	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-07	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-07	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-07	
7103286	008	WOOLWICH	Monitoring		10.4	0.0	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.0	02-Jan-07	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.0	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.0	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.0	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.0	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.9	02-Jan-08	
7103286	008	WOOLWICH	Monitoring		10.4	0.0	02-Jan-07	
7108106		WOOLWICH	Domestic		29.0	2.7	27-Jun-07	
7142358		WOOLWICH	Test Hole		3.0		18-Mar-10	
7142358		WOOLWICH	Test Hole		3.0		18-Mar-10	
7142358		WOOLWICH	Test Hole		3.0		18-Mar-10	
7142358		WOOLWICH	Test Hole		3.0		16-Mar-10	
7142358		WOOLWICH	Test Hole		3.0		16-Mar-10	
7142358		WOOLWICH	Test Hole		3.0		18-Mar-10	
7153778		WOOLWICH	Monitoring		10.3		28-Sep-10	
7153778		WOOLWICH	Monitoring		10.3		30-Sep-10	
7153778		WOOLWICH	Monitoring		10.3		30-Sep-10	
7153778		WOOLWICH	Monitoring		10.3		30-Sep-10	
7153778		WOOLWICH	Monitoring		10.3		28-Sep-10	
7153778		WOOLWICH	Monitoring		10.3		28-Sep-10	
7153778		WOOLWICH	Monitoring		10.3		28-Sep-10	
7153778		WOOLWICH	Monitoring		10.3		28-Sep-10	
7153778		WOOLWICH	Monitoring		10.3		10-Oct-10	
7153778		WOOLWICH	Monitoring		10.3		10-Oct-10	
7153778		WOOLWICH	Monitoring		10.3		10-Oct-10	
7153778		WOOLWICH	Monitoring		10.3		28-Sep-10	
7164277		WOOLWICH						Y
7168643		WOOLWICH					30-Aug-11	
7175195		WOOLWICH					30-Aug-11	
7175818		WOOLWICH	Test Hole		9.3		16-Jan-12	
7175831	007	WOOLWICH	Test Hole		5.3		10-Jan-12	
7191642	008	WOOLWICH	Test Hole		6.1		17-Oct-12	
7200624		WOOLWICH	Test Hole		11.5		28-Mar-13	
7200625		WOOLWICH	Test Hole		10.0		28-Mar-13	
7200626		WOOLWICH	Test Hole		10.9		28-Mar-13	
7210412		WOOLWICH					29-Oct-13	Y
7210413		WOOLWICH					29-Oct-13	Y
7210414		WOOLWICH					29-Oct-13	Y
7210415	007	WOOLWICH					29-Oct-13	
7218492		WOOLWICH	Test Hole		10.0		03-Feb-14	
7218493		WOOLWICH	Test Hole		6.8		03-Feb-14	
7218494		WOOLWICH	Test Hole		10.0		14-Jan-14	
7226588		WOOLWICH	Test Hole		4.6		05-Aug-14	
7226589		WOOLWICH	Test Hole		5.3		06-Aug-14	
7226590	007	WOOLWICH	Test Hole		3.9		05-Aug-14	
7239066		WOOLWICH	Monitoring		4.5		19-Mar-15	
7240084		WOOLWICH	Monitoring		15.2		23-Jan-15	
7241680		WOOLWICH					15-May-15	Y

MECP Well ID	Lot	Township	Well Use	Depth to Bedrock (m)	Well Depth (m)	Static Water Level (m)	Date Completed	Abandonment Record (Y/N)
7267037	008	WOOLWICH					03-Nov-14	
7267050	008	WOOLWICH						
7274016	007	WOOLWICH						Y
7274024	008	WOOLWICH					12-Oct-16	Y
7284479		WOOLWICH	Test Hole/ Monitoring		7.6		08-Mar-17	
7284598	036	WOOLWICH	Monitoring		7.6		09-Mar-17	
7284599	036	WOOLWICH	Monitoring		7.6		09-Mar-17	
7287098		WOOLWICH	Test Hole		8.5		13-Apr-17	
7287099		WOOLWICH	Test Hole		7.6		13-Apr-17	
7287100		WOOLWICH	Test Hole		9.1		13-Apr-17	
7287537		WOOLWICH	Test Hole/ Monitoring		7.6		13-Apr-17	
7287711		WOOLWICH					17-Apr-17	Y
7287712	036	WOOLWICH	Monitoring				17-Apr-17	Y
7287713		WOOLWICH	Monitoring				17-Apr-17	Y
7295547	008	WOOLWICH	Monitoring		7.3		24-Apr-17	
7295548	008	WOOLWICH	Monitoring		6.4		24-Apr-17	
7295549	008	WOOLWICH	Monitoring		7.3		24-Apr-17	
7297080	008	WOOLWICH	Test Hole		12.2		15-Sep-17	
7297081		WOOLWICH	Test Hole		4.6		15-Sep-17	
7298478		WOOLWICH	Test Hole/ Monitoring		4.9		26-Sep-17	
7298479		WOOLWICH	Monitoring		5.2		27-Sep-17	
7298480		WOOLWICH	Monitoring		5.2		26-Sep-17	
7309333	037	WOOLWICH					14-Mar-18	Y
7324922		WOOLWICH	Monitoring		6.1	4.9	24-Sep-18	
7326215	008	WOOLWICH	Monitoring		6.0	0.0	27-Nov-18	
7326218	008	WOOLWICH	Monitoring		5.4	0.0	27-Nov-18	
7328146	036	WOOLWICH				0.0	13-Dec-18	
7332038		WOOLWICH	Monitoring		6.1	0.0	05-Feb-19	
7332049		WOOLWICH	Monitoring		4.9	0.0	05-Feb-19	
7332050		WOOLWICH	Monitoring		6.1	0.0	05-Feb-19	
7332051		WOOLWICH	Monitoring		4.6	0.0	05-Feb-19	
7341052		WOOLWICH	Monitoring			0.0	19-Jun-19	Y
7341053		WOOLWICH	Monitoring		4.6	0.0	24-Jun-19	
7352545		WOOLWICH				0.0	20-Aug-18	
7359796		WOOLWICH				0.0	20-Mar-20	Y
7359797		WOOLWICH				0.0	20-Mar-20	Y
7359798		WOOLWICH				0.0	20-Mar-20	Y
7359799		WOOLWICH				0.0	20-Mar-20	Y
7359800		WOOLWICH				0.0	20-Mar-20	Y
7359801		WOOLWICH				0.0	20-Mar-20	Y
7359802		WOOLWICH				0.0	20-Mar-20	Y
7359803		WOOLWICH				0.0	20-Mar-20	Y
7359804		WOOLWICH				0.0	20-Mar-20	Y

Table 2. Metals and Inorganics in Groundwater with Comparison to MECP PWQOs

Sample Name Well ID	MECP PWQOs (Hardness > 100 mg/L)	MECP Interim PWQOs (Hardness > 100 mg/L)	BH/MW1 24-01 13-05-2024	BH/MW3 24-03 13-05-2024	BH/MW5 24-05 13-05-2024	MW-01 24-01 23-05-2025	MW-03 24-03 23-05-2025	MW-05 24-05 23-05-2025
Anions, Nutrients and Physical Tests								
Alkalinity, bicarbonate (as HCO3) mg/L						1820	561	1480
Alkalinity, carbonate (as CO3) mg/L						<3.0	<0.6	<3.0
Alkalinity, hydroxide (as OH) mg/L						<1.7	<0.3	<1.7
Alkalinity, total (as CaCO3) mg/L			1280	1680	2340	1490	460	1210
Colour, apparent CU			10800	10800	12200	1080	2690	10700
Conductivity µS/cm			2310	1160	915	3030	1030	850
Hardness (as CaCO3), dissolved mg/L						783	510	406
Langelier index (@ 20°C) -						1.62	0.798	1.42
Langelier index (@ 4°C) -						1.37	0.550	1.17
pH pH units	6.5-8.5		7.77	7.60	7.99	7.78	7.49	7.83
pH, saturation (@ 20°C) pH units						6.16	6.69	6.41
pH, saturation (@ 4°C) pH units						6.40	6.94	6.66
Solids, total dissolved [TDS] mg/L			1280	700	578	1570	697	591
Solids, total dissolved [TDS], calculated mg/L						1970	670	552
Turbidity NTU			>4000	>4000	>4000	136	1020	>4000
Ammonia, total (as N) mg/L			48.8	0.0283	0.0396	124	0.0128	0.0405
Bromide mg/L			<0.50	<0.50	<0.50	<0.50	<0.20	<0.10
Chloride mg/L			203	89.4	69.4	208	58.2	62.1
Fluoride mg/L			0.233	<0.100	<0.100	0.198	0.090	0.073
Nitrate (as N) mg/L			<0.100	8.46	<0.100	<0.100	14.8	<0.020
Nitrate + Nitrite (as N) mg/L						<0.112	14.8	<0.0224
Nitrite (as N) mg/L			<0.050	<0.050	<0.050	<0.050	<0.020	<0.010
Phosphate, ortho-, dissolved (as P) mg/L						0.0063	<0.0010	<0.0010
Sulfate (as SO4) mg/L			26.8	23.8	75.4	<1.50	26.5	79.9
Carbon, dissolved organic [DOC] mg/L						11.4	3.10	1.99
Ion Balance								
Anion sum meq/L						35.6	12.4	27.6
Cation sum meq/L						33.5	11.6	9.43
Ion balance (APHA) %						-3.04	-3.33	-49.1
Ion balance (cations/anions) %						94.1	93.5	34.2
Dissolved Metals								
Aluminum, dissolved mg/L		<=0.075	0.0119	<0.0100	0.0035	0.0110	0.0118	0.0024
Antimony, dissolved mg/L		<=0.02	<0.00100	<0.00100	<0.00010	<0.00100	<0.00010	<0.00010
Arsenic, dissolved mg/L	<=0.1	<=0.005	0.00145	<0.00100	0.00050	0.00210	0.00026	0.00115
Barium, dissolved mg/L			0.142	0.0766	0.0900	0.0837	0.0573	0.0989
Beryllium, dissolved mg/L	<=0.011		<0.000200	<0.000200	<0.000020	<0.000200	<0.000020	<0.000020
Bismuth, dissolved mg/L			<0.000500	<0.000500	<0.000050	<0.000500	<0.000050	<0.000050
Boron, dissolved mg/L			<0.100	<0.100	0.017	0.109	0.012	0.013
Cadmium, dissolved mg/L	<=0.0002	<=0.0005	<0.0000500	<0.0000500	<0.0000050	<0.0000500	0.0000083	<0.0000050
Calcium, dissolved mg/L			160	140	98.3	191	142	99.3
Cesium, dissolved mg/L			<0.000100	<0.000100	<0.000010	<0.000100	<0.000010	<0.000010
Chromium, dissolved mg/L			<0.00500	<0.00500	<0.00050	<0.00500	<0.00050	<0.00050
Cobalt, dissolved mg/L		<=0.0009	0.00502	<0.00100	<0.00010	0.00473	<0.00010	0.00034
Copper, dissolved mg/L	<=0.005	<=0.005	<0.00200	<0.00200	0.00074	<0.00200	0.00121	0.00077
Dissolved metals filtration location -			Laboratory	Laboratory	Laboratory	Field	Field	Field
Iron, dissolved mg/L	<=0.3		<0.100	<0.100	<0.010	0.561	0.010	<0.010
Lead, dissolved mg/L	<=0.025	<=0.005	<0.000500	<0.000500	<0.000050	<0.000500	<0.000050	<0.000050
Lithium, dissolved mg/L			<0.0100	<0.0100	0.0040	<0.0100	0.0044	0.0069
Magnesium, dissolved mg/L			64.6	47.2	40.3	74.3	37.7	38.5
Manganese, dissolved mg/L			1.59	0.0281	0.0335	1.56	0.00882	0.121
Molybdenum, dissolved mg/L		<=0.04	0.0203	0.000957	0.000995	0.00920	0.000350	0.000506
Nickel, dissolved mg/L	<=0.025	<=0.025	0.00828	<0.00500	0.00055	0.00991	0.00066	0.00056
Phosphorus, dissolved mg/L		<=0.01	<0.500	<0.500	<0.050	<0.500	<0.050	<0.050
Potassium, dissolved mg/L			50.5	1.10	3.00	93.1	0.724	2.30
Rubidium, dissolved mg/L			0.0121	<0.00200	0.00107	0.0267	0.00057	0.00058
Selenium, dissolved mg/L	<=0.1		0.000557	<0.000500	0.000100	<0.000500	<0.000050	<0.000050
Silicon (as SiO2), dissolved mg/L						20.0	15.8	13.0
Silicon, dissolved mg/L			9.15	7.38	5.56	9.34	7.39	6.08
Silver, dissolved mg/L	<=0.0001	<=0.0001	<0.000100	<0.000100	<0.000010	<0.000100	<0.000010	<0.000010
Sodium, dissolved mg/L			200	43.4	39.4	150	31.6	28.6
Strontium, dissolved mg/L			0.646	0.504	0.253	0.778	0.369	0.285
Sulfur, dissolved mg/L			10.3	8.14	26.9	<5.00	9.82	29.2
Tellurium, dissolved mg/L			<0.00200	<0.00200	<0.00020	<0.00200	<0.00020	<0.00020
Thallium, dissolved mg/L		<=0.0003	<0.000100	<0.000100	<0.000010	<0.000100	0.000013	<0.000010
Thorium, dissolved mg/L			<0.00100	<0.00100	<0.00010	<0.00100	<0.00010	<0.00010
Tin, dissolved mg/L			<0.00100	<0.00100	0.00017	<0.00100	<0.00010	<0.00010
Titanium, dissolved mg/L			<0.00300	<0.00300	<0.00030	0.00504	<0.00060	<0.00030
Tungsten, dissolved mg/L		<=0.03	<0.00100	<0.00100	<0.00010	<0.00100	<0.00010	<0.00010
Uranium, dissolved mg/L		<=0.005	0.00224	0.000749	0.00156	0.000309	0.000642	0.00156
Vanadium, dissolved mg/L		<=0.006	<0.00500	<0.00500	<0.00050	<0.00500	<0.00050	0.00059
Zinc, dissolved mg/L	<=0.03	<=0.02	<0.0100	<0.0100	<0.0010	<0.0100	0.0015	0.0016
Zirconium, dissolved mg/L		<=0.004	<0.00300	<0.00300	<0.00030	0.00354	<0.00020	<0.00020
Sodium adsorption ratio [SAR] -						2.33	0.61	0.62

Evaluations and Notes:

MECP PWQOs Ministry of the Environment, Conservation and Parks Provincial Water Quality Objectives

LOR Limit of Reporting

No Spec No Objective/No Standard

Within Limit Within Limit

Exceeds Limit Exceeds Limit

Result LOR > Limit Result LOR > Limit

Table 3. Petroleum Hydrocarbons in Groundwater with Comparison to MECP PWQOs

Polocorp Inc.
51-55 Hawkesville Road, St. Jacobs, ON
Hydrogeological Study
Project No. 2403070
December 2025

Sample Name Well ID Sampling Date	MECP PWQOs (Hardness > 100 mg/L)	MECP Interim PWQOs (Hardness > 100 mg/L)	BH/MW1 24-01 13-05-2024	BH/MW3 24-03 13-05-2024	BH/MW5 24-05 13-05-2024
Hydrocarbons					
Chromatogram to baseline at nC50 -			YES	YES	YES
F1 (C6-C10) µg/L			<25	<25	<25
F1-BTEX µg/L			<25	<25	<25
F2 (C10-C16) µg/L			<100	<100	<100
F3 (C16-C34) µg/L			<250	<250	<250
F4 (C34-C50) µg/L			<250	<250	<250
Hydrocarbons, total (C6-C50) µg/L			<370	<370	<370
Volatile Organic Compounds					
Benzene µg/L		<=100	<0.50	<0.50	<0.50
BTEX, total µg/L			11.1	<1.0	<1.0
Ethylbenzene µg/L		<=8	<0.50	<0.50	<0.50
Toluene µg/L		<=0.8	11.1	<0.50	<0.50
Xylene, m+p- µg/L	<=2	<=30	<0.40	<0.40	<0.40
Xylene, o- µg/L	<=40	<=40	<0.30	<0.30	<0.30
Xylenes, total µg/L			<0.50	<0.50	<0.50

Evaluations and Notes:

MECP PWQOs Ministry of the Environment, Conservation and Parks Provincial Water Quality

LOR Limit of Reporting

No Spec No Objective/No Standard

Within Limit Within Limit

Exceeds Limit Exceeds Limit

Result LOR > Limit Result LOR > Limit

Sample Name Well ID Sampling Date	Region of Waterloo Sanitary Sewer Bylaw (21-036)	BH/MW1 24-01 13-05-2024	BH/MW3 24-03 13-05-2024	BH/MW5 24-05 13-05-2024	MW-01 24-01 23-05-2025	MW-03 24-03 23-05-2025	MW-05 24-05 23-05-2025
Anions, Nutrients and Physical Tests							
Alkalinity, bicarbonate (as HCO3) mg/L					1820	561	1480
Alkalinity, carbonate (as CO3) mg/L					<3.0	<0.6	<3.0
Alkalinity, hydroxide (as OH) mg/L					<1.7	<0.3	<1.7
Alkalinity, total (as CaCO3) mg/L		1280	1680	2340	1490	460	1210
Colour, apparent CU		10800	10800	12200	1080	2690	10700
Conductivity µS/cm		2310	1160	915	3030	1030	850
Hardness (as CaCO3), dissolved mg/L					783	510	406
Langelier index (@ 20°C) -					1.62	0.798	1.42
Langelier index (@ 4°C) -					1.37	0.550	1.17
pH pH units	>=6 <=10.5	7.77	7.60	7.99	7.78	7.49	7.83
pH, saturation (@ 20°C) pH units					6.16	6.69	6.41
pH, saturation (@ 4°C) pH units					6.40	6.94	6.66
Solids, total dissolved [TDS] mg/L		1280	700	578	1570	697	591
Solids, total dissolved [TDS], calculated mg/L					1970	670	552
Turbidity NTU		>4000	>4000	>4000	136	1020	>4000
Ammonia, total (as N) mg/L		48.8	0.0283	0.0396	124	0.0128	0.0405
Bromide mg/L		<0.50	<0.50	<0.50	<0.50	<0.20	<0.10
Chloride mg/L	<=1500	203	89.4	69.4	208	58.2	62.1
Fluoride mg/L	<=10	0.233	<0.100	<0.100	0.198	0.090	0.073
Nitrate (as N) mg/L		<0.100	8.46	<0.100	<0.100	14.8	<0.020
Nitrate + Nitrite (as N) mg/L					<0.112	14.8	<0.0224
Nitrite (as N) mg/L		<0.050	<0.050	<0.050	<0.050	<0.020	<0.010
Phosphate, ortho-, dissolved (as P) mg/L					0.0063	<0.0010	<0.0010
Sulfate (as SO4) mg/L	<=1500	26.8	23.8	75.4	<1.50	26.5	79.9
Ion Balance							
Anion sum meq/L					35.6	12.4	27.6
Cation sum meq/L					33.5	11.6	9.43
Ion balance (APHA) %					-3.04	-3.33	-49.1
Ion balance (cations/anions) %					94.1	93.5	34.2
Organic / Inorganic Carbon							
Carbon, dissolved organic [DOC] mg/L					11.4	3.10	1.99
Dissolved Metals							
Aluminum, dissolved mg/L		0.0119	<0.0100	0.0035	0.0110	0.0118	0.0024
Antimony, dissolved mg/L		<0.00100	<0.00100	<0.00010	<0.00100	<0.00010	<0.00010
Arsenic, dissolved mg/L		0.00145	<0.00100	0.00050	0.00210	0.00026	0.00115
Barium, dissolved mg/L		0.142	0.0766	0.0900	0.0837	0.0573	0.0989
Beryllium, dissolved mg/L		<0.000200	<0.000200	<0.000020	<0.000200	<0.000020	<0.000020
Bismuth, dissolved mg/L		<0.000500	<0.000500	<0.000050	<0.000500	<0.000050	<0.000050
Boron, dissolved mg/L		<0.100	<0.100	0.017	0.109	0.012	0.013
Cadmium, dissolved mg/L		<0.0000500	<0.0000500	<0.0000050	<0.0000500	0.0000083	<0.0000050
Calcium, dissolved mg/L		160	140	98.3	191	142	99.3
Cesium, dissolved mg/L		<0.000100	<0.000100	<0.000010	<0.000100	<0.000010	<0.000010
Chromium, dissolved mg/L		<0.00500	<0.00500	<0.00050	<0.00500	<0.00050	<0.00050
Cobalt, dissolved mg/L		0.00502	<0.00100	<0.00010	0.00473	<0.00010	0.00034
Copper, dissolved mg/L		<0.00200	<0.00200	0.00074	<0.00200	0.00121	0.00077
Dissolved metals filtration location -		Laboratory	Laboratory	Laboratory	Field	Field	Field
Iron, dissolved mg/L		<0.100	<0.100	<0.010	0.561	0.010	<0.010
Lead, dissolved mg/L		<0.000500	<0.000500	<0.000050	<0.000500	<0.000050	<0.000050
Lithium, dissolved mg/L		<0.0100	<0.0100	0.0040	<0.0100	0.0044	0.0069
Magnesium, dissolved mg/L		64.6	47.2	40.3	74.3	37.7	38.5
Manganese, dissolved mg/L		1.59	0.0281	0.0335	1.56	0.00882	0.121
Molybdenum, dissolved mg/L		0.0203	0.000957	0.000995	0.00920	0.000350	0.000506
Nickel, dissolved mg/L		0.00828	<0.00500	0.00055	0.00991	0.00066	0.00056
Phosphorus, dissolved mg/L	<=10	<0.500	<0.500	<0.050	<0.500	<0.050	<0.050
Potassium, dissolved mg/L		50.5	1.10	3.00	93.1	0.724	2.30
Rubidium, dissolved mg/L		0.0121	<0.00200	0.00107	0.0267	0.00057	0.00058
Selenium, dissolved mg/L		0.000557	<0.000500	0.000100	<0.000500	<0.000050	<0.000050
Silicon (as SiO2), dissolved mg/L					20.0	15.8	13.0
Silicon, dissolved mg/L		9.15	7.38	5.56	9.34	7.39	6.08
Silver, dissolved mg/L		<0.000100	<0.000100	<0.000010	<0.000100	<0.000010	<0.000010

Sample Name Well ID Sampling Date	Region of Waterloo Sanitary Sewer Bylaw (21-036)	BH/MW1 24-01 13-05-2024	BH/MW3 24-03 13-05-2024	BH/MW5 24-05 13-05-2024	MW-01 24-01 23-05-2025	MW-03 24-03 23-05-2025	MW-05 24-05 23-05-2025
Sodium, dissolved mg/L		200	43.4	39.4	150	31.6	28.6
Strontium, dissolved mg/L		0.646	0.504	0.253	0.778	0.369	0.285
Sulfur, dissolved mg/L		10.3	8.14	26.9	<5.00	9.82	29.2
Tellurium, dissolved mg/L		<0.00200	<0.00200	<0.00020	<0.00200	<0.00020	<0.00020
Thallium, dissolved mg/L		<0.000100	<0.000100	<0.000010	<0.000100	0.000013	<0.000010
Thorium, dissolved mg/L		<0.00100	<0.00100	<0.00010	<0.00100	<0.00010	<0.00010
Tin, dissolved mg/L	<=5	<0.00100	<0.00100	0.00017	<0.00100	<0.00010	<0.00010
Titanium, dissolved mg/L		<0.00300	<0.00300	<0.00030	0.00504	<0.00060	<0.00030
Tungsten, dissolved mg/L		<0.00100	<0.00100	<0.00010	<0.00100	<0.00010	<0.00010
Uranium, dissolved mg/L		0.00224	0.000749	0.00156	0.000309	0.000642	0.00156
Vanadium, dissolved mg/L		<0.00500	<0.00500	<0.00050	<0.00500	<0.00050	0.00059
Zinc, dissolved mg/L		<0.0100	<0.0100	<0.0010	<0.0100	0.0015	0.0016
Zirconium, dissolved mg/L		<0.00300	<0.00300	<0.00030	0.00354	<0.00020	<0.00020
Metals							
Sodium adsorption ratio [SAR] -					2.33	0.61	0.62

Evaluations and Notes:

ROW	Region of Waterloo
No Spec	No Objective/No Standard
Within Limit	Within Limit
Exceeds Limit	Exceeds Limit
Result LOR > Limit	Result LOR > Limit

Table 5. Petroleum Hydrocarbons in Groundwater with
Comparison to ROW Sewer Use Bylaw (21-036)

Polocorp Inc.
51-55 Hawkesville Road, St. Jacobs, ON
Hydrogeological Study
Project No. 2403070
December 2025

Sample Name	Region of Waterloo Sanitary Sewer Bylaw (21- 036)	BH/MW1 24-01 13-05-2024	BH/MW3 24-03 13-05-2024	BH/MW5 24-05 13-05-2024
Well ID				
Sampling Date				
Hydrocarbons				
Chromatogram to baseline at nC50 -		YES	YES	YES
F1 (C6-C10) µg/L		<25	<25	<25
F1-BTEX µg/L		<25	<25	<25
F2 (C10-C16) µg/L		<100	<100	<100
F3 (C16-C34) µg/L		<250	<250	<250
F4 (C34-C50) µg/L		<250	<250	<250
Hydrocarbons, total (C6-C50) µg/L		<370	<370	<370
Volatile Organic Compounds				
Benzene µg/L	<=10	<0.50	<0.50	<0.50
BTEX, total µg/L		11.1	<1.0	<1.0
Ethylbenzene µg/L	<=160	<0.50	<0.50	<0.50
Toluene µg/L	<=270	11.1	<0.50	<0.50
Xylene, m+p- µg/L		<0.40	<0.40	<0.40
Xylene, o- µg/L		<0.30	<0.30	<0.30
Xylenes, total µg/L	<=1400	<0.50	<0.50	<0.50

Evaluations and Notes:

ROW Region of Waterloo

No Spec No Objective/No Standard

Within Limit Within Limit

Exceeds Limit Exceeds Limit

Result LOR > Limit Result LOR > Limit

Figures

Figure 1. Site Location

Figure 2. Study Area Layout

Figure 3. Physiographic Regions

Figure 4. Physiographic Landforms

Figure 5. Surficial Geology

Figure 6. MECP Well Records

Figure 7. Site Investigation Plan

Figure 8. Interpreted Groundwater Level Contours

Figure 9. Seasonal High Groundwater Level Elevations (up to Dec. 9, 2025)

Figure 10. Cross Section Locations

Figure 11. Cross Section A-A'

Figure 12. Cross Section B-B'

Project: 2403070
Hydrogeological Study

51 & 55 Hawkesville Rd.
St. Jacobs, Ontario

Site

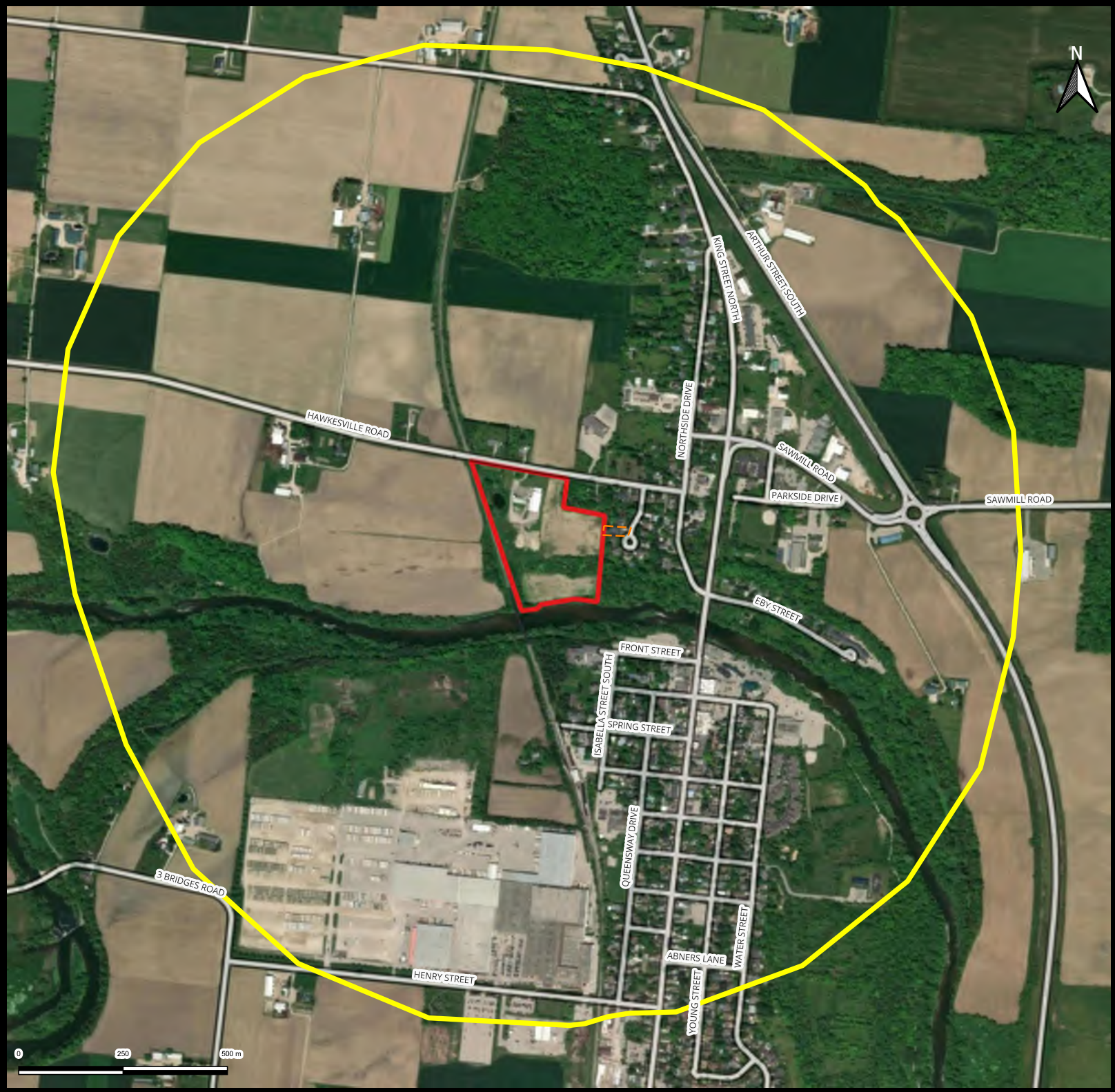
Site Boundary

Scale: 1: 100,000
May 2024

Figure 1:
Site Location

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community





Project: 2403070
Hydrogeological Study
51 & 55 Hawkesville Road
St. Jacobs, Ontario

Legend

-  Future Property Acquisition
Connection to Chris Court
-  Site Boundary
-  Study Area (1000m)
-  Roads

Figure 2:
Study Area Layout



Project: 2403070
Hydrogeological Study
51 & 55 Hawkesville Road
St. Jacobs, Ontario

Legend

-  Future Property Acquisition
Connection to Chris Court
-  Site Boundary
-  Study Area (1000m)

Physiographic Regions

-  Oxford Till Plain

Oxford Till Plain

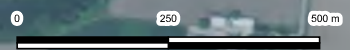


Figure 3:
Physiographic Region





Project: 2403070
Hydrogeological Study
51 & 55 Hawkesville Road
St. Jacobs, Ontario

Legend

- Future Property Acquisition
Connection to Chris Court
- Site Boundary
- Study Area (1000m)

Physiographic Landforms

- Spillways
- Till Plains (Drumlinized)

Figure 4:
Physiographic Landforms



Project: 2403070
Hydrogeological Study
51 & 55 Hawkesville Road
St. Jacobs, Ontario

Legend

-  Future Property Acquisition
Connection to Chris Court
-  Site Boundary
-  Study Area (1000m)

Surficial Geology

-  Catfish Creek Till
-  Ice-contact sand
-  Maryhill Till
-  Outwash gravel
-  Outwash sand
-  Port Stanley Till
-  Stream alluvium
-  Tavistock Till

Figure 5:

Surficial Geology

Project: 2403070
Hydrogeological Study
51 & 55 Hawkesville Road
St. Jacobs, Ontario

Legend

-  Future Property Acquisition
Connection to Chris Court
-  Site Boundary
-  Study Area (1000m)
-  MECP Well Records



Figure 6:
MECP Water Well Records

Project: 2403070
Hydrogeological Study
51 & 55 Hawkesville Road
St. Jacobs, Ontario

Legend

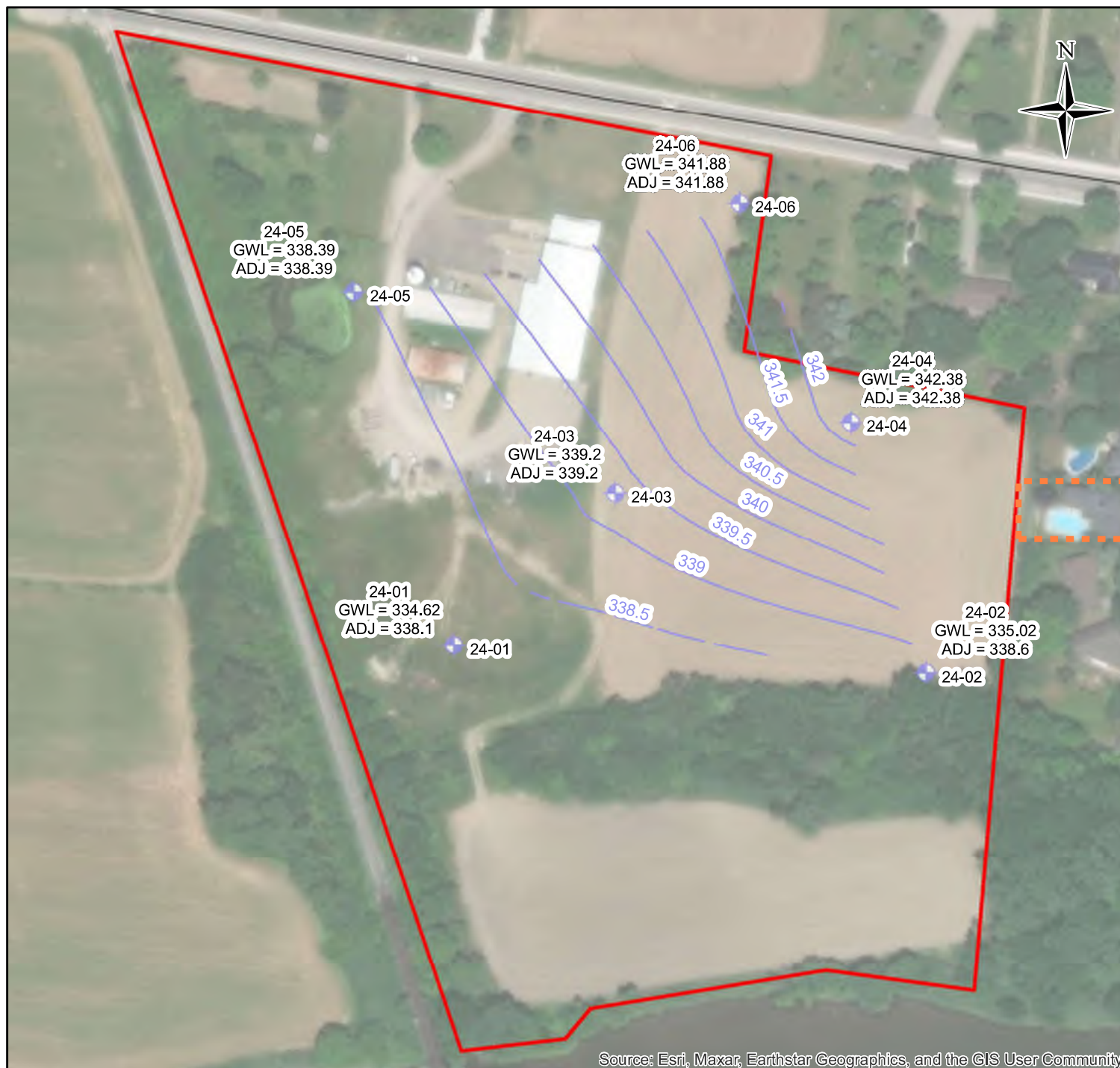
-  Monitoring Wells
-  Piezometers
-  Future Property Acquisition
Connection to Chris Court
-  Site Boundary



Figure 7:
Site Investigation Plan

Project: 2403070
Hydrogeological Study

51 & 55 Hawkesville Rd.
St. Jacobs, Ontario



Future Property Acquisition
Connection to Chris Court

Monitoring Wells

Roads

GW Contours (Adjusted)

Site Boundary

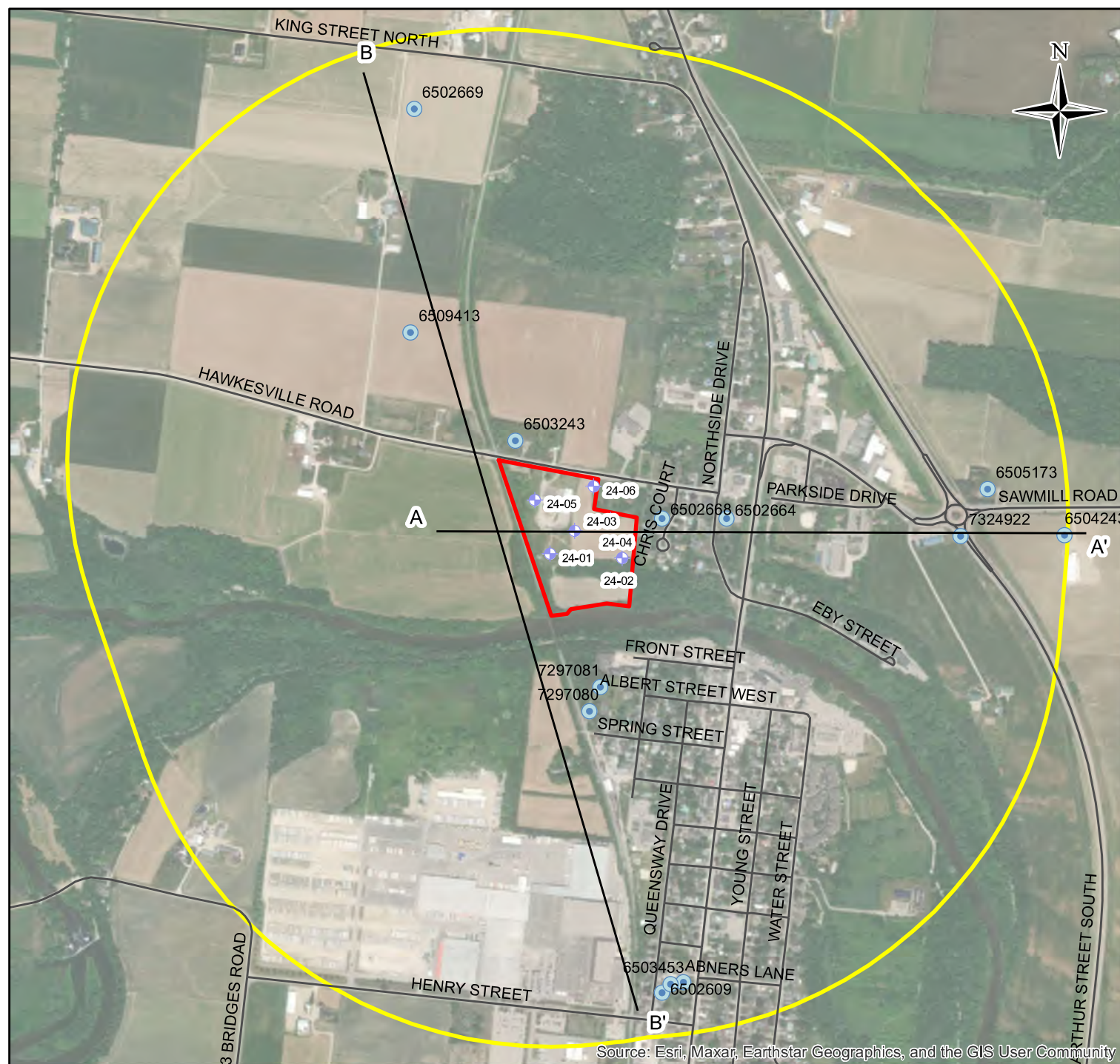
Groundwater levels measured
on May 3, 2024

Scale: 1: 2,000
November 2024

Figure 8:
Interpreted
Groundwater Contours

Project: 2403070
Hydrogeological Study

51 & 55 Hawkesville Rd.
St. Jacobs, Ontario



- Monitoring Wells
- Well Records (1000m) Cross Section
- Roads
- Site Boundary
- Study Area (1000m)

Scale: 1: 13,000
November 2024

Figure 9:
Cross Section Locations



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

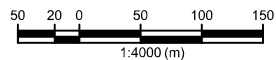
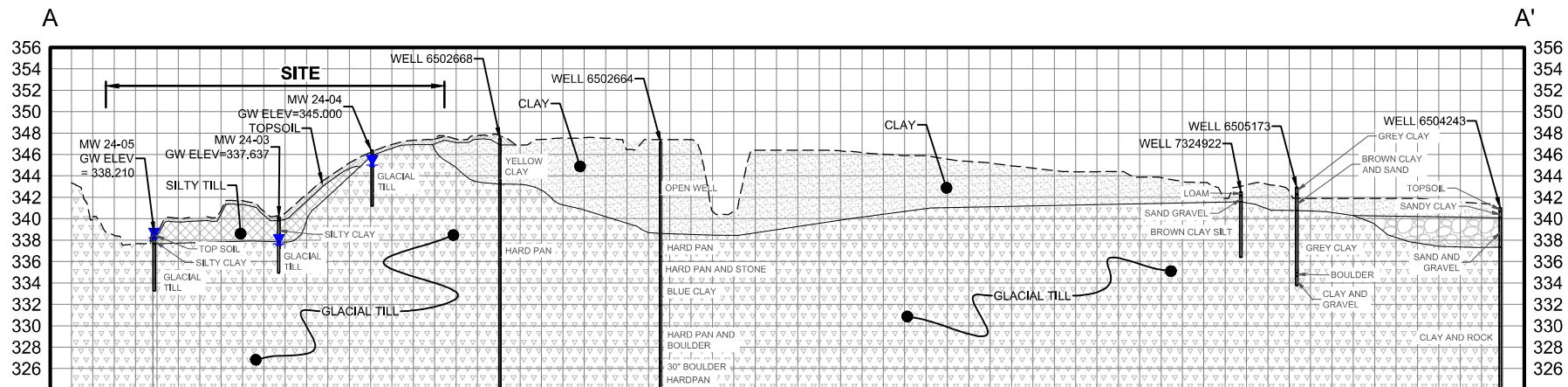
Project: 2403070
Hydrogeological Study
51 & 55 Hawkesville Road
St. Jacobs, Ontario

Legend

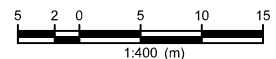
-  Monitoring Wells
-  SHGWL Contours (up to Dec. 2025)
-  Future Property Acquisition / Connection to Chris Court
-  Site Boundary



Figure 10:
Seasonal High Groundwater Level
Elevations (up to Dec.9.2025)



HORIZONTAL SCALE



VERTICAL SCALE

LEGEND



WATER LEVEL AT MONITORING
WELL (SEPTEMBER 3, 2024)

51 - 55 HAWKESVILLE ROAD
ST. JACOBS (TOWNSHIP OF WOOLWICH)
ONTARIO

POLOCORP INC.

