CHUNG & VANDER DOELEN
ENGINEERING LTD.

HYDROGEOLOGICAL ASSESSMENT
PROPOSED EXPANSION of
WHISTLE BARE CAMPGROUND
Part of Lot 28, Concession 12
Township of North Dumfries

SUBMITTED TO:
Whistle Bare Campground
1898 Whistle Bare Road
Cambridge, Ontario
N1R 5S3

FILE NO / H19111 / January 9 2020

CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 5E1
519-742-8979

January 9, 2020
FILE NO.: H19111

Whistle Bare Campground
1898 Whistle Bare Road
Cambridge, Ontario
N1R 5S3

Dear Mr. Peter Bingeman:

RE: HYDROGEOLOGICAL ASSESSMENT
PROPOSED EXPANSION of WHISTLE BARE CAMPGROUND
Part of Lot 28, Concession 12, Township of North Dumfries

This report summarizes the results of a hydrogeological assessment in support of a proposed expansion of the Whistle Bare Campground located at Part of Lot 28, Concession 12 in North Dumfries Township.

It is intended that this report be read in conjunction with the Functional Servicing and Preliminary Stormwater Management Report prepared by GM BluePlan Engineering Limited.

If you have any questions or concerns regarding the report, please contact the undersigned.

Yours truly,
CHUNG & VANDER DOELEN ENGINEERING LTD.

William (Sandy) Anderson, M.Sc., P.Eng.
Senior Hydrogeologist and Engineer

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1.0 INTRODUCTION

This report presents a hydrogeological assessment of a proposed expansion of the Whistle Bare Campground located at Lot 28, Concession 12 in North Dumfries Township (Figure 1).

The objectives of the investigation are as follows:

1. To characterize the hydrogeological setting at the site and identify the groundwater and surface water receptors.
2. To evaluate the potential impacts to these receptors from the proposed water taking, sewage effluent and stormwater management facilities and make recommendations to address these potential impacts, where appropriate.
3. To identify potential opportunities for enhancing groundwater recharge as part of the campground expansion.

The expanded campground would be serviced with a new communal water distribution system supplied from an on-site well (or wells) and a communal wastewater collection and on-site large treatment system. The preliminary site servicing and stormwater management requirements are identified in the Functional Servicing and Preliminary Stormwater Management Report prepared by GM BluePlan Engineering Limited.

2.0 BACKGROUND

The following background information have been considered as part of this investigation:

- Regional-scale topographic mapping (Figure 1).
- Quaternary Geology (i.e. surficial geology) mapping for the area (Figures 2).
- Water Well Records (Appendix B, with locations in Figure 1).
- The 'Sewage Systems Assessment Report' by LVM (Oct 2014) for the existing sewage systems at the former Sage Campground that includes a summary of a 2012-2013 field program that included test pits, boreholes, monitoring wells, water levels, surface water and groundwater quality analyses.
- 2017 borehole/well logs and 2017-2019 water levels and water quality analyses from FlowSpec.
- Functional Servicing and Preliminary Stormwater Management Report (GM BluePlan Engineering Limited, dated November 2019)
- GSP Group Development Concept (November 2019)

The existing Campground (formerly the Sage Campground) has been in existence since the 1980s. The water supply has been historically supplied by two wells. The first well was a bored well and was decommissioned in August 2010. It was only about 4-m deep based on its decommissioning record (Appendix B). The second well (Record #A070624, Appendix B, Figure 1) was drilled in June 2008 to 6.7-m and is still used at present.

3.0 SITE CHARACTERIZATION

3.1 TOPOGRAPHY & DRAINAGE

Regional topography and drainage features are shown in Figure 1. On-site, the topographic setting is generally split into two areas, an upland area in the south half with ground elevations ranging from about 310 to 312 mASL and a much lower area with elevations of 296 to 302 mASL in the northern half, where there are several wetland features and ponds.

