James Keating Construction

Hydrogeological Study Ainley Farm Subdivision Township of Centre Wellington (Elora)

GMBP File: 411009-1

April 12, 2023

GUELPH | OWEN SOUND | LISTOWEL | KITCHENER |LONDON | HAMILTON | GTA

650 WOODLAWN RD. W., BLOCK C, UNIT 2, GUELPH ON N1K 1B8 P: 519-824-8150
WWW.GMBLUEPLAN.CA

TABLE OF CONTENTS

APPENDICES

HYDROGEOLOGICAL STUDY AINLEY FARM SUBDIVISION

JAMES KEATING CONSTRUCTION

APRIL 12, 2023

GMBP FILE: 411009-1

1. INTRODUCTION

GM BluePlan Engineering Limited (GMBP) was retained by James Keating Construction (the Client) to conduct a Hydrogeological Study in support of a proposed residential development, the Ainley Farm Subdivision, located at a property legally described as Part Lots 17 and 18, Concession 12 in the northwest portion of the Town of Elora in the Township of Centre Wellington, Ontario (shown on Figure 1, hereafter referred to as the "Site").

Due to the anticipated high groundwater table conditions and depth of excavations required for proposed service installation, this Hydrogeological Study is being undertaken to assess the potential hydrogeological impacts, identify construction dewatering requirements, and to support construction dewatering and municipal approvals.

It is our understanding that the proposed development will include 101 single-detached residential lots, three (3) street townhouse blocks, one (1) apartment block, one (1) cluster townhouse block, one (1) open space block, one (1) park block and two (2) stormwater management blocks. It is also understood that the proposed development will be serviced with municipal sewage systems and municipal water services. The Draft Plan of Subdivision for the development is provided in Appendix A (Plan dated March 23, 2023).

This report presents the findings of the hydrogeological study, which has gathered data from a review of background information and field investigations and provides an assessment of the expected requirements for construction dewatering.

1.1 Purpose and Scope

The purpose of this report is to gather information about the Site from existing sources as well as from Site-specific field investigation activities to characterize the hydrogeological setting of the Site.

The study considers a desktop "Study Area" that encloses the area within 500 m of the Site (see Figure 2) and involves the following scope of work:

1. Desktop Study, including collection of information from publicly available sources (Ontario Geological Survey maps, Ontario water well database, Grand River Conservation Authority (GRCA), Ontario Source Protection Atlas),
2. Search of the Ministry of the Environment, Conservation and Parks (MECP) water well records within 500 m of the Site boundary,
3. Field Investigation, including,
    a. Review of information from existing overburden boreholes and monitoring wells, for characterization of site geological and hydrogeological conditions (installations completed as part of Geotechnical Investigation by CMT Engineering Inc. (CMT) (March 2006),
    b. Measurement of groundwater levels including review of long-term groundwater elevation data set collected by CMT (2006 – 2016) and GMBP (2022),

   c. Collection of groundwater samples and laboratory analysis by a CALA/SCC accredited laboratory for general groundwater chemistry parameters,
   d. Completion of single well response tests in select, accessible monitoring wells, and,
4. Hydrogeological data analysis and reporting including:
   a. Presentation of information gathered through desktop study and field investigation,
   b. Preliminary Construction Dewatering Assessment, including estimated flow rates and water quality as well as identification of potential impacts due to dewatering,
   c. Monitoring and Mitigation Plan for use during construction dewatering,
   d. Preparation of Water Discharge Plan and maps as required by the Permit to Take Water application to support construction dewatering approvals,
5. PTTW application (to be completed prior to start of construction works)
   a. Preparation of PTTW application, compilation of supporting documents and submission to the MECP.

A more detailed description of the field investigation activities is provided in Section 3 (Methodology). As part of future activities related to this Hydrogeological Study, a door-to-door well survey of potential well supplied properties within 125 m of the proposed development Site boundaries will be conducted in the near future.

2. BACKGROUND

2.1 Site Location and Setting

The 21.46-hectare (ha) subject property is located in the northwest portion of Elora in the Township of Centre Wellington (Figure 1). The subject property is roughly rectangular, with approximately 305 m of frontage along Gerrie Road and approximately 510 m deep.

The Site is bordered to the east by Gerrie Road, beyond which is the Elora Waste Transfer Station property; an existing residential subdivision to the south and west; and agricultural lands to the north. Generally, the land use in the general Site vicinity is residential and agricultural.

The subject Site is located at municipal addresses 6542, 6560 Gerrie Road and includes the southerly portion of the adjacent property located at municipal address of 6574 Irvine Street North, as shown on Figure 2. Legally, the Site is described as Part Lots 17 and 18, Concession 12, Township of Centre Wellington (Geographic Township of Nichol), County of Wellington.

The Site is currently under agricultural use, with a residential dwelling in the easterly portion of the property (fronting onto Gerrie Road). The westerly portion of the property includes forested lands and wetlands. Mapping presented in the Ainley Farm Environmental Impact Study: Addendum #2 (North-South Environmental Inc. 2023) identified a swamp in the southwesterly portion of the Site as well as swamp, wetland and former wetland in the westerly portion of the property, east of the existing Walser Street Road allowance (refer to Ecological Land Classification mapping in Appendix A).

Figure 1 shows the location of the Site on a regional scale and Figure 2 shows an aerial view of the Site and the Study Area.

2.2 Proposed Development

The "Project" mainly involves the development of a residential subdivision located in the northeast portion of the Town of Elora in the Township of Centre Wellington (per Draft Plan of Subdivision, enclosed in Appendix A, prepared by J. D. Barnes Limited, March 23, 2023)).

The proposed site development will contain the following elements:

- 101 single-detached residential lots,
- three (3) street townhouse blocks,
- one (1) apartment block,
- one (1) cluster townhouse block,
- one (1) open space block,
- one (1) park block, and
- two (2) stormwater management blocks.

The development will be serviced with municipal water and municipal sewage services. The plan enclosed in Appendix A shows the proposed layout of the development.

2.3 Local Relief and Drainage

The topography throughout the Ainley Farm Subdivision Site is undulating and consists of rolling slopes with gradients ranging from 0.5% to 20%. Original ground elevations on Site range from approximately 410 m to approximately 416 m.

The northeastern portion of the Site generally drains in a northeast direction towards Gerrie Road. The remainder of the Site generally drains in a southwest direction towards the existing wetland, ultimately discharging to the existing drainage channel located immediately south of the wetland. The northwestern portion of the Site, adjacent to the existing Walser Street right-of-way, drains in a southerly direction towards Walser Street.

On a sub-regional scale, drainage from the Site is southerly towards the Grand River, which lies approximately 1,200 m south of the Site.

2.4 Geology and Physiography

The Site is located within the physiographic region known as the Guelph Drumlin Field as shown on Figure 3a (Chapman and Putnam 1984). In the Guelph Drumlin Field, the local soils generally consist of stony tills and deep gravel terraces, the latter being typical of glacial meltwater spillways and the former being typical of drumlins and till plains (Chapman and Putnam 1984).

In terms of physiographic landforms, mapping from the Ontario Geological Survey (Chapman and Putnam 2007) indicates that the majority of the Site is within drumlinized Till Plains, with the northerly tip of the Site within the Spillways landform. Figure 3b shows the physiographic landforms present at and in the vicinity of the Site.

According to the mapping from the Ontario Geological Survey (2010), the surficial geological materials of the Site are mainly Wentworth Till materials in the easterly portion of the property with kames and eskers identified in the westerly portion of the property (Figure 4).

The bedrock in the Study Area is the Guelph Formation dolostone, a tan to brown, fine-to medium-crystalline, fossiliferous, locally biohermal, sucrosic dolostone. Beneath the Guelph Formation is a discontinuous aquitard known as the Eramosa Formation, which contains argillaceous and bituminous material, which in turn is underlain by the Goat Island Formation, an aquifer of lower transmissivity which is noted for distinctive geochemistry with elevated sulphate and halite (Brunton 2009). The Goat Island Formation is underlain by the Gasport Formation.

Water well records attributed to locations near the Site provide observations of the stratigraphy at greater depths (MECP 2022a). A review of select records in the vicinity of the Site indicate that at shallow depths the soils are reported as clay; sandy/gravelly clay; gravel; clay and sand; stones and clay, with soils at depth being described mainly as “hardpan” (till) and being underlain by limestone/dolostone bedrock.

Water well records from properties within 125 m of the Site indicate that the subcrop (i.e., the upper surface) of the bedrock generally lies at a depth of approximately 7.4 m and 18.6 m below ground surface in the vicinity of the Site, depending on location and topography.

2.5 Local Use of Groundwater

2.5.1 Source Protection

A review of source protection mapping available through the GRCA (2022) indicates that the Site overlaps the following vulnerable area designations:

- Wellhead Protection Area (WHPA) “C” (westerly portion of the Site), vulnerability 6
    - Significant Groundwater Recharge Area (SGRA)
- Wellhead Protection Area (WHPA) “D” (easterly portion of the Site), vulnerability 4
- Wellhead Water Quantity Zone (WHPA Q), risk level “Significant”

The nearest municipal wellhead to the Site is located approximately 780 m to the southwest (Centre Wellington well E1).

These designations under the Sourcewater Protection framework will guide the impact assessment of the dewatering activities insofar as potential impacts to municipal water sources are concerned.

2.5.2 Water Well Records

A search of the MECP water well records database (MECP 2022a) returned 68 water well records attributed to locations within the 500 m Study Area. Table 1 provides a summary of the information provided in the MECP water well records database. Figure 5 illustrates the locations of the water well records within the Study Area.

A brief summary of information collected from the water well records is as follows:

- Well records by well type in the 500 m Study Area:
    - 53 bedrock wells
    - 11 overburden wells
    - 4 wells with status listed as unknown
        - Of these 4 wells, 1 well record is listed as “Abandoned”.
        - 3 well records with no additional information provided

- Well records belonging to bedrock wells:
    - By usage:
        - Abandoned: 7 records
        - Domestic: 40 records
        - Monitoring/Observation: 6 records
    - Average Static Water Level: 11 mbgs

- Well records belonging to overburden wells:
    - By usage:
        - Abandoned: 3 records
        - Monitoring/Observation: 8 records

- Average Static Water Level: no static water level data provided in the database

There were no domestic overburden domestic water supply well records identified in the Study Area.

Based on the coordinates provided in the MECP well records database, three (3) well records for bedrock domestic water supply wells plot on the eastern portion of the subject property: two (2) records plot on the portion of the property occupied by a residential home and one (1) well record plots in the agricultural field, adjacent to Gerrie Road. No domestic water supply wells were specifically identified in agricultural portion of the Site during the site reconnaissance. It is possible that this well record may be for a well for neighbouring rural residential properties in the vicinity of the Site.

Copies of water well records for properties within 125 m of the Site are provided in Appendix B.

2.6 Relevant Local and Site-Specific Reports

2.6.1 Geotechnical Investigation – CMT Engineering Inc. (2006)

A geotechnical investigation for the proposed development was completed by CMT Engineering Inc. (dated March 29, 2006). The report documents the findings of a field investigation that included the drilling of eight (8) boreholes (BH101 to BH108) to depths of up to 3.5 to 5.0 mbgs on January 25, 2006. Monitoring wells were installed in all eight (8) boreholes.

Generally, based on conditions encountered during geotechnical borehole drilling, the stratigraphy of the subsurface materials is quite variable and is summarized as follows:

- Topsoil, between 0.3 m to 0.6 m thick (thinnest at BH104 and BH102, thickest at BH107), overlying,
- Upper Silt/Organic Silt, Silt Till/Sandy Silt Till units approximately 0.45 m to 1.78 m in thickness at locations BH101, BH102, BH103 and BH104, underlain by Sand or Silty at BH104 to end of borehole, and Sand/Silty Sand followed by Silt Till at BH102 and BH101 to end of borehole.
- Upper Sand or Silty Sand units at BH105, BH 106, BH 107 and BH108 approximately 0.77 to 1.78 m in thickness underlain by Clayey Silt (at BH107 only) and Silt or Sandy Silt Till extending to end of borehole at these four locations.

During drilling, saturated conditions were encountered within the Sand and Silty Sand layer. CMT reported that perched groundwater conditions can be expected at locations BH101, BH102, BH103, BH105 and BH106. CMT suggested that the perched water appears to be surface water that has perched on top of the relatively impermeable sandy silt till, sandy silt and silt till soils.

Historical groundwater level measurements reported in BH101 to BH108, indicate variable groundwater conditions, with water levels ranging from just above ground surface with maximum reported elevation of 414.15 masl at location of BH105 (approximately 0.11 m above ground surface, recorded on March 9 and 25, 2006 by CMT) to approximately 406.08 masl reported at BH108 (October 3, 2008).

The locations of the boreholes and monitoring wells are shown on Figure 6 and on the geotechnical investigation borehole location plan enclosed in Appendix C. Copy of the borehole logs, cross-sections and grain-size analyses of select soil samples performed as part of the Geotechnical Investigation are also provided in Appendix C.

In the discussion regarding site dewatering, CMT (2006) indicates that construction dewatering will be required during installation of site services and residential foundations and that water concerns including the effects of high groundwater table conditions should be anticipated for this project. Dewatering conditions may improve if works are conducted during drier summer months and following installation of services (CMT 2006).

2.7 Identified Receptors

Receptors are those entities which may be affected by the proposed development or its construction. They may include anthropogenic features, water users, or ecological features.

Receptors relevant to the anticipated construction dewatering activities include the following:

- Municipal water resources (per the Source Protection Plan),
- Private water supply wells on nearby properties,
- Construction activities,
- Significant natural areas (e.g., wetland/woodland areas) on-Site.

3. METHODOLOGY

The hydrogeological field investigation involved the following activities:

- Water level monitoring (2006-1016 by CMT, 2022 by GMBP),
- Hydraulic conductivity testing (single-well response testing),
- Groundwater quality sampling and analyses,
- Desktop review of water well records in the Study Area, and
- Site reconnaissance.

Water levels were monitored by CMT at each of the existing on-Site monitoring wells (BH101 to BH108) between 2006 and 2016, and by GMBP in select wells in the summer of 2022. Water level data was collected by manual measurement using an electronic water level tape.

Samples of groundwater were collected by GMBP from select accessible monitoring wells, within portion of the Site where development activities will occur (i.e., BH101, BH102 and BH106) on August 12, 2022. The remaining wells within the future development area, were inaccessible for sampling (i.e., BH103 was dry and BH105 was blocked/inaccessible due to an obstruction above water level).

Prior to sampling, the monitoring wells were purged of at least three (3) well volumes of water or until the well went dry, using dedicated inertial foot valve attached to low density polyethylene tubing. The monitoring wells were allowed to recharge with fresh groundwater and using the same dedicated pump and tubing, water quality samples were collected into laboratory supplied bottles specific to the requested analysis with laboratory added sample preservative, where required. Samples were kept cool (between 0 and 10°C) and submitted to a CALA/SCC-accredited laboratory (ALS Laboratories, Waterloo) under standard chain-of-custody protocols for analyses. Samples for metals analysis were field filtered using 0.45 µm Waterra® inline disposable filter and preserved using laboratory prepared preservative. The laboratory-issued Certificates of Analyses are provided in Appendix D.

Single-well response tests (or “slug tests”) were conducted at select accessible monitoring wells on August 31, 2022 (BH101, BH102 and BH106). These tests were conducted using the rising-head mode. Preparation for the test began by recording a manual measurement of the static groundwater level and installing a datalogging pressure transducer at an appropriate depth. A “slug” (weighted PVC cylinder) was inserted into the well to cause an increase in the water level in the well. The slug was then removed from the well to cause a proportional decrease in the water level and the subsequent increase in water levels (“rising-head”) was measured with time as the water level in the well returned to equilibrium. The data collected from these tests was then analyzed using the Bouwer-Rice (1976) method to determine the hydraulic conductivity of the soil intersecting the well screen.

Site reconnaissance was completed by GMBP to visually observe the Site and confirm desktop study information. This occurred concurrently with other field activities, mainly in August and September 2022.

A door-to-door water well survey of properties within 125 m of the property boundaries will be conducted in the near future.

4. FIELD INVESTIGATION FINDINGS

4.1 Groundwater Levels

At monitoring wells BH101 through BH108, groundwater levels were measured manually by CMT (2006-2016) and GMBP staff (August 2022) using an electronic water level probe.

Hydrographs of the groundwater level data collected from BH101 through BH108 are plotted in the enclosed Charts 1 to 8, respectively. A record of manual groundwater level measurements and monitoring well details, is provided in Table 2.

The record of available groundwater data indicates that the range of overall fluctuation (i.e., vertical distance between maximum ("seasonal high") and minimum ("seasonal low") in measured groundwater levels is approximately 2.1 m (recorded at BH106) to 3.5 m (recorded at BH103), indicating a high degree of seasonal fluctuation. Based on available reported data, the highest seasonal groundwater elevations reach up to between 409.33 masl (BH108) to 414.15 (BH105), during short periods in late winter and early spring (February/March). During summer and early fall, lowest reported seasonal groundwater elevations range from 406.82 masl (BH108) to 411.22 masl (BH105), recorded on occasion during June, September and October monitoring events.

4.1.1 Groundwater Gradients

Groundwater contours based on reported seasonal high groundwater level readings from have been plotted and are presented in Figure 7. These contours have been determined through a numerical interpolation of the maximum 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.

The orientation of the contours indicates that the lateral direction of groundwater flow is generally southwesterly, indicating flow generally toward wetland area in the westerly portion of the property.

The spacing of the contours indicates a lateral gradient of approximately 0.6% (in the northeasterly portion of the Site) to approximately 1.8% (in the southwesterly portion of the Site).

4.2 Shallow Groundwater Quality

Samples of groundwater were collected from the three accessible wells located within the portion of the property to be developed (i.e., BH101, BH102, and BH106).

Results of analyses are provided in Appendix D (Laboratory Certificate of Analysis) and are summarized in Table 3a for general chemistry parameters and Table 3b for dissolved metal parameters.

Generally, the results of the analyses indicate that the quality of the groundwater in the shallow sand/silty sand aquifer is compliant with Provincial Water Quality Objectives (PWQOs) with the exception of aluminum (0.184 mg/L) at location BH106, which slightly exceeds the criteria for this parameter (0.075 mg/L). This is interpreted to be due to natural occurrence of aluminum in the on-Site soils.

Qualitatively, the groundwater quality results are characterized by moderate mineralization, as indicated by the elevated hardness, calcium, and magnesium concentrations. There is some evidence of anthropogenic impact to the shallow aquifer, with elevated nitrate concentrations (7.80 to 9.83 mg/L), slightly elevated sodium (1.61 to 8.40 mg/L), and chloride (43.3 to 103 mg/L) reported at the three sampled locations. Elevated nitrate concentrations are likely due to impacts from agricultural activities (i.e., application of nitrogenous fertilizers).

The elevated sodium and chloride concentrations are inferred to be due to the application of road deicing products on nearby right-of-ways.

4.3 Hydraulic Conductivity Testing

4.3.1 Single Well Response Tests (Slug Tests)

The hydraulic conductivity of the soil intersected by the well screen was tested at three accessible monitoring wells within lands where development activities will occur (i.e., BH101, BH102, and BH106) using a single-well response testing method. The testing was conducted at each of the three monitoring wells in a rising-head mode on August 31, 2022.

Spreadsheets showing the test data and the calculated hydraulic conductivity values are provided in Appendix E. Overall, the data collected from the tests were conducive to analysis, with few irregularities and consistent trends in water level change with time.

Monitoring wells BH101 and BH102, intersect a Sand and Silty Sand and Sand and Silty Till layers, respectively, therefore the results of testing at these locations provide estimates of the hydraulic conductivity of the "Sand" layer. At the location BH106, the Sand layer was not encountered and the well screen at this location intersects Silty Sand and Sandy Silt Till layers. Therefore, at this location, the hydraulic testing provides the estimate of the hydraulic conductivity of the Silty Sand, or the more permeable layer compared to the Silt Till layer.

Below is a summary of the estimated hydraulic conductivity test results:

- BH101
  - Rising-Head Test: 1.7×10^{-5} m/s
  - Soils in screened interval: sand, silty sand, sand with trace silt
- BH102
  - Rising-Head Test: 1.5×10^{-4} m/s
  - Soils in screened interval: silt till, sand with trace silt and gravel, silt till
- BH106
  - Rising-Head Test: 1.5×10^{-7} m/s
  - Soils in screened interval: sandy silt till

Based on the variable soil conditions, that the three monitoring wells where the testing was conducted intersect, as expected, there is some variability in the estimates of hydraulic conductivity values at these locations (i.e., more permeable Sand layer has higher hydraulic conductivity than the finer texture Silty Sand layer).

Summary of slug test data and calculations are provided in Appendix E.

4.4 Site Reconnaissance

While attending the Site to undertake other fieldwork activities, GMBP made reconnaissance observations to verify, where possible, findings from the desktop review.

The Site topography was confirmed to be generally undulating, with an upland area in the central portion of the Site (in the vicinity of BH103) and a slight to moderate slope towards Gerrie Road to the north, as well as towards Thomas Boulevard to the southeast and the woodland/wetland portion of the property to the south/southwest.

The Site was observed to be under agricultural use with crop (winter wheat) recently harvested. There is a residential portion of property in the easterly portion of the Site, adjacent to Gerrie Road. A residential structure was observed on the subject property and no water supply wells were specifically identified at the Site at the time of the site visit.

The woodland/wetland area in the westerly portion of the property was observed to be very densely forested, with pedestrian paths throughout the westerly and southerly portion of the wooded area, in the vicinity of the neighbouring residential subdivision and a City park/playground area. A municipal drainage channel is located in the southerly portion of the wooded/wetland area, which is reported to drain the wetland to a nearby storm catch basin in a road south of the proposed development. At the time of site reconnaissance, the drainage feature was observed to be dry to damp, with no standing water observed.

5. HYDROGEOLOGICAL CONCEPTUAL SITE MODEL

A "conceptual model" of a Site describes its physical setting and provides an interpreted overview of the hydrogeological behavior of the Site. It provides a basis for general understanding of groundwater flows and other hydrogeological phenomena as well as a basis for the assessment of potential impacts.

The topography of the Site consists of an upland area in the central part of the Site with slight to moderate slope towards Gerrie Road to the north, Tomas Boulevard the southeast and the wetland/forested area to the south/southwest.

In terms of hydrostratigraphy, the geologic strata underlying the Site are characterized generally as:

- Sand/Silty Sand aquifer (approximately 1-3 m thick), overlying
- Silt Till aquitard, overlying
- Guelph Formation (dolostone) bedrock.

In the northerly portion of the Site, the Sand/Silty Sand unit is overlain by a Silt Till/Sandy Silt Till unit. The Sand unit does not appear to be continuous throughout the Site, nor be of uniform thickness. It is anticipated to have varying connectivity throughout the Site.

Based on the water level data collected from the Site since 2016, the Sand/Silty Sand aquifer is interpreted to be an unconfined or "water-table" aquifer, in which the direction of lateral groundwater flow is mainly toward the southwest to the wetland/woodland in the west portion of the Site.

An interpreted SHGWL surface has been determined and is presented as a contour plot in Figure 7. Groundwater levels fluctuate over the course of the year, typically reaching "seasonal high" levels during the late winter and early spring and descending gradually to "seasonal low" levels in the summer and fall. At, near and slightly above ground surface groundwater elevations were reported at select monitoring well locations (BH101, BH104, BH105, BH106, and BH107) during the spring melt season (i.e., occasionally in February, and typically in March/early April).

The interval separating "seasonal high" from "seasonal low" ranges from about 2.1 m (recorded at BH106) to 3.5 m (recorded at BH103), indicating a high degree of seasonal fluctuation in groundwater level.

The low-lying wetland area in the southwesterly part of the Site appears to be a reflection of the proximity of the water table to ground surface. During seasons of high groundwater levels, it appears that the water table intersects the ground surface in at least some parts of the wetland area.

Given the average thickness of the overburden (approximately 15.4 m, based on MECP well records in Site vicinity) in the Site vicinity and the predominance of till materials below the shallow, surficial sand/silty sand aquifer, there appears to be a significant hydraulic separation between the overburden aquifer and the bedrock aquifer. As such, activities affecting the overburden aquifer (e.g., dewatering) would not be likely to affect the bedrock aquifer.

6. CONSTRUCTION DEWATERING ANALYSIS

6.1 Dewatering Rates

As previously noted, it is expected that construction of the proposed subdivision may require excavations below the groundwater table and therefore construction dewatering may be required to facilitate construction.

Depending on the dewatering rates that may be required, water-taking approvals may be required from the MECP. Furthermore, the taking and discharge of groundwater may result in impacts to the project or to other receptors.

Appendix F provides calculations for estimating construction dewatering rates. These calculations were based on analytical models provided by Powers *et al* (2007) for an unconfined aquifer. The calculations were further based on the following scenarios:

- Sanitary Sewer Construction was modeled as a finite trench 3 m wide and up to 30 m long for two cases:
  - Maximum:
    - Hydraulic conductivity of $3x10^{-4}$ m/s (i.e., a factor of safety of 2 applied to the hydraulic conductivity obtained by testing at BH102)
    - Drawdown of up to 4.5 m (i.e., representing the case of servicing along Walser Street near the west property boundary, at which trench depth is expected to be 407.0 masl and historical groundwater levels are 411.0 masl)
  - Typical:
    - Hydraulic conductivity of $3.4x10^{-5}$ m/s (i.e., a factor of safety of 2 applied to the hydraulic conductivity obtained by testing at BH101)
    - Drawdown of up to 3 m (i.e., typical depth of excavation for most servicing applications)
- Construction of SWM Facility No. 1, which was modeled as flow-to-well for an equivalent well with perimeter equal to 410 m (approximate perimeter of the SWM Facility) and a target drawdown of 0.5 m for the following cases:
  - Maximum:
    - Hydraulic conductivity of $3x10^{-4}$ m/s (i.e., a factor of safety of 2 applied to the hydraulic conductivity obtained by testing at BH102)
  - Typical:
    - Hydraulic conductivity of $3.4x10^{-5}$ m/s (i.e., a factor of safety of 2 applied to the hydraulic conductivity obtained by testing at BH101)
- Construction of SWM Facility No. 2, which was modeled as flow-to-well for an equivalent well with perimeter equal to 124 m (i.e., approximate perimeter of the SWM Facility) and a target drawdown of 2.0 m for the following cases:
  - Maximum:
    - Hydraulic conductivity of $3x10^{-4}$ m/s (i.e., a factor of safety of 2 applied to the hydraulic conductivity obtained by testing at BH102)
  - Typical:
    - Hydraulic conductivity of $3.4x10^{-5}$ m/s (i.e., a factor of safety of 2 applied to the hydraulic conductivity obtained by testing at BH101)

The infiltration galleries are not included in the construction dewatering estimates because, by design, they will be set at elevations above the seasonal high groundwater level.

The estimated drawdowns used in the calculation of maximum dewatering rates were based on maximum recorded groundwater levels in nearby monitoring wells (CMT 2006, 2016).

Additional assumptions are given in the construction dewatering calculation sheets (Appendix F).

For permitting purposes, the construction dewatering rates have been estimated to be as follows (values have been rounded from line estimates provided in Appendix F):

- **Expected Maximum Daily Discharge: 2,228,000 L**
  - Accounts for upper-limit (i.e., maximum) estimated flows from both stormwater management facilities (1,046,000 L/d) and sanitary sewer construction (1,182,000 L/d).
- **Expected Typical Daily Discharge: 187,000 L/d**
  - Accounts for non-concurrent flow from the largest "typical" flow estimated for a single source (i.e., SWM Pond No. 1).

Based on the estimates provided, construction site dewatering is likely to exceed 400,000 L/d. As such, it is recommended that a Permit to Take Water be sought from the MECP to permit dewatering.

6.2 Zone of Influence

The zone of influence is expected to vary depending on the location of a given excavation in which dewatering is occurring. For the various types of dewatering situations, the zone of influence is defined as the area within the "radius of influence" from the edge of excavation, with the radius of influence (R_0) being calculated using the Sichardt equation (see Appendix F).

The largest expected zone of influence is attributed to the servicing along Walser Street near the west property boundary, with a radius of up to 234 m from the limits of excavation. Servicing trenches in other parts of the Site may have smaller zones of influence due to shallower excavation depths and soils of lower hydraulic conductivity.

For the SWM Facilities, the zone of influence may extend up to a distance of 26 m from SWM Facility No. 1. And up to 104 m from SWM Facility No. 2. The drawdown is estimated at about 3.9 m in the immediate vicinity of the excavation, at the deepest connection to the existing sanitary sewer at the easterly extent of the existing Walser Street right-of-way and decreases with distance across the Site as the remaining portions of the sanitary sewer are at higher elevations (up to a maximum elevation of approximately 412.97 masl in the southeasterly portion of site, corresponding to less than 2 m of drawdown at that location).

It is noted that currently, based on desktop review of water well records, there were no overburden water supply wells identified on properties within 125 m of the proposed development. The purpose of the door-to-door survey which will be undertaken in the near future, is to confirm whether there are any nearby residences that rely on shallow overburden wells for water supply. Furthermore, at the location of the deepest connection to the sanitary sewer (at the easterly extent of existing Walser Street right-of-way), based on review of available well records, there do not appear to be private water supply wells serving the existing residential properties within 250 m of this location.

The zone of influence overlaps the wetland area in the west part of the Site. As such, this receptor along with potential overburden aquifer users (unless confirmed otherwise during door to door well survey), will be considered in the impact assessment (Section 7) and monitoring and mitigation plan (Section 8).

6.3 Methodology

Due to the prevalence of cohesionless soils (predominantly sand/silty sand), it may be preferable to undertake the dewatering operation using wellpoints, especially for the installation of the sanitary sewer along Walser Street. The target groundwater level is as deep as approximately 4.5 mbgs, which may be near the practical limit of operation for wellpoints, which may be 4.5 m to 6 m depending on the design of the system (Powers *et al,* 2007). It may be necessary to reduce the suction lift by excavating a bench alongside the servicing trench and placing the header line and pump on the bench. Alternatively, for the segment of the proposed alignment of Walser Street along the north side of the woodlot, it may be feasible to utilize deep wells with submersible pumps due to the coarseness of the deposits. Wellpoints and wells, if utilized, shall be installed by a licensed well drilling

contractor and decommissioned by a licensed well drilling contractor at the end of the project: all installation and decommissioning shall be conducted in accordance with O.Reg. 903.

Alternatively, the dewatering could be undertaken using sumps, though due to the instability of the trench below groundwater it is expected that sump dewatering would require the excavation of a much wider trench than would be required if wellpoints were used.

It will be the responsibility of the contractor to select and implement an appropriate dewatering methodology.

7. IMPACT ASSESSMENT

A proposed development may result in hydrogeological impacts due to the effects it may have on the hydrogeological system. Hydrogeological impacts generally fall into two categories: water quality impacts or water quantity impacts. A given receptor may be impacted by both, either, or neither of these types of impacts depending on the potential severity of the effect, whether there is a pathway between the source and the receptor, and whether the receptor is sensitive to that type of impact.

Table 4 (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 4: Screening of Potential Hydrogeological Impacts.

Receptor	Potential Impacts Related to		Rationale
	Water Quantity	Water Quality	
Municipal Water Resources/ Source Water Protection	■	■	The Site lies within a WHPA-C (6) and WHPA-D (4) areas as well as within WHPA-Q area. The proposed dewatering activities should be reviewed in light of the source protection context and applicable policies.
Private Water Wells	■	■	Several domestic water well records within the Study Area were identified. The records indicate 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 within 125 m of the Site.
On-Site/Adjacent Wetland Area	■	■	Ecological classification mapping (North-South Environmental Inc. 2019) indicates the presence of wetlands in the westerly portion of the property. The zone of influence is expected to overlap with part of the wetland area. There is potential for the dewatering discharge to be released overland and flow into the wetland area.
Construction Activities	■	■	Construction dewatering may be required to complete servicing activities. The approval and operation of groundwater control systems will be considered a potential water quantity impact to the project. The dewatering discharge may result in impacts to surface water quality for which the construction project is responsible to mitigate.

7.1 Municipal Water Resources / Source Water Protection

7.1.1 Quantity

The Site overlaps with a WHPA-Q area as designated by the local source protection plan (LESPR 2022). The following activities are designated as “significant” drinking water threats within the WHPA-Q area.

1. “an activity that takes water from an aquifer or a surface water body without returning the water taken to the same aquifer or surface water body.”
2. “an activity that reduces the recharge of an aquifer”

<u>Long-Term Subdivision Operation</u>

Regarding the long-term operation of the subdivision, quantity impacts have been addressed through the provision of LID/ enhanced recharge structures.

For example, based the water budget presented in the Preliminary Servicing and SWM Report (GM BluePlan, Draft Report, August 2022), indicates the following:

- Recharge:
  - Pre-Development Conditions: 12,674 m^3/year
  - Post-Development Conditions: 11,974 m^3/year
    - Includes contributions from the proposed infiltration galleries.

The net change in recharge due to development is expected to be small (5.5% decrease).

As such, it is expected that the proposed development will not have a negative impact on the water quantity available to the municipal wells.

Construction Dewatering

With respect to the anticipated construction dewatering, it is noted that water will be drawn from the shallow sand/silty sand aquifer and be discharged to land. Technically, this will involve the withdrawal of water from an aquifer without returning it to that same aquifer. However, there is potential for some of the discharge to flow overland into the low-lying wetland areas in the westerly portion of the Site, due to the occurrence of sand/silty sand soils at the Site, there is also potential for water to infiltrate into the ground and there is potential for additional infiltration and recharge once it arrives in the low-lying, wetland area. This effect will be temporary because it will be limited to the duration of construction dewatering.

The dewatering activity may be considered to reduce the recharge of the bedrock aquifer by a small amount for the duration of dewatering. This is because, by drawing down the water level in the surficial aquifer, there is a slight decrease in the hydraulic gradient that drives seepage from the surface toward the bedrock. However, it is noted that the dewatering will affect a relatively small area (i.e., limited to the zone of influence) and due to the temporary nature of dewatering and the modest drawdown (less than 4 m) it is not expected that this will result in a significant impact to the municipal water supply quantity.

It is emphasized that the anticipated construction dewatering will draw water from a shallow overburden aquifer, not from the municipal source aquifer, which is in the bedrock (e.g., Guelph Formation).

It is therefore expected that the dewatering will not cause a significant impact to the overall water quantity of the municipal source aquifer.

7.1.2 Quality

Long-Term Subdivision Operation

Potential groundwater quality impacts related to the long-term operation of the subdivision are being addressed through the stormwater management design which will provide a level of treatment according MECP stormwater management guidelines.

With respect to other Source Protection concerns, the *Tables of Drinking Water Threats* (2021) indicate that the only “Significant” drinking water threat activity that is attributable to the vulnerable areas on-Site (i.e., WHPA-C (6)) is the handling and storage of Dense Non-Aqueous Phase Liquids (DNAPL). Due to the anticipated residential land use, DNAPL use is not expected and therefore it is not expected that a Risk Management Plan will be required for this Site.

Construction Dewatering

The proposed construction dewatering activity is not expected to affect the water quality available to the municipal water resources. This is because there is hydraulic separation (till layer) between the surficial sand aquifer and the bedrock aquifer (which is the municipal source).

Furthermore, the expected impacts to water quality that might occur due to dewatering are mainly limited to suspended solids in the discharge water. By nature, suspended solids are not likely to impact groundwater due to the filtration provided by the surficial geological materials.

7.2 Private Water Wells

7.2.1 Quantity

Long-Term Subdivision Operation

Regarding the long-term operation of the subdivision, potential groundwater quantity impacts have been addressed through the provision of LID/ enhanced recharge structures (see discussion in Section 7.1.1).

The subdivision is not expected to induce long-term impacts to the quantity of water available to private water wells.

Construction Dewatering

Construction dewatering will be undertaken to facilitate certain aspects of the construction process (i.e., construction of SWM pond and site servicing) and is expected to result in a temporary drawdown of the water table. The zone of influence of the dewatering activity has been estimated to extend up from about 9 m to 234 m from the proposed excavation areas (depending on hydraulic conductivity and dewatering scenario).

These activities are 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.

However, there is potential for the shallow/ dug wells constructed in the surficial sand aquifer to be affected by the drawdowns imposed by the construction dewatering activities. Based on the review of the available MECP well records, there were no shallow overburden wells identified on properties within 125 m of the Site. A door-to-door survey will be completed in the near future, to provide additional information on whether there are shallow overburden water supply wells in the Site vicinity.

Regardless, should shallow water supply wells be identified in the Site vicinity, it is expected that because of the distance between the excavation areas, the amount of drawdown that will be experienced by these wells is expected to be relatively minor and should not result in substantial loss of water availability. Should shallow overburden wells be identified in Site vicinity as part of the door-to-door well survey, it is recommended that a water quantity (i.e., water level) monitoring program be implemented for all users of dug wells who will permit the monitoring of their well.

7.2.2 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 a shallow overburden well within 100 m of either of the proposed Stormwater Management ponds. It is also recommended that the SWM ponds be constructed with a suitable

liner (e.g., geomembrane, geosynthetic-clay, or compacted clay) to mitigate the entry of these constituents into the groundwater.

Construction Dewatering

For the same reasons discussed above (Section 7.2.1), the dewatering activity is not expected to affect drilled wells installed in the bedrock. Though generally more susceptible to being affected by surficial activities, the quality of water available to the dug overburden water supply wells (should any be identified) is not expected to be affected by the proposed dewatering.

The discharge of water from the dewatering system is not expected to cause degradation of water quality available to local wells because the main parameter of interest is total suspended solids, which will be filtered out by the local geological materials before it reaches a nearby well. Furthermore, erosion and sediment controls will be provided to prevent the release of sediment-laden water to the environment (see Section 8 for more information about mitigation plans).

The act of pumping water 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 wells servicing currently developed properties in Site vicinity, should any be overburden wells be identified as part of the door-to-door well survey on neighbouring properties, 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, 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 Site vicinity.

7.3 Wetland Area

7.3.1 Quantity

Long-Term Subdivision Operation

With respect to the subdivision itself, the quantity of water available to the wetland area is considered to have been addressed satisfactorily through the stormwater management design (see discussion in Section 7.1.1).

Because erosion and channelization can cause increased runoff and reduced recharge, to preserve the recharge functionality of the wetland area it is recommended that the stormwater management facility outlet be designed to minimize erosion. This may involve the provision of a dispersed discharge (e.g., flow spreader) in the design of the stormwater management facility outlet. The stormwater management design should also seek to maintain peak runoff flows at pre-development levels.

Incorporating these provisions to limit erosion, water quantity impacts to the wetland area are not expected.

Construction Dewatering

During construction dewatering, it is noted that the quantity of water available in the wetland area may be affected by the drawdown caused by the dewatering system. The drawdown at the wetland area is expected to be relatively minor (up to 2 to 4 m). Monitoring data have shown that groundwater levels on-Site tend to fluctuate within a range of 2.1 to 3.5 m over the course of a year (see Section 4.1, as well as groundwater elevation charts for BH101 to BH108 (enclosed after report text)). As such, the drawdown caused by dewatering is likely to be within the range of typical seasonal fluctuation. The potential for impact is further offset by the fact that the dewatering discharge will be released to the same catchment from which it was taken and would thus offset the magnitude and extent of impact of the drawdown.

The discharge of water from the dewatering system is not expected to cause quantity-related impacts to the wetland area. This is partly because the water is being taken from the same catchment to which it is being discharged, and also because there is a municipal drainage channel downstream of the wetland area which drains the wetland to a storm catch basin south of the proposed development. The channel will provide an opportunity for excess water to drain away, limiting the potential for flooding or waterlogged conditions to impact the wetland.

In addition to the foregoing, the drawdown will also be temporary because the construction dewatering activity itself is expected to be temporary.

As such, it is not expected that the dewatering activity will cause water quantity impacts to the wetland area.

7.3.2 Quality

Long-Term Subdivision Operation

As discussed in Section 7.2.2, stormwater management ponds may be a potential point of entry for certain chemical constituents to enter the groundwater. Based on the available groundwater level data, it is expected that seepage from SWM Facility No. 1 (i.e., the southwesterly facility) would enter the shallow groundwater system in the vicinity of the wetland area. Though wetland area is not a “discharge” feature (i.e., gradients support downward flow), there is still the potential that groundwater from or affected by the seepage from SWM Facility No. 1 could be available to the wetland area during periods of high groundwater.

To mitigate potential impacts to the wetland in this way, it is recommended that SWM Facility No. 1 be provided with a suitable liner to reduce the rate of mass transfer between the SWM Facility and the groundwater.