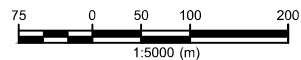
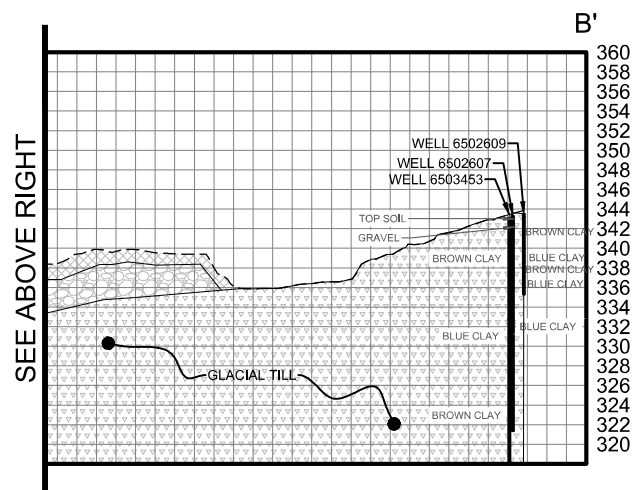
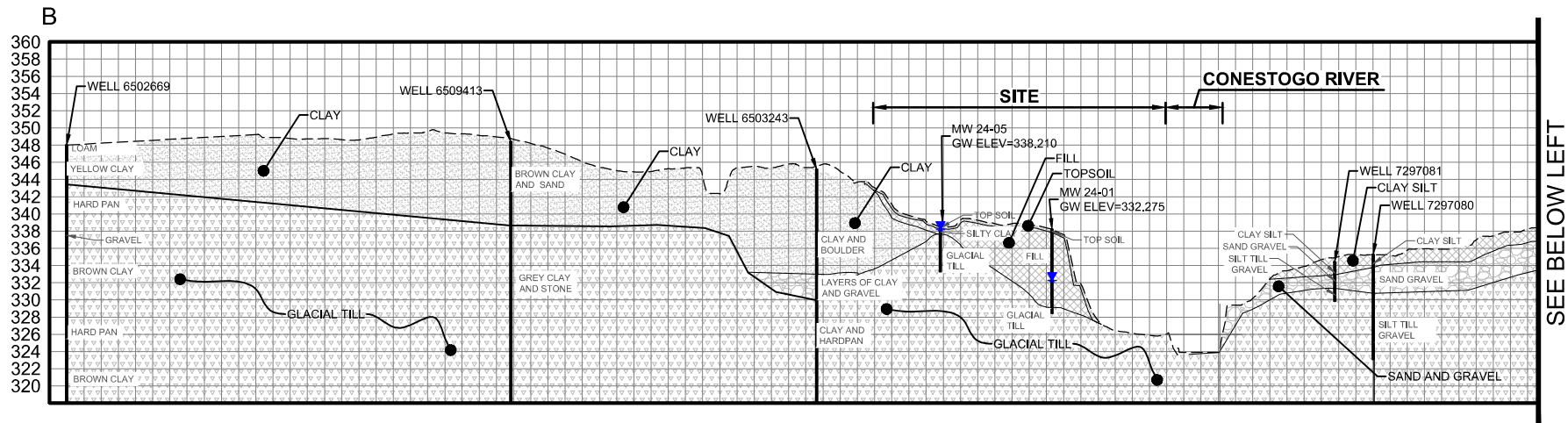


Project 2403070

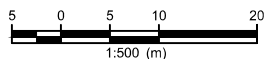
HYDROGEOLOGICAL CROSS
SECTION A - A'

NOVEMBER 2024

Fig. 11



HORIZONTAL SCALE



VERTICAL SCALE

LEGEND



WATER LEVEL AT MONITORING
WELL (SEPTEMBER 3, 2024)

51 - 55 HAWKESVILLE ROAD
ST. JACOBS (TOWNSHIP OF WOOLWICH)
ONTARIO

POLOCORP INC.



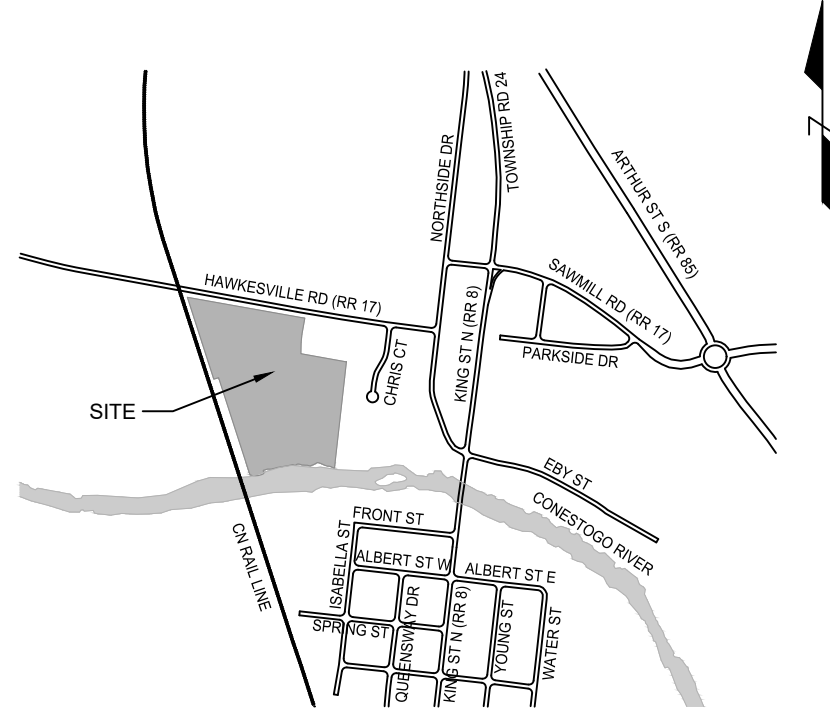
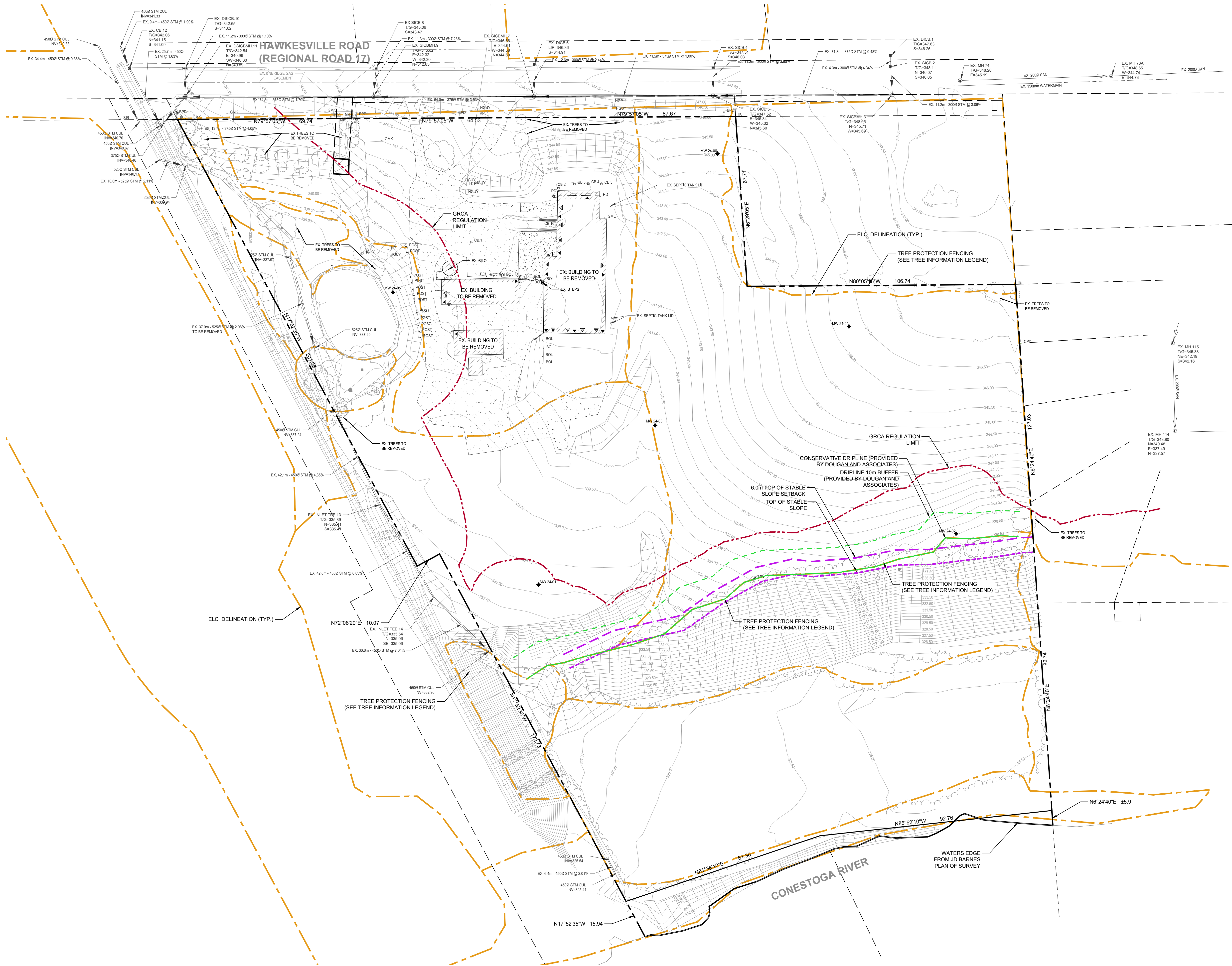
Project 2403070

HYDROGEOLOGICAL CROSS
SECTION B - B'

NOVEMBER 2024

Figure 12

Appendix A Existing Conditions Plan



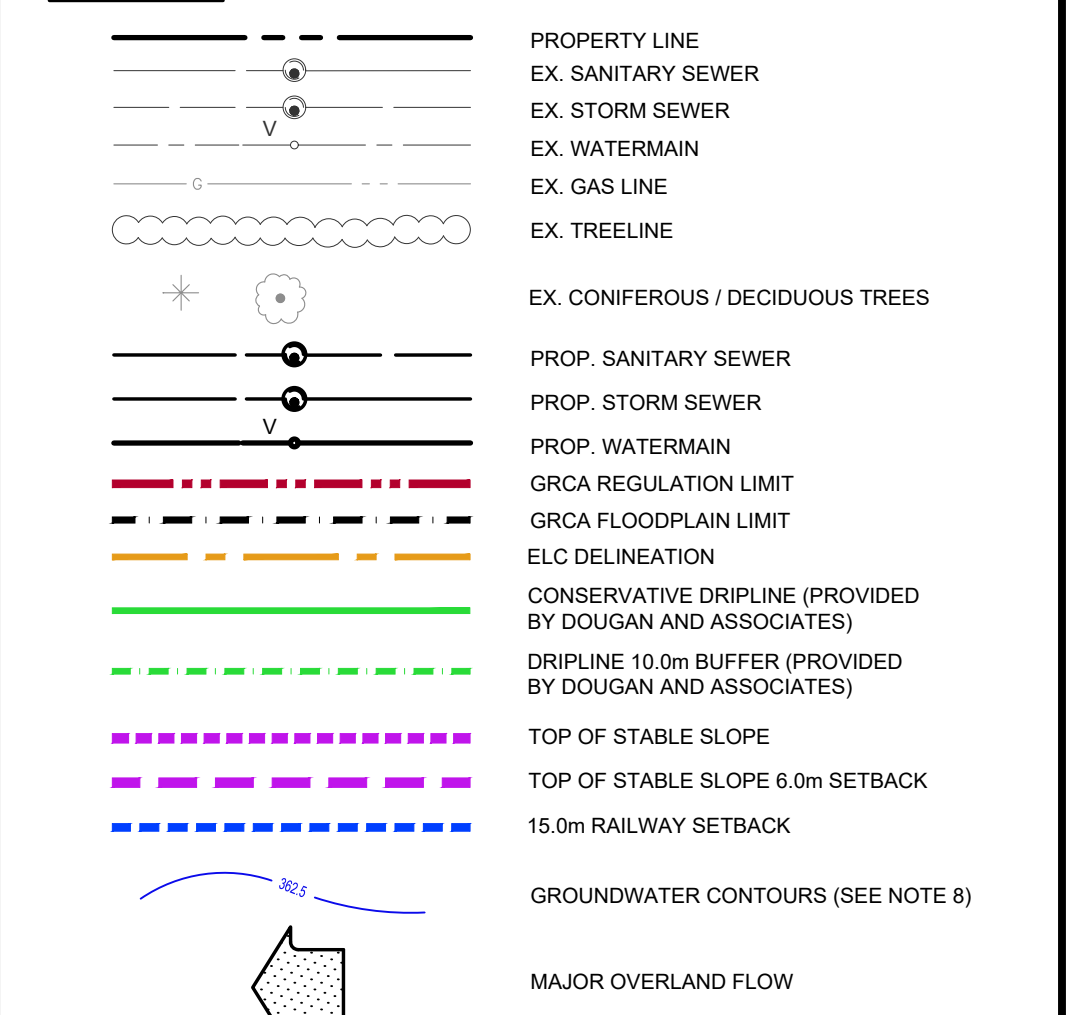
KEY PLAN

N.T.S.

NOTES :

- TOPOGRAPHIC SURVEY COMPLETED BY GM BLUEPLAN ENGINEERING ON MAY 6, 2023, OCTOBER 24, 2023 AND FEBRUARY 29, 2024.
- DIAPHRANE FEATURE DELINEATION COMPLETED BY DOUGAN AND ASSOCIATES ECOLOGICAL CONSULTING AND DESIGN, DATED JUNE 10, 2024.
- PROPOSED SITE PLAN PROVIDED BY POLOCORP, DATED AUGUST 14, 2025.
- LEGAL BOUNDARY TAKEN FROM PLAN OF SURVEY PROVIDED BY JD BARNES LIMITED, DATED MAY 17, 2024.
- BOREHOLE LOCATIONS PROVIDED BY GEI CONSULTANTS CANADA LTD., DATED JUNE 2024.
- EXISTING INFRASTRUCTURE INFORMATION ON HAWKESVILLE ROAD OBTAINED FROM REGION OF WATERLOO, "REGIONAL ROAD NO. 17 ROAD IMPROVEMENTS, ST. JACOBS", DATED JULY 27, 2021.
- EXISTING GAS MAIN INFORMATION PROVIDED BY ENBRIDGE GAS INC., RECEIVED SEPT. 12, 2023.
- GROUNDWATER LEVEL CONTOURS INTERPRETED BASED ON MEASUREMENTS MADE MAY 3, 2024, WITH ADJUSTMENTS MADE TO ACCOUNT FOR DIFFERENCES IN MONITORING WELL DEPTH. NOT TO BE CONSTRUED AS SEASONAL HIGH GROUNDWATER LEVEL SURFACE. INTERPRETATION OF THE SEASONAL HIGH GROUNDWATER LEVEL SURFACE IS SUBJECT TO COLLECTION OF ADDITIONAL DATA.
- EXTERNAL EXISTING CONTOURS AT PROPERTY #47 HAWKESVILLE ROAD FROM GRCA ONLINE WEB MAP, RETRIEVED 2024-12-03.

LEGEND



BENCHMARK		SURVEYOR INFORMATION	
CUT CROSS IN BACK OF CURB BESIDE 1ST SIDE INLET CATCH BASIN EAST OF EAST DRIVEWAY INTO SITE.		GEI CONSULTANTS CANADA LTD 650 WOODLAWN ROAD, BLOCK C, UNIT 2, GUELPH, ON, N1K 1B8 PHONE: 1-800-461-3281	

No.	DESCRIPTION	DATE	CHKD BY
3	RE-ISSUED FOR APPROVAL	DRAFT	P.G.
2	INTERIM STOCKPILE PLAN	2025-07-17	P.G.
1	ISSUED FOR APPROVAL	2025-01-23	A.E.K.

REVISIONS

TOWNSHIP OF WOOLWICH (ST JACOBS) REGION OF WATERLOO

POLOCORP INC. 51 HAWKESVILLE ROAD

DRAFT PLAN OF SUBDIVISION NUMBER:

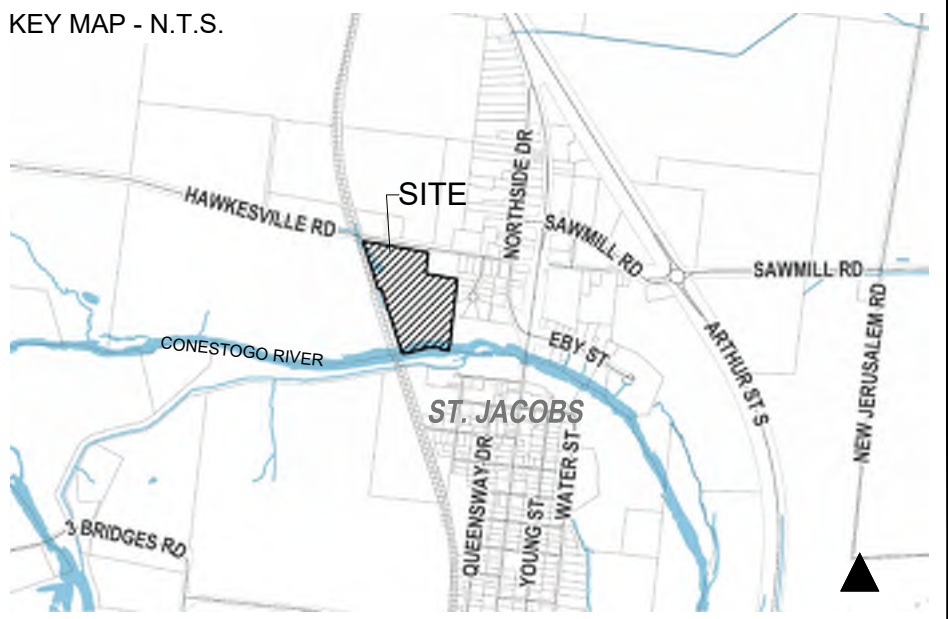
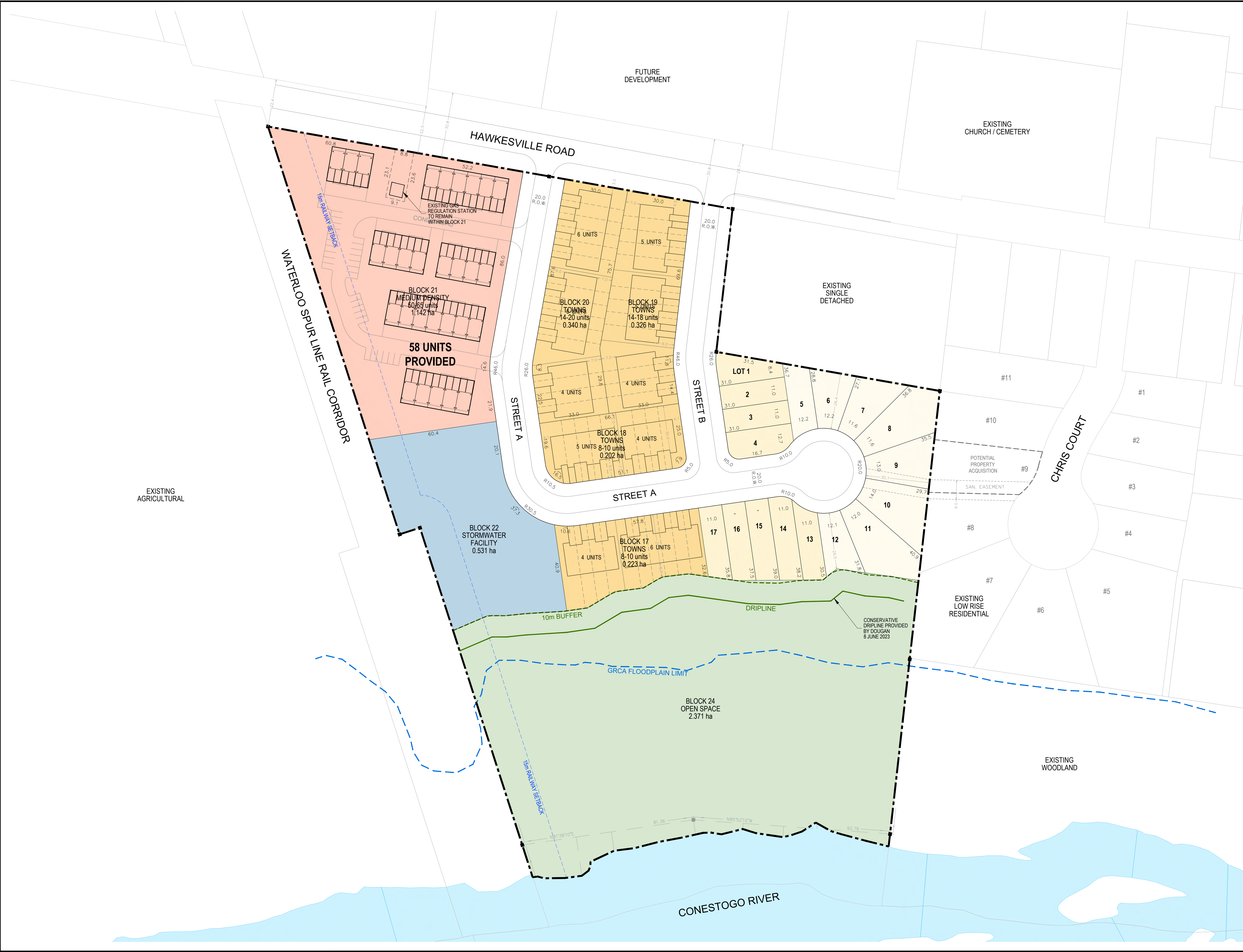
REGISTERED PLAN NUMBER:

OPTION A & B EXISTING CONDITIONS AND REMOVALS PLAN



DESIGN BY:	P.G. / B.L.	SCALE:	PROJECT No.
CHECKED BY:	P.G.	1:750	2401775
DRAWN BY:	B.L.	DATE: OCTOBER 2025	DRAWING No.
CITY FILE NUMBER:			EX-1

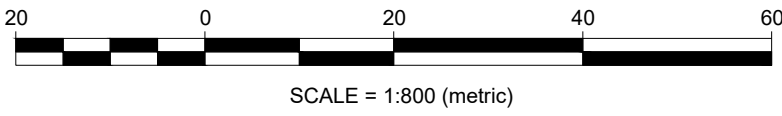
Appendix B Draft Plan of Subdivision



DRAFT PLAN OF SUBDIVISION

PART OF LOT 37, GERMAN COMPANT TRACT,
TOWNSHIP OF WOOLWICH
REGIONAL MUNICIPALITY OF WATERLOO

51 HAWKESVILLE ROAD, ST. JACOBS



LAND USE SCHEDULE			
DESCRIPTION	LOTS/BLKS.	UNITS	AREA (ha.)
Single Detached	1-17	17	0.792
Street Townhouses	17-20	44-58	1.097
Medium Density	21	50-65	1.142
Stormwater Facility	22	-	0.531
Open Space	24	-	2.371
Public Roads	-	-	0.914
TOTAL		111-140	6.847

DENSITY	GROSS	NET
Area (ha)	6.847	4.477
Density (uph)	16.2 - 20.5	24.8 - 31.3
People & Jobs per ha. (P&J/ha)	62.9 - 78.7	41.1 - 51.4

LEGEND

- Dripline Limit
- Dripline 10m Buffer
- Railway 15m Setback
- GRCA Floodline

INFORMATION REQUIRED
UNDER SECTION 51 (17) OF THE PLANNING ACT, R.S.O. 1990, c.P.13 AS AMENDED
INFORMATION REQUIRED BY CLAUSES a,b,c,d,e,f,i,g,j AND l ARE AS SHOWN ON THE DRAFT PLAN.

- (n) Municipal Water Supply
- (i) Silty Sands
- (k) Municipal Sanitary and Storm Sewers

SURVEYOR'S CERTIFICATE
I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

JASON ELLIOTT, O.L.S.
J.D. Barnes Limited

OWNER'S CERTIFICATE
I HEREBY CONSENT TO THE FILING OF THIS PLAN BY POLOCORP INC., IN DRAFT FORM

MIKE PUOPOLO
Polocorp Inc.

APPROVALS

DRAFT FOR COORDINATION

REVISIONS		
DATE	BY	DESCRIPTION

POLOCORP 379 Queen Street South
Kitchener, ON N2T 1W6
polocorpinc.com
519-745-3249

DATE: 2026.02.09
PROJECT: 1010 (Hawkesville)
FILE: dps1010-2026.02.09.dwg

SCALE 1:800 (metric)
DRAWN BY: GFE/RT

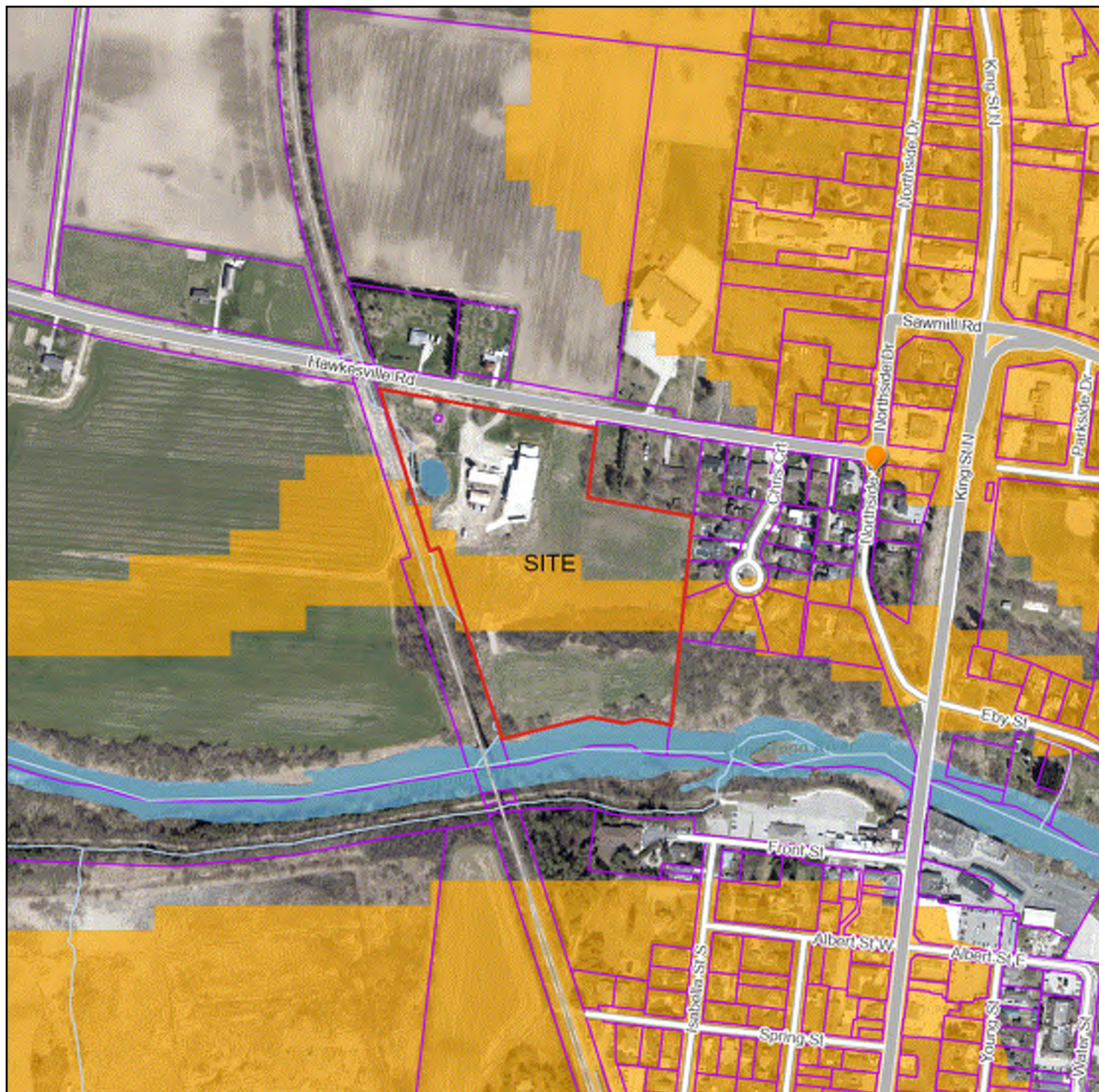
Appendix C Significant Groundwater Recharge Area



Significant Groundwater Recharge Areas

Legend

- Municipal Boundary (GRCA)
- Signif. GW Recharge - Tier 2 (GRCA)
- Parcel - Assessment (MPAC/MNRF)
- Watercourse (GRCA)
- Waterbody (GRCA)
- Conservation Area Boundary (GRCA)



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Disclaimer: This map is for illustrative purposes only. Information contained herein is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.

The source for each data layer is shown in parentheses in the map legend. See [Sources and Citations](#) for details.

Scale 1:5,591

NAD83 UTM zone 17 (EPSG:26917)



Appendix D MECP Well Records

40 P10E

UTP: 17 536000E

9 ~~5~~_R 4820/25^N750

Elev. ~~5~~ R 1425

Basin 23



The Well Drillers Act

Department of Mines, Province of Ontario

65 No. 2600
RECEIVED
MAY 25 1967
GEOLOGICAL BRANCH
DEPARTMENT OF MINES

Water Well Record

Conv-G.C.T.

Con. Lot Pt. Lot 8
Acres

Date Completed... 06/07/2007 ... Cost or wren (not including pump)

Pipe and Casing Record

Pumping Test

Casing diameter(s) 4" O.D.
Length(s) of casing(s) 166
Length of screen
Type of screen
Type of pump 3 1/4" casing
Capacity of pump 1,000 gal per hr
Depth of pump setting 75 ft

Date Aug. 22nd 1948
Developed Capacity
Duration of Test 12 hrs
Pumping Rate 900 gal per hr
Drawdown
Static level of completed well 142' 3"
Is well a gravel-wall type? Rock

Water Record

Kind (fresh or mineral) *Fresh*
 Quality (hard, soft, contains iron, sulphur etc.)
 Appearance (clear, cloudy, coloured) *Clear*
 For what purpose(s) is the water to be used? .. *House*
 How far is well from possible source of contamination? .. *Town & Village*
 What is source of contamination?
 Enclose a copy of any mineral analysis that has been made of water

[illegible]

Well Log

Drift and Bedrock Record

From	To
0 ft.	2 ft.

	O ft.	3 ft.
top soil		
Blue clay	3	140
Sand	140	160
Hard Rock	160	173

Location of Well

In diagram below show distances of well from road and lot line

[illegible]

Situation: Is well on upland, in valley, or on hillside? Hillside
 Drilling Firm John Squader Driller Dial 2313 Elmira
 Address R.R. No. 1 St. Jacobs Ont.
 Recorded by John Squader Address R.R. No. 1 St. Jacobs
 Date May 18th 1950 Licence Number 396

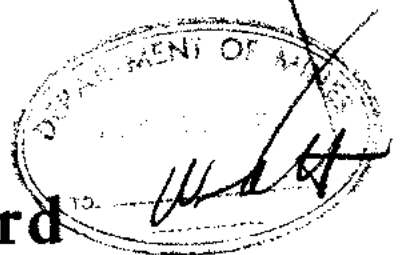
CS\$S8

40 P10E 32
UTM 17 536050 E
15 4821050 N
Elev. 5 1125
Base 23 C. T.
Lot - 36



3-65 No 2664

The Well Drillers Act
Department of Mines, Province of Ontario



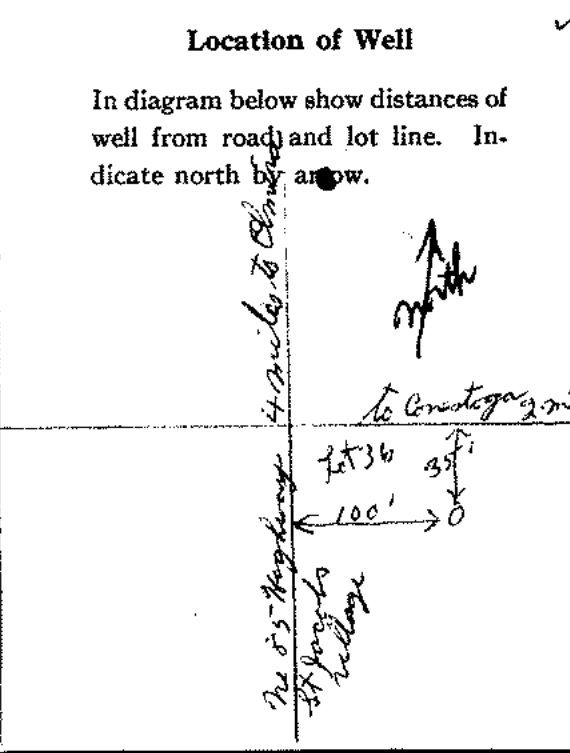
Water Well Record

Waterloo Township, Village, Town or City
Woolwich
Date Completed 22nd Dec 1951 Cost of Well (excluding pump) 4.50 per ft.

Pipe and Casing Record		Pumping Test	
Casing diameter(s)	4.0 P.	Date	Oct. 20, 1951
Length(s) of casing(s)	155 1/2	Static level	43'
Type of screen		Pumping level	
Length of screen		Pumping rate	900 gals per hr
Distance from top of screen to ground level		Duration of test	9 hrs
Is well a gravel-wall type?	Rock	Distance from cylinder or bowls to ground level	70'

Water Record			
Kind (fresh or mineral)	fresh	Depth(s) to Water Horizon(s)	No. of Feet Water Risen
Quality (hard, soft, contains iron, sulphur, etc.)	soft		
Appearance (clear, cloudy, coloured)	clear	164 1/2'	127 1/2'
For what purpose(s) is the water to be used?	house		
How far is well from possible source of contamination?	200		
What is the source of contamination?	prury		
Enclose a copy of any mineral analysis that has been made of water			

Well Log		
Overburden and Bedrock Record	From	To
OPEN WELL	0 ft.	28 ft.
hardpan	28'	35'
hardpan & stones	35'	41'
blue clay	41'	50'
hardpan & boulders	50'	67 1/2'
1 3/4" boulders	67 1/2'	70'
hardpan	70'	102'
Red clay	102'	120'
hardpan & stones	120'	130'
soft blue clay	130'	133'
crushed gravel	133'	138'
limestone rock	138'	146'
Shale rock	146'	150'
limestone rock	150'	164 1/2'



Situation: Is well on upland, in valley, or on hillside? Hillside
Drilling Firm.
Address.
Name of Driller JOHN SAUDER Address 2313 Elmira
Date Jan 12, 1952 - Well Drilling Licence Number 210
MR. L. ST. JACQUES, ONTARIO
John Sauder
Signature of Licensee

40P10E

RECEIVED

37

✓

 UTM 17Z 536073E
 5R 4821100N
 Elev. 5R 1125


ONTARIO

JUL - 2 1952 65 No. 2665

GEOLOGICAL BRANCH
DEPARTMENT OF MINES

The Well Drillers Act

Department of Mines, Province of Ontario

Water Well Record

 Basin 23 Company 1st
 Lot - 36

 Date Completed... 11 March 1952... Cost of Well (excluding pump)... 4.50
 (day) (month) (year)

Pipe and Casing Record

Pumping Test

 Casing diameter(s) 3 5/8 inch
 Length(s) of casing(s) 150 feet
 Type of screen X
 Length of screen X
 Distance from top of screen to ground level
 Is well a gravel-wall type? In Rock
 Date Mar 8th 1952
 Static level 122 4/6
 Pumping level
 Pumping rate 900 gal per hr
 Duration of test 10 hrs
 Distance from cylinder or bowls to ground level 75'

Water Record

Kind (fresh or mineral)	Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
Quality (hard, soft, contains iron, sulphur, etc.)	166	Fresh	122
Appearance (clear, cloudy, coloured)	168		
For what purpose(s) is the water to be used?	46'		
How far is well from possible source of contamination?	168		
What is the source of contamination?			
Enclose a copy of any mineral analysis that has been made of water			

Well Log

Overburden and Bedrock Record

From

To

top soil	0 ft.	06 ft.
Clay & Stones	06	14
Hard Pan	14	24
Soft Blue Clay	24	31
Clay & Stones	31	45
Sandy Clay	45	55
Soft Sandy Clay slightly silt	55	110
Hard Pan	110	125
Shooting sand	125	131
Hard Pan	131	150
Solid Rock	150	168

Location of Well

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

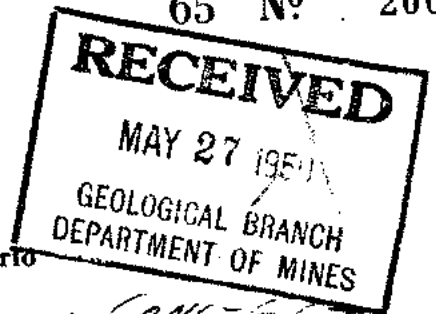
 Situation: Is well on upland, in valley, or on hillside?
 Drilling Firm
 Address
 Name of Driller
 Date
 Address
 Licence Number

 John Sander
 Signature of Licensee

UTM 17 535900 E
9 4821050 N
Elev 1125
Basin 23



The Well Drillers Act
Department of Mines, Province of Ontario



65 No 2668

Water Well Record

CONC-S.C.T.
401-37

Date Completed Dec 23rd 1949 Cost of Well (not including pump) 425
R #1 ST JACOBS

Pipe and Casing Record

Pumping Test

Casing diameter(s) 4" O.D.
Length(s) of casing(s) 164'
Length of screen -
Type of screen -
Type of pump 3 1/4" casing
Capacity of pump 1000 gal per hr
Depth of pump setting 98'
Date Dec 22nd
Developed Capacity -
Duration of Test 10 hrs
Pumping Rate 950 gal per hr
Drawdown -
Static level of completed well 126' 46"
Is well a gravel-wall type? Rock

Water Record

Kind (fresh or mineral) Fresh
Quality (hard, soft, contains iron, sulphur etc.) Soft
Appearance (clear, cloudy, coloured) Clear
For what purpose(s) is the water to be used? Farm & Hatching
How far is well from possible source of contamination? 200'
What is source of contamination? Ven Stable
Enclose a copy of any mineral analysis that has been made of water

Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
46	Fresh	126

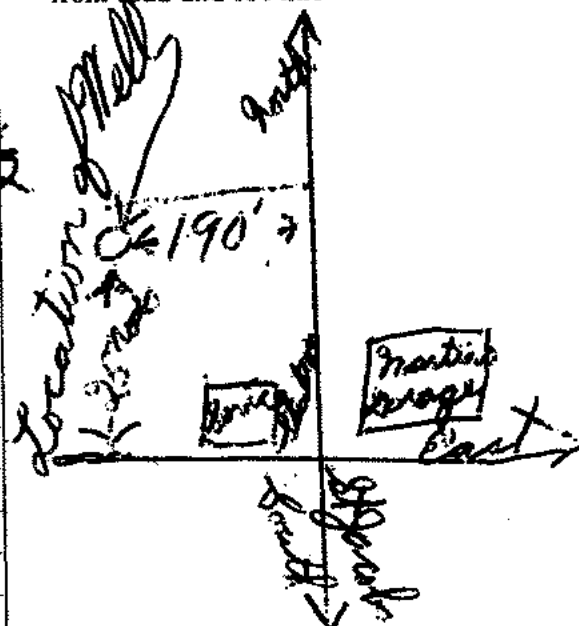
Well Log

Drift and Bedrock Record

	From 0 ft.	To ft.
Top Soil	2	14
Yellow Clay	14	148
Hard Pan & Shales	148	164
Shale Rock	164	172
Hard Rock		

Location of Well

In diagram below show distances of well from road and lot line



Situation: Is well on upland, in valley, or on hillside? Upland
Drilling Firm John Sawyer Drilling Co. 2313 Elmira
Address R.R. #1 St. Jacobs Ont.
Recorded by John Sawyer Address R.R. #1 St. Jacobs
Date May 23rd 1950 Licence Number 390

Instructions for Completing Form

- | | |
|---|--|
| <ul style="list-style-type: none"> • For use in the Province of Ontario only. This document is a permanent legal document. Please retain for future reference. • All Sections must be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form. • Questions regarding completing this application can be directed to the Water Well Management Coordinator at 416-235-6203. • All measurements shall be reported to 1/10th of a metre. • Please print clearly in blue or black ink only. | <div style="border: 1px solid black; padding: 5px; text-align: center;"> Ministry Use Only </div> |
|---|--|

Well Owner's Information and Location of Well Information

[illegible]

Address of Well Location (County/District/Municipality) Waterloo				Township Woodwich		Lot —	Concession —
RR#/Street Number/Name 10 Front St				City/Town/Village St Jacobs		Site/Compartment/Block/Tract etc.	
GPS Reading	NAD 83	Zone 17	Easting 535947	Northing 482099	Unit Make/Model Garmin	Mode of Operation: ☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify _____	

Log of Overburden and Bedrock Materials (see instructions)

[illegible][illegible]

Plugging and Sealing Record			☐ Annular space	☐ Abandonment
Depth set at - Metres		Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)	
From	To			
~~2.0~~	~~1.0~~	~~Bentonite~~		
0.0	1.1	Bentonite		
2.1	2.9	Sand		
2.9	6.0	Bentonite		
6.0	9.1	Sand		

Method of Construction			
☐ Cable Tool	☐ Rotary (air)	☐ Diamond	☐ Digging
☐ Rotary (conventional)	☐ Air percussion	☐ Jetting	☐ Other
☐ Rotary (reverse)	☒ Boring	☐ Driving	

Water Use			
☐ Domestic	☐ Industrial	☐ Public Supply	☒ Other
☐ Stock	☐ Commercial	☐ Not used	
☐ Irrigation	☐ Municipal	☐ Cooling & air conditioning	

Final Status of Well			
☐ Water Supply	☐ Recharge well	☐ Unfinished	☐ Abandoned, (Other) _____
☒ Observation well	☐ Abandoned, insufficient supply	☐ Dewatering	
☐ Test Hole	☐ Abandoned, poor quality	☐ Replacement well	

Well Contractor/Technician Information			
Name of Well Contractor		Well Contractor's Licence No.	
Geo-Environmental Drilling		6607	
Business Address (street name, number, city etc.)			
340 Market Ave Milton			
Name of Well Technician (last name, first name)		Well Technician's Licence No.	
MANNING		T3013	
Signature of Technician/Contractor		Date Submitted	
		YYYY MM DD 2006 01 10	

Location of Well	
In diagram below show distances	of well from road, lot line, and building.

Indicate north by arrow.

see ATTACH.

[REDACTED]

Audit No.	Z 42228	Date Well Completed	YYYY	MM	DD
			2006	01	18
Was the well owner's information package delivered?	☐ Yes ☐ No	Date Delivered	YYYY	MM	DD

Ministry Use Only			
Data Source		Contractor	6607
Date Received	JAN 25 2006	Date of Inspection	YYYY MM DD
Remarks		Well Record Number	



No.	Revisions	Date
0	Report Issued	
1		
2		
3		

Drawing Reference: Base drawing from Region of Waterloo GIS Locator (2003 Aerial Photograph).

Note:
* Locations of site features in this drawing are approximate based on available information. Exact locations must be verified in the field.