The southern edge of the property at Whistle Bare Road is also at the southern edge of the Blair Creek subwatershed. Blair Creek (Figure 1) flows from west to east and passes within about 50 m of the northeast corner of the property. It is fed by the Roseville Swamp to the west (Figure 1) and by groundwater discharge and surface runoff from within the watershed. The Creek discharges to the Grand River about 2.5 km to the northeast at the hamlet of Blair. There is also a tributary of Blair Creek that originates from ponds located in the northern part of the Campground property (Figure 3) and crosses the eastern property boundary before its confluence with Blair Creek about 50 m to the northeast.

3.2 GEOLOGIC SETTING

Surface geological mapping for the area (by Karrow, 1987) is presented in Figure 2. The mapping indicates the southern two-thirds of the property is underlain by Outwash Gravel (Deposit 7, Figure 2) and the northern third by Outwash Sand (Deposit 12, Figure 2). Notably, the adjacent Blair Creek riparian area is underlain by alluvial stream deposits with wide ranging textures, from clay and silt to sand and gravel depending on the location and often interlayered.

The site test pit and borehole data (Appendix C) are generally consistent with the geological mapping and confirms that the property is underlain almost exclusively by sand and gravel deposits. This includes the sand and gravel confirmed to at least 13.7 m depth (298.4 mASL) at BH7-FS in the southeast corner and to at least 4-m depth (294.1 mASL) at BH7-12 in the northeast corner.

Variations in the general description provided above include: 1) surficial 0.9-1.2 m layers of sandy silt fill at BH1-12, BH3-12, BH4-12 and BH6-12) peat and marl layers beneath the fill at BH3-12, BH4-12 and BH6-12 to 2.3-3.6 m depths, 3) surficial silt and silt till to the 3.8-m depth at BH8-12, and 4) a buried peat layer and thin sandy silt layer to the 6-m depth at BH3-FS. It is also noted that the upper 0.2-1.0 m of the sand deposit in the northern part of the property was described to be ‘sand/silt’ in the test pits and ‘sand’ in the boreholes.

Information on the overburden deposits surrounding the property and also to depths much greater than the on-site boreholes is available from local water well records (Appendix B and Figure 1). Most of the well records confirm the widespread extend of the surficial sand and gravel deposits in the area ranging

in thickness from about 5 to 20 m, with the exception of well #7550 to the south, where the surficial granular deposit was not encountered.

Most well records also confirm the presence of an intermediate depth clayey aquitard deposit, separating the surficial granular deposits from deeper granular layers (and/or bedrock). Figure 1 provides the depths at which the aquitard layers were found at each location. The apparent absence of an aquitard at well #A029255 is anomalous with the adjacent wells. The existing campground well, #A0700624, was too shallow (6.7 m) to have encountered the aquitard, while the new 30.6-m deeper well, #A219397, encountered clayey aquitard deposits from 14 to 23.2 m.

3.3 HYDROGEOLOGIC SETTING

The hydrogeological setting at the property has three primary components:

- The ***upper aquifer zone*** within the surficial sand/gravel deposits and which is hydraulically connected to Blair Creek and its on-site tributary.
- The low-permeability clayey ***aquitard*** that separates the upper and deeper water bearing aquifer zones.
- The ***deeper aquifer zone*** within lower sand and gravel deposits and/or hydraulically-connected bedrock.

3.3.1 Water Table Configuration

Water level and elevation data for the on-site monitoring wells and wetland/stream piezometers are available from LVM (spring and summer 2012) and Flowspec (selected wells, fall 2017, fall 2018, spring and summer 2019) and these data are presented in tables in Appendix D.

Figure 3 presents the interpreted water table configuration and shallow groundwater flow direction using August 21, 2019 elevation data (Note: MP3 and MP4 could not be found in 2019, so available levels from August 2012 are used in Figure 3). As shown, shallow groundwater flow is northward across the southern upland area and then converges from the west and south toward the on-site tributary of Blair Creek, which functions as a groundwater discharge feature.