Construction Dewatering

Due to the potential for some of the dewatering discharge water to reach the wetland area as runoff, there is a possibility that the surface water quality of the wetland will be impacted by the dewatering operation.

The parameter of interest is total suspended solids, which may be due to the direct uptake of sediment from the pumps and/or wellpoints or may be due to the erosion of the ground surface at the point of discharge.

Monitoring and mitigation plans (see Section 8) are to be implemented during the dewatering process to ensure that water received by the wetland will be of suitable quality.

7.4 Construction Activities

Construction activities are expected to be subject to potential hydrogeological impacts in the sense that there is potential for groundwater to seep into excavations. Dewatering is therefore required to facilitate the construction work.

An analysis of construction dewatering requirements has been completed and has identified potential for dewatering in excess of 400,000 L/d (see Section 6). As such, it is recommended that a Permit to Take Water be obtained from the MECP in respect of the proposed dewatering project.

As discussed elsewhere in Section 7, there is potential for the dewatering activities to cause impacts to local overburden well users and the local environment. To control the risk of impacting these receptors, a monitoring and mitigation plan for the proposed dewatering activity is provided in Section 8. This monitoring plan will be updated after completion of the door-to-door well survey, specifically if overburden water supply wells are identified within 125 m of the Site.

8. CONSTRUCTION DEWATERING MONITORING AND MITIGATION PLANS

The following describes the details of the monitoring and mitigation plan proposed to be implemented alongside the construction dewatering activities. Appendix G provides a listing of the monitoring and mitigation activities in a tabular format.

8.1 Monitoring Activities

The results of all monitoring activities should be kept in a monitoring logbook. The logbook may be maintained in paper or electronic format but must be available for review on-Site, as required.

8.1.1 Water Well Monitoring

At the time of preparation of this report, the door-to-door well survey was not yet completed. Door to door survey will be undertaken once the Draft Plan of Subdivision is submitted and approved.

Owners of properties where overburden wells are used for water supply, will be invited to join the water well monitoring program, which will include the following activities:

1. Installation of a datalogger to monitor groundwater level before, during, and after dewatering
2. Collection of a baseline water quality sample for general water quality.

Regarding item 1: Dataloggers will be installed at least 2 weeks before the expected start of construction dewatering and will be checked once again before dewatering to ensure that they are operating properly. During dewatering, the data from the dataloggers will be downloaded and reviewed once per month.

Regarding item 2: Baseline water quality samples will be collected as a raw (unfiltered) water samples from a pre-treatment tap/faucet in the residence's water system. The water samples will be sent to an accredited environmental laboratory for analysis of the following parameters:

- Metals and major anions,
- Total suspended solids,
- Turbidity,
- Total Suspended Solids, and,
- Microbiological parameters.

Appendix G provides additional details about the scheduling of these activities throughout the project, as well as the thresholds at which point mitigative action would be required.

Should no overburden water supply wells be identified as part of the door-to-door well survey, monitoring of overburden water levels will be conducted in the accessible remaining monitoring wells (as available) to monitor general water level conditions during dewatering activities. Since no impacts to water levels in bedrock aquifer are anticipated, bedrock water supply wells are not proposed to be monitored.

8.1.2 Discharge Monitoring

The discharge monitoring program will include the following tasks:

1. Inspection of erosion and sediment control facilities
2. Inspection of the discharge water for evidence of impacted water (e.g., hydrocarbon sheen)
3. Field measurement of turbidity in dewatering discharge and in receiving water body
4. Sampling and analysis of discharge water
5. Measurement of daily discharge volume

Regarding item 1: the inspection shall address all facilities installed by the contractor to control erosion and sediment for the dewatering activity, including but not limited to filter bags, check dams, silt socks or barriers, and/or armouring.

Regarding item 2: the inspection shall be conducted to identify potential changes in water quality (e.g., sheen, odour, globules, colour change, other characteristics) which may signal the discharge of deleterious materials into the environment.

Regarding item 3: Field measurement of turbidity is to be completed on occasions where the dewatering discharge flows overland into the wetland: if the discharge infiltrates before reaching the wetland area, turbidity measurement is not necessary.

Regarding item 4: a sample of discharge water shall be collected “as is” (i.e., unfiltered) and submitted to an accredited environmental laboratory for analysis of total suspended solids and turbidity.

Regarding item 5: the measurement of daily discharge volume is preferably completed using a totalizing flow meter installed according to the manufacturer’s specifications on the discharge line; alternatively, the discharge volume may be determined through calculation by multiplying the daily runtime of the pump by the discharge rate of the pump. If the calculation method is used, the pump discharge rate shall be measured by an appropriate method at least once per week. Daily discharge volumes are to be reported to the MECP in accordance with conditions of the PTTW approval.

Appendix G provides additional details about the scheduling of monitoring activities throughout the project as well as the thresholds at which point mitigative action would be required.

8.2 Mitigation Activities

Mitigation activities are divided into two categories: general mitigation activities and contingency mitigation activities.

General mitigation activities are those which are implemented for the duration of the dewatering project.

Contingency mitigation activities are those which are implemented when indicated by the results of the monitoring activities. For example, if a monitoring activity indicates that a water quality threshold has been exceeded, the corresponding contingency activity would then be implemented.

8.2.1 General Mitigation Activities

The following mitigation activities are to be maintained throughout the duration of the dewatering activity:

1. Erosion and Sediment Control Plan
2. Dewatering Intake Points

<u>Erosion and Sediment Control Plan</u>

The Erosion and Sediment Control Plan concerns the management of discharge water. It involves the preparation of a discharge area consisting of a pad of clearstone surrounded by a silt sock barrier. Discharge will be released into the discharge area through a geotextile filter bag to capture sediment. The discharge area, selected by the contractor, shall be placed at least 15 m away from the wetland area (i.e., outside the established wetland buffer). Where possible, the discharge area shall be placed such that the overland flow path that would be taken by the discharge, is fully vegetated.

The discharge area and filter bag shall be sized by the contractor according to the manufacturer specifications to ensure that there is sufficient capacity for the expected flow. It may be necessary to provide multiple filter bags to provide sufficient capacity and to provide flexibility or redundancy in maintenance.

All erosion and sediment control facilities shall be installed according to the following standards:

- OPSS.MUNI 805 (*Construction Specification for Temporary Erosion and Sediment Control Measures*)
- OPSS.MUNI 518 (*Construction Specification for Control of Water from Dewatering Operations*).

Dewatering Intake Points

Sump dewatering is particularly susceptible to the uptake of entrained sediment with the discharge water.

Therefore, all sumps shall be constructed as filtered sumps, lined with a clean granular material (e.g., clearstone), to allow entrained sediment to settle out before being taken up by the sump pump.

The contractor shall determine the number of sumps and select appropriate pumps to meet the dewatering drawdown and flow requirements.

Where wellpoints are utilized, the wellpoints shall be provided with adequate screens and/or filters and the network shall be properly developed and tuned to ensure minimal uptake of sediment with the dewatering stream.

The discharge from the construction dewatering works shall be released within the prepared discharge area described in "Erosion and Sediment Control Plan" above.

8.2.2 Contingency Mitigation Activities

When a monitoring activity indicates a deficiency or an exceedance of an identified standard/threshold, the corresponding mitigation activity shall be undertaken. Appendix G provides a list of the contingency mitigation activities.

In the event that an exceedance is identified, it shall be reported to the Contract Administrator of GMBP, who will then contact the MECP and Conservation Authority, as needed.

9. SUMMARY

A hydrogeological study has been undertaken to support the proposed development as well as dewatering approvals for construction dewatering activities associated with the construction of the Ainley Farm Subdivision, a residential development on Part Lots 17 and 18, Concession 12 in the northeast portion of the Town of Elora, Township of Centre Wellington. The following is a summary of the findings of the investigation:

- The Site is approximately 21.46 ha in size.
- Municipal water services are available in the area; however, several rural neighbouring properties rely on private water wells for water supply.
- The topography of the Site is undulating and consists of rolling slopes with gradients ranging from 0.5% to 20%. Original ground elevations on Site range from approximately 416.0 m in the upland area to approximately 410.0 m in the westerly portion of the site, within the wooded and wetland areas.
- The Site is within the Grand River watershed. The Grand River is located approximately 1,200 m south of Site.
- The Site is situated within the Guelph Drumlin Field physiographic region. The majority of the Site lies within the drumlinized Till Plains physiographic landform, with the northerly tip of the Site within the Spillways landform.
- The hydrostratigraphy of the Site consists of:
    - Glaciofluvial sand/silty sand, overlying
    - Silt Till, overlying
    - Bedrock (Guelph Formation)
- Groundwater level measurements made in shallow monitoring wells (installed to depths of up to 3.5 to 5 mbgs) on-Site indicate groundwater elevations reaching 409.33 masl (BH108) to 414.15 (BH105) masl

during “high” season (i.e., late winter and early spring), with higher elevations being observed in the easterly part of the Site and lower elevations being observed in the westerly part of the Site, including in the on-Site wetland and wooded area.

- Groundwater gradients indicate that the lateral component of groundwater flow is generally southwesterly (e.g., toward the low-lying wooded area and on-Site wetlands). The vertical component of groundwater flow is interpreted to be downward (i.e., recharge conditions).
- Locally, groundwater resources supply both the municipal system and private water well users.
- In terms of source protection, the Site is located within a WHPA-C (6), Significant Groundwater Recharge Area (westerly portion of the Site) and WHPA-D (6) (easterly portion of the Site), with the entire Site within WHPA-Q (Significant).
- Hydraulic testing of overburden soils indicates that the average hydraulic conductivity of the surficial glaciofluvial sand/silty sand unit is approximately 7.2×10^{-6} m/s (geometric mean). At location BH102 hydraulic conductivity of the sand unit was estimated at 1.5×10^{-4} m/s.
- Groundwater quality testing indicates general compliance with the Provincial Water Quality Objectives (with slightly elevated aluminum concentration at one of the monitoring locations above the respective criteria).
- Groundwater quality results indicate minor influence of anthropogenic activities on general water quality (e.g., elevated sodium and chloride, likely from road salt applications; elevated nitrate, likely from fertilizer applications).
- Due to reported high seasonal groundwater elevation, construction dewatering is expected to be required for this Site for the construction of services and stormwater management facilities. Based on information available to date, for approval purposes the following dewatering rates have been determined:
    - Maximum dewatering rate: 2,228,000 L/d
        - From sanitary sewer trench 1,182,000 L/d
        - From two SWM pond excavations 1,046,000 L/d
    - Typical dewatering rate: 187,000 L/d
        - Taken to be the estimated typical dewatering rate for anticipated largest single source, which is SWM Facility No. 1
- The zone of influence of dewatering has been estimated to be those areas within 9 to 234 m of excavations requiring dewatering.
- A monitoring and mitigation plan has been prepared to address potential impacts that the construction dewatering operations may have on private dug well users (if any) and on the natural environment.
    - The monitoring plan will be updated accordingly after the door-to-door well survey is completed.

10. CONCLUSIONS AND RECOMMENDATIONS

Based on the information presented in this report, the hydrogeological impact assessment of the Site indicates that there are no major regulatory obstacles to the development of the Site.

Regarding the hydrogeological conditions and impact assessment of the Site, GM BluePlan make the following recommendations for consideration of the proposed dewatering activities:

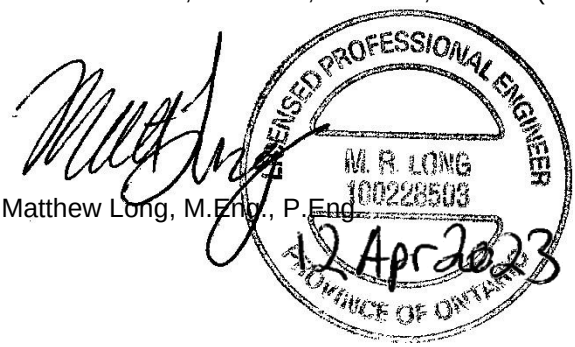
- That all on-Site wells be decommissioned according to O.Reg. 903 by a licensed water well drilling contractor when it has been determined that the wells are no longer required for monitoring purposes and preferably before the start of house construction at the Site;
- That a Permit to Take Water be obtained from the MECP in respect of the proposed dewatering activity;
- That the monitoring and mitigation plan (described in Section 8 of this report as well as the applicable appendices) be updated following the completion of the door-to-door well survey and that the monitoring plan be implemented during construction dewatering;
- That the stormwater management facilities (i.e., Ponds No. 1 and No. 2) be constructed with appropriate liners;
- That a well monitoring program be developed and conducted during construction dewatering to monitor water quality at overburden wells within 100 m of either of the proposed SWM ponds; and
- That the outlet from SWM Pond No. 1 be constructed with provisions to limit erosion in the wetland area.

All of which is respectfully submitted.

GM BLUEPLAN ENGINEERING LIMITED

Per:

Joanna Olesiuk, M. A. Sc., C. Tech., P. Geo. (Limited)



Matthew Long, M.Eng., P.Eng.

11. STATEMENT OF LIMITATIONS

The information in this report is intended for the sole use of James Keating Construction (2004) Limited. GM BluePlan Engineering Limited accepts 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.

GM BluePlan Engineering Limited cannot guarantee the accuracy or reliability of information provided by others. GM BluePlan Engineering Limited does 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. GM BluePlan Engineering Limited 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 September 23, 2022.

12. REFERENCES

Bouwer, H., and Rice, R.C. 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells. Water Resources Research, 12:3, pp. 423-428.

Brunton, F.R. 2009. Update of revisions of the Early Silurian stratigraphy of the Niagara Escarpment: integration of sequence stratigraphy, sedimentology, and hydrogeology to delineate hydrogeologic units: *in* Summary of Field Work and Other Activities 2009, Ontario Geological Survey, Open File Report 6240, p. 25-1 to 25-20.

Chapman, L.J. and Putnam, D.F. 2007. Physiography of Southern Ontario. Ontario Geological Survey, Miscellaneous Release, Data 228.

Chapman, L.J. and Putnam, D.F. 1984. Physiography of Southern Ontario – 3rd Edition. Ontario Geological Survey. Special Volume 2.

CMT Engineering Inc. 2003. Geotechnical Investigation Ville Lora Downs North, Phase III, Elora, Ontario.

CMT Engineering Inc. 2006. Groundwater Monitoring, Ville Lora Downs North, Phase III, Elora, Ontario.

CMT Engineering Inc. 2006. Preliminary Geotechnical Investigation Ainley Subdivision, Township of Centre Wellington, Village of Elora, Ontario.

CMT Engineering Inc. 2016. Groundwater Level Monitoring, Ainley Farm Subdivision, Elora, Ontario.

Grand River Conservation Authority (GRCA). 2022. GIS Services Interactive Mapping: Source Water Protection. Accessed online at https://maps.grandriver.ca/web-gis/public/

Grand River Conservation Authority (GRCA). 2019. GIS Services Interactive Mapping: Contour 2017-2018. Accessed online at https://maps.grandriver.ca/web-gis/public/

Lake Erie Source Protection Region. 2022. Grand River Approved Source Protection Plan, Chapter 7 County of Wellington. Dated February 9, 2022.

North-South Environmental Inc. 2023. Ainley Farm Environmental Impact Study Addendum # 2.

OMAFRA (Ontario Ministry of Agriculture, Food, and Rural Affairs). 2022. AgMaps GIS – Constructed Drains. Accessed online at: https://www.lioapplications.lrc.gov.on.ca/AgMaps/Index.html?viewer=AgMaps.AgMaps&locale=en-CA

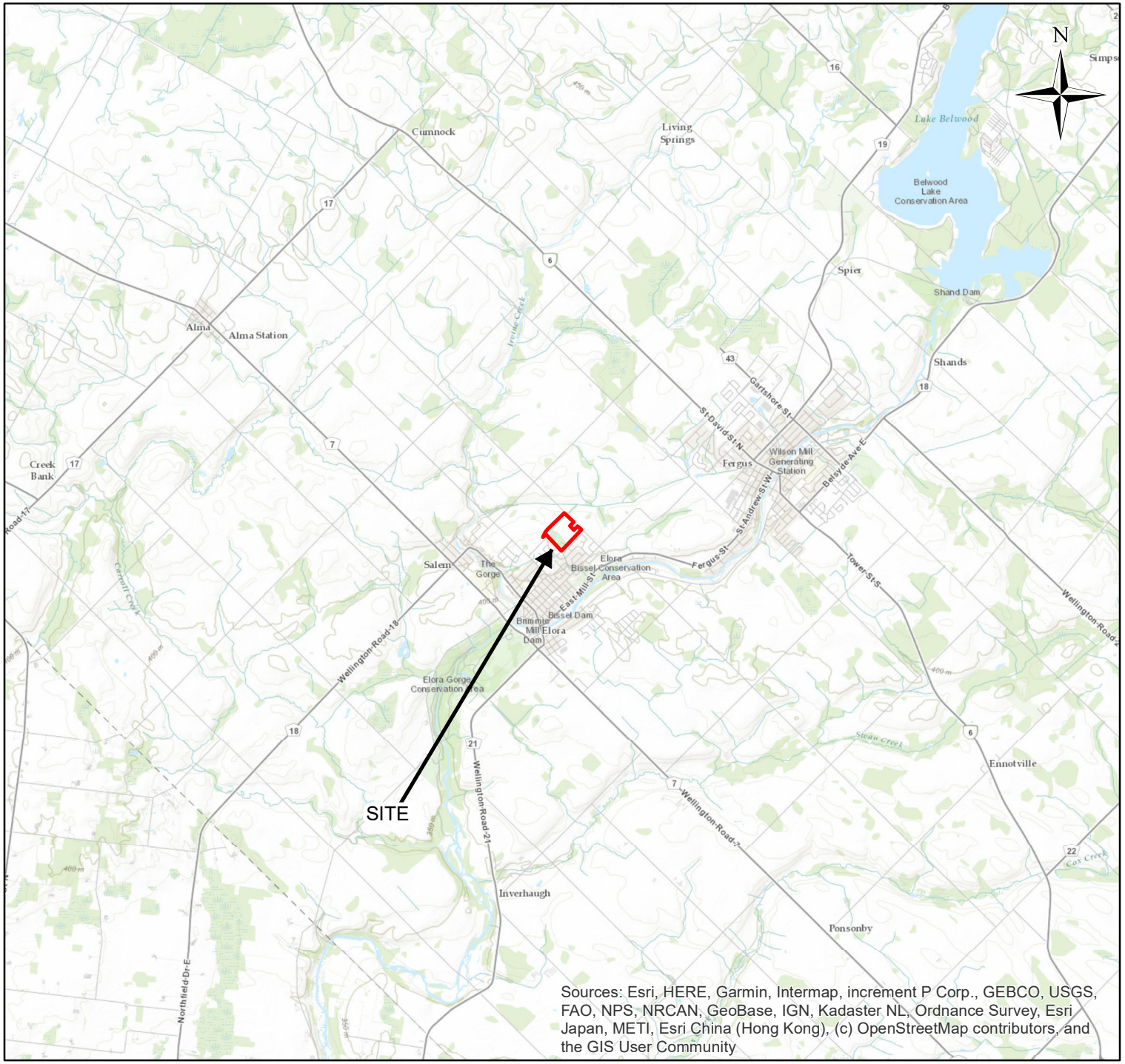
Ontario Geological Survey. 2010. Surficial Geology of Southern Ontario; Ontario Geological Survey. Miscellaneous Release, Data 128 – Rev.

Ontario Geological Survey. 2011. 1:250,000 Scale Bedrock Geology of Ontario. Ontario Geological Survey, Miscellaneous Release, Data 126 - Rev. 1

Ontario Ministry of the Environment, Conservation and Parks (MECP). 2022a. Ontario Water Well Information System – Map: Well Records. Accessed online at https://www.ontario.ca/environment-and-energy/map-well-records

Powers, J.P., Corwin, A.B., Schmall, P.C., and Kaeck, W.E. 2007. Construction Dewatering and Groundwater Control: New Methods and Applications. Third Edition. Wiley.

FIGURES



Project: 411009-1
Ainley Farm
Subdivision
Elora, ON

Part Lots 17 and 18,
Concession 12,
Township of
Centre Wellington

Site Boundary (approx.)

Scale: 1: 100,000
September 2022

Figure 1:
Study Location

BluePlan ENGINEERING

Project: 411009-1
Ainley Farm
Subdivision
Elora, ON

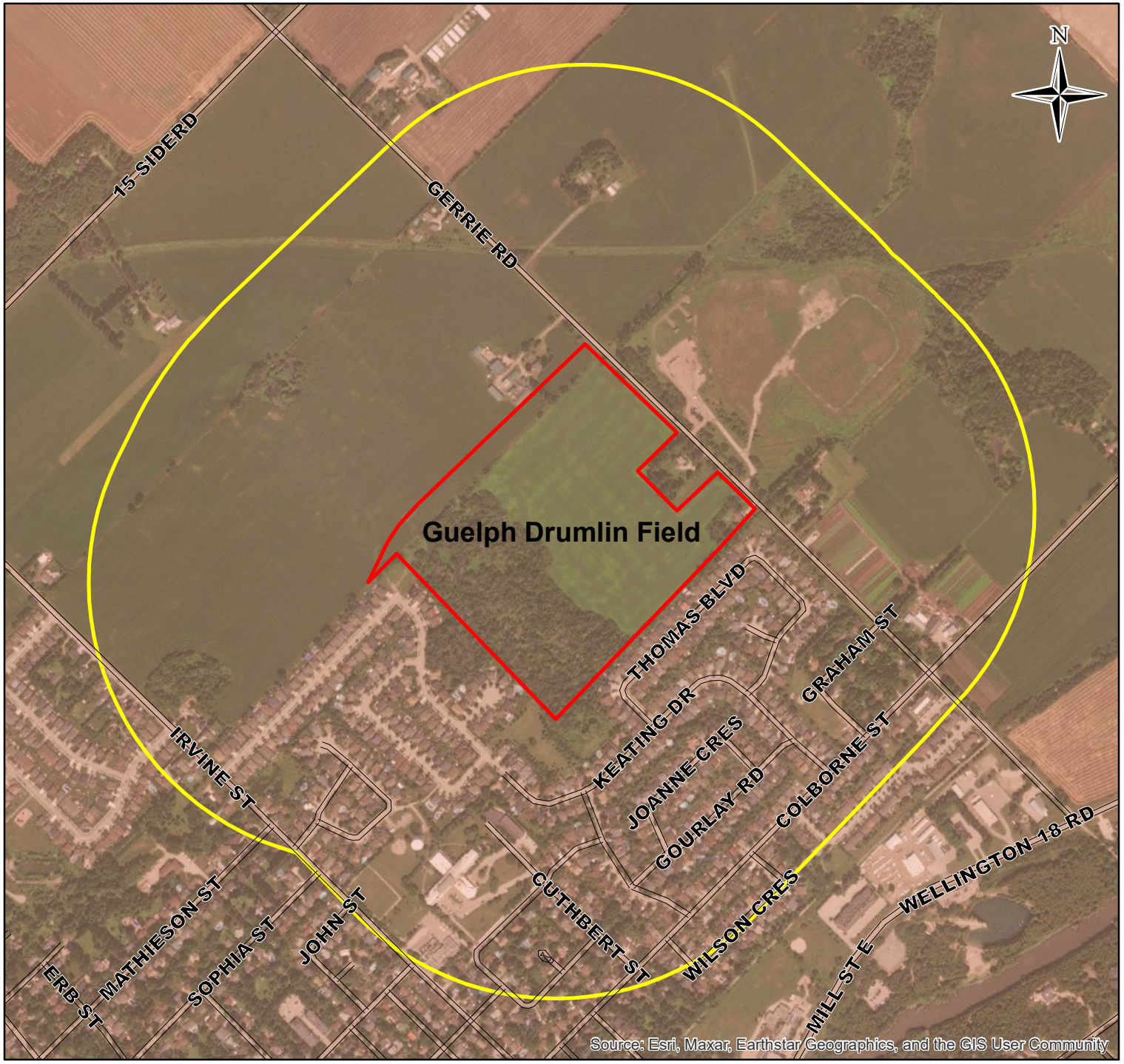
Part Lots 17 and 18,
Concession 12,
Township of
Centre Wellington

Roads
Study Area (500m)
Site Boundary (approx.)

Scale: 1: 10,000
September 2022

Figure 2:
Study Area Layout

BluePlan ENGINEERING



Project: 411009-1
Ainley Farm
Subdivision
Elora, ON

Part Lots 17 and 18,
Concession 12,
Township of
Centre Wellington

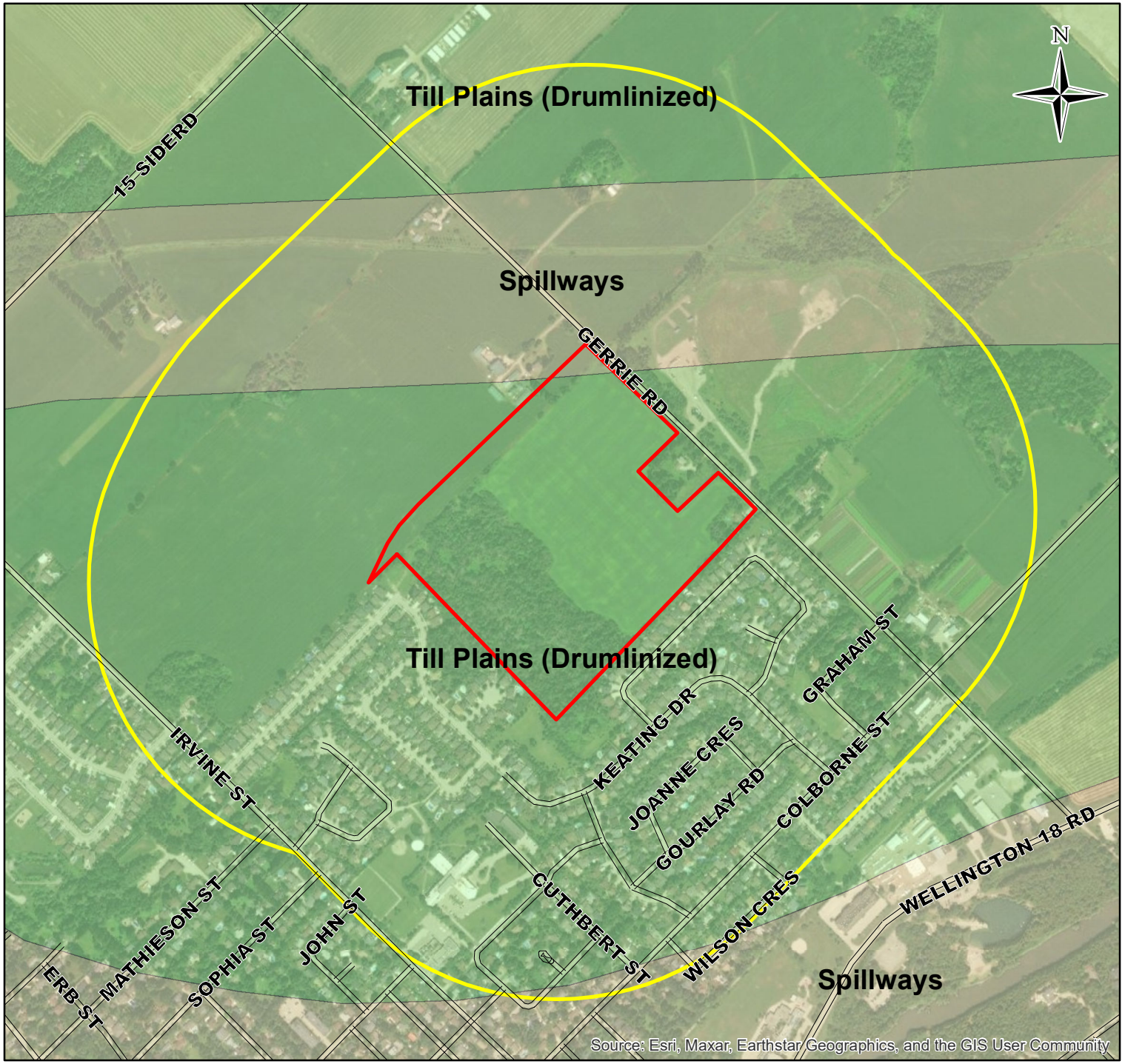
Roads
Study Area (500m)
Site Boundary (approx.)

Physiographic Regions
UNIT, REGION
11, Guelph Drumlin Field

Scale: 1: 10,000
September 2022

Figure 3a:
Physiographic Regions

BluePlan ENGINEERING



Project: 411009-1
Ainley Farm
Subdivision
Elora, ON

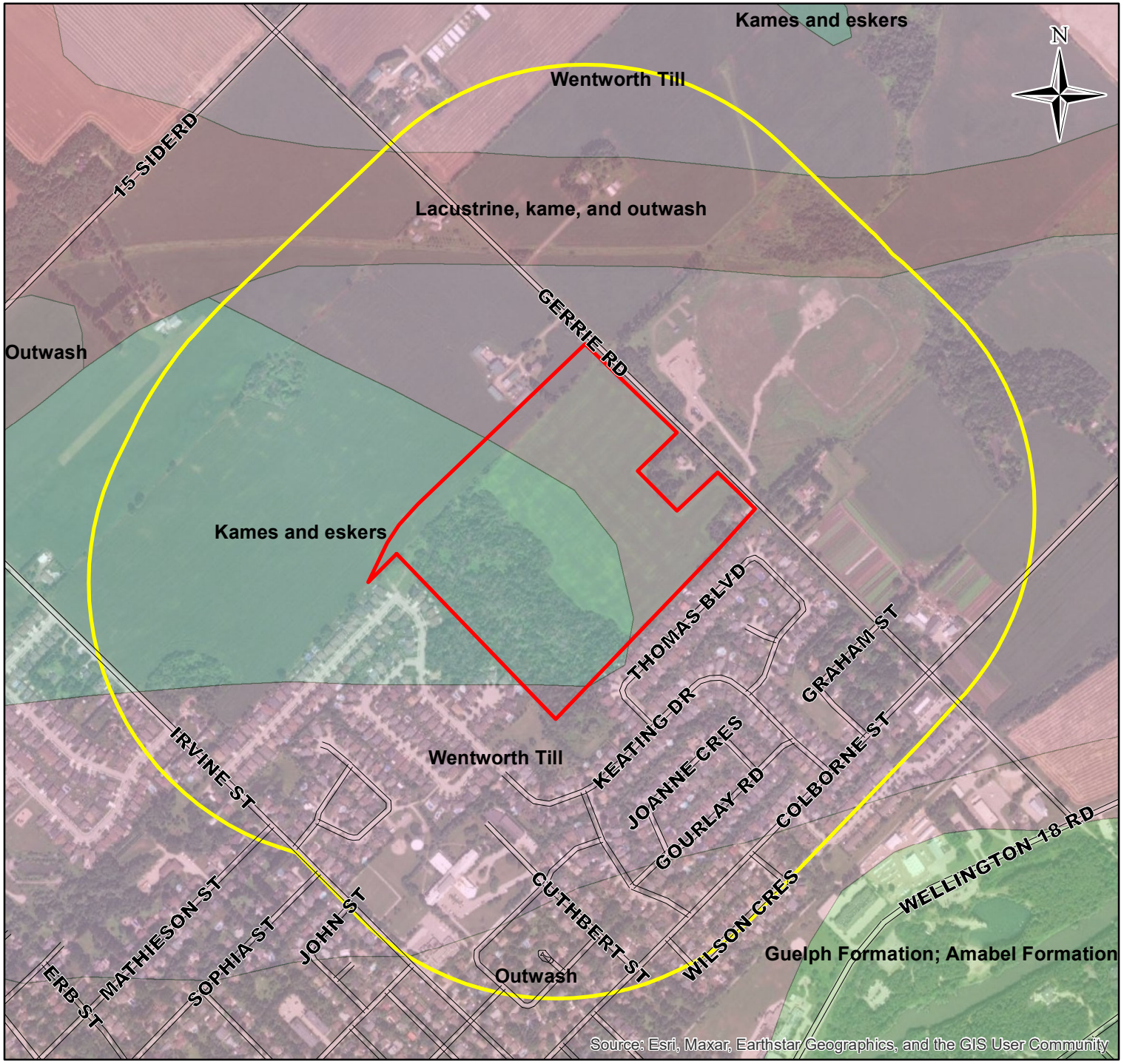
Part Lots 17 and 18,
Concession 12,
Township of
Centre Wellington

Roads
Study Area (500m)
Site Boundary (approx.)
Physiography of Southern Ontario
Spillways
Till Plains (Drumlinized)

Scale: 1: 10,000
September 2022

Figure 3b:
Physiographic Landforms

BluePlan ENGINEERING



Project: 411009-1
Ainley Farm
Subdivision
Elora, ON

Part Lots 17 and 18,
Concession 12,
Township of
Centre Wellington

Roads
Study Area (500m)
Site Boundary (approx.)

Scale: 1: 10,000
September 2022

Figure 4:
Surficial Geology

BluePlan ENGINEERING

Project: 411009-1
Ainley Farm
Subdivision
Elora, ON

Part Lots 17 and 18,
Concession 12,
Township of
Centre Wellington

Roads
Study Area (500m)
Site Boundary (approx.)

Well Use, Well Type

Abandoned, Bedrock
Abandoned, Overburden
Abandoned, Unknown
Domestic, Bedrock
Observation, Bedrock
Observation, Overburden
Unknown, Unknown

Scale: 1: 10,000
September 2022

Figure 5:
Water Wells

BluePlan ENGINEERING

Project: 411009-1
Ainley Farm
Subdivision
Elora, ON

Part Lots 17 and 18,
Concession 12,
Township of
Centre Wellington

Roads
Site Boundary (approx.)
Boreholes

Scale: 1: 3,750
September 2022

Figure 6:
Site Investigation Plan

BluePlan ENGINEERING

Project: 411009-1
Ainley Farm
Subdivision
Elora, ON

Part Lots 17 and 18,
Concession 12,
Township of
Centre Wellington

Roads
Site Boundary (approx.)
Boreholes
SHGWL Contours

Scale: 1: 3,750
January 2023

Figure 7:
Interpreted GW Contours

BluePlan ENGINEERING

TABLES

Table 1
MECP Well Records Summary

MECP Well ID	Date Completed	Well Type	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Static Water Level (mbgs)	Well Use	Notes
6703117	7/13/1968	Bedrock	30.5	16.8	6.1	Domestic	Plot on Site
6705327	8/25/1974	Bedrock	29.3	12.2	9.1	Domestic	
6701900	8/20/1953	Bedrock	36.3	15.2	6.7	Domestic	
6701901	5/20/1960	Bedrock	64	18	16.8	Domestic	
6701902	11/4/1965	Bedrock	57.3	9.1	12.2	Domestic	
6701903	8/19/1965	Bedrock	34.1	12.2	6.1	Domestic	
6701904	7/23/1966	Bedrock	31.1	10.7	6.7	Domestic	
6701905	11/15/1967	Bedrock	27.4	0	9.1	Domestic	
6701907	1/7/1961	Bedrock	48.8	13.4	5.5	Domestic	
6701908	7/13/1964	Bedrock	24.4	5.5	10.7	Domestic	
6701913	7/6/1965	Bedrock	32.6	15.8	7.6	Domestic	
6703118	11/12/1968	Bedrock	25.6	12.2	8.2	Domestic	
6703332	1/31/1969	Bedrock	26.5	13.1	4.6	Domestic	
6703394	5/5/1969	Bedrock	30.5	11.3	7	Domestic	
6703594	10/11/1969	Bedrock	14.3	0	9.1	Domestic	
6703611	1/21/1970	Bedrock	68.9	18.6	13.7	Domestic	
6703662	3/19/1970	Bedrock	39	3	8.5	Domestic	
6703755	9/3/1970	Bedrock	17.4	16.8	0	Observation	
6703756	9/4/1970	Bedrock	15.2	14.6	0	Observation	
6703757	9/8/1970	Bedrock	17.1	16.8	0	Observation	
6703758	9/10/1970	Bedrock	14.9	14.6	0	Observation	
6703759	9/11/1970	Bedrock	7.9	7.3	0	Observation	
6704065	7/26/1971	Bedrock	38.1	13.7	2.7	Domestic	
6704066	8/24/1971	Bedrock	50.9	13.7	7.6	Domestic	
6704816	8/13/1973	Bedrock	61	12.2	8.2	Domestic	
6704873	11/10/1973	Bedrock	5.2	4.3	1.2	Domestic	
6705241	7/23/1974	Bedrock	19.5	6.4	1.5	Domestic	
6705388	10/28/1974	Bedrock	44.2	15.2	7.6	Domestic	
6706017	3/21/1976	Bedrock	45.7	14.6	7.6	Domestic	
6706082	6/14/1976	Bedrock	27.7	12.2	10.7	Domestic	
6706321	5/5/1976	Bedrock	50.3	14.3	12.2	Domestic	
6707245	10/31/1979	Bedrock	66.8	18	15.2	Domestic	

Table 1
MECP Well Records Summary

MECP Well ID	Date Completed	Well Type	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Static Water Level (mbgs)	Well Use	Notes
6708134	4/24/1984	Bedrock	32.9	13.7	12.2	Domestic	
6709365	8/26/1988	Bedrock	67.1	12.2	13.7	Domestic	
6709676	9/23/1988	Bedrock	58.5	14.9	15.2	Domestic	
6711876	12/5/1995	Bedrock	54.9	14.6	25.3	Domestic	
6712280	6/26/1997	Bedrock	79.2	16.2	49.7	Domestic	
6713622	1/2/2001	Bedrock	61	14	14.3	Domestic	
6809372	4/26/1976	Bedrock	38.1	11.9	4.3	Domestic	
6715644	1/25/2006	Overburden	4.5	0	0	Observation	
6715822	6/30/2006	Unknown	0	0	0	Unknown	
7168480	7/28/2011	Bedrock	152.4	0	0	Observation	
7180042	4/4/2012	Overburden	5.1	0	0	Observation	
7180043	4/4/2012	Overburden	4.5	0	0	Observation	
7181551	5/3/2012	Overburden	6	0	0	Observation	
7183878	6/26/2012	Overburden	0	0	0	Abandoned	
7183879	6/26/2012	Overburden	0	0	0	Abandoned	
7183880	6/26/2012	Overburden	0	0	0	Abandoned	
7195808	7/10/2012	Overburden	0	0	0	Observation	
7195809	7/10/2012	Overburden	11.9	0	0	Observation	
7205525	7/11/2013	Bedrock	0	0	0	Abandoned	
7205526	7/15/2013	Bedrock	40.5	0	3.7	Domestic	
7210015	10/7/2013	Bedrock	0	0	0	Abandoned	
7210102	7/27/2013	Unknown	0	0	0	Unknown	
7222743	5/30/2014	Unknown	0	0	0	Abandoned	
7231243	3/9/2011	Unknown	0	0	0	Unknown	
7241635	4/24/2015	Bedrock	92	0	19.2	Domestic	
7248371	8/27/2015	Bedrock	28.4	0	17	Domestic	
7248372	8/28/2015	Bedrock	0	0	0	Abandoned	
7248374	9/15/2015	Bedrock	33.5	0	16.5	Domestic	
7248375	9/16/2015	Bedrock	0	0	0	Abandoned	
7261563	6/18/2015	Bedrock	0	0	0	Abandoned	
7317883	7/19/2018	Bedrock	0	0	5.8	Domestic	
7350552	12/11/2019	Bedrock	33.5	0	8.5	Domestic	
7368186	8/28/2020	Bedrock	0	0	0	Abandoned	
7378145	12/18/2020	Bedrock	0	0	0	Abandoned	
7386773	4/21/2021	Overburden	6.1	0	0	Observation	
7386774	4/22/2021	Overburden	6.1	0	0	Observation	