---, Ontario



SITE PLAN

Date	Scale	Job No.	Drawing No.
Dec. 2005	1:2000	6130G1	2

6607

Z42228

JAN 25 2006

Ministry of
the Environment

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

A 062498

6130-62 Jumper 0801056 Jan 2/08

Master Well Record for
Cluster Well Construction

Regulation 933 Ontario Water Resources Act

Page 1 of 2

Master Well Owner's and Land Owner's Information

First Name: MERCEDES Corp Last Name: E-mail Address: _____
 Mailing Address (Street Number/Name, RR): 1386-3 King St N Municipality: ST JOHNS Province: ON Postal Code: M0B 2N0 Telephone No. (inc. area code): 519 664 2293

Location and Construction of the Master Well in the Cluster

Address of Well Location (Street Number/Name, RR): 10 Front St Township: _____ Lot: _____ Concession: _____
 County/District/Municipality: Waterloo City/Town/Village: ST. JOHNS Province: Ontario Postal Code: _____
 UTM Coordinates: Zone: Easting: Northing: GPS Unit Make: Model: Mode of Operation: ☐ Undifferentiated ☐ Averaged
 NAD 83 179359444820970 ☐ Differentiated, specify: _____

Overburden and Bedrock Materials (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From To
	Asphalt			0 0.15
Brown	sand	gravel		0.15 0.25
Dark Brown	silt			0.25 2.5
Black	Root			2.5 3.7
Brown	silt	semi-gravel		3.7 7.5
Brown	silt	sand		7.5 10.4

Hole Details

Depth (Metres) From To	Diameter (Centimetres)
0 10.4	15

Water Use

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

Method of Construction

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

Status of Well

☒ Test Hole ☐ Abandoned, Insufficient Supply
☐ Replacement Well ☐ Abandoned, Poor Water Quality
☐ Dewatering Well ☐ Other, specify _____
☐ Alteration (Construction) ☐ Abandoned, other, specify _____

No Casing and Screen Used

Open Hole ☐ Yes ☐ No

Static Water Level Test

Metres

Construction Details

Inside Diameter (Centimetres)	Material (steel, plastic, fiberglass, concrete, galvanized)	Wall Thickness	Depth (Metres) From To
1.9	Plastic	0.4	0 10.4

Screen

☐ Galvanized ☐ Steel ☐ Fiberglass ☐ Concrete ☐ Plastic
 Outside Diameter (Centimetres): 2.7 Slot No. /

Water Details

Water found at Depth: 7.5 Metres ☐ Gas ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
 Water found at Depth: _____ Metres ☐ Gas ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
 Water found at Depth: _____ Metres ☐ Gas ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Disinfected ☐ Yes ☐ No If no, provide reason: _____ Date Master Well Completed (yyyy/mm/dd): 2008/01/02

Cluster Information (Please also fill out the additional Cluster Well information for Well Construction for each parcel of land and cluster)

Total Wells in Cluster: 6 Please indicate Number of Cluster Well Information Log Sheets Submitted: 2
 Total Wells on this Property: 6

Location of Well Cluster

Detailed Map must be provided as an attachment no larger than legal size (8.5" x 14"). Sketches are not allowed.
☒ Check box to confirm detailed map is provided as per Section 11.1 (3)

Consent to release additional information concerning the cluster to the Director upon request

Signature of Technician/Contractor: _____ Date (yyyy/mm/dd): 2008/01/07

Well Contractor and Well Technician Information

Business Name of Well Contractor: G-50 ENVIRONMENTAL Well Contractor's Licence No.: 6607
 Business Address (Street No./Name, number, RR): 340 HORTON AVE WATON Municipality: HALTON
 Province: ON Postal Code: L4T 5A4 Business E-mail Address: _____
 Business Telephone No. (inc. area code): 416 876 3308 Name of Well Technician (Last Name, First Name): GANNE Gary
 Licence No.: 9 Signature of Technician: _____ Date Submitted (yyyy/mm/dd): 2008/01/07

Ministry Use Only

Audit No.: M 00778 Well Contractor No.: _____
 Date Received (yyyy/mm/dd): MAR 26 2008 Date of Inspection (yyyy/mm/dd): _____
 Remarks: _____

A 062498

Property Owner's Information

First Name MERCEDES	Last Name Camp	Mailing Address (Street No./Name, RR) 1386-3 King St N	Municipality St. Jacobs
Province ON	Postal Code N0B3N0	E-mail Address	Telephone No. (inc. area code) 519 664 7279

Cluster Well Information

Address of Well Location (Street Number/Name, RR)		Lot	Concession	Township	County/District/Municipality	
10 Front St				W	WATERLOO	
City/Town/Village	Province	Postal Code	GPS Unit Make	Model	Unit Mode of Operation	☐ Undifferentiated ☐ Averaged
W. St. Thomas	Ontario				☐ Differentiated, specify:	

upon request.

Signature of Technician/Contractor	Date (mm/dd/yyyy)
------------------------------------	-------------------

[illegible]

Well Contractor and Well Technician Information

Business Name of Well Contractor GEO-ENVIRONMENTAL Drilling		Business Address (Street Number/Name, RR) 340 Market Dr. M2L 1W1		Municipality Halton	Province ON
Postal Code L9T 5A4	Business Telephone No. (inc. area code) 905 976 3388	Well Contractor's Licence No. 6607	Business E-mail Address		
Name of Well Technician (First Name, Last Name) Doug Lawrence		Well Technician's Licence No. 3109	Date Submitted (yyyy/mm/dd) 2008/01/07	Signature of Technician 	

Date 1st Well in Cluster Constructed (mmmmmmmm)	Date Last Well in Cluster Constructed (mmmmmmmm)
2003/01/02	2003/01/07

Ministry Use Only

Date Received (yy/mm/dd)	Date Inspected (yy/mm/dd)
MAR 26 2009	
Audit No.	Remarks
c 00880	0088778

A 097510

A097510

Master Well Owner's and Land Owner's Information

First Name MAGNUS GARAGE LTD	Last Name	E-mail Address
Mailing Address (Street Number/Name, R/R)	Municipality	Province
477 NOONWIDE ROAD	St. Jacobs	ONT
Postal Code	Telephone No. (inc. area code)	
N0B2N0	519 664 2281	

Location and Construction of the Master Well in the Cluster

Address of Well Location (Street Number/Name, R/R)	Township	Lot	Concession
477 NOONWIDE ROAD	-	-	-
County/District/Municipality	City/Village	Province	Postal Code
WATERLOO	St. Jacobs	Ontario	N0B2N0
UTM Coordinates	Zone	Easting	Northing
NAD 83	17	336107	4821381
GPS Unit Make	Model	Mode of Operation:	
Sony	500	☐ Undifferentiated ☐ Averaged	
		☐ Differentiated, specify	

Overburden and Bedrock Materials (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres)
				From To
Brown	Sand	Gravel		0 0.3
Brown	Sand			0.3 1.2
Brown	Sand		WET	1.2 2.8
Grey	Silt	Clay	Dark	2.8 3.0

Hole Details

Depth (Metres)	Diameter (Centimetres)
From To	
0 3.0	10cm

Water Use

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

Method of Construction

☐ Cable Tool	☐ Air Percussion	☐ Digging
☐ Rotary (Conventional)	☐ Diamond	☐ Boring
☐ Rotary (Reverse)	☐ Jetting	☒ Other, specify
☐ Rotary (Air)	☐ Driving	Direct Push

Status of Well

☒ Test Hole	☐ Abandoned, insufficient supply
☐ Replacement Well	☐ Abandoned, poor water quality
☐ Dewatering Well	☐ Other, specify
☐ Alteration (Construction)	☐ Abandoned, other, specify

No Casing and Screen Used	Static Water Level Test
Open Hole	Metres
☐ Yes ☐ No	

Screen

☐ Galvanized	☐ Steel	☐ Fibreglass	☐ Concrete	☒ Plastic
Outside Diameter (Centimetres)	Slot No.			
4.6cm	1010			

Water Details

Water found at Depth	Kind of Water
N/A Metres ☐ Gas	☒ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Water found at Depth	Kind of Water
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Water found at Depth	Kind of Water
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Disinfected ☐ Yes ☐ No if no, provide reason	Date Master Well Completed (yyyy/mm/dd)
	2010/03/16

Cluster Information (Please also fill out the additional Cluster Well Information for Well Construction for each parcel of land and cluster.)	
Total Wells in Cluster	Please indicate Number of Cluster Well Information Log Sheets Submitted
3	2
Total Wells on this Property	
3	

Location of Well Cluster

Detailed Map must be provided as an attachment no larger than legal size (8 1/2" x 14"). Sketches are not allowed.
☒ Check box to confirm detailed map is provided as per Section 11.1 (3)

Consent to release additional information concerning the cluster to:

Construction Details

Inside Diameter (Centimetres)	Material (steel, plastic, fibreglass, concrete, galvanized)	Wall Thickness	Depth (Metres)
			From To
3.1cm	Plastic Casing	1cm	0 1.5
3.1cm	Plastic Screen	1cm	1.5 3.0

Annular Space/Abandonment Sealing Record

Depth Set at (Metres)	Type of Sealant Used (Material and Type)	Volume Used (Cubic Metres)
From To		
0 0.15	Concrete	
0.15 1.2	Grout	
1.2 3.0	Silica Sand #2	

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's License No.
Direct Environmental Drilling	7320
Business Address (Street No./Name, number, R/R)	Municipality
37 Sunn Valley Drive	St. Thomas
Province	Postal Code
ONT	N5R6B9
Business E-mail Address	Business Telephone No. (inc. area code)
environmentaldrilling.com	519 864 0175
Name of Well Technician (Last Name, First Name)	Date Submitted (yyyy/mm/dd)
Andrew Anderson	2010/03/16
Well Technician's License No.	
34416	

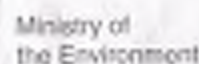
Ministry Use Only

Audit No.	Well Contractor No.
M 05075	
Date Received (yyyy/mm/dd)	Date of Inspection (yyyy/mm/dd)
MAR 25 2010	



C-7320
m05075
c05109

MAR 25 2010



Well Tan No. for Master Well (Print Well Tag No.)

A 097510 A097510

Cluster Well Information for Cluster Well Construction

Regulation 903 Ontario Water Resources Act

Page 0 of 3

Property Owner's Information

First Name MARTIN'S GRAVE LTD	Last Name [REDACTED]	Mailing Address (Street No./Name, RR) 192 HORSING ROAD	Municipality ST. JACOB'S
Province ONT	Postal Code N0B2N0	E-mail Address -	Telephone No. (inc. area code) 519 664 7281

Cluster Well Information

Address of Well Location (Street Number/Name, RPO)			Lot	Concession	Township	County District Municipality
477 Northside Road			—	—	—	Waterloo
City/Town/Village	Province	Postal Code	GPS Unit Make	Model	Unit Mode of Operation	☐ Undifferentiated ☐ Averaged
St. James's	Ontario		Eaton	500	☐ Differentiated, specify:	

Consent

Property Owner's Consent to use cluster form

Consent to release addressee information to the Director upon request.

Signature of Veterinary Contractor	Date (yyyy-mm-dd)
------------------------------------	-------------------

Continues

Date of Completion

[illegible]

Well Contractor and Well Technician Information

Business Name of Well Contractor Direct Environmental Drilling		Business Address (Street Number/Name, RR) 37 Shaw Valley Drive		Municipality St. Thomas	Province Ont
Postal Code N5R6B4	Business Telephone No. (inc. area code) 5198680175	Well Contractor's Licence No. 7320	Business E-mail Address darmstrong@directenvironmentaldrilling.com		
Name of Well Technician (First Name, Last Name) Andrew Armstrong		Well Technician's Licence No. 3446	Date Submitted (yyyy/mm/dd) 2010/03/18	Signature of Technician 	

Date 1st Well in Cluster Constructed 01/01/2014	Date Last Well in Cluster Constructed 01/01/2014
--	---

Ministry Use Only

Downloaded by [your name] on [date]
Date Inspected [your name]

Audio No. **c 05109**

Remarka
m 075

A134593

Measurements recorded in: ☐ Metric ☒ Imperial

Address of Well Location (Street Number/Name)

16 ISABELLA ST

Township

ST JACOBS

Lot

Concession

County/District/Municipality

REGION OF WATERLOO

City/Town/Village

ST JACOBS

Province

Ontario

Postal Code

UTM Coordinates

Zone

Easting

Northing

Municipal Plan and Sublot Number

Other

NAD 83 175358124820888

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)
DARK BROWN	TOPSOIL	SAND	Suby SANDY SILT TOPSOIL	0 1
BROWN	SAND	GRAVEL	SAND & GRAVEL, SANDSIFT	1 11
GRAY	SILT	SAND	GRAY SILT TILL CLUMP	11 20

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
20 13 1/2	FILTER SAND	
13 1/2 0	BENTONITE PLUG	

Results of Well Yield Testing

After test of well yield, water was:	Draw Down	Recovery
☐ Clear and sand free	Time (min)	Water Level (m/ft)
☐ Other, specify	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:	Static Level	
	1	1
Pump intake set at (m/ft)	2	2
Pumping rate (l/min / GPM)	3	3
Duration of pumping	4	4
hrs + min	5	5
Final water level end of pumping (m/ft)	10	10
If flowing give rate (l/min / GPM)	15	15
Recommended pump depth (m/ft)	20	20
Recommended pump rate (l/min / GPM)	25	25
Well production (l/min / GPM)	30	30
Disinfected?	40	40
☐ Yes ☐ No	50	50
	60	60

Method of Construction

Well Use

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

Construction Record - Casing

Status of Well

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	Status of Well
1 1/2	PLASTIC		0 15	☐ 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

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)
1 1/2	PLASTIC		20 15

Water Details

Hole Diameter

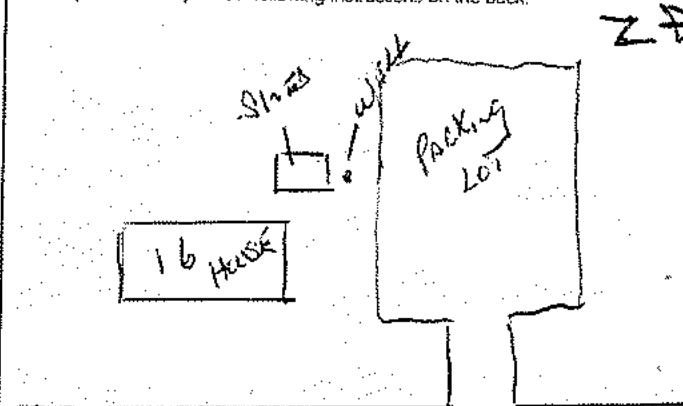
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☒ Untested	Depth (m/ft)	Diameter (cm/in)
5.1 (m/ft)	☐ Gas ☐ Other, specify	From To	

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
LONDON SOIL TEST LTD	7190
Business Address (Street Number/Name)	Municipality
RR6	BRINDAR
Province	Postal Code
ON	NOC1B0
Business E-mail Address	
Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5194655777	LIVINGSTON, MARK
Well Technician's Licence No.	Signature of Technician and/or Contractor
73577	
	Date Submitted
	2012/10/25

Map of Well Location

Please provide a map below following instructions on the back.



ISABELLA

Comments:

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
☐ Yes ☐ No	2012/10/17	Audit No. 2153905
	Date Work Completed	NOV 16 2012

Ministry of
the EnvironmentMeasurements recorded in: ☒ Metric ☐ Imperial

W

Tag#: A144477

(Print Below)

Well Record
Regulation 903 Ontario Water Resources Act

Page 1 of 1

MERCEDES CORPORATION

Address of Well Location (Street Number/Name) 10 Front Street		Township -	Lot -	Concession -
County/District/Municipality Waterloo		City/Town/Village St Jacobs	Province Ontario	Postal Code -
UTM Coordinates NAD 83	Zone 17	Easting 535878	Northings 4820955	Municipal Plan and Sublot Number -

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
brown	Soil	Gravel cobbles	loose	0	4.6
Gray	silt	fill gravel	Dense	4.6	7.1
brown	Soil	silt	loose	7.1	11.5

Annular Space		
Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)
0	0.3	concrete
0.3	7.8	Benkrite 38 Hole plug
7.8	11.5	Silica Seal

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

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To	
5.1	Plastic	.5	0	8.4	☐ 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

Construction Record - Screen				
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
6.1	Plastic	10	8.4	11.5

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☒ Untested	Depth (m/ft) From	To
?	☐ Gas ☐ Other, specify	0	11.5
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested	Diameter (cm/in)	
	☐ Gas ☐ Other, specify	21cm	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested		
	☐ Gas ☐ Other, specify		

Well Contractor and Well Technician Information			
Business Name of Well Contractor Direct Environmental Drilling		Well Contractor's Licence No. 7320	
Business Address (Street Number/Name) 37 Shaw Valley Dr		Municipality St Thomas	
Province Ont	Postal Code N5R1G5	Business E-mail Address armstrong@directenvironmentaldrilling.com	
Bus. Telephone No. (inc. area code) 519 868 0175		Name of Well Technician (Last Name, First Name) Armstrong Anthony	
Well Technician's Licence No. 2772		Signature of Technician and/or Contractor [Signature]	
Date Submitted 20130304		Date Submitted 20130304	

Results of Well Yield Testing			
After test of well yield, water was:	Draw Down		Recovery
☐ Clear and sand free ☐ Other, specify	Time (min)	Water Level (m/ft)	Time (min)
If pumping discontinued, give reason:	Static Level		Water Level (m/ft)
	1		1
	2		2
	3		3
	4		4
	5		5
Pump intake set at (m/ft)	2		2
Pumping rate (l/min / GPM)	3		3
Duration of pumping hrs + min	4		4
Final water level end of pumping (m/ft)	5		5
If flowing give rate (l/min / GPM)	10		10
Recommended pump depth (m/ft)	15		15
Recommended pump rate (l/min / GPM)	20		20
Well production (l/min / GPM)	25		25
Disinfected?	30		30
☐ Yes ☐ No	40		40
	50		50
	60		60

Map of Well Location	
Please provide a map below following instructions on the back.	
Front Street	
[Map showing well location with handwritten notes: Tag: A144477, E 535878, N 4820955, 2m]	

Well owner's information package delivered ☒ Yes ☐ No	Date Package Delivered 20130408	Date Work Completed 20130328	Ministry Use Only Audit No. 2166458
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Measurements recorded in: ☒ Metric ☐ Imperial

Address of Well Location (Street Number/Name)		Township	Lot	Concession
Front Street				
County/District/Municipality	City/Town/Village	Province	Postal Code	
Waterloo	St Jacobs	Ontario		
UTM Coordinates	Zone	Easting	Northings	Municipal Plan and Sublot Number
NAD 83	17	535947	4820967	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)					
General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
From	To				
0	0.3	concrete	Fill	0	3.1
0.3	6.25	Bentonite Seal	dense	3.1	4.6
6.25	10	S. lime Seal	dense	4.6	7.5
				7.5	10.0

Annular Space		
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
From	To	
0	0.3	concrete
0.3	6.25	Bentonite Seal
6.25	10	S. lime Seal

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

Construction Record - Casing				Status of Well
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	
			From	To
5.2	Plastic	5	0	6.2

Construction Record - Screen				Status of Well
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To
6.2	Plastic	10	6.8	10

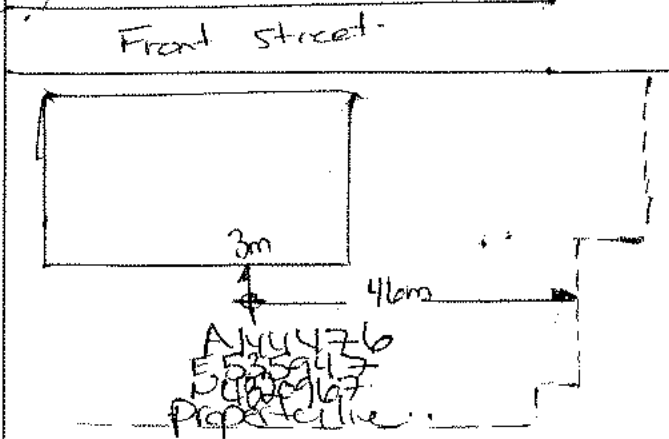
Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☒ Untested	Depth (m/ft)	Diameter (cm/in)
?		From	To
		0	10
			21cm

Business Name of Well Contractor		Well Contractor's Licence No.	
Direct Environmental Drilling		7320	
Business Address (Street Number/Name)		Municipality	
37 Shear Valley Dr		St Thomas	
Province	Postal Code	Business E-mail Address	
Ont	N5R6J5	armstrong@chillars.com	
Bus Telephone No. (inc. area code)		Name of Well Technician (Last Name, First Name)	
519 868 0175		Armstrong Anthony	
Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted	
2772	[Signature]	20130404	

Results of Well Yield Testing			
Draw Down		Recovery	
Time (min)	Water Level (m/ft)	Time (min)	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 owner's information package delivered ☒ Yes ☐ No	Date Package Delivered	Ministry Use Only
		20130404	Audit No.
		20130328	2166460
			Resolved

Ministry of
the EnvironmentMeasurements recorded in: ☒ Metric ☐ Imperial

Well Tag No.

Tag#: A144475

(Print Below)

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

MERCEDIES CORPORATION

Address of Well Location (Street Number/Name) 10 Front Street		Township	Lot	Concession
County/District/Municipality Waterloo		City/Town/Village St Jacobs	Province Ontario	Postal Code
UTM Coordinates NAD 83	Zone 17	Easting 535923	Northings 4820981	Municipal Plan and Sublot Number

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)
				From To
Dark	Soil	gravel clay	Soft	0 4.6
Grey	clay	silt gravel	dense	4.6 7.8
Brown	Soil	silt	loose	7.8 10.9

Annular Space		
Depth Set at (m)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
From To		
0 0.3	concrete	
0.3 7.1	Bentonite 38 H2O pig	
7.1 10.9	Silica Seal	

Method of Construction	Well Use
☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☒ Boring ☐ Air percussion ☐ Other, specify HSA	☐ Public ☐ Domestic ☐ Livestock ☐ Irrigation ☐ Industrial ☐ Other, specify ☐ Commercial ☐ Municipal ☒ Test Hole ☐ Cooling & Air Conditioning ☐ Not used ☐ Dewatering ☐ Monitoring

Construction Record - Casing			Status of Well	
Inside Diameter (cm)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm)	Depth (m)	
			From To	
5.1	Plastic	.5	0 7.8	☐ 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

Construction Record - Screen			Status of Well	
Outside Diameter (cm)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m)	
			From To	
6.1	Plastic	10	7.8 10.9	☐ Other, specify

Water Details		Hole Diameter	
Water found at Depth (m)	Kind of Water: ☐ Fresh ☒ Untested	Depth (m)	Diameter (cm)
	☐ Gas ☐ Other, specify	From To	
Water found at Depth (m)	Kind of Water: ☐ Fresh ☐ Untested	0 10.9	2cm
	☐ Gas ☐ Other, specify		
Water found at Depth (m)	Kind of Water: ☐ Fresh ☐ Untested		
	☐ Gas ☐ Other, specify		

Business Name of Well Contractor Direct Environmental Drilling		Well Contractor's Licence No. 7520
Business Address (Street Number/Name) 37 Shear Valley Dr.		Municipality Ont.
Province Ont	Postal Code N2R 6P6	Business E-mail Address info@directenvirodrilling.com
Bus. Telephone No. (inc. area code) 519 868 0175		Name of Well Technician (Last Name, First Name) Armstrong Anthony
Well Technician's Licence No. 2772		Signature of Technician and/or Contractor Anthony Armstrong
Date Submitted 20130404		

Results of Well Yield Testing			
After test of well yield, water was:	Draw Down		Recovery
☐ Clear and sand free ☐ Other, specify	Time (min)	Water Level (m)	Time (min)
If pumping discontinued, give reason:	Static Level		Water Level (m)
	1		1
Pump intake set at (m)	2		2
Pumping rate (l/min / GPM)	3		3
Duration of pumping hrs + min	4		4
Final water level end of pumping (m)	5		5
If flowing give rate (l/min / GPM)	10		10
	15		15
	20		20
Recommended pump depth (m)	25		25
Recommended pump rate (l/min / GPM)	30		30
Well production (l/min / GPM)	40		40
Disinfected? ☐ Yes ☒ No	50		50
	60		60

Map of Well Location	
Please provide a map below following instructions on the back.	
Comments:	

Well owner's information package delivered ☒ Yes ☐ No	Date Package Delivered 20130306 Date Work Completed 20130328	Ministry Use Only Audit No. Z166459 Received 20130328
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Tag#: A159487

Measurements recorded in: ☒ Metric ☐ Imperial

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Well Owner's Information

First Name: Mercedes Corporation Last Name / Organization: [Redacted] E-mail Address: [Redacted] ☐ Well Constructed by Well Owner

Well Location

Address of Well Location (Street Number/Name): 1441 King St N Township: Woodbridge Lot: - Concession: -

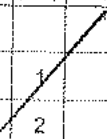
County/District/Municipality: Woodbridge City/Town/Village: St. Jacobs Province: Ontario Postal Code: [Redacted]

UTM Coordinates Zone: 18 Easting: 536029 Northing: 4820961 Municipal Plan and Sublot Number: [Redacted] Other: [Redacted]

NAD 83 18 536029 4820961

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)
brown	sand	silt	loose	0 3.1
brown	clay	silt	dense	3.1 4.6
Grey	clay	silt	dense	4.6 7.8
brown	sand	silt	med.	7.8 10.0

Annular Space			Results of Well Yield Testing						
Depth Set at (m/ft) From To		Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify	Draw Down		Recovery		
					Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)	
0	0.3	concrete		If pumping discontinued, give reason:	Static Level				
0.3	6.5	Portland 3/8 Hopsley			1			1	
6.5	10.0	Silica Seal #2			2			2	
Pump intake set at (m/ft)									

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

Construction Record - Casing			Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	
From To			From To	
5.1	Plastic	.5	0 6.8	☐ 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

Construction Record - Screen			Status of Well	
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
From To			From To	
6.1	Plastic	10	6.8 10.0	☐ Other, specify

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☒ Untested	Depth (m/ft)	Diameter (cm/in)
?	☐ Gas ☐ Other, specify	From To	
		0 10.0	2 km

Well Contractor and Well Technician Information			
Business Name of Well Contractor: Direct Environmental Dilling		Well Contractor's Licence No.: 713210	
Business Address (Street Number/Name): 57 Saw Valley Dr		Municipality: St. Thomas	
Province: ON	Postal Code: N5R6S5	Business E-mail Address: [Redacted]	
Bus. Telephone No. (inc. area code): 517 868 0175		Name of Well Technician (Last Name, First Name): Armstrong Anthony	
Well Technician's Licence No.: 2772		Signature of Technician and/or Contractor: [Redacted]	
		Date Submitted: 20140228	

Map of Well Location			
Please provide a map below following instructions on the back.			

Comments:	
Well owner's information package delivered: ☒ Yes ☐ No	Date Package Delivered: 20140305
Date Work Completed: 20140203	
Ministry Use Only	
Audit No.: 2183360	



Tag#: A159489

Measurements recorded in: ☒ Metric ☐ Imperial

Page 1 of 1

Well Owner's Information

First Name: Mercedes Corporation Last Name / Organization: [Redacted] E-mail Address: [Redacted] ☐ Well Constructed by Well Owner

Mailing Address (Street Number/Name): [Redacted] Municipality: [Redacted] City/Town/Village: [Redacted] Province: [Redacted] Postal Code: [Redacted]

Well Location

Address of Well Location (Street Number/Name): 10 Front St Township: Woodhouse Lot: - Concession: -
County/District/Municipality: Waterloo City/Town/Village: St Jacobs Province: Ontario Postal Code: -
UTM Coordinates: Zone: 17 Easting: 535977 Northing: 4820974 Municipal Plan and Sublot Number: - Other: -
NAD: 83

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)
tan	sand	silt gravel	loose	0 3.1
brown	clay	silt	dense	3.1 4.6
gray	clay	silt	dense	4.6 7.8
brown	sand	silt	moist	7.8 10.0

Annular Space		
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
0 0.3	Plaster concrete	
0.3 6.5	Berbit 38 Heping	
6.5 10.0	Silica Sand #2	

Method of Construction		Well Use	
☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial
☐ Rotary (Conventional)	☐ Jetting	☐ Domestic	☐ Municipal
☐ Rotary (Reverse)	☐ Driving	☐ Livestock	☒ Test Hole
☒ Boring	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning
☐ Air percussion	HSA	☐ Industrial	☐ Monitoring
☐ Other, specify		☐ Other, specify	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	From	To
5.1	Plastic	5	0	6.8	

☐ 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	

Construction Record - Screen			
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)
6.1	Plastic	10	6.8 10.0

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☒ Untested	Depth (m/ft)	Diameter (cm/in)
	☐ Gas ☐ Other, specify	From To	
		0 10.0	21cm

Well Contractor and Well Technician Information			
Business Name of Well Contractor: Direct Environmental/Dallas		Well Contractor's Licence No.: 7320	
Business Address (Street Number/Name): 37 Shaw Valley Dr		Municipality: St Thomas	
Province: Ont	Postal Code: N5K1B9	Business E-mail Address: [Redacted]	
Bus. Telephone No. (inc. area code): 5198680175		Name of Well Technician (Last Name, First Name): Armstrong Anthony	
Well Technician's Licence No.: 2772		Signature of Technician and/or Contractor: [Redacted]	
		Date Submitted: 20140224	

Results of Well Yield Testing				
After test of well yield, water was: ☐ Clear and sand free ☐ Other, <i>specify</i>	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:	Static Level			
	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
Duration of pumping	4		4	
hrs. + min	5		5	
Final water level end of pumping (m/ft)	10		10	
If flowing give rate (l/min / GPM)	15		15	
Recommended pump depth (m/ft)	20		20	
	25		25	
Recommended pump rate (l/min / GPM)	30		30	
Well production (l/min / GPM)	40		40	
	50		50	
Disinfected?	60		60	
☐ Yes ☐ No				

Map of Well Location

Please provide a map below following instructions on the back.

Front St

32m

3m

ES35977
N4820974
A159489

Edge of Property

Comments:

Well owner's information package delivered: ☒ Yes ☐ No	Date Package Delivered: 20140205	Ministry Use Only Audit No: 183352
Date Work Completed: 20140114		



Ministry of
the Environment

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

Tag #: A162249

Well Record

Regulation 903 Ontario Water Resources Act

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Measurements recorded in: ☐ Metric ☒ Imperial

MERCEDES CORPORATION

Address of Well Location (Street Number/Name)		Township	Lot	Concession
10 Front St / 1441 King St. N				
County/District/Municipality		City/Town/Village	Province	Postal Code
R.M. of WATERLOO		St. Jacobs	Ontario	
UTM Coordinates		Municipal Plan and Sublot Number		Other
Zone Easting Northing				
NAD 83 1753597814820975				

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
				From To
Brown	silty sand (fill)			0' 5'
Grey/Brown	sandy silt			5' 15'
Brown	sandy silt till			15' 25'
Brown	fine-course grain sand			25' 48'
Reddish/Brown	clayey silt till			48' 50'
"cluster of 4 monitoring wells"				

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)	After test of well yield, water was:	Draw Down		Recovery
From To			☐ Clear and sand free ☐ Other, specify	Time (min)	Water Level (m/ft)	Time (min)
50 38	Sand					
38 1	Bentonite					
1 0	Concrete					

Method of Construction		Well Use	
☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial
☒ Rotary (Conventional)	☐ Jetting	☐ Domestic	☐ Municipal
☐ Rotary (Reverse)	☐ Driving	☐ Livestock	☐ Test Hole
☐ Boring	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning
☐ Air percussion		☐ Industrial	
☐ Other, specify		☐ Other, specify	

Construction Record - Casing			Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	
			From To	
2	Plastic		40 0	
				☐ 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

Construction Record - Screen			Status of Well	
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From To	
2	Plastic	010	50 40	
				☐ 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		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☒ Antested	Depth (m/ft)	Diameter (cm/in)
30	☐ Gas ☐ Other, specify	From To	
30	☐ Gas ☐ Other, specify	0 50	8.5
30	☐ Gas ☐ Other, specify		
	☐ Gas ☐ Other, specify		

Well Contractor and Well Technician Information		Ministry Use Only	
Business Name of Well Contractor	Well Contractor's Licence No.	Audit No.	
LONDON SOIL TEST LTD	7190	2186054	
Business Address (Street Number/Name)	Municipality	Date Package Delivered	
R.R. 6	DUNDALK		
Province	Postal Code	Date Work Completed	
ON	N0C1B0	20150123	
Business E-mail Address	Name of Well Technician (Last Name, First Name)	Well owner's information package delivered	
info@londonsoil.com	Koss, Ryan	☐ Yes ☒ No	
Bus Telephone No. (inc. area code)	Signature of Technician and/or Contractor	Date Submitted	
5194555777		20150123	
Well Technician's Licence No.			
3576			

Map of Well Location

Please provide a map below following instructions on the back.

Comments:



Measurements recorded in: ☒ Metric ☒ Imperial

Page 1 of 1

Well Owner's Information

First Name	Last Name / Organization Mercedes Corporation	E-mail Address	☐ Well Constructed by Well Owner	
Mailing Address (Street Number/Name) 1350 King St E	Municipality St. Jacobs	Province ON	Postal Code	Telephone No. (inc. area code)

Well Location

Address of Well Location (Street Number/Name) 1441 King St N	Township Waterloo	Lot	Concession		
County/District/Municipality Waterloo	City/Town/Village St. Jacobs	Province Ontario	Postal Code		
UTM Coordinates NAD 83	Zone 18	Easting 536001	Northings 4820974	Municipal Plan and Sublot Number	Other

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From To
NW 1	UTM 17 536010 4820971	(2")		0 9'
NW 2	UTM 17 535998 4820971	(2")		0 30'
NW 3	UTM 17 536001 4820974	(3/4")	PIPE BENCH AND NOT GET FAR	0 33'6"
NW 4	UTM 17 535978 4820974	(3/4")		0 33'6"
NW 5	UTM 17 535977 4820978	(2")		0 9'8"

Annular Space		
Depth Set at (m/ft) From To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
	BENTONITE	

Method of Construction		Well Use	
☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial
☐ Rotary (Conventional)	☐ Jetting	☐ Domestic	☐ Municipal
☐ Rotary (Reverse)	☐ Driving	☐ Livestock	☐ Test Hole
☐ Boring	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning
☐ Air percussion		☐ Industrial	
☐ Other, specify		☐ Other, specify	

Construction Record - Casing			Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fiberglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From To	
				☐ 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 Construction
				☐ Other, specify

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

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested	Depth (m/ft) From To	Diameter (cm/in)
	☐ Gas ☐ Other, specify		
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested		
	☐ Gas ☐ Other, specify		
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested		
	☐ Gas ☐ Other, specify		

Business Name of Well Contractor CMT DRILLING INC		Well Contractor's Licence No. 7131616
Business Address (Street Number/Name) 1011 INDUSTRIAL CRES		Municipality WATERLOO
Province ON	Postal Code N1B2M2	Business E-mail Address CMT@CMTINC.NET
Bus. Telephone No. (inc. area code) 519 495 7775	Name of Well Technician (Last Name, First Name)	
Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted Y Y Y Y M M D D

Results of Well Yield Testing			
After test of well yield, water was:		Draw Down	
☐ Clear and sand free		Time (min)	Water Level (m/ft)
☐ Other, specify			
If pumping discontinued, give reason:		Static Level	
Pump intake set at (m/ft)		1	1
Pumping rate (l/min / GPM)		2	2
Duration of pumping hrs + min		3	3
Final water level end of pumping (m/ft)		4	4
If flowing give rate (l/min / GPM)		5	5
Recommended pump depth (m/ft)		10	10
Recommended pump rate (l/min / GPM)		15	15
Well production (l/min / GPM)		20	20
Disinfected?		25	25
☐ Yes ☐ No		30	30
		40	40
		50	50
		60	60

Map of Well Location	
Please provide a map below following instructions on the back.	
SEE ATTACHED	
Comments:	
Well owner's information package delivered ☐ Yes ☐ No	Date Package Delivered Y Y Y Y M M D D Date Work Completed Y Y Y Y M M D D
Ministry Use Only Audit No. 2236926 OCT 27 2016 Received	



Google Earth



C-7366
Z36926

OCT 27 2016

Measurements recorded in: ☒ Metric ☐ Imperial

Page 1 of 1

Well Owner's Information

First Name	Last Name / Organization	E-mail Address		☐ Well Constructed by Well Owner	
	Heracles Corporation				
Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)	
1386 King St W	St. James	ON			

Well Location

Address of Well Location (Street Number/Name) 441 King St N		Township	Lot	Concession
County/District/Municipality Nanticoke		City/Town/Village St. Jacobs		Province Ontario
Postal Code N0M 1S0		UTM Coordinates		Other
Zone	Easting	Northing	Municipal Plan and Sublot Number	
NAD 83	17Q UTM Zone 18Q	5036000	4026532	

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

[illegible]

Annular Space

Depth Set at From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/m^3)
0	11.1	Bentonite	41

Method of Construction

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

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	
					☐ Water Supply
					☐ Replacement Well
					☐ Test Hole
					☐ Recharge Well
					☐ Dewatering Well
					☐ Observation and/or Monitoring Hole
					☐ Alteration (Construction)
					☐ Abandoned,

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
Construction
☐ Other, specify

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		☐ Abandoned, Poor Water Quality ☒ Abandoned, other, specify <u>Construction</u> ☐ Other, specify
			From	To	

Water Details

Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	Depth (m/ft)		Diameter (cm/in)
		From	To	
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____			
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____			
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____			

Hole Diameter

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

Well Contractor and Well Technician Information

Business Name of Well Contractor		Well Contractor's Licence No.
CHT Drilling Inc.		713 16 16
Business Address (Street Number/Name)		Municipality
1211 Industrial Cres.		Waterloo
Province	Postal Code	Business E-mail Address
ON	N6B1Z1/10	chit@cht-drilling.net
Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)	
519 499 5595	Black, Chris	
Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3171111	CE Black	2007/04/20

Results of Well Yield Testing

After test of well yield, water was:		Draw Down		Recovery	
☐ Clear and sand free ☐ Other, specify _____		Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:		Static Level			
		1		1	
Pump intake set at (m/ft)		2		2	
Pumping rate (l/min / GPM)		3		3	
Duration of pumping _____ hrs + _____ min		4		4	
Final water level end of pumping (m/ft)		5		5	
If flowing give rate (l/min / GPM)		10		10	
Recommended pump depth (m/ft)		15		15	
Recommended pump rate (l/min / GPM)		20		20	
Well production (l/min / GPM)		25		25	
Disinfected?		30		30	
☐ Yes ☐ No		40		40	
		50		50	
		60		60	

Map of Well Location

Please provide a map below following instructions on the back.

The map shows a site layout with the following features:

- Lonetech River**: A wavy line at the top of the map.
- Well**: A circle with an 'X' inside, located 20m from the river.
- North Arrow**: A vertical arrow pointing upwards, labeled 'N'.
- Distance**: A horizontal line segment labeled '20m' between the river and the well.
- Building**: A stepped polygon at the bottom right, labeled '144'.
- Orientation**: The text 'Front St' is written vertically on the right side of the map.

Comments:

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
	Date Work Completed	
☐ Yes ☐ No	Y Y Y Y M M D D Y Y M M D D	Audit No. Z236925 Recd OCT 27 2015

MERCEDES CORPORATION

Address of Well Location (Street Number/Name) 1430 King St N		Township Woolwich	Lot -	Concession -
County/District/Municipality Waterloo		City/Town/Village St Jacobs	Province Ontario	Postal Code N0A 1H0
UTM Coordinates Zone NAD 83	Easting 17535880	Northing 4820962	Municipal Plan and Sublot Number	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)				
General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From To
brown	sand	calcates gravel	loose	0 3.6
brown	silt	sand	packed	3.6 6.1
Grey	silt	Till	dense	6.1 7.6
Brown	Sand	Gravel	loose med	7.6 9.1

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft) From To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify	Draw Down		Recovery
0 0.3	concrete			Time (min)	Water Level (m/ft)	Time (min)
0.3 5.7	Bentonite 3E Hecapag			Static Level		
5.7 9.1	Silica Sand #2			1		
				2		
				3		
				4		
				5		
				10		
				15		
				20		
				25		
				30		
				40		
				50		
				60		

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

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From To	☐ Water Supply	☐ Replacement Well
5.1	Plastic	5	0 6.1	☒ 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	

Construction Record - Screen				Status of Well	
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From To	☐ Water Supply	☐ Replacement Well
6.1	Plastic	10	6.1 9.1	☒ 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		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☒ Untested	Depth (m/ft) From To	Diameter (cm/in)
7.6 (m/ft)	☐ Gas ☐ Other, specify	0 9.1	21cm

Well Contractor and Well Technician Information			
Business Name of Well Contractor Direct Environmental Pty Ltd	Well Contractor's Licence No. 731210	Business Address (Street Number/Name) 37 Shew Valley Dr	Municipality St Thomas
Province Ont	Postal Code N5R2G9	Business E-mail Address sean@directenvironmental.com	
Bus. Telephone No. (inc. area code) 5198680175	Name of Well Technician (Last Name, First Name) Anthony	Well Technician's Licence No. 2772	Signature of Technician and/or Contractor Anthony
		Date Submitted 20170425	

Well owner's information package delivered ☒ Yes ☐ No

Date Package Delivered
20170413

Date Work Completed
20170413

Ministry Use Only
Audit No. 2256401
MAY 25 2017
Received

Measurements recorded in: ☒ Metric ☐ Imperial

Tag #: A 234427

Page 1 of 1

Well Owner's Information

First Name: Pohocorp Inc. Last Name / Organization: Mailing Address (Street Number/Name): 379 Queen Street South Municipality: Kitchener Province: ONT Postal Code: N2G 1W6 Telephone No. (inc. area code): 519 741 5324 ☐ Well Constructed by Well Owner

Well Location: Address of Well Location (Street Number/Name): 16 Isabella St South Township: Lot: Concession: County/District/Municipality: City/Town/Village: St Jacobs Province: Ontario Postal Code: UTM Coordinates Zone: Easting: Northing: Municipal Plan and Sublot Number: Other:

UTM Coordinates Zone: Easting: Northing: Municipal Plan and Sublot Number: Other:

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

General Colour: Most Common Material: Other Materials: General Description: Depth (m/ft) From To

brown clay silt soft 0 1.5

brown sand gravel loose 1.5 4.5

brown silt fill gravel dense 4.5 12.2

Measurements recorded in: ☒ Metric ☐ Imperial

Tag #: A 234426

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Well Owner's Information

First Name Polarcorp Inc.	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
Mailing Address (Street Number/Name) 379 Queen Street South	Municipality Kitchener	Province ONT	Postal Code N2G 1W6
Telephone No. (inc. area code) 519 245 5324			

Well Location

Address of Well Location (Street Number/Name) 16 Eschella St South		Township	Lot	Concession
City/Town/Village Waterloo		St Jacobs		
Province Ontario		Postal Code		
UTM Coordinates Zone Easting Northing NAD 83 17535771 4820882		Municipal Plan and Sublot Number		
Other				

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From To
brown	brown	sand gravel	Fill	0 1.5
brown	sand	gravel	loose	1.5 3.1
brown	sand	gravel	moist	3.1 4.6

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft) From To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify	Draw Down Time (min) Water Level (m/ft)	Recovery Time (min) Water Level (m/ft)	
0 0.3	concrete			1	1	
0.3 1.2	Pembark 3/8 Holes			2	2	
1.2 4.6	Silver Sand #2			3	3	
				4	4	
				5	5	
				10	10	
				15	15	
				20	20	
				25	25	
				30	30	
				40	40	
				50	50	
				60	60	

Method of Construction		Well Use	
☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial
☐ Rotary (Conventional)	☐ Jetting	☐ Domestic	☐ Municipal
☐ Rotary (Reverse)	☐ Driving	☐ Livestock	☒ Test Hole
☒ Boring	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning
☐ Air percussion		☐ Industrial	☐ Monitoring
☐ Other, specify HSA		☐ Other, specify	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From To	☐ Water Supply	☐ Replacement Well
5.1	Plastic	.5	0.7+ 1.5	☒ 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	

Construction Record - Screen			
Outside Diameter (cm/in)	Material (Plastic, Galvanized Steel)	Slot No.	Depth (m/ft) From To
6.1	Plastic	10	1.5 4.6

Water Details		Hole Diameter	
Water found at Depth 3.1 (m/ft)	Kind of Water: ☐ Fresh ☒ Untested	Depth (m/ft) From To	Diameter (cm/in)
Water found at Depth 0 (m/ft)	Kind of Water: ☐ Fresh ☐ Untested	0 4.6	2cm
Water found at Depth 0 (m/ft)	Kind of Water: ☐ Fresh ☐ Untested		

Well Contractor and Well Technician Information			
Business Name of Well Contractor Direct Environmental Drilling Inc.		Well Contractor's Licence No. 7320	
Business Address (Street Number/Name) 37 Shear Valley Dr		Municipality St Thomas	
Province Ont	Postal Code N5R 6J5	Business E-mail Address garmon@directenvironmentaldrilling.com	
Bus. Telephone No. (inc. area code) 519 868 0125		Name of Well Technician (Last Name, First Name) Armstrong Anthony	
Well Technician's Licence No. 277		Signature of Technician and/or Contractor 20170915	

Well owner's information package delivered ☒ Yes ☐ No	Date Package Delivered Y Y Y Y M M D D 20170915	Date Work Completed 20170915
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Ministry Use Only	
Audit No. 2268815	Received OCT 13 2017



Measurements recorded in: ☒ Metric ☐ Imperial

A262316

Well Owner's Information

First Name Last Name / Organization E-mail Address ☐ Well Constructed by Well Owner

Mailing Address (Street Number/Name) Municipality Province Postal Code Telephone No. (inc. area code)

Well Location

Address of Well Location (Street Number/Name) Township Lot Concession

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

UTM Coordinates Zone Easting Northing Municipal Plan and Sublot Number Other

NAD 83 17 53 51 14 418 12 09 159

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)
Brown	Fill			0 3
Brown	Sand	Silt		3 36
Brown	Sand	Gravel		36 6

Annular Space			
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)	
0 2.4	3/8 Hbaplug	21	
2.4 6	#2 sand	21	

Method of Construction		Well Use	
☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial
☐ Rotary (Conventional)	☐ Jetting	☐ Domestic	☐ Municipal
☐ Rotary (Reverse)	☒ Driving	☐ Livestock	☐ Test Hole
☐ Boring	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning
☐ Air percussion		☐ Industrial	
☐ Other, specify		☐ Other, specify	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	From	To
3.8	Plastic		0	3	

☐ 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		

Construction Record - Screen			
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)
4	Plastic	10	3 6

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify	Depth (m/ft)	Diameter (cm/in)
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify	0 6	10
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify		

Results of Well Yield Testing			
After test of well yield, water was:	Draw Down		Recovery
☐ Clear and sand free	Time (min)	Water Level (m/ft)	Time (min)
☐ Other, specify			
If pumping discontinued, give reason:	Static Level		
Pump intake set at (m/ft)	1		1
Pumping rate (l/min / GPM)	2		2
Duration of pumping hrs + min	3		3
Final water level end of pumping (m/ft)	4		4
If flowing give rate (l/min / GPM)	5		5
Recommended pump depth (m/ft)	10		10
Recommended pump rate (l/min / GPM)	15		15
Well production (l/min / GPM)	20		20
Disinfected? ☐ Yes ☐ No	25		25
	30		30
	40		40
	50		50
	60		60

Map of Well Location

Please provide a map below following instructions on the back.