The depth to the water table varies across the property, from about 10 m (+/- 1 m) in the southern upland area to about 1 to 2 m in most of the northern area (see tables in Appendix D). The water table is essentially at ground surface within the wetland areas and at the tributary and ponds.

Shallow groundwater levels fall seasonally (i.e. drop from spring to late summer in 2012 and 2019) by about 0.2 to 0.6 m across the property (see tables in Appendix D).

The static water level elevation in the new deep aquifer supply well (#A219397) was also measured on

August 21, 2019. The 298.91 mASL elevation is higher than the interpreted water table elevation at that location (about 298.25 mASL). This indicates there is an upward vertical hydraulic gradient between the deeper and upper aquifers zones, which implies a degree of natural protection to the deeper aquifer from potential surface contaminants that may exist in the northern part of the campground.

3.3.2 Groundwater / Surface Water Interaction

The historical and recent water level data from the four drive-point piezometers, MP1 to MP4, provide insight on the relationship between shallow groundwater and surface water features at the site.

At location MP1, there are consistently higher surface water elevations compared to the groundwater elevations in the piezometer, indicating a strong downward hydraulic gradient. This indicates that this particular pond serves to hold surface water runoff (and/or perhaps lateral groundwater interflow) and recharge this water into the groundwater flow system passing beneath the pond.

The July and August 2012 data at MP3 and MP4, as well as all 2012 and 2019 seasonal data at MP2, indicate upward hydraulic gradients. Conversely, the spring 2012 data at MP3 and MP4 indicated downward gradients. On balance, these data confirm that the tributary receives shallow groundwater discharge during the 'low-flow' summer period and less consistently along all reaches during the spring season, when there is expected to be larger amounts of surface water runoff.

3.3.3 Groundwater Infiltration & Recharge

Based on the varied near-surface soil types described in Section 2.2, infiltration rates at the property are expected to vary accordingly.

In the northern area, where there is typically a thin 1-m (+/-) silt/sand (native and/or fill) overlying modest permeability compacted peat and marl at some locations and very permeable sand or sand & gravel at other locations, the infiltration rates are expected to be in the 10 to 30 mm/hr range, depending on the degree of silt content and fill compaction. In areas where there is limited compaction (i.e. away from the roads and driveways), the thin surficial layers are likely to contain significant secondary permeability (i.e., weathering cracks) that allow increased infiltration to the underlying permeable granular materials. In the few locations in the north where the granular material extends to ground surface (e.g., BH2, BH5, BH7 and TP11), the infiltration rates can be expected to be greater, in the 50 to 300 mm/hr and in the lower end of this range where the water table extends closer than 1 m of ground surface. On balance, an average infiltration rate of 25 mm/hr is estimated for the northern area.

In the south, where course sand or sand & gravel materials extend to surface, the infiltration rates are expected to be in the 50 to 300 mm/hr range, with 100 mm/hr being an estimated average for that area.

Annual groundwater recharge at the property, from an overall water balance perspective, is expected to

be in the 25-35 cm/yr range, based on the highly permeable soils in the south and the thin layer of silty materials overlying permeable soils in the north.

3.3.4 Shallow Groundwater and Surface Water Quality

Flowspec's 2017 to 2019 shallow groundwater and surface water quality data for nitrogen species, total phosphorous, bacteria, pH and temperature are provided in tables in Appendix D. It is cautioned that the groundwater samples were not filtered, so the total phosphorous results are likely biased by the sediment in the samples and not truly reflective of the total 'mobile' phosphorous in the groundwater (i.e., the dissolved forms). Phosphorous is seldom ever mobile in groundwater environments. Further, coliform bacteria in monitoring wells is quite common, due to the nature of monitoring well construction and lack of disinfection after drilling. Coliform bacteria from monitoring wells is seldom reflective of actual bacterial presence in the groundwater. Nevertheless, the data provide some useful insights on the extent and nature of the existing impacts to shallow groundwater and surface water from area agricultural activities and the existing sewage systems at the property.