Table 2
Summary of Groundwater Elevations

Date	BH101 (masl)	BH102 (masl)	BH103 (masl)	BH104 (masl)	BH105 (masl)	BH106 (masl)	BH107 (masl)	BH108 (masl)
Ground surface Elevation (masl)	*413.64*	*414.37*	*414.89*	*410.93*	*414.05*	*410.91*	*409.58*	*410.32*
8-Feb-2006	413.07	411.57	412.65	410.36	414.05	410.67	409.43	409.06
20-Feb-2006	413.11	411.96	412.98	410.6	414.07	410.86	409.06	409.21
9-Mar-2006	412.83	411.91	412.88	410.17	414.15	410.93	409.12	408.82
25-Mar-2006	412.96	412.48	412.77	410.66	414.15	410.75	409.41	409.01
28-Apr-2006	412.94	412.43	412.76	410.69	413.44	410.54	409.42	408.99
6-Jun-2006	412.59	412.12	411.55	410.15	412.86	410.36	409.03	408.43
8-Jul-2006	411.7	411.78	410.95	409.15	412.27	409.93	408.11	407.94
7-Aug-2006	411.34	411.43	410.43	408.71	412.06	409.89	408	407.76
7-Sep-2006	411	411.14	410.31	408.52	411.59	409.39	407.63	407.11
6-Oct-2006	410.83	411	410.36	408.71	411.95	410.13	408.28	407.62
11-Nov-2006	412.67	411.25	411.1	409.13	413.94	410.74	408.94	408.21
7-Dec-2006	412.97	411.71	411.91	409.45	413.71	410.57	409.11	408.48
9-Jan-2007	413.03	411.99	412.27	409.65	413.90	410.59	409.16	408.57
12-Feb-2007	412.11	411.69	411.05	409.12	412.95	410.28	408.6	408.07
8-Mar-2007	411.61	411.45	410.66	408.96	412.65	410.22	408.43	407.93
10-Apr-2007	413.02	412.14	412.5	409.78	413.72	410.55	409.25	408.69
12-May-2007	412.75	411.96	411.59	409.39	413.29	410.5	409.01	408.36
11-Jun-2007	411.87	411.67	410.97	409.24	412.51	410.07	408.24	407.96
11-Jul-2007	411.42	411.38	410.54	408.92	412.11	409.59	407.71	407.57
15-Aug-2007	411.01	411.13	410.34	408.73	411.67	409.22	407.49	407.36
13-Sep-2007	410.72	410.98	410.36	408.61	411.34	408.99	407.4	407.37
12-Oct-2007	410.5	410.87	410.36	408.57	411.22	408.89	407.43	407.37
8-Nov-2007	410.35	410.81	410.36	408.58	411.22	408.89	407.52	407.37
11-Dec-2007	410.33	410.77	410.36	408.76	411.22	409.44	407.91	407.52
15-Jan-2008	412.73	411.26	411.29	409.7	414.00	410.63	409.2	408.52
12-Feb-2008	412.92	411.53	411.74	409.66	414.11	410.61	409.05	408.5
8-Mar-2008	413	411.8	412.03	409.81	414.10	410.64	409.1	408.57
13-Apr-2008	413.19	412.92	413.4	410.7	413.99	410.77	409.52	409.19
8-May-2008	413.05	412.46	412.5	410.35	413.71	410.69	409.35	408.89
10-Jun-2008	412.58	412.13	411.53	409.86	412.96	410.83	409	408.33
8-Jul-2008	412.6	412.06	411.6	409.71	412.87	410.24	408.72	408.2
1-Aug-2008	412.55	411.95	411.56	409.76	412.93	410.36	408.86	408.29

Table 2
Summary of Groundwater Elevations

Date	BH101 (masl)	BH102 (masl)	BH103 (masl)	BH104 (masl)	BH105 (masl)	BH106 (masl)	BH107 (masl)	BH108 (masl)
Ground surface Elevation (masl)	*413.64*	*414.37*	*414.89*	*410.93*	*414.05*	*410.91*	*409.58*	*410.32*
10-Sep-2008	411.67	411.57	410.86	409.34	412.26	410.28	408.4	407.95
3-Oct-2008	410.86	410.3	410.64	408.18	411.60	409.04	407.36	406.82
17-Nov-2008	413.08	411.52	412.14	409.98	413.99	410.78	409.24	408.51
17-Dec-2008	413.135	411.979	412.746	410.183	413.97	410.67	409.249	408.662
23-Jan-2009	412.725	412.147	411.796	409.902	413.22	410.567	409.009	408.359
20-Feb-2009	412.96	412.419	412.6	410.238	414.07	411.01	409.246	408.651
18-Mar-2009	413.053	412.772	413.046	410.67	414.07	410.963	409.502	408.948
21-Apr-2009	412.95	412.79	412.88	410.45	413.45	410.55	409.35	408.86
21-May-2009	412.77	412.43	412.03	410.11	412.98	410.43	409.12	408.51
26-Jun-2009	411.93	411.93	411.17	409.61	412.21	410.08	408.62	408.08
22-Jul-2009	411.54	411.63	410.8	409.35	411.93	409.87	408.13	407.84
27-Aug-2009	411.27	411.28	410.44	409.15	412.05	409.9	407.97	407.66
29-Sep-2009	411.16	411.11	410.36	409.04	412.12	410.08	407.97	407.52
30-Oct-2009	411.72	411.11	410.57	409.23	412.97	410.33	408.47	407.79
7-Dec-2009	412.26	411.15	410.91	409.41	413.25	410.54	408.85	408.01
5-Jan-2010	412.04	411.19	410.83	409.36	413.05	410.33	408.81	408.05
9-Feb-2010	411.55	411.06	410.47	409.19	412.72	410.22	408.6	407.93
2-Mar-2010	411.31	411.01	410.37	409.14	412.47	410.12	408.38	407.81
17-Apr-2010	412.7	411.6	411.53	409.82	413.22	410.49	409.12	408.43
11-May-2010	412.87	411.65	411.73	410.09	413.36	410.55	409.34	408.7
1-Jun-2010	412.31	411.64	411.21	409.51	412.67	410.15	408.69	408.16
29-Jun-2010	412.92	411.73	411.8	409.9	413.37	410.53	409.23	408.42
5-Aug-2010	411.66	411.43	410.76	409.17	412.16	409.9	408.06	407.78
22-Sep-2010	410.97	411.09		408.85	411.49	409.5	407.69	407.41
22-Oct-2010	410.83	410.58		408.86	411.75	409.6	407.8	407.44
9-Nov-2010	410.84	410.89		408.89	412.25	409.75	407.88	407.51
6-Dec-2010	411.37	410.93		409.2	413.30	410.33	408.72	407.59
11-Jan-2011	412.24	411.1	410.76	409.27	413.52	410.37	408.85	408.02
19-Feb-2011	412.62	411.09	411.02	409.2	413.93	410.61	408.7	407.89
31-Mar-2011	413.09			410.05	413.86	410.66	409.29	408.66
19-Jul-2011	412.33	412.09	411.42	409.54	412.53	410.09	408.21	407.92
30-Sep-2011	411.51	411.22	410.49	409.24	412.83	410.23	408.18	407.73

Table 2
Summary of Groundwater Elevations

Date	BH101 (masl)	BH102 (masl)	BH103 (masl)	BH104 (masl)	BH105 (masl)	BH106 (masl)	BH107 (masl)	BH108 (masl)
Ground surface Elevation (masl)	*413.64*	*414.37*	*414.89*	*410.93*	*414.05*	*410.91*	*409.58*	*410.32*
7-Dec-2011	413.21	412.23	413.25	410.45	413.93	410.73	409.44	408.92
10-Feb-2012	412.91	412.16	412.28	409.95	413.53	410.52	409.14	408.45
12-Apr-2012	412.67	412.07	411.73	409.86	412.99	410.46	409.1	408.38
27-Jun-2012	411.22	411.28	410.45	409.06	411.75	409.64	407.93	407.69
1-Aug-2012	410.84	411.05		408.73	411.30	409.17	407.52	
11-Oct-2012	410.48	410.81		408.69		409.26	407.61	
11-Dec-2012	412.25	411.18	410.87	409.36	413.48	410.53	408.91	408.1
9-Mar-2013	412.19	411.42	411	408.32	413.12	410.4	408.84	408.09
3-May-2013	412.94	412.52	412.71	410.21	413.38	410.55	409.32	408.74
3-Jul-2013	412.74	412.08	411.74	409.94	412.89	410.44	409.21	408.5
30-Sep-2013	412.56	411.59	411.3	409.63	413.15	410.37	408.97	408.22
19-Dec-2013	412.58	411.98	411.6	409.77	413.09	410.46	409.02	408.28
19-Feb-2014	412.28	411.74	411.28	409.56	412.90	410.4	408.83	408.13
8-Apr-2014	413.6	412.51	413.77	410.71	414.02	411.02	409.61	409.33
6-Jun-2014	412.7	412.47	411.95	409.94	412.89	410.38	409	408.35
7-Aug-2014	411.94	411.83	411.18	409.52	412.36	410.11	408.41	407.92
27-Oct-2014	412.8	411.81	411.83	409.8	413.36	410.55	409.15	408.34
12-Dec-2014	412.71	411.9	411.79	409.83	413.20	410.48	409.17	408.4
17-Mar-2015	411.34	411.3	410.6	409.25	412.10	410.11	408.21	407.9
8-May-2015	412.41	411.66	411.38	409.72	412.95	410.33	409.07	408.43
8-Jul-2015	412.62	411.53	411.4	409.73	413.29	410.55	409.16	408.48
1-Sep-2015	411.33	411.16	410.49	409.07	412.23	409.82	407.91	407.71
5-Nov-2015	410.85	410.88	410.31	408.96	412.33	409.91	408.02	407.6
15-Jan-2016	412.64	411.14	411.35	409.52	413.67	410.57	409.01	408.36
7-Mar-2016	412.71	411.67	411.78	409.71	413.45	410.54	409.03	408.46
22-Aug-2022	410.786	411.147	*Dry*	*Not Found*	*Obstructed*	409.066	*Not Found*	*Not Found*
Seasonal High Groundwater Elev.	*413.6*	*412.92*	*413.77*	*410.71*	*414.15*	*411.02*	*409.61*	*409.33*
Seasonal Low Groundwater Elev.	*410.33*	*410.3*	*410.31*	*408.18*	*411.22*	*408.89*	*407.36*	*406.82*

Notes:
Water level data collected by CMT 2006-2016, GM BLuePlan in 2022

Table 3a
Results of Groundwater Quality Analyses - General Chemistry and Organic Parameters

Name / ***Sampling Date*** / ***ALS ID***	**Units**	**LOR**	**PWQOs**	**BH101 12-Aug-2022 1.5 - 4.5 m**	**BH102 12-Aug-2022 1.5 - 4.5 m**	**BH106 12-Aug-2022 1.5 - 4.5m**
ammonia, total (as N)	mg/L	0.005		<0.0050	0.0112	0.0161
chloride	mg/L			20.9	2.84	6.13
fluoride	mg/L			0.084	0.055	0.061
nitrate (as N)	mg/L			9.83	8.72	7.80
nitrite (as N)	mg/L	0.01		<0.010	<0.010	<0.010
phosphate, ortho-, dissolved (as P)	mg/L	0.003		0.0117	0.0039	<0.0030
sulfate (as SO4)	mg/L			7.35	3.38	13.1
alkalinity, total (as CaCO3)	mg/L			222	183	228
colour, apparent	CU			32.8	25.9	99.4
conductivity	µS/cm			568	459	573
hardness (as CaCO3), dissolved	mg/L			266	240	342
pH	pH units		8.5	8.24	8.00	7.84
solids, total dissolved [TDS]	mg/L			348	287	392
turbidity	NTU	4000		1140	>4000	>4000

Notes:

1. Criteria are the Provincial Water Quality Objectives (MECP 1994) (for hardness >100 mg/L)

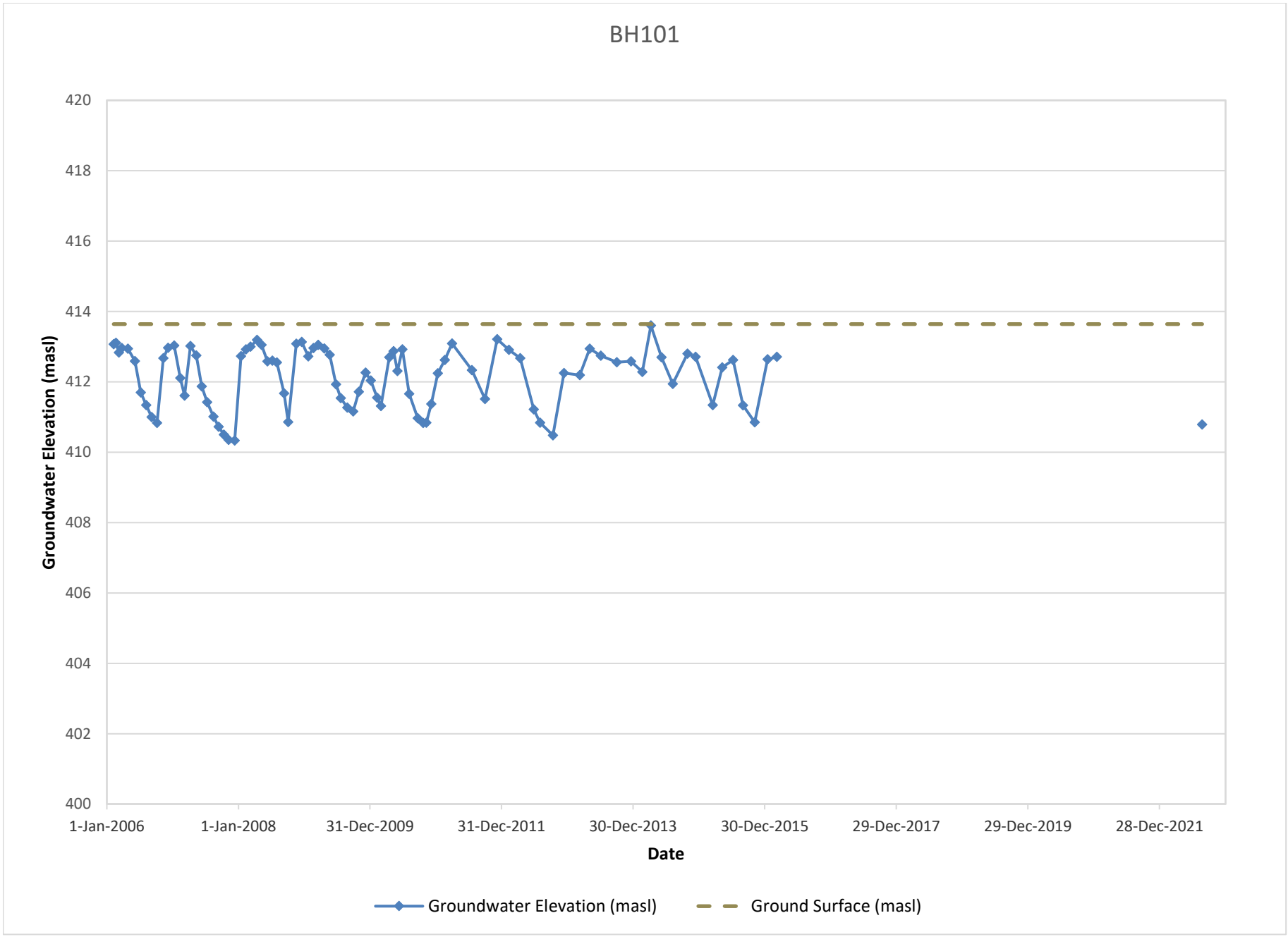
Table 3a
Results of Groundwater Quality Analyses - Dissolved Metals

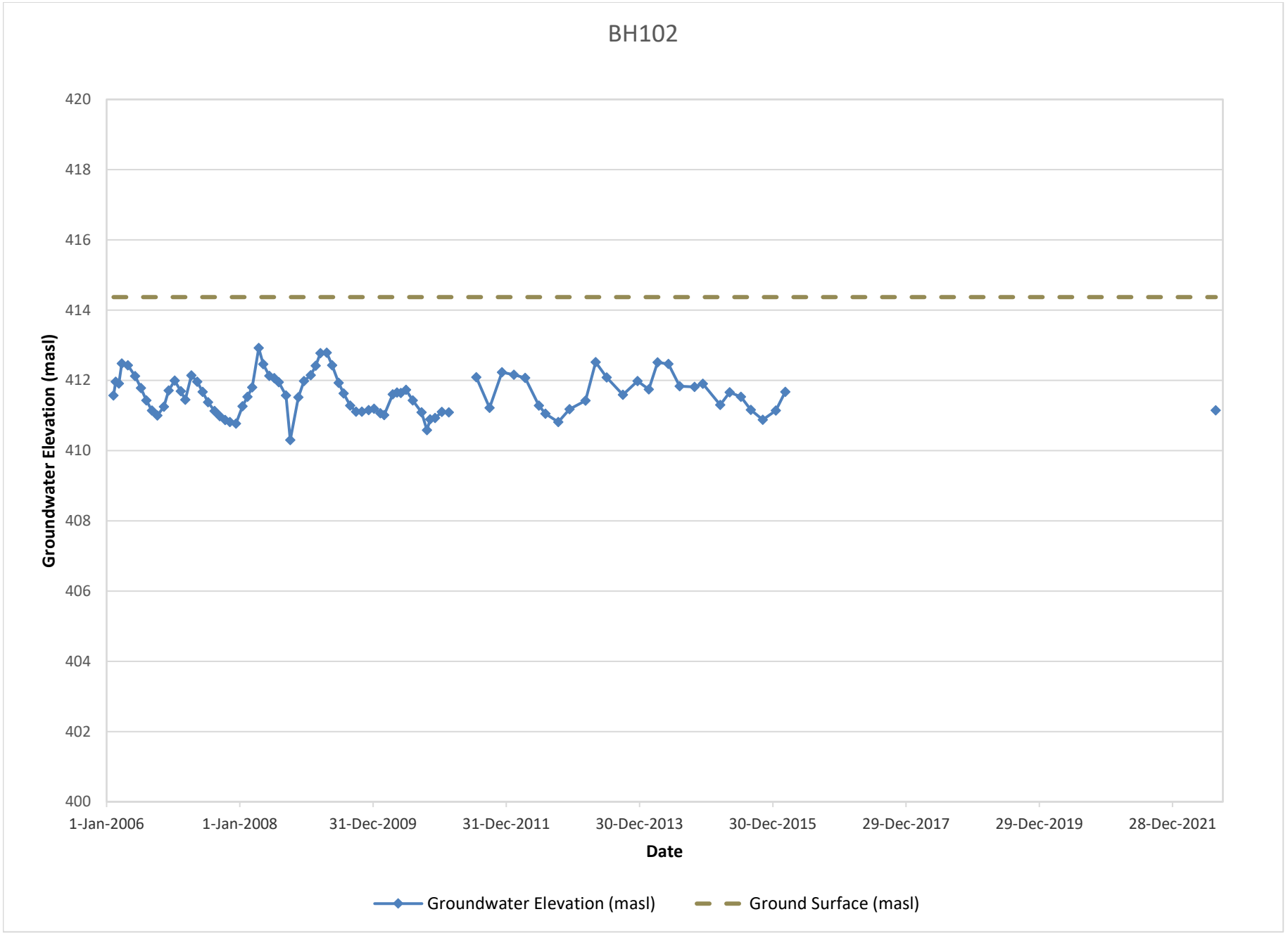
Name / ***Sampling Date*** / ***ALS ID***	**Units**	**LOR**	**PWQOs**	**BH101** **12-Aug-2022** **1.5 - 4.5 m**	**BH102** **12-Aug-2022** **1.5 - 4.5 m**	**BH106** **12-Aug-2022** **1.5 - 4.5m**
aluminum, dissolved	mg/L		0.075	0.0126	0.0015	**0.184**
antimony, dissolved	mg/L	0.0001	0.02	<0.00010	<0.00010	<0.00010
arsenic, dissolved	mg/L		0.005	0.00018	0.00012	0.00030
barium, dissolved	mg/L			0.0205	0.0139	0.0527
beryllium, dissolved	mg/L	0.00002	1.1	<0.000020	<0.000020	<0.000020
bismuth, dissolved	mg/L	0.00005		<0.000050	<0.000050	<0.000050
boron, dissolved	mg/L	0.01	0.2	<0.010	0.011	<0.010
cadmium, dissolved	mg/L		0.0005	0.0000085	0.0000138	0.0000175
calcium, dissolved	mg/L			74.1	63.9	94.9
cesium, dissolved	mg/L	0.00001		<0.000010	<0.000010	0.000020
chromium, dissolved	mg/L			0.00067	0.00068	0.00063
cobalt, dissolved	mg/L	0.0001	0.0009	<0.00010	<0.00010	0.00021
copper, dissolved	mg/L		0.005	0.00146	0.00040	0.00149
iron, dissolved	mg/L	0.01	0.3	0.017	<0.010	0.208
lead, dissolved	mg/L	0.00005	0.005	0.000068	<0.000050	0.000514
lithium, dissolved	mg/L	0.001		<0.0010	<0.0010	0.0023
magnesium, dissolved	mg/L			19.6	19.6	25.4
manganese, dissolved	mg/L	0.0001		0.00174	<0.00010	0.0192
molybdenum, dissolved	mg/L		0.04	0.000190	0.000073	0.000344
nickel, dissolved	mg/L	0.0005	0.025	<0.00050	<0.00050	0.00071
phosphorus, dissolved	mg/L	0.05	0.01	*<0.050*	*<0.050*	*<0.050*
potassium, dissolved	mg/L			1.46	1.53	1.28
rubidium, dissolved	mg/L			0.00040	0.00047	0.00097
selenium, dissolved	mg/L		0.1	0.000247	0.000145	0.000477
silicon, dissolved	mg/L			3.94	3.56	4.90
silver, dissolved	mg/L	0.00001	0.0001	<0.000010	<0.000010	<0.000010
sodium, dissolved	mg/L			8.40	1.61	4.39
strontium, dissolved	mg/L			0.101	0.102	0.205
sulfur, dissolved	mg/L			2.63	1.24	4.22
tellurium, dissolved	mg/L	0.0002		<0.00020	<0.00020	<0.00020
thallium, dissolved	mg/L	0.00001	0.0003	<0.000010	<0.000010	<0.000010
thorium, dissolved	mg/L	0.0001		<0.00010	<0.00010	<0.00010
tin, dissolved	mg/L	0.0001		<0.00010	<0.00010	<0.00010
titanium, dissolved	mg/L	0.0003		0.00046	<0.00030	0.00863
tungsten, dissolved	mg/L	0.0001	0.03	<0.00010	<0.00010	<0.00010
uranium, dissolved	mg/L		0.005	0.000230	0.000099	0.00206
vanadium, dissolved	mg/L	0.0005	0.006	<0.00050	<0.00050	0.00068
zinc, dissolved	mg/L		0.02	0.0022	0.0015	0.0030
zirconium, dissolved	mg/L	0.0002	0.004	<0.00020	<0.00020	0.00022

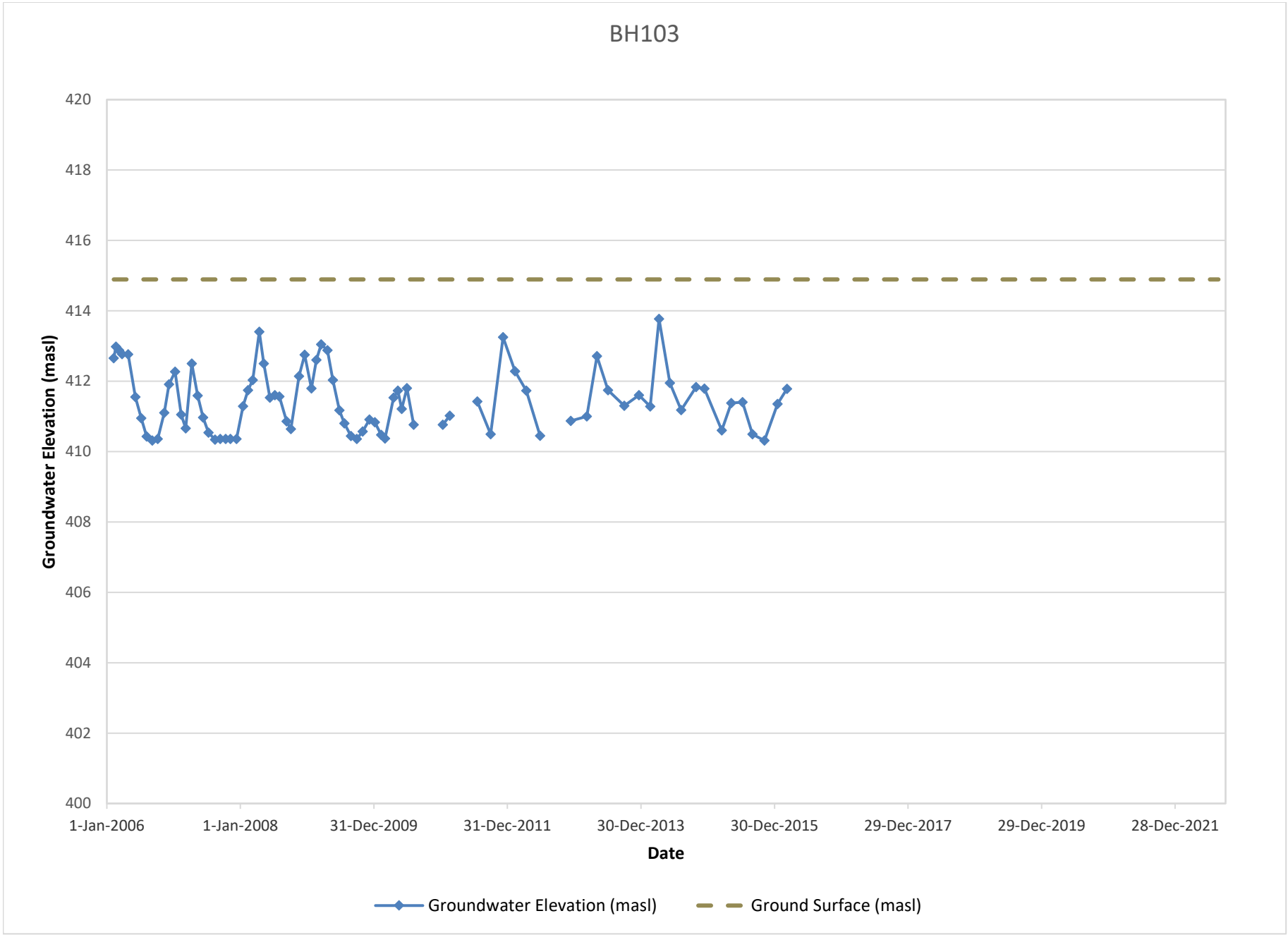
Notes:

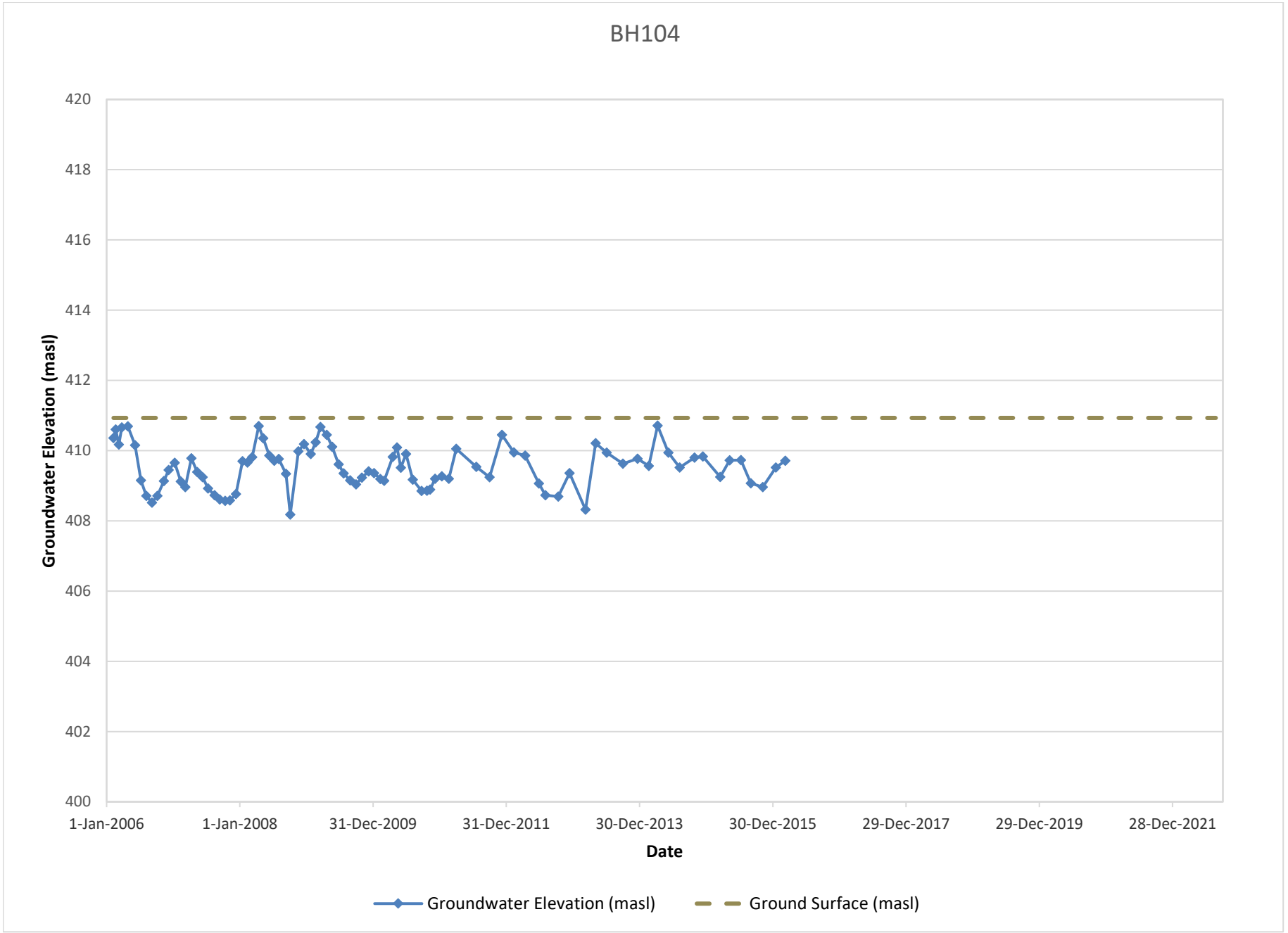
1. Criteria are the Provincial Water Quality Objectives (for hardness >100 mg/L) (MECP 1994)
2. Criteria and concentrations are given in units consistent with the units listed for the associated parameter.
3. Concentrations with **bold** text in shaded cells exceed the corresponding criteria.
4. Screened well intervals presented are approximate.
5. LOR = Limit of Reporting.
6. Concentrations in *italicized* text indicate those parameters where the Limit of Reporting is higher than the respective PWQO criteria.

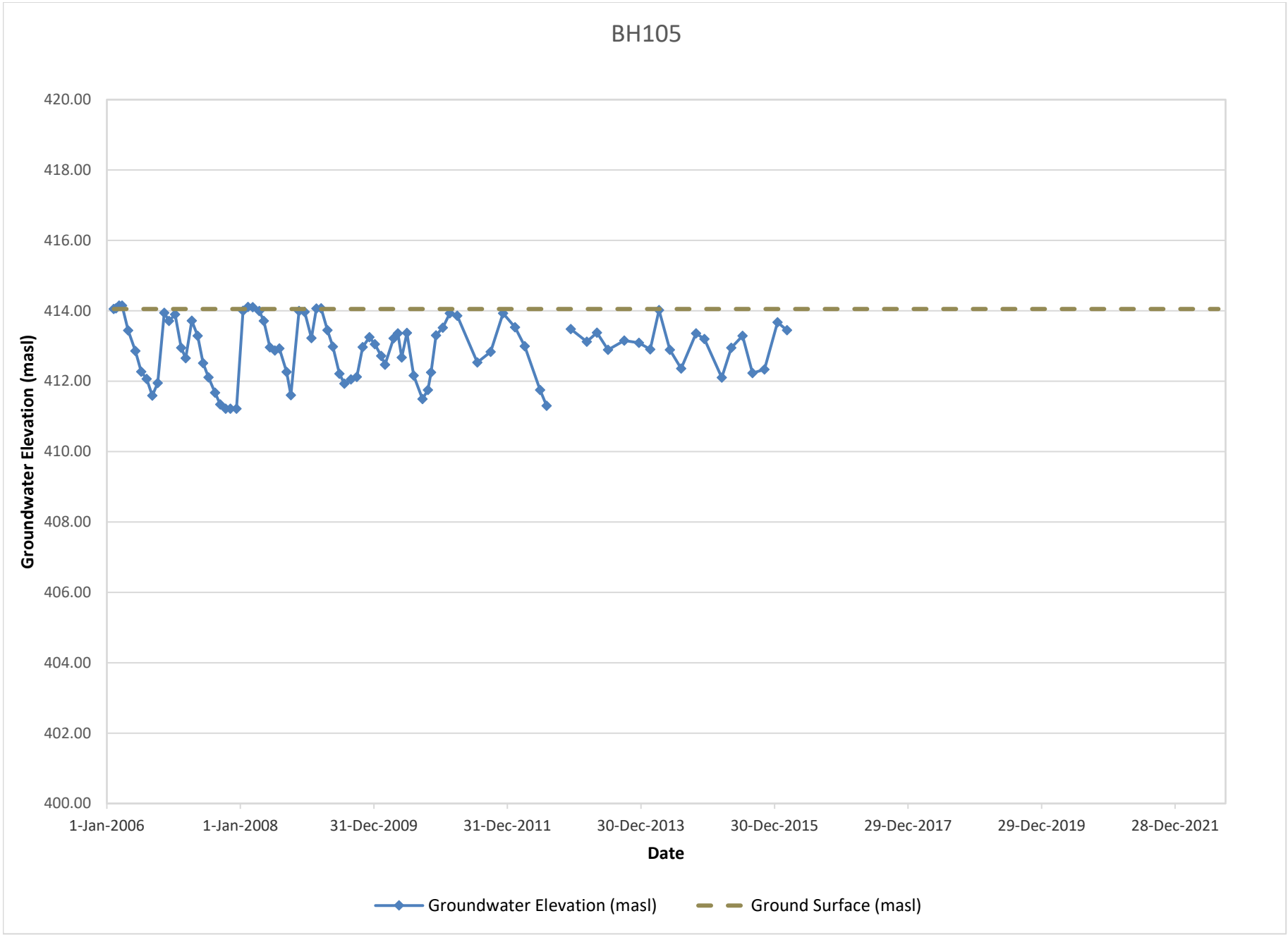
CHARTS

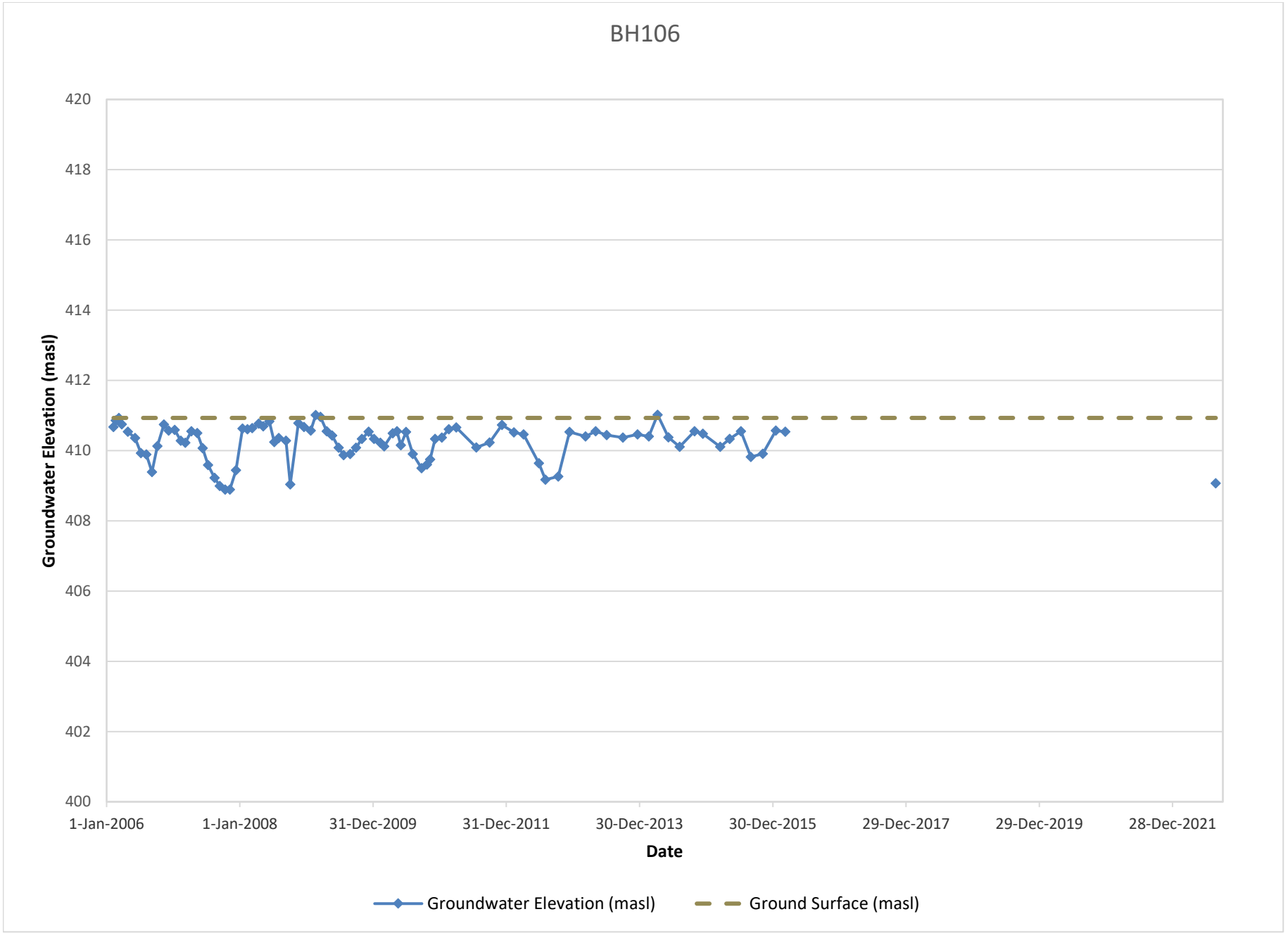

BH101
420
418
416
414
412
410
408
406
404
402
400
Groundwater Elevation (masl)
1-Jan-2006
1-Jan-2008
31-Dec-2009
31-Dec-2011
30-Dec-2013
30-Dec-2015
29-Dec-2017
29-Dec-2019
28-Dec-2021
Date
Groundwater Elevation (masl)
Ground Surface (masl)

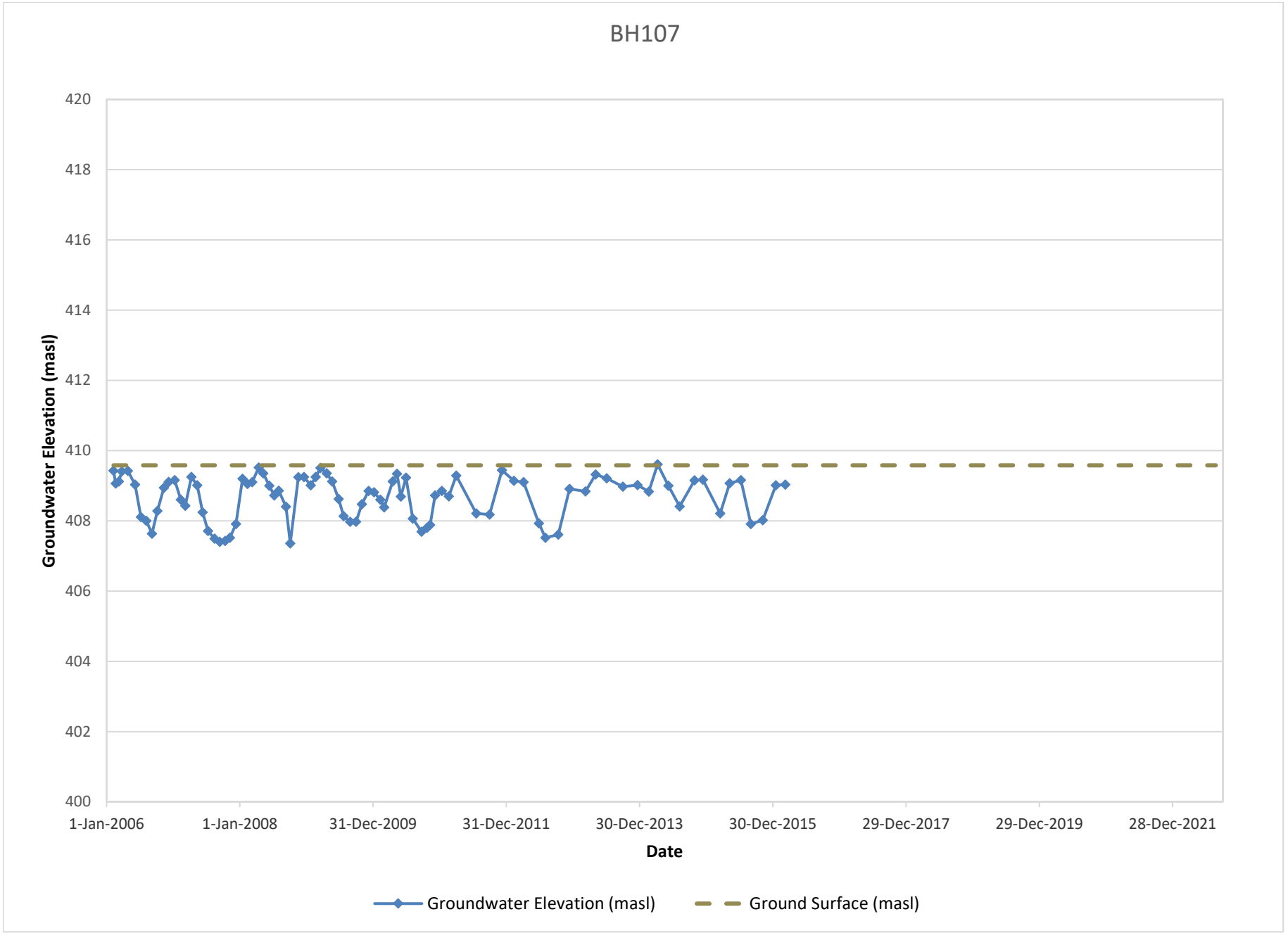

BH102
420
418
416
414
412
410
408
406
404
402
400
Groundwater Elevation (masl)
1-Jan-2006
1-Jan-2008
31-Dec-2009
31-Dec-2011
30-Dec-2013
30-Dec-2015
29-Dec-2017
29-Dec-2019
28-Dec-2021
Date
Groundwater Elevation (masl)
Ground Surface (masl)