SEE ATTACHED

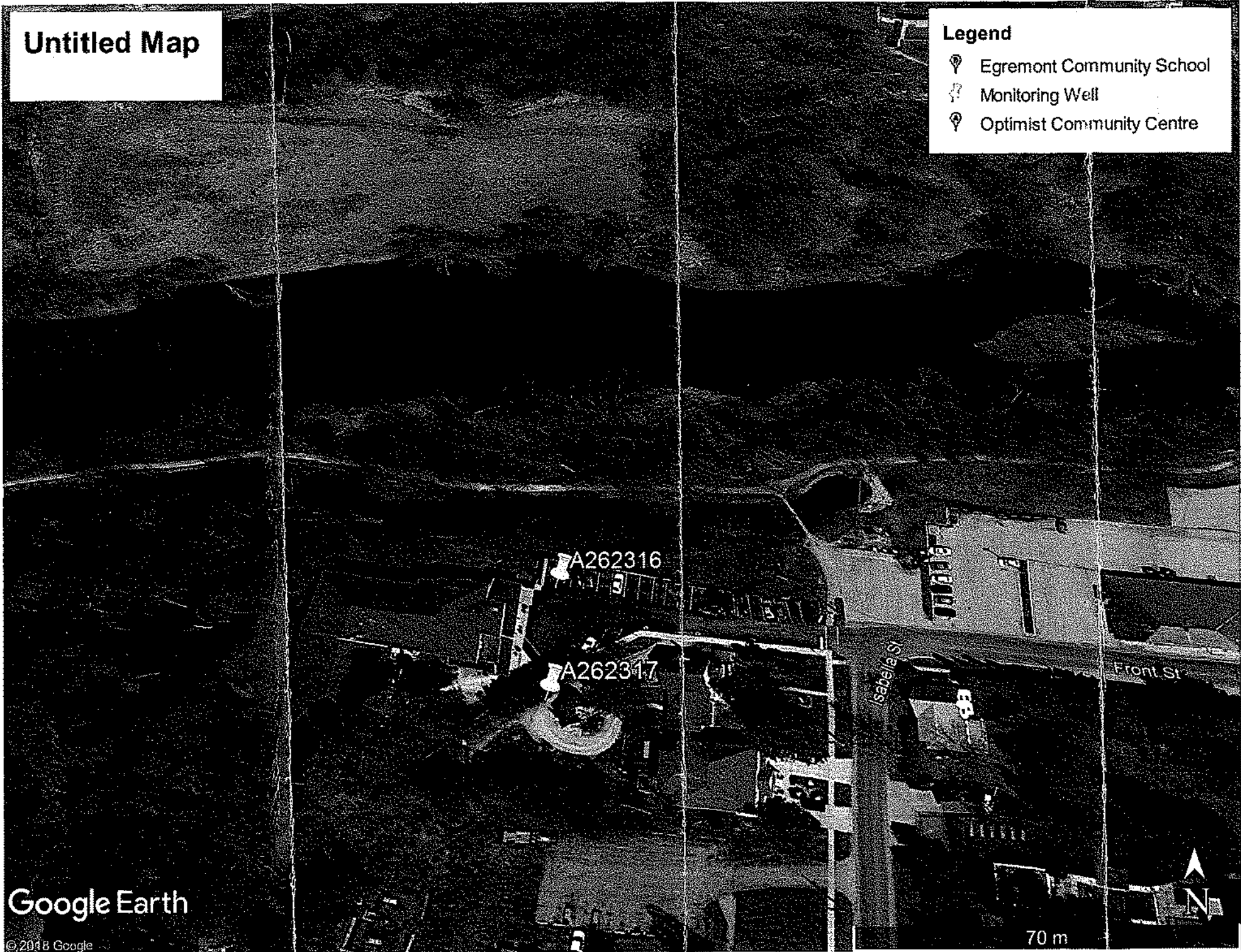
Bus CMT Drilling Inc. License No. 7366
Bus 1011 Industrial Cres, Unit 1, St. Clements
Pro Ontario, N0B 2M0 eblack@cmtinc.net
Bus 519-699-5775 Black, Chris
We 3711 2018/12/20
Tech License No. Signature of Contractor Date Submitted

Well owner's information package delivered ☐ Yes ☐ No	Date Package Delivered	Ministry Use Only Audit No. Z304210 JAN 11 2018 Received
	Date Work Completed	
	2018/12/20	

Untitled Map

Legend

-  Egremont Community School
-  Monitoring Well
-  Optimist Community Centre



Google Earth

©2018 Google

70 m



Measurements recorded in: ☒ Metric ☐ Imperial

Page 1 of 1

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner	
	Sprucekwn Apartments Rr Smith's Inc.			
Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
33 Front St	St. Jacobs	ON	N0B 2N0	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession		
33 Front St					
County/District/Municipality	City/Town/Village	Province	Postal Code		
	St. Jacobs	Ontario			
UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	535811	418120932		

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)
Brown	Fill			0 to 0.6
Brown	Sand	Gravel		0.6 to 5.4

Annular Space			
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)	
0 to 1.5	3/8 HERRING	21	
1.5 to 5.4	#2 SAND	21	

Method of Construction	Well Use
☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☐ Air percussion ☐ Other, specify	☐ Public ☐ Domestic ☐ Livestock ☐ Irrigation ☐ Industrial ☐ Other, specify
☐ Diamond ☐ Jetting ☒ Driving ☐ Digging	☐ Commercial ☐ Municipal ☐ Test Hole ☐ Cooling & Air Conditioning ☒ Monitoring ☐ Dewatering

Construction Record - Casing				Status of Well
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	
3.8	PLASTIC		0 to 2.4	☐ 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

Construction Record - Screen				Status of Well
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
4	PLASTIC	10	2.4 to 5.4	☐ 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		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify	Depth (m/ft)	Diameter (cm/in)
		From To	
		0 to 5.4	10

Results of Well Yield Testing			
After test of well yield, water was:		Draw Down	
☐ Clear and sand free ☐ Other, specify		Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:		Time (min)	Water Level (m/ft)
Pump intake set at (m/ft)		1	1
Pumping rate (l/min / GPM)		2	2
Duration of pumping hrs + min		3	3
Final water level end of pumping (m/ft)		4	4
If flowing give rate (l/min / GPM)		5	5
Recommended pump depth (m/ft)		10	10
Recommended pump rate (l/min / GPM)		15	15
Well production (l/min / GPM)		20	20
Disinfected? ☐ Yes ☐ No		25	25
		30	30
		40	40
		50	50
		60	60

Map of Well Location

Please provide a map below following instructions on the back.

SEE ATTACHED

CMT Drilling Inc. License No. 7366
1011 Industrial Cres, Unit 1, St. Clements
Ontario, N0B 2M0
519-699-5775
3711

Tech License No. Signature of Contractor Date Submitted

or's Licence No.

Comments:

Well owner's information package delivered ☐ Yes ☐ No	Date Package Delivered YYY YYY M M D D Date Work Completed	Ministry Use Only Audit No. 2304211 Recd JAN 11 2018

Untitled Map

JAN 11 2018

C-3711
230211

Legend

-  Egremont Community School
-  Monitoring Well
-  Optimist Community Centre

A262316

A262317

Isabella St

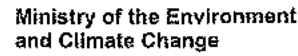
Front St



70 m

Google Earth

© 2018 Google



(Only for Multiple Test Holes or Dewatering Wells)

Regulation 903 Ontario Water Resources Act

Follow instructions on the front and back of this form. Print or Type

3

Page 1 of 1

[illegible]

14-597A

Northside Dr @ Hawkesville Rd, St. Jacobs

A250717

C42205

Dec. 13, 2018

18-5974

FEB 04 2019

C-7464
C-2205



Google Earth

© 2018 Google



Well Record for Well Cluster - Part 1 of 3
(Only for Multiple Test Holes or Dewatering Wells)
Regulation 903 Ontario Water Resources Act

All measurements recorded in: ☐ Metric ☒ Imperial

Follow instructions on the front and back of this form. Print or Type

Well Tag No. of Deepest Well: (Print Well Tag No.)

A250308
Well No. on Drawing of Deepest Well: BH16

☐ Dewatering wells

☒ Test holes

No. of wells reported 10

Page 1 of 1

Well Cluster Location Information

Address of Well Location (Street Number(s)/Name(s), RR, if available)		Lot(s)	Concession(s)	Geographic Township	County/District/Upper Tier Municipality
16 ISABELLA ST. SOUTH					RM of Waterloo
City, Town, Village or Hamlet		Province	GPS Unit Make	Model	Unit Mode of Operation
ST. JACOBS		Ontario			☒ Undifferentiated ☐ Averaged
☐ Differentiated, specify:					

Mandatory Attachments/Additional Information

☒ Land Owner Consent Form must be attached.
☒ Detailed Drawing of All Well Locations must be attached.
I, the person constructing the well, will promptly submit to the Director, on request, any additional information in my custody or control related to any well in the well cluster that I have constructed.
Signature of Technician/Contractor: PER MIKE WATTS
Date (yyyy/mm/dd): 2018/08/20

Well Details

Well # on Drawing	UTM Coordinates		Hole Depth (m/ft)	Hole Diameter (cm/in)	Method of Construction	Casing Material, Diameter (cm/in)	Casing (m/ft)		Screen Interval (m/ft)		Annular Space Material (m/ft)		Overburden/Bedrock or Abandonment Filling Material Intervals (m/ft)	Static Water Level (m/ft)	Date of Completion (yyyy/mm/dd)
	Zone	Easting					From	To	From	To	From	To			
BH16	17	535780	4820900	18	8"	AUGER	1.5	13	13	18	13	18	0-18 SAND & GRAVEL	3Ft	2018/08/20
BH13	17	535833	4820895	14	8"		1.5	9	0	14	9	14	0-14 SAND & GRAVEL	4Ft	2018/08/20
BH20	17	535852	4820887	14	8"		1.5	9	0	14	9	14	0-14 SAND & GRAVEL	3Ft	2018/08/20
BH17	17	535804	4820887	15	8"		1.5	10	0	15	10	15	0-15 SAND & GRAVEL	3Ft	2018/08/20
#7 BH18	17	535805	4820896	15	8"		1.5	10	13	15	10	15	0-15 SAND & GRAVEL	3Ft	2018/08/20
#8 BH19	17	535817	4820898	15	8"		1.5	10	0	15	10	15	0-15 SAND & GRAVEL	3Ft	2018/08/20
#9 BH21	17	535838	4820878	15	8"		1.5	10	0	15	10	15	0-15 SAND & GRAVEL	4Ft	2018/08/20
BH12	17	535843	4820878	15	8"		1.5	10	0	15	10	15	0-15 SAND & GRAVEL	3Ft	2018/08/20
BH11	17	535834	4820857	15	8"		1.5	10	0	15	10	15	0-15 SAND & GRAVEL	3Ft	2018/08/20
BH18	17	535816	4820865	15	8"		1.5	10	0	15	10	15	0-15 SAND & GRAVEL	3Ft	2018/08/20

LONDON SOIL TEST LTD.

712078 Southgate Sdrd. 71
Dundalk, ON N0C 1B0
519-455-5777 info@londonsoil.com

Information

Business Address (Street Number/Name, RR) Municipality Province
7190 ONT.

Well Contractor's Licence No. Business E-mail Address

7190

Name of Well Technician (First Name, Last Name) Well Technician's Licence No. Signature of Well Technician Date Submitted (yyyy/mm/dd)

MIKE WATTS 1671 [Signature] 2018/08/20

Date First Well in Cluster Constructed or Abandoned (yyyy/mm/dd)

2018/08/20

Date Last Well in Cluster Completed (yyyy/mm/dd)

2018/08/20

Well Abandonment

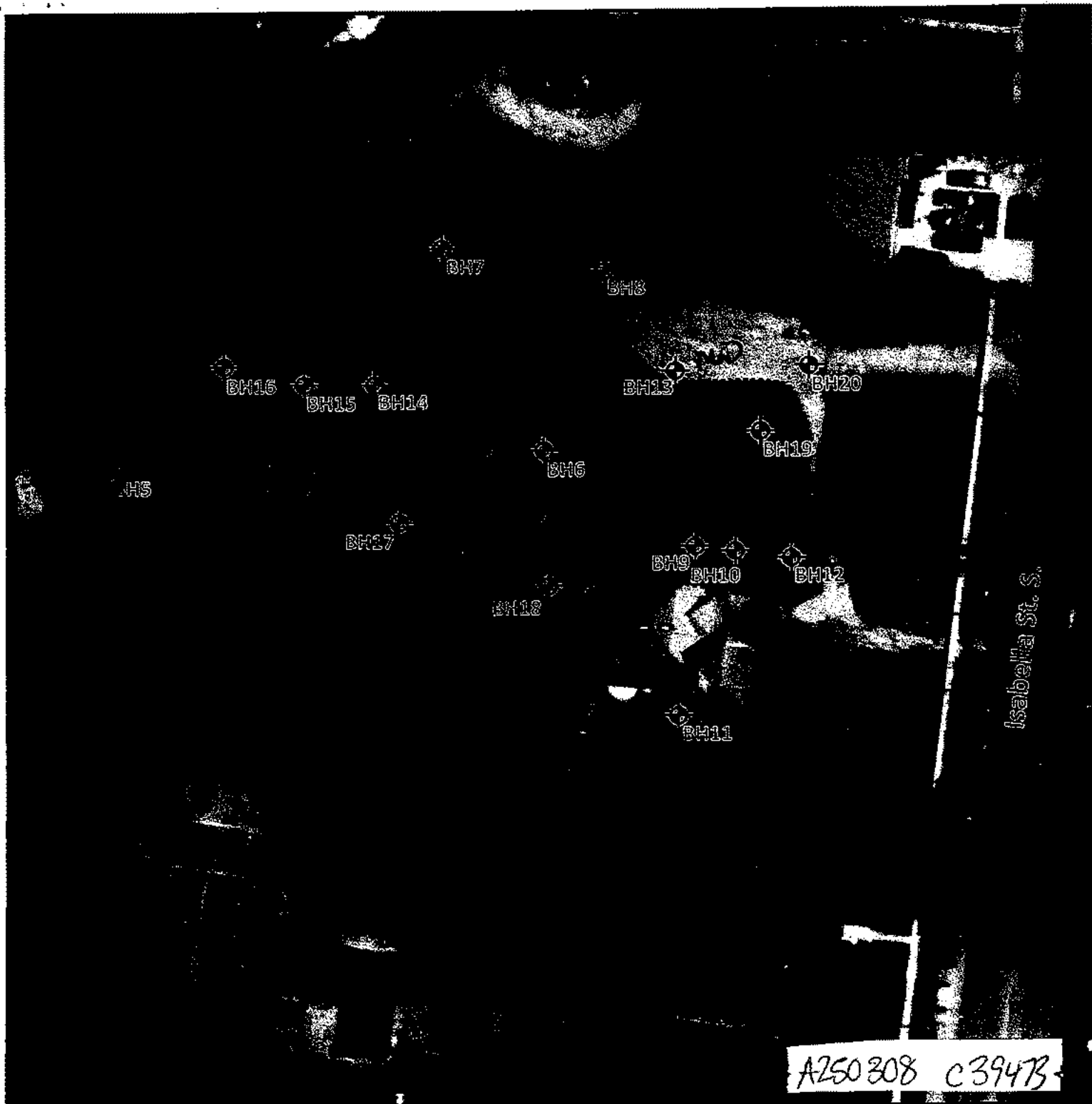
Person Abandoning the Wells:

Name (Print or Type) - See instruction 11 on the back of this form

Ministry Use Only

Date Received (yyyy/mm/dd) Audit No.
OCT 04 2018 C 39473

Comments:



Legend

Site Boundary



Monitoring Well



Borehole



Test Pit

OCT 04 2018



C-7190 C39473

	CHUNG & VANDER DOELEN ENGINEERING LTD. 311 Victoria Street North Kitchener / Ontario / N2H 5E1 519-742-8979		
	BOREHOLE LOCATION PLAN 16 ISABELLA STREET SOUTH ST. JACOBS, ONTARIO		
		Date:	August 2018
		Scale:	NTS
		File No.:	E17484
		Figure:	2

Measurements recorded in: ☐ Metric ☒ Imperial

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

BH 18-1

Well Location

Address of Well Location (Street Number/Name) Northside Drive				Township		Lot		Section			
County/District/Municipality				City/Town/Village Waterloo				Province Ontario		Postal Code 	
UTM Coordinates		Zone	Easting	Northing		Municipal Plan and Sublot Number				Other	
NAD		8	3	1	753604	19821443					

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

[illegible]

Annular Space

[illegible]

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		
			From	To	
					☐ Water Supply
					☐ Replacement Well
					☐ Test Hole
					☐ Recharge Well
					☐ Dewatering Well
					☐ Observation and/or Monitoring Hole
					☐ Alteration (Construction)
					☐ Abandoned, Insufficient Supply

Status of Well

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		
			From	To	
					☐ Water Supply
					☐ Replacement Well
					☐ Test Hole
					☐ Recharge Well
					☐ Dewatering Well
					☐ Observation and/or Monitoring Hole
					☐ Alteration (Construction)
					☐ Abandoned, Insufficient Supply

Construction Record - Screen

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

☐ Water Quality

☐ Abandoned, other, *specify* _____

☐ Other, *specify* _____

☐ _____

Water Details

Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	Depth (m/ft)		Diameter (cm/in)
		From	To	
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____			
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____			
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____			

Hole Diameter

Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	Depth (m/ft)		Diameter (cm/in)
		From	To	
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____			
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____			
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____			

Well Contractor and Well Technician Information

Business Name of Well Contractor Golder Associates Ltd.		Well Contractor's Licence No. 7610	
Business Address (Street Number/Name) 6925 Centary Ave. #100		Municipality MISSISSAUGA	
Province ON	Postal Code L5M 7K2	Business E-mail Address JYune@golder.com	
Bus. Telephone No. (inc. area code) 416 200 2911		Name of Well Technician (Last Name, First Name) Whately, Owen	
Well Technician's Licence No. 3693	Signature of Technician and/or Contractor 	Date Submitted 2020 04 21	

Results of Well Yield Testing

After test of well yield, water was:		Draw Down		Recovery	
☐ Clear and sand free ☐ Other, specify _____		Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:		Static Level			
		1		1	
Pump intake set at (m/ft)		2		2	
Pumping rate (l/min / GPM)		3		3	
Duration of pumping _____ hrs + _____ min		4		4	
Final water level end of pumping (m/ft)		5		5	
If flowing give rate (l/min / GPM)		10		10	
Recommended pump depth (m/ft)		15		15	
		20		20	
Recommended pump rate (l/min / GPM)		25		25	
		30		30	
Well production (l/min / GPM)		40		40	
		50		50	
Disinfected?		60		60	
☐ Yes ☐ No					

Map of Well Location

Please provide a map below following instructions on the back.

See Attached Map

18-1

Comments:

Well owner's information package delivered	Date Package Delivered								Ministry Use Only	
	Y	Y	Y	Y	M	M	D	D	Audit No. 232885	
☐ Yes ☐ No	Date Work Completed								JUN 03 2020 Received	
	2	0	2	0	0	3	2	0		

© Queen's Printer for Ontario, 2018

Measurements recorded in: ☐ Metric ☒ Imperial

RA 15-3

Well Location		Township		Lot		Concession	
Address of Well Location (Street Number/Name) Northside Dr.							
County/District/Municipality		City/Town/Village Warkburg		Province Ontario		Postal Code 	
UTM Coordinates		Zone		Easting		Northing	
NAD 83		17		536641		4831448	
						Municipal Plan and Sublot Number	
						Other	

[illegible]

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify _____	Draw Down Time (min) Water Level (m/ft)	Recovery Time (min) Water Level (m/ft)
				If pumping discontinued, give reason:	Static Level	
					1	1
					2	2
				Pump intake set at (m/ft)	3	3

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

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		
			From	To	
					☐ Water Supply
					☐ Replacement Well
					☐ Test Hole
					☐ Recharge Well
					☐ Dewatering Well
					☐ Observation and/or Monitoring Hole
					☐ Alteration (Construction)
					☐ Abandoned

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

Insufficient Supply

☐ Abandoned, Poor Water Quality

☐ Abandoned, other, specify _____

☐ Other, specify _____

Water Details		Hole Diameter	
Water found at Depth _____ (m/ft) ☐ Gas ☐ Other, specify _____	Kind of Water: ☐ Fresh ☐ Untested	Depth (m/ft) From _____ To _____	Diameter (cm/in) _____
Water found at Depth _____ (m/ft) ☐ Gas ☐ Other, specify _____	Kind of Water: ☐ Fresh ☐ Untested		
Water found at Depth _____ (m/ft) ☐ Gas ☐ Other, specify _____	Kind of Water: ☐ Fresh ☐ Untested		

Well Contractor and Well Technician Information			
Business Name of Well Contractor		Well Contractor's Licence No.	
Golder Associates Ltd.		7610	
Business Address (Street Number/Name)		Municipality	
6925 Century Ave.		Mississauga	
Province	Postal Code	Business E-mail Address	
ON	L5N7K2	j.vukob@golder.com	
Bus. Telephone No. (inc. area code)		Name of Well Technician (Last Name, First Name)	
4162002911		Whately, Owen	
Well Technician's Licence No.	Signature of Technician and/or Contractor		Date Submitted
3693			20200428

Results of Well Yield Testing				
After test of well yield, water was: ☐ Clear and sand free ☐ Other, <i>specify</i> _____	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason: _____	Static Level			
	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
Duration of pumping _____ hrs _____ min	4		4	
	5		5	
Final water level end of pumping (m/ft)	10		10	
If flowing give rate (l/min / GPM)	15		15	
	20		20	
Recommended pump depth (m/ft)	25		25	
Recommended pump rate (l/min / GPM)	30		30	
	40		40	
Well production (l/min / GPM)	50		50	
	60		60	
Disinfected? ☐ Yes ☐ No				

Map of Well Location

Please provide a map below following instructions on the back.

See Attached Map

18-3

Well owner's information package delivered	Date Package Delivered	Ministry Use Only Audit No. 2328856 JUN 03 2020 Received
	Y Y Y Y M M D D Date Work Completed 20200320	
☐ Yes ☐ No		

Measurements recorded in: ☐ Metric ☒ Imperial

RA 15-3

Well Location		Township		Lot	Concession
Address of Well Location (Street Number/Name) Northside Dr.					
County/District/Municipality		City/Town/Village Warkburg		Province Ontario	Postal Code
UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	
NAD 83	17	536641	4821448		
				Other	

[illegible]

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify _____	Draw Down Time (min) Water Level (m/ft)	Recovery Time (min) Water Level (m/ft)
				If pumping discontinued, give reason:	Static Level	
					1	1
					2	2
				Pump intake set at (m/ft)	3	3

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

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		
			From	To	
					☐ Water Supply
					☐ Replacement Well
					☐ Test Hole
					☐ Recharge Well
					☐ Dewatering Well
					☐ Observation and/or Monitoring Hole
					☐ Alteration (Construction)
					☐ Abandoned

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

Insufficient Supply

☐ Abandoned, Poor Water Quality

☐ Abandoned, other, specify _____

☐ Other, specify _____

Water Details		Hole Diameter	
Water found at Depth _____ (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	Depth (m/ft) From _____ To _____	Diameter (cm/in)
Water found at Depth _____ (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____		
Water found at Depth _____ (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____		

Well Contractor and Well Technician Information			
Business Name of Well Contractor		Well Contractor's Licence No.	
Golder Associates Ltd.		7610	
Business Address (Street Number/Name)		Municipality	
6925 Century Ave.		Mississauga	
Province	Postal Code	Business E-mail Address	
ON	L5N 7K2	j.vukob@golder.com	
Bus. Telephone No. (inc. area code)		Name of Well Technician (Last Name, First Name)	
416 200 2911		Whately, Owen	
Well Technician's Licence No.	Signature of Technician and/or Contractor		Date Submitted
3693			20200428

Results of Well Yield Testing				
After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify _____	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason: _____	Static Level			
	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
Duration of pumping _____ hrs + _____ min	4		4	
	5		5	
Final water level end of pumping (m/ft)	10		10	
If flowing give rate (l/min / GPM)	15		15	
	20		20	
Recommended pump depth (m/ft)	25		25	
Recommended pump rate (l/min / GPM)	30		30	
	40		40	
Well production (l/min / GPM)	50		50	
	60		60	
Disinfected? ☐ Yes ☐ No				

Map of Well Location

Please provide a map below following instructions on the back.

Sec Attached Map
18-3

Comments:											
Well owner's information package delivered ☐ Yes ☐ No		Date Package Delivered						Ministry Use Only Audit No. 2328856 JUN 03 2020 Received			
		Y Y Y Y M M D D 20200320									

Measurements recorded in: ☐ Metric ☒ Imperial

BH 18-E3

Address of Well Location (Street Number/Name) Northside Dr.		Township	Lot	Concession
County/District/Municipality		City/Town/Village Waterloo	Province Ontario	Postal Code
UTM Coordinates: Zone	Easting	Northing	Municipal Plan and Sublot Number	
NAD 83	17531604	7482131	Other	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)				
General Colour	Most Common Material	Other Materials	General Description	Depth (m) From To
	PVC Removed / Bentonite Chip.			16.6 0.0

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft) From To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	After test of well yield, water was:		Draw Down	Recovery
			☐ Clear and sand free		Time (min)	Water Level (m/ft)
			☐ Other, specify		Static Level	
			If pumping discontinued, give reason:		1	1
			Pump intake set at (m/ft)		2	2
			Pumping rate (l/min / GPM)		3	3
			Duration of pumping hrs + min		4	4
			Final water level end of pumping (m/ft)		5	5
			If flowing give rate (l/min / GPM)		10	10
			Recommended pump depth (m/ft)		15	15
			Recommended pump rate (l/min / GPM)		20	20
			Well production (l/min / GPM)		25	25
			Disinfected?		30	30
			☐ Yes ☐ No		40	40
					50	50
					60	60

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From To	☐ 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	

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

Well Contractor and Well Technician Information			
Business Name of Well Contractor Golder Associates Ltd		Well Contractor's Licence No. 7610	
Business Address (Street Number/Name) 6925 Century Ave. #100		Municipality Mississauga	
Province ON	Postal Code L5N 7K2	Business E-mail Address 3446@Golder.com	

Bus. Telephone No. (inc. area code) 416 200 2911		Name of Well Technician (Last Name, First Name) Whately, Owen	
Well Technician's Licence No. 3693		Date Submitted 22000422	
Signature of Technician and/or Contractor		Date Package Delivered 20200320	
Ministry's Copy		Ministry Use Only Audit No. 328858 JUN 03 2020 Received	

See Attached Map

18-E3

Comments:

Well owner's information package delivered
☐ Yes
☐ No

Date Package Delivered
Y Y Y Y M M D D
Date Work Completed
20200320

Ministry Use Only
Audit No. 328858
JUN 03 2020
Received

Measurements recorded in: ☐ Metric ☒ Imperial

BH 18-E2

Page 7 of 9

Address of Well Location (Street Number/Name) Hawkesville Rd		Township		Lot		Concession	
County/District/Municipality		City/Town/Village Waterloo		Province Ontario		Postal Code	
UTM Coordinates Zone Easting Northing NAD 83 1753603248213816		Municipal Plan and Sublot Number		Other			

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)				
General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From To
		Bentonite Chip.		15.0 0.0

Annular Space			Results of Well Yield Testing				
Depth Set at (m/ft) From To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify	Draw Down		Recovery	
				Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
			If pumping discontinued, give reason:	Static Level			
				1		1	
			Pump intake set at (m/ft)	2		2	
			Pumping rate (l/min / GPM)	3		3	
			Duration of pumping hrs + min	4		4	
				5		5	
			Final water level end of pumping (m/ft)	10		10	
			If flowing give rate (l/min / GPM)	15		15	
				20		20	
			Recommended pump depth (m/ft)	25		25	
				30		30	
			Recommended pump rate (l/min / GPM)	40		40	
				50		50	
			Well production (l/min / GPM)	60		60	
			Disinfected? ☐ Yes ☐ No				

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

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From To	☐ 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	

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

Water Details		Hole Diameter	
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify	Depth (m/ft) From To	Diameter (cm/in)
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify		
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify		

Well Contractor and Well Technician Information			
Business Name of Well Contractor Golder Associates Ltd.		Well Contractor's Licence No. 7610	
Business Address (Street Number/Name) 6925 Canterbury Ave.		Municipality M5S1S9	
Province ON	Postal Code L5N7K2	Business E-mail Address JYuke@golder.com	
Bus. Telephone No. (inc. area code) 9162002911		Name of Well Technician (Last Name, First Name) W. L. O'Connell	
Well Technician's Licence No. 30693	Signature of Technician and/or Contractor	Date Submitted 2020 04 22	

Map of Well Location			
Please provide a map below following instructions on the back.			
See Attached map			
18-E2			

Comments:	
Well owner's information package delivered ☐ Yes ☐ No	Date Package Delivered Y Y Y Y M M D D 20200320
Date Work Completed 20200320	Ministry Use Only Audit No. 328859 JUN 03 2020 Received

Measurements recorded in: ☐ Metric ☒ Imperial

RH 18-E1

Address of Well Location (Street Number/Name) Hawkesville Rd		Township	Lot	Concession
County/District/Municipality		City/Town/Village Waterloo	Province Ontario	Postal Code
UTM Coordinates Zone	Easting	Northings	Municipal Plan and Sublot Number	
NAD 83	1753601	84821338		

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) From To
	PVC removed/Bentonite chip			18.0 0.0

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft) From To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	After test of well yield, water was:		Draw Down	Recovery
			☐ Clear and sand free	☐ Other, specify	Time (min)	Water Level (m/ft)
			If pumping discontinued, give reason:		Static Level	
			Pump intake set at (m/ft)		1	1
			Pumping rate (l/min / GPM)		2	2
			Duration of pumping hrs + min		3	3
			Final water level and of pumping (m/ft)		4	4
			If flowing give rate (l/min / GPM)		5	5
			Recommended pump depth (m/ft)		10	10
			Recommended pump rate (l/min / GPM)		15	15
			Well production (l/min / GPM)		20	20
			Disinfected? ☐ Yes ☐ No		25	25
					30	30
					40	40
					50	50
					60	60

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From To	☐ 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	

Construction Record - Screen			Water Details		Hole Diameter	
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From To	Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested	Depth (m/ft) From To
				☐ Gas ☐ Other, specify		Diameter (cm/in)
				☐ Gas ☐ Other, specify		
				☐ Gas ☐ Other, specify		

Well Contractor and Well Technician Information			
Business Name of Well Contractor Golden Associates Ltd.		Well Contractor's Licence No. 7610	
Business Address (Street Number/Name) 6925 Century Ave.		Municipality M35135499	
Province ON	Postal Code L5M7K2	Business E-mail Address yuke@golden.com	
Bus. Telephone No. (inc. area code) 416 200 2911		Name of Well Technician (Last Name, First Name) Whately, Owen	
Well Technician's Licence No. 2693		Date Submitted 2020 04 22	

Map of Well Location	
Please provide a map below following instructions on the back.	
See Attached map	
18-E1	
Comments:	
Well owner's information package delivered ☐ Yes ☐ No	Date Package Delivered Y Y Y Y M M D D 2020 03 20
Date Work Completed 2020 03 20	
Ministry Use Only Audit No. 2328864 Received JUN 03 2020	

BH17-A10

Address of Well Location (Street Number/Name) Hawkesville Rd.		Township		Lot		Concession	
County/District/Municipality		City/Town/Village Windsor		Province Ontario		Postal Code	
UTM Coordinates		Zone Easting		Northing		Municipal Plan and Sublot Number	
NAD 83		753551		848214		22	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)				
General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From To
			PVC Removed / Bentonite Chip	15.0 0.0

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft) From To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify	Draw Down		Recovery
				Time (min)	Water Level (m/ft)	Time (min)
			If pumping discontinued, give reason:	Static Level		
				1		1
			Pump intake set at (m/ft)	2		2
			Pumping rate (l/min / GPM)	3		3
				4		4
			Duration of pumping hrs + min	5		5
			Final water level end of pumping (m/ft)	10		10
				15		15
			If flowing give rate (l/min / GPM)	20		20
				25		25
			Recommended pump depth (m/ft)	30		30
				40		40
			Recommended pump rate (l/min / GPM)	50		50
				60		60
			Well production (l/min / GPM)			
			Disinfected? ☐ Yes ☐ No			

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

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From To		
				☐ 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		Hole Diameter	
Water found at Depth (m/ft) ☐ Gas ☐ Other, specify	Kind of Water: ☐ Fresh ☐ Untested	Depth (m/ft) From To	Diameter (cm/in)
Water found at Depth (m/ft) ☐ Gas ☐ Other, specify	Kind of Water: ☐ Fresh ☐ Untested		
Water found at Depth (m/ft) ☐ Gas ☐ Other, specify	Kind of Water: ☐ Fresh ☐ Untested		

Well Contractor and Well Technician Information			
Business Name of Well Contractor Grider Associates Ltd.		Well Contractor's Licence No. 7610	
Business Address (Street Number/Name) 6925 Century Ave.		Municipality MISSISSAUGA	
Province ON	Postal Code L5N7K2	Business E-mail Address JYK@grider.com	
Bus. Telephone No. (inc. area code) 41620102911		Name of Well Technician (Last Name, First Name) Whitely, Owen	
Well Technician's Licence No. 31693		Signature of Technician and/or Contractor [Signature]	
		Date Submitted 20200422	

Map of Well Location			
Please provide a map below following instructions on the back.			
See Attached map			
17-A10			

Comments:	
Well owner's information package delivered ☐ Yes ☐ No	Date Package Delivered Y Y Y Y M M D D 20200520
Date Work Completed 20200520	Ministry Use Only Audit No. 328863 JUN 03 2020 Received

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 *

A333477

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

Organization | Email Address

Polocorp Inc.

Current Address

Unit Number | Street Number * | Street Name * | City/Town/Village

Country | Province | Postal Code | Telephone Number

Canada

Ontario

2. Well Location

Address of Well Location

Unit Number | Street Number * | Street Name * | Township

51

Hawkesville Road

Lot | Concession | County/District/Municipality

WATERLOO

City/Town | Province | Postal Code

St. Jacobs

Ontario

UTM Coordinates | Zone * | Easting * | Northing * | Municipal Plan and Sublot Number

NAD 83

17

535743

4821180

Test UTM in Map

Other

3. Overburden and Bedrock Material *

Well Depth * 50 (ft)

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

				(ft)	(ft)
Black	Topsoil		Loose	0	0.66
Brown	Clay	Silt	Dense	0.66	12
Brown	Clay	Till	Dense	12	35
Grey	Clay	Till	Dense	35	50

4. Annular Space *

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	0.5	Concrete	0.2
0.5	38	Bentonite	14.09
38	50	Silica Sand	4.54

5. Method of Construction *

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

6. Well Use *

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

7. Status of Well *

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

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

Inside Diameter (in)	Open Hole or Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)
2	Plastic	0.154	-3	40
4	Steel	0.125	-3	1

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)
2.375	Plastic	0.01	40	50

10. Water Details

Water found at Depth 35 (ft) ☐ Gas Kind of water ☐ Fresh ☒ Untested ☐ Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0	50	8.5

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)	35													

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 ☐ Yes ☒ No	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) * 2021/07/27
Comments		

15. Well Contractor and Well Technician Information

Business Name of Well Contractor * Envirocore Drilling Inc.		Well Contractor's License Number * 7747	
Business Address			
Unit Number	Street Number 67	Street Name * Beattie Avenue	
City/Town/Village * London		Province ON	Postal Code * N5W 2P1
Business Telephone Number 519-851-4116	Business Email Address envirocoredrillinginc@gmail.com		
Last Name of Well Technician * Collette	First Name of Well Technician * Raymond	Well Technician's License Number * 3552	

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 Collette	First Name Raymond	Email Address envirocoredrillinginc@gmail.com
Signature Raymond Collette  Digitally signed by Raymond Collette DN: cn=Raymond Collette, o=Envirocore Drilling Inc., ou, email=wells.envirocoredrilling@gmail.com, c=CA Date: 2021.09.21 11:39:48 -04'00'		Date Submitted (yyyy/mm/dd) 2021/09/21

17. Ministry Use Only

Audit Number 6VPX WL8Q

Measurements recorded in: ☐ Metric ☒ Imperial

Well Owner's Information

First Name
Frey's

Last Name/Organization
Hatchery

E-mail Address

☐ Well Constructed by Well Owner

Mailing Address (Street Number/Name)
80 Northside Dr

Municipality
St. Jacobs

Province
ON

Postal Code
N0B 2W0

Telephone No. (inc. area code)
519 664 2291

Well Location

Address of Well Location (Street Number/Name)
2955 Sawmill Rd

Township
Woodwich

Lot
36

Concession
GCT

County/District/Municipality
Waterloo

City/Town/Village
St. Jacobs

Province
Ontario

Postal Code
N0B 2W0

UTM Coordinates: Zone
NAD 83

Easting
175730859

Northing
4821201

Municipal Plan and Sublot Number

Other

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)					
General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
Br	sand	fill	soft	0	3
Br	clay		hard	3	12
grey	clay		hard	12	58
grey	Till	stones	hard	58	92
grey	clay		hard	92	132
br	Limestone	bl - shale	soft	132	148

Annular Space

Depth Set at (m/ft)
From To

Type of Sealant Used (Material and Type)

Volume Placed (m³/ft³)

0 20

Woleplug

9 bgs

20 134

Bentonite

Method of Construction

Well Use

☐ Cable Tool
☒ Rotary (Conventional)
☐ Rotary (Reverse)
☐ Boring
☐ Air percussion
☐ Other, specify

☐ Diamond
☐ Jetting
☐ Driving
☐ Digging
☐ Other, specify

☐ Public
☐ Domestic
☐ Livestock
☐ Irrigation
☐ Industrial
☐ Other, specify

☒ Commercial
☐ Municipal
☐ Test Hole
☐ Cooling & Air Conditioning
☐ Not used
☐ Dewatering
☐ Monitoring

Construction Record - Casing

Status of Well

Inside Diameter (cm/in)

Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)

Wall Thickness (cm/in)

Depth (m/ft)
From To

6 3/8

steel

1.88

13

134

6 3/8

open

134

148

☐ 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

Construction Record - Screen

Map of Well Location

Outside Diameter (cm/in)

Material (Plastic, Galvanized, Steel)

Slot No.

Depth (m/ft)
From To

Water Details

Hole Diameter

Water found at Depth (m/ft)

Kind of Water: ☒ Fresh ☐ Untested ☐ Gas ☐ Other, specify

277

Water found at Depth (m/ft)

Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify

142

Water found at Depth (m/ft)

Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify

146

Depth (m/ft)
From To

Diameter (cm/in)

0 20

10

20 134

8 3/4

134 148

6 1/2

Well Contractor and Well Technician Information

Comments

Business Name of Well Contractor
Well Initiatives Limited

Well Contractor's Licence No.
7221

Business Address (Street Number/Name)
15 Townline Orangeville

Municipality

Province
ont

Postal Code
L9W 3R4

Business E-mail Address
info@wellinitiatives.com

Bus. Telephone No. (inc. area code)
519 846 9299

Name of Well Technician (Last Name, First Name)
Fenton Doug

Well Technician's Licence No.
72003

Signature of Technician and/or Contractor
Doug Fenton

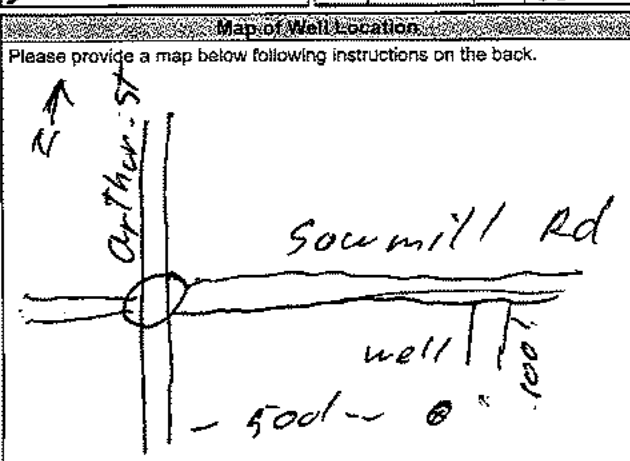
Date Submitted
2021 09 29

Well owner's information package delivered ☐ Yes ☒ No

Date Package Delivered
Y Y Y Y M M D D
2021 09 13

Date Work Completed

Ministry Use Only
Audit No. 2362851
SEP 23 2021
Received



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Fields marked with an asterisk (*) are mandatory.