Upgradient Groundwater. Based on the water table configuration and shallow groundwater flow pattern, all of the 2017 monitoring wells installed by Flowspec are expected to be upgradient of the existing campground sewage systems in the north end of the property. Rather, the groundwater in the southern end of the property would be almost exclusively influenced by area agricultural activities. In general, the primary nitrogen species in these wells is nitrate, which ranged in concentration from 3.4 to 9.1 mg/L (average 6.1 mg/L) in the eighteen samples collected from six of these wells (i.e., excluding BH3-FS, which had no nitrate) over the three sampling rounds. These six wells had modest concentrations of organic nitrogen (TKN – ammonia), ranging from 0 to 4.5 mg/L (average 1.9 mg/L) in thirteen samples from these wells (not including four results where the detection limit was too high to be useful and one anomalously elevated result from BH6-FS, which was not used because the samples were not filtered, so the highly elevated organic nitrogen likely reflects nitrogen in the solids].

The nitrogen species results from well BH3-FS are anomalous (i.e., no nitrate and very high TKN) compared to the other upgradient wells. This is likely due to the buried peat layer in the screened interval at this location. The available organic carbon from the peat undoubtedly creates a low-redox geochemical state, thus converting (or maintaining) all nitrogen to 'reduced' forms (i.e., TKN or ammonia + organic nitrogen). Notwithstanding the expectation for reduced nitrogen at this location, it is also noted (as above) that because the samples were not filtered, a portion of the organic nitrogen is likely from nitrogen-rich peaty sediment in the samples.

Overall, it is concluded that upgradient (and perhaps on-site) agricultural practices (fertilizer and manure applications) have created a measurable but modest background nitrate and organic nitrogen presence in the shallow groundwater passing beneath the property.

Downgradient Groundwater. Based on the water table configuration and shallow groundwater flow pattern, the data from wells BH3-12 and BH4-12 are reflective of conditions downgradient from some existing campground sewage systems in the north end of the property. These two wells are also

downgradient from the western pond, which could also potentially influence the groundwater quality based on the downward gradient at the pond (Section 2.3.2). In general, the nitrogen results from these wells are very similar to the upgradient results, with nitrate concentrations ranging from 4.3 to 7.3 mg/L (average 5.9 mg/L) and organic nitrogen (TKN – ammonia) ranging from 0.4 to 3.2 mg/L (average 1.3 mg/L) in the '*non-anomalous'* samples collected from these wells.

Overall, the limited available data indicate that the existing sewage systems have no apparent detrimental impact on the downgradient groundwater.

Surface Water. Surface water samples have been collected at the two ponds (SW1 and SW2) and along the Blair Creek tributary upstream of where it crosses the downstream property boundary (SW3). In this case, the unfiltered samples are appropriate for consideration. The important parameters at these locations are 'unionized' ammonia (a '*calculated'* parameter based on pH, temperature and total ammonia), nitrate and total phosphorous. Unionized ammonia results at all three locations were very low (ranging from 0.0002 to 0.005 mg/L), well below the Provincial Water Quality Objective (PWQO) of 0.02 mg/L. The nitrate results in the ponds (averages of 1.9 mg/L at SW1 and 2.2 at SW2 mg/L) were lower than the upgradient and downgradient groundwater averages of 6.1 and 5.9 mg/L, perhaps reflecting dilution from rainfall. At SW3, the average nitrate of 4.6 mg/L was closer but still lower than the groundwater averages. In general, total phosphorous results at all three locations were low (ranging from 0.003 to 0.02 mg/L), below the Provincial Water Quality Objectives (PWQO) of 0.02 and 0.03 mg/L, established to avoid any nuisance algal growth in lakes and streams, respectively.

Overall, the available data indicate that the existing sewage systems have no apparent detrimental impact to the surface water in two on-site ponds or in the Blair Creek tributary leaving the property. The Creek tributary, in particular, has modest elevated nitrate from area background sources and little or no significant unionized ammonia or total phosphorous.