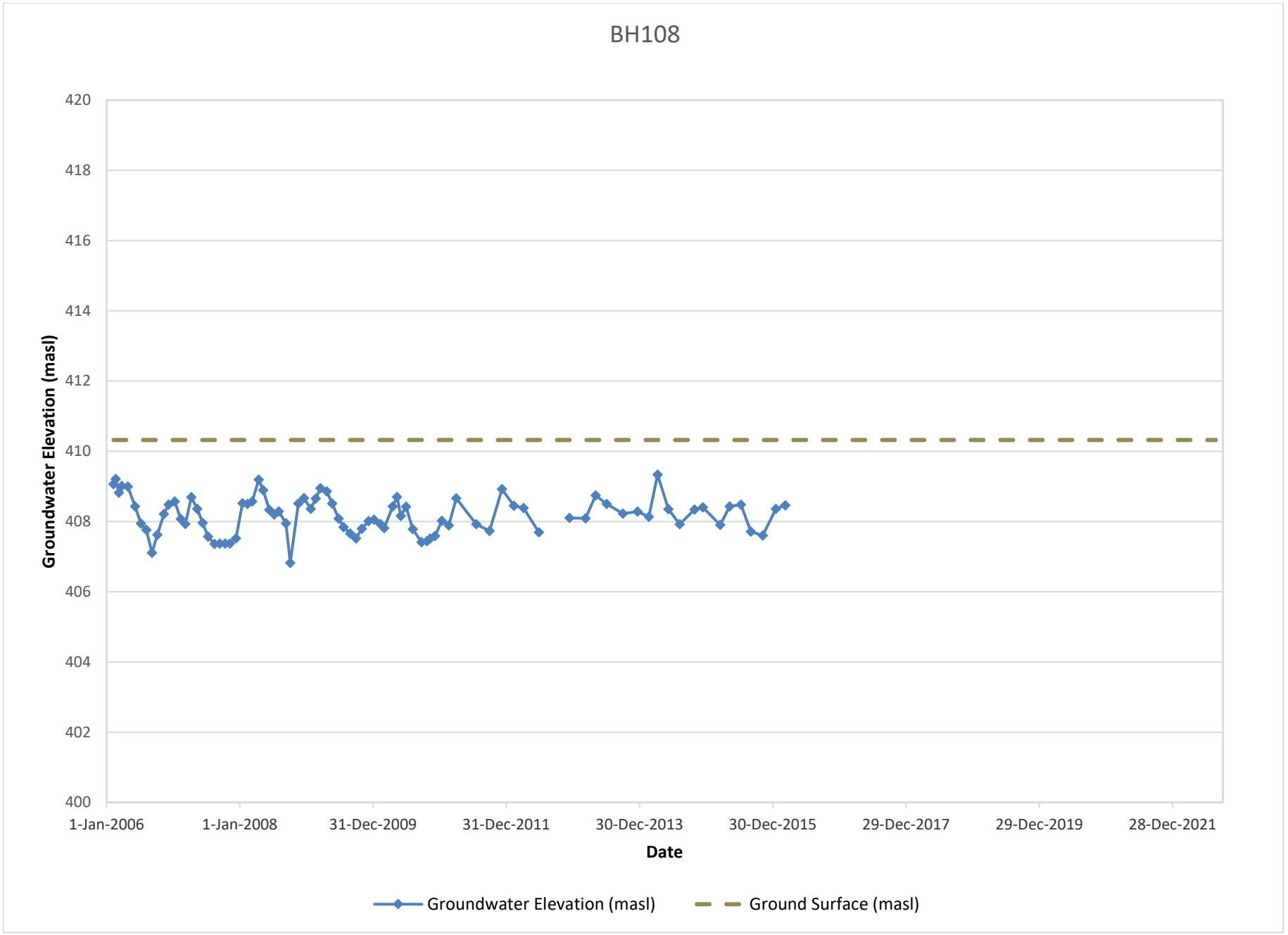

BH103
420
418
416
414
412
410
408
406
404
402
400
Groundwater Elevation (masl)
1-Jan-2006
1-Jan-2008
31-Dec-2009
31-Dec-2011
30-Dec-2013
30-Dec-2015
29-Dec-2017
29-Dec-2019
28-Dec-2021
Date
Groundwater Elevation (masl)
Ground Surface (masl)


BH104
420
418
416
414
412
410
408
406
404
402
400
Groundwater Elevation (masl)
1-Jan-2006
1-Jan-2008
31-Dec-2009
31-Dec-2011
30-Dec-2013
30-Dec-2015
29-Dec-2017
29-Dec-2019
28-Dec-2021
Date
Groundwater Elevation (masl)
Ground Surface (masl)

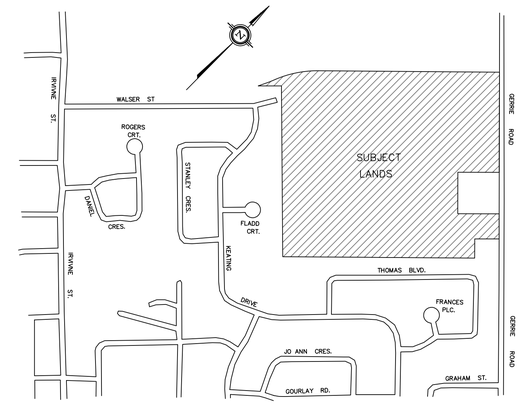

BH105
420.00
418.00
416.00
414.00
412.00
410.00
408.00
406.00
404.00
402.00
400.00
Groundwater Elevation (masl)
1-Jan-2006
1-Jan-2008
31-Dec-2009
31-Dec-2011
30-Dec-2013
30-Dec-2015
29-Dec-2017
29-Dec-2019
28-Dec-2021
Date
Groundwater Elevation (masl)
Ground Surface (masl)


BH106
Groundwater Elevation (masl)
420
418
416
414
412
410
408
406
404
402
400
1-Jan-2006
1-Jan-2008
31-Dec-2009
31-Dec-2011
30-Dec-2013
30-Dec-2015
29-Dec-2017
29-Dec-2019
28-Dec-2021
Date
Groundwater Elevation (masl)
Ground Surface (masl)


BH107
420
418
416
414
412
410
408
406
404
402
400
Groundwater Elevation (masl)
1-Jan-2006
1-Jan-2008
31-Dec-2009
31-Dec-2011
30-Dec-2013
30-Dec-2015
29-Dec-2017
29-Dec-2019
28-Dec-2021
Date
Groundwater Elevation (masl)
Ground Surface (masl)


BH108
420
418
416
414
412
410
408
406
404
402
400
Groundwater Elevation (masl)
1-Jan-2006
1-Jan-2008
31-Dec-2009
31-Dec-2011
30-Dec-2013
30-Dec-2015
29-Dec-2017
29-Dec-2019
28-Dec-2021
Date
Groundwater Elevation (masl)
Ground Surface (masl)

APPENDIX A:
DRAFT PLAN OF SUBDIVISION AND ECOLOGICAL LAND CLASSIFICATION MAPPING



KEY PLAN N.T.S.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT

51 (17) (a) – (c) AS SHOWN
(d) SEE SCHEDULE
(e) – (g) AS SHOWN
(h) MUNICIPAL WATER SUPPLY
(i) HARRISTON LOAM
(j) AS SHOWN
(k) MUNICIPAL STORM AND SANITARY SEWERS
(l) NONE KNOWN

OWNERS CERTIFICATE

WE HEREBY AUTHORIZE BLACK, SHOEMAKER, ROBINSON, AND DONALDSON LIMITED, ONTARIO LAND SURVEYORS, URBAN AND RURAL PLANNERS TO SUBMIT THIS DRAFT PLAN OF PROPOSED SUBDIVISION.

DATE

JAMES KEATING CONSTRUCTION (2004) LTD.

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE

KERRY F. HILLIS
ONTARIO LAND SURVEYOR

METRIC

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

RELEVANT INFORMATION

LOTS/BLOCKS	LAND USE	UNITS	AREAS (ha)
LOTS 1 TO 101	SINGLE-DETACHED RESIDENTIAL	101	5.6078
BLOCKS 102 TO 104	STREET TOWNHOUSES	18	0.4364
BLOCK 105	APARTMENT SITE	59	0.7880
BLOCK 106	CLUSTER TOWNHOUSES	65	1.8628
BLOCK 107	PARK		0.7039
BLOCKS 108 & 109	STORMWATER MANAGEMENT		1.3974
BLOCK 110	OPEN SPACE		7.3820
STREETS	ROADS		3.2004
BLOCK 111	FUTURE DEVELOPMENT	4	0.0816
TOTAL		247	21.4603 ha.

NOTES:
ELEVATIONS AND RELEVANT INFORMATION TAKEN FROM

DRAFT PLAN OF SUBDIVISION

OF PART OF
LOTS 17 & 18, CONCESSION 12
TOWNSHIP OF CENTRE WELLINGTON
(GEOGRAPHIC TOWNSHIP OF NICHOL)
COUNTY OF WELLINGTON

SCALE 1 : 1000 0 20 40 60 80 METRES

J.D.BARNES LIMITED SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
257 WOODLAWN ROAD WEST, UNIT 101, GUELPH, ON N1H 8J1
T: (519) 822-4031 F: (519) 822-1220 www.jdbarnes.com

DATE: MARCH 23, 2023
DRAWN BY: KS/RA
PROJECT 04-5865-18 16-14-086-01

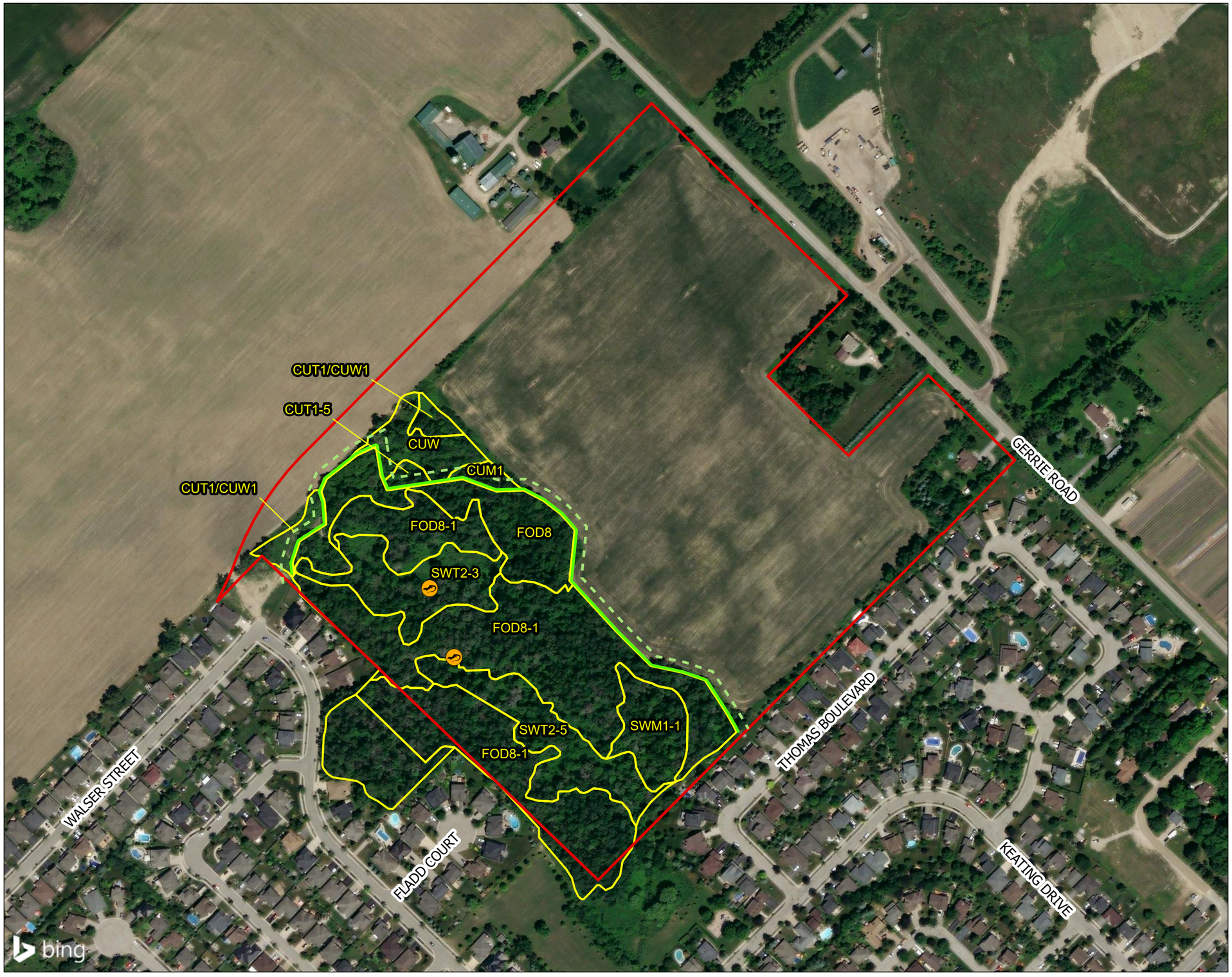


Figure 1 | Ainley Subdivision
Ecological Land Classification

Legend

- Subject Property
- Woodland Dripline (surveyed November 13, 2021)
- Woodland Dripline Buffer (10 m)
- Amphibian Monitoring Station
- Ecological Land Classification (ELC)

Vegetation Communities

CUM1 - Mineral Cultural Meadow
CUT1 - Mineral Cultural Thicket
CUT1-5 - Raspberry Cultural Thicket
CUW - Cultural Woodland
CUW1 - Mineral Cultural Woodland
FOD8 - Fresh-Moist Poplar-Sassafras Deciduous Forest
FOD8-1 - Fresh-Moist Poplar Deciduous Forest
SWM1-1 - White Cedar-Hardwood Mineral Mixed Swamp
SWT2-3 - Red-osier Mineral Thicket Swamp
SWT2-5 - Willow Organic Thicket Swamp

0 50 100 150 200 Meters

Project Number	Date:	N
15-799	2023-04-06	

north-south ENVIRONMENTAL

APPENDIX B:
WATER WELL RECORDS

17 54665 Con XII
5 48381 6 Lot 18
5 1370
23

6703117
3 9

40P/9W

Well Record Plots on Site

7

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District Wellington Township, Village, Town or City Nichol

Con. 12 XII Lot PART 18 Date completed 18 (day) 7 (month) 1968 (year)

[redacted] Address R R #3 ELORA ONTARIO

Casing and Screen Record

Inside diameter of casing 4"8

Total length of casing 5-8

Type of screen —

Length of screen —

Depth to top of screen —

Diameter of finished hole 4"8

Pumping Test

Static level 20 feet

Test-pumping rate 10 G.P.M.

Pumping level 30 feet

Duration of test pumping 1 Hour

Water clear or cloudy at end of test Clear

Recommended pumping rate 10 G.P.M.

with pump setting of 30 feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
Sandy Clay	0	20		
Hard Pan	20	5-3-	100	fresh
gray Lime Stone	5-3-	100		

For what purpose(s) is the water to be used? Domestic

Is well on upland, in valley, or on hillside?

Drilling or Boring Firm JOHN CUDNEY

Address SALEM ONT

Licence Number 2934

Name of Driller or Borer same

Address

Date July 13/68

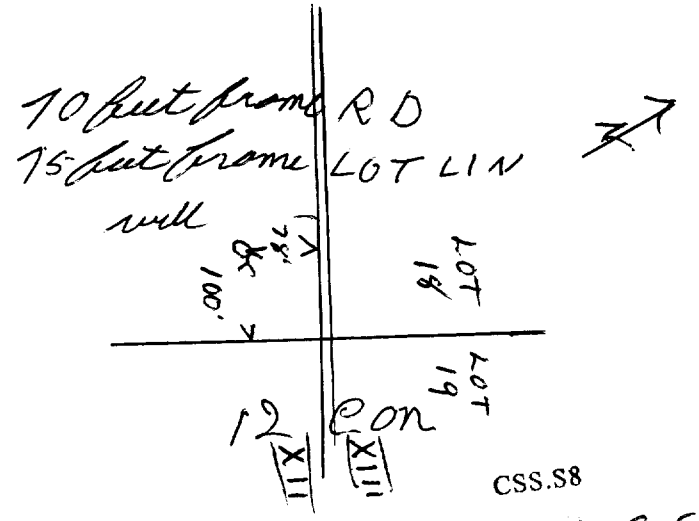
John Cudney
(Signature of Licensed Drilling or Boring Contractor)

Form 7 5M 60-20912

OWRC COPY

Location of Well

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



CSS.S8

S.C.

Well Record Plots on Site

MINISTRY OF THE ENVIRONMENT

The Ontario Water Resources Act

WATER WELL RECORD

40 of 9W

Ontario

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

11 | 6705327 | MUNICIP. 67009 | CON. GON 12

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
WELLINGTON	NICHOL	XII	019

OWNER (SURNAME FIRST) [redacted] ADDRESS ELORA

DATE COMPLETED DAY 25 MO. 08 YR. 74

21 | UTM ZONE 17 | EASTING 546650 | NORTHING 4838100 | RC 5 | ELEVATION 1360 | RC 5 | BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BLACK		FILL		0	2
BROWN		CLAY		2	10
BROWN	CLAY & SAND			10	20
-	STONES & CLAY			20	30
GREY	[redacted]	HARDPAN		30	40
	LIMESTONE			40	96

31 | 0002801 | 0010605 | 0020605 28 | 0030 1205 | 0040 2/4 | 0096 V5

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0096	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
04	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0096
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER (INCHES)	LENGTH (FEET)

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN (FEET)

61 PLUGGING & SEALING RECORD

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

PUMPING TEST

71

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE: 0005 GPM

DURATION OF PUMPING: 04 HOURS 00 MINS

WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
030 FEET	045 FEET	030 FEET	040 FEET	045 FEET	045 FEET

IF FLOWING, GIVE RATE: GPM

PUMP INTAKE SET AT: 50 FEET

WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP

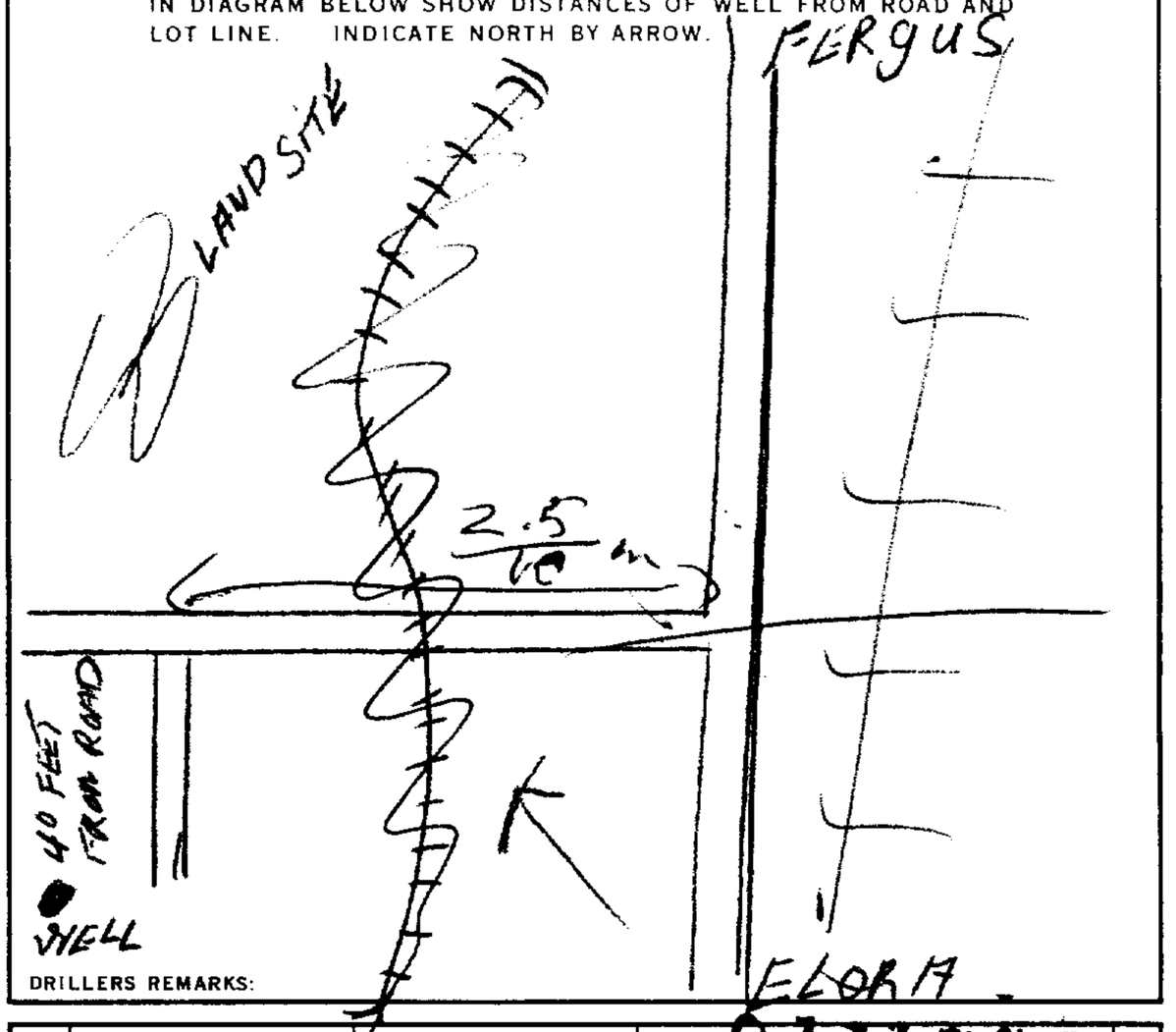
RECOMMENDED PUMP SETTING: 060 FEET

RECOMMENDED PUMPING RATE: 0005 GPM.

GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL 1

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

WATER USE 01

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

METHOD OF DRILLING 1

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: J.N. CUDNEY & SON | LICENCE NUMBER:

ADDRESS: P.O. BOX 26 SALEM ONT.

NAME OF DRILLER OR BORER: HERBERT N CUDNEY | LICENCE NUMBER: 1669

SIGNATURE OF CONTRACTOR: Herbert N Cudney | SUBMISSION DATE: DAY 25 MO. Aug. YR. 74

OFFICE USE ONLY

DATA SOURCE 1 | CONTRACTOR 1669 | DATE RECEIVED 01 11 74

DATE OF INSPECTION July 25/78 | INSPECTOR EG

REMARKS: CSS.S8 | P | WI

FORM 7 07-091

MINISTRY OF THE ENVIRONMENT COPY

UTM Z E

R N

Elev. 9 R 1355

Basin 23

67 No 1900

ONTARIO

The Well Drillers Act

Department of Mines, Province of Ontario

Water Well Record

[redacted]ip, ~~Village, Town or City~~ Nichol

[redacted]Town or City)

[redacted]ss

Date Completed ..... (day) (month) (year) Cost of Well (excluding pump) .....

Pipe and Casing Record

Casing diameter(s) .....

Length(s) of casing(s) .....

Type of screen .....

Length of screen .....

Distance from top of screen to ground level .....

Is well a gravel-wall type? .....

Pumping Test

Date .....

Static level .....

Pumping level 25'

Pumping rate .....

Duration of test .....

Distance from cylinder or bowls to ground level .....

Water Record

Kind (fresh or mineral) .....

Quality (hard, soft, contains iron, sulphur, etc.) .....

Appearance (clear, cloudy, coloured) .....

For what purpose(s) is the water to be used? .....

.....

How far is well from possible source of contamination? .....

What is the source of contamination? .....

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
11'	fresh	

Well Log

Overburden and Bedrock Record	From	To
	0 ft.	ft.
		112

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 .... O. H. Gow .....

Address .....

Name of Driller ..... Address .....

Date ..... Licence Number .....

.....

Signature of Licensee

FORM 5

CSS.S8

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

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

11 — 6712280 — Municipality 67704 — Con.

County or District: [redacted] | Township/Borough/City/Town/Village: Nicol | Con block tract survey, etc.: Part lot 8 | Lot: 25-27 Plan 11

Address: RR#5 Guelph | Date completed: 26 day 06 month 97 year

21 — Northing — RC — Elevation — RC — Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
	Top Soil			0	2
Grey	Clay	Gravel / Stones		2	53
Med Brown Light Brown	Limestone			53	260
			Total 260'		
			6" Casing drive shoe		

31

32

41 WATER RECORD

Water found at – feet	Kind of water
180	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
200	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
260	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6"	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	+2	54
6"	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☑ Open hole 5 ☐ Plastic		54	260
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet
Material and type	Depth at top of screen feet	

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0	20	Bensecal

71 PUMPING TEST

Pumping test method: 1 ☑ Pump 2 ☐ Bailer | Pumping rate: 12 GPM | Duration of pumping: ..... Hours ..... Mins

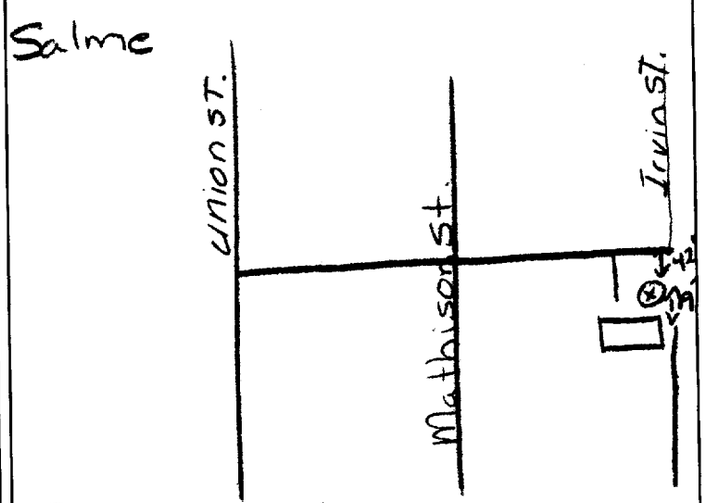
Static level	Water level end of pumping	Water levels during: 1 ☐ Pumping 2 ☐ Recovery — 15 minutes	30 minutes	45 minutes	60 minutes
163 feet	230 feet	180 feet	220 feet	230 feet	230 feet

If flowing give rate: GPM | Pump intake set at: feet | Water at end of test: ☑ Clear ☐ Cloudy

Recommended pump type: ☐ Shallow ☑ Deep | Recommended pump setting: 250 feet | Recommended pump rate: 12 GPM

LOCATION OF WELL

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



176579

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 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☑ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other

METHOD OF CONSTRUCTION

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

Name of Well Contractor: Hanlon Well Drilling | Well Contractor's Licence No.: 2663

Address: RR#5 Guelph Ont.

Name of Well Technician: Henry R. Hanlon | Well Technician's Licence No.: T-0590

Signature of Technician/Contractor: [signature] | Submission date: 01 day 07 mo 97 yr

MINISTRY USE ONLY

Data source | Contractor: 2663 | Date received: JUL 15 1997

Date of inspection | Inspector

Remarks

OSS.S8

0506 (07/94) Front Form 9

2 - MINISTRY OF ENVIRONMENT & ENERGY COPY

MINISTRY OF THE ENVIRONMENT

The Ontario Water Resources Act

WATER WELL RECORD

40 P/9W

Ontario

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

11 | 6704816 | MUNICIP. 6700 | CON. CON

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
WELLINGTON	NICHOL	XI	18
[redacted]	ELORA ONT.		

DATE COMPLETED DAY 13 MO. Aug. YR. 73

RC. ELEVATION | RC. BASIN CODE

6704816 11 52

OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BLUE	FINE CLAY			0	10
GREY	HARDPAN			10	30
BROWN	CLAY			30	40
WHITE		LIMESTONE		40	200

31 | 00|0305 | 00302|4 | 00404|05 | 02001|15

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0200	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	045
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

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

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
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	0003 GPM	03 HOURS 30 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
021 FEET	080 FEET	1 ☒ PUMPING 2 ☐ RECOVERY	030 FEET	040 FEET	010 FEET	080 FEET

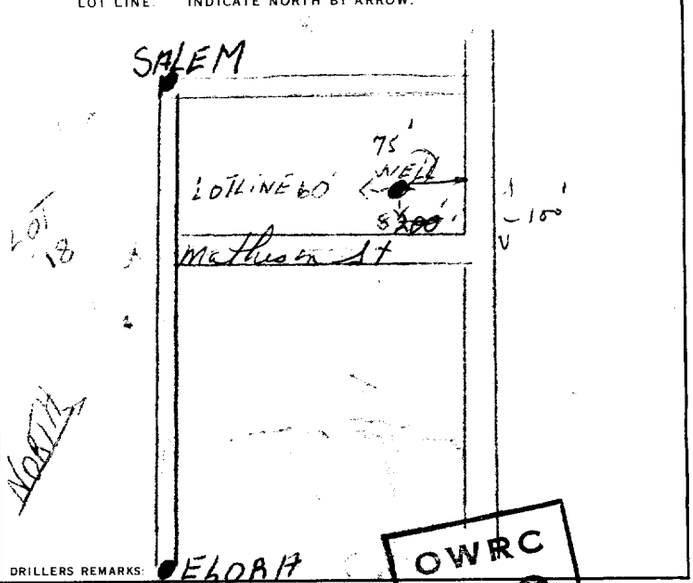
IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	80 FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	100 FEET	0003 GPM

50-53 0001

LOCATION OF WELL

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



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

CONTRACTOR

NAME OF WELL CONTRACTOR: J.N. CUDNEY | LICENCE NUMBER: 1659

ADDRESS: PO BOX 26 SALEM, ONT.

NAME OF DRILLER OR BORER | LICENCE NUMBER

SIGNATURE OF CONTRACTOR: John Cudney | SUBMISSION DATE: DAY 13 MO. Aug. YR. 73

OFFICE USE ONLY

DATA SOURCE 58 | CONTRACTOR 59-62: 1659 | DATE RECEIVED 63-68: 22 10 73 | 80

DATE OF INSPECTION | INSPECTOR

REMARKS:

OWRC

CSS.S8

PLAN

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 07-091

MINISTRY OF THE ENVIRONMENT

The Ontario Water Resources Act

WATER WELL RECORD

4 of 9 cd

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

11 | 6706017 | MUNICIP. 67009 | CON. CON | 11

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
WELLINGTON	NICHOL ELORA	11	9 11

DATE COMPLETED: DAY 21 MO 03 YR 76

[redacted]

UTM NORTHING 337650 | RC 5 | ELEVATION 1340 | RC 5 | BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	Top Soil			0	2
	Clay			2	5
	Sand			5	20
	Clay and Hardpan			20	40
	Clay			40	48
	Limestone			48	150

31: 0002 02 | 0005 05 | 0020 28 | 0040 05 14 | 0048 05 | 0150 15

32:

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0150	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 4 8	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0053
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE: | DEPTH TO TOP OF SCREEN FEET:

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE: 0004 GPM | DURATION OF PUMPING: HOURS 03 MINS 00

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
025 FEET	075 FEET	025 FEET	030 FEET	040 FEET	075 FEET

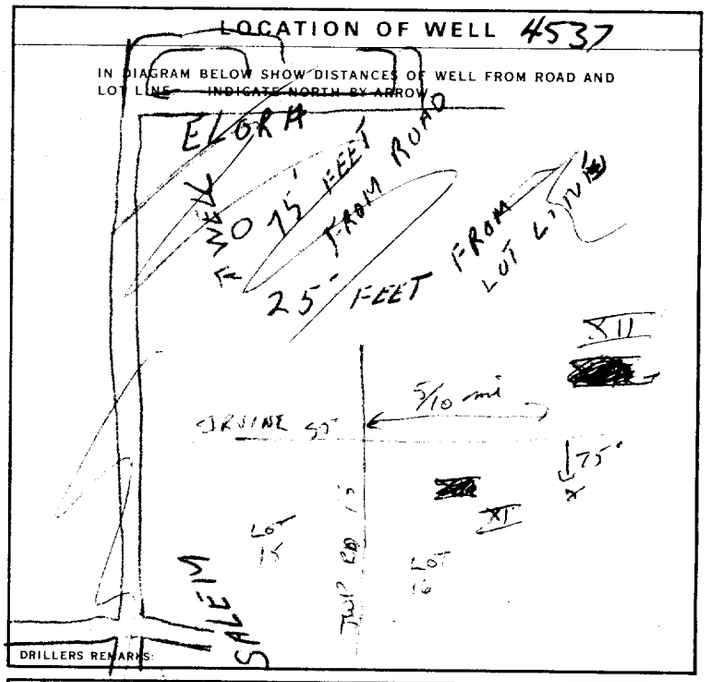
IF FLOWING, GIVE RATE: GPM | PUMP INTAKE SET AT: 75 FEET | WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING: 085 FEET | RECOMMENDED PUMP RATE: 0005 GPM

GPM./FT. SPECIFIC CAPACITY:

LOCATION OF WELL 4537

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



DRILLERS REMARKS:

FINAL STATUS OF WELL 54: 1

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: 01

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

METHOD OF DRILLING 57: 1

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: CUDNEY WELL DRILLING | LICENCE NUMBER

ADDRESS: P O BOX 26 SALEM ONT

NAME OF DRILLER OR BORER: HERBERT CUDNEY | LICENCE NUMBER: 1669

SIGNATURE OF CONTRACTOR: Herbert Cudney | SUBMISSION DATE: DAY 21 MO May YR 76

MINISTRY OF THE ENVIRONMENT COPY

OFFICE USE ONLY

DATA SOURCE 58: 1 | CONTRACTOR 59-62: 1669 | DATE RECEIVED 63-68: 15 06 76

DATE OF INSPECTION: July 6/77 | INSPECTOR: JMC

REMARKS:

P

CSS.S8

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 | 6709676 | MUNICIP. 6,7,0,0,9 | CON. C,O,N

COUNTY OR DISTRICT: Wellington
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: ELORA
CON. BLOCK, TRACT, SURVEY ETC: CON 11
LOT: 17
[redacted] IRUINE ST ELORA NOB 1S0
DATE COMPLETED: DAY 23 MO 09 YR 88

RC | ELEVATION | RC | BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
Brown	Gravel + sand			0	25
	Clay			25	49
Grey	Limstone			49	150
WHITE	Limstone			150	192

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
192	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	188	0	54
4	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		54	192
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

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

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER
PUMPING RATE: 4 GPM
DURATION OF PUMPING: 1 HOURS ____ MINS

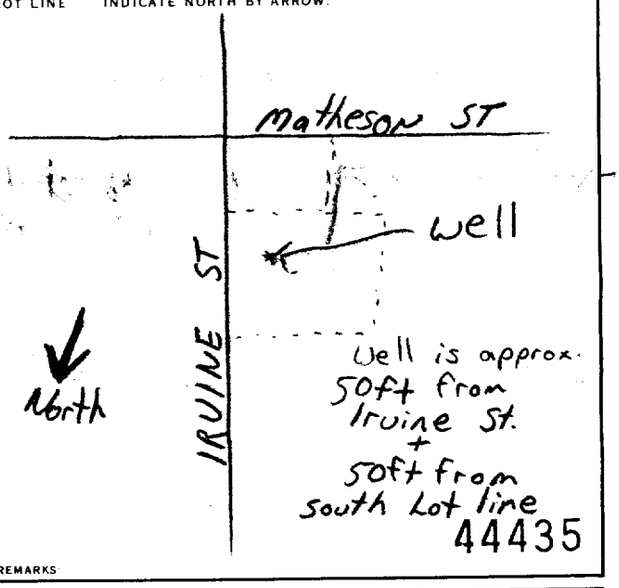
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
50 FEET	185 FEET	FEET	FEET	FEET	FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 188 FEET
RECOMMENDED PUMPING RATE: 4 GPM

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL

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

WATER USE

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 CONSTRUCTION

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

CONTRACTOR

NAME OF WELL CONTRACTOR: Harvey Hill
WELL CONTRACTOR'S LICENCE NUMBER: 2564
ADDRESS: RR#1 ELORA
NAME OF WELL TECHNICIAN: DONALD HILL
WELL TECHNICIAN'S LICENCE NUMBER:
SIGNATURE OF TECHNICIAN/CONTRACTOR: Harry Hill
SUBMISSION DATE: DAY 08 MO. 03 YR. 89

OFFICE USE ONLY

DATA SOURCE
CONTRACTOR: 2564
DATE RECEIVED: MAR 13 1989
DATE OF INSPECTION:
INSPECTOR:
REMARKS: CSS.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ontario (https://www.ontario.ca/page/government-ontario)

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: 7231243
Well Audit Number: *C13763*
Well Tag Number: *A023282*
This table contains information from the original well record and any subsequent updates.

This well is part of a well cluster.

The information below is extracted from the cluster well record.

More information on the cluster well record (related to other wells in the cluster)

is also available.

Well Location

Address of Well Location	
Township	NICHOL TOWNSHIP
Lot	017
Concession	CON 11
County/District/Municipality	WELLINGTON
City/Town/Village	
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 545659.00 Northing: 4837939.00
Municipal Plan and Sublot Number	

Other	

Overburden and Bedrock Materials Interval

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

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

Status of Well

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7302

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?	

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL			
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

Hole Diameter

Depth From	Depth To	Diameter

Audit Number: C13763

Date Well Completed: March 09, 2011

Date Well Record Received by MOE: March 31, 2011

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: October 18, 2021
Published: March 20, 2014

Ontario (https://www.ontario.ca/page/government-ontario)

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: 6715822
Well Audit Number: *Z50613*
Well Tag Number: *A06382*
This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	WALDER STREET
Township	NICHOL TOWNSHIP
Lot	
Concession	

County/District/Municipality	WELLINGTON
City/Town/Village	ELORA
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 546007.00 Northing: 4838178.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

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

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed	
		PORTLAND CEMENT		

Method of Construction & Well Use

Method of Construction	Well Use

Status of Well

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7238

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?	