Well Tag Number *

A262316

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
Organization Sprucelawn Apartments for Seniors Inc	Email Address

Current Address

Unit Number	Street Number * 33	Street Name * Front St	City/Town/Village St. Jacobs
Country Canada	Province ON	Postal Code N0B 2N0	Telephone Number

2. Well Location

Address of Well Location

Unit Number	Street Number * 33	Street Name * Front St	Township
Lot	Concession	County/District/Municipality	
City/Town St Jacobs	Province Ontario	Postal Code N0B 2N0	
UTM Coordinates NAD 83	Zone * 17	Easting * 535814	Northing * 4820959
			Municipal Plan and Sublot Number Test UTM in Map

Other

3. Abandonment and Sealing

Well Depth 20 (ft)

Provide information of well (e.g. construction date, original contractor). **Do not** enter private information

Original Owner

General Description	Depth From (ft)	Depth To (ft)

4. Annular Space

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	20	3/8 HOLEPLUG	0.25

5. Method of Construction

☐ Cable Tool

☐ Rotary (Conventional)

☐ Rotary (Reverse)

☐ Boring

☐ Air percussion

☐ Diamond

☐ Jetting

☐ Driving

☐ Digging

☐ Rotary (Air)

☐ Augering

☐ Direct Push

☐ Other (specify) _____

6. Well Use

☐ Public

☐ Industrial

☐ Cooling & Air Conditioning

☐ Domestic

☐ Commercial

☐ Not Used

☐ Livestock

☐ Municipal

☐ Monitoring

☐ Irrigation

☐ Test Hole

☐ Dewatering

☐ Other (specify) _____

7. Status of Well

☐ Water Supply

☐ Replacement Well

☐ Test Hole

☐ Recharge Well

☐ Dewatering Well

☒ Observation and/or Monitoring Hole

☐ Alteration (Construction)

☐ Abandoned, Insufficient Supply

☐ Abandoned, Poor Water Quality

☒ Abandoned, other (specify) Construction

☐ 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)

9. Construction Record - Screen

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

10. Water Details

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

11. Hole Diameter

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

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)														

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 ☐ Yes ☐ No	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) * 2022/05/05
Comments		

15. Well Contractor and Well Technician Information

Business Name of Well Contractor * CMT DRILLING INC		Well Contractor's License Number * 7366	
Business Address			
Unit Number 1	Street Number 1011	Street Name * INDUSTRIAL CRES	
City/Town/Village * ST CLEMENTS		Province ON	Postal Code * N0B 2M0
Business Telephone Number 519-699-5775		Business Email Address info@cmtinc.net	
Last Name of Well Technician * BLACK		First Name of Well Technician * CHRIS	Well Technician's License Number * 3711

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 BLACK	First Name CHRIS	Email Address cblack@cmtinc.net
Signature Chris Black		Date Submitted (yyyy/mm/dd) 2022/05/25
Digitally signed by Chris Black Date: 2022.05.25 14:49:16 -04'00'		

17. Ministry Use Only

Audit Number
JJ7E B84C

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 *

A262317

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
Organization Sprucelawn Apartments for Seniors Inc	Email Address

Current Address

Unit Number	Street Number * 33	Street Name * Front St	City/Town/Village St. Jacobs
Country Canada	Province ON	Postal Code N0B 2N0	Telephone Number

2. Well Location

Address of Well Location

Unit Number	Street Number * 33	Street Name * Front St	Township
Lot	Concession	County/District/Municipality	
City/Town St Jacobs	Province Ontario	Postal Code N0B 2N0	
UTM Coordinates NAD 83	Zone * 17	Easting * 535813	Northing * 4820932
			Municipal Plan and Sublot Number

Other

3. Abandonment and Sealing

Well Depth 17 (ft)

Provide information of well (e.g. construction date, original contractor). **Do not** enter private information

Original Owner		
General Description	Depth From (ft)	Depth To (ft)

4. Annular Space			
Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	17	3/8 HOLEPLUG	0.25

5. Method of Construction					
☐ Cable Tool	☐ Rotary (Conventional)	☐ Rotary (Reverse)	☐ Boring	☐ Air percussion	☐ Diamond
☐ Jetting	☐ Driving	☐ Digging	☐ Rotary (Air)	☐ Augering	☐ Direct Push
☐ Other (specify) _____					

6. Well Use		
☐ Public	☐ Industrial	☐ Cooling & Air Conditioning
☐ Domestic	☐ Commercial	☐ Not Used
☐ Livestock	☐ Municipal	☐ Monitoring
☐ Irrigation	☐ Test Hole	☐ Dewatering
☐ Other (specify) _____		

7. Status of Well		
☐ Water Supply	☐ Replacement Well	☐ Test Hole
☐ Recharge Well	☐ Dewatering Well	☒ Observation and/or Monitoring Hole
☐ Alteration (Construction)	☐ Abandoned, Insufficient Supply	☐ Abandoned, Poor Water Quality
☒ Abandoned, other (specify) <u>Construction</u>		
☐ 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)

9. Construction Record - Screen				
Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)

10. Water Details

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

11. Hole Diameter

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

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)														

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 ☐ Yes ☐ No	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
		2022/05/05
Comments		

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *		Well Contractor's License Number *	
CMT DRILLING INC		7366	
Business Address			
Unit Number	Street Number	Street Name *	
1	1011	INDUSTRIAL CRES	
City/Town/Village *		Province	Postal Code *
ST CLEMENTS		ON	N0B 2M0
Business Telephone Number	Business Email Address		
519-699-5775	info@cmtinc.net		
Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *	
BLACK	CHRIS	3711	

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
BLACK	CHRIS	cblack@cmtinc.net
Signature		Date Submitted (yyyy/mm/dd)
Chris Black		2022/05/25
Digitally signed by Chris Black Date: 2022.05.25 14:52:13 -04'00'		

17. Ministry Use Only

Audit Number
R9D8 ELPR

Notice of Collection of Personal Information

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Fields marked with an asterisk (*) are mandatory.

Well Tag Number *

A219107

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
Organization Township of Woolwich	Email Address

Current Address

Unit Number Box 158	Street Number * 24	Street Name * Church St West	City/Town/Village Elmira
Country Canada	Province ON	Postal Code N3B 2Z6	Telephone Number

2. Well Location

Address of Well Location

Unit Number	Street Number * 33	Street Name * Front St	Township
Lot	Concession	County/District/Municipality	
City/Town St Jacobs	Province Ontario	Postal Code N0B 2N0	
UTM Coordinates NAD 83	Zone * 17	Easting * 535884	Northing * 4820953
			Municipal Plan and Sublot Number Test UTM in Map

Other

3. Abandonment and Sealing

Well Depth 24 (ft)

Provide information of well (e.g. construction date, original contractor). **Do not** enter private information

Original Owner		
General Description	Depth From (ft)	Depth To (ft)

4. Annular Space			
Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	24	3/8 HOLEPLUG	0.52

5. Method of Construction					
☐ Cable Tool	☐ Rotary (Conventional)	☐ Rotary (Reverse)	☐ Boring	☐ Air percussion	☐ Diamond
☐ Jetting	☐ Driving	☐ Digging	☐ Rotary (Air)	☐ Augering	☐ Direct Push
☐ Other (specify) _____					

6. Well Use		
☐ Public	☐ Industrial	☐ Cooling & Air Conditioning
☐ Domestic	☐ Commercial	☐ Not Used
☐ Livestock	☐ Municipal	☐ Monitoring
☐ Irrigation	☐ Test Hole	☐ Dewatering
☐ Other (specify) _____		

7. Status of Well		
☐ Water Supply	☐ Replacement Well	☐ Test Hole
☐ Recharge Well	☐ Dewatering Well	☒ Observation and/or Monitoring Hole
☐ Alteration (Construction)	☐ Abandoned, Insufficient Supply	☐ Abandoned, Poor Water Quality
☒ Abandoned, other (specify) <u>Construction</u>		
☐ 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)

9. Construction Record - Screen				
Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)

10. Water Details

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

11. Hole Diameter

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

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)														

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 ☐ Yes ☐ No	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
		2022/05/05
Comments		

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *		Well Contractor's License Number *	
CMT DRILLING INC		7366	
Business Address			
Unit Number	Street Number	Street Name *	
1	1011	INDUSTRIAL CRES	
City/Town/Village *		Province	Postal Code *
ST CLEMENTS		ON	N0B 2M0
Business Telephone Number		Business Email Address	
519-699-5775		info@cmtinc.net	
Last Name of Well Technician *		First Name of Well Technician *	Well Technician's License Number *
BLACK		CHRIS	3711

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
BLACK	CHRIS	cblack@cmtinc.net
Signature		Date Submitted (yyyy/mm/dd)
Chris Black		2022/05/25
Digitally signed by Chris Black Date: 2022.05.25 14:59:44 -04'00'		

17. Ministry Use Only

Audit Number
DT9V ZQ64

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Fields marked with an asterisk (*) are mandatory.

Well Tag Number *

A219103

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
Organization Township of Woolwich	Email Address

Current Address

Unit Number Box 158	Street Number * 24	Street Name * Church St West	City/Town/Village Elmira
Country Canada	Province ON	Postal Code N3B 2Z6	Telephone Number

2. Well Location

Address of Well Location

Unit Number	Street Number * 33	Street Name * Front St	Township
Lot	Concession	County/District/Municipality	
City/Town St Jacobs	Province Ontario	Postal Code N0B 2N0	
UTM Coordinates NAD 83	Zone * 17	Easting * 535871	Northing * 4820945
			Municipal Plan and Sublot Number Test UTM in Map

Other

3. Abandonment and Sealing

Well Depth 21 (ft)

Provide information of well (e.g. construction date, original contractor). **Do not** enter private information

Original Owner

General Description	Depth From (ft)	Depth To (ft)

4. Annular Space

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	21	3/8 HOLEPLUG	0.52

5. Method of Construction

☐ Cable Tool

☐ Rotary (Conventional)

☐ Rotary (Reverse)

☐ Boring

☐ Air percussion

☐ Diamond

☐ Jetting

☐ Driving

☐ Digging

☐ Rotary (Air)

☐ Augering

☐ Direct Push

☐ Other (specify) _____

6. Well Use

☐ Public

☐ Industrial

☐ Cooling & Air Conditioning

☐ Domestic

☐ Commercial

☐ Not Used

☐ Livestock

☐ Municipal

☐ Monitoring

☐ Irrigation

☐ Test Hole

☐ Dewatering

☐ Other (specify) _____

7. Status of Well

☐ Water Supply

☐ Replacement Well

☐ Test Hole

☐ Recharge Well

☐ Dewatering Well

☒ Observation and/or Monitoring Hole

☐ Alteration (Construction)

☐ Abandoned, Insufficient Supply

☐ Abandoned, Poor Water Quality

☒ Abandoned, other (specify) Construction

☐ 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)

9. Construction Record - Screen

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

10. Water Details

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

11. Hole Diameter

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

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)														

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 ☐ Yes ☐ No	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
		2022/05/05
Comments		

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *		Well Contractor's License Number *	
CMT DRILLING INC		7366	
Business Address			
Unit Number	Street Number	Street Name *	
1	1011	INDUSTRIAL CRES	
City/Town/Village *		Province	Postal Code *
ST CLEMENTS		ON	N0B 2M0
Business Telephone Number		Business Email Address	
519-699-5775		info@cmtinc.net	
Last Name of Well Technician *		First Name of Well Technician *	Well Technician's License Number *
BLACK		CHRIS	3711

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
BLACK	CHRIS	cblack@cmtinc.net
Signature		Date Submitted (yyyy/mm/dd)
Chris Black		2022/05/25
Digitally signed by Chris Black Date: 2022.05.25 15:01:59 -04'00'		

17. Ministry Use Only

Audit Number
QM5G KI7I

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Fields marked with an asterisk (*) are mandatory.

Well Tag Number *

A219101

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
Organization Township of Woolwich	Email Address

Current Address

Unit Number Box 158	Street Number * 24	Street Name * Church St West	City/Town/Village Elmira
Country Canada	Province ON	Postal Code N3B 2Z6	Telephone Number

2. Well Location

Address of Well Location

Unit Number	Street Number * 33	Street Name * Front St	Township
Lot	Concession	County/District/Municipality	
City/Town St Jacobs	Province Ontario	Postal Code N0B 2N0	
UTM Coordinates NAD 83	Zone * 17	Easting * 535886	Northing * 4820950
			Municipal Plan and Sublot Number Test UTM in Map

Other

3. Abandonment and Sealing

Well Depth 24 (ft)

Provide information of well (e.g. construction date, original contractor). **Do not** enter private information

Original Owner		
General Description	Depth From (ft)	Depth To (ft)

4. Annular Space			
Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	24	3/8 HOLEPLUG	0.52

5. Method of Construction					
☐ Cable Tool	☐ Rotary (Conventional)	☐ Rotary (Reverse)	☐ Boring	☐ Air percussion	☐ Diamond
☐ Jetting	☐ Driving	☐ Digging	☐ Rotary (Air)	☐ Augering	☐ Direct Push
☐ Other (specify) _____					

6. Well Use		
☐ Public	☐ Industrial	☐ Cooling & Air Conditioning
☐ Domestic	☐ Commercial	☐ Not Used
☐ Livestock	☐ Municipal	☐ Monitoring
☐ Irrigation	☐ Test Hole	☐ Dewatering
☐ Other (specify) _____		

7. Status of Well		
☐ Water Supply	☐ Replacement Well	☐ Test Hole
☐ Recharge Well	☐ Dewatering Well	☒ Observation and/or Monitoring Hole
☐ Alteration (Construction)	☐ Abandoned, Insufficient Supply	☐ Abandoned, Poor Water Quality
☒ Abandoned, other (specify) <u>Construction</u>		
☐ 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)

9. Construction Record - Screen				
Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)

10. Water Details

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

11. Hole Diameter

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

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)														

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 ☐ Yes ☐ No	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
		2022/05/05
Comments		

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *		Well Contractor's License Number *	
CMT DRILLING INC		7366	
Business Address			
Unit Number	Street Number	Street Name *	
1	1011	INDUSTRIAL CRES	
City/Town/Village *		Province	Postal Code *
ST CLEMENTS		ON	N0B 2M0
Business Telephone Number	Business Email Address		
519-699-5775	info@cmtinc.net		
Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *	
BLACK	CHRIS	3711	

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
BLACK	CHRIS	cblack@cmtinc.net
Signature		Date Submitted (yyyy/mm/dd)
Chris Black		2022/05/25
Digitally signed by Chris Black Date: 2022.05.25 15:04:13 -04'00'		

17. Ministry Use Only

Audit Number
F79R E2E3



WATER WELL RECORD

40P110F

Water management in Ontario 1. PRINT ONLY IN SPACES PROVIDED

2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

6503453

MUNICIP

65005

CON.

G.C.T.

COUNTY OR DISTRICT

Waterloo

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE

St. Jacobs WOOLWICH

CON., BLOCK, TRACT, SURVEY, ETC.

G.C.T.

LOT 25-27

008

OWNER (SURNAME FIRST)

Bell Canada

ADDRESS

St. Jacobs

DATE COMPLETED

DAY 21 MO April YR 71

21 17 536920 4819970 4 1120 5 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	Clay		Hard	1	33
" "	" "		Soft	33	35
Blue	" "		Hard	35	48
Brown	Clay	Stoney	" "	48	146
" "	Limestone			146	171

31

0035405

0048305

014460512

0171615

32

41

WATER RECORD

WATER SOUND AT FEET	KIND OF WATER			
10-13	1 ☒ FRESH	3 ☐ SULPHUR	4 ☐ MINERAL	14
15-18	1 ☐ FRESH	3 ☐ SULPHUR	4 ☐ MINERAL	19
20-23	1 ☐ FRESH	3 ☐ SULPHUR	4 ☐ MINERAL	24
25-28	1 ☐ FRESH	3 ☐ SULPHUR	4 ☐ MINERAL	29
30-33	1 ☐ FRESH	3 ☐ SULPHUR	4 ☐ MINERAL	34-80

51 CASING & OPEN HOLE RECORD

INSIDE DIA. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
10-11	1 ☒ STEEL	244	I	0146
12-13	2 ☐ GALVANIZED			
14-15	3 ☐ CONCRETE			
16-17	4 ☐ OPEN HOLE			
18-19	1 ☐ STEEL			
20-21	2 ☐ GALVANIZED			
22-23	3 ☐ CONCRETE			
24-25	4 ☐ OPEN HOLE			
26-27	1 ☐ STEEL			
28-29	2 ☐ GALVANIZED			
30-31	3 ☐ CONCRETE			
32-33	4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
31-33	34-36	39-40
MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN
		41-44
		50

61 PLUGGING & SEALING RECORD

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

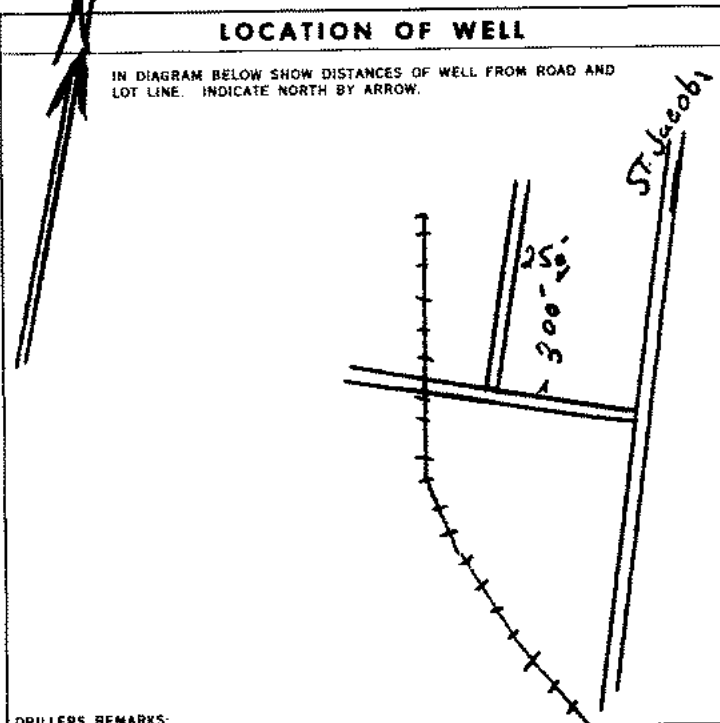
71

PUMPING TEST

PUMPING TEST METHOD		PUMPING RATE	DURATION OF PUMPING	
1 ☒ PUMP	2 ☐ BAILER	0007	GPM	03 HOURS 00 MINS.
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING		
19-21	22-24	15 MINUTES	30 MINUTES	45 MINUTES
036 FEET	073 FEET	060 FEET	066 FEET	069 FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST		
	GPM	90	FEET	1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE		RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE	
1 ☐ SHALLOW 2 ☒ DEEP		090	0005	
SPECIFIC CAPACITY				
000-2 GPM./FT.				

LOCATION OF WELL

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



DRILLERS REMARKS:

54

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

55-56

WATER USE

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

57

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	LICENCE NUMBER
Kerr's Well Drilling	3106
ADDRESS	
New Hamburg	
NAME OF DRILLER OR BORER	LICENCE NUMBER
Charles A. Kerr	3106
SIGNATURE OF CONTRACTOR	SUBMISSION DATE
Charles A. Kerr	DAY 27 MO April YR 71

OFFICE USE ONLY

DATA SOURCE	CONTRACTOR	DATE RECEIVED
1	3106	270971X
DATE OF INSPECTION	INSPECTOR	
4-8-72	7/72	
REMARKS:		



40 P/10 E

11

6504243

6500

GC T

COUNTY OR DISTRICT Waterloo	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE Woolwich	CON., BLOCK, TRACT, SURVEY, ETC. G.C.T.	LOT 036
		St. Jacobs	DATE COMPLETED 12 DAY 24 MO. Dec. YR. 74

6504243 17 536833 4821011 5 1115 5 23 AUG 09, 1977 322

[illegible]

31	0001802	000360528	0012 2811	013220512	013970517	0162317		
32								

41 WATER RECORD	
WATER FOUND AT - FEET	KIND OF WATER
~~100-102~~ 0160	☒ FRESH ☒ SULPHUR ☐ SALTY ☐ MINERAL
15-18	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
20-23	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
25-28	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
30-33	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL

CASING & OPEN HOLE RECORD				
INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
06	☒ STEEL ☐ GALVANIZED ☐ CONCRETE ☒ OPEN HOLE	.188	0	0.140
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☒ OPEN HOLE		140	162
06	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☒ OPEN HOLE			0.62

SCREEN	SIZE(S) OF OPENING (SLOT NO.)		31-33	DIAMETER	34-38	LENGTH	39-40
				INCHES		FEET	
	MATERIAL AND TYPE			DEPTH TO TOP OF SCREEN		c'-44	
						FEET	

61 PLUGGING & SEALING RECORD			
DEPTH SET AT - FEET		MATERIAL AND TYPE	CEMENT GROUT, LEAD PACKER, ETC.)
FROM	TO		
10-12	14-17		
18-21	22-25		
26-29	30-33	80	

PUMPING TEST	71	PUMPING TEST METHOD		10	PUMPING RATE		11-18	DURATION OF PUMPING	
		1 ☒ PUMP	2 ☐ BAILER		0010	GPM	01	35-16 HOURS	17-18 MINS
		STATIC LEVEL	WATER LEVEL END OF PUMPING	25	WATER LEVELS DURING		1 ☒ PUMPING	2 ☐ RECOVERY	
		19-21	22-24		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES	
	040	087		26-28	29-31	32-34	087		
	FEET	FEET		FEET	FEET	FEET	FEET		
	IF FLOWING, GIVE RATE		30-31	PUMP INTAKE SET AT		WATER AT END OF TEST			
				100		FEET	1 ☒ CLEAR	2 ☐ CLOUDY	
	RECOMMENDED PUMP TYPE			RECOMMENDED PUMP SETTING		43-45	RECOMMENDED PUMPING RATE		46-49
	☐ SHALLOW ☒ DEEP			100		FEET	0010		GPM
	50-53		GPM / FT. SPECIFIC CAPACITY						

FINAL STATUS OF WELL	54 1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL	5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED
WATER USE	55-56 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	57 1 ☐ CABLE TOOL 2 ☒ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION	6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

LOCATION OF WELL 3621

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

Follow paved road out of St. Jacobs
towards Conestogo to the first farm
on the left as you leave St. Jacobs.

Well is located behind the house.
.25 miles from HWY 85 on
right. Stop sign on the right
is just by his drain way.

DRILLERS REMARKS:

CONTRACTOR	NAME OF WELL CONTRACTOR		LICENCE NUMBER
	HADCO WELL DRILLING & DIGGING LTD.		2519
	ADDRESS		
	BOX 730 ELMIRA ONT.		
	NAME OF DRILLER OR BORER		LICENCE NUMBER
	R. L. FRANKLIN		
	SIGNATURE OF CONTRACTOR		SUBMISSION DATE
			DAY 3 MO. Jan. YR. 75

OFFICE USE ONLY	DATA SOURCE	1	58	CONTRACTOR	2519	AS-B2	DATE RECEIVED	100175	63-68	SO
	DATE OF INSPECTION			INSPECTOR						
	REMARKS							P <i>[Signature]</i>		
	CSS SR							WI		



Ontario

Ministry
of the
Environment

The Ontario Water Resources Act

WATER WELL RECORD

1 PRINT ONLY IN SPACES PROVIDED

2 CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

6505173

MUNICIP

CON

COUNTY OR DISTRICT

TOWNSHIP BOROUGH CITY, TOWN, VILLAGE

CON BLOCK, TRACT, SURVEY, ETC

LOT 25-27

10-11

12

14-15

16

18

20

22

24

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Gray	Clay			0	2
Brown	Clay	Sandy clay		2	7
Gray	Clay			7	26
	Boulders			26	27
	Clay	Clay & Gravel		27	30

31

32

41

WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-15	1 ☒ FRESH	3 ☐ SULPHUR	4 ☐ MINERAL	
15-18	1 ☐ FRESH	3 ☐ SULPHUR	4 ☐ MINERAL	
20-25	1 ☐ FRESH	3 ☐ SULPHUR	4 ☐ MINERAL	
25-30	1 ☐ FRESH	3 ☐ SULPHUR	4 ☐ MINERAL	
30-35	1 ☐ FRESH	3 ☐ SULPHUR	4 ☐ MINERAL	

51

CASING & OPEN HOLE RECORD

INSIDE DIA INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 ☒ STEEL	18	0	30
17-18	1 ☐ STEEL			20-23
24-25	1 ☐ STEEL			27-30

SCREEN

SIZE OF OPENING (SLOT NO 1)	DIAMETER	LENGTH
	INCHES	FEET
MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN
		FEET

61

PLUGGING & SEALING RECORD

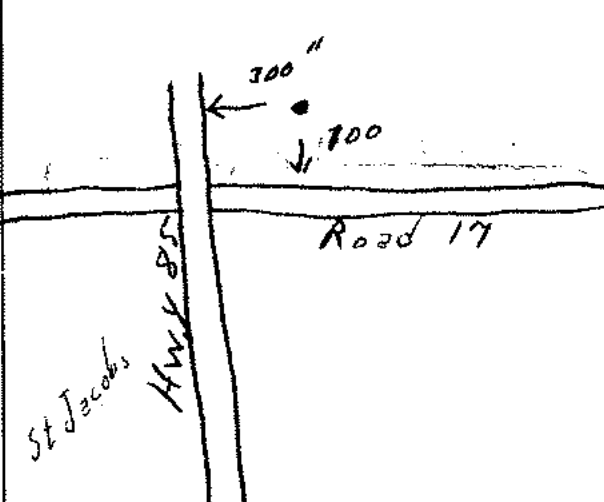
DEPTH SET AT - FEET		MATERIAL AND TYPE	CEMENT GROUT LEAD PACKER, ETC
FROM	TO		
10-12	14-17		
18-21	22-25		
26-29	30-33		

71

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING	
		GPM	HOURS MIN
1 ☐ PUMP 2 ☐ BAILEY			
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	
19		15 MINUTES	30 MINUTES
		45 MINUTES	60 MINUTES
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST	
		1 ☐ CLEAR 2 ☒ CLOUDY	
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE	
1 ☒ SHALLOW 2 ☐ DEEP	28	2	

LOCATION OF WELL

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



DRILLERS REMARKS

81

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	1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL 5 ☐ OTHER				6 ☐ COMMERCIAL 7 ☐ MUNICIPAL 8 ☐ PUBLIC SUPPLY 9 ☐ COOLING OR AIR CONDITIONING 10 ☐ 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	LICENCE NUMBER
Speedy Water Wells	4854
ADDRESS	
Box 1073 Kitchener	
NAME OF DRILLER OR BORE	LICENCE NUMBER
Vic Ridgeman	4854
SIGNATURE OF CONTRACTOR	SUBMISSION DATE
Vic Ridgeman	DAY MONTH YEAR

OFFICE USE ONLY	DATA SOURCE	CONTRACTOR	DATE RECEIVED
			010581
DATE OF INSPECTION	INSPECTOR		
REMARKS			

CSS.E.S.

FORM NO. 1-77

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

6509413

Municipality
65005

Con.
GCT

County or District Waterloo	Township/Borough/City/Town/Village Woolwich Twp.	Con block tract survey, etc. Con. GCT	Lot Pt. 37
	Address 192 Edgehill Dr. Kitchener, Ont	Date completed 5 day Feb 03	Feb 03 month year

[illegible]

41		14 15		21	
WATER RECORD					
Water found at - feet		Kind of water			
154	10-13	1 ☒ Fresh	3 ☐ Sulphur	14	
	2 ☐ Salty	4 ☐ Minerals	6 ☐ Gas		
	15-18	1 ☐ Fresh	3 ☐ Sulphur	19	
	2 ☐ Salty	4 ☐ Minerals	5 ☐ Gas		
	20-23	1 ☐ Fresh	3 ☐ Sulphur	24	
	2 ☐ Salty	4 ☐ Minerals	5 ☐ Gas		
	25-28	1 ☐ Fresh	3 ☐ Sulphur	29	
	2 ☐ Salty	4 ☐ Minerals	5 ☐ Gas		
	30-33	1 ☐ Fresh	3 ☐ Sulphur	34	
	2 ☐ Salty	4 ☐ Minerals	5 ☐ Gas		

51 CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
10-11 6	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	+2-1	13-16
17-18	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			20-23
24-25	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			27-30

SCREEN	Sizes of opening (Slot No.)	31-33	Diameter	34-36	Length	39-40
	# 30 slot		5.75 inches		3	feet
	Material and type	Depth at top of screen		30		
	Stainless Steel	151		feet		

61	PLUGGING & SEALING RECORD			
☒ Annular space		☐ Abandonment		
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)		
From	To			
154 ¹⁰⁻¹³	20 ¹⁴⁻¹⁷	Bentonite grout Holeplug		
20 ¹⁸⁻²¹	0 ²²⁻²⁵			
26-29	30-33	60		

PUMPING TEST	71 Pumping test method ¹⁰ 1 ☒ Pump 2 ☐ Baller		Pumping rate ¹¹⁻¹⁴ 12 GPM		Duration of pumping ¹⁵⁻¹⁸ 2 Hours 30 Mins	
	Static level ¹⁹⁻²¹		Water level end of pumping ²²⁻²⁴		Water levels during 1 ☐ Pumping 2 ☒ Recovery	
	41 feet		61 feet		51 feet	
	15 minutes ²⁶⁻²⁸		30 minutes ²⁹⁻³¹		45 minutes ³²⁻³⁴	
	60 minutes ³⁵⁻³⁷		41 feet		41 feet	
	If flowing give rate ³⁸⁻⁴¹		Pump intake seal at		Water at end of test ⁴²	
GPM		100 feet		☒ Clear ☐ Cloudy		
Recommended pump type ☐ Shallow ☒ Deep		Recommended pump setting ⁴³⁻⁴⁵ 100 feet		Recommended pump rate ⁴⁶⁻⁴⁹ 10 GPM		

FINAL STATUS OF WELL			54
1 ☒ Water supply	5 ☐ Abandoned, insufficient supply	9 ☐ Unfinished	
2 ☐ Observation well	6 ☐ Abandoned, poor quality	10 ☐ Replacement well	
3 ☐ Test hole	7 ☐ Abandoned (Other)		
4 ☐ Recharge well	8 ☐ Dewatering		

WATER USE			55-56
1 ☒ Domestic	5 ☐ Commercial	9 ☐ Not use	
2 ☐ Stock	6 ☐ Municipal	10 ☐ Other	
3 ☐ Irrigation	7 ☐ Public supply		
4 ☐ Industrial	8 ☐ Cooling & air conditioning		

METHOD OF CONSTRUCTION			57
1 ☐ Cable tool	5 ☐ Air percussion	9 ☐ Driving	
2 ☒ Rotary (conventional)	6 ☐ Boring	10 ☐ Digging	
3 ☐ Rotary (reverse)	7 ☐ Diamond	11 ☐ Other	
4 ☐ Rotary (air)	8 ☐ Jetting		

LOCATION OF WELL

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

The diagram illustrates the location of a well (marked 'X') on a property. A vertical line on the left represents the 'COUNTY ROAD'. A horizontal dashed line represents the 'LOT LINE'. The well 'X' is located 60 feet from the road and 40 feet from the lot line. A 'HOUSE' is located above the well, and a 'SHOP' is located to the right of the well. A north arrow points towards the top right of the diagram.

249679

Name of Well Contractor	Well Contractor's Licence No.
Davidson Well Drilling Ltd.	1737
Address	
Box 486, Wingham, Ontario NOG 2W0	
Name of Well Technician	Well Technician's Licence No.
K. Losch	T0927
Signature of Technician/Contractor	Submission date
<i>K. Losch</i> get: <i>D. C. Davidson</i>	19 Feb 03 day mo yr

MINISTRY USE ONLY	Data source	59 Contractor	59-82	Date received	53-66	80
		1737		AUG 05 2003		
	Date of inspection		Inspector			
	Remarks					

Measurements recorded in: ☒ Metric ☐ Imperial

Tag #: A 234427

Page 1 of 1

Well Owner's Information

First Name: Pohocorp Inc. Last Name / Organization: Mailing Address (Street Number/Name): 379 Queen Street South Municipality: RITENGEUR Province: ONT Postal Code: N2G1W6S Telephone No. (inc. area code): 1974532444 ☐ Well Constructed by Well Owner

Well Location: Address of Well Location (Street Number/Name): 16 Isabella St South Township: Lot: Concession: County/District/Municipality: City/Town/Village: St Jacobs Province: Ontario Postal Code: UTM Coordinates Zone: Easting: Northing: Municipal Plan and Sublot Number: Other:

UTM Coordinates Zone: Easting: Northing: Municipal Plan and Sublot Number: Other:

UTM Coordinates Zone: Easting: Northing: Municipal Plan and Sublot Number: Other:

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Measurements recorded in: ☒ Metric ☐ Imperial

Tag #: A 234426

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Well Owner's Information

First Name Polarcorp Inc.	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
Mailing Address (Street Number/Name) 379 Queen Street South	Municipality Kitchener	Province ONT	Postal Code N2G 1W6
Telephone No. (inc. area code) 519 245 5324			

Well Location

Address of Well Location (Street Number/Name) 16 Eschella St South	Township	Lot	Concession
Country/District/Municipality Waterloo	City/Town/Village St Jacobs	Province Ontario	Postal Code
UTM Coordinates Zone 18	Easting 535771	Northing 4820882	Municipal Plan and Sublot Number
Other			

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From To
brown	brown	sand gravel	Fill	0 1.5
brown	sand	gravel	loose	1.5 3.1
brown	sand	gravel	moist	3.1 4.6

Annular Space		
Depth Set at (m/ft) From To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0 0.3	concrete	
0.3 1.2	Pentabek 36 Helepey	
1.2 4.6	Sika Seal #2	

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

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From To	☐ 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	
5.1	Plastic	.5	0.7+ 1.5		

Construction Record - Screen			
Outside Diameter (cm/in)	Material (Plastic, Galvanized Steel)	Slot No.	Depth (m/ft) From To
6.1	Plastic	10	1.5 4.6

Water Details		Hole Diameter	
Water found at Depth 3.1 (m/ft)	Kind of Water: ☐ Fresh ☒ Untested	Depth (m/ft) From To	Diameter (cm/in)
Water found at Depth 0 (m/ft)	Kind of Water: ☐ Fresh ☐ Untested	0 4.6	2cm
Water found at Depth 0 (m/ft)	Kind of Water: ☐ Fresh ☐ Untested		

Business Name of Well Contractor Direct Environmental Drilling Inc.		Well Contractor's Licence No. 7320
Business Address (Street Number/Name) 37 Shear Valley Dr		Municipality St Thomas
Province Ont	Postal Code N5R 6J5	Business E-mail Address garnston@directenvironmentaldrilling.com
Bus. Telephone No. (inc. area code) 519 868 0125		Name of Well Technician (Last Name, First Name) Armstrong Anthony
Well Technician's Licence No. 277		Signature of Technician and/or Contractor L. Colyer
Date Submitted 20130615		

Results of Well Yield Testing				
After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify _____	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason: _____	Static Level			
	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
Duration of pumping _____ hrs + _____ min	4		4	
Final water level end of pumping (m/ft)	10		10	
If flowing give rate (l/min / GPM)	15		15	
Recommended pump depth (m/ft)	20		20	
	25		25	
Recommended pump rate (l/min / GPM)	30		30	
	40		40	
Well production (l/min / GPM)	50		50	
Disinfected? ☐ Yes ☐ No	60		60	

Map of Well Location

Please provide a map below following instructions on the back.

Eschella St S

16 Eschella St South

Wellhead

Tag A234426

E535771

N4820882

143m - property line

Well owner's information package delivered ☒ Yes ☐ No	Date Package Delivered Y Y Y Y M M D D 20130615	Ministry Use Only Audit No. 2268815 OCT 13 2017 Received
---	---	---

Measurements recorded in: ☐ Metric ☒ Imperial

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

Well Record

Regulation 903 Ontario Water Resources Act

Page of

Address of Well Location (Street Number/Name) 1801 KING ST. N.		Township WOOLWICH	Lot 37	Concession GCT	
County/District/Municipality WATERLOO		City/Town/Village ST. JACOBS	Province Ontario	Postal Code N0B2N0	
UTM Coordinates Zone Easting NAD 8 3 175352574821945		Municipal Plan and Sublot Number		Other	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
			BENTONITE	20	19
			GRAVEL	19	8
			BENTONITE	8	7
			GRAVEL	7	0

Annular Space			
Depth Set at (m/ft)		Type of Sealant Used	Volume Placed
From	To	(Material and Type)	(m³/ft³)

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

Construction Record - Casing					Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)			
			From	To		
					☐ Water Supply	
					☐ Replacement Well	
					☐ Test Hole	
					☐ Recharge Well	
					☐ Dewatering Well	
					☐ Observation and/or Monitoring Hole	
					☐ Alteration (Construction)	
					☒ Abandoned,	

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

☐ Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify* _____
☐ Other, *specify* _____

Water Details		Hole Diameter	
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	Depth (m/ft) From	To Diameter (cm/in)
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____		
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____		

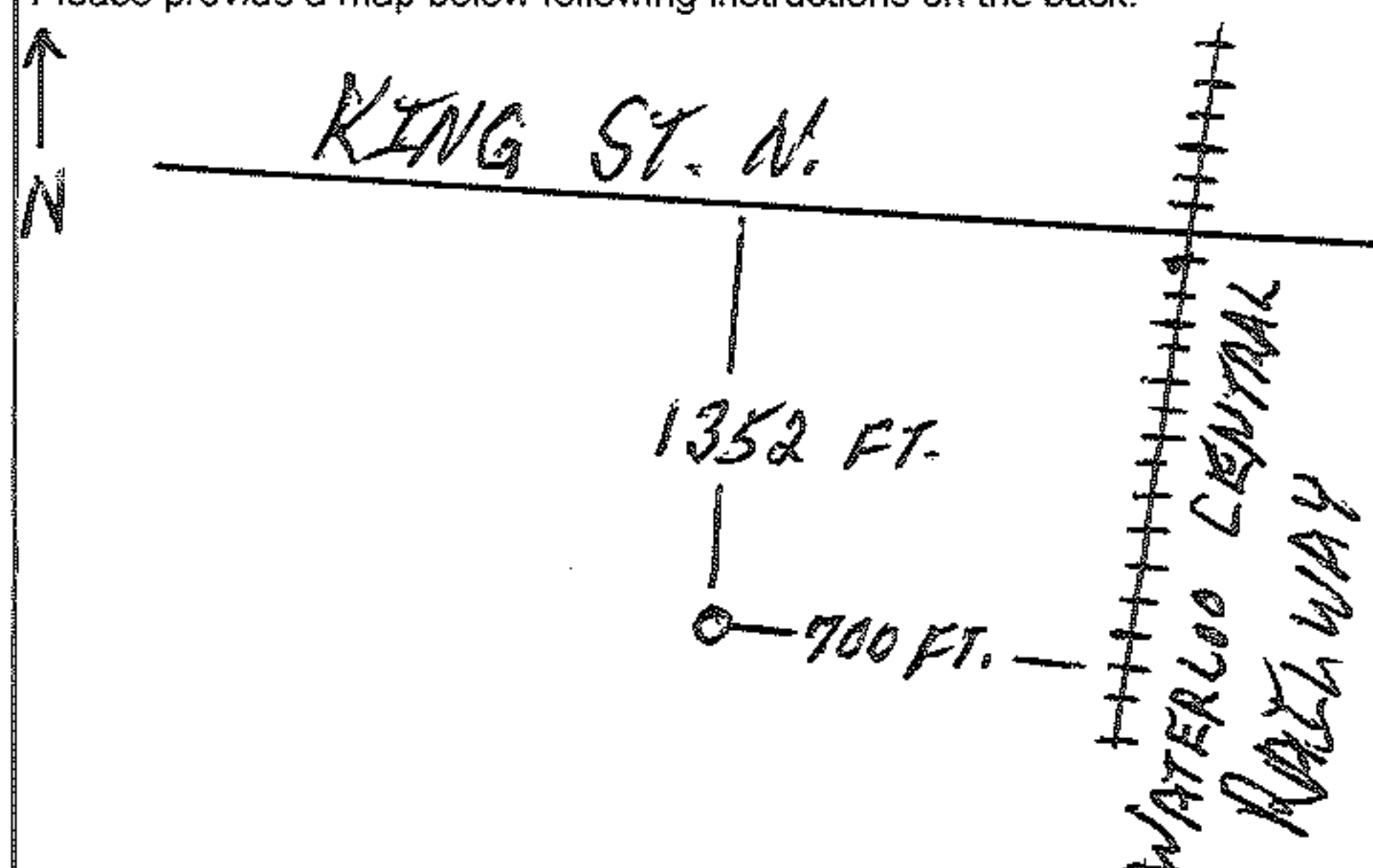
Well Contractor and Well Technician Information			
Business Name of Well Contractor		Well Contractor's Licence No.	
MARTIN'S WATER SYSTEMS LTD.		6-231	
Business Address (Street Number/Name)		Municipality	
2090 BRECKER SCHOOL LINE		KEMERA	
Province	Postal Code	Business E-mail Address	
ONT.	N3B2Z3	jerry@martinswater.ca	
Bus Telephone No. (inc. area code)		Name of Well Technician (Last Name, First Name)	
5196642580		MARTIN LAMORA	
Well Technician's Licence No.	Signature of Technician and/or Contractor		Date Submitted
3530	[Signature]		20180321

Results of Well Yield Testing

After test of well yield, water was:	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
☐ Clear and sand free ☐ Other, specify _____	Static Level			
If pumping discontinued, give reason:	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
Duration of pumping _____ hrs + _____ min	4		4	
Final water level end of pumping (m/ft)	5		5	
If flowing give rate (l/min / GPM)	10		10	
Recommended pump depth (m/ft)	15		15	
	20		20	
Recommended pump rate (l/min / GPM)	25		25	
	30		30	
Well production (l/min / GPM)	40		40	
	50		50	
Disinfected?	60		60	
☐ Yes ☐ No				

Map of Well Location

Please provide a map below following instructions on the back.



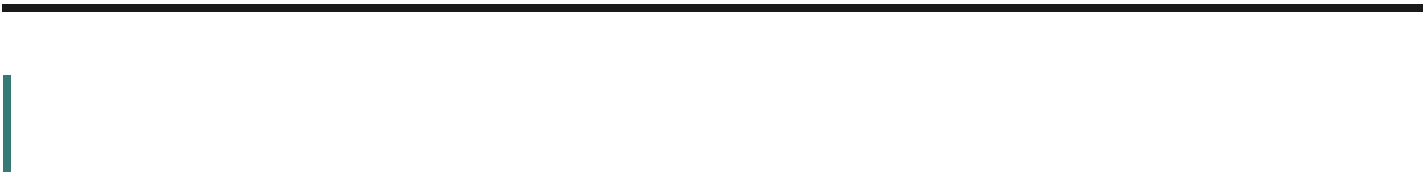
Comments:

Well owner's information package delivered	Date Package Delivered												Ministry Use Only	
	Y	Y	Y	Y	M	M	D	D	Audit No.	2284107			Received APR 16 2018	
☐ Yes ☐ No	Date Work Completed													
	20170314													

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the Open Data catalogue (<https://data.ontario.ca/dataset/well-records>) .