3.3.5 Groundwater Use

CVD has completed an inventory of all private wells within 500 m of the subject property, as well as several wells located beyond the inventory area to the east and west and including one residence with an unconfirmed supply to the southeast (Figure 1). The information gathered provides insight regarding the location, depths, aquifer types and extent of groundwater use in the area and supports the water servicing for the proposed expanded campground. All well records are included in Appendix B.

Figure 1 summarizes the well depths (i.e., the depth to the water bearing zone) and the well capacities (pumping rate per unit drawdown, in gpm/m) for the fifteen wells identified. Each record includes pumping test data (i.e., pumping rate and water level drawdown) and this allows calculation of the well capacity, which is a good relative indicator of the aquifer capability. Nine of the well capacities are in the 1 to 9 gpm/m range, independent of the aquifer zone (i.e., surficial water table, the deeper sand & gravel or the bedrock). These capacities are indicative of very good aquifer capability for most residences, farms or businesses. Six of the wells, including both the shallow and deep wells at the campground (#A070624 and #A219397) and the house well at the south end of the campground

property (#A003434), have considerably higher capacities, in the 13 to 100 gpm/m range. These are indicative of a greater aquifer capability and would support larger demands, such as that required for a multi-residence campground. Not surprisingly, the existing shallow campground well has easily served the campground demands for the past decade.

3.3.6 Water Receptors

The following four water receptors are identified based on the hydrogeological setting described above:

- The shallow water table sand & gravel aquifer that is used by the current supply well for the campground and one other private well in the area (#7763).
- The deeper sand & gravel aquifer located below intermediate depth aquitard layers and into which the majority of the private wells in the area are drilled, including the new supply well intended for use for the expanded campground.
- Blair Creek and its associated on-site tributary and wetlands.
- The on-site recreational ponds.

4.0 SITE SERVICING REQUIREMENTS & IMPACT ASSESSMENT

4.1 WASTEWATER SYSTEMS & POTENTIAL IMPACT OF EFFLUENT

The FSR describes the proposed wastewater collection and treatment system for the expanded campground, including a technical memorandum regarding the treatment system by Flowspec Engineering.

The treatment system including an on-site leaching bed is proposed to be located in the southwest corner of the property (see GMBP Report and GSP Development Concept). The design details for this large system (i.e., >10,000 L/day), including treatment units, effluent criteria and leaching bed, would be developed in consultation with and approved by the Ministry of Environment Conservation and Parks (MECP). The MECP approval process for a large communal system is very thorough and ensures a high degree of environmental protection and responsible monitoring and maintenance.

From a hydrogeological perspective, the following points highlight the merits and requirements of the proposed sewage system:

1. The southwest corner of the property is well suited for large-scale infiltration of effluent, based on the permeable soil conditions and large depth to the water table.
2. The southwest corner takes advantage of the shallow groundwater flow direction by keeping the effluent plume on-site and away from any directly downgradient well supplies, including the existing and future campground wells.
3. The southwest corner of the property takes advantage of the large approximately 400-m on-site distance between the leaching bed and the Blair Creek tributary, ponds and wetlands, therein maximizing on-site attenuative capabilities before shallow groundwater discharge to these receptors.

4. By implementing a large-scale sewage system, the required treatment technology required for approval will be an improvement over the current low-technology individual treatment systems.
5. The effluent criteria developed (in consultation with MECP) for the new treatment system should suitably consider the existing background groundwater nitrate concentrations and the excellent capability of the shallow groundwater flow system to attenuate phosphorous and unionized ammonia in limiting the impact to the Blair Creek Tributary.

4.2 WATER SUPPLY & POTENTIAL IMPACT OF WATER TAKING

The FSR describes the proposed water distribution system for the expanded campground, including average and peak water demand requirements, pump considerations, storage considerations and provisions for fire protection. It is planned that the new 30-m deep well (#A219397) be used to satisfy the demands of the expanded campground. The existing shallow well is also capable of servicing the expanded campground; however the owner prefers a deeper well for the future development.