Draw Down & Recovery

Draw Down	Draw Down	Recovery	Recovery

Time(min)	Water level	Time(min)	Water level
SWL			
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

Hole Diameter

Depth From	Depth To	Diameter

Audit Number: Z50613

Date Well Completed: June 30, 2006

Date Well Record Received by MOE: July 14, 2006

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: October 18, 2021
Published: March 20, 2014

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

40P/9W

Ontario

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

11 | 6706321 | MUNICIP. 67009 | CON. CON XII

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
[redacted]	NICHOL	X11	019

[redacted] 05 HILL ST. EAST. FERGUS — DATE COMPLETED 05 MO [illegible] YR. 76

UTM ZONE | NORTHING 837900 | RC 5 | ELEVATION 1350 | RC 5 | BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	CLAY - STONIES - SAND			0	47
BROWN & GREY	LIMESTONE			47	95
LIGHT GREY				95	165

31 ODH7 051228 0095615 0165826

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0095	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
165	
0163	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL — #5
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. - INCHES	MATERIAL	WALL THICKNESS - INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
04"	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	055
04"	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		55	0165
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER - INCHES	LENGTH - FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN - FEET

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☐ PUMP 2 ☒ BAILER	0006 GPM	02 HOURS 30 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
040 FEET	070 FEET		FEET	FEET	FEET	FEET

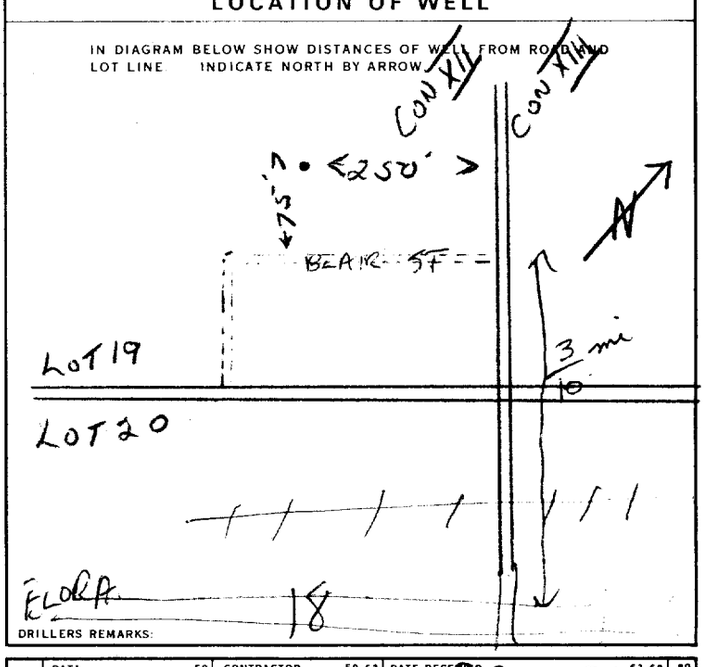
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	090 FEET	0006 GPM

50-53 ——•—— GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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



FINAL STATUS OF WELL 54: 1

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: 01

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

METHOD OF DRILLING 57: 2

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: LANG WELL DRILLING — LICENCE NUMBER: 3316

ADDRESS: RR #1 HILLSBURGH

NAME OF DRILLER OR BORER: Roy Lang — LICENCE NUMBER: 3316

SIGNATURE OF CONTRACTOR: Roy Lang — SUBMISSION DATE: DAY 5 MO. MAY YR. 76

OFFICE USE ONLY

DATA SOURCE 58: 1 | CONTRACTOR 59-62: 3316 | DATE RECEIVED 63-68: 290377 | 80

DATE OF INSPECTION: July 5/77 | INSPECTOR: [illegible]

REMARKS: CSS.S8 | P | WI

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 MOE 07-091

40P9W

The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

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

11 (1 2) | 6704065 | MUNICIP. 67009 (10–14) | CON. CON (15) 12 (22 23 24)

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
WELLINGTON	NICHOL	12 PT	019

OWNER (SURNAME FIRST) 28-47 [redacted] | ADDRESS ELORA, ONT | DATE COMPLETED 48-53: DAY 26 MO. 07 YR. 71

21 (1 2) | UTM ZONE 17 (10) | EASTING 546610 (12–17) | NORTHING 4837930 (18–24) | RC. 4 (25) | ELEVATION 1350 (26) | RC. 5 (30) | BASIN CODE 23 (31) | II | III | IV (47)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	DEPTH – FEET TO
	TOP SOIL			0	2
STONEY	CLAY			2	45
HARD	GRAY LIMESTONE			45	125

31 (1 2): 0002 02 | 0045 05 12 | 01252 1ST

32 (1 2): 10 | 14 15 | 21 | 32 | 43 | 54 | 65 | 75 | 80

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
10-13: 0125	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (14)
15-18	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (19)
20-23	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (24)
25-28	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (29)
30-33	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (34) (80)

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	DEPTH – FEET TO
10-11: ~~4~~ 04	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE (12)	188	0	0050 (15-16) ~~50~~
17-18: 04	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE (19)		50	0125 (20-23) ~~125~~
24-25	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE (26)			27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO.) 31-33	DIAMETER 34-38 INCHES	LENGTH 39-40 FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN 41-44 FEET	80

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	DEPTH SET AT – FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33	80

71 PUMPING TEST

PUMPING TEST METHOD 10: 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE 11-14: 0008 GPM. | DURATION OF PUMPING: 01 (15-16) HOURS 00 (17-18) MINS.

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING (25): 1 ☒ PUMPING 2 ☒ ~~RECOVERY~~			
19-21	22-24	15 MINUTES 26-28	30 MINUTES 29-31	45 MINUTES 32-34	60 MINUTES 35-37
009 FEET	040 FEET	030 FEET	FEET	FEET	040 FEET

IF FLOWING, GIVE RATE 38-41	PUMP INTAKE SET AT	WATER AT END OF TEST 42
GPM.	45 FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING 43-45	RECOMMENDED PUMPING RATE 46-49
☐ SHALLOW ☒ DEEP	060 FEET	0068 GPM.

50-53: 0003 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) 01

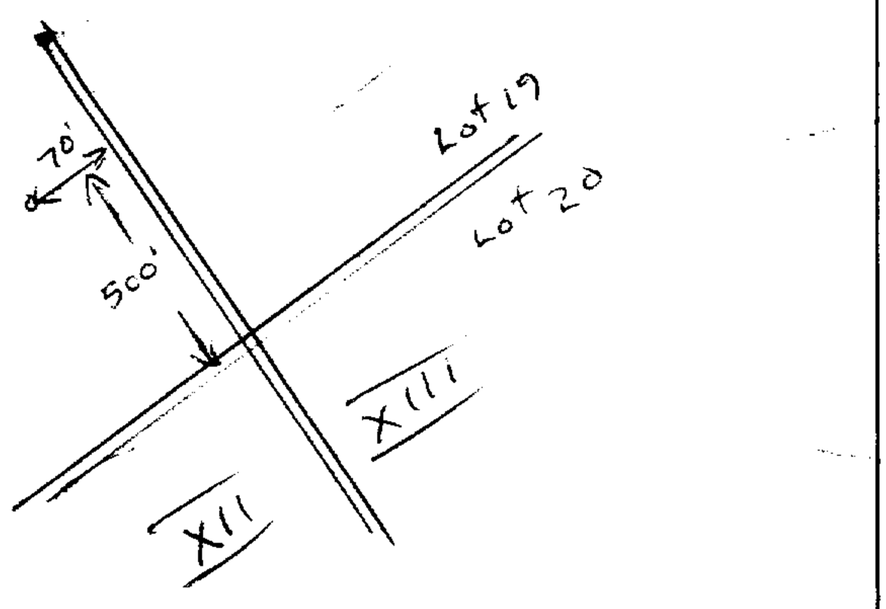
1 ☒ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
☐ OTHER
9 ☐ NOT USED

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

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



DRILLERS REMARKS:

CONTRACTOR

NAME OF WELL CONTRACTOR: JOHN CUDNEY | LICENCE NUMBER: 1659

ADDRESS: SALEM, ONT

NAME OF DRILLER OR BORER: JOHN CUDNEY | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: John Cudney | SUBMISSION DATE: DAY 26 MO 7 YR 71

OFFICE USE ONLY

DATA SOURCE 58: 1 | CONTRACTOR 59-62: 1659 | DATE RECEIVED 63-68: 111171 | 80

DATE OF INSPECTION | INSPECTOR

REMARKS: P 2 | WI

OWRC COPY

The Ontario Water Resources Commission Act

WATER WELL RECORD

40 P/9W

Water management in Ontario

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

11 | 6703759 | MUNICIP. 67009 | CON CON 13

COUNTY OR DISTRICT: Wellington
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Nichol
CON., BLOCK, TRACT, SURVEY, ETC.: ~~Con Road 13~~ XIII
LOT: 018
OWNER (SURNAME FIRST): Town Flora ~~Fergus~~
ADDRESS: Town of Fergus
DATE COMPLETED: DAY 11 MO. ~~Sept~~ 09 YR. ~~1970~~ 70

21 | UTM ZONE 17 | EASTING 546680 | NORTHING 4838650 | RC 4 | ELEVATION 1335 | RC 5 | BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	DEPTH – FEET TO
Brown	clay		soft	0	7
Gray	clay	rock's		7	15
	boulders	gravel		15	24
	rock			24	26
		For Univesity of Waterloo			
			Hole No 5		

31 | 0007 6 0 ~~5~~ | 0015 2 0 ~~5~~ 12 | 0024 13 11 | 0026 26

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
10-13	1 ☐ FRESH 3 ☐ SULPHUR 14 / 2 ☐ SALTY 4 ☐ MINERAL
15-18	1 ☐ FRESH 3 ☐ SULPHUR 19 / 2 ☐ SALTY 4 ☐ MINERAL
20-23	1 ☐ FRESH 3 ☐ SULPHUR 24 / 2 ☐ SALTY 4 ☐ MINERAL
25-28	1 ☐ FRESH 3 ☐ SULPHUR 29 / 2 ☐ SALTY 4 ☐ MINERAL
30-33	1 ☐ FRESH 3 ☐ SULPHUR 34 80 / 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	DEPTH – FEET TO
02 10-11	1 ~~☒~~ STEEL 12			13-16
~~7~~ "	2 ☐ GALVANIZED			0026
~~7~~	3 ☐ CONCRETE		0	~~26~~
	4 ☐ OPEN HOLE			20-23
17-18	1 ☐ STEEL 19			
	2 ☐ GALVANIZED			
	3 ☐ CONCRETE			
	4 ☐ OPEN HOLE			27-30
24-25	1 ☐ STEEL 26			
	2 ☐ GALVANIZED			
	3 ☐ CONCRETE			
	4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) 31-33	DIAMETER 34-38 INCHES	LENGTH 39-40 FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN 41-44 80 FEET	

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	DEPTH SET AT – FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33 80	

71 PUMPING TEST

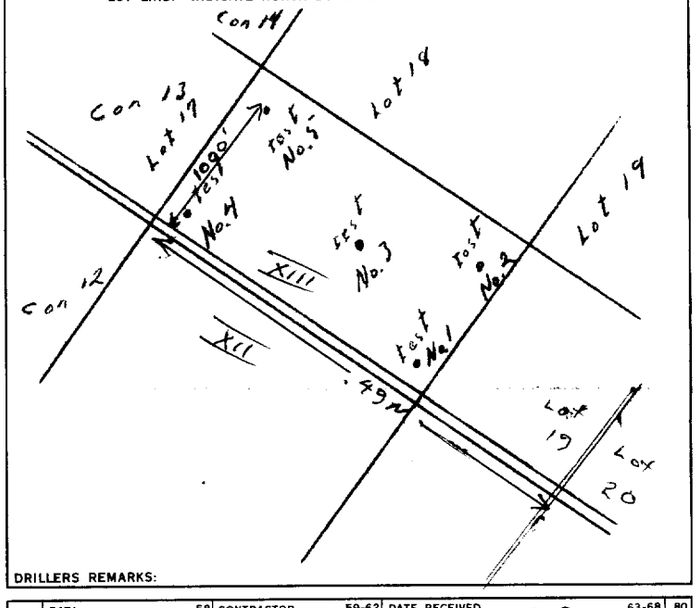
PUMPING TEST METHOD 10: 1 ☐ PUMP 2 ☐ BAILER
PUMPING RATE 11-14 GPM.
DURATION OF PUMPING 15-16 HOURS 17-18 MINS.

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING 25: 1 ☐ PUMPING 2 ☐ RECOVERY			
		15 MINUTES 26-28	30 MINUTES 29-31	45 MINUTES 32-34	60 MINUTES 35-37
19-21 FEET	22-24 FEET	FEET	FEET	FEET	FEET

IF FLOWING, GIVE RATE 38-41 GPM.
PUMP INTAKE SET AT FEET
WATER AT END OF TEST 42: 1 ☐ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING 43-45 FEET
RECOMMENDED PUMPING RATE 46-49 GPM.
50-53 _____ GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL 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 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING ☐ OTHER ~~POLLUTION CON~~ 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

CONTRACTOR

NAME OF WELL CONTRACTOR: Coralta Drilling (Kit) | LICENCE NUMBER: 1657
ADDRESS: 2210 King St E Kit
NAME OF DRILLER OR BORER: Norm Faber | LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: N J Pidgeon | SUBMISSION DATE: DAY 17 MO. Sept YR. 70

OWRC COPY

OFFICE USE ONLY

DATA SOURCE 58: 1
CONTRACTOR 59-62: 1657
DATE RECEIVED 63-68 80: 160970
DATE OF INSPECTION:
INSPECTOR: P/E
REMARKS:

CSS.S8

Ontario Ministry of the Environment

Well Tag No. (Plate below) A 035811

A 035811

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 Management Coordinator at 416-235-6203.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only

MUN | CON | LOT

Well Owner's Information and Location of Well Information

[redacted]

Gerrie Rd. | Center Wellington | 17 4/8 | Concession 12

RR#/Street Number/Name | City/Town/Village Elora | Site/Compartment/Block/Tract etc.

GPS Reading | NAD 83 | Zone | Easting NO SIGNAL | 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	Depth To
Brown	SILT TILL			0	1.5
Brown	SILT SAND			1.5	4.5

Hole Diameter

Depth From	Depth To	Diameter Centimetres
0	4.5	77

Water Record

Water found at ___ Metres / Kind of Water

___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

___ m ☐ 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	Depth To
Casing				
4	☐ Steel ☐ Fibreglass ☑ Plastic ☐ Concrete ☐ Galvanized		0	1.5
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam 4	☐ Steel ☐ Fibreglass ☒ Plastic ☐ Concrete ☐ Galvanized	Slot No. 10	1.5	4.5
No Casing or Screen				
	☐ Open hole			

Test of Well Yield

Pumping test method	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres)	Static Level			
Pumping rate - (litres/min)	1		1	
Duration of pumping ___hrs +___ min	2		2	
Final water level end of pumping ___metres	3		3	
Recommended pump type. ☐ Shallow ☐ Deep	4		4	
Recommended pump depth. ___metres	5		5	
Recommended pump rate. (litres/min)	10		10	
	15		15	
If flowing give rate - (litres/min)	20		20	
	25		25	
If pumping discontinued, give reason	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record ☐ Annular space ☐ Abandonment

Depth set at - Metres From	Depth set at - Metres To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	1	Bentonite Pellets	10 Lbs
1	4.5	#3 Well Sand	30 Lbs

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: Aardvark Drilling Inc | Well Contractor's Licence No.: 7238

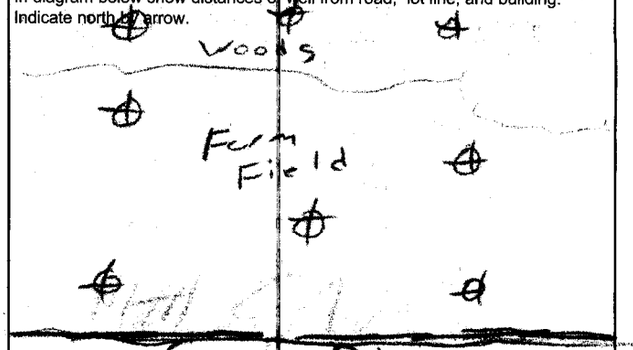
Business Address (street name, number, city etc.): C-25 Lewis Rd. Guelph On N1H 1E9

Name of Well Technician (last name, first name): Henry, Nathan | Well Technician's Licence No.: T-3305

Signature of Technician/Contractor: X [signature] | Date Submitted YYYY MM DD: 2006 02 01

Location of Well

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



Audit No. Z 39731 | Date Well Completed YYYY MM DD: 2006 01 25

Was the well owner's information package delivered? ☐ Yes ☐ No | Date Delivered YYYY MM DD: 2006 02 01

Ministry Use Only

Data Source | Contractor 7238

Date Received FEB 07 2006 YYYY MM DD | Date of Inspection YYYY MM DD

Remarks | Well Record Number

0506E (09/03) Contractor's Copy ☐ Ministry's Copy ☐ Well Owner's Copy ☐ *Cette formule est disponible en français*

40P/9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 6707245 MUNICIP. 67.009 CON. CON 1/2

COUNTY OR DISTRICT: [redacted] CO.
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: NICHOL TWP.
CON., BLOCK, TRACT, SURVEY, ETC.: CON. 12
LOT: 017
[redacted] RR1 ELORA ONT.
DATE COMPLETED: DAY 31 MO 10 YR 79
UTM: 538450 RC 5 ELEVATION 1350 RC 5 BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	SAND			0	10
	CLAY			10	50
	GRAVEL			50	59
GRAY	LIMESTONE			59	160
WHITE	LIMESTONE			160	219

31 0110 28 | 0050 05 | 0059 11 | 0160215 | 0219115

32

41 WATER RECORD

WATER FOUND	KIND OF WATER
0150 ~~150~~ ~~210~~	1 ☒ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
15-18	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
20-23	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
25-28	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
30-33	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
04 ~~7~~	1 ☒ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE	188	0	~~065~~ 065
04 4	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☒ OPEN HOLE		65	~~219~~ 0219
24-25	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO.) 31-33	DIAMETER 34-38 INCHES	LENGTH 39-40 FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN 41-44 FEET	80

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33	80

71 PUMPING TEST

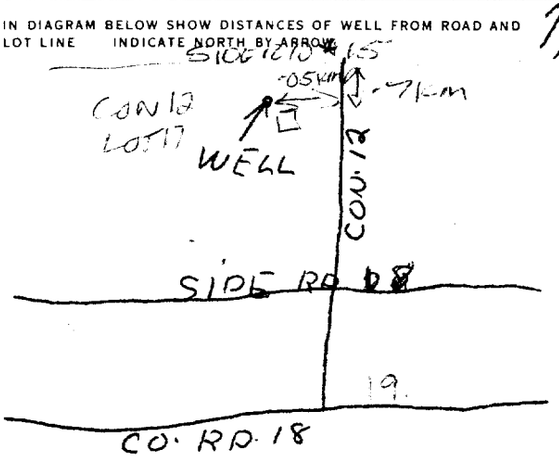
PUMPING TEST METHOD 10: 1 ☐ PUMP 2 ☒ BAILER
PUMPING RATE 11-14: 0007 GPM
DURATION OF PUMPING 15-16 HOURS 02 17-18 MINS

STATIC LEVEL 19-21	WATER LEVEL END OF PUMPING 22-24	WATER LEVELS DURING 25: 1 ☒ PUMPING 2 ☐ RECOVERY			
050 FEET	140 FEET	15 MINUTES 26-28 FEET	30 MINUTES 29-31 FEET	45 MINUTES 32-34 FEET	60 MINUTES 35-37 140 FEET

IF FLOWING, GIVE RATE 38-41 GPM
PUMP INTAKE SET AT FEET
WATER AT END OF TEST 42: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING 43-45: 160 FEET
RECOMMENDED PUMPING RATE 46-49: 0007 GPM
50-53

LOCATION OF WELL

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



Well is 250' from L.L. on S. Side

DRILLERS REMARKS:

FINAL STATUS OF WELL 94: 1

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: 12

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

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: HARVEY HILL — LICENCE NUMBER: 2564
ADDRESS: RR1 ELORA ONT.
NAME OF DRILLER OR BORER: SAME — LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: Harvey Hill — SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE 58: 1 — CONTRACTOR 59-62: 2564 — DATE RECEIVED 63-68: 160480 — 80
DATE OF INSPECTION: Aug 24/1980 — INSPECTOR:
REMARKS: CSS.S8

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77 FORM 7

-40 P/9W

The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

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

11 | 6703758 | MUNICIP. 67009 | CON. CON 13

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Wellington	Nichol	Con. Road 13 XIII	018

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Town Flora ~~t~~ Fergus	Town of Fergus	DAY 10 MO. ~~Sept~~ Oct YR. ~~1970~~ 70

21 | UTM ZONE 17 | EASTING 546450 | NORTHING 4838420 | RC. 4 | ELEVATION 1350 | RC. 5 | BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	DEPTH – FEET TO
Brown	clay	stone		0	10
Gray	clay			10	39
	boulder			39	48
	rock			48	49
			Hole No 4		

31 | 0010 | 0505 | 12 | 0039 | 205 | 0048 | 13 | 0049 | 26

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
10-13	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
15-18	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
20-23	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
25-28	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
30-33	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	DEPTH – FEET TO
02	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE		0	0049 ~~49~~
2"				
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

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

61 PLUGGING & SEALING RECORD

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

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING 1 ☐ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
FEET	FEET	FEET	FEET	FEET	FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM.	FEET	1 ☐ CLEAR 2 ☐ CLOUDY

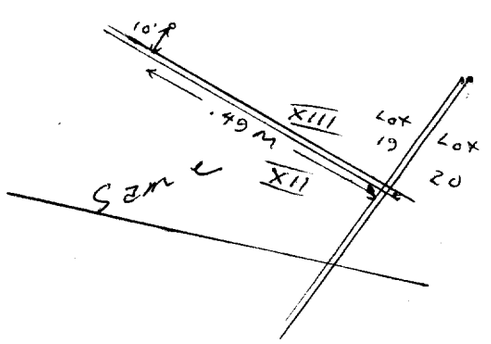
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☐ DEEP	FEET	GPM.

GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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

Same Diagram as for Hole #5



DRILLERS REMARKS:

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

CONTRACTOR

NAME OF WELL CONTRACTOR	LICENCE NUMBER
Coralta Drilling Ltd.,	1657
ADDRESS: 2210 King Street E., Kitchener, Ont.	
NAME OF DRILLER OR BORER: Norm Tober	LICENCE NUMBER
SIGNATURE OF CONTRACTOR: [signature]	SUBMISSION DATE: DAY 14 MO. Sept. 1970

OFFICE USE ONLY

DATA SOURCE	CONTRACTOR	DATE RECEIVED
1	1657	160970
DATE OF INSPECTION	INSPECTOR	
	P/L	
REMARKS: CSS.S8		

OWRC COPY

40P/9W

The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

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

11 | 6703756 | MUNICIP. 67009 | CON. C&N | 13

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Wellington	Nichol	Con. Road 13 XIII	018

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Town Flora ~~T~~ Fergus	Town of Fergus	DAY 04 MO. ~~Sept~~ 09 YR. 70

21 | UTM ZONE 17 | EASTING 546940 | NORTHING 4838450 | RC. ~~4~~ | ELEVATION 1350 | RC. ~~5~~ | BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	DEPTH – FEET TO
Brown	clay	rocks	soft	0	11
Gray	clay	rocks		11	39
	boulder			39	48
	rock			48	50
			Hole No 2		

31 | 0011 | 0050 | 12 | 0039 | 0050 | 12 | 0048 | 13 | 0050 | 26

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
10-13	1 ☐ FRESH 3 ☐ SULPHUR 14; 2 ☐ SALTY 4 ☐ MINERAL
15-18	1 ☐ FRESH 3 ☐ SULPHUR 19; 2 ☐ SALTY 4 ☐ MINERAL
20-23	1 ☐ FRESH 3 ☐ SULPHUR 24; 2 ☐ SALTY 4 ☐ MINERAL
25-28	1 ☐ FRESH 3 ☐ SULPHUR 29; 2 ☐ SALTY 4 ☐ MINERAL
30-33	1 ☐ FRESH 3 ☐ SULPHUR 34; 2 ☐ SALTY 4 ☐ MINERAL 80

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	DEPTH – FEET TO
02 10-11	1 ☒ STEEL 12; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE		0	0050 13-16
17-18	1 ☐ STEEL 19; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			20-23
24-25	1 ☐ STEEL 26; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO.) 31-33	DIAMETER INCHES 34-38	LENGTH FEET 39-40
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET 41-44	80

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	DEPTH SET AT – FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33 80	

71 PUMPING TEST

PUMPING TEST METHOD 10: 1 ☐ PUMP 2 ☐ BAILER

PUMPING RATE 11-14 GPM. | DURATION OF PUMPING 15-16 HOURS 17-18 MINS.

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING 25: 1 ☐ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
19-21 FEET	22-24 FEET	26-28 FEET	29-31 FEET	32-34 FEET	35-37 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST 42
38-41 GPM.	FEET	1 ☐ CLEAR 2 ☐ CLOUDY

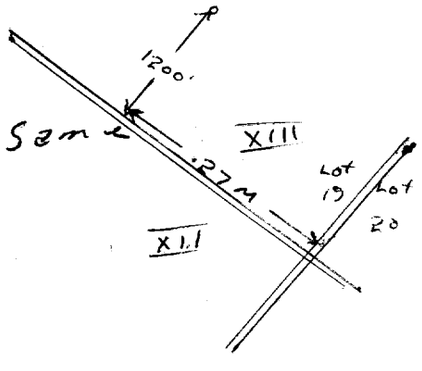
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☐ DEEP	43-45 FEET	46-49 GPM.

50-53 _____ GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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

Same Diagram as for Hole #5



DRILLERS REMARKS:

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 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING ☐ OTHER ~~POLLUTION CON.~~ 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

CONTRACTOR

NAME OF WELL CONTRACTOR: Coralta Drilling Ltd., | LICENCE NUMBER: 1657

ADDRESS: 2210 King Street E., Kitchener, Ont.

NAME OF DRILLER OR BORER: Norm Tober | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: ~~J. Pidgeon~~ | SUBMISSION DATE: DAY 14 MO. Sept. YR. 1970

OFFICE USE ONLY

DATA SOURCE 1 58 | CONTRACTOR 59-62 1657 | DATE RECEIVED 160970 63-68 80

DATE OF INSPECTION | INSPECTOR P/L

REMARKS: CSS.S8

OWRC COPY

Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. *(Place Sticker and/or Print Below)*: Not Recovered

5-15570

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 2

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	Elora Waste transfer facility		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
6450 Gerrie road	Wellington	Ontario	N0B 1S0	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
6450 Gerrie road			

County/District/Municipality	City/Town/Village	Province	Postal Code
	[redacted] Elora	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	546886	4838769		

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

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

Well Decommissioned

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	26.5'	Grout	

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
2"	PVC	0.25"	0	16.5'

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
2.25"	PVC	10	16.5'	26.5'

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*: not needed
☐ Other, *specify*

Water Details

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

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	26.5'	N/A

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

Well production (l/min / GPM)

Disinfected? ☐ Yes ☐ No

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

Map of Well Location

Please provide a map below following instructions on the back.

See Map

p 125

Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Strata Soil Sampling	7241

Business Address (Street Number/Name)	Municipality
165 Shields Court	Markham

Province	Postal Code	Business E-mail Address
ON	L3R 8V2	

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
(905) 764-9380	Gasparac, Mark

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3708		20140620

Well owner's information package delivered ☐ Yes ☐ No

Date Package Delivered:

Date Work Completed: 20140530

Ministry Use Only

Audit No. Z 185625

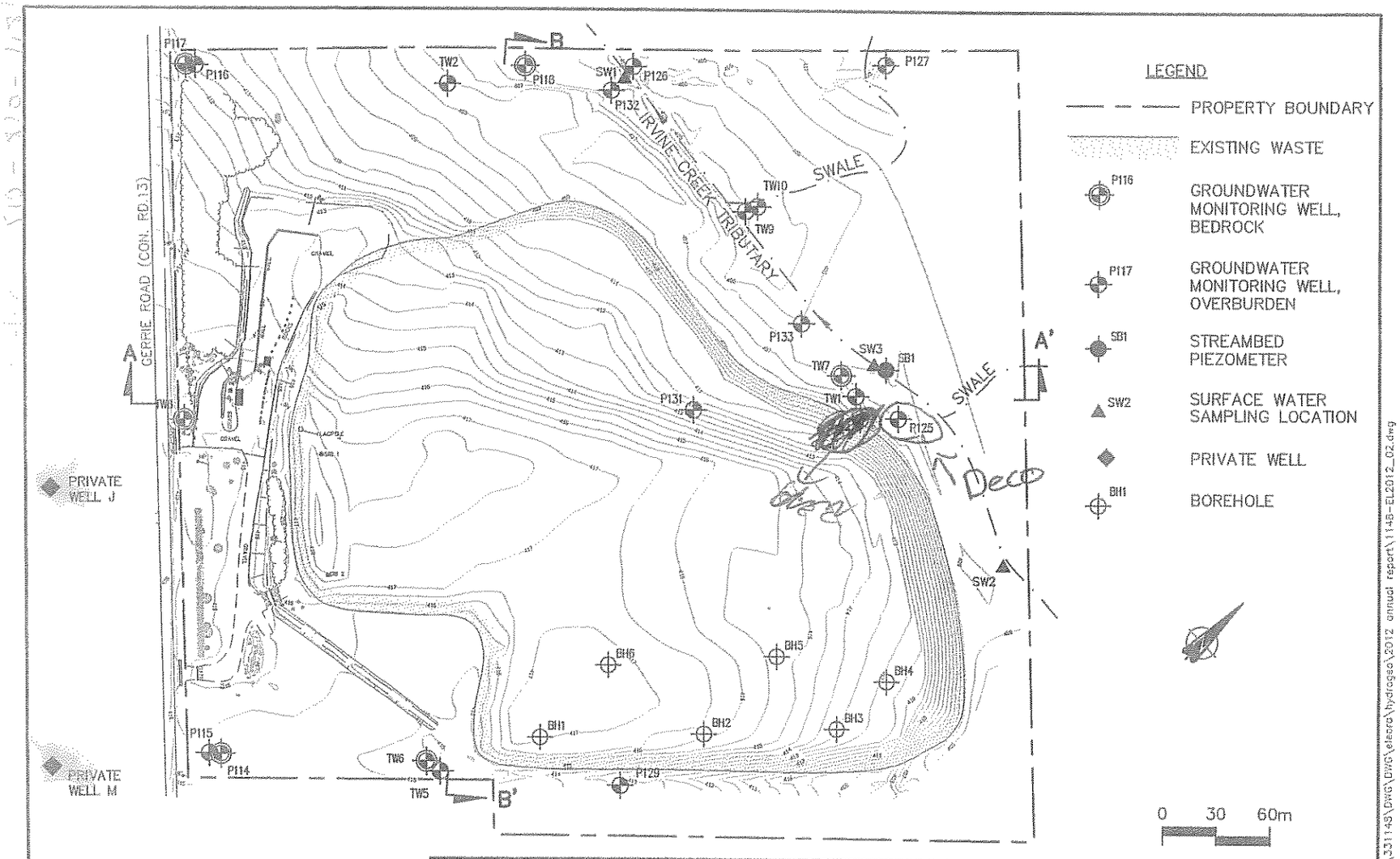
JUN 27 2014

Received

0506E (2007/12) © Queen's Printer for Ontario, 2007

Ministry's Copy

5-15570



SNC·LAVALIN Environment

Client/Location: COUNTY OF WELLINGTON ELORA WASTE MANAGEMENT FACILITY 2012 ANNUAL MONITORING REPORT		Title: MONITORING AND CROSS SECTION LOCATIONS	
Project No: 331148	Filename: 1148-EL2012_02	Date: APRIL 2013	Drawing No: FIGURE 3
Drawn: DM	Verified: MS	Project Manager: DD	

PAGE FORMAT: 8.5x11

FILENAME: P:\Jobs\331148\DWG\DWG\elora\hydrogeo\2012 annual report\1148-EL2012_02.dwg

JUN 27 2014

C-7241 218535

SWCL July 23/13
130738

Ontario — Ministry of the Environment

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Measurements recorded in: ☐ Metric ☐ Imperial

Well Tag No. *(Place Sticker and/or Print Below)* A146692 P127

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	County of Wellington, Solid Waste Services Division		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
7-11 Woolwich St.	Guelph	On.	N1H3T9	5198372601

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
6549 GERRIE RD			

County/District/Municipality	City/Town/Village	Province	Postal Code
WELLINGTON	ELORA	Ontario	N0B1S0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	546801	4838695		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
			Well was altered due to change in grade	14.4	17.7
	WELL # P131				

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)

Method of Construction

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

Well Use

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

Construction Record - Casing

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

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*

Construction Record - Screen

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

Water Details

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

Hole Diameter

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

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping hrs + min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

Well production (l/min / GPM)

Disinfected? ☐ Yes ☐ No

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

Map of Well Location

Please provide a map below following instructions on the back.

See pH

Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Geo-Environmental	6607

Business Address (Street Number/Name)	Municipality
1 Mansfield Crt.	Hutton Hill

Province	Postal Code	Business E-mail Address
Ont	L7P0A4	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
9058763388	Gamm, Gary

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3109		2013 07 27

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No		2013 07 27

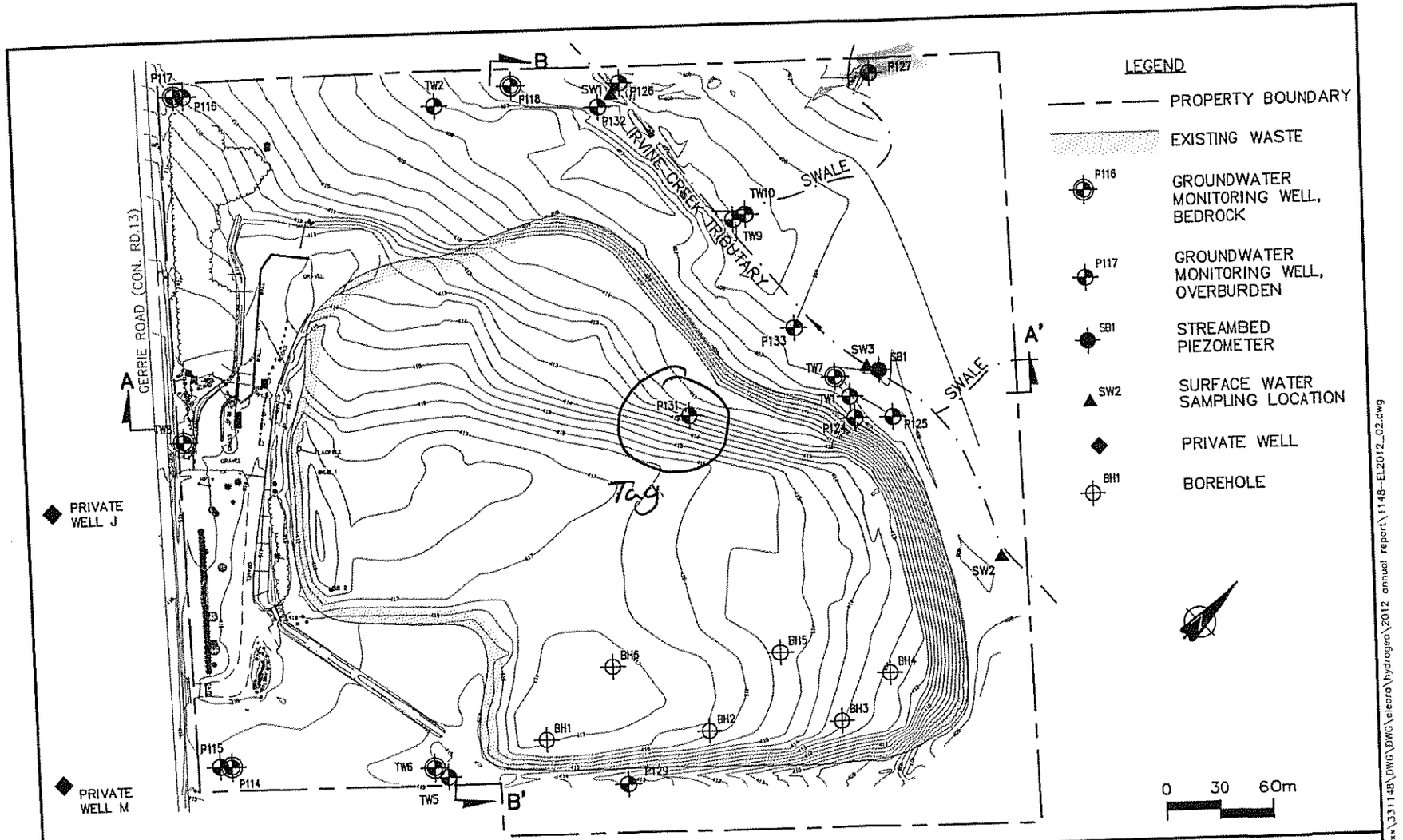
Ministry Use Only

Audit No. Z169901

Received OCT 2 5 2013

0506E (2007/12) © Queen's Printer for Ontario, 2007

Ministry's Copy



SNC·LAVALIN Environment

Client/Location:	COUNTY OF WELLINGTON ELORA WASTE MANAGEMENT FACILITY 2012 ANNUAL MONITORING REPORT
Title:	MONITORING AND CROSS SECTION LOCATIONS
Project No:	331148
Filename:	1148-EL2012_02
Date:	APRIL 2013
Drawing No:	FIGURE 3
Drawn:	DM
Verified:	MS
Project Manager:	DD

PAGE FORMAT: 8.5x11

FILENAME: P:\3xxxxx\331148\DWG\DWG\elecro\hydrogeo\2012 annual report\1148-EL2012_02.dwg

C-6607 2169901

OCT 2 9 2013

40P/9W

The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

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

11

6703757 | MUNICIP. 67009 | CON. CON 13

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Wellington	Nichol	Con. Road 13 XIII	018

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Town Flora & Fergus	Town of Fergus	DAY 08 MO. Sept 09 YR. 70

21 | ZONE 17 | EASTING 546700 | NORTHING 4838400 | RC. 4 | ELEVATION 1350 | RC. 5 | BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	DEPTH – FEET TO
Brown	clay	rocks	soft	0	20
Gray	clay	rocks		20	40
	boulder	clay		40	55
	rock			55	56
			Hole No. 3		

31 | 0020 | 0056 12 | 0040 | 0056 12 | 0055 | 1350 | 0056 | 26

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
10-13	1 ☐ FRESH 3 ☐ SULPHUR 14; 2 ☐ SALTY 4 ☐ MINERAL
15-18	1 ☐ FRESH 3 ☐ SULPHUR 19; 2 ☐ SALTY 4 ☐ MINERAL
20-23	1 ☐ FRESH 3 ☐ SULPHUR 24; 2 ☐ SALTY 4 ☐ MINERAL
25-28	1 ☐ FRESH 3 ☐ SULPHUR 29; 2 ☐ SALTY 4 ☐ MINERAL
30-33	1 ☐ FRESH 3 ☐ SULPHUR 34; 2 ☐ SALTY 4 ☐ MINERAL 80

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	DEPTH – FEET TO
10-11 02 2	1 ☒ STEEL 12; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE		0	13-16 0056
17-18	1 ☐ STEEL 19; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			20-23
24-25	1 ☐ STEEL 26; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO.) 31-33	DIAMETER 34-38 INCHES	LENGTH 39-40 FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN 41-44 FEET	80

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33 80	

PUMPING TEST

71 | PUMPING TEST METHOD 10: 1 ☐ PUMP 2 ☐ BAILER | PUMPING RATE 11-14 GPM. | DURATION OF PUMPING 15-16 HOURS 17-18 MINS.

STATIC LEVEL 19-21 FEET	WATER LEVEL END OF PUMPING 22-24 FEET	25 WATER LEVELS DURING: 1 ☐ PUMPING 2 ☐ RECOVERY	15 MINUTES 26-28 FEET	30 MINUTES 29-31 FEET	45 MINUTES 32-34 FEET	60 MINUTES 35-37 FEET

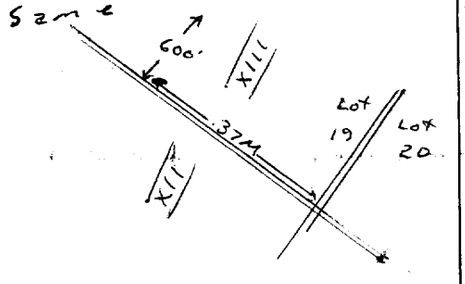
IF FLOWING, GIVE RATE 38-41 GPM.	PUMP INTAKE SET AT FEET	WATER AT END OF TEST 42: 1 ☐ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE ☐ SHALLOW ☐ DEEP	RECOMMENDED PUMP SETTING 43-45 FEET	RECOMMENDED PUMPING RATE 46-49 GPM.

50-53 _____ GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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

Same Diagram as for Hole #5



DRILLERS REMARKS:

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; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; ☐ OTHER Pollution Con; 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

CONTRACTOR

NAME OF WELL CONTRACTOR: Coralta Drilling Ltd., | LICENCE NUMBER: 1657

ADDRESS: 2210 King Street E., Kitchener, Ont.