[Go Back to Map](#)

Well ID

Well ID Number: 7324922

Well Audit Number: Z294406

Well Tag Number: A253984

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	SAWMILL RD. SOUTH OF ROUNDABOUT WEST SIDE
Township	WOOLWICH TOWNSHIP

Lot	
Concession	
County/District/Municipality	WATERLOO
City/Town/Village	ST. JACOBS
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 536607.00 Northing: 4821232.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
BRWN	LOAM	LOOS	PCKD	0 ft	1 ft

BRWN	SAND	GRVL		1 ft	3 ft
BRWN	CLAY	SILT		3 ft	20 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed	
0 ft	1 ft	CONCRETE		
1 ft	13 ft	BENTONITE		
13 ft	20 ft	SAND		

Method of Construction & Well Use

Method of Construction	Well Use	
Rotary (Convent.)		
	Monitoring	

Status of Well

Observation Wells

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To	
6 inch	OTHER	0 ft	1 ft	
2 inch	PLASTIC	0 ft	15 ft	

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To	
2 inch	PLASTIC	15 ft	20 ft	

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7190

Results of Well Yield Testing

After test of well yield, water was		
If pumping discontinued, give reason		
Pump intake set at		

Pumping Rate	
Duration of Pumping	
Final water level	
If flowing give rate	
Recommended pump depth	
Recommended pump rate	
Well Production	
Disinfected?	N

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL	16 ft		
1		1	
2		2	
3		3	

4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind	
16 ft		

Hole Diameter

Depth From	Depth To	Diameter
0 ft	20 ft	8.25 inch

Audit Number: Z294406

Date Well Completed: September 24, 2018

Date Well Record Received by MOE: December 28, 2018

Related

How to use a Ministry of the Environment map (<https://www.ontario.ca/page/how-use-ministry-environment-map#wells>)

Technical documentation: Metadata record (<https://data.ontario.ca/dataset/well-records/resource/3031344e-e3f2-48d5-888c-c1deadfd2f77>)

Updated: January 10, 2024
Published: March 20, 2014

BH17-A10

Address of Well Location (Street Number/Name) Hawkesville Rd.		Township		Lot		Concession	
County/District/Municipality		City/Town/Village Wgto/100		Province Ontario		Postal Code	
UTM Coordinates		Zone Easting		Northing		Municipal Plan and Sublot Number	
NAD 83		753551		84821		422	

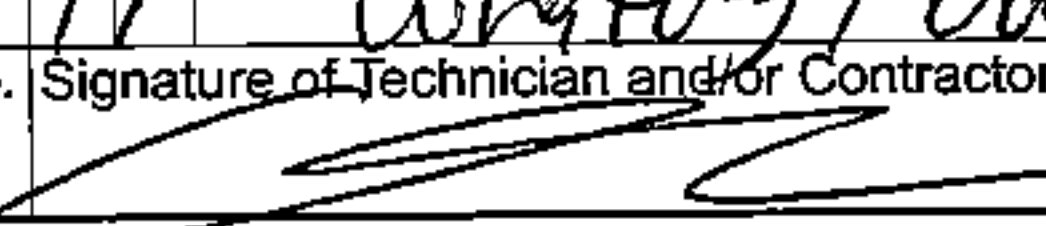
Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)				
General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From To
			PVC Removed / Bentonite Chip	15.0 0.0

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft) From To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify	Draw Down		Recovery
				Time (min)	Water Level (m/ft)	Time (min)
			If pumping discontinued, give reason:	Static Level		
				1		1
			Pump intake set at (m/ft)	2		2
			Pumping rate (l/min / GPM)	3		3
				4		4
			Duration of pumping hrs + min	5		5
			Final water level end of pumping (m/ft)	10		10
				15		15
			If flowing give rate (l/min / GPM)	20		20
				25		25
			Recommended pump depth (m/ft)	30		30
				40		40
			Recommended pump rate (l/min / GPM)	50		50
				60		60
			Well production (l/min / GPM)			
			Disinfected? ☐ Yes ☐ No			

Method of Construction		Well Use	
☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial
☐ Rotary (Conventional)	☐ Jetting	☐ Domestic	☐ Municipal
☐ Rotary (Reverse)	☐ Driving	☐ Livestock	☐ Test Hole
☐ Boring	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning
☐ Air percussion		☐ Industrial	
☐ Other, specify		☐ Other, specify	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From To	☐ 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		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify	Depth (m/ft) From To	Diameter (cm/in)

Well Contractor and Well Technician Information			
Business Name of Well Contractor Grider Associates Ltd.		Well Contractor's Licence No. 7610	
Business Address (Street Number/Name) 6925 Century Ave.		Municipality MISSISSAUGA	
Province ON	Postal Code L5N7K2	Business E-mail Address JYk@grider.com	
Bus. Telephone No. (inc. area code) 4162002911		Name of Well Technician (Last Name, First Name) Whately, Owen	
Well Technician's Licence No. 31693		Signature of Technician and/or Contractor 	
		Date Submitted 20200422	

Map of Well Location			
Please provide a map below following instructions on the back.			
See Attached map			
17-A10			

Comments:	
Well owner's information package delivered ☐ Yes ☐ No	
Date Package Delivered Y Y Y Y M M D D 20200520	Date Work Completed 20200520

Ministry Use Only	
Audit No.	328863
JUN 03 2020	
Received	



Ministry of
the Environment

Well Tag Number:

A 050321

Well Record

Regulation 903 Ontario Water Resources Act

page ____ of ____

Instructions for Completing Form

- For use in the Province of Ontario only. This document is a permanent legal document. Please retain for future reference.
- All Sections must be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Help Desk (Toll Free) at 1-888-396-9355.
- All metre measurements shall be reported to 1/10th of a metre.
- Please print clearly in blue or black ink only.

Ministry Use Only

Address of Well Location (County/District/Municipality)

Waterloo

Township

Woolwich

Lot

Concession

RR#/Street Number/Name

120 Flax Mill Rd

City/Town/Village

Conestogo

Site/Compartment/Block/Tract etc.

GPS Reading

NAD

Zone

Easting

Northing

Unit Make/Model

Mode of Operation:

☐ Undifferentiated

☒ Averaged

☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Metres To
brown	clay	silt		0	5
grey	clay	stones		5	28
grey	gravel			28	29

Hole Diameter		
Depth From	Metres To	Diameter Centimetres
+5	29	15.5

Water Record

Water found at _____ metres

Kind of Water:

☒ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals

Other: _____

☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals

Other: _____

After test of well yield, water was

☐ Clear and sediment free

☐ Other, specify _____

Chlorinated ☒ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Metres To
15.5	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	1.88	+5	29

Casing

☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized

Screen

Outside diam ☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized

Slot No. _____

No Casing or Screen

☐ Open hole

Test of Well Yield				
Pumping test method	Draw Down	Recovery		
	Time min	Water Level Metres	Time min	Water Level Metres
Pump intake set at - (metres) 25	Static Level	8.9		8.9
Pumping rate - (litres/min) 55	1	10.2	1	9.5
Duration of pumping 1 hrs + 0 min	2	10.4	2	9.1
Final water level end of pumping 2.4 metres	3	10.5	3	9
Recommended pump type ☐ Shallow ☐ Deep	4	10.4	4	9
Recommended pump depth 20 metres	5	10.6	5	9
Recommended pump rate (litres/min) 80	10	10.8	10	8.9
	15	10.5	15	8.9
If flowing give rate - (litres/min) 20	20	10.8	20	8.9
	25	10.8	25	8.9
If pumping discontinued, give reason.	30	10.8	30	8.9
	40	10.6	40	8.9
	50	10.6	50	8.9
	60	10.6	60	8.9

Plugging and Sealing Record ☒ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	6	Bentonite	35

Method of Construction

☐ Cable Tool ☒ Rotary (air) ☐ Diamond ☐ Digging

☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other

☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☒ Domestic ☐ Industrial ☐ Public Supply ☐ Other

☐ Stock ☐ Commercial ☐ Not used

☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☒ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)

☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering

☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Well Contractor/Technician Information

Name of Well Contractor: Packham Well Drilling Inc.

Well Contractor's Licence No.: 4207

Business Address (street name, number, city etc.): R.R. #2 Ancaster, Ont.

Name of Well Technician (last name, first name): Mervyn Packham

Well Technician's Licence No.: T0058

Signature of Technician/Contractor: [Signature]

Date Submitted: 2007 07 17

Location of Well

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

Diagram showing well location relative to road (Flax Mill Rd), lot line, and building. Well is at 312 Golf Course Rd.

Audit No. 59396

Date Well Completed: 2007 06 27

Was the well owner's information package delivered? ☒ Yes ☐ No

Date Delivered: 2007 06 27

Ministry Use Only

Data Source: Contractor

Date Received: 2007 09 20

Date of Inspection: 2007 06 27

Remarks:

Well Record Number:

65 N° 2591

UTM 17Z 536030E
5R 4820100N
Elev. 5R ~~1135~~ → 1100
Basin 28

The Water-well Drillers Act, 1954
Department of Mines

Water-Well Record

County or Territorial District Waterloo Township, Village, Town or City Woolwich
 [REDACTED] Village, Town or City)
 Address St. Jacobs
 Date completed
 (day) (month) (year)

Pipe and Casing Record

Pumping Test

Casing diameter(s) 5" I.D.
Length(s) 120'
Type of screen No 60 Cook slot 4 7/8
Length of screen 5' + 3' Blank pipe
with hemp rope Parker

Static level 45'
Pumping rate 750 G.P.H.
Pumping level 60
Duration of test 8 hrs.

Well Log

Water Record

[illegible]

For what purpose(s) is the water to be used?
Church Test No 1.

Is water clear or cloudy?.....*Clear*

Is well on upland, in valley, or on hillside?.....*Hillside*

Drilling firm

Address

Name of Driller

Address

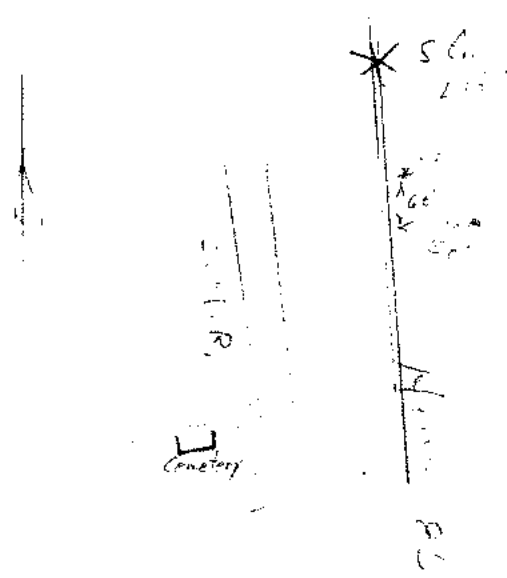
Licence Number.....*210*.....

I certify that the foregoing
statements of fact are true.

Date.....*April 24/55*.....*John Sander*
Signature of Licensee

Location of Well

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



CSS:5X

4010E



GROUND WATER BRANCH

65 ANO 1/ 2607

ONTARIO WATER
RESOURCES COMMISSION

UTM 17 2 535950 E

5 R 4819975 N

Elev. 5 R 1125

The Ontario Water Resources Commission Act

WATER WELL RECORD

Basin 23 Waterloo

County or District

Con. G. C. Lot 20 8

Township, Village, Town or City St. Jacobs

Date completed 3 Jan 63

Address St. Jacobs

Casing and Screen Record

Inside diameter of casing 30"

Total length of casing 72'

Type of screen

Length of screen

Depth to top of screen

Diameter of finished hole 30"

Pumping Test

Static level 64'

Test-pumping rate 2 G.P.M.

Pumping level 66

Duration of test pumping 24 hrs.

Water clear or cloudy at end of test clear

Recommended pumping rate 2 G.P.M.

with pump setting of 70' feet below ground surface

Well Log

Overburden and Bedrock Record

	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
top soil	0	2'	62'	fresh
gravel	2	5'		
blue clay	5'	72'		

Water Record

For what purpose(s) is the water to be used?

domestic

Is well on upland, in valley, or on hillside?

hillside

Drilling or Boring Firm

J. Moore

Address

Davis Drive
Newmarket

Licence Number

Name of Driller or Borer

J. Moore

Address

Davis Drive Newmarket

Date

10 Feb 1963

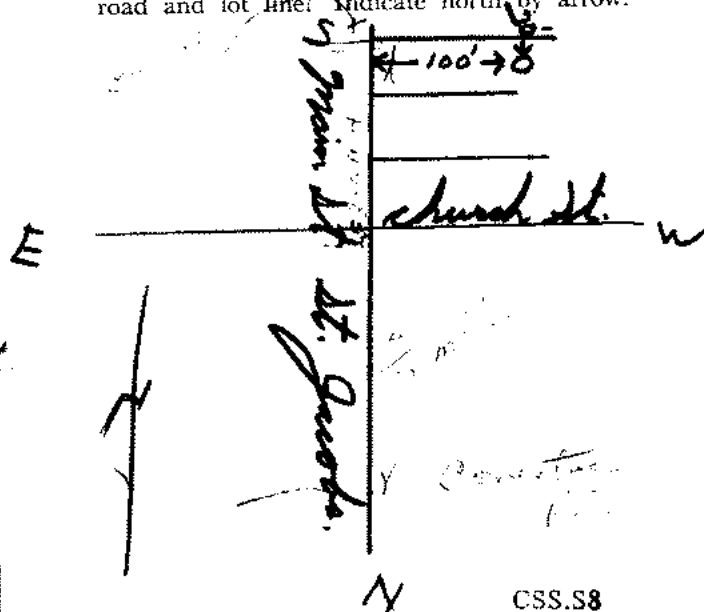
(Signature of Licensed Drilling or Boring Contractor)

J. Moore

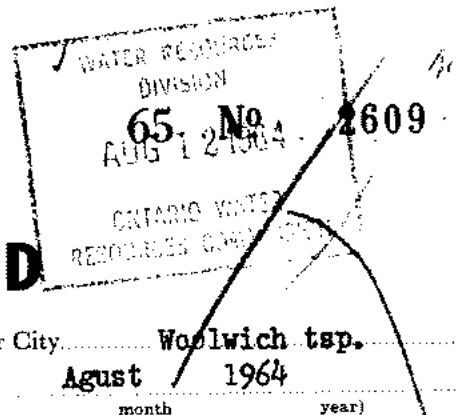
Form 7 15M Sets 60-5930

OWRC COPY

Location of Well

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

CSS.S8



40P1QE
UTM 17Z 535900E
5R 4819950N
Elev 51R 1825

The Ontario Water Resources Commission Act

WATER WELL RECORD

Basin 23 Waterloo county Township, Village, Town or City Woolwich tsp.
County or District not known Lot 8 Date completed 7 August 1964
(day month year)
St. Jacobs, Ontario.

Casing and Screen Record

Inside diameter of casing 30"
Total length of casing 27 feet
Type of screen gravelpacked
Length of screen
Depth to top of screen
Diameter of finished hole 30"

Pumping Test

Static level timed recovery 18'
Test-pumping rate 2 G.P.M.
Pumping level 27 feet
Duration of test pumping 1 hour bail test
Water clear or cloudy at end of test cloudy
Recommended pumping rate 2 G.P.M.
with pump setting of 26 feet below ground surface

Well Log

Overburden and Bedrock Record

	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
top soil	0	1		
brown clay	1	14		
blue clay	14	16		
brown sand	16	21	18m	fresh
blue clay	21	27		

Water Record

For what purpose(s) is the water to be used?

domestic

Is well on upland, in valley, or on hillside? level

Drilling or Boring Firm

Hadco Well Digging Ltd.
Elmira Ontario.

Address

Licence Number 1308

Name of Driller or Borer R.J. Franklin

Address St. Jacobs, Ontario.

Date August 7, 19 64

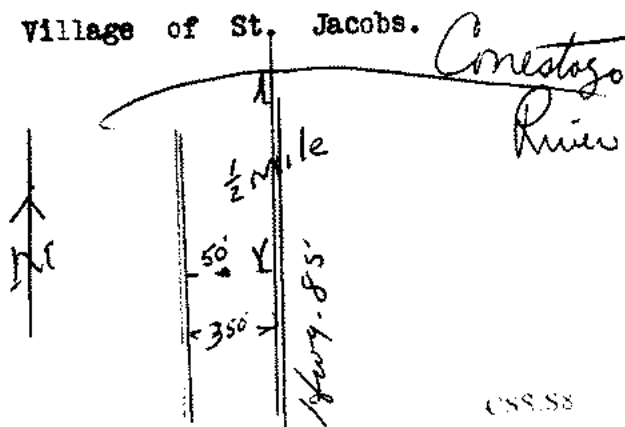
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

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

Next to the Bell Telephone automatic station on Queen Street.

Village of St. Jacobs.

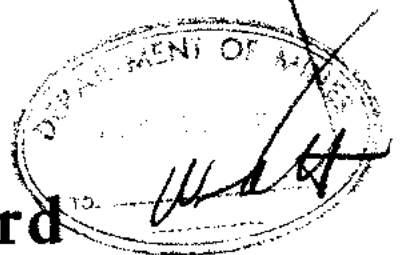


40 P10E 32
UTM 17 536050 E
15 4821050 N
Elev. 5 1125
Base 23 C. T.
Lot - 36



3-65 No 2664

The Well Drillers Act
Department of Mines, Province of Ontario



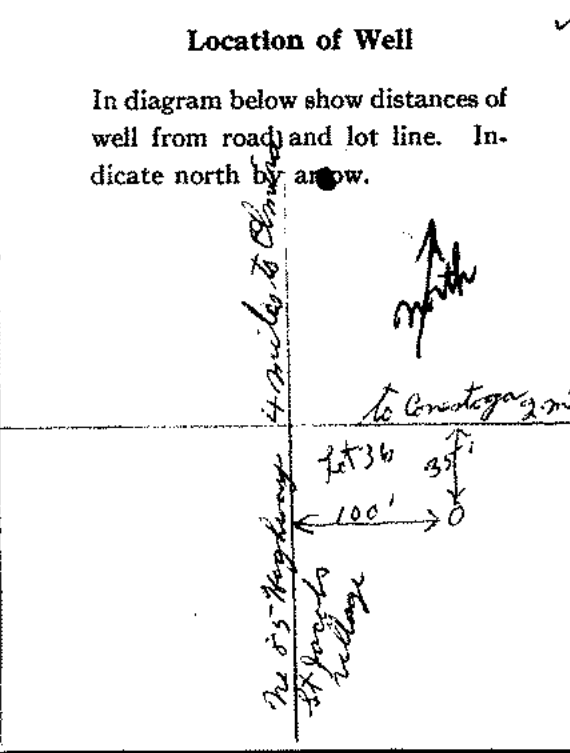
Water Well Record

Waterloo Township, Village, Town or City
Woolwich
St. Jacobs
Date Completed 22nd Dec 1951 Cost of Well (excluding pump) 4.50 per ft

Pipe and Casing Record		Pumping Test	
Casing diameter(s)	4.0 P.	Date	Oct 20, 1951
Length(s) of casing(s)	155 1/2	Static level	43'
Type of screen		Pumping level	
Length of screen		Pumping rate	900 gals per hr
Distance from top of screen to ground level		Duration of test	9 hrs
Is well a gravel-wall type?	Rock	Distance from cylinder or bowls to ground level	70'

Water Record			
Kind (fresh or mineral)	fresh	Depth(s) to Water Horizon(s)	No. of Feet Water Risen
Quality (hard, soft, contains iron, sulphur, etc.)	soft		
Appearance (clear, cloudy, coloured)	clear	164 1/2'	127 1/2'
For what purpose(s) is the water to be used?	house		
How far is well from possible source of contamination?	200		
What is the source of contamination?	prury		
Enclose a copy of any mineral analysis that has been made of water			

Well Log		
Overburden and Bedrock Record	From	To
OPEN WELL	0 ft.	28 ft.
hardpan	28'	35'
hardpan & stones	35'	41'
blue clay	41'	50'
hardpan & boulders	50'	67 1/2'
1 3/4" boulders	67 1/2'	70'
hardpan	70'	102'
Red clay	102'	120'
hardpan & stones	120'	130'
soft blue clay	130'	133'
crushed gravel	133'	138'
limestone rock	138'	146'
Shale rock	146'	150'
limestone rock	150'	164 1/2'

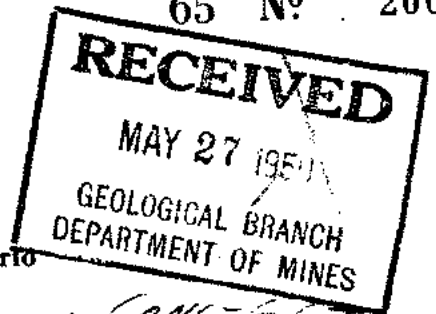


Situation: Is well on upland, in valley, or on hillside? Hillside
Drilling Firm.
Address.
Name of Driller JOHN SAUDER Address 2313 Elmira
Date Jan 12, 1952 - Well Drilling Licence Number 210
MR. L. ST. JACQUES, ONTARIO
John Sauder
Signature of Licensee

UTM 17 535900 E
9 4821050 N
Elev 1125
Basin 23



The Well Drillers Act
Department of Mines, Province of Ontario



65 No 2668

Water Well Record

CONC-S.C.T.
401-37

Date Completed Dec 23rd 1949 Cost of Well (not including pump) 425
R #1 ST JACOBS

Pipe and Casing Record

Pumping Test

Casing diameter(s) 4" O.D.
Length(s) of casing(s) 164'
Length of screen -
Type of screen -
Type of pump 3 1/4" casing
Capacity of pump 1000 gal per hr
Depth of pump setting 98'
Date Dec 22nd
Developed Capacity -
Duration of Test 10 hrs
Pumping Rate 950 gal per hr
Drawdown -
Static level of completed well 126' 46"
Is well a gravel-wall type? Rock

Water Record

Kind (fresh or mineral) Fresh
Quality (hard, soft, contains iron, sulphur etc.) Soft
Appearance (clear, cloudy, coloured) Clear
For what purpose(s) is the water to be used? Farm & Hatching
How far is well from possible source of contamination? 200'
What is source of contamination? Ven Stable
Enclose a copy of any mineral analysis that has been made of water

Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
46	Fresh	126

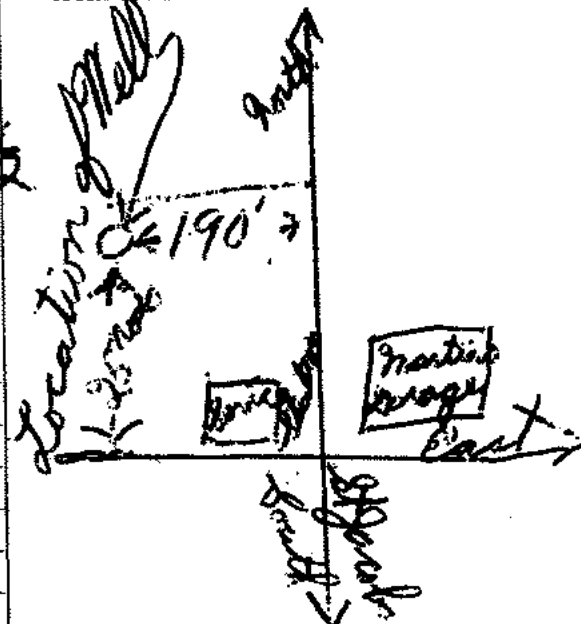
Well Log

Drift and Bedrock Record

	From 0 ft.	To ft.
Top Soil	2	14
Yellow Clay	14	148
Hard Pan & Shales	148	164
Shale Rock	164	172
Hard Rock		

Location of Well

In diagram below show distances of well from road and lot line



Situation: Is well on upland, in valley, or on hillside? Upland
Drilling Firm John Sawyer & Sons
Address R.R. #1 St. Jacobs Ont
Recorded by John Sawyer Address R.R. #1 St. Jacobs
Date May 23rd 1950 Licence Number 390

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the Open Data catalogue (<https://data.ontario.ca/dataset/well-records>) .



[Go Back to Map](#)

Well ID

Well ID Number: 6502669

Well Audit Number:

Well Tag Number:

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	
Township	WOOLWICH TOWNSHIP
Lot	037
Concession	GCT
County/District/Municipality	WATERLOO
City/Town/Village	
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 535339.10 Northing: 4822223.00
Municipal Plan and Sublot Number	

Other	
-------	--

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
	LOAM			0 ft	3 ft
YLLW	CLAY			3 ft	15 ft
	HPAN			15 ft	34 ft
	GRVL			34 ft	35 ft
BRWN	CLAY	MSND		35 ft	65 ft
	HPAN			65 ft	82 ft
BRWN	CLAY	MSND		82 ft	98 ft

BLUE	CLAY	STNS		98 ft	104 ft
	STNS			104 ft	106 ft
	HPAN			106 ft	142 ft
	MSND			142 ft	153 ft
	LMSN			153 ft	182 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed	

Method of Construction & Well Use

Method of Construction	Well Use	

Cable Tool	Domestic
	Livestock

Status of Well

Water Supply

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To	
4 inch	STEEL		164 ft	
4 inch	OPEN HOLE		182 ft	

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To	

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 4725

Results of Well Yield Testing

After test of well yield, water was	CLEAR	
If pumping discontinued, give reason		
Pump intake set at		
Pumping Rate	15 GPM	
Duration of Pumping	8 h:0 m	

Final water level	
If flowing give rate	
Recommended pump depth	
Recommended pump rate	
Well Production	PUMP
Disinfected?	

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL	48 ft		
1		1	
2		2	

3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
45		45	
50		50	

60		60	

Water Details

Water Found at Depth	Kind	
182 ft	Fresh	

Hole Diameter

Depth From	Depth To	Diameter	

--	--	--

Audit Number:**Date Well Completed:** September 08, 1951**Date Well Record Received by MOE:** January 14, 1952**Related**

How to use a Ministry of the Environment map (<https://www.ontario.ca/page/how-use-ministry-environment-map#wells>)

Technical documentation: Metadata record (<https://data.ontario.ca/dataset/well-records/resource/3031344e-e3f2-48d5-888c-c1deadfd2f77>)

Updated: January 10, 2024

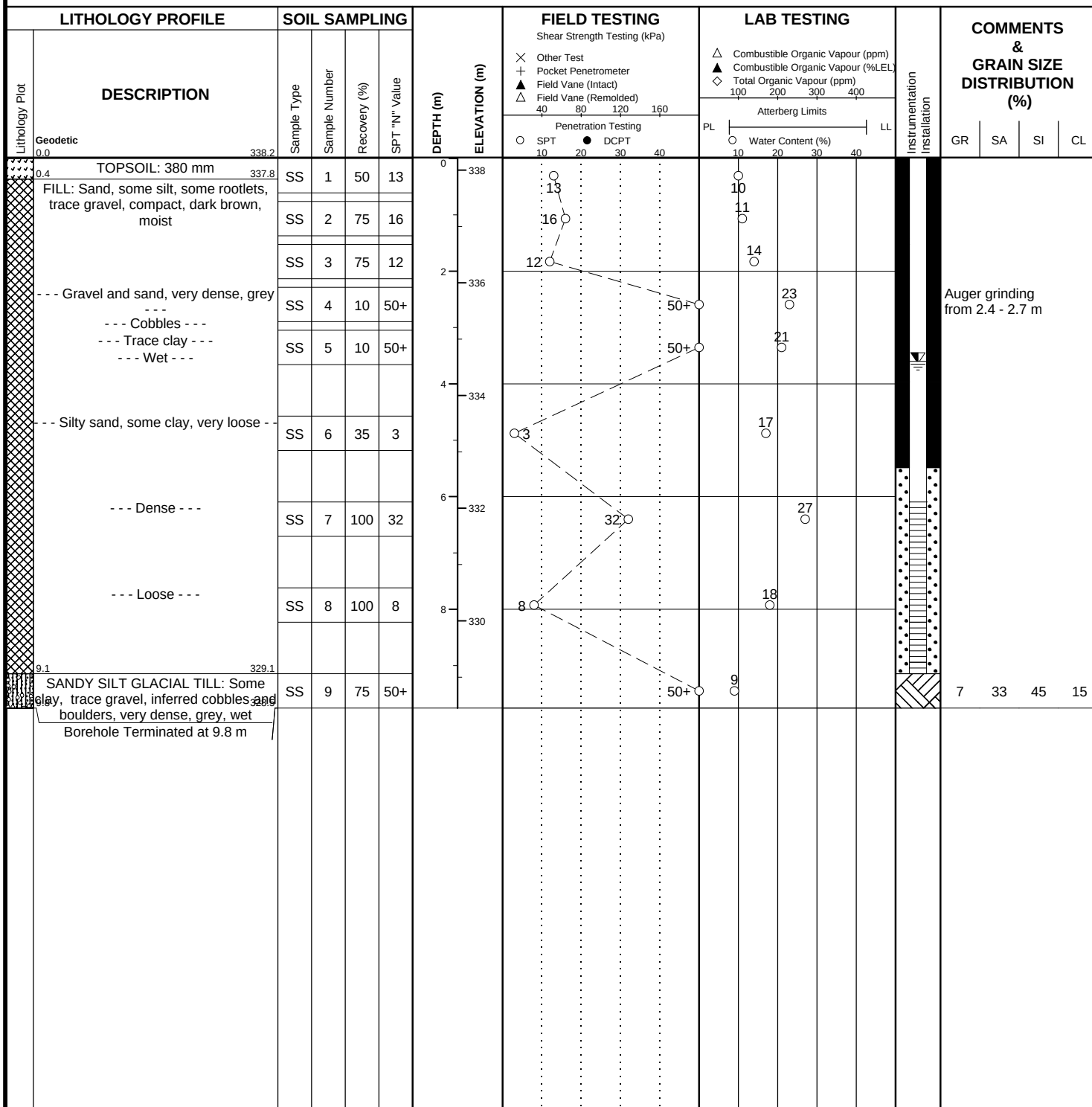
Published: March 20, 2014

Appendix E Borehole Logs and Geotechnical Testing

RECORD OF BOREHOLE No. 24-01

Project Number: **2403070**
 Project Client: **Polocorp**
 Project Name: _____
 Project Location: **51-55 Hawkesville Road, St. Jacobs, ON**
 Drilling Location: **See Borehole Location Plan**
 Local Benchmark: _____

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
 Logged By: **MM** Northing: **4821191** Date Started: **Apr 23/24**
 Reviewed By: **GL** Easting: **535655** Date Completed: **Apr 23/24**



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Groundwater depth encountered on completion of drilling: Dry Cave depth after auger removal: Open
 Groundwater depth observed on: May 03/24 at depth of: 3.6 m. Groundwater Elevation: 334.6 m

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

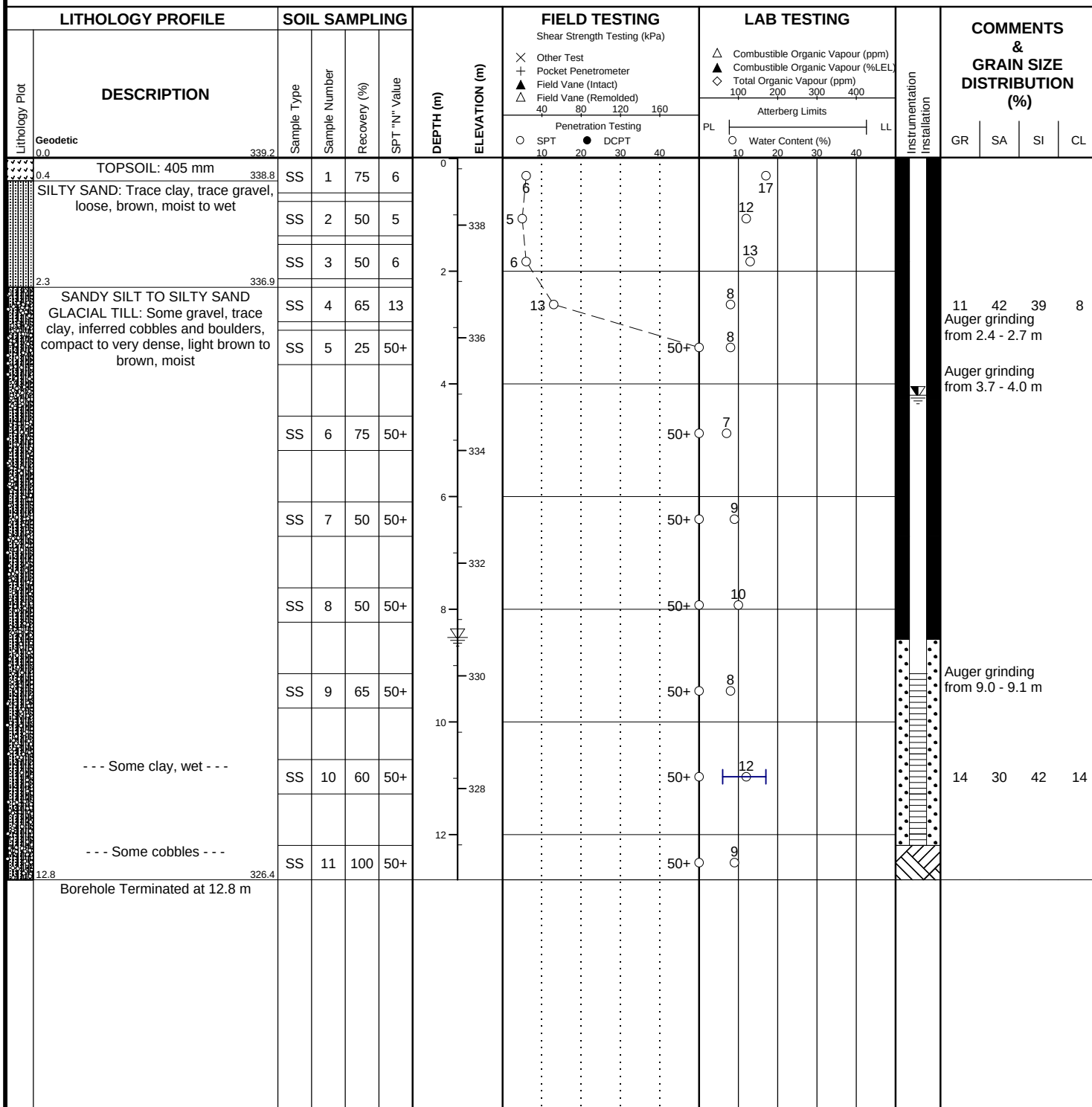
Scale: 1 :100

Page: 1 of 1

RECORD OF BOREHOLE No. 24-02

Project Number: **2403070**
 Project Client: **Polocorp**
 Project Name: _____
 Project Location: **51-55 Hawkesville Road, St. Jacobs, ON**
 Drilling Location: **See Borehole Location Plan**
 Local Benchmark: _____

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
 Logged By: **MM** Northing: **4821181** Date Started: **Apr 23/24**
 Reviewed By: **GL** Easting: **535822** Date Completed: **Apr 23/24**



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Groundwater depth encountered on completion of drilling: 8.5 m. Cave depth after auger removal: Open
 Groundwater depth observed on: May 03/24 at depth of: 4.2 m. Groundwater Elevation: 335.0 m

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: 1:100

Page: 1 of 1

RECORD OF BOREHOLE No. 24-03

Project Number: **2403070**

Project Client: **Polocorp**

Project Name: _____

Project Location: 51-55 Hawkesville Road, St. Jacobs, ON

Drilling Location: See Borehole Location Plan

Local Benchmark: _____

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**

Logged By: MM Northing: 4821245 Date Started: Apr 23/24

Reviewed By: GL Easting: 535712 Date Completed: Apr 23/24

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[illegible]

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	Groundwater depth encountered on completion of drilling: Dry		Cave depth after auger removal: Open
	Groundwater depth observed on: May 03/24 at depth of: 0.9 m.		Groundwater Elevation: 339.2 m

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale 1 : 100

Page: 1 of 1

RECORD OF BOREHOLE No. 24-04



Project Number: **2403070**
 Project Client: **Polocorp**
 Project Name: _____
 Project Location: **51-55 Hawkesville Road, St. Jacobs, ON**
 Drilling Location: **See Borehole Location Plan**
 Local Benchmark: _____

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
 Logged By: **MM** Northing: **4821270** Date Started: **Apr 23/24**
 Reviewed By: **GL** Easting: **535795** Date Completed: **Apr 23/24**

LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING		LAB TESTING		Instrumentation Installation	COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value			Shear Strength Testing (kPa)	Penetration Testing	Atterberg Limits	Water Content (%)		GR	SA	SI	CL
	Geodetic 0.0							×	△ Combustible Organic Vapour (ppm) ▲ Combustible Organic Vapour (%LEL) ◇ Total Organic Vapour (ppm) 100 200 300 400	PL	○					
	0.5	TOPSOIL: 455 mm	SS	1	100	4	346.4	○	●	LL	○					
		SANDY SILT TO SILTY SAND	SS	2	75	15		4			○					
		GLACIAL TILL: Trace clay, trace gravel, inferred cobbles and boulders, compact to dense, brown, moist	SS	3	100	21					○					
			SS	4	100	31					○					
			SS	5	100	31					○					
											○					
			SS	6	100	45					○					
	5.2	Borehole Terminated at 5.2 m														

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Groundwater depth encountered on completion of drilling: Dry Cave depth after auger removal: Open
 Groundwater depth observed on: May 03/24 at depth of: 4.0 m. Groundwater Elevation: 342.4 m

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: 1:100

Page: 1 of 1

RECORD OF BOREHOLE No. 24-05



Project Number: **2403070**
 Project Client: **Polocorp**
 Project Name: _____
 Project Location: **51-55 Hawkesville Road, St. Jacobs, ON**
 Drilling Location: **See Borehole Location Plan**
 Local Benchmark: _____

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
 Logged By: **MM** Northing: **4821316** Date Started: **Apr 23/24**
 Reviewed By: **GL** Easting: **535619** Date Completed: **Apr 23/24**

LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING		LAB TESTING		Instrumentation Installation	COMMENTS & GRAIN SIZE DISTRIBUTION (%)				
DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT "N" Value			Shear Strength Testing (kPa)		Atterberg Limits			GR SA SI CL				
Lithology Plot	Geodetic					0	338.6	X Other Test + Pocket Penetrometer ▲ Field Vane (Intact) △ Field Vane (Remolded)		△ Combustible Organic Vapour (ppm) ▲ Combustible Organic Vapour (%LEL) ◇ Total Organic Vapour (ppm)		Instrumentation Installation					
	0.0					0.2	338.5	Penetration Testing ○ SPT ● DCPT		PL Water Content (%) LL							
	TOPSOIL: 355 mm		SS	1	35	3	0	338	○ 3		○ 13						
	SILTY CLAY: Some sand, some organics, trace gravel, soft, brown to grey, wet		SS	2	75	2	0.2	337.9	○ 2		○ 10		4 41 46 9				
	SANDY SILT TO SILTY SAND		SS	3	75	4	2		○ 4								
	GLACIAL TILL: Trace to some clay, trace gravel, inferred cobbles and boulders, very loose to compact, grey, moist to wet		SS	4	65	11		336	○ 11		○ 14						
	- - - Dense to very dense - - -		SS	5	75	39	4		○ 39		○ 11						
								334	○ 50+		○ 12						
	5.2		SS	6	20	50+		333.5									
Borehole Terminated at 5.2 m																	

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Groundwater depth encountered on completion of drilling: Dry Cave depth after auger removal: Open
 Groundwater depth observed on: May 03/24 at depth of: 0.2 m. Groundwater Elevation: 338.4 m

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: 1:100

Page: 1 of 1

RECORD OF BOREHOLE No. 24-06



Project Number: **2403070**
 Project Client: **Polocorp**
 Project Name: _____
 Project Location: **51-55 Hawkesville Road, St. Jacobs, ON**
 Drilling Location: **See Borehole Location Plan**
 Local Benchmark: _____

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
 Logged By: **MM** Northing: **4821347** Date Started: **Apr 23/24**
 Reviewed By: **GL** Easting: **535756** Date Completed: **Apr 23/24**

LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING		LAB TESTING		Instrumentation Installation	COMMENTS & GRAIN SIZE DISTRIBUTION (%)				
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value			Shear Strength Testing (kPa)	Penetration Testing	Atterberg Limits	Water Content (%)		GR	SA	SI	CL	
	Geodetic 0.0 345.1																
	0.3 TOPSOIL: 305 mm 344.7	SS	1	75	4	0	344.7	4									
	SANDY SILT TO SILTY SAND GLACIAL TILL: Trace clay, trace gravel, inferred cobbles and boulders, loose to compact, brown, moist	SS	2	100	8			8									
		SS	3	100	19	2		19									
		SS	4	100	21			21									
		SS	5	100	25			25									
							4										
	--- Dense ---	SS	6	100	34	5.2	339.9	34									
	Borehole Terminated at 5.2 m																

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Groundwater depth encountered on completion of drilling: Dry Cave depth after auger removal: Open
 Groundwater depth observed on: May 03/24 at depth of: 3.2 m. Groundwater Elevation: 341.9 m

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: 1 : 100

Page: 1 of 1

RECORD OF BOREHOLE No. PZ-01



Project Number: 2403070

Project Client: **Polocorp**

Project Name:

Project Location: **51-55 Hawkesville Road, St. Jacobs, ON**

Drilling Location: **See Borehole Location Plan**

Local Benchmark: _____

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**

Logged By: MM/MO Northing: _____ Date Started: May 13/24

Reviewed By: **GL** Easting: _____ Date Completed: **May 13/24**

[illegible]