Well #A219397 was tested by the driller at 80 gpm (363 L/min) for one hour and this resulted in a stabilized drawdown of 6 m after just 10 minutes of pumping. The water level also fully recovered from pumping (i.e., to the static water level) in just 15 minutes. Not only is this drawdown only about 20% of the available drawdown in the well (approximately 30 m, since the static water level is at ground surface), but the quick stabilized drawdown and quick recovery suggests that most of the drawdown is actually due to "well loss or efficiency effects" and not actual drawdown in the aquifer itself. Furthermore, these test results also indicate the well has an excellent ability to be pumped at high rates for short durations without an accumulated aquifer drawdown (i.e., aquifer 'dewatering').

From a hydrogeological perspective, the following points highlight the merits and requirements of the proposed well supply:

1. The proposed deep well obtains water from a deeper confined aquifer zone. Based on the clayey aquitard layer from 14 to 23 m depth. This confining layer will provide a higher degree of aquifer security from surface contamination compared to the existing shallower well.
2. Based on well record data, the expected high aquifer transmissivity and the modest campground demands, no significant impact to the water receptors in the area are predicted (i.e., other aquifer users and surface water features). It is noted that all water pumped will ultimately be recharged back to the shallow water table through the sewage system leaching bed or used for irrigation purposes.
3. A standard 24-hr pumping test is recommended to support an MECP Permit To Take Water (PTTW) application for >50,000 L/day use of the well. The test should be completed during an off-season period when there is no potential drawdown occurring from the existing shallow supply well use. The network of monitoring wells and shallow piezometers should be monitored during the test to confirm the extent of the water table drawdown and potential impacts to the surface receptors. Groundwater samples should also be collected during the test to confirm the general water quality and potability of the supply.

4.3 POTENTIAL IMPACT TO GROUNDWATER RECHARGE

All water pumped from the deep aquifer well will ultimately be returned to the shallow groundwater system via the sewage system leaching bed or used for irrigation purposes across the property. As a result, a net increase in water infiltrated to the shallow groundwater flow system is expected and this will ultimately increase the groundwater flow discharging to the local surface water receptors (Blair Creek, its on-site tributary and associated wetlands).

In addition, a passive approach to stormwater management is being recommended in the FSR and this will promote and maintain recharge rates. Specifically, there will be a limited amount impervious cover in the expanded campground (still mostly grass cover) and the runoff from individual trailers, patios and decks will be directed to a network of shallow swales between lots and then to open ditches along laneways. These swales and ditches overlie soils with good to excellent infiltration characteristics as described in Section 2.3.3. The same approach has been taken with the existing campground with a high degree of success (i.e., water ponding is not common after rainfall events) and there has been no need for extensive stormwater management facilities.

5.0 CONCLUSIONS & RECOMMENDATIONS

Based on the results of the hydrogeological assessment described in this report, the following general conclusions and recommendations are provided.