NAME OF DRILLER OR BORER: Norm Tober | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: V. K. Pidgeon | SUBMISSION DATE: DAY 14 MO. Sept. 1970

OFFICE USE ONLY

DATA SOURCE 58: 1 | CONTRACTOR 59-62: 1657 | DATE RECEIVED 63-68: 160970 | 80

DATE OF INSPECTION | INSPECTOR: P/L

REMARKS: CSS.S8

OWRC COPY

Ontario

Ministry of the Environment, Conservation and Parks

Measurements recorded in: ☒ Metric ☐ Imperial

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

No Tag

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
6537 Gerrie Rd	Centre Wellington (Nichol)	Pt 19	XIII
County/District/Municipality	**City/Town/Village**	**Province**	**Postal Code**
Wellington	Elora	Ontario	N0B 1S0
UTM Coordinates Zone / Easting / Northing	**Municipal Plan and Sublot Number**	**Other**	
NAD 83 17 547979 4838374			

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
			Abandonment of 10 cm (4") drilled well located in well pit. Well pit reinstated following abandonment		
			Native Soil	0	2.1
			Bentonite Chips.	2.1	32.6
			See Audit for well ID 6701913 for original construction details.		

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	2.1	Native Soil	
2.1	32.6	Bentonite Chips	0.247

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
10	steel		2.1	?

Construction Record - Screen

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

Status of Well

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

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping ____ hrs + ____ min

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

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

Recommended pump depth *(m/ft)*

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

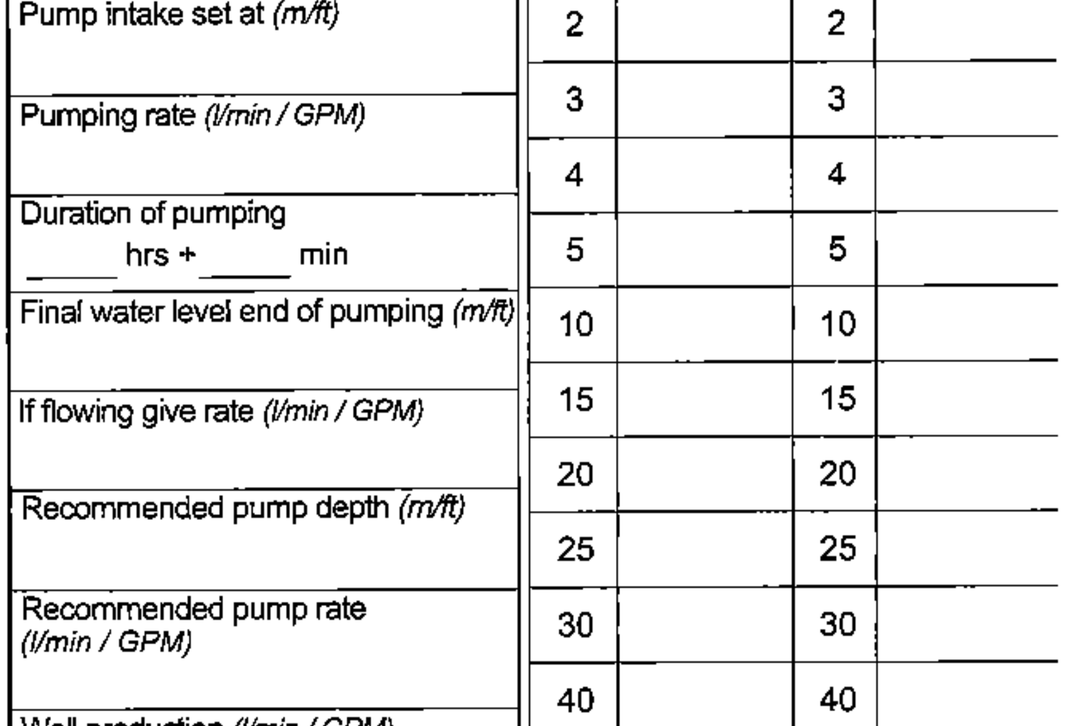
Well production *(l/min / GPM)*

Disinfected? ☒ Yes ☐ No

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

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Water Details

Water found at Depth (m/ft)	Kind of Water		Hole Diameter Depth (m/ft) From	To	Diameter (cm/in)
☐ Gas	☐ 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	Well Contractor's Licence No.
Well Initiatives Limited	7221
Business Address (Street Number/Name)	**Municipality**
15 Townline Orangeville	
Province	**Postal Code** / **Business E-mail Address**
ON	L9W3R4 info@wellinitiatives.com
Bus. Telephone No. (inc. area code)	**Name of Well Technician (Last Name, First Name)**
5198460289	Weed, Patrick
Well Technician's Licence No.	**Signature of Technician and/or Contractor** / **Date Submitted**
3800	Patrick Weed 2020/08/31

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
☐ Yes ☒ No	Y Y Y Y M M D D	Audit No. Z336411
	Date Work Completed 2020/08/28	SEP 17 2020 Received

0506E (2018/12)

Ministry's Copy

UTM. 30 Z E
5 R N
Elev. 5 R 1350 (Con 13 Lot 19)

The Ontario Water Resources Commission Act

WATER WELL RECORD

Basin 23 County or District Shelburne Co. Township, Village, Town or City Nichol Twp.
Con. 13 Lot PT. 19 Date completed 6 (day) July (month) 65 (year)
[redacted] ress Box 67 Elora Ont. Peony & Iris Gardens.

Casing and Screen Record

Inside diameter of casing 4"
Total length of casing 60 ft.
Type of screen —
Length of screen —
Depth to top of screen —
Diameter of finished hole 4"

Pumping Test

Static level 25
Test-pumping rate 6½ G.P.M.
Pumping level 80
Duration of test pumping 1 hr.
Water clear or cloudy at end of test clear.
Recommended pumping rate 6½ G.P.M.
with pump setting of 80 feet below ground surface

Well Log

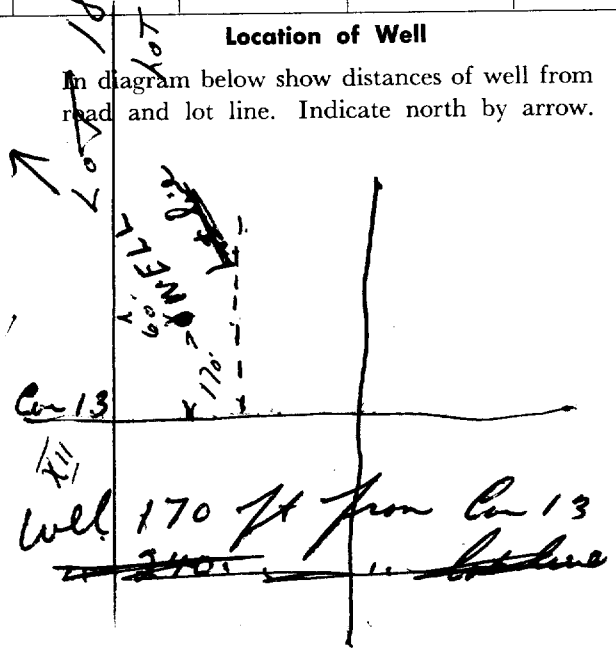
Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
Clay & stone	0	52	107	fresh.
hard grey limestone	52	107		

For what purpose(s) is the water to be used? domestic & peony & Iris gardens.
Is well on upland, in valley, or on hillside? upland.
Drilling or Boring Firm Charles Hall
RR 2
Address Elora

Licence Number 1585
Name of Driller or Borer Harvey Hall
Address Elora
Date July 6/65
Charles Hall
(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.



Form 7 15M-60-4138

OWRC COPY

CSS.S8

40 P/9W

The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

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

11 | 6703755 | MUNICIP. 67009 | CON. CON | 13

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Wellington	Nichol	Con. Road 13	018

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Town Flora & Fergus	Town of Fergus	DAY 03 MO 09 YR 70

21 | UTM ZONE 17 | EASTING 546700 | NORTHING 4838180 | ELEVATION 1355 | RC. 5 | BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	DEPTH – FEET TO
Brown	clay		soft	0	12
	gravel			12	14
Gray	clay			14	20
	boulder	clay	sandy	20	51
	gravel			51	54
	clay			54	55
Gray	bed rock			55	57
			Hole No 1		

31 | 0912605 | 0014 11 | 0920205 | 0051 1305 09 | 0054 11 | 0055205 | 1

32 | 0057 26

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
10-13	1 ☐ FRESH 3 ☐ SULPHUR 14; 2 ☐ SALTY 4 ☐ MINERAL
15-18	1 ☐ FRESH 3 ☐ SULPHUR 19; 2 ☐ SALTY 4 ☐ MINERAL
20-23	1 ☐ FRESH 3 ☐ SULPHUR 24; 2 ☐ SALTY 4 ☐ MINERAL
25-28	1 ☐ FRESH 3 ☐ SULPHUR 29; 2 ☐ SALTY 4 ☐ MINERAL
30-33	1 ☐ FRESH 3 ☐ SULPHUR 34 80; 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	DEPTH – FEET TO
10-11 02	1 ☒ STEEL 12; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE		0	13-16 0057 ~~57~~
17-18	1 ☐ STEEL 19; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			20-23
24-25	1 ☐ STEEL 26; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO.) 31-33	DIAMETER 34-38 INCHES	LENGTH 39-40 FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN 41-44 FEET	80

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33 80	

71 PUMPING TEST

PUMPING TEST METHOD 10	PUMPING RATE 11-14 GPM.	DURATION OF PUMPING 15-16 HOURS 17-18 MINS.
1 ☐ PUMP 2 ☐ BAILER		

STATIC LEVEL	WATER LEVEL END OF PUMPING	25 WATER LEVELS DURING 1 ☐ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
19-21 FEET	22-24 FEET	26-28 FEET	29-31 FEET	32-34 FEET	35-37 FEET

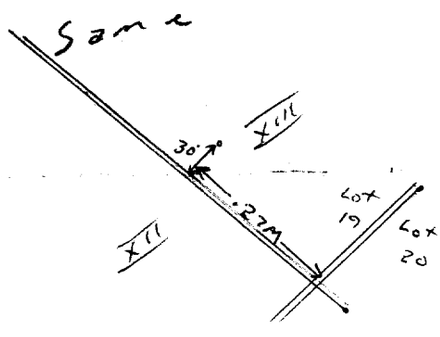
IF FLOWING, GIVE RATE 38-41 GPM.	PUMP INTAKE SET AT FEET	WATER AT END OF TEST 42: 1 ☐ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE ☐ SHALLOW ☐ DEEP	RECOMMENDED PUMP SETTING 43-45 FEET	RECOMMENDED PUMPING RATE 46-49 GPM.

50-53 _____ GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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

Same Diagram as for Hole #5



DRILLERS REMARKS:

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 Pollution Con	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

CONTRACTOR

NAME OF WELL CONTRACTOR: Coralta Drilling Ltd., — LICENCE NUMBER: 1657

ADDRESS: 2210 King Street E., Kitchener, Ont.

NAME OF DRILLER OR BORER: Norm Tober — LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: [signature] — SUBMISSION DATE: DAY 14 MO. Sept. YR. 1970

OFFICE USE ONLY

DATA SOURCE 58	CONTRACTOR 59-62	DATE RECEIVED 63-68	80
1	1657	160970	

DATE OF INSPECTION | INSPECTOR: P/E 71

REMARKS: CSS.SS

OWRC COPY

Ontario — Ministry of the Environment, Conservation and Parks

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. *(Place Sticker and/or Print Below)*: A296868

Well Record

Regulation 903 Ontario Water Resources Act

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
6550 Gerrie Rd	Centre Wellington.	Pt Lt 18	12.

County/District/Municipality	City/Town/Village	Province	Postal Code
Wellington	Elora.	Ontario	N0B 1S0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	546590	4838419		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
	Raised well head from 4' below grade to 16" above grade with 5" casing. well was grouted from below the joint to grade level.				

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)

Method of Construction

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

Well Use

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

Construction Record - Casing

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

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	4	5
4	195	4"

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping _____ hrs + _____ min

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

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

Recommended pump depth *(m/ft)*

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

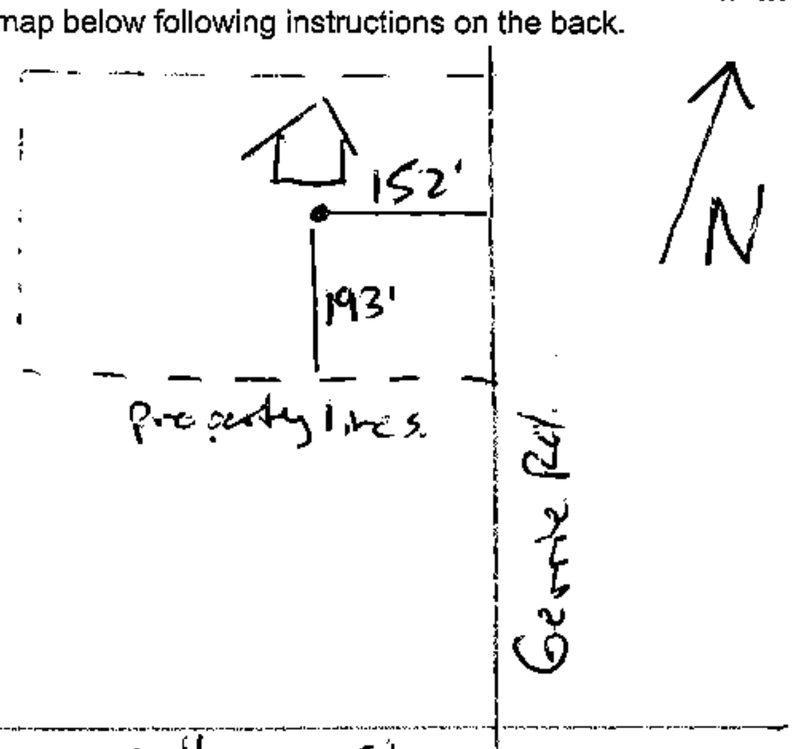
Well production *(l/min / GPM)*

Disinfected? ☒ Yes ☐ No

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

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Holyoake Pump Sales + Service (2016) LTD.	7622

Business Address (Street Number/Name)	Municipality
7513 10th Line.	East Garafraxa.

Province	Postal Code	Business E-mail Address
On	L9W 7A3	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
2268203347	Holyoake, Art

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3449		2021/01/05

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	2021/01/05	2020/12/18

Ministry Use Only

Audit No. Z338604

Received JAN 19 2021

0506E (2018/12)

Ministry's Copy

40 P/9W

The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

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

11 (1 2) | 6703611 | MUNICIP. 67009 (10 14) | CON. Gwn (15 22 23 24) | 12

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT (25-27)
Wellington Cty.	Nichol Twsp.	Con 12	018

[redacted] R3 Elora

DATE COMPLETED (48-53): DAY 21 MO. ~~8~~ 01 YR. 70

UTM ING 838200 (24) RC. 4 (25) ELEVATION 13155 (26) RC. 5 (27) BASIN CODE 23 (31) — I II III IV (47)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	DEPTH – FEET TO
		Gravelly Clay		0	61
		Grey Limestone		61	226

31: 0061 0511 0226 2115

32: (1 2) (10) (14 15) (21) (32) (43) (54) (65) (75) (80)

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0226 (10-13)	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (14)
(15-18)	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (19)
(20-23)	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (24)
(25-28)	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (29)
(30-33)	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL (34) (80)

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	DEPTH – FEET TO
~~04~~ (10-11)	1 ☒ STEEL (12) 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	~~61~~ (16)
04				0067
(17-18)	1 ☐ STEEL (19) 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE			(20-23) 0226
(24-25)	1 ☐ STEEL (26) 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ ~~OPEN HOLE~~			(27-30) ~~67~~ ~~226~~

SCREEN

SIZE(S) OF OPENING (SLOT NO.) (31-33)	DIAMETER INCHES (34-38)	LENGTH FEET (39-40)
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET (41-44)	(80)

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
(10-13)	(14-17)	
(18-21)	(22-25)	
(26-29)	(30-33) (80)	

71 PUMPING TEST

PUMPING TEST METHOD (10)	PUMPING RATE (11-14)	DURATION OF PUMPING (15-16 HOURS, 17-18 MINS.)
1 ☐ PUMP 2 ☒ BAILER	0005 GPM.	02 HOURS 00 MINS.

STATIC LEVEL (19-21)	WATER LEVEL END OF PUMPING (22-24)	WATER LEVELS DURING (25) 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES (26-28)	30 MINUTES (29-31)	45 MINUTES (32-34)	60 MINUTES (35-37)
045 FEET	075 FEET		FEET	FEET	FEET	075 FEET

IF FLOWING, GIVE RATE (38-41)	PUMP INTAKE SET AT	WATER AT END OF TEST (42)
GPM.	FEET	1 ☒ CLEAR 2 ☐ CLOUDY

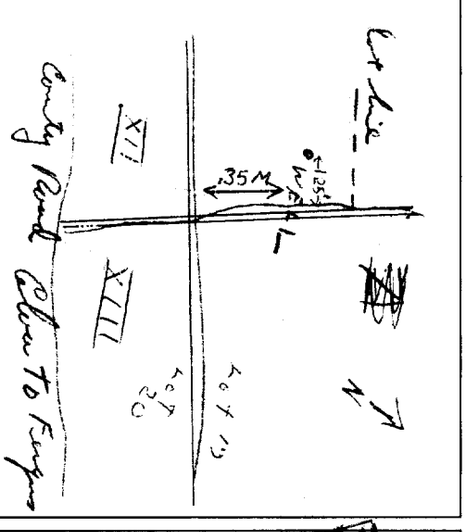
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING (43-45)	RECOMMENDED PUMPING RATE (46-49)
☐ SHALLOW ☒ DEEP	090 FEET	0005 GPM.

(50-53) 0002 1/2 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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

well 500 ft to lot line
" 150 " " Con 12



DRILLERS REMARKS:

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) 01

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

METHOD OF DRILLING (57)

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: Charles Hill — LICENCE NUMBER: ~~3029~~ 2521

ADDRESS: 251 Speedvale Ave E. Guelph

NAME OF DRILLER OR BORER: Harvey Hill — LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: Harvey Hill — SUBMISSION DATE: DAY 25 MO. 3 YR. 70

OWRC COPY

OFFICE USE ONLY

DATA SOURCE (58): 1 — CONTRACTOR (59-62): 2521 — DATE RECEIVED (63-68): ~~03 07 70~~ 03 03 70 (80)

DATE OF INSPECTION: 10/7/70 — INSPECTOR: F/P

REMARKS: CSS.S8 7

APPENDIX C:
BOREHOLE LOGS AND GRAIN SIZE ANALYSIS RESULTS

BOREHOLE 101

Date Drilled: Jan. 25, 2006
Rig: CME 55
Contractor: Aardvark
Drilling Method: HSA

Elevation: 413.64m
Logged by: CD

Project No.: 06-004
Project: Ainley Subdivision
Township of Centre Wellington
Location: Elora

Depth (ft/m)	Sample Type	Recovery (%)	Sample Number	Symbols	SOIL DESCRIPTION		Well Installation
					Ground Surface (m)	413.64	
0					***Topsoil***	0.00	
					Dark brown silt, frozen	413.31	
1					***Sandy Silt Till***	0.33	
	SS		1		Compact brown sandy silt till, some clay, some gravel, moist		
2							
	SS		2			411.84	
					Sand	1.80	
					Compact brown sand, very moist to wet	411.54	
						2.10	
					Silty Sand		
	SS		3		Compact brown silty sand, wet		
					spoon sank through silty sand under weight of rods		
	SS		4			409.64	
					Sand	4.00	
					Dense brown sand, trace silt, wet		
						408.94	
	SS		5		***Silt Till***	4.70	
					Dense brown silt till, some sand, gravel and clay, moist	408.64	
						5.00	
					End of Borehole		

Well Installation: 413.07m (Feb 8/06); Stick up well with protective metal casing; Bentonite Seal; #3 Sand Filter; 50mm schedule 40 PVC pipe with slot 10 screen

Please refer to section 4.7 of this report for additional water levels

Moisture Content % (Wp [----X----] Wl; 10 20 30 40)	SPT (N) (Blows/0.3 m; 10 30 50 70 90)
9.7	22
20.7	20
24.9	14
27.7	1
20.4	40

Pocket Penetrometer kPa (100 300)

CMT ENGINEERING INC.
1011 Industrial Crescent, Unit 1
St. Clements, Ontario N0B 2M0
phone 519-699-5775 fax 519-699-4664
www.cmtinc.net

BOREHOLE 102

Date Drilled: Jan. 25, 2006
Rig: CME 55
Contractor: Aardvark
Drilling Method: HSA

Elevation: 414.37m
Logged by: CD

Project No.: 06-004
Project: Ainley Subdivision
Township of Centre Wellington
Location: Elora

Depth (ft/m)	Sample Type	Recovery (%)	Sample Number	Symbols	SOIL DESCRIPTION		Well Installation	Moisture Content % Wp [----X----] Wl 10 20 30 40	Pocket Penetrometer kPa 100 300 / SPT (N) Blows/0.3 m 10 30 50 70 90
					Ground Surface (m)	414.37			
0					***Topsoil***	0.00			
					Dark brown silt, frozen	414.07			
						0.30			
1	SS		1		***Sandy Silt*** Compact mottled brown sandy silt till, trace clay, trace gravel, moist			10.4	12
						413.00			
2					***Silt Till***	1.37			
	SS		2		Compact brown silt till, trace sand, trace gravel, moist			17.6	15
	SS		3					4.8	30
						411.77			
3					***Sand***	2.60			
	SS		4		Compact brown sand, trace silt, trace gravel, moist to very moist			20.0	22
						410.37			
4					***Silt Till***	4.00			
	SS		5		Dense grey silt till, trace sand gravel and clay, moist			7.7	53
						409.37			
5					End of Borehole	5.00			

Bentonite Seal
#3 Sand Filter
411.57m (Feb 8/06)
Stick up well with protective metal casing
50mm schedule 40 PVC pipe with slot 10 screen

Please refer to section 4.7 of this report for additional water levels

CMT ENGINEERING INC.
1011 Industrial Crescent, Unit 1
St. Clements, Ontario N0B 2M0
phone 519-699-5775 fax 519-699-4664
www.cmtinc.net

BOREHOLE 103

Date Drilled: Jan. 24, 2006
Rig: CME 55
Contractor: Aardvark
Drilling Method: HSA

Elevation: 414.89m
Logged by: CD

Project No.: 06-004
Project: Ainley Subdivision
Township of Centre Wellington
Location: Elora

Depth (ft/m)	Sample Type	Recovery (%)	Sample Number	Symbols	SOIL DESCRIPTION		Well Installation
					Ground Surface (m)	414.89	
0					***Topsoil***	0.00	
					Dark brown silt, frozen		
						414.34	
2					***Organic Silt***	0.55	
3	SS		1		Loose brown organic silt, some sand, occasional topsoil nodule, very moist	413.89	
4						1.00	
					Silt Till		
5					Compact brown silt till, trace sand, trace gravel, moist, becoming dense with depth		
6	AS		2				
7							
8	SS		3				
9							
10							
11	SS		4			411.54	
					Silty Sand	3.35	
12					Dense brown silty sand, wet		
13						410.89	
14					Becoming loose, trace clay, saturated	4.00	
15							
16	SS		5			409.89	
17						5.00	
					End of Borehole		

Well Installation: Bentonite Seal; #3 Sand Filter; 50mm schedule 40 PVC pipe with slot 10 screen; 412.65m (Feb 8/06); Stick up well with protective metal casing

Please refer to section 4.7 of this report for additional water levels

Moisture Content %
Wp [----X----] Wl
10 20 30 40

Pocket Penetrometer
kPa
100 300

SPT (N)
Blows/0.3 m
10 30 50 70 90

Moisture Content %	SPT (N)
	>508)
13.6	20
9.2	32
13.1	37
23.1	6

CMT ENGINEERING INC.
1011 Industrial Crescent, Unit 1
St. Clements, Ontario N0B 2M0
phone 519-699-5775 fax 519-699-4664
www.cmtinc.net

BOREHOLE 104

Date Drilled: Jan. 24, 2006
Rig: CME 55
Contractor: Aardvark
Drilling Method: HSA

Elevation: 410.93m
Logged by: CD

Project No.: 06-004
Project: Ainley Subdivision
Township of Centre Wellington
Location: Elora

Depth (ft/m)	Sample Type	Recovery (%)	Sample Number	Symbols	SOIL DESCRIPTION		Well Installation	Moisture Content % Wp [----X----] Wl 10 20 30 40	Pocket Penetrometer kPa 100 300 / SPT (N) Blows/0.3 m 10 30 50 70 90
					Ground Surface (m)	410.93			
0					***Topsoil***	0.00			
					Dark brown silt, frozen	410.63			
1					***Silt Till***	0.30			
2					Compact dark brown silt till, some clay, trace sand, trace gravel, moist				
3	SS		1					10.2	14
4						409.56			
5					***Silty Sand***	1.37			
6	SS		2		Compact brown silty sand, saturated			23.0	14
7									
8	SS		3					17.8	8
9									
10									
11	SS		4			407.43		25.9	10
12					End of Borehole	3.50			
13									
14									

Bentonite Seal
410.36m (Feb 8/06)
Stick up well with protective metal casing
#3 Sand Filter
50mm schedule 40 PVC pipe with slot 10 screen

Please refer to section 4.7 of this report for additional water level readings

CMT ENGINEERING INC.
1011 Industrial Crescent, Unit 1
St. Clements, Ontario N0B 2M0
phone 519-699-5775 fax 519-699-4664
www.cmtinc.net

BOREHOLE 105

Date Drilled: Jan. 25, 2006
Rig: CME 55
Contractor: Aardvark
Drilling Method: HSA

Elevation: 414.05m
Logged by: CD

Project No.: 06-004
Project: Ainley Subdivision
Township of Centre Wellington
Location: Elora

Depth (ft/m)	Sample Type	Recovery (%)	Sample Number	Symbols	SOIL DESCRIPTION	Elevation	Depth
					Ground Surface (m)	414.05	0.00
					Topsoil Dark brown silt, frozen	413.67	0.38
	SS		1		***Silty Sand*** Loose red-brown silty sand, moist	412.68	1.37
	SS		2		***Silt*** Loose brown silt, some clay, trace sand, trace gravel, very moist	412.05	2.00
					Sand wet sand seam at 2.0m depth		
	SS		3		***Sandy Silt Till*** Very dense brown sandy silt till, some clay, trace gravel, moist		
	SS		4				
	SS		5			409.28	4.77
					End of Borehole		

Well Installation (Feb 8/06)

- 414.05m
- Stick up well with protective metal casing
- Bentonite Seal
- #3 Sand Filter
- 50mm schedule 40 PVC pipe with slot 10 screen

Please refer to section 4.7 of this report for additional water level readings

Moisture Content % (Wp [----X----] WI, 10 20 30 40)	Pocket Penetrometer kPa (100 300) / SPT (N) Blows/0.3 m (10 30 50 70 90)
18.5	4
18.5	8
7.7	26
8.1	100
7.6	100

CMT ENGINEERING INC.
1011 Industrial Crescent, Unit 1
St. Clements, Ontario N0B 2M0
phone 519-699-5775 fax 519-699-4664
www.cmtinc.net

BOREHOLE 106

Date Drilled: Jan. 25, 2006
Rig: CME 55
Contractor: Aardvark
Drilling Method: HSA

Elevation: 410.91m
Logged by: CD

Project No.: 06-004
Project: Ainley Subdivision
Township of Centre Wellington
Location: Elora

Depth (ft/m)	Sample Type	Recovery (%)	Sample Number	Symbols	SOIL DESCRIPTION	Elevation / Depth	Well Installation	Moisture Content % Wp [----X----] Wl 10 20 30 40	Pocket Penetrometer kPa 100 300 / SPT (N) Blows/0.3 m 10 30 50 70 90
ft m					Ground Surface (m)	410.91			
0 0					***Topsoil***	0.00			
					Dark brown silt, frozen	410.59			
1						0.32			
2					***Silty Sand*** Loose mottled grey silty sand, trace gravel, moist				
3 1	SS		1					24.0	9
4									
5									
6	SS		2					12.1	9
2						408.81			
7					***Sandy Silt Till*** Dense to very dense grey sandy silt till, trace sand, trace gravel, moist	2.10			
8	SS		3					6.8	33
9									
10 3								8.3	28
11	SS		4						
12									
13 4									
14									
15	SS		5					9.0	100
16						405.94			
5					End of Borehole	4.97			
17									
18									
19									

Well Installation: 410.67m (Feb 8/06); Stick up well with protective metal casing; Bentonite Seal; #3 Sand Filter; 50mm schedule 40 PVC pipe with slot 10 screen

Please refer to section 4.7 of this report for additional water level readings

CMT ENGINEERING INC.
1011 Industrial Crescent, Unit 1
St. Clements, Ontario N0B 2M0
phone 519-699-5775 fax 519-699-4664
www.cmtinc.net

BOREHOLE 107

Date Drilled: Jan. 24, 2006
Rig: CME 55
Contractor: Aardvark
Drilling Method: HSA

Elevation: 409.58m
Logged by: CD

Project No.: 06-004
Project: Ainley Subdivision
Township of Centre Wellington
Location: Elora

Depth (ft/m)	Sample Type	Recovery (%)	Sample Number	Symbols	SOIL DESCRIPTION		Well Installation	Moisture Content % Wp [----X----] Wl 10 20 30 40	Pocket Penetrometer kPa 100 300 / SPT (N) Blows/0.3 m 10 30 50 70 90
					Ground Surface (m)	409.58			
0 ft / 0 m					***Topsoil***	0.00			
					Dark brown silt, frozen				
2						408.98			
					Sand	0.60			
3	SS		1		Loose red-brown sand, some silt, moist to wet			14.3	7
1 m						408.21			
					Clayey Silt	1.37			
5	SS		2		Compact brown clayey silt, trace sand, trace gravel, moist			13.6	11
2 m						407.48			
7					***Sandy Silt Till***	2.10			
8	AS		3		Compact to loose brown sandy silt till, trace clay, saturated			19.1	25
3 m									
10	SS		4					17.3	7
						406.08			
12					End of Borehole	3.50			
4 m									
14									

Well Installation: 409.43m (Feb 8/06); Stick up well with protective metal casing; Bentonite Seal; #3 Sand Filter; 50mm schedule 40 PVC pipe with slot 10 screen

Please refer to section 4.7 of this report for additional water level readings

CMT ENGINEERING INC.
1011 Industrial Crescent, Unit 1
St. Clements, Ontario N0B 2M0
phone 519-699-5775 fax 519-699-4664
www.cmtinc.net

BOREHOLE 108

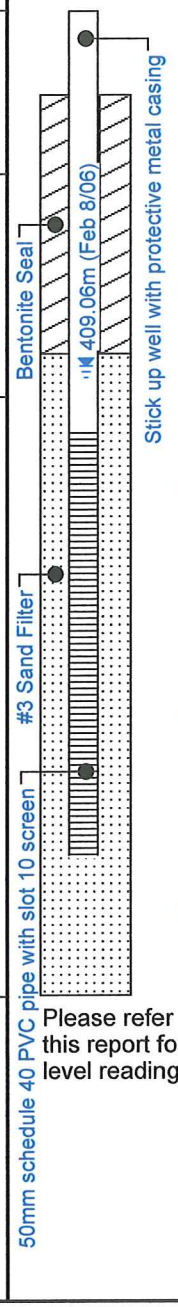
Date Drilled: Jan. 25, 2006
Rig: CME 55
Contractor: Aardvark
Drilling Method: HSA

Elevation: 410.32m
Logged by: CD

Project No.: 06-004
Project: Ainley Subdivision
Township of Centre Wellington
Location: Elora

Depth (ft/m)	Sample Type	Recovery (%)	Sample Number	Symbols	SOIL DESCRIPTION	Elevation	Depth
					Ground Surface (m)	410.32	
0					***Topsoil*** Dark brown silt, frozen		0.00
						409.74	
2					***Silty Sand*** Compact mottled brown silty sand, trace gravel, moist		0.58
3	SS		1				
4						408.95	
5					***Sandy Silt Till*** Dense to loose brown sandy silt till, wet		1.37
6	SS		2				
7							
8	SS		3				
9							
10							
11	SS		4				
						406.82	
12					End of Borehole		3.50
13							
14							

Well Installation



Please refer to section 4.7 of this report for additional water level readings

Moisture Content %
Wp [----X----] Wl
10 20 30 40

Depth	Moisture Content %
3	10.5
5	16.8
8	19.9
10	26.7

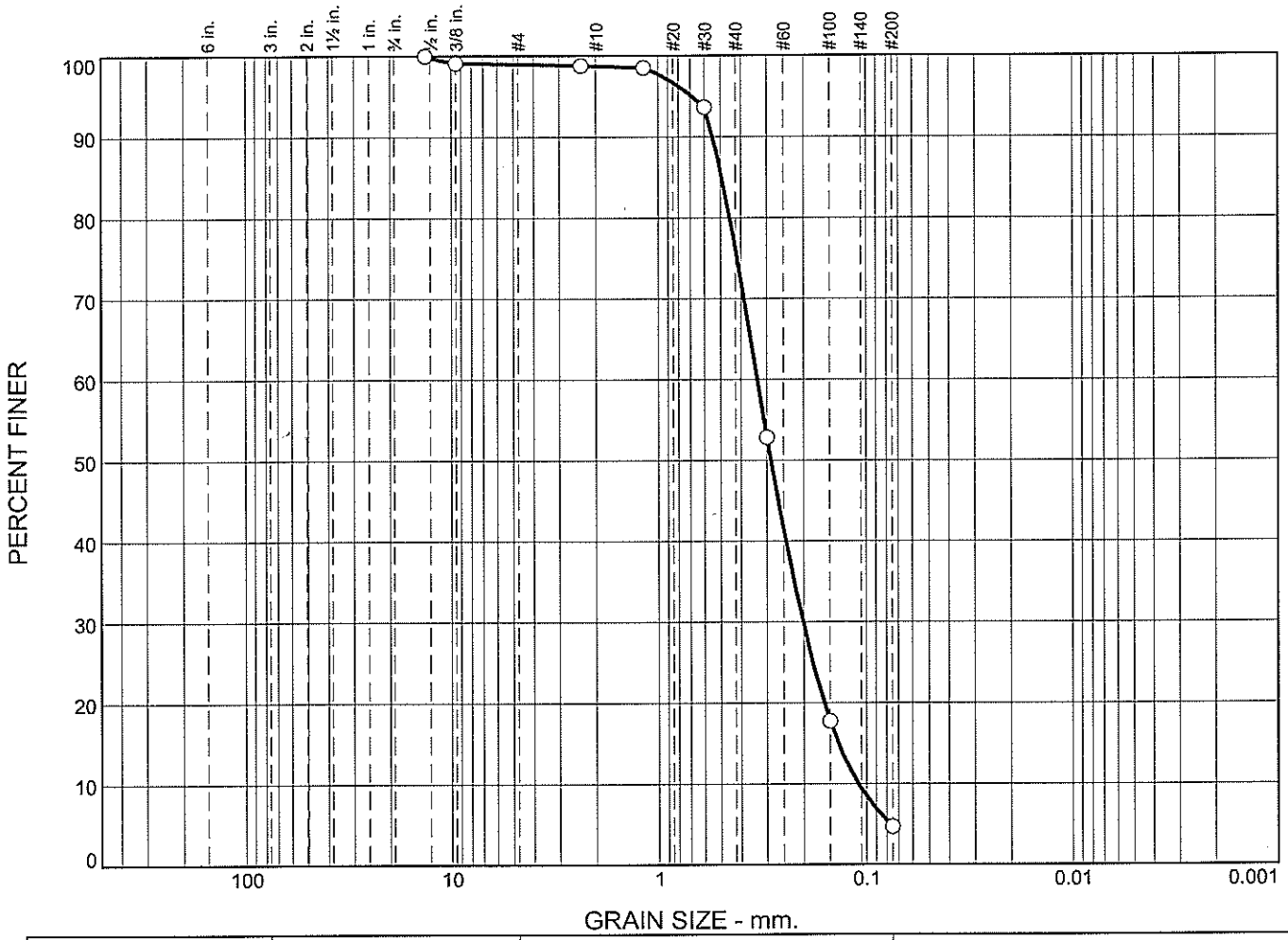
Pocket Penetrometer
kPa
100 300

SPT (N)
Blows/0.3 m
10 30 50 70 90

Depth	SPT (N)
3	25
5	38
8	18
10	7

CMT ENGINEERING INC.
1011 Industrial Crescent, Unit 1
St. Clements, Ontario N0B 2M0
phone 519-699-5775 fax 519-699-4664
www.cmtinc.net

Particle Size Distribution Report



	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	1.0	0.2	22.7	71.4	4.7	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	BH102 - SS4	1	3.05-3.51m	Sand, trace silt, trace gravel	SP
				Tested by CMT - January 27, 2006	

CMT Engineering Inc.

St. Clements, ON

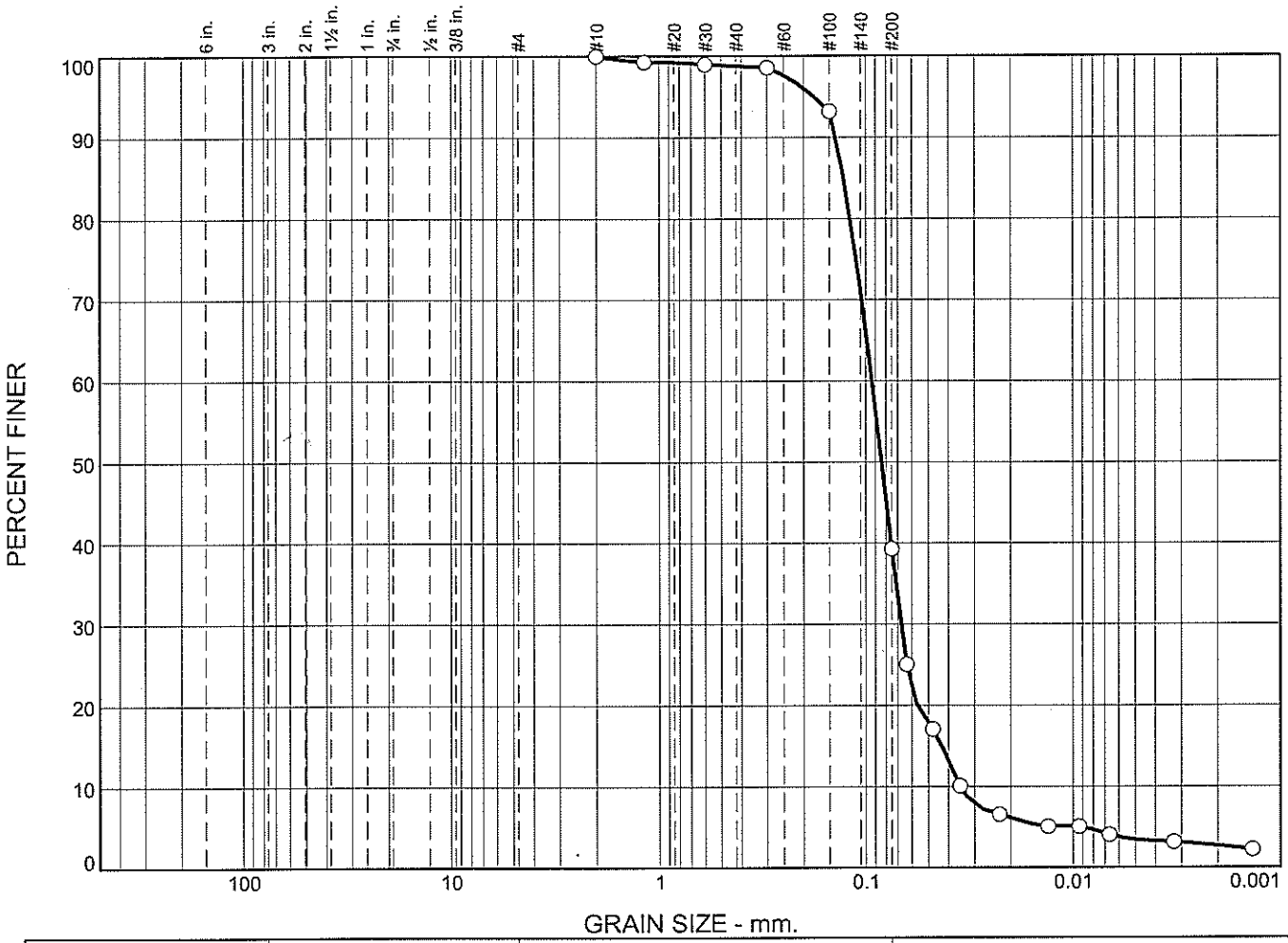
Client: Ainley Subdivision

Project: Township of Centre Wellington
Elora, Ontario

Project No.: 06-004

Figure 1

Particle Size Distribution Report



	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.2	59.5	36.6	2.7

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	BH103 - SS5	1	4.57-5.03m	Silty sand, trace clay	SM
				Tested by CMT - January 27, 2006	

CMT Engineering Inc.