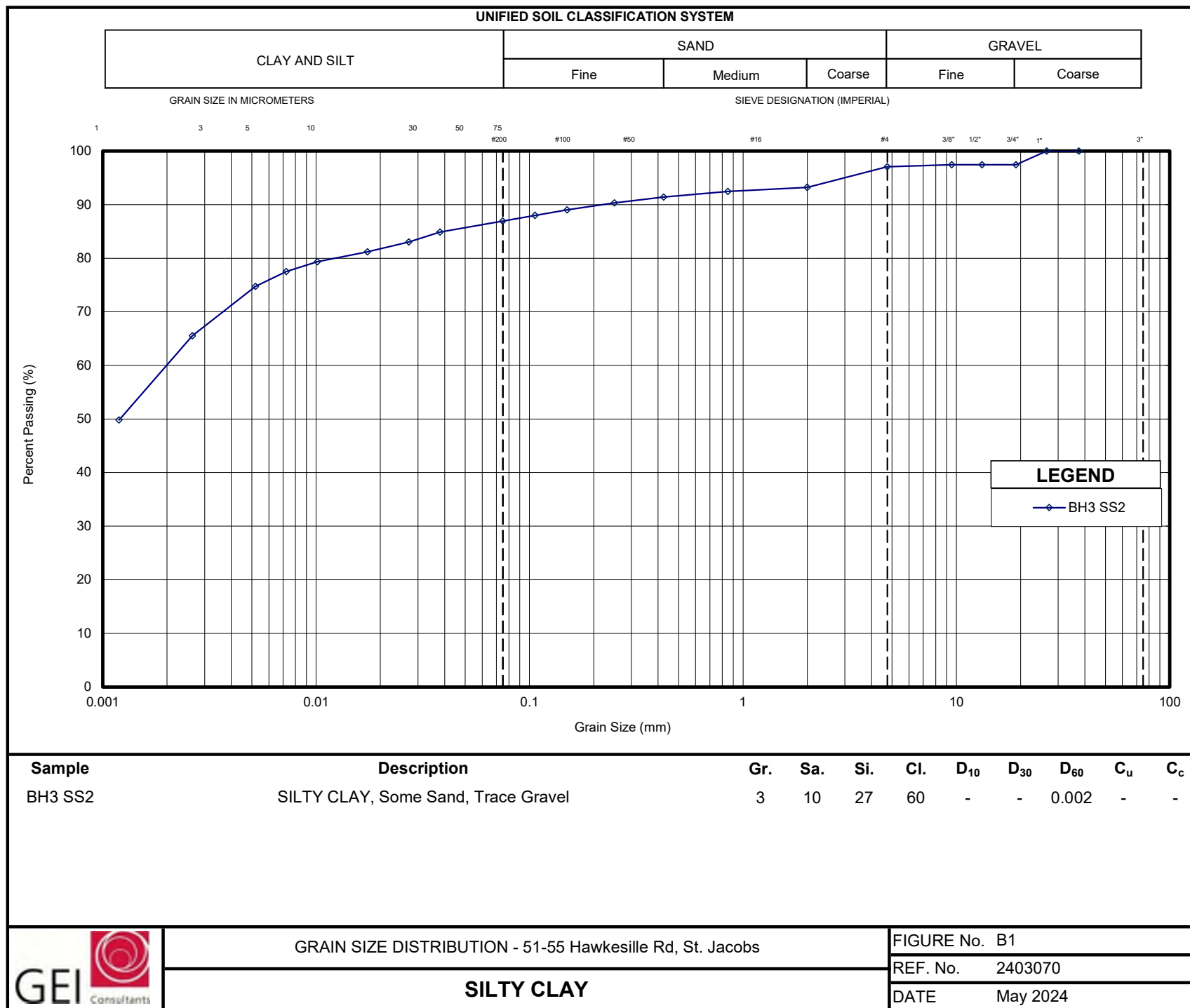
GEI CONSULTANTS
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	Groundwater depth encountered on completion of drilling:	<u>C</u>
	Groundwater depth observed on: May 13/24 at depth of: 0.3 m.	Groundwater Elevation: 338.3 m

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale 1 : 100

Page: 1 of 1





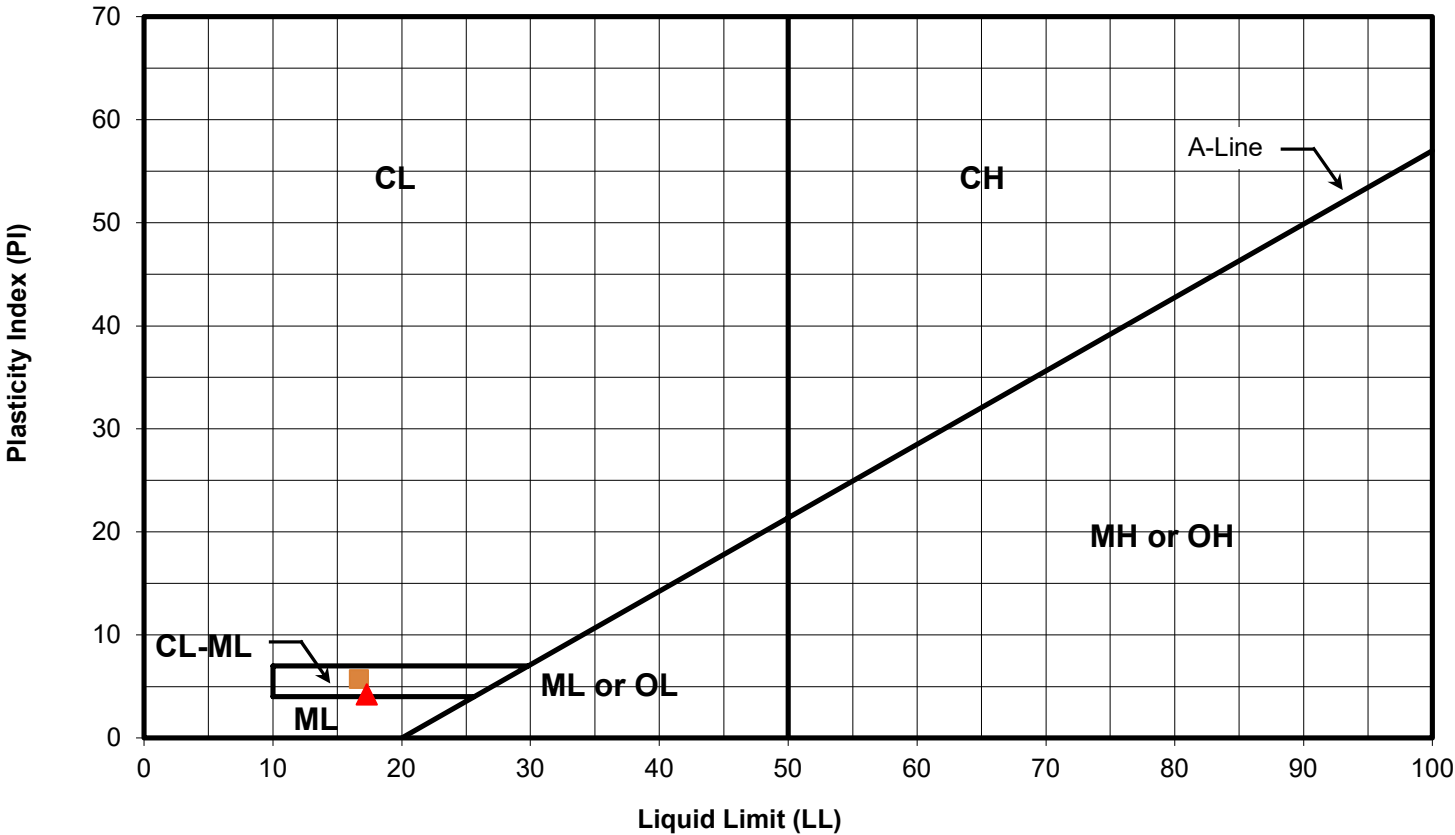
Atterberg Limits Report

Project Name: 51-55 Hawkesville Rd, St. Jacobs
Project No.: 2403070
Client: Polocorp

Figure No.: B3
Date Tested: May 2, 2024
Date Sampled: April 23, 2024

SAMPLE INFORMATION								
SAMPLE ID	BH2 SS10	LIQUID LIMIT (LL):	16.7	PLASTIC LIMIT (PL)	11.0	PLASTIC INDEX (PI)	5.7	■
SAMPLE ID	BH5 SS2	LIQUID LIMIT (LL):	17.3	PLASTIC LIMIT (PL)	13.1	PLASTIC INDEX (PI)	4.2	▲

Plasticity Chart - Glacial Till



Appendix F Laboratory Certificate of Analysis

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: WT2412415	Page	: 1 of 11
Amendment	: 1		
Client	: GEI Consultants Ltd.	Laboratory	: ALS Environmental - Waterloo
Contact	: Matthew Long	Account Manager	: Amanda Overholster
Address	: 650 Woodlawn Rd West Block C, Unit 2 Guelph ON Canada N1H 8J1	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 2403070	Date Samples Received	: 16-May-2024 15:20
PO	: ----	Date Analysis Commenced	: 17-May-2024
C-O-C number	: 20-1082938	Issue Date	: 24-May-2024 13:43
Sampler	: MO		
Site	: ----		
Quote number	: 2024 SOA		
No. of samples received	: 3		
No. of samples analysed	: 3		

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
- Guideline Comparison

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
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Kelly Fischer	Technical Specialist	Inorganics, Waterloo, Ontario
Kelly Fischer	Technical Specialist	Metals, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, 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.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	no units
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units

>: greater than.

<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).

For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit .

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	<i>Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.</i>
DLHC	<i>Detection Limit Raised: Dilution required due to high concentration of test analyte(s).</i>
DLM	<i>Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).</i>
OWP	<i>Organic water sample contained visible sediment (must be included as part of analysis). Measured concentrations of organic substances in water can be biased high due to presence of sediment.</i>
TMV	<i>Turbidity exceeded upper limit of the nephelometric method. Minimum value reported.</i>



Analytical Results

				Client sample ID							
				Sampling date/time	BH/MW1						
Sub-Matrix: Groundwater (Matrix: Water)					13-May-2024 10:00						
Analyte	Method/Lab	LOR	Unit	WT2412415-001		ON153/04 T2-GW-C-All	ON153/04 T2-GW-F-All	--	--	--	--
Physical Tests											
Colour, apparent	E330/WT	2.0	CU	10800	DLHC DLM	--	--	--	--	--	--
Conductivity	E100/WT	2.0	µS/cm	2310		--	--	--	--	--	--
pH	E108/WT	0.10	pH units	7.77		--	--	--	--	--	--
Solids, total dissolved [TDS]	E162/WT	10	mg/L	1280	DLDS	--	--	--	--	--	--
Turbidity	E121/WT	0.10	NTU	>4000	TMV	--	--	--	--	--	--
Alkalinity, total (as CaCO3)	E290/WT	2.0	mg/L	1280	DLHC	--	--	--	--	--	--
Anions and Nutrients											
Ammonia, total (as N)	E298/WT	0.0050	mg/L	48.8	DLHC	--	--	--	--	--	--
Bromide	E235.Br/WT	0.10	mg/L	<0.50	DLDS	--	--	--	--	--	--
Chloride	E235.Cl/WT	0.50	mg/L	203	DLDS	790 mg/L	790 mg/L	--	--	--	--
Fluoride	E235.F/WT	0.020	mg/L	0.233	DLDS	--	--	--	--	--	--
Nitrate (as N)	E235.NO3/WT	0.020	mg/L	<0.100	DLDS	--	--	--	--	--	--
Nitrite (as N)	E235.NO2/WT	0.010	mg/L	<0.050	DLDS	--	--	--	--	--	--
Sulfate (as SO4)	E235.SO4/WT	0.30	mg/L	26.8	DLDS	--	--	--	--	--	--
Dissolved Metals											
Aluminum, dissolved	E421/WT	0.0010	mg/L	0.0119	DLHC	--	--	--	--	--	--
Antimony, dissolved	E421/WT	0.00010	mg/L	<0.00100	DLHC	0.006 mg/L	0.006 mg/L	--	--	--	--
Arsenic, dissolved	E421/WT	0.00010	mg/L	0.00145	DLHC	0.025 mg/L	0.025 mg/L	--	--	--	--
Barium, dissolved	E421/WT	0.00010	mg/L	0.142	DLHC	1 mg/L	1 mg/L	--	--	--	--
Beryllium, dissolved	E421/WT	0.000020	mg/L	<0.000200	DLHC	0.004 mg/L	0.004 mg/L	--	--	--	--
Bismuth, dissolved	E421/WT	0.000050	mg/L	<0.000500	DLHC	--	--	--	--	--	--
Boron, dissolved	E421/WT	0.010	mg/L	<0.100	DLHC	5 mg/L	5 mg/L	--	--	--	--
Cadmium, dissolved	E421/WT	0.0000050	mg/L	<0.0000500	DLHC	0.0027 mg/L	0.0027 mg/L	--	--	--	--
Calcium, dissolved	E421/WT	0.050	mg/L	160	DLHC	--	--	--	--	--	--
Cesium, dissolved	E421/WT	0.000010	mg/L	<0.000100	DLHC	--	--	--	--	--	--
Chromium, dissolved	E421/WT	0.00050	mg/L	<0.00500	DLHC	0.05 mg/L	0.05 mg/L	--	--	--	--
Cobalt, dissolved	E421/WT	0.00010	mg/L	0.00502	DLHC	0.0038 mg/L	0.0038 mg/L	--	--	--	--
Copper, dissolved	E421/WT	0.00020	mg/L	<0.00200	DLHC	0.087 mg/L	0.087 mg/L	--	--	--	--
Iron, dissolved	E421/WT	0.010	mg/L	<0.100	DLHC	--	--	--	--	--	--
Lead, dissolved	E421/WT	0.000050	mg/L	<0.000500	DLHC	0.01 mg/L	0.01 mg/L	--	--	--	--
Lithium, dissolved	E421/WT	0.0010	mg/L	<0.0100	DLHC	--	--	--	--	--	--
Magnesium, dissolved	E421/WT	0.0050	mg/L	64.6	DLHC	--	--	--	--	--	--



Analyte	Method/Lab	LOR	Unit	WT2412415-001 (Continued)	ON153/04 T2-GW-C-All	ON153/04 T2-GW-F-All	--	--	--	--
Dissolved Metals - Continued										
Manganese, dissolved	E421/WT	0.00010	mg/L	1.59 DLHC	--	--	--	--	--	--
Molybdenum, dissolved	E421/WT	0.000050	mg/L	0.0203 DLHC	0.07 mg/L	0.07 mg/L	--	--	--	--
Nickel, dissolved	E421/WT	0.00050	mg/L	0.00828 DLHC	0.1 mg/L	0.1 mg/L	--	--	--	--
Phosphorus, dissolved	E421/WT	0.050	mg/L	<0.500 DLHC	--	--	--	--	--	--
Potassium, dissolved	E421/WT	0.050	mg/L	50.5 DLHC	--	--	--	--	--	--
Rubidium, dissolved	E421/WT	0.00020	mg/L	0.0121 DLHC	--	--	--	--	--	--
Selenium, dissolved	E421/WT	0.000050	mg/L	0.000557 DLHC	0.01 mg/L	0.01 mg/L	--	--	--	--
Silicon, dissolved	E421/WT	0.050	mg/L	9.15 DLHC	--	--	--	--	--	--
Silver, dissolved	E421/WT	0.000010	mg/L	<0.000100 DLHC	0.0015 mg/L	0.0015 mg/L	--	--	--	--
Sodium, dissolved	E421/WT	0.050	mg/L	200 DLHC	490 mg/L	490 mg/L	--	--	--	--
Strontium, dissolved	E421/WT	0.00020	mg/L	0.646 DLHC	--	--	--	--	--	--
Sulfur, dissolved	E421/WT	0.50	mg/L	10.3 DLHC	--	--	--	--	--	--
Tellurium, dissolved	E421/WT	0.00020	mg/L	<0.00200 DLHC	--	--	--	--	--	--
Thallium, dissolved	E421/WT	0.000010	mg/L	<0.000100 DLHC	0.002 mg/L	0.002 mg/L	--	--	--	--
Thorium, dissolved	E421/WT	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
Tin, dissolved	E421/WT	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
Titanium, dissolved	E421/WT	0.00030	mg/L	<0.00300 DLHC	--	--	--	--	--	--
Tungsten, dissolved	E421/WT	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
Uranium, dissolved	E421/WT	0.000010	mg/L	0.00224 DLHC	0.02 mg/L	0.02 mg/L	--	--	--	--
Vanadium, dissolved	E421/WT	0.00050	mg/L	<0.00500 DLHC	0.0062 mg/L	0.0062 mg/L	--	--	--	--
Zinc, dissolved	E421/WT	0.0010	mg/L	<0.0100 DLHC	1.1 mg/L	1.1 mg/L	--	--	--	--
Zirconium, dissolved	E421/WT	0.00030	mg/L	<0.00300 DLHC	--	--	--	--	--	--
Dissolved metals filtration location	EP421/WT		-	Laboratory	--	--	--	--	--	--
Volatile Organic Compounds										
Benzene	E611A/WT	0.50	µg/L	<0.50	5 µg/L	5 µg/L	--	--	--	--
Ethylbenzene	E611A/WT	0.50	µg/L	<0.50	2.4 µg/L	2.4 µg/L	--	--	--	--
Toluene	E611A/WT	0.50	µg/L	11.1 OWP	24 µg/L	24 µg/L	--	--	--	--
Xylene, m+p-	E611A/WT	0.40	µg/L	<0.40	--	--	--	--	--	--
Xylene, o-	E611A/WT	0.30	µg/L	<0.30	--	--	--	--	--	--
Xylenes, total	E611A/WT	0.50	µg/L	<0.50	300 µg/L	300 µg/L	--	--	--	--
BTEX, total	E611A/WT	1.0	µg/L	11.1	--	--	--	--	--	--
Hydrocarbons										
F1 (C6-C10)	E581.F1-L/WT	25	µg/L	<25	750 µg/L	750 µg/L	--	--	--	--
F2 (C10-C16)	E601.SG/WT	100	µg/L	<100	150 µg/L	150 µg/L	--	--	--	--
F3 (C16-C34)	E601.SG/WT	250	µg/L	<250	500 µg/L	500 µg/L	--	--	--	--



Analyte	Method/Lab	LOR	Unit	WT2412415-001 (Continued)	ON153/04 T2-GW-C-All	ON153/04 T2-GW-F-All	--	--	--	--
Hydrocarbons - Continued										
F4 (C34-C50)	E601.SG/WT	250	µg/L	<250	500 µg/L	500 µg/L	--	--	--	--
F1-BTEX	EC580/WT	25	µg/L	<25	750 µg/L	750 µg/L	--	--	--	--
Hydrocarbons, total (C6-C50)	EC581SG/WT	240	µg/L	<370	--	--	--	--	--	--
Chromatogram to baseline at nC50	E601.SG/WT		-	YES	--	--	--	--	--	--
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	E601.SG/WT	1.0	%	112	--	--	--	--	--	--
Dichlorotoluene, 3,4-	E581.F1-L/WT	1.0	%	91.0	--	--	--	--	--	--
Bromofluorobenzene, 4-	E611A/WT	1.0	%	98.0	--	--	--	--	--	--
Difluorobenzene, 1,4-	E611A/WT	1.0	%	99.7	--	--	--	--	--	--

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
BH/MW1	Water	Cobalt, dissolved		ON153/04	T2-GW-C-All	0.00502 mg/L	0.0038 mg/L
	Water	Cobalt, dissolved		ON153/04	T2-GW-F-All	0.00502 mg/L	0.0038 mg/L

Key:

ON153/04	Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)
T2-GW-C-All	153 T2-Ground Water (Coarse Soil)-All Types of Property Use
T2-GW-F-All	153 T2-Ground Water (Fine Soil)-All Types of Property Use



Analytical Results

				Client sample ID							
				Sampling date/time	BH/MW3						
					13-May-2024 09:20						
					WT2412415-002	ON153/04 T2-GW-C-All	ON153/04 T2-GW-F-All	--	--	--	--
Sub-Matrix: Groundwater (Matrix: Water)											
Analyte	Method/Lab	LOR	Unit								
Physical Tests											
Colour, apparent	E330/WT	2.0	CU	10800	DLHC DLM	--	--	--	--	--	--
Conductivity	E100/WT	2.0	µS/cm	1160		--	--	--	--	--	--
pH	E108/WT	0.10	pH units	7.60		--	--	--	--	--	--
Solids, total dissolved [TDS]	E162/WT	10	mg/L	700	DLDS	--	--	--	--	--	--
Turbidity	E121/WT	0.10	NTU	>4000	TMV	--	--	--	--	--	--
Alkalinity, total (as CaCO3)	E290/WT	2.0	mg/L	1680	DLHC	--	--	--	--	--	--
Anions and Nutrients											
Ammonia, total (as N)	E298/WT	0.0050	mg/L	0.0283		--	--	--	--	--	--
Bromide	E235.Br/WT	0.10	mg/L	<0.50	DLDS	--	--	--	--	--	--
Chloride	E235.Cl/WT	0.50	mg/L	89.4	DLDS	790 mg/L	790 mg/L	--	--	--	--
Fluoride	E235.F/WT	0.020	mg/L	<0.100	DLDS	--	--	--	--	--	--
Nitrate (as N)	E235.NO3/WT	0.020	mg/L	8.46	DLDS	--	--	--	--	--	--
Nitrite (as N)	E235.NO2/WT	0.010	mg/L	<0.050	DLDS	--	--	--	--	--	--
Sulfate (as SO4)	E235.SO4/WT	0.30	mg/L	23.8	DLDS	--	--	--	--	--	--
Dissolved Metals											
Aluminum, dissolved	E421/WT	0.0010	mg/L	<0.0100	DLHC	--	--	--	--	--	--
Antimony, dissolved	E421/WT	0.00010	mg/L	<0.00100	DLHC	0.006 mg/L	0.006 mg/L	--	--	--	--
Arsenic, dissolved	E421/WT	0.00010	mg/L	<0.00100	DLHC	0.025 mg/L	0.025 mg/L	--	--	--	--
Barium, dissolved	E421/WT	0.00010	mg/L	0.0766	DLHC	1 mg/L	1 mg/L	--	--	--	--
Beryllium, dissolved	E421/WT	0.000020	mg/L	<0.000200	DLHC	0.004 mg/L	0.004 mg/L	--	--	--	--
Bismuth, dissolved	E421/WT	0.000050	mg/L	<0.000500	DLHC	--	--	--	--	--	--
Boron, dissolved	E421/WT	0.010	mg/L	<0.100	DLHC	5 mg/L	5 mg/L	--	--	--	--
Cadmium, dissolved	E421/WT	0.0000050	mg/L	<0.0000500	DLHC	0.0027 mg/L	0.0027 mg/L	--	--	--	--
Calcium, dissolved	E421/WT	0.050	mg/L	140	DLHC	--	--	--	--	--	--
Cesium, dissolved	E421/WT	0.000010	mg/L	<0.000100	DLHC	--	--	--	--	--	--
Chromium, dissolved	E421/WT	0.00050	mg/L	<0.00500	DLHC	0.05 mg/L	0.05 mg/L	--	--	--	--
Cobalt, dissolved	E421/WT	0.00010	mg/L	<0.00100	DLHC	0.0038 mg/L	0.0038 mg/L	--	--	--	--
Copper, dissolved	E421/WT	0.00020	mg/L	<0.00200	DLHC	0.087 mg/L	0.087 mg/L	--	--	--	--
Iron, dissolved	E421/WT	0.010	mg/L	<0.100	DLHC	--	--	--	--	--	--
Lead, dissolved	E421/WT	0.000050	mg/L	<0.000500	DLHC	0.01 mg/L	0.01 mg/L	--	--	--	--
Lithium, dissolved	E421/WT	0.0010	mg/L	<0.0100	DLHC	--	--	--	--	--	--
Magnesium, dissolved	E421/WT	0.0050	mg/L	47.2	DLHC	--	--	--	--	--	--



Analyte	Method/Lab	LOR	Unit	WT2412415-002 (Continued)	ON153/04 T2-GW-C-All	ON153/04 T2-GW-F-All	--	--	--	--
Dissolved Metals - Continued										
Manganese, dissolved	E421/WT	0.00010	mg/L	0.0281 DLHC	--	--	--	--	--	--
Molybdenum, dissolved	E421/WT	0.000050	mg/L	0.000957 DLHC	0.07 mg/L	0.07 mg/L	--	--	--	--
Nickel, dissolved	E421/WT	0.00050	mg/L	<0.00500 DLHC	0.1 mg/L	0.1 mg/L	--	--	--	--
Phosphorus, dissolved	E421/WT	0.050	mg/L	<0.500 DLHC	--	--	--	--	--	--
Potassium, dissolved	E421/WT	0.050	mg/L	1.10 DLHC	--	--	--	--	--	--
Rubidium, dissolved	E421/WT	0.00020	mg/L	<0.00200 DLHC	--	--	--	--	--	--
Selenium, dissolved	E421/WT	0.000050	mg/L	<0.000500 DLHC	0.01 mg/L	0.01 mg/L	--	--	--	--
Silicon, dissolved	E421/WT	0.050	mg/L	7.38 DLHC	--	--	--	--	--	--
Silver, dissolved	E421/WT	0.000010	mg/L	<0.000100 DLHC	0.0015 mg/L	0.0015 mg/L	--	--	--	--
Sodium, dissolved	E421/WT	0.050	mg/L	43.4 DLHC	490 mg/L	490 mg/L	--	--	--	--
Strontium, dissolved	E421/WT	0.00020	mg/L	0.504 DLHC	--	--	--	--	--	--
Sulfur, dissolved	E421/WT	0.50	mg/L	8.14 DLHC	--	--	--	--	--	--
Tellurium, dissolved	E421/WT	0.00020	mg/L	<0.00200 DLHC	--	--	--	--	--	--
Thallium, dissolved	E421/WT	0.000010	mg/L	<0.000100 DLHC	0.002 mg/L	0.002 mg/L	--	--	--	--
Thorium, dissolved	E421/WT	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
Tin, dissolved	E421/WT	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
Titanium, dissolved	E421/WT	0.00030	mg/L	<0.00300 DLHC	--	--	--	--	--	--
Tungsten, dissolved	E421/WT	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
Uranium, dissolved	E421/WT	0.000010	mg/L	0.000749 DLHC	0.02 mg/L	0.02 mg/L	--	--	--	--
Vanadium, dissolved	E421/WT	0.00050	mg/L	<0.00500 DLHC	0.0062 mg/L	0.0062 mg/L	--	--	--	--
Zinc, dissolved	E421/WT	0.0010	mg/L	<0.0100 DLHC	1.1 mg/L	1.1 mg/L	--	--	--	--
Zirconium, dissolved	E421/WT	0.00030	mg/L	<0.00300 DLHC	--	--	--	--	--	--
Dissolved metals filtration location	EP421/WT		-	Laboratory	--	--	--	--	--	--
Volatile Organic Compounds										
Benzene	E611A/WT	0.50	µg/L	<0.50	5 µg/L	5 µg/L	--	--	--	--
Ethylbenzene	E611A/WT	0.50	µg/L	<0.50	2.4 µg/L	2.4 µg/L	--	--	--	--
Toluene	E611A/WT	0.50	µg/L	<0.50	24 µg/L	24 µg/L	--	--	--	--
Xylene, m+p-	E611A/WT	0.40	µg/L	<0.40	--	--	--	--	--	--
Xylene, o-	E611A/WT	0.30	µg/L	<0.30	--	--	--	--	--	--
Xylenes, total	E611A/WT	0.50	µg/L	<0.50	300 µg/L	300 µg/L	--	--	--	--
BTEX, total	E611A/WT	1.0	µg/L	<1.0	--	--	--	--	--	--
Hydrocarbons										
F1 (C6-C10)	E581.F1-L/WT	25	µg/L	<25	750 µg/L	750 µg/L	--	--	--	--
F2 (C10-C16)	E601.SG/WT	100	µg/L	<100	150 µg/L	150 µg/L	--	--	--	--
F3 (C16-C34)	E601.SG/WT	250	µg/L	<250	500 µg/L	500 µg/L	--	--	--	--



Analyte	Method/Lab	LOR	Unit	WT2412415-002 (Continued)	ON153/04 T2-GW-C-All	ON153/04 T2-GW-F-All	--	--	--	--
Hydrocarbons - Continued										
F4 (C34-C50)	E601.SG/WT	250	µg/L	<250	500 µg/L	500 µg/L	--	--	--	--
F1-BTEX	EC580/WT	25	µg/L	<25	750 µg/L	750 µg/L	--	--	--	--
Hydrocarbons, total (C6-C50)	EC581SG/WT	240	µg/L	<370	--	--	--	--	--	--
Chromatogram to baseline at nC50	E601.SG/WT		-	YES	--	--	--	--	--	--
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	E601.SG/WT	1.0	%	108	--	--	--	--	--	--
Dichlorotoluene, 3,4-	E581.F1-L/WT	1.0	%	92.6	--	--	--	--	--	--
Bromofluorobenzene, 4-	E611A/WT	1.0	%	97.6	--	--	--	--	--	--
Difluorobenzene, 1,4-	E611A/WT	1.0	%	99.9	--	--	--	--	--	--

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

No Breaches Found

Key:

ON153/04	Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)
T2-GW-C-All	153 T2-Ground Water (Coarse Soil)-All Types of Property Use
T2-GW-F-All	153 T2-Ground Water (Fine Soil)-All Types of Property Use



Analytical Results

				Client sample ID						
				Sampling date/time						
					BH/MW5					
					13-May-2024 10:30					
					WT2412415-003	ON153/04 T2-GW-C-All	ON153/04 T2-GW-F-All	--	--	--
Analyte	Method/Lab	LOR	Unit							
Physical Tests										
Colour, apparent	E330/WT	2.0	CU	12200	DLHC DLM	--	--	--	--	--
Conductivity	E100/WT	2.0	µS/cm	915		--	--	--	--	--
pH	E108/WT	0.10	pH units	7.99		--	--	--	--	--
Solids, total dissolved [TDS]	E162/WT	10	mg/L	578	DLDS	--	--	--	--	--
Turbidity	E121/WT	0.10	NTU	>4000	TMV	--	--	--	--	--
Alkalinity, total (as CaCO3)	E290/WT	2.0	mg/L	2340	DLHC	--	--	--	--	--
Anions and Nutrients										
Ammonia, total (as N)	E298/WT	0.0050	mg/L	0.0396		--	--	--	--	--
Bromide	E235.Br/WT	0.10	mg/L	<0.50	DLDS	--	--	--	--	--
Chloride	E235.Cl/WT	0.50	mg/L	69.4	DLDS	790 mg/L	790 mg/L	--	--	--
Fluoride	E235.F/WT	0.020	mg/L	<0.100	DLDS	--	--	--	--	--
Nitrate (as N)	E235.NO3/WT	0.020	mg/L	<0.100	DLDS	--	--	--	--	--
Nitrite (as N)	E235.NO2/WT	0.010	mg/L	<0.050	DLDS	--	--	--	--	--
Sulfate (as SO4)	E235.SO4/WT	0.30	mg/L	75.4	DLDS	--	--	--	--	--
Dissolved Metals										
Aluminum, dissolved	E421/WT	0.0010	mg/L	0.0035		--	--	--	--	--
Antimony, dissolved	E421/WT	0.00010	mg/L	<0.00010		0.006 mg/L	0.006 mg/L	--	--	--
Arsenic, dissolved	E421/WT	0.00010	mg/L	0.00050		0.025 mg/L	0.025 mg/L	--	--	--
Barium, dissolved	E421/WT	0.00010	mg/L	0.0900		1 mg/L	1 mg/L	--	--	--
Beryllium, dissolved	E421/WT	0.000020	mg/L	<0.000020		0.004 mg/L	0.004 mg/L	--	--	--
Bismuth, dissolved	E421/WT	0.000050	mg/L	<0.000050		--	--	--	--	--
Boron, dissolved	E421/WT	0.010	mg/L	0.017		5 mg/L	5 mg/L	--	--	--
Cadmium, dissolved	E421/WT	0.0000050	mg/L	<0.0000050		0.0027 mg/L	0.0027 mg/L	--	--	--
Calcium, dissolved	E421/WT	0.050	mg/L	98.3		--	--	--	--	--
Cesium, dissolved	E421/WT	0.000010	mg/L	<0.000010		--	--	--	--	--
Chromium, dissolved	E421/WT	0.00050	mg/L	<0.00050		0.05 mg/L	0.05 mg/L	--	--	--
Cobalt, dissolved	E421/WT	0.00010	mg/L	<0.00010		0.0038 mg/L	0.0038 mg/L	--	--	--
Copper, dissolved	E421/WT	0.00020	mg/L	0.00074		0.087 mg/L	0.087 mg/L	--	--	--
Iron, dissolved	E421/WT	0.010	mg/L	<0.010		--	--	--	--	--
Lead, dissolved	E421/WT	0.000050	mg/L	<0.000050		0.01 mg/L	0.01 mg/L	--	--	--
Lithium, dissolved	E421/WT	0.0010	mg/L	0.0040		--	--	--	--	--
Magnesium, dissolved	E421/WT	0.0050	mg/L	40.3		--	--	--	--	--



Analyte	Method/Lab	LOR	Unit	WT2412415-003 (Continued)	ON153/04 T2-GW-C-All	ON153/04 T2-GW-F-All	--	--	--	--
Dissolved Metals - Continued										
Manganese, dissolved	E421/WT	0.00010	mg/L	0.0335	--	--	--	--	--	--
Molybdenum, dissolved	E421/WT	0.000050	mg/L	0.000995	0.07 mg/L	0.07 mg/L	--	--	--	--
Nickel, dissolved	E421/WT	0.00050	mg/L	0.00055	0.1 mg/L	0.1 mg/L	--	--	--	--
Phosphorus, dissolved	E421/WT	0.050	mg/L	<0.050	--	--	--	--	--	--
Potassium, dissolved	E421/WT	0.050	mg/L	3.00	--	--	--	--	--	--
Rubidium, dissolved	E421/WT	0.00020	mg/L	0.00107	--	--	--	--	--	--
Selenium, dissolved	E421/WT	0.000050	mg/L	0.000100	0.01 mg/L	0.01 mg/L	--	--	--	--
Silicon, dissolved	E421/WT	0.050	mg/L	5.56	--	--	--	--	--	--
Silver, dissolved	E421/WT	0.000010	mg/L	<0.000010	0.0015 mg/L	0.0015 mg/L	--	--	--	--
Sodium, dissolved	E421/WT	0.050	mg/L	39.4	490 mg/L	490 mg/L	--	--	--	--
Strontium, dissolved	E421/WT	0.00020	mg/L	0.253	--	--	--	--	--	--
Sulfur, dissolved	E421/WT	0.50	mg/L	26.9	--	--	--	--	--	--
Tellurium, dissolved	E421/WT	0.00020	mg/L	<0.00020	--	--	--	--	--	--
Thallium, dissolved	E421/WT	0.000010	mg/L	<0.000010	0.002 mg/L	0.002 mg/L	--	--	--	--
Thorium, dissolved	E421/WT	0.00010	mg/L	<0.00010	--	--	--	--	--	--
Tin, dissolved	E421/WT	0.00010	mg/L	0.00017	--	--	--	--	--	--
Titanium, dissolved	E421/WT	0.00030	mg/L	<0.00030	--	--	--	--	--	--
Tungsten, dissolved	E421/WT	0.00010	mg/L	<0.00010	--	--	--	--	--	--
Uranium, dissolved	E421/WT	0.000010	mg/L	0.00156	0.02 mg/L	0.02 mg/L	--	--	--	--
Vanadium, dissolved	E421/WT	0.00050	mg/L	<0.00050	0.0062 mg/L	0.0062 mg/L	--	--	--	--
Zinc, dissolved	E421/WT	0.0010	mg/L	<0.0010	1.1 mg/L	1.1 mg/L	--	--	--	--
Zirconium, dissolved	E421/WT	0.00030	mg/L	<0.00030	--	--	--	--	--	--
Dissolved metals filtration location	EP421/WT		-	Laboratory	--	--	--	--	--	--
Volatile Organic Compounds										
Benzene	E611A/WT	0.50	µg/L	<0.50	5 µg/L	5 µg/L	--	--	--	--
Ethylbenzene	E611A/WT	0.50	µg/L	<0.50	2.4 µg/L	2.4 µg/L	--	--	--	--
Toluene	E611A/WT	0.50	µg/L	<0.50	24 µg/L	24 µg/L	--	--	--	--
Xylene, m+p-	E611A/WT	0.40	µg/L	<0.40	--	--	--	--	--	--
Xylene, o-	E611A/WT	0.30	µg/L	<0.30	--	--	--	--	--	--
Xylenes, total	E611A/WT	0.50	µg/L	<0.50	300 µg/L	300 µg/L	--	--	--	--
BTEX, total	E611A/WT	1.0	µg/L	<1.0	--	--	--	--	--	--
Hydrocarbons										
F1 (C6-C10)	E581.F1-L/WT	25	µg/L	<25	750 µg/L	750 µg/L	--	--	--	--
F2 (C10-C16)	E601.SG/WT	100	µg/L	<100	150 µg/L	150 µg/L	--	--	--	--
F3 (C16-C34)	E601.SG/WT	250	µg/L	<250	500 µg/L	500 µg/L	--	--	--	--



Analyte	Method/Lab	LOR	Unit	WT2412415-003 (Continued)	ON153/04 T2-GW-C-All	ON153/04 T2-GW-F-All	--	--	--	--
Hydrocarbons - Continued										
F4 (C34-C50)	E601.SG/WT	250	µg/L	<250	500 µg/L	500 µg/L	--	--	--	--
F1-BTEX	EC580/WT	25	µg/L	<25	750 µg/L	750 µg/L	--	--	--	--
Hydrocarbons, total (C6-C50)	EC581SG/WT	240	µg/L	<370	--	--	--	--	--	--
Chromatogram to baseline at nC50	E601.SG/WT		-	YES	--	--	--	--	--	--
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	E601.SG/WT	1.0	%	96.3	--	--	--	--	--	--
Dichlorotoluene, 3,4-	E581.F1-L/WT	1.0	%	86.7	--	--	--	--	--	--
Bromofluorobenzene, 4-	E611A/WT	1.0	%	94.5	--	--	--	--	--	--
Difluorobenzene, 1,4-	E611A/WT	1.0	%	99.8	--	--	--	--	--	--

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

No Breaches Found

Key:

ON153/04	Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)
T2-GW-C-All	153 T2-Ground Water (Coarse Soil)-All Types of Property Use
T2-GW-F-All	153 T2-Ground Water (Fine Soil)-All Types of Property Use

CERTIFICATE OF ANALYSIS

Work Order	: WT2512794	Laboratory	: ALS Environmental - Waterloo
Client	: GEI Consultants Ltd.	Account Manager	: Amanda Overholster
Contact	: Matthew Long	Address	: 60 Northland Road, Unit 1
Address	: 650 Woodlawn Rd West Block C, Unit 2 Guelph Ontario Canada N1H 8J1		: Waterloo ON Canada N2V 2B8
Telephone	: ----	E-mail	: Amanda.Overholster@ALSGlobal.com
Project	: 2407030	Telephone	: 1 416 817 2944
PO	: ----	Date Samples Received	: 26-May-2025 16:10
C-O-C number	: 23-1119427	Date Analysis Commenced	: 28-May-2025
Sampler	: Client	Issue Date	: 02-Jun-2025 10:21
Site	: ----		
Quote number	: 2025 SOA		
No. of samples received	: 3		
No. of samples analysed	: 3		

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Jon Fisher	Production Manager, Environmental	Metals, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Inorganics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Centralized Prep, Waterloo, Ontario
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
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
µS/cm	microsiemens per centimetre

<: 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.



Qualifiers

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLUI	Detection Limit Raised: Unknown interference generated an apparent false positive test result.
TMV	Turbidity exceeded upper limit of the nephelometric method. Minimum value reported.