St. Clements, ON

Client: Ainley Subdivision

Project: Township of Centre Wellington
Elora, Ontario

Project No.: 06-004

Figure 2

Particle Size Distribution Report

	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	12.8	3.2	7.6	20.3	38.7	17.4

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	BH105 - SS3	1	2.29-2.74m	Sandy silt, some clay, some gravel	ML
				Tested by CMT - January 27, 2006	

CMT Engineering Inc.

St. Clements, ON

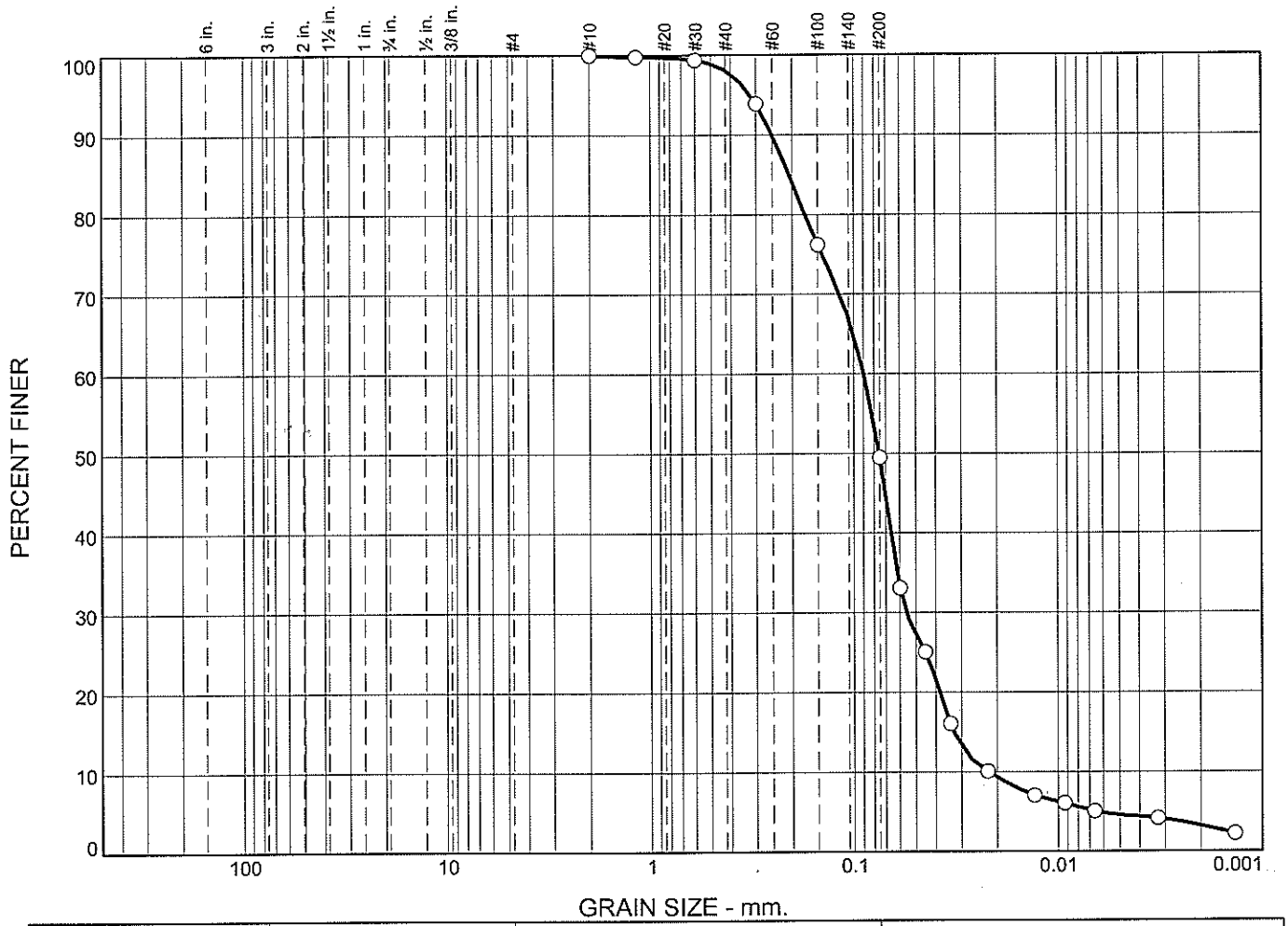
Client: Ainley Subdivision

Project: Township of Centre Wellington
Elora, Ontario

Project No.: 06-004

Figure 3

Particle Size Distribution Report



	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.9	48.6	46.3	3.2

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	BH107 - SS3	1	2.29-2.74m	Sand and silt, trace clay	SM
				Tested by CMT - January 27, 2006	

CMT Engineering Inc.

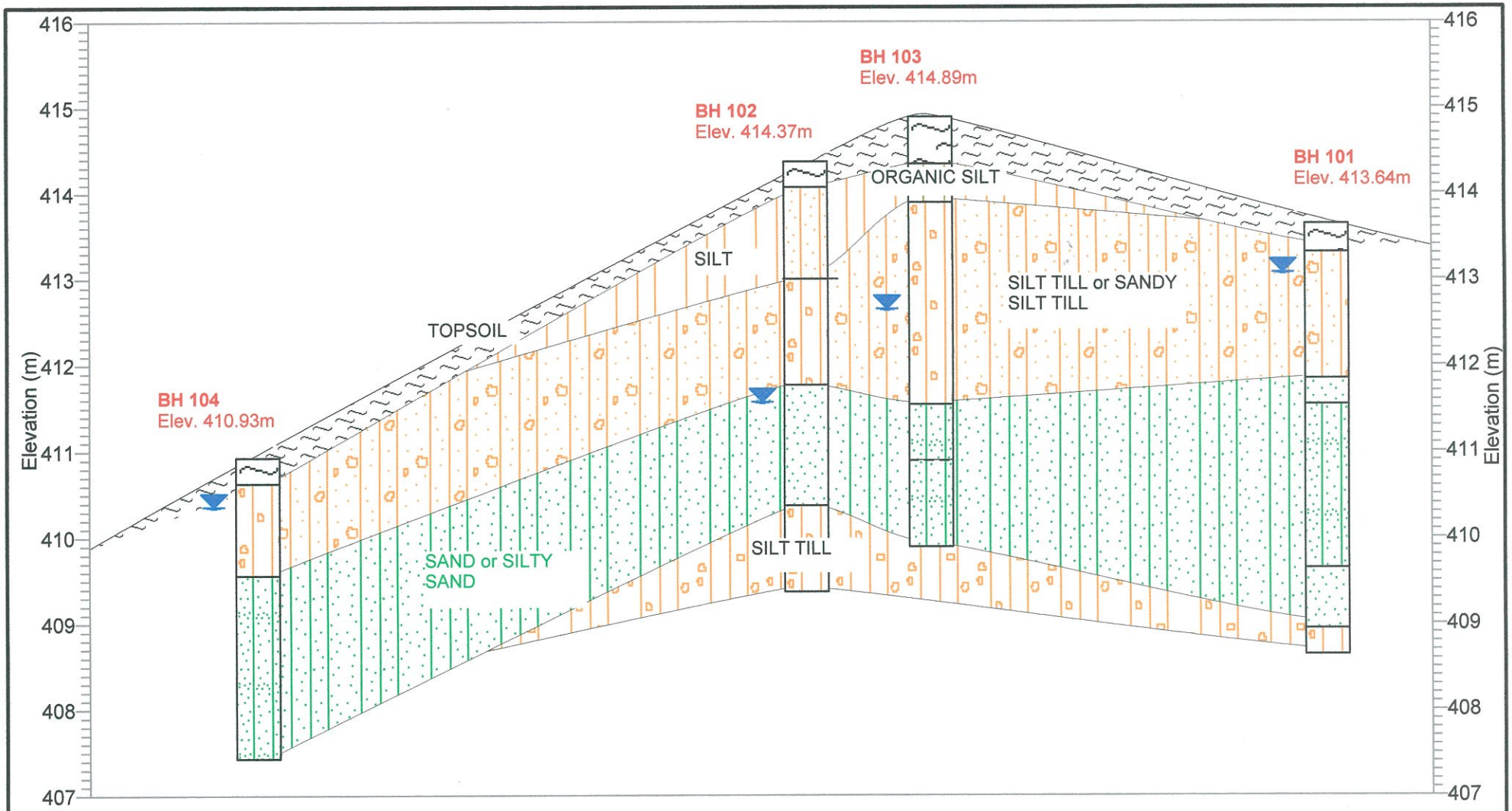
St. Clements, ON

Client: Ainley Subdivision

Project: Township of Centre Wellington
Elora, Ontario

Project No.: 06-004

Figure 4



CMT ENGINEERING INC.
1011 Industrial Cres.,
Unit 1
St. Clements, Ontario

Project: AINLEY SUBDIVISION

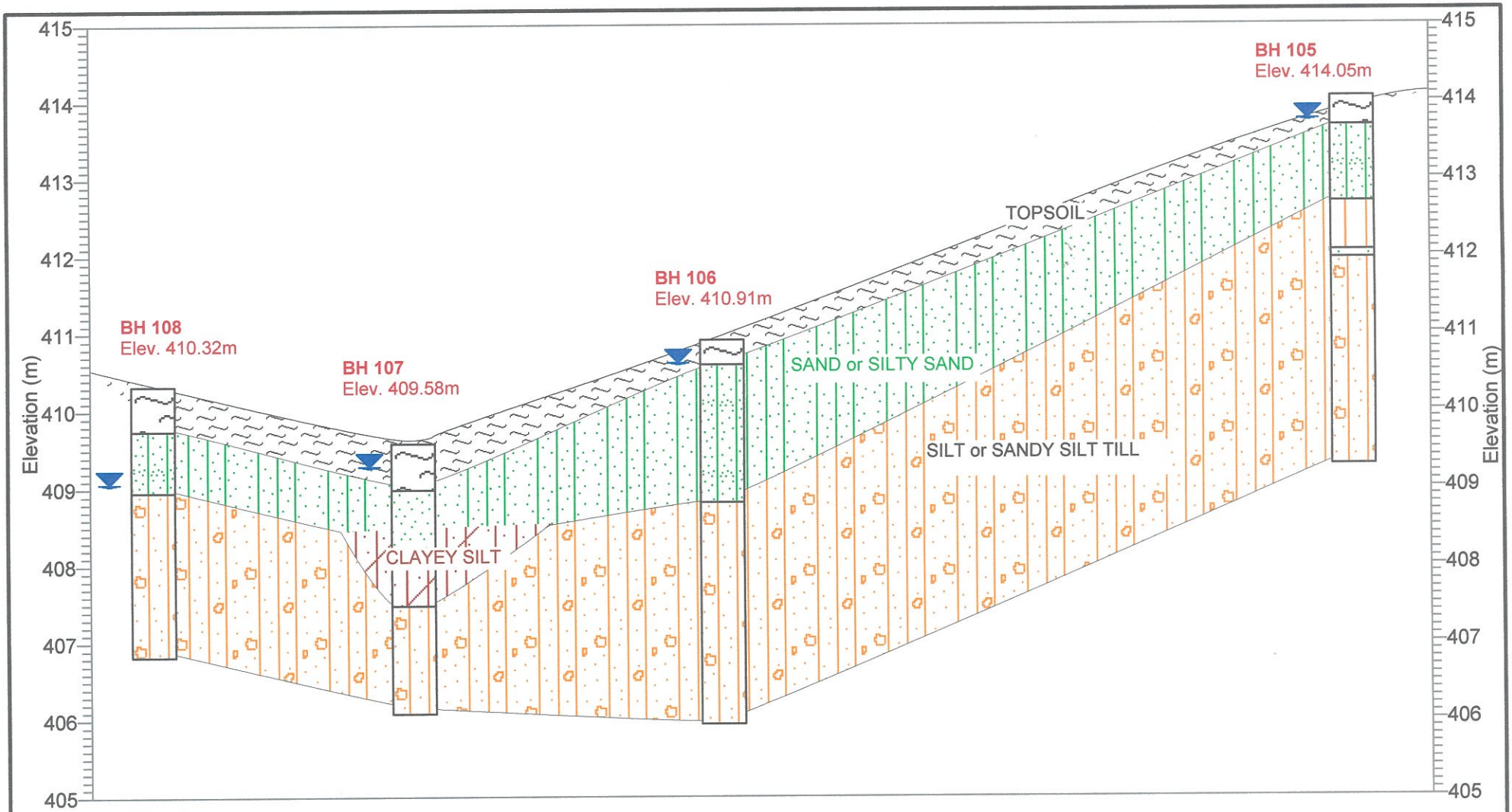
Project Number: 06-004

Location: Elora, Ontario

Drawn By: JS

Date: February, 2006

NOTE: Water levels shown were measured on Feb. 8, 2006. Please refer to Section 4.7 of this report for additional water levels.



CMT ENGINEERING INC.

1011 Industrial Cres.,
Unit 1
St. Clements, Ontario

Project: AINLEY SUBDIVISION

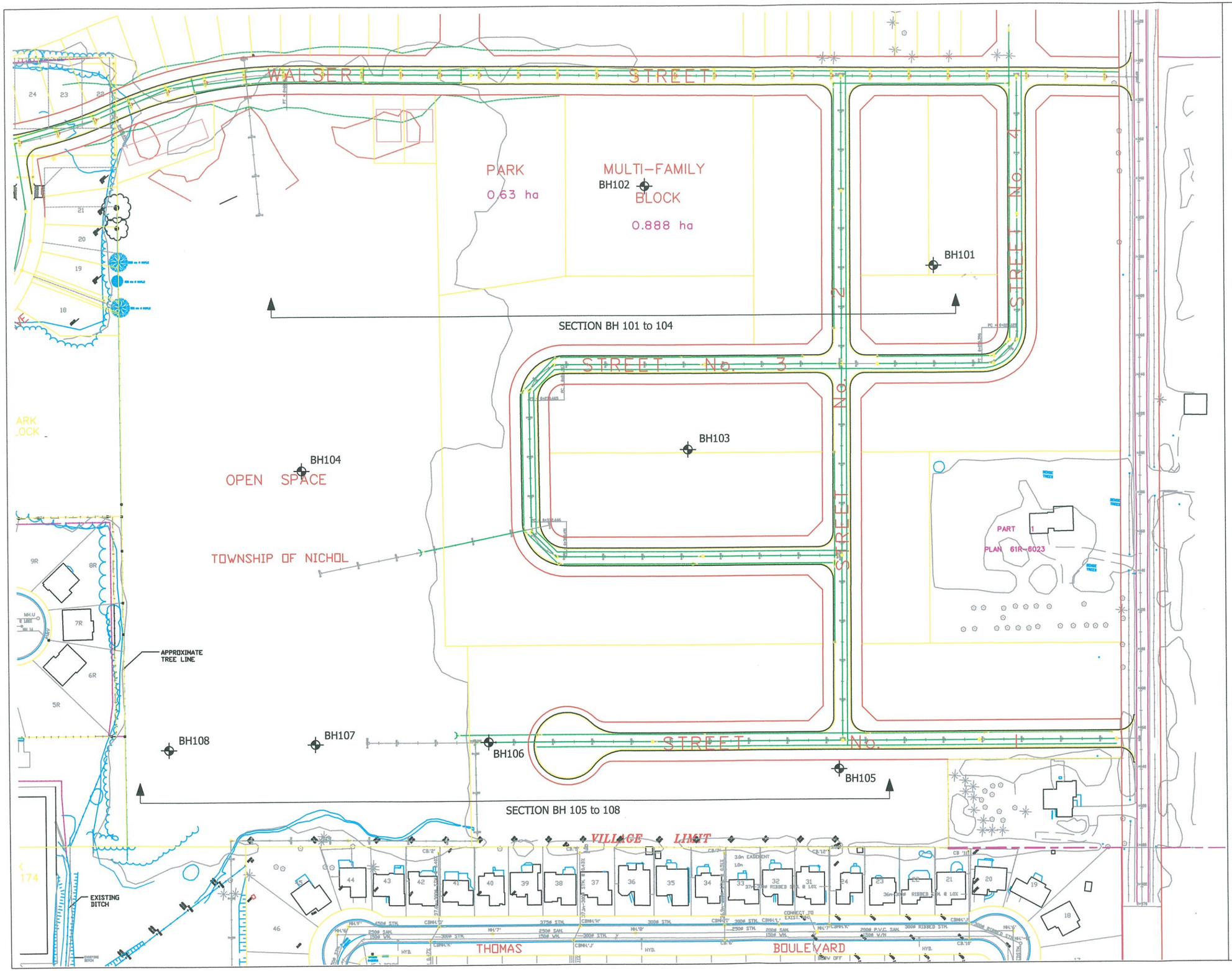
Project Number: 06-004

Location: Elora, Ontario

Drawn By: JS

Date: February 2006

NOTE: Water levels shown were measured on Feb. 8, 2006. Please refer to Section 4.7 of this report for additional water levels.



Base plan provided by:

GAMSBY AND MANNEROW Limited
CONSULTING PROFESSIONAL ENGINEERS
GUELPH OWEN SOUND LISTOWEL

CMT ENGINEERING INC.

1011 Industrial Crescent, Unit 1
St. Clements, Ontario N0B 2M0
Tel.: 519-699-5775
Fax: 519-699-4664
www.cmtinc.net

BOREHOLE LOCATION PLAN
Ainley Subdivision
Township of Centre Wellington
Village of Elora, ON

Project: 06-004	Drawing: 2
Date: Mar. 2006	Sheet: 1
Scale: 1:2000	

APPENDIX D:
LABORATORY CERTIFICATES OF ANALYSIS

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WT2210732**	Page	: 1 of 4
Amendment	: **1**		
Client	: **GM BluePlan Engineering**	Laboratory	: Waterloo - Environmental
Contact	: Joanna Olesiuk	Account Manager	: Karanpartap Singh
Address	: 650 Woodlawn Rd West Block C, Unit 2 Guelph ON Canada N1H 8J1	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: 519 824 8150	Telephone	: 19055076910
Project	: 411009-1	Date Samples Received	: 15-Aug-2022 13:30
PO	: ----	Date Analysis Commenced	: 16-Aug-2022
C-O-C number	: 20-1006989	Issue Date	: 20-Sep-2022 12:40
Sampler	: ----		
Site	: ----		
Quote number	: GM BluePlan 2022 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.

Signatories	*Position*	*Laboratory Department*
Greg Pokocky	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Metals, 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 Unit
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

<: 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.*

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BH101	BH102	BH106	----	----
					Client sampling date / time	12-Aug-2022 15:50	12-Aug-2022 16:30	12-Aug-2022 17:45	----	----
						WT2210732-001	WT2210732-002	WT2210732-003	--------	--------
						Result	Result	Result	----	----
Physical Tests										
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		222	183	228	----	----
colour, apparent	----	E330	2.0	CU		32.8	25.9	99.4	----	----
conductivity	----	E100	1.0	µS/cm		568	459	573	----	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		266	240	342	----	----
pH	----	E108	0.10	pH units		8.24	8.00	7.84	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L		348 DLDS	287 DLDS	392 DLDS	----	----
turbidity	----	E121	0.10	NTU		1140	>4000	>4000	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		<0.0050	0.0112	0.0161	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L		20.9	2.84	6.13	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L		0.084	0.055	0.061	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L		9.83	8.72	7.80	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L		<0.010	<0.010	<0.010	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-T	0.0030	mg/L		0.0117	0.0039	<0.0030	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		7.35	3.38	13.1	----	----
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L		0.0126	0.0015	0.184	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L		0.00018	0.00012	0.00030	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L		0.0205	0.0139	0.0527	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L		<0.000020	<0.000020	<0.000020	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L		<0.000050	<0.000050	<0.000050	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L		<0.010	0.011	<0.010	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L		0.0000085	0.0000138	0.0000175	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L		74.1	63.9	94.9	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L		<0.000010	<0.000010	0.000020	----	----
chromium, dissolved	7440-47-3	E421	0.00050	mg/L		0.00067	0.00068	0.00063	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L		<0.00010	<0.00010	0.00021	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L		0.00146	0.00040	0.00149	----	----
iron, dissolved	7439-89-6	E421	0.010	mg/L		0.017	<0.010	0.208	----	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BH101	BH102	BH106	----	----
					Client sampling date / time	12-Aug-2022 15:50	12-Aug-2022 16:30	12-Aug-2022 17:45	----	----
						WT2210732-001	WT2210732-002	WT2210732-003	--------	--------
						Result	Result	Result	----	----
Dissolved Metals										
lead, dissolved	7439-92-1	E421	0.000050	mg/L		0.000068	<0.000050	0.000514	----	----
lithium, dissolved	7439-93-2	E421	0.0010	mg/L		<0.0010	<0.0010	0.0023	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		19.6	19.6	25.4	----	----
manganese, dissolved	7439-96-5	E421	0.00010	mg/L		0.00174	<0.00010	0.0192	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L		0.000190	0.000073	0.000344	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L		<0.00050	<0.00050	0.00071	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L		<0.050	<0.050	<0.050	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L		1.46	1.53	1.28	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L		0.00040	0.00047	0.00097	----	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L		0.000247	0.000145	0.000477	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L		3.94	3.56	4.90	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	----	----
sodium, dissolved	7440-23-5	E421	0.050	mg/L		8.40	1.61	4.39	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L		0.101	0.102	0.205	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L		2.63	1.24	4.22	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L		<0.00020	<0.00020	<0.00020	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L		0.00046	<0.00030	0.00863	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L		0.000230	0.000099	0.00206	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L		<0.00050	<0.00050	0.00068	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L		0.0022	0.0015	0.0030	----	----
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L		<0.00020	<0.00020	0.00022	----	----
dissolved metals filtration location	----	EP421	-	-		Field	Field	----	----	----

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

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: **WT2210732**	Page	: 1 of 7
Amendment	: **1**		
Client	: **GM BluePlan Engineering**	Laboratory	: Waterloo - Environmental
Contact	: Joanna Olesiuk	Account Manager	: Karanpartap Singh
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	: 519 824 8150	Telephone	: 19055076910
Project	: 411009-1	Date Samples Received	: 15-Aug-2022 13:30
PO	: ----	Date Analysis Commenced	: 16-Aug-2022
C-O-C number	: 20-1006989	Issue Date	: 20-Sep-2022 12:40
Sampler	: ----		
Site	: ----		
Quote number	: GM BluePlan 2022 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*
Greg Pokocky	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Metals, 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).

Unit	*Description*
-	No Unit
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 is greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.
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

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Unit	Client sample ID	BH101	BH102	BH106	----	----	----	----
			Sampling date/time	12-Aug-2022 15:50	12-Aug-2022 16:30	12-Aug-2022 17:45	----	----	----	----
			Sub-Matrix	Water	Water	Water	----	----	----	----
				WT2210732-001	WT2210732-002	WT2210732-003	--------	--------	--------	--------
Physical Tests										
alkalinity, total (as CaCO3)	----	mg/L		222	183	228	----	----	----	----
colour, apparent	----	CU		32.8	25.9	99.4	----	----	----	----
conductivity	----	µS/cm		568	459	573	----	----	----	----
hardness (as CaCO3), dissolved	----	mg/L		266	240	342	----	----	----	----
pH	----	pH units		8.24	8.00	7.84	----	----	----	----
solids, total dissolved [TDS]	----	mg/L		348 DLDS	287 DLDS	392 DLDS	----	----	----	----
turbidity	----	NTU		1140	>4000	>4000	----	----	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	mg/L		<0.0050	0.0112	0.0161	----	----	----	----
chloride	16887-00-6	mg/L		20.9	2.84	6.13	----	----	----	----
fluoride	16984-48-8	mg/L		0.084	0.055	0.061	----	----	----	----
nitrate (as N)	14797-55-8	mg/L		9.83	8.72	7.80	----	----	----	----
nitrite (as N)	14797-65-0	mg/L		<0.010	<0.010	<0.010	----	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	mg/L		0.0117	0.0039	<0.0030	----	----	----	----
sulfate (as SO4)	14808-79-8	mg/L		7.35	3.38	13.1	----	----	----	----
Dissolved Metals										
aluminum, dissolved	7429-90-5	mg/L		0.0126	0.0015	0.184	----	----	----	----
antimony, dissolved	7440-36-0	mg/L		<0.00010	<0.00010	<0.00010	----	----	----	----
arsenic, dissolved	7440-38-2	mg/L		0.00018	0.00012	0.00030	----	----	----	----
barium, dissolved	7440-39-3	mg/L		0.0205	0.0139	0.0527	----	----	----	----
beryllium, dissolved	7440-41-7	mg/L		<0.000020	<0.000020	<0.000020	----	----	----	----
bismuth, dissolved	7440-69-9	mg/L		<0.000050	<0.000050	<0.000050	----	----	----	----
boron, dissolved	7440-42-8	mg/L		<0.010	0.011	<0.010	----	----	----	----
cadmium, dissolved	7440-43-9	mg/L		0.0000085	0.0000138	0.0000175	----	----	----	----
calcium, dissolved	7440-70-2	mg/L		74.1	63.9	94.9	----	----	----	----
cesium, dissolved	7440-46-2	mg/L		<0.000010	<0.000010	0.000020	----	----	----	----
chromium, dissolved	7440-47-3	mg/L		0.00067	0.00068	0.00063	----	----	----	----

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Unit	Client sample ID	BH101	BH102	BH106	----	----	----	----
			Sampling date/time	12-Aug-2022 15:50	12-Aug-2022 16:30	12-Aug-2022 17:45	----	----	----	----
			Sub-Matrix	Water	Water	Water	----	----	----	----
				WT2210732-001	WT2210732-002	WT2210732-003	--------	--------	--------	--------
Dissolved Metals										
cobalt, dissolved	7440-48-4	mg/L		<0.00010	<0.00010	0.00021	----	----	----	----
copper, dissolved	7440-50-8	mg/L		0.00146	0.00040	0.00149	----	----	----	----
iron, dissolved	7439-89-6	mg/L		0.017	<0.010	0.208	----	----	----	----
lead, dissolved	7439-92-1	mg/L		0.000068	<0.000050	0.000514	----	----	----	----
lithium, dissolved	7439-93-2	mg/L		<0.0010	<0.0010	0.0023	----	----	----	----
magnesium, dissolved	7439-95-4	mg/L		19.6	19.6	25.4	----	----	----	----
manganese, dissolved	7439-96-5	mg/L		0.00174	<0.00010	0.0192	----	----	----	----
molybdenum, dissolved	7439-98-7	mg/L		0.000190	0.000073	0.000344	----	----	----	----
nickel, dissolved	7440-02-0	mg/L		<0.00050	<0.00050	0.00071	----	----	----	----
phosphorus, dissolved	7723-14-0	mg/L		<0.050	<0.050	<0.050	----	----	----	----
potassium, dissolved	7440-09-7	mg/L		1.46	1.53	1.28	----	----	----	----
rubidium, dissolved	7440-17-7	mg/L		0.00040	0.00047	0.00097	----	----	----	----
selenium, dissolved	7782-49-2	mg/L		0.000247	0.000145	0.000477	----	----	----	----
silicon, dissolved	7440-21-3	mg/L		3.94	3.56	4.90	----	----	----	----
silver, dissolved	7440-22-4	mg/L		<0.000010	<0.000010	<0.000010	----	----	----	----
sodium, dissolved	7440-23-5	mg/L		8.40	1.61	4.39	----	----	----	----
strontium, dissolved	7440-24-6	mg/L		0.101	0.102	0.205	----	----	----	----
sulfur, dissolved	7704-34-9	mg/L		2.63	1.24	4.22	----	----	----	----
tellurium, dissolved	13494-80-9	mg/L		<0.00020	<0.00020	<0.00020	----	----	----	----
thallium, dissolved	7440-28-0	mg/L		<0.000010	<0.000010	<0.000010	----	----	----	----
thorium, dissolved	7440-29-1	mg/L		<0.00010	<0.00010	<0.00010	----	----	----	----
tin, dissolved	7440-31-5	mg/L		<0.00010	<0.00010	<0.00010	----	----	----	----
titanium, dissolved	7440-32-6	mg/L		0.00046	<0.00030	0.00863	----	----	----	----
tungsten, dissolved	7440-33-7	mg/L		<0.00010	<0.00010	<0.00010	----	----	----	----
uranium, dissolved	7440-61-1	mg/L		0.000230	0.000099	0.00206	----	----	----	----
vanadium, dissolved	7440-62-2	mg/L		<0.00050	<0.00050	0.00068	----	----	----	----
zinc, dissolved	7440-66-6	mg/L		0.0022	0.0015	0.0030	----	----	----	----
zirconium, dissolved	7440-67-7	mg/L		<0.00020	<0.00020	0.00022	----	----	----	----
dissolved metals filtration location	----	-		Field	Field	----	----	----	----	----

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

Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
BH101	Water	phosphorus, dissolved		ONPWQO	H>100	<0.050	0.01 mg/L
	Water	copper, dissolved		ONPWQO	PWQO	0.00146 mg/L	0.001 mg/L
	Water	phosphorus, dissolved		ONPWQO	PWQO	<0.050	0.01 mg/L
BH102	Water	phosphorus, dissolved		ONPWQO	H>100	<0.050	0.01 mg/L
	Water	phosphorus, dissolved		ONPWQO	PWQO	<0.050	0.01 mg/L
BH106	Water	aluminum, dissolved		ONPWQO	H>100	0.184 mg/L	0.075 mg/L
	Water	phosphorus, dissolved		ONPWQO	H>100	<0.050	0.01 mg/L
	Water	aluminum, dissolved		ONPWQO	PWQO	0.184 mg/L	0.015 mg/L
	Water	copper, dissolved		ONPWQO	PWQO	0.00149 mg/L	0.001 mg/L
	Water	phosphorus, dissolved		ONPWQO	PWQO	<0.050	0.01 mg/L

Summary of Guideline Limits

Analyte	CAS Number	Unit	ONPWQO H>100	ONPWQO PWQO					
Physical Tests									
alkalinity, total (as CaCO3)	----	mg/L							
colour, apparent	----	CU							
conductivity	----	µS/cm							
hardness (as CaCO3), dissolved	----	mg/L							
pH	----	pH units	**6.5 - 8.5 pH units**	**6.5 - 8.5 pH units**					
solids, total dissolved [TDS]	----	mg/L							
turbidity	----	NTU							
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	mg/L							
chloride	16887-00-6	mg/L							
fluoride	16984-48-8	mg/L							
nitrate (as N)	14797-55-8	mg/L							
nitrite (as N)	14797-65-0	mg/L							
phosphate, ortho-, dissolved (as P)	14265-44-2	mg/L							
sulfate (as SO4)	14808-79-8	mg/L							
Dissolved Metals									
aluminum, dissolved	7429-90-5	mg/L	**0.075 mg/L**	**0.015 mg/L**					
antimony, dissolved	7440-36-0	mg/L	**0.02 mg/L**	**0.02 mg/L**					
arsenic, dissolved	7440-38-2	mg/L	**0.005 mg/L**	**0.005 mg/L**					
barium, dissolved	7440-39-3	mg/L							
beryllium, dissolved	7440-41-7	mg/L	**1.1 mg/L**	**0.011 mg/L**					
bismuth, dissolved	7440-69-9	mg/L							
boron, dissolved	7440-42-8	mg/L	**0.2 mg/L**	**0.2 mg/L**					
cadmium, dissolved	7440-43-9	mg/L	**0.0005 mg/L**	**0.0001 mg/L**					
calcium, dissolved	7440-70-2	mg/L							
cesium, dissolved	7440-46-2	mg/L							
chromium, dissolved	7440-47-3	mg/L							
cobalt, dissolved	7440-48-4	mg/L	**0.0009 mg/L**	**0.0009 mg/L**					
copper, dissolved	7440-50-8	mg/L	**0.005 mg/L**	**0.001 mg/L**					
dissolved metals filtration location	----	-							
iron, dissolved	7439-89-6	mg/L	**0.3 mg/L**	**0.3 mg/L**					
lead, dissolved	7439-92-1	mg/L	**0.005 mg/L**	**0.001 mg/L**					
lithium, dissolved	7439-93-2	mg/L							
magnesium, dissolved	7439-95-4	mg/L							
manganese, dissolved	7439-96-5	mg/L							
molybdenum, dissolved	7439-98-7	mg/L	**0.04 mg/L**	**0.04 mg/L**					

Analyte	CAS Number	Unit	ONPWQO H>100	ONPWQO PWQO					
Dissolved Metals - Continued									
nickel, dissolved	7440-02-0	mg/L	**0.025 mg/L**	**0.025 mg/L**					
phosphorus, dissolved	7723-14-0	mg/L	**0.01 mg/L**	**0.01 mg/L**					
potassium, dissolved	7440-09-7	mg/L							
rubidium, dissolved	7440-17-7	mg/L							
selenium, dissolved	7782-49-2	mg/L	**0.1 mg/L**	**0.1 mg/L**					
silicon, dissolved	7440-21-3	mg/L							
silver, dissolved	7440-22-4	mg/L	**0.0001 mg/L**	**0.0001 mg/L**					
sodium, dissolved	7440-23-5	mg/L							
strontium, dissolved	7440-24-6	mg/L							
sulfur, dissolved	7704-34-9	mg/L							
tellurium, dissolved	13494-80-9	mg/L							
thallium, dissolved	7440-28-0	mg/L	**0.0003 mg/L**	**0.0003 mg/L**					
thorium, dissolved	7440-29-1	mg/L							
tin, dissolved	7440-31-5	mg/L							
titanium, dissolved	7440-32-6	mg/L							
tungsten, dissolved	7440-33-7	mg/L	**0.03 mg/L**	**0.03 mg/L**					
uranium, dissolved	7440-61-1	mg/L	**0.005 mg/L**	**0.005 mg/L**					
vanadium, dissolved	7440-62-2	mg/L	**0.006 mg/L**	**0.006 mg/L**					
zinc, dissolved	7440-66-6	mg/L	**0.02 mg/L**	**0.02 mg/L**					
zirconium, dissolved	7440-67-7	mg/L	**0.004 mg/L**	**0.004 mg/L**					

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

Key:

ONPWQO	Ontario PWQO (Provincial Water Quality Objectives, JULY, 1994)
H>100	Surface Water - PWQO - Hardness>100PPM
PWQO	Surface Water PWQO

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2210732**	Page	: 1 of 11
Amendment	: 1		
Client	: **GM BluePlan Engineering**	Laboratory	: Waterloo - Environmental
Contact	: Joanna Olesiuk	Account Manager	: Karanpartap Singh
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	: 519 824 8150	Telephone	: 19055076910
Project	: 411009-1	Date Samples Received	: 15-Aug-2022 13:30
PO	: ----	Issue Date	: 20-Sep-2022 12:41
C-O-C number	: 20-1006989		
Sampler	: ----		
Site	: ----		
Quote number	: GM BluePlan 2022 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 Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- 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.

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 / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
BH101	E298	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
BH102	E298	12-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
BH106	E298	12-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP]										
BH101	E235.Cl	12-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP]										
BH102	E235.Cl	12-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP]										
BH106	E235.Cl	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (0.003 mg/L)										
HDPE [ON MECP]										
BH101	E378-T	12-Aug-2022	----	----	----		16-Aug-2022	7 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (0.003 mg/L)										
HDPE [ON MECP] BH102	E378-T	12-Aug-2022	----	----	----		16-Aug-2022	7 days	4 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (0.003 mg/L)										
HDPE [ON MECP] BH106	E378-T	12-Aug-2022	----	----	----		16-Aug-2022	7 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] BH101	E235.F	12-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] BH102	E235.F	12-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] BH106	E235.F	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] BH101	E235.NO3	12-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	7 days	4 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] BH102	E235.NO3	12-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	7 days	4 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] BH106	E235.NO3	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	7 days	5 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP] BH101	E235.NO2	12-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	7 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP]										
BH102	E235.NO2	12-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	7 days	4 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP]										
BH106	E235.NO2	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	7 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
BH101	E235.SO4	12-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
BH102	E235.SO4	12-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
BH106	E235.SO4	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
BH101	E421	12-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
BH102	E421	12-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
BH106	E421	12-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	180 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP]										
BH101	E290	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	14 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP] BH102	E290	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP] BH106	E290	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	14 days	5 days	✓
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE [ON MECP] BH106	E330	12-Aug-2022	----	----	----		16-Aug-2022	48 hrs	93 hrs	× EHTR
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE [ON MECP] BH102	E330	12-Aug-2022	----	----	----		16-Aug-2022	48 hrs	94 hrs	× EHTR
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE [ON MECP] BH101	E330	12-Aug-2022	----	----	----		16-Aug-2022	48 hrs	95 hrs	× EHTR
Physical Tests : Conductivity in Water										
HDPE [ON MECP] BH101	E100	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP] BH102	E100	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP] BH106	E100	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] BH101	E108	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	14 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE [ON MECP] BH102	E108	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	14 days	5 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] BH106	E108	12-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	14 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP] BH101	E162	12-Aug-2022	----	----	----		16-Aug-2022	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP] BH102	E162	12-Aug-2022	----	----	----		16-Aug-2022	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP] BH106	E162	12-Aug-2022	----	----	----		16-Aug-2022	7 days	4 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE [ON MECP] BH101	E121	12-Aug-2022	----	----	----		17-Aug-2022	3 days	5 days	× EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE [ON MECP] BH102	E121	12-Aug-2022	----	----	----		17-Aug-2022	3 days	5 days	× EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE [ON MECP] BH106	E121	12-Aug-2022	----	----	----		17-Aug-2022	3 days	5 days	× EHTL

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			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	605715	1	16	6.2	5.0	✓
Ammonia by Fluorescence	E298	605829	2	40	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	604326	2	24	8.3	5.0	✓
Colour (Apparent) by Spectrometer	E330	604741	1	13	7.6	5.0	✓
Conductivity in Water	E100	605716	1	13	7.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	604835	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (0.003 mg/L)	E378-T	604090	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	604329	2	16	12.5	5.0	✓
Nitrate in Water by IC	E235.NO3	604327	2	33	6.0	5.0	✓
Nitrite in Water by IC	E235.NO2	604328	2	20	10.0	5.0	✓
pH by Meter	E108	605714	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	604325	2	18	11.1	5.0	✓
TDS by Gravimetry	E162	604853	1	19	5.2	5.0	✓
Turbidity by Nephelometry	E121	606070	1	11	9.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	605715	1	16	6.2	5.0	✓
Ammonia by Fluorescence	E298	605829	2	40	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	604326	2	24	8.3	5.0	✓
Colour (Apparent) by Spectrometer	E330	604741	1	13	7.6	5.0	✓
Conductivity in Water	E100	605716	1	13	7.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	604835	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (0.003 mg/L)	E378-T	604090	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	604329	2	16	12.5	5.0	✓
Nitrate in Water by IC	E235.NO3	604327	2	33	6.0	5.0	✓
Nitrite in Water by IC	E235.NO2	604328	2	20	10.0	5.0	✓
pH by Meter	E108	605714	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	604325	2	18	11.1	5.0	✓
TDS by Gravimetry	E162	604853	1	19	5.2	5.0	✓
Turbidity by Nephelometry	E121	606070	1	11	9.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	605715	1	16	6.2	5.0	✓
Ammonia by Fluorescence	E298	605829	2	40	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	604326	2	24	8.3	5.0	✓
Colour (Apparent) by Spectrometer	E330	604741	1	13	7.6	5.0	✓
Conductivity in Water	E100	605716	1	13	7.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	604835	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (0.003 mg/L)	E378-T	604090	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							
Fluoride in Water by IC	E235.F	604329	2	16	12.5	5.0	✓
Nitrate in Water by IC	E235.NO3	604327	2	33	6.0	5.0	✓
Nitrite in Water by IC	E235.NO2	604328	2	20	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	604325	2	18	11.1	5.0	✓
TDS by Gravimetry	E162	604853	1	19	5.2	5.0	✓
Turbidity by Nephelometry	E121	606070	1	11	9.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	605829	2	40	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	604326	2	24	8.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	604835	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (0.003 mg/L)	E378-T	604090	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	604329	2	16	12.5	5.0	✓
Nitrate in Water by IC	E235.NO3	604327	2	33	6.0	5.0	✓
Nitrite in Water by IC	E235.NO2	604328	2	20	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	604325	2	18	11.1	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 Waterloo - Environmental	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 Waterloo - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Waterloo - Environmental	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 Waterloo - Environmental	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 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl Waterloo - Environmental	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 Waterloo - Environmental	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 Waterloo - Environmental	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 Waterloo - Environmental	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 Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Waterloo - Environmental	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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Waterloo - Environmental	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 Waterloo - Environmental	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 Orthophosphate by Colourimetry (0.003 mg/L)	E378-T Waterloo - Environmental	Water	APHA 4500-P E (mod)	Dissolved Orthophosphate is determined colourimetrically on a water 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 Waterloo - Environmental	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 Waterloo - Environmental	Water	APHA 2340B	“Hardness (as CaCO3), dissolved” is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 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.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Waterloo - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Dissolved Metals Water Filtration	EP421 Waterloo - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **WT2210732**	Page	: 1 of 14
Amendment	: **1**		
Client	: GM BluePlan Engineering	Laboratory	: Waterloo - Environmental
Contact	: Joanna Olesiuk	Account Manager	: Karanpartap Singh
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	: 519 824 8150	Telephone	: 19055076910
Project	: 411009-1	Date Samples Received	: 15-Aug-2022 13:30
PO	: ----	Date Analysis Commenced	: 16-Aug-2022
C-O-C number	: 20-1006989	Issue Date	: 20-Sep-2022 12:40
Sampler	: ----		
Site	: ----		
Quote number	: GM BluePlan 2022 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*
Greg Pokocky	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Metals, 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: 604741)											
WR2200823-001	Anonymous	colour, apparent	----	E330	2.0	CU	<2.0	<2.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 604853)											
WT2210481-001	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	193	192	1	Diff <2x LOR	----
Physical Tests (QC Lot: 605714)											
WT2210747-001	Anonymous	pH	----	E108	0.10	pH units	8.18	8.13	0.613%	4%	----
Physical Tests (QC Lot: 605715)											
WT2210747-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	78.7	95.8	19.6%	20%	----
Physical Tests (QC Lot: 605716)											
WT2210747-001	Anonymous	conductivity	----	E100	1.0	µS/cm	323	327	1.23%	10%	----
Physical Tests (QC Lot: 606070)											
WT2210619-001	Anonymous	turbidity	----	E121	0.10	NTU	3.74	3.63	2.98%	15%	----
Anions and Nutrients (QC Lot: 604090)											
WT2210562-005	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-T	0.0300	mg/L	0.113	0.113	0.00008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 604325)											
WT2210747-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	27.1	26.2	3.09%	20%	----
Anions and Nutrients (QC Lot: 604326)											
WT2210747-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	27.3	26.4	3.13%	20%	----
Anions and Nutrients (QC Lot: 604327)											
WT2210747-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.671	0.637	5.23%	20%	----
Anions and Nutrients (QC Lot: 604328)											
WT2210747-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 604329)											
WT2210747-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.674	0.654	2.96%	20%	----
Anions and Nutrients (QC Lot: 605709)											
WT2210789-003	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	13.2	13.0	1.52%	20%	----
Anions and Nutrients (QC Lot: 605710)											
WT2210789-003	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.200	0.199	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 605711)											
WT2210789-003	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 605712)											
WT2210789-003	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.060	0.057	0.003	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*
Anions and Nutrients (QC Lot: 605713)											
WT2210789-003	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	7.71	7.65	0.759%	20%	----
Anions and Nutrients (QC Lot: 605829)											
WT2210481-004	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0231	0.0231	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 607553)											
WT2210931-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0074	0.0054	0.0020	Diff <2x LOR	----
Dissolved Metals (QC Lot: 604835)											
WT2210712-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0032	0.0040	0.0007	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	5.52 µg/L	0.00570	3.05%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.020 µg/L	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	<10 µg/L	<0.010	0	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0050 µg/L	0.0000059	0.0000009	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	64.7	65.0	0.416%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.50 µg/L	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	1.64 µg/L	0.00165	0.000005	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.084 µg/L	0.000131	0.000047	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	3.65	3.72	1.78%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00068	0.00061	0.00007	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.591 µg/L	0.000605	2.37%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.50 µg/L	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	2.21	2.24	1.10%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.423 µg/L	0.000400	0.000024	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.91	3.99	1.82%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	8050 µg/L	8.06	0.126%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.133	0.131	1.96%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	2.37	2.42	0.06	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: 604835) - continued											
WT2210712-001	Anonymous	tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.136 µg/L	0.000137	0.293%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.50 µg/L	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	1.1 µg/L	0.0013	0.0001	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	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: 604741)						
colour, apparent	----	E330	2	CU	<2.0	----
Physical Tests (QCLot: 604853)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 605715)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	1.1	----
Physical Tests (QCLot: 605716)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 606070)						
turbidity	----	E121	0.1	NTU	<0.10	----
Anions and Nutrients (QCLot: 604090)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-T	0.003	mg/L	<0.0030	----
Anions and Nutrients (QCLot: 604325)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 604326)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 604327)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 604328)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 604329)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 605709)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 605710)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 605711)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 605712)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 605713)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 605829)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 607553)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Dissolved Metals (QCLot: 604835)						
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	----
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 604835) - continued						
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	----

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 (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 604741)									
colour, apparent	----	E330	2	CU	25 CU	99.3	70.0	130	----
Physical Tests (QCLot: 604853)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Physical Tests (QCLot: 605714)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 605715)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	96.4	85.0	115	----
Physical Tests (QCLot: 605716)									
conductivity	----	E100	1	µS/cm	1409 µS/cm	102	90.0	110	----
Physical Tests (QCLot: 606070)									
turbidity	----	E121	0.1	NTU	200 NTU	95.4	85.0	115	----
Anions and Nutrients (QCLot: 604090)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-T	0.003	mg/L	0.0196 mg/L	111	80.0	120	----
Anions and Nutrients (QCLot: 604325)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 604326)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 604327)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 604328)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 604329)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 605709)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	106	90.0	110	----
Anions and Nutrients (QCLot: 605710)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 605711)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 605712)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 605713)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 605713) - continued									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 605829)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.9	85.0	115	----
Anions and Nutrients (QCLot: 607553)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	92.8	85.0	115	----
Dissolved Metals (QCLot: 604835)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	0.1 mg/L	102	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	0.05 mg/L	104	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	0.05 mg/L	104	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.0125 mg/L	101	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.005 mg/L	93.9	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	0.05 mg/L	104	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	0.05 mg/L	93.1	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.005 mg/L	103	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	2.5 mg/L	99.9	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.0025 mg/L	106	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.0125 mg/L	100	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.0125 mg/L	101	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.0125 mg/L	101	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	0.05 mg/L	102	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.025 mg/L	104	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.0125 mg/L	89.9	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	2.5 mg/L	107	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.0125 mg/L	103	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.0125 mg/L	102	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.025 mg/L	103	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	0.5 mg/L	103	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	2.5 mg/L	97.6	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.005 mg/L	106	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	0.05 mg/L	105	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	0.5 mg/L	102	60.0	140	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.005 mg/L	92.8	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	2.5 mg/L	104	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.0125 mg/L	106	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	2.5 mg/L	105	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.005 mg/L	106	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 604835) - continued									
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	0.05 mg/L	108	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.005 mg/L	101	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.025 mg/L	101	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.0125 mg/L	101	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.005 mg/L	104	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.00025 mg/L	105	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.025 mg/L	102	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.025 mg/L	105	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.005 mg/L	100	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.

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
Anions and Nutrients (QCLot: 604090)										
WT2210562-005	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-T	ND mg/L	0.0196 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 604325)										
WT2210747-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	97.7 mg/L	100 mg/L	97.7	75.0	125	----
Anions and Nutrients (QCLot: 604326)										
WT2210747-001	Anonymous	chloride	16887-00-6	E235.Cl	98.2 mg/L	100 mg/L	98.2	75.0	125	----
Anions and Nutrients (QCLot: 604327)										
WT2210747-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.41 mg/L	2.5 mg/L	96.4	75.0	125	----
Anions and Nutrients (QCLot: 604328)										
WT2210747-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.492 mg/L	0.5 mg/L	98.4	75.0	125	----
Anions and Nutrients (QCLot: 604329)										
WT2210747-001	Anonymous	fluoride	16984-48-8	E235.F	0.998 mg/L	1 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 605709)										
WT2210789-003	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	101 mg/L	100 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 605710)										
WT2210789-003	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.46 mg/L	2.5 mg/L	98.6	75.0	125	----
Anions and Nutrients (QCLot: 605711)										
WT2210789-003	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.499 mg/L	0.5 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 605712)										
WT2210789-003	Anonymous	fluoride	16984-48-8	E235.F	0.977 mg/L	1 mg/L	97.7	75.0	125	----
Anions and Nutrients (QCLot: 605713)										
WT2210789-003	Anonymous	chloride	16887-00-6	E235.Cl	99.3 mg/L	100 mg/L	99.3	75.0	125	----
Anions and Nutrients (QCLot: 605829)										
WT2210481-004	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.101 mg/L	0.1 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 607553)										
WT2210931-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.101 mg/L	0.1 mg/L	101	75.0	125	----
Dissolved Metals (QCLot: 604835)										
WT2210712-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0967 mg/L	0.1 mg/L	96.7	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0509 mg/L	0.05 mg/L	102	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: 604835) - continued										
WT2210712-002	Anonymous	arsenic, dissolved	7440-38-2	E421	0.0539 mg/L	0.05 mg/L	108	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.00479 mg/L	0.005 mg/L	95.8	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0452 mg/L	0.05 mg/L	90.4	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.046 mg/L	0.05 mg/L	91.3	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00504 mg/L	0.005 mg/L	101	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00252 mg/L	0.0025 mg/L	101	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0122 mg/L	0.0125 mg/L	98.0	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0120 mg/L	0.0125 mg/L	96.3	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0115 mg/L	0.0125 mg/L	92.3	70.0	130	----
		iron, dissolved	7439-89-6	E421	0.049 mg/L	0.05 mg/L	98.6	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0247 mg/L	0.025 mg/L	98.6	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0123 mg/L	0.0125 mg/L	98.2	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0127 mg/L	0.0125 mg/L	101	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0121 mg/L	0.0125 mg/L	97.0	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0236 mg/L	0.025 mg/L	94.5	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	0.471 mg/L	0.5 mg/L	94.2	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.00522 mg/L	0.005 mg/L	104	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0565 mg/L	0.05 mg/L	113	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	0.5 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00428 mg/L	0.005 mg/L	85.6	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.00522 mg/L	0.005 mg/L	104	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.0502 mg/L	0.05 mg/L	100	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.00478 mg/L	0.005 mg/L	95.6	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0241 mg/L	0.025 mg/L	96.3	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0121 mg/L	0.0125 mg/L	96.7	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.00493 mg/L	0.005 mg/L	98.6	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.00025 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0251 mg/L	0.025 mg/L	100	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.0251 mg/L	0.025 mg/L	100	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.00482 mg/L	0.005 mg/L	96.3	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2(

Page

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Environmental Division Waterloo

Work Order Reference

WT2210732

Telephone : +1 519 886 6910

Report To	Contact and company name below will appear on the final report
Company:	GM Blueplan Eng. Ltd.
Contact:	J. Olesiuk
Phone:	
	Company address below will appear on the final report
Street:	650 Woodlawn Rd W.
City/Province:	Guelph Ont Unit 2 Block C
Postal Code:	

Reports / Recipients

Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☒ N/A

☒ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: joanna.olesiuk@gmblueplan.ca

Email 2:

Email 3:

Turnaround Time (TAT) Requested

☒ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additi may apply to rush requests on weekends, statutory holidays and non-rou

Date and Time Required for all E&P TATs:

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

Invoice To		
	Same as Report To	☒ YES ☐ NO
	Copy of Invoice with Report	☐ YES ☒ NO
Company:	GM Blueplan Eng. Ltd.	
Contact:		

Invoice Recipients

Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: joanna.olesiuk@gmblueplan.ca

Email 2:

Project Information

ALS Account # / Quote #:

Job #: 411009-1

PO / AFE:

LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Lab Work Order # (ALS use only): ~~WT2210674~~ 0732

ALS Contact: K. Singh Sampler: D.

Analysis Request

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Routine Water Quality	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BH 101	12-Aug-22	1530	GW	4	✓			
	BH 102	"	1630	"	"	✓			
	BH 103	"	1745	"	"	✓			

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☒ NO

Are samples for human consumption/ use? ☐ YES ☒ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

PWQO's

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☒ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☒ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
				7.5			

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
[signature]	12/Aug/22	1900

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
[signature]	8/15/22	13:30

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

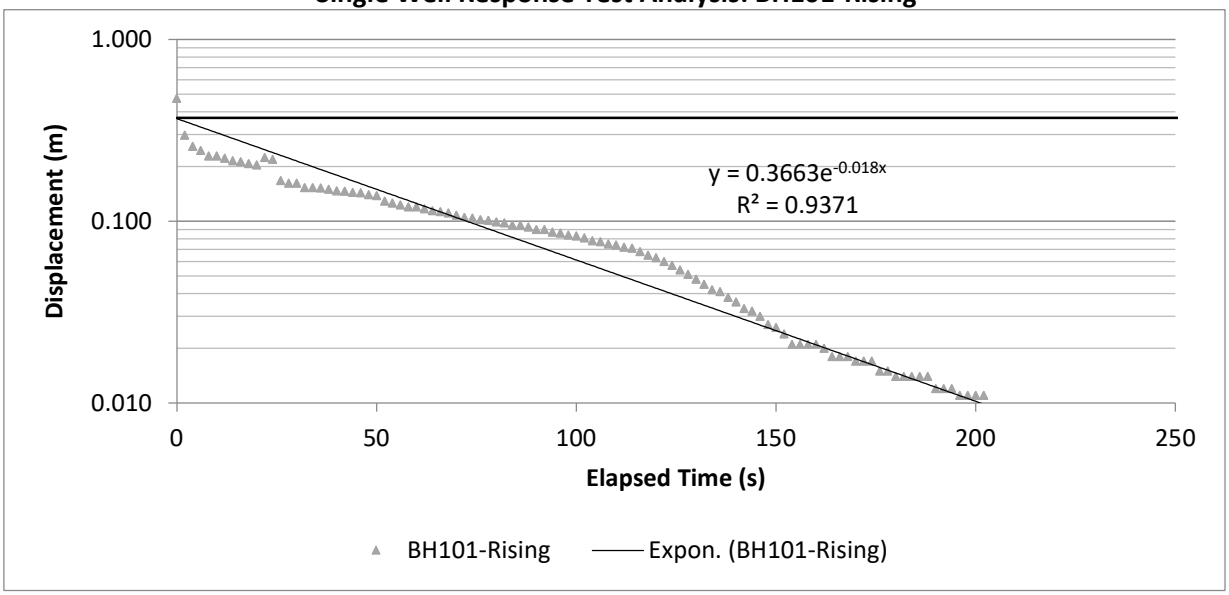
AUG 2020 FRONT

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

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

APPENDIX E:
SLUG TEST ANALYSES

Single Well Response Test Analysis: BH101-Rising



Bouwer-Rice Analysis

Governing Equation:

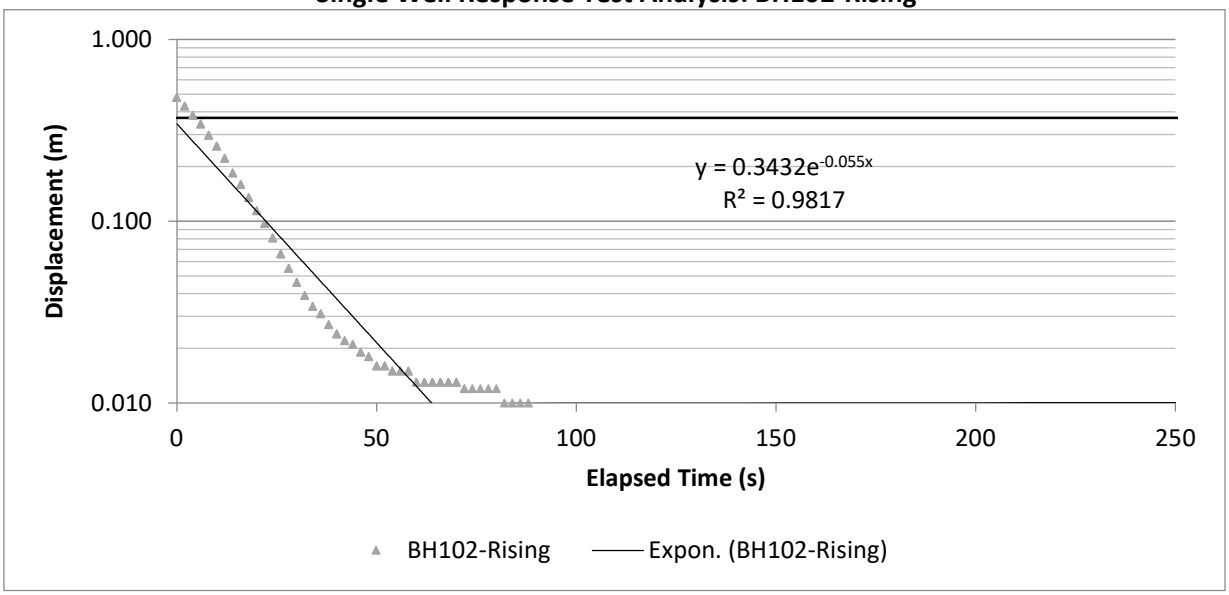
$$k = \frac{r_c^2 ln\left(\frac{R_e}{r_w}\right)\left(\frac{1}{t}\right) ln\left(\frac{y_o}{y_t}\right)}{2L}$$

$(1/t)(\ln(y_o/y_t))=$	1.80E-02	(from slope of data)
L =	1.514	(Saturated Length of Screen)
$r_w=$	0.14	(radius of filter pack)
$L/r_w=$	10.8	(ratio)
A =	1.91	(from shape factor curves in Bouwer and Rice, 1976)
B =	0.333	(from shape factor curves in Bouwer and Rice, 1976)
C =	1.62	(from shape factor curves in Bouwer and Rice, 1976)
$\ln(R_e/r_w)=$	0.763	(from shape factor equation in Bouwer and Rice, 1976)
D =	1.709	(Saturated Thickness of Geologic Unit)
H =	1.514	(Height of water column above bottom of well)
$r_c=$	0.061	(radius of well casing)
k =	1.7E-05	m/s

Hydraulic Conductivity of Silty Sand is 1.7E-05 m/s

GM BluePlan Engineering Ltd.
Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA
650 Woodlawn Rd. W. Block C, Unit 2, Guelph, ON N1K 1B8
www.GMBluePlan.ca

Single Well Response Test Analysis: BH102-Rising



Bouwer-Rice Analysis

Governing Equation:

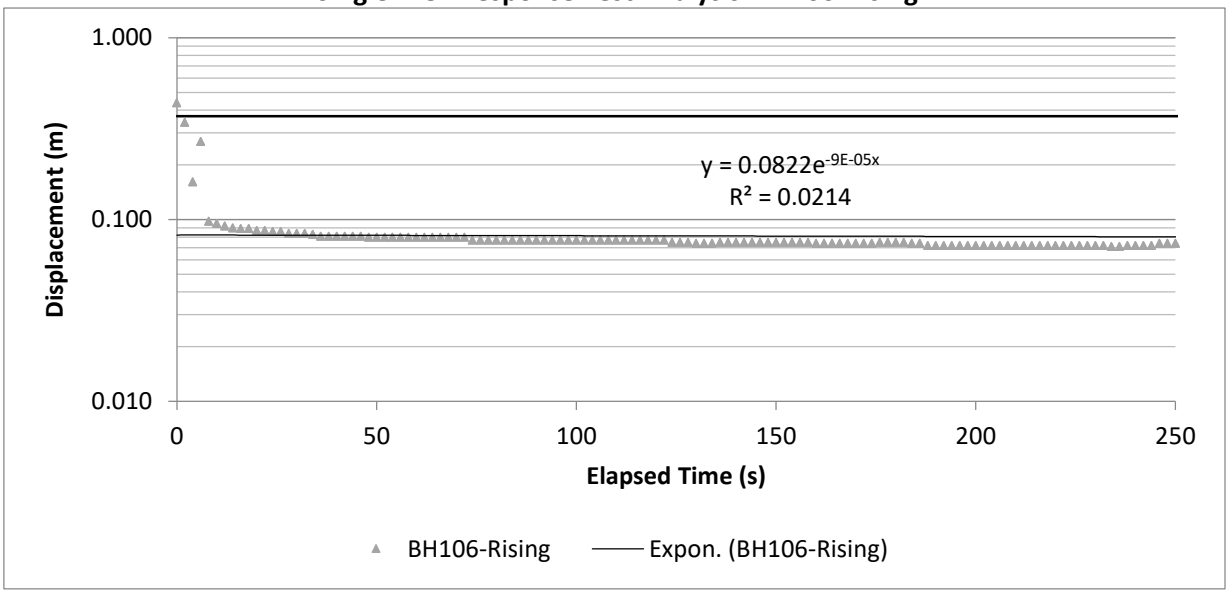
$$k = \frac{r_c^2 ln\left(\frac{R_e}{r_w}\right)\left(\frac{1}{t}\right) ln\left(\frac{y_o}{y_t}\right)}{2L}$$

$(1/t)(\ln(y_o/y_t))=$	6.50E-02	(from slope of data)
L =	1.146	(Saturated Length of Screen)
$r_w=$	0.14	(radius of filter pack)
$L/r_w=$	8.2	(ratio)
A =	1.77	(from shape factor curves in Bouwer and Rice, 1976)
B =	0.333	(from shape factor curves in Bouwer and Rice, 1976)
C =	1.52	(from shape factor curves in Bouwer and Rice, 1976)
$\ln(R_e/r_w)=$	1.411	(from shape factor equation in Bouwer and Rice, 1976)
D =	0.656	(Saturated Thickness of Geologic Unit)
H =	1.146	(Height of water column above bottom of well)
$r_c=$	0.061	(radius of well casing)
k =	1.5E-04	m/s

Hydraulic Conductivity of Silty Sand is 1.5E-04 m/s

GM BluePlan Engineering Ltd.
Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA
650 Woodlawn Rd. W. Block C, Unit 2, Guelph, ON N1K 1B8
www.GMBluePlan.ca

Single Well Response Test Analysis: BH106-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 =	2.894	(Saturated Length of Screen)
$r_w=$	0.14	(radius of filter pack)
$L/r_w=$	20.7	(ratio)
A =	1.78	(from shape factor curves in Bouwer and Rice, 1976)
B =	0.394	(from shape factor curves in Bouwer and Rice, 1976)
C =	1.22	(from shape factor curves in Bouwer and Rice, 1976)
$\ln(R_e/r_w)=$	2.547	(from shape factor equation in Bouwer and Rice, 1976)
D =	3.783	(Saturated Thickness of Geologic Unit)
H =	3.783	(Height of water column above bottom of well)
$r_c=$	0.061	(radius of well casing)
k =	1.5E-07	m/s

Hydraulic Conductivity of Sandy Silt Till is 1.5E-07 m/s

GM BluePlan Engineering Ltd.
Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA
650 Woodlawn Rd. W. Block C, Unit 2, Guelph, ON N1K 1B8
www.GMBluePlan.ca

APPENDIX F:
CONSTRUCTION DEWATERING ESTIMATES

Hydrogeological Calculations for Dewatering Estimates

Project: Ainley Farm Subdivision Hydrogeological Study

Project Number: 411009-1 **Engineer/Technician:** MRL/JO

Description of Project: Construction of a residential development including servicing and construction of two stormwater management facilities.

Description of Conceptual Model for Dewatering Estimation:

All scenarios assumed to be unconfined flow. Radius of Influence determined by Sichart equation.

Dimensions for Servicing Trenches
- Length = 30 m
- Width = 3 m

Dimensions for SWM Pond No.1
- Perimeter = 410 m
- Radius of Equivalent well = 65 m

Dimensions for SWM Pond No. 2
- Perimeter = 124 m
- Radius of Equivalent well = 20 m

Maximum Flow Scenario

#1 Dewatering for Servicing (Walser at west property boundary): Flow to Finite Trench model
- Static Groundwater Level = 411 masl
- Base of Excavation = 407.0 masl
- Target Drawdown = 4.5 masl (includes 0.5 m buffer below base of excavation)
- Initial Saturated Thickness = 9 m (till elevation not confirmed so use twice the drawdown)
- Hydraulic conductivity = $3x10^{-4}$ m/s (factor of safety of 2 applied to BH102 slug test)

#2 Dewatering for SWM Pond No. 1: Flow to Well model
- Static Groundwater Level = 411.0 masl
- Base of Excavation = 411.0 masl
- Target Drawdown (H-h) = 0.5 masl (includes 0.5 m buffer below base of excavation)
- Impermeable Layer = 408.2 masl (clayey silt at BH107)
- Initial Saturated Thickness (H) = 2.8 masl
- Hydraulic conductivity = $3x10^{-4}$ m/s (factor of safety of 2 applied to BH102 slug test)

#3 Dewatering for SWM Pond No. 2: Flow to Well model
- Static Groundwater Level = 412.0 masl (average original ground surface)
- Base of Excavation = 410.5 masl
- Target Drawdown (H-h) = 2.0 masl (includes 0.5 m buffer below base of excavation)
- Impermeable Layer = 408.6 masl (deeper Till at BH101)
- Initial Saturated Thickness (H) = 3.4 masl
- Hydraulic conductivity = $3x10^{-4}$ m/s (factor of safety of 2 applied to BH102 slug test)

Hydrogeological Calculations for Dewatering Estimates

Project: Ainley Farm Subdivision Hydrogeological Study

Project Number: 411009-1 **Engineer/Technician:** MRL/JO

Typical Flow Scenario

#1 Dewatering for Servicing: Flow to Finite Trench model

Target Drawdown (H-h) = 3.0 masl (maximum expected drawdown for typical servicing applications)
Initial Saturated Thickness (H) = 4.5 m (assumed typical)
Hydraulic conductivity = 3.4×10^{-5} m/s (factor of safety of 2 applied to BH101 slug test)

#2 Dewatering for SWM Pond No. 1: Flow to Well model

Static Groundwater Level = 411.0 masl
Base of Excavation = 411.0 masl
Target Drawdown (H-h) = 0.5 masl (includes 0.5 m buffer below base of excavation)
Impermeable Layer = 408.2 masl (clayey silt at BH107)
Initial Saturated Thickness (H) = 2.8 masl
Hydraulic conductivity = 3.4×10^{-5} m/s (factor of safety of 2 applied to BH101 slug test)

#3 Dewatering for SWM Pond No. 2: Flow to Well model

Static Groundwater Level = 412.0 masl (average original ground surface)
Base of Excavation = 410.5 masl

Hydrogeological Calculations for Dewatering Estimates

Project: Ainley Farm Subdivision Hydrogeological Study

Project Number: 411009-1 **Engineer/Technician:** MRL/JO

MAXIMUM DEWATERING SCENARIO

#1 - Dewatering for Servicing

Radius of Influence

Sichart

$$R_o = 3000(H - h)\sqrt{k}$$

R_0 =	234	m (Radius of Influence)
H=	9	m (Initial Head)
h=	4.5	m (Head at Drawdown)
k=	3.00E-04	m/s (Hydraulic Conductivity)

Aquifer Type: Unconfined (Water Table)

Calculation Approach: Flow to Finite Trench

Governing Equation:

$$Q = \pi k \frac{(H^2 - h^2)}{ln\frac{R_o}{r_w}} + xk\frac{(H^2 - h^2)}{L}$$

Q=	1,181,778	L/d (Dewatering Flow)	(A)
x=	30	m (Length of Trench)	
k=	3.00E-04	m/s (Hydraulic Conductivity)	
H=	9	m (Initial Head)	
h=	4.5	m (Head at Drawdown)	
L=	234	m (Distance to "Source")	
R_0 =	234	m (Radius of Influence)	
r_w=	1.5	m (Radius of Well or System)	

GM BluePlan Engineering Ltd.
Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA
650 Woodlawn Rd. W. Block C, Unit 2, Guelph, ON N1K 1B8
www.GMBluePlan.ca

Hydrogeological Calculations for Dewatering Estimates

Project: Ainley Farm Subdivision Hydrogeological Study

Project Number: 411009-1 **Engineer/Technician:** MRL/JO

MAXIMUM DEWATERING SCENARIO (ctd.)
#2 - Dewatering for Stormwater Management Pond 1

Radius of Influence
Sichart

$$R_o = 3000(H - h)\sqrt{k}$$

R_0 =	26	m (Radius of Influence)
H=	2.8	m (Initial Head)
h=	2.3	m (Head at Drawdown)
k=	3.00E-04	m/s (Hydraulic Conductivity)

Aquifer Type: Unconfined (Water Table)
Calculation Approach: Flow to Well
Governing Equation:

$$Q = \pi k \frac{(H^2 - h^2)}{ln\frac{R_{o\prime}}{r_w}}$$

Q=	617,517	m^3/s (Dewatering Flow)	(B)
k=	3.00E-04	m/s (Hydraulic Conductivity)	
H=	2.8	m (Initial Head)	
h=	2.3	m (Head at Drawdown)	
$R_{0'}$ =	91	m (Radius of Influence, R_0 plus r_w due to relative size of excavation)	
r_w=	65	m (Radius of Well or System)	

Hydrogeological Calculations for Dewatering Estimates

Project: Ainley Farm Subdivision Hydrogeological Study

Project Number: 411009-1 **Engineer/Technician:** MRL/JO

MAXIMUM DEWATERING CASE (ctd.)

#3 - Dewatering for Stormwater Management Pond 2

Radius of Influence

Sichart

$$R_o = 3000(H - h)\sqrt{k}$$

R_0 =	104	m (Radius of Influence)
H=	3.4	m (Initial Head)
h=	1.4	m (Head at Drawdown)
k=	3.00E-04	m/s (Hydraulic Conductivity)

Aquifer Type: Unconfined (Water Table)

Calculation Approach: Flow to Well

Governing Equation:

$$Q = \pi k \frac{(H^2 - h^2)}{ln\frac{R_o}{r_w}}$$

Q=	428,596	m^3/s (Dewatering Flow)	(C)
k=	3.00E-04	m/s (Hydraulic Conductivity)	
H=	3.4	m (Initial Head)	
h=	1.4	m (Head at Drawdown)	
$R_{0'}$ =	124	m (Radius of Influence, R_0 plus r_w due to relative size of excavation)	
r_w=	20	m (Radius of Well or System)	

Hydrogeological Calculations for Dewatering Estimates

Project: Ainley Farm Subdivision Hydrogeological Study

Project Number: 411009-1 **Engineer/Technician:** MRL/JO

TYPICAL DEWATERING SCENARIO

#1 - Dewatering for Servicing

Radius of Influence

Sichart

$$R_o = 3000(H - h)\sqrt{k}$$

R_0 =	52	m (Radius of Influence)
H=	4.5	m (Initial Head)
h=	1.5	m (Head at Drawdown)
k=	3.40E-05	m/s (Hydraulic Conductivity)

Aquifer Type: Unconfined (Water Table)

Calculation Approach: Flow to Finite Trench

Governing Equation:

$$Q = \pi k \frac{(H^2 - h^2)}{ln\frac{R_o}{r_w}} + xk\frac{(H^2 - h^2)}{L}$$

Q=	76,956	L/d (Dewatering Flow)	(D)
x=	30	m (Length of Trench)	
k=	3.40E-05	m/s (Hydraulic Conductivity)	
H=	4.5	m (Initial Head)	
h=	1.5	m (Head at Drawdown)	
L=	52	m (Distance to "Source")	
R_0 =	52	m (Radius of Influence)	
r_w=	1.5	m (Radius of Well or System)	

GM BluePlan Engineering Ltd.
Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA
650 Woodlawn Rd. W. Block C, Unit 2, Guelph, ON N1K 1B8
www.GMBluePlan.ca

Hydrogeological Calculations for Dewatering Estimates

Project: Ainley Farm Subdivision Hydrogeological Study

Project Number: 411009-1 **Engineer/Technician:** MRL/JO

TYPICAL DEWATERING SCENARIO (ctd.)
#2 - Dewatering for Stormwater Management Pond 1

Radius of Influence
Sichart

$$R_o = 3000(H - h)\sqrt{k}$$

R_0 =	9	m (Radius of Influence)
H=	2.8	m (Initial Head)
h=	2.3	m (Head at Drawdown)
k=	3.40E-05	m/s (Hydraulic Conductivity)

Aquifer Type: Unconfined (Water Table)
Calculation Approach: Flow to Well
Governing Equation:

$$Q = \pi k \frac{(H^2 - h^2)}{ln\frac{R_o}{r_w}}$$

Q=	186,409	m^3/s (Dewatering Flow)	(E)
k=	3.40E-05	m/s (Hydraulic Conductivity)	
H=	2.8	m (Initial Head)	
h=	2.3	m (Head at Drawdown)	
$R_{0'}$ =	74	m (Radius of Influence, R_0 plus r_w due to relative size of excavation)	
r_w=	65	m (Radius of Well or System)	

GM BluePlan Engineering Ltd.
Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA
650 Woodlawn Rd. W. Block C, Unit 2, Guelph, ON N1K 1B8
www.GMBluePlan.ca

Hydrogeological Calculations for Dewatering Estimates

Project: Ainley Farm Subdivision Hydrogeological Study

Project Number: 411009-1 **Engineer/Technician:** MRL/JO

TYPICAL DEWATERING SCENARIO (ctd.)

#3 - Dewatering for Stormwater Management Pond 2

Radius of Influence

Sichart

$$R_o = 3000(H - h)\sqrt{k}$$

R_0 =	35	m (Radius of Influence)
H=	3.4	m (Initial Head)
h=	1.4	m (Head at Drawdown)
k=	3.40E-05	m/s (Hydraulic Conductivity)

Aquifer Type: Unconfined (Water Table)

Calculation Approach: Flow to Well

Governing Equation:

$$Q = \pi k \frac{(H^2 - h^2)}{ln\frac{R_o}{r_w}}$$

Q=	87,602	m^3/s (Dewatering Flow)	(F)
k=	3.40E-05	m/s (Hydraulic Conductivity)	
H=	3.4	m (Initial Head)	
h=	1.4	m (Head at Drawdown)	
$R_{0'}$ =	55	m (Radius of Influence, R_0 plus r_w due to relative size of excavation)	
r_w=	20	m (Radius of Well or System)	

Expected Maximum Groundwater Flow*	**2,228,000 L/day**	=(A)+(B) +(C)
Expected Typical Groundwater Flow**	**187,000 L/day**	=(E)

*Assumes concurrent dewatering at both the stormwater management facilities and the sanitary sewer.

**Assumes non-concurrent dewatering. Rate taken to be the largest among the "typical" estimates.

GM BluePlan Engineering Ltd.
Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA
650 Woodlawn Rd. W. Block C, Unit 2, Guelph, ON N1K 1B8
www.GMBluePlan.ca

APPENDIX G:
MONITORING AND MITIGATION PLAN

G1: DEWATERING MONITORING PLAN
PRIOR TO CONSTRUCTION DEWATERING

Number	Activity	Frequency or Schedule	Location*	Threshold	Threshold ID†
P1	Well Monitoring Program: Water Quality	Once	All residences supplied with overburden water supply wells, that agree to monitoring.	N/A. Baseline monitoring only.	N/A
P2	Well Monitoring Program: Water Level	2 weeks before Start: Install Dataloggers Within week before Start: Check loggers and download data	All residences that agree to monitoring.	N/A. Baseline monitoring only.	N/A

*Monitoring locations (if any) will be identified based on the door-to-door well survey. Residents on overburden wells will be invited to participate in the monitoring program.

†No thresholds apply because these activities are baseline data collection activities.

GM BluePlan Engineering Ltd.
Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA
650 Woodlawn Rd. W. Block C, Unit 2, Guelph, ON N1K 1B8
www.GMBluePlan.ca

G2: DEWATERING MONITORING PLAN
DURING DEWATERING

Number	Activity	Frequency or Schedule	Location	Threshold**	Threshold ID†
D1	Inspect Erosion and Sediment Control Facilities	Daily during dewatering	All applicable facilities.	Evidence of erosion along the overland flow path between discharge point and receiver (e.g. wetland area). Evidence of damage or other equipment deficiency.	D1.1
D2	Inspect Discharge Water	Daily during dewatering	1. At discharge point. 2. At receiver (e.g. wetland or municipal drain).	Evidence of sheen, odour, globules or other characteristics which may indicate impacted water.	D2.1
D3	Field Monitoring of Turbidity	Daily during dewatering	1. Any point along route between discharge area and receiver. 2. Receiver (i.e., wetland) upgradient of point of entry of discharge.	Turbidity of discharge exceeds turbidity of receiver by more than 8 NTU.	D3.1
D4	Sampling of Discharge (unfiltered water)	Once at startup. Once monthly thereafter.	Any point along flow route between the discharge area and the receiver.	Any parameter exceeds corresponding PWQO.	D4.1
D5	Measurement of Dewatering Volume	Daily during dewatering.	At discharge point or on discharge line	Exceeds permitted value (2,228,000 L/d requested)	D5
D6	Complaint Received from Resident	Upon receipt of complaint.	At the residence involved.	N/A	D6.1

** In the event that a threshold is exceeded, proceed with mitigation activities.
†If a threshold is reached or exceeded, then consult the contingency plan (Section 8.2.2 and next page) according to the matching Threshold ID.
PWQO - Provincial Water Quality Objectives

GM BluePlan Engineering Ltd.
Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA
650 Woodlawn Rd. W. Block C, Unit 2, Guelph, ON N1K 1B8
www.GMBluePlan.ca

G3: DEWATERING MITIGATION PLAN
GENERAL AND CONTINGENCY MITIGATION ACTIVITIES

Mitigation Type		Threshold ID	Mitigation Measures*
General	Erosion and Sediment Control Plan	N/A	Implement an E&SC plan according to OPSS.MUNI 805 and 518. See Section 8.2.1 of report.
	Intake Points	N/A	Sumps to be constructed as filtered sumps. Wellpoints to be installed, developed and tuned to minimize generation of sediment. See Section 8.2.1 of report.
Contingency	Inspect Erosion and Sediment Control Facilities	D1.1	□ Repair or replace equipment as necessary to restore proper function of erosion and sediment control system.
	Inspect Discharge Water	D2.1	□ Immediately report observations to Contract Administrator (i.e., GMBP). □ If the observation is related to turbid/cloudy water or sediment-laden water, conduct an inspection of erosion and sediment control features (including dewatering sumps) and rectify any deficiencies. Conduct another field turbidity test. If problem persists and cannot be immediately rectified, discontinue dewatering if safe to do so. □ If the observation is related to a potential chemical impact (e.g. fuel), then stop dewatering immediately. Dewatering shall not continue until GMBP has undertaken an investigation and determined a revised approach for dewatering.
	Field Monitoring of Turbidity	D3.1	□ Immediately report exceedance to Contract Administrator (i.e., GMBP). □ Conduct an inspection of erosion and sediment control features (including dewatering sumps) and rectify any deficiencies. □ Provide additional sediment control measures according to OPSS.MUNI 805 and/or 518 to provide additional sediment capture and prevent erosion. □ Conduct another field turbidity test. If problem persists and cannot be immediately rectified, discontinue dewatering if safe to do so.
	Sampling of Discharge	D4.1	□ Follow D3.1 above
	Dewatering Volume	D5.1	□ Immediately report exceedance to Contract Administrator (i.e., GMBP). □ If the exceedance appears to be due to a temporary occurrence (e.g. recent rainstorm) continue dewatering. □ If the exceedance appears to be persistent, reduce the size of excavation to minimize the amount of dewatering required. If this is not feasible, cease dewatering until the PTTW can be amended, or until other approval to proceed is provided by the MECP.
	Complaint Received from Resident	D6.1	□ Immediately report exceedance to Contract Administrator (i.e., GMBP). □ GMBP to conduct an investigation of the potential impacts by downloading data from datalogger and conducting water quality sampling (as applicable). □ Contractor to provide alternate source of water to the resident until dewatering concludes. □ GMBP to complete a follow up investigation (i.e., water level measurement and/or sampling) after the completion of dewatering to ensure that water supply has been restored to pre-construction condition.

* Note: this is not the entire mitigation plan. Please refer to Hydrogeological Study report, Section 8 for additional details.

GM BluePlan Engineering Ltd.
Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA
650 Woodlawn Rd. W. Block C, Unit 2, Guelph, ON N1K 1B8
www.GMBluePlan.ca