Analytical Results

Sub-Matrix: Water

(Matrix: Water)

Sub-Matrix: Water (Matrix: Water)					Client sample ID	MW-01	MW-03	MW-05	----	----
Client sampling date / time					23-May-2025 01:30	23-May-2025 02:00	23-May-2025 02:15	----	----	
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2512794-001	WT2512794-002	WT2512794-003	----	----	
					Result	Result	Result	----	----	
Sample Preparation										
Dissolved carbon filtration location	----	EP358/WT	-	-	lab	lab	lab	----	----	
Physical Tests										
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/WT	1.2	mg/L	1820	561	1480	----	----	
Alkalinity, carbonate (as CO3)	3812-32-6	E290/WT	1.0	mg/L	----	<0.6	<3.0	----	----	
Alkalinity, carbonate (as CO3)	3812-32-6	E290/WT	1	mg/L	0.0	----	----	----	----	
Alkalinity, hydroxide (as OH)	14280-30-9	E290/WT	1.0	mg/L	----	<0.3	<1.7	----	----	
Alkalinity, hydroxide (as OH)	14280-30-9	E290/WT	1	mg/L	0.00	----	----	----	----	
Alkalinity, total (as CaCO3)	----	E290/WT	1.0	mg/L	1490	460	1210	----	----	
Colour, apparent	----	E330/WT	2.0	CU	1080	2690	10700	----	----	
Conductivity	----	E100/WT	1.0	µS/cm	3030	1030	850	----	----	
Hardness (as CaCO3), dissolved	----	EC100/WT	0.50	mg/L	783	510	406	----	----	
pH	----	E108/WT	0.10	pH units	7.78	7.49	7.83	----	----	
Solids, total dissolved [TDS]	----	E162/WT	10	mg/L	1570 ^{DLDS}	697 ^{DLDS}	591 ^{DLDS}	----	----	
Solids, total dissolved [TDS], calculated	----	EC103A/WT	1.0	mg/L	1970	670	552	----	----	
Turbidity	----	E121/WT	0.10	NTU	136	1020	>4000 ^{TMV}	----	----	
Langelier index (@ 20°C)	----	EC105/WT	0.010	-	1.62	0.798	1.42	----	----	
Langelier index (@ 4°C)	----	EC105/WT	0.010	-	1.37	0.550	1.17	----	----	
pH, saturation (@ 20°C)	----	EC105/WT	0.010	pH units	6.16	6.69	6.41	----	----	
pH, saturation (@ 4°C)	----	EC105/WT	0.010	pH units	6.40	6.94	6.66	----	----	
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/WT	0.0050	mg/L	124	0.0128	0.0405	----	----	



Analytical Results

Sub-Matrix: Water

(Matrix: Water)

Sub-Matrix: Water (Matrix: Water)					Client sample ID	MW-01	MW-03	MW-05	----	----
Client sampling date / time					23-May-2025 01:30	23-May-2025 02:00	23-May-2025 02:15	----	----	
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2512794-001	WT2512794-002	WT2512794-003	----	----	
					Result	Result	Result	----	----	
Anions and Nutrients										
Bromide	24959-67-9	E235.Br/WT	0.10	mg/L	<0.50 ^{DLDS}	<0.20 ^{DLDS}	<0.10	----	----	
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L	208 ^{DLDS}	58.2 ^{DLDS}	62.1	----	----	
Fluoride	16984-48-8	E235.F/WT	0.020	mg/L	0.198 ^{DLDS}	0.090 ^{DLDS}	0.073	----	----	
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L	<0.100 ^{DLDS}	14.8 ^{DLDS}	<0.020	----	----	
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	0.0032	mg/L	<0.112	14.8	<0.0224	----	----	
Nitrite (as N)	14797-65-0	E235.NO2/WT	0.010	mg/L	<0.050 ^{DLDS}	<0.020 ^{DLDS}	<0.010	----	----	
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	0.0010	mg/L	0.0063	<0.0010	<0.0010	----	----	
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	0.30	mg/L	<1.50 ^{DLDS}	26.5 ^{DLDS}	79.9	----	----	
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L	11.4	3.10	1.99	----	----	
Metals										
Sodium adsorption ratio [SAR]	----	EC102A/WT	0.10	-	2.33	0.61	0.62	----	----	
Ion Balance										
Anion sum	----	EC101/WT	0.10	meq/L	35.6	12.4	27.6	----	----	
Cation sum	----	EC101/WT	0.10	meq/L	33.5	11.6	9.43	----	----	
Ion balance (APHA)	----	EC101/WT	0.01	%	-3.04	-3.33	-49.1	----	----	
Ion balance (cations/anions)	----	EC101/WT	0.010	%	94.1	93.5	34.2	----	----	
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/WT	0.0010	mg/L	0.0110 ^{DLHC}	0.0118	0.0024	----	----	
Antimony, dissolved	7440-36-0	E421/WT	0.00010	mg/L	<0.00100 ^{DLHC}	<0.00010	<0.00010	----	----	
Arsenic, dissolved	7440-38-2	E421/WT	0.00010	mg/L	0.00210 ^{DLHC}	0.00026	0.00115	----	----	



Analytical Results

Sub-Matrix: Water
 (Matrix: Water)

Sub-Matrix: Water (Matrix: Water)					Client sample ID	MW-01	MW-03	MW-05	----	----
Client sampling date / time					23-May-2025 01:30	23-May-2025 02:00	23-May-2025 02:15	----	----	
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2512794-001	WT2512794-002	WT2512794-003	----	----	
					Result	Result	Result	----	----	
Dissolved Metals										
Barium, dissolved	7440-39-3	E421/WT	0.00010	mg/L	0.0837 ^{DLHC}	0.0573	0.0989	----	----	
Beryllium, dissolved	7440-41-7	E421/WT	0.000020	mg/L	<0.000200 ^{DLHC}	<0.000020	<0.000020	----	----	
Bismuth, dissolved	7440-69-9	E421/WT	0.000050	mg/L	<0.000500 ^{DLHC}	<0.000050	<0.000050	----	----	
Boron, dissolved	7440-42-8	E421/WT	0.010	mg/L	0.109 ^{DLHC}	0.012	0.013	----	----	
Cadmium, dissolved	7440-43-9	E421/WT	0.0000050	mg/L	<0.0000500 ^{DLHC}	0.0000083	<0.0000050	----	----	
Calcium, dissolved	7440-70-2	E421/WT	0.050	mg/L	191 ^{DLHC}	142	99.3	----	----	
Cesium, dissolved	7440-46-2	E421/WT	0.000010	mg/L	<0.000100 ^{DLHC}	<0.000010	<0.000010	----	----	
Chromium, dissolved	7440-47-3	E421/WT	0.00050	mg/L	<0.00500 ^{DLHC}	<0.00050	<0.00050	----	----	
Cobalt, dissolved	7440-48-4	E421/WT	0.00010	mg/L	0.00473 ^{DLHC}	<0.00010	0.00034	----	----	
Copper, dissolved	7440-50-8	E421/WT	0.00020	mg/L	<0.00200 ^{DLHC}	0.00121	0.00077	----	----	
Iron, dissolved	7439-89-6	E421/WT	0.010	mg/L	0.561 ^{DLHC}	0.010	<0.010	----	----	
Lead, dissolved	7439-92-1	E421/WT	0.000050	mg/L	<0.000500 ^{DLHC}	<0.000050	<0.000050	----	----	
Lithium, dissolved	7439-93-2	E421/WT	0.0010	mg/L	<0.0100 ^{DLHC}	0.0044	0.0069	----	----	
Magnesium, dissolved	7439-95-4	E421/WT	0.0050	mg/L	74.3 ^{DLHC}	37.7	38.5	----	----	
Manganese, dissolved	7439-96-5	E421/WT	0.00010	mg/L	1.56 ^{DLHC}	0.00882	0.121	----	----	
Molybdenum, dissolved	7439-98-7	E421/WT	0.000050	mg/L	0.00920 ^{DLHC}	0.000350	0.000506	----	----	
Nickel, dissolved	7440-02-0	E421/WT	0.00050	mg/L	0.00991 ^{DLHC}	0.00066	0.00056	----	----	
Phosphorus, dissolved	7723-14-0	E421/WT	0.050	mg/L	<0.500 ^{DLHC}	<0.050	<0.050	----	----	
Potassium, dissolved	7440-09-7	E421/WT	0.050	mg/L	93.1 ^{DLHC}	0.724	2.30	----	----	
Rubidium, dissolved	7440-17-7	E421/WT	0.00020	mg/L	0.0267 ^{DLHC}	0.00057	0.00058	----	----	
Selenium, dissolved	7782-49-2	E421/WT	0.000050	mg/L	<0.000500 ^{DLHC}	<0.000050	<0.000050	----	----	



Analytical Results

Sub-Matrix: Water
 (Matrix: Water)

Sub-Matrix: Water (Matrix: Water)					Client sample ID	MW-01	MW-03	MW-05	----	----
Client sampling date / time					23-May-2025 01:30	23-May-2025 02:00	23-May-2025 02:15	----	----	
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2512794-001	WT2512794-002	WT2512794-003	----	----	
					Result	Result	Result	----	----	
Dissolved Metals										
Silicon (as SiO2), dissolved	7440-21-3	EC421.SiO2/WT	0.15	mg/L	20.0	15.8	13.0	----	----	
Silicon, dissolved	7440-21-3	E421/WT	0.050	mg/L	9.34 ^{DLHC}	7.39	6.08	----	----	
Silver, dissolved	7440-22-4	E421/WT	0.000010	mg/L	<0.000100 ^{DLHC}	<0.000010	<0.000010	----	----	
Sodium, dissolved	7440-23-5	E421/WT	0.050	mg/L	150 ^{DLHC}	31.6	28.6	----	----	
Strontium, dissolved	7440-24-6	E421/WT	0.00020	mg/L	0.778 ^{DLHC}	0.369	0.285	----	----	
Sulfur, dissolved	7704-34-9	E421/WT	0.50	mg/L	<5.00 ^{DLHC}	9.82	29.2	----	----	
Tellurium, dissolved	13494-80-9	E421/WT	0.00020	mg/L	<0.00200 ^{DLHC}	<0.00020	<0.00020	----	----	
Thallium, dissolved	7440-28-0	E421/WT	0.000010	mg/L	<0.000100 ^{DLHC}	0.000013	<0.000010	----	----	
Thorium, dissolved	7440-29-1	E421/WT	0.00010	mg/L	<0.00100 ^{DLHC}	<0.00010	<0.00010	----	----	
Tin, dissolved	7440-31-5	E421/WT	0.00010	mg/L	<0.00100 ^{DLHC}	<0.00010	<0.00010	----	----	
Titanium, dissolved	7440-32-6	E421/WT	0.00030	mg/L	0.00504 ^{DLHC}	<0.00060 ^{DLUI}	<0.00030	----	----	
Tungsten, dissolved	7440-33-7	E421/WT	0.00010	mg/L	<0.00100 ^{DLHC}	<0.00010	<0.00010	----	----	
Uranium, dissolved	7440-61-1	E421/WT	0.000010	mg/L	0.000309 ^{DLHC}	0.000642	0.00156	----	----	
Vanadium, dissolved	7440-62-2	E421/WT	0.00050	mg/L	<0.00500 ^{DLHC}	<0.00050	0.00059	----	----	
Zinc, dissolved	7440-66-6	E421/WT	0.0010	mg/L	<0.0100 ^{DLHC}	0.0015	0.0016	----	----	
Zirconium, dissolved	7440-67-7	E421/WT	0.00020	mg/L	0.00354 ^{DLHC}	<0.00020	<0.00020	----	----	
Dissolved metals filtration location	----	EP421/WT	-	-	Field	Field	Field	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2512794	Page	: 1 of 14
Client	: GEI Consultants Ltd.	Laboratory	: ALS Environmental - Waterloo
Contact	: Matthew Long	Account Manager	: Amanda Overholster
Address	: 650 Woodlawn Rd West Block C, Unit 2 Guelph ON Canada N1H 8J1	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 2407030	Date Samples Received	: 26-May-2025 16:10
PO	: ----	Issue Date	: 02-Jun-2025 10:21
C-O-C number	: 23-1119427		
Sampler	: Client		
Site	: ----		
Quote number	: 2025 SOA		
No. of samples received	: 3		
No. of samples analysed	: 3		

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 Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- 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)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Method Blank (MB) Values								
Physical Tests	QC-MRG2-2019040001	----	Alkalinity, total (as CaCO ₃)	----	E290	2.1 mg/L ^B	2 mg/L	Blank result exceeds permitted value

Result Qualifiers

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.



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: **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		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP] MW-01	E298	23-May-2025	29-May-2025	28 days	7 days	✓	29-May-2025	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP] MW-03	E298	23-May-2025	29-May-2025	28 days	7 days	✓	29-May-2025	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP] MW-05	E298	23-May-2025	29-May-2025	28 days	7 days	✓	29-May-2025	28 days	7 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE [ON MECP] MW-01	E235.Br	23-May-2025	28-May-2025	28 days	6 days	✓	30-May-2025	28 days	6 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE [ON MECP] MW-03	E235.Br	23-May-2025	28-May-2025	28 days	6 days	✓	30-May-2025	28 days	6 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE [ON MECP] MW-05	E235.Br	23-May-2025	28-May-2025	28 days	6 days	✓	30-May-2025	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP] MW-01	E235.Cl	23-May-2025	28-May-2025	28 days	6 days	✓	30-May-2025	28 days	6 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP] MW-03	E235.Cl	23-May-2025	28-May-2025	28 days	6 days	✓	30-May-2025	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP] MW-05	E235.Cl	23-May-2025	28-May-2025	28 days	6 days	✓	30-May-2025	28 days	6 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE [ON MECP] MW-01	E378-U	23-May-2025	28-May-2025	7 days	6 days	✓	30-May-2025	7 days	6 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE [ON MECP] MW-03	E378-U	23-May-2025	28-May-2025	7 days	6 days	✓	30-May-2025	7 days	6 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE [ON MECP] MW-05	E378-U	23-May-2025	28-May-2025	7 days	6 days	✓	30-May-2025	7 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] MW-01	E235.F	23-May-2025	28-May-2025	28 days	6 days	✓	30-May-2025	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] MW-03	E235.F	23-May-2025	28-May-2025	28 days	6 days	✓	30-May-2025	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] MW-05	E235.F	23-May-2025	28-May-2025	28 days	6 days	✓	30-May-2025	28 days	6 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] MW-01	E235.NO3	23-May-2025	28-May-2025	7 days	6 days	✓	30-May-2025	7 days	6 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] MW-03	E235.NO3	23-May-2025	28-May-2025	7 days	6 days	✓	30-May-2025	7 days	6 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] MW-05	E235.NO3	23-May-2025	28-May-2025	7 days	6 days	✓	30-May-2025	7 days	6 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP] MW-01	E235.NO2	23-May-2025	28-May-2025	7 days	6 days	✓	30-May-2025	7 days	6 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP] MW-03	E235.NO2	23-May-2025	28-May-2025	7 days	6 days	✓	30-May-2025	7 days	6 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP] MW-05	E235.NO2	23-May-2025	28-May-2025	7 days	6 days	✓	30-May-2025	7 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP] MW-01	E235.SO4	23-May-2025	28-May-2025	28 days	6 days	✓	30-May-2025	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP] MW-03	E235.SO4	23-May-2025	28-May-2025	28 days	6 days	✓	30-May-2025	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP] MW-05	E235.SO4	23-May-2025	28-May-2025	28 days	6 days	✓	30-May-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-01	E421	23-May-2025	28-May-2025	180 days	5 days	✓	28-May-2025	180 days	5 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-03	E421	23-May-2025	28-May-2025	180 days	5 days	✔	28-May-2025	180 days	5 days	✔
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-05	E421	23-May-2025	28-May-2025	180 days	5 days	✔	28-May-2025	180 days	5 days	✔
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
HDPE [ON MECP] MW-01	E358-L	23-May-2025	28-May-2025	3 days	6 days	✖ EHTL	29-May-2025	28 days	1 days	✔
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
HDPE [ON MECP] MW-03	E358-L	23-May-2025	28-May-2025	3 days	6 days	✖ EHTL	29-May-2025	28 days	1 days	✔
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
HDPE [ON MECP] MW-05	E358-L	23-May-2025	28-May-2025	3 days	6 days	✖ EHTL	29-May-2025	28 days	1 days	✔
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP] MW-01	E290	23-May-2025	28-May-2025	14 days	6 days	✔	29-May-2025	14 days	6 days	✔
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP] MW-03	E290	23-May-2025	28-May-2025	14 days	6 days	✔	29-May-2025	14 days	6 days	✔
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP] MW-05	E290	23-May-2025	28-May-2025	14 days	6 days	✔	29-May-2025	14 days	6 days	✔
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE [ON MECP] MW-01	E330	23-May-2025	----	----	----		28-May-2025	48 hrs	134 hrs	✖ EHTR



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		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE [ON MECP] MW-03	E330	23-May-2025	----	----	----		28-May-2025	48 hrs	134 hrs	✖ EHTR
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE [ON MECP] MW-05	E330	23-May-2025	----	----	----		28-May-2025	48 hrs	134 hrs	✖ EHTR
Physical Tests : Conductivity in Water										
HDPE [ON MECP] MW-01	E100	23-May-2025	28-May-2025	28 days	6 days	✓	29-May-2025	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP] MW-03	E100	23-May-2025	28-May-2025	28 days	6 days	✓	29-May-2025	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP] MW-05	E100	23-May-2025	28-May-2025	28 days	6 days	✓	29-May-2025	28 days	6 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] MW-01	E108	23-May-2025	28-May-2025	14 days	6 days	✓	29-May-2025	14 days	6 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] MW-03	E108	23-May-2025	28-May-2025	14 days	6 days	✓	29-May-2025	14 days	6 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] MW-05	E108	23-May-2025	28-May-2025	14 days	6 days	✓	29-May-2025	14 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP] MW-01	E162	23-May-2025	----	----	----		29-May-2025	7 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		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP] MW-03	E162	23-May-2025	----	----	----		29-May-2025	7 days	7 days	✔
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP] MW-05	E162	23-May-2025	----	----	----		29-May-2025	7 days	7 days	✔
Physical Tests : Turbidity by Nephelometry										
HDPE [ON MECP] MW-03	E121	23-May-2025	----	----	----		28-May-2025	48 hrs	128 hrs	✖ EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE [ON MECP] MW-05	E121	23-May-2025	----	----	----		28-May-2025	48 hrs	128 hrs	✖ EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE [ON MECP] MW-01	E121	23-May-2025	----	----	----		28-May-2025	48 hrs	129 hrs	✖ EHTR

Legend & Qualifier Definitions

EHTR: Exceeded ALS recommended hold time prior to sample receipt.

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

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: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
Analytical Methods			QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Conductivity in Water	E100	2019040	1	13	7.6	5.0	✓
pH by Meter	E108	2019039	1	16	6.2	5.0	✓
Turbidity by Nephelometry	E121	2019075	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	2021496	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	2019037	1	6	16.6	5.0	✓
Chloride in Water by IC	E235.Cl	2019032	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	2019036	1	5	20.0	5.0	✓
Nitrite in Water by IC	E235.NO2	2019033	1	18	5.5	5.0	✓
Nitrate in Water by IC	E235.NO3	2019034	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	2019035	1	11	9.0	5.0	✓
Alkalinity Species by Titration	E290	2019041	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	2021694	1	14	7.1	5.0	✓
Colour (Apparent) by Spectrometer	E330	2020134	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	2019761	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	2019038	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2018625	1	8	12.5	5.0	✓
Laboratory Control Samples (LCS)							
Conductivity in Water	E100	2019040	1	13	7.6	5.0	✓
pH by Meter	E108	2019039	1	16	6.2	5.0	✓
Turbidity by Nephelometry	E121	2019075	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	2021496	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	2019037	1	6	16.6	5.0	✓
Chloride in Water by IC	E235.Cl	2019032	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	2019036	1	5	20.0	5.0	✓
Nitrite in Water by IC	E235.NO2	2019033	1	18	5.5	5.0	✓
Nitrate in Water by IC	E235.NO3	2019034	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	2019035	1	11	9.0	5.0	✓
Alkalinity Species by Titration	E290	2019041	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	2021694	1	14	7.1	5.0	✓
Colour (Apparent) by Spectrometer	E330	2020134	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	2019761	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	2019038	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2018625	1	8	12.5	5.0	✓
Method Blanks (MB)							
Conductivity in Water	E100	2019040	1	13	7.6	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
Method Blanks (MB) - Continued							
Turbidity by Nephelometry	E121	2019075	1	20	5.0	5.0	✔
TDS by Gravimetry	E162	2021496	1	20	5.0	5.0	✔
Bromide in Water by IC	E235.Br	2019037	1	6	16.6	5.0	✔
Chloride in Water by IC	E235.Cl	2019032	1	16	6.2	5.0	✔
Fluoride in Water by IC	E235.F	2019036	1	5	20.0	5.0	✔
Nitrite in Water by IC	E235.NO2	2019033	1	18	5.5	5.0	✔
Nitrate in Water by IC	E235.NO3	2019034	1	20	5.0	5.0	✔
Sulfate in Water by IC	E235.SO4	2019035	1	11	9.0	5.0	✔
Alkalinity Species by Titration	E290	2019041	1	9	11.1	5.0	✔
Ammonia by Fluorescence	E298	2021694	1	14	7.1	5.0	✔
Colour (Apparent) by Spectrometer	E330	2020134	1	18	5.5	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	2019761	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	2019038	1	10	10.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	2018625	1	8	12.5	5.0	✔
Matrix Spikes (MS)							
Bromide in Water by IC	E235.Br	2019037	1	6	16.6	5.0	✔
Chloride in Water by IC	E235.Cl	2019032	1	16	6.2	5.0	✔
Fluoride in Water by IC	E235.F	2019036	1	5	20.0	5.0	✔
Nitrite in Water by IC	E235.NO2	2019033	1	18	5.5	5.0	✔
Nitrate in Water by IC	E235.NO3	2019034	1	20	5.0	5.0	✔
Sulfate in Water by IC	E235.SO4	2019035	1	11	9.0	5.0	✔
Ammonia by Fluorescence	E298	2021694	1	14	7.1	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	2019761	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	2019038	1	10	10.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	2018625	1	8	12.5	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
Conductivity in Water	E100 ALS Environmental - Waterloo	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally $20 \pm 5^\circ\text{C}$). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 ALS Environmental - Waterloo	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TDS by Gravimetry	E162 ALS Environmental - Waterloo	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at $180 \pm 2^\circ\text{C}$ for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC	E235.Br ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
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.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Alkalinity Species by Titration	E290 ALS Environmental - Waterloo	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (Apparent) by Spectrometer	E330 ALS Environmental - Waterloo	Water	APHA 2120 C (mod)	Colour (Apparent) is measured in an unfiltered sample spectrophotometrically using the single wavelength method. The colour contribution of settleable solids are not included in the result. This method is intended for potable waters. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Waterloo	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Waterloo	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Waterloo	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Waterloo	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sodium Adsorption Ratio (SAR) from Dissolved Metals	EC102A ALS Environmental - Waterloo	Water	CCME Sodium Adsorption Ratio (SAR)	The Sodium Adsorption Ratio (SAR) for a water sample is calculated from the Sodium, Calcium, and Magnesium concentrations of the water, using the same calculations as would be used for a sediment paste extract.
TDS calculated from conductivity	EC103A ALS Environmental - Waterloo	Water	APHA 1030 E	Total dissolved solids (as mg/L) can be estimated by multiplying electrical conductance (in umhos/cm) by 0.65.
Saturation Index using Laboratory pH (Ca-D)	EC105 ALS Environmental - Waterloo	Water	APHA 2330B	Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO ₃ . Negative values indicate undersaturation of CaCO ₃ . This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C. Ryznar Stability Index is an alternative index used for scale formation and corrosion potential. If available, Field pH measurements are recommended for best accuracy (test code EC104).
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Waterloo	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Dissolved Silicon as Silica (Calculation)	EC421.SiO ₂ ALS Environmental - Waterloo	Water	N/A	Dissolved Silicon (as SiO ₂) is a calculated parameter. Dissolved Silicon (as SiO ₂ mg/L) = 2.139 x Dissolved Silicon (mg/L).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Waterloo	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421 ALS Environmental - Waterloo	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO ₃ .



QUALITY CONTROL REPORT

Work Order	: WT2512794	Page	: 1 of 13
Client	: GEI Consultants Ltd.	Laboratory	: ALS Environmental - Waterloo
Contact	: Matthew Long	Account Manager	: Amanda Overholster
Address	: 650 Woodlawn Rd West Block C, Unit 2 Guelph ON Canada N1H 8J1	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 2407030	Date Samples Received	: 26-May-2025 16:10
PO	: ----	Date Analysis Commenced	: 28-May-2025
C-O-C number	: 23-1119427	Issue Date	: 02-Jun-2025 10:21
Sampler	: Client		
Site	: ----		
Quote number	: 2025 SOA		
No. of samples received	: 3		
No. of samples analysed	: 3		

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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

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
Jon Fisher	Production Manager, Environmental	Waterloo Centralized Prep, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Waterloo Inorganics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Waterloo Metals, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology 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

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

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



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 2019039)											
WT2512568-001	Anonymous	pH	----	E108	0.10	pH units	8.16	8.15	0.123%	4%	----
Physical Tests (QC Lot: 2019040)											
WT2512568-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	2500	2520	0.797%	10%	----
Physical Tests (QC Lot: 2019041)											
WT2512568-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	191	186	2.88%	20%	----
Physical Tests (QC Lot: 2019075)											
WT2512794-001	MW-01	Turbidity	----	E121	0.10	NTU	136	139	2.18%	15%	----
Physical Tests (QC Lot: 2020134)											
HA2501541-013	Anonymous	Colour, apparent	----	E330	10.0	CU	578	577	0.177%	20%	----
Physical Tests (QC Lot: 2021496)											
WT2512497-001	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	437000 µg/L	439	0.457%	20%	----
Anions and Nutrients (QC Lot: 2019032)											
WT2512794-001	MW-01	Chloride	16887-00-6	E235.Cl	2.50	mg/L	208	208	0.0832%	20%	----
Anions and Nutrients (QC Lot: 2019033)											
WT2512794-001	MW-01	Nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2019034)											
WT2512794-001	MW-01	Nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2019035)											
WT2512794-001	MW-01	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	<1.50	<1.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2019036)											
WT2512794-001	MW-01	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.198	0.205	0.007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2019037)											
WT2512794-001	MW-01	Bromide	24959-67-9	E235.Br	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2019038)											
WT2512615-004	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0305	0.0303	0.625%	20%	----
Anions and Nutrients (QC Lot: 2021694)											
WT2511067-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0475	0.0498	0.0023	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 2019761)											
TY2505151-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	3.80	3.32	0.48	Diff <2x LOR	----
Dissolved Metals (QC Lot: 2018625)											



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 2018625) - continued											
HA2501535-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0100	mg/L	0.0243	0.0255	0.0012	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00100	mg/L	0.329	0.332	0.689%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.100	mg/L	0.141	0.144	0.003	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000500	mg/L	0.00207	0.00213	2.90%	20%	----
		Calcium, dissolved	7440-70-2	E421	0.500	mg/L	271	269	0.787%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000100	mg/L	0.00113	0.00110	2.60%	20%	----
		Chromium, dissolved	7440-47-3	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00100	mg/L	0.00316	0.00326	0.00010	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00200	mg/L	<0.00200	0.00208	0.00008	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0100	mg/L	0.0144	0.0150	0.0006	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	11.0	10.9	0.792%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00100	mg/L	0.109	0.108	1.18%	20%	----
		Molybdenum, dissolved	7439-98-7	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		Nickel, dissolved	7440-02-0	E421	0.00500	mg/L	0.0210	0.0212	0.00021	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.500	mg/L	15.9	15.9	0.149%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00200	mg/L	0.0229	0.0236	3.26%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000500	mg/L	0.00294	0.00295	0.000013	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.500	mg/L	6.15	6.24	1.45%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.500	mg/L	2250	2240	0.125%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00200	mg/L	0.915	0.936	2.26%	20%	----
		Sulfur, dissolved	7704-34-9	E421	5.00	mg/L	79.4	80.5	1.37%	20%	----
		Tellurium, dissolved	13494-80-9	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000100	mg/L	0.000280	0.000288	0.000008	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 2018625) - continued											
HA2501535-001	Anonymous	Tungsten, dissolved	7440-33-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Vanadium, dissolved	7440-62-2	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0100	mg/L	0.253	0.257	1.52%	20%	----
		Zirconium, dissolved	7440-67-7	E421	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 2019040)						
Conductivity	----	E100	1	µS/cm	1.2	----
Physical Tests (QCLot: 2019041)						
Alkalinity, total (as CaCO ₃)	----	E290	1	mg/L	# 2.1	B
Physical Tests (QCLot: 2019075)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 2020134)						
Colour, apparent	----	E330	2	CU	<2.0	----
Physical Tests (QCLot: 2021496)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 2019032)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 2019033)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 2019034)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2019035)						
Sulfate (as SO ₄)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 2019036)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2019037)						
Bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 2019038)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 2021694)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 2019761)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 2018625)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 2018625) - continued						
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----



Qualifiers

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Target Concentration	LCS	Low	High	
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 2019039)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 2019040)									
Conductivity	----	E100	1	µS/cm	1410 µS/cm	98.5	90.0	110	----
Physical Tests (QCLot: 2019041)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	98.1	85.0	115	----
Physical Tests (QCLot: 2019075)									
Turbidity	----	E121	0.1	NTU	200 NTU	101	85.0	115	----
Physical Tests (QCLot: 2020134)									
Colour, apparent	----	E330	2	CU	25 CU	99.1	85.0	115	----
Physical Tests (QCLot: 2021496)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	95.9	85.0	115	----
Anions and Nutrients (QCLot: 2019032)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.5	90.0	110	----
Anions and Nutrients (QCLot: 2019033)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	99.1	90.0	110	----
Anions and Nutrients (QCLot: 2019034)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	98.5	90.0	110	----
Anions and Nutrients (QCLot: 2019035)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 2019036)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 2019037)									
Bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	99.9	85.0	115	----
Anions and Nutrients (QCLot: 2019038)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.05 mg/L	102	80.0	120	----
Anions and Nutrients (QCLot: 2021694)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	104	85.0	115	----
Organic / Inorganic Carbon (QCLot: 2019761)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	101	80.0	120	----



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 2018625)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	0.1 mg/L	95.4	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	0.05 mg/L	97.7	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	0.05 mg/L	98.4	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.012 mg/L	99.1	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.005 mg/L	91.8	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	0.05 mg/L	96.2	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	0.05 mg/L	90.4	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.005 mg/L	92.7	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	2.5 mg/L	92.1	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.002 mg/L	99.0	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.012 mg/L	90.9	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.012 mg/L	89.4	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.012 mg/L	88.4	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	0.05 mg/L	89.0	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.025 mg/L	95.3	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.012 mg/L	85.6	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	2.5 mg/L	98.2	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.012 mg/L	92.6	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.012 mg/L	93.6	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.025 mg/L	89.4	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	0.5 mg/L	95.2	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	2.5 mg/L	92.3	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.005 mg/L	97.4	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	0.05 mg/L	92.8	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	0.5 mg/L	93.0	60.0	140	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.005 mg/L	90.6	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	2.5 mg/L	93.2	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.012 mg/L	96.0	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	2.5 mg/L	94.5	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.005 mg/L	97.5	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	0.05 mg/L	98.6	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.005 mg/L	83.4	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.025 mg/L	95.1	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.012 mg/L	89.2	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.005 mg/L	89.9	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0 mg/L	92.0	80.0	120	----



Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 2018625) - continued									
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.025 mg/L	92.8	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.025 mg/L	93.3	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.005 mg/L	88.6	80.0	120	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Laboratory sample ID					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	Target	MS	Low	High	
Client sample ID	Analyte	CAS Number	Method							
Anions and Nutrients (QCLot: 2019032)										
WT2512794-001	MW-01	Chloride	16887-00-6	E235.Cl	478 mg/L	500 mg/L	95.6	75.0	125	----
Anions and Nutrients (QCLot: 2019033)										
WT2512794-001	MW-01	Nitrite (as N)	14797-65-0	E235.NO2	2.38 mg/L	2.5 mg/L	95.3	75.0	125	----
Anions and Nutrients (QCLot: 2019034)										
WT2512794-001	MW-01	Nitrate (as N)	14797-55-8	E235.NO3	11.6 mg/L	12.5 mg/L	93.1	75.0	125	----
Anions and Nutrients (QCLot: 2019035)										
WT2512794-001	MW-01	Sulfate (as SO4)	14808-79-8	E235.SO4	477 mg/L	500 mg/L	95.3	75.0	125	----
Anions and Nutrients (QCLot: 2019036)										
WT2512794-001	MW-01	Fluoride	16984-48-8	E235.F	4.94 mg/L	5 mg/L	98.9	75.0	125	----
Anions and Nutrients (QCLot: 2019037)										
WT2512794-001	MW-01	Bromide	24959-67-9	E235.Br	2.46 mg/L	2.5 mg/L	98.6	75.0	125	----
Anions and Nutrients (QCLot: 2019038)										
WT2512615-004	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	ND mg/L	----	ND	70.0	130	----
Anions and Nutrients (QCLot: 2021694)										
WT2511067-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0910 mg/L	0.1 mg/L	91.0	75.0	125	----
Organic / Inorganic Carbon (QCLot: 2019761)										
TY2505151-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	5.38 mg/L	5 mg/L	108	70.0	130	----
Dissolved Metals (QCLot: 2018625)										
WT2512721-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.998 mg/L	1 mg/L	99.8	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.473 mg/L	0.5 mg/L	94.6	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.489 mg/L	0.5 mg/L	97.7	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	----	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0454 mg/L	0.05 mg/L	90.9	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.408 mg/L	0.5 mg/L	81.5	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.424 mg/L	0.5 mg/L	84.9	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.0421 mg/L	0.05 mg/L	84.1	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	----	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.0244 mg/L	0.025 mg/L	97.7	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.116 mg/L	0.125 mg/L	92.7	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.111 mg/L	0.125 mg/L	88.6	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.103 mg/L	0.125 mg/L	82.5	70.0	130	----
		Iron, dissolved	7439-89-6	E421	ND mg/L	----	ND	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.213 mg/L	0.25 mg/L	85.3	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.119 mg/L	0.125 mg/L	95.3	70.0	130	----



Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 2018625) - continued										
WT2512721-001	Anonymous	Magnesium, dissolved	7439-95-4	E421	ND mg/L	----	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	ND mg/L	----	ND	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.123 mg/L	0.125 mg/L	98.3	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.212 mg/L	0.25 mg/L	84.6	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	4.96 mg/L	5 mg/L	99.1	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	24.6 mg/L	25 mg/L	98.3	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0501 mg/L	0.05 mg/L	100	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.446 mg/L	0.5 mg/L	89.2	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	ND mg/L	----	ND	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.0396 mg/L	0.05 mg/L	79.1	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	----	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	----	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	24.4 mg/L	25 mg/L	97.5	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0419 mg/L	0.05 mg/L	83.8	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.445 mg/L	0.5 mg/L	89.1	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0419 mg/L	0.05 mg/L	83.9	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.232 mg/L	0.25 mg/L	92.7	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.119 mg/L	0.125 mg/L	95.3	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0438 mg/L	0.05 mg/L	87.7	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00215 mg/L	0.002 mg/L	86.2	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.247 mg/L	0.25 mg/L	98.9	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.206 mg/L	0.25 mg/L	82.3	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0473 mg/L	0.05 mg/L	94.6	70.0	130	----



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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9678

COC Number: 23 - 1119427

Page of

Environmental Division
Waterloo
Work Order Reference
WT2512794

Report To: Contact and company names below will appear on the final report

Company: GFL Consultants Ltd.

Contact: Chad Matt Long

Phone: Company address below will appear on the final report

Street: 650 Woodlawn Rd. West Unit 2

City/Province: Oakville, ON

Postal Code: M6K 1B8

Invoice To: Same as Report To

Copy of Invoice with Report: ☒ YES ☐ NO

Company: Project Information

ALS Client Code / QUOTE #: 2407030

2007 Project #: 2407030

PO / A/E: Location:

LSD: ALS Lab Work Order # (ALS use only): WT2512794

ALS Sample # (ALS use only): Sample Identification and/or Coordinates

MW-01

MW-03

MW-05

Date (dd-mm-yy): 23-05-25

Time (hh:mm): 1:30

Sample Type: GW

Date (dd-mm-yy): 23-05-25

Time (hh:mm): 2:00

Sample Type: GW

Date (dd-mm-yy): 23-05-25

Time (hh:mm): 2:15

Sample Type: GW

Date (dd-mm-yy): 23-05-25

Time (hh:mm): 2:15

Sample Type: GW

Date (dd-mm-yy): 23-05-25

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Sample Type: GW

Date (dd-mm-yy): 23-05-25

Time (hh:mm): 2:15

Sample Type: GW

Date (dd-mm-yy): 23-05-25

Time (hh:mm): 2:15

Turnaround Time (TAT) Requested

4 day (14) if received by 3pm M-F - no surcharges apply

3 day (12) if received by 3pm M-F - 20% rush surcharge minimum

2 day (10) if received by 3pm M-F - 30% rush surcharge minimum

1 day (8) if received by 3pm M-F - 40% rush surcharge minimum

Same day (2) if received by 10am M-F - 50% rush surcharge

Additional fees may apply to turn requests on weekends, etc.

See and Time Required for all ALS TATs

For all tests with rush TATs requested, please contact

Analytical Request

Indicate Filtered (F), Filtered (F) or Filtered and Filtered (FF) below

ANALYSIS REQUEST

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ANALYSIS REQUEST

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SAMPLES ON HOLD

EXTENDED STORAGE REQUIRED

SUSPECTED HAZARD (see notes)

SAMPLES ON HOLD

EXTENDED STORAGE REQUIRED

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SUSPECTED HAZARD (see notes)

SAMPLES ON HOLD

EXTENDED STORAGE REQUIRED

Released by: Chahana Mistry 26 May '25 9:00

RECEIVED TO BACK PAGE FOR ALS COORDINATES AND SAMPLING INFORMATION

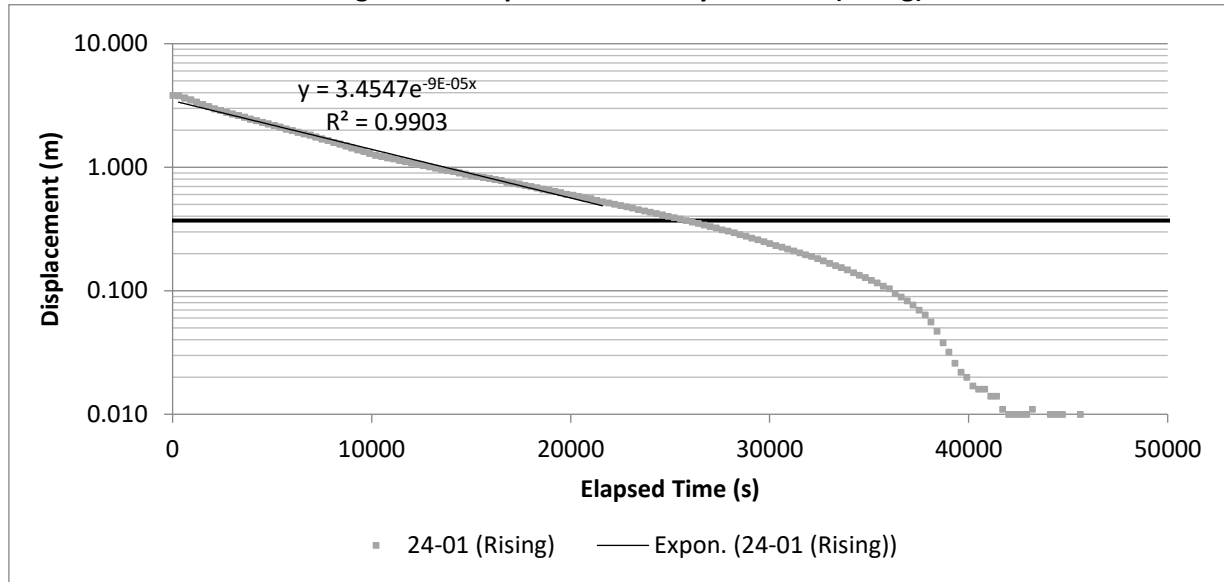
WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GC-85 N-845

MN-977

Appendix G Single Well Response Testing

Single Well Response Test Analysis: 24-01 (Rising)



Bouwer-Rice Analysis

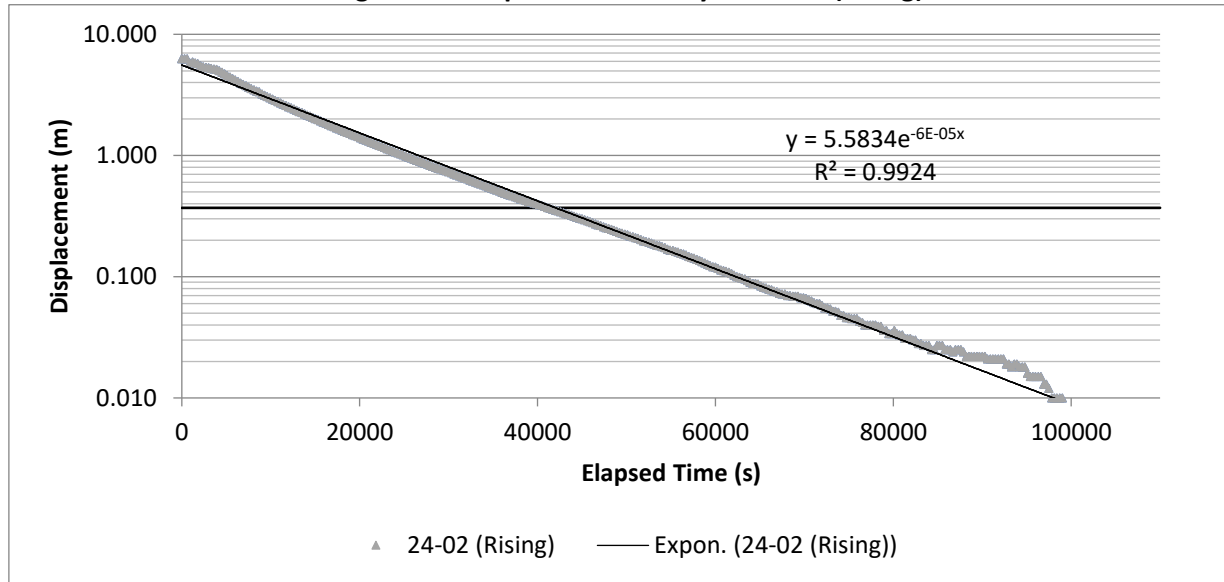
Governing Equation:

$$k = \frac{r_c^2 \ln\left(\frac{R_e}{r_w}\right) \left(\frac{1}{t}\right) \ln\left(\frac{y_o}{y_t}\right)}{2L}$$

$(1/t)(\ln(y_o/y_t)) =$	9.00E-05	(from slope of data)
$L =$	3.05	(Saturated Length of Screen)
$r_w =$	0.1048	(radius of filter pack)
$L/r_w =$	29.1	(ratio)
$A =$	2.50	(from shape factor curves in Bouwer and Rice, 1976)
$B =$	0.4	(from shape factor curves in Bouwer and Rice, 1976)
$C =$	2	(from shape factor curves in Bouwer and Rice, 1976)
$\ln(R_e/r_w) =$	2.956	(from shape factor equation in Bouwer and Rice, 1976)
$D =$	5.5	(Saturated Thickness of Geologic Unit)
$H =$	6.2	(Height of water column above bottom of well)
$r_c =$	0.0586	(radius of well casing, equivalent using porosity of 0.3)
$k =$	1.5E-07	m/s

Hydraulic Conductivity of FILL: Silty Sand, some clay 1.5E-07 m/s

Single Well Response Test Analysis: 24-02 (Rising)



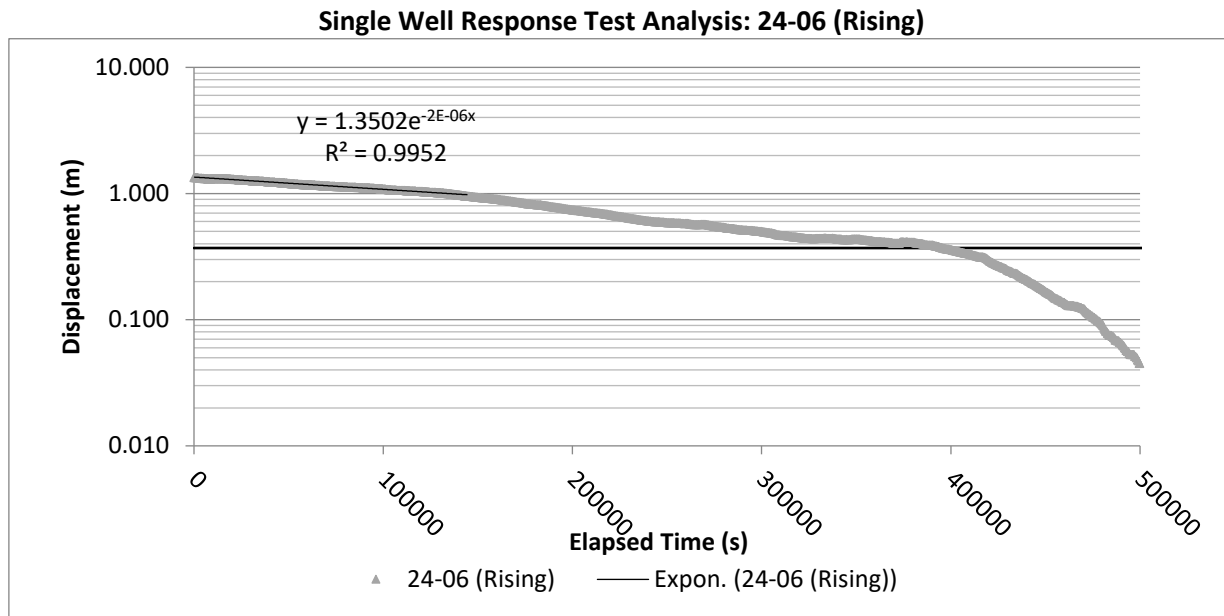
Bouwer-Rice Analysis

Governing Equation:

$$k = \frac{r_c^2 \ln\left(\frac{R_e}{r_w}\right) \left(\frac{1}{t}\right) \ln\left(\frac{y_o}{y_t}\right)}{2L}$$

$(1/t)(\ln(y_o/y_t))=$	6.00E-05	(from slope of data)
$L =$	3.05	(Saturated Length of Screen)
$r_w =$	0.1048	(radius of filter pack)
$L/r_w =$	29.1	(ratio)
$A =$	2.50	(from shape factor curves in Bouwer and Rice, 1976)
$B =$	0.4	(from shape factor curves in Bouwer and Rice, 1976)
$C =$	2	(from shape factor curves in Bouwer and Rice, 1976)
$\ln(R_e/r_w) =$	3.145	(from shape factor equation in Bouwer and Rice, 1976)
$D =$	8.65	(Saturated Thickness of Geologic Unit)
$H =$	8.65	(Height of water column above bottom of well)
$r_c =$	0.0586	(radius of well casing, equivalent using porosity of 0.3)
$k =$	1.1E-07	m/s

Hydraulic Conductivity of SANDY SILT to SILTY SAND 1.1E-07 m/s



Bouwer-Rice Analysis

Governing Equation:

$$k = \frac{r_c^2 \ln \left(\frac{R_e}{r_w} \right) \left(\frac{1}{t} \right) \ln \left(\frac{y_o}{y_t} \right)}{2L}$$

$(1/t)(\ln(y_o/y_t)) =$	2.00E-06	(from slope of data)
$L =$	3.05	(Saturated Length of Screen)
$r_w =$	0.1048	(radius of filter pack)
$L/r_w =$	29.1	(ratio)
$A =$	2.50	(from shape factor curves in Bouwer and Rice, 1976)
$B =$	0.4	(from shape factor curves in Bouwer and Rice, 1976)
$C =$	2	(from shape factor curves in Bouwer and Rice, 1976)
$\ln(R_e/r_w) =$	2.270	(from shape factor equation in Bouwer and Rice, 1976)
$D =$	2.02	(Saturated Thickness of Geologic Unit)
$H =$	2.02	(Height of water column above bottom of well)
$r_c =$	0.0586	(radius of well casing, equivalent using porosity of 0.3)
$k =$	2.6E-09	m/s

Hydraulic Conductivity of SANDY SILT to SILTY SAND is 2.6E-09 m/s