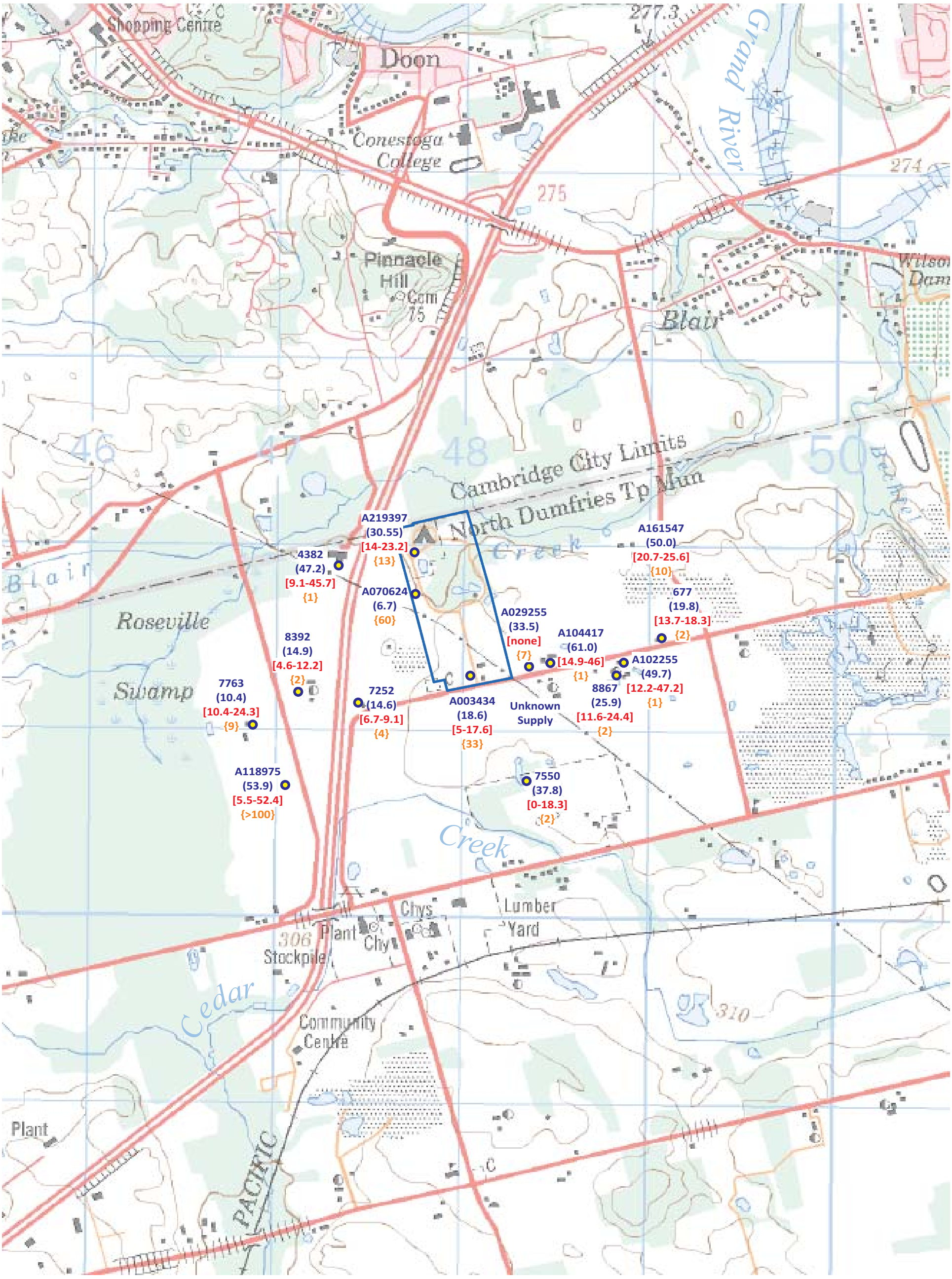
1. Well records confirm the excellent aquifer capabilities to supply the proposed campground expansion and also confirm the existence of an intermediate depth aquitard layer that provides good security to the deep aquifer from potential surface contaminants. The proposed supply would come from an existing deep aquifer well in the northern part of the property that has been tested at 80 gpm with minimal drawdown. No quantity impacts to groundwater and surface water receptors in the area is predicted form the water taking. A confirmatory pumping test to support a MECP Permit To Take Water is recommended.
2. The campground property is underlain by moderately to highly permeable soils with good to excellent infiltration capabilities to support both the proposed ‘passive’ stormwater management approach and the leaching bed for the proposed new communal sewage system. Groundwater recharge should be easily maintained or enhanced with the stormwater approach and the sewage effluent infiltration.
3. The proposed wastewater treatment system for the campground expansion will be designed in accordance with MECP requirements. The MECP approval process for a large communal system is very thorough and ensures a high degree of environmental protection and responsible monitoring and maintenance.
4. The depth to the water table varies across the property, from about 10 m in the southern upland area to about 1-2 m in most of the northern low-lying area. The deep water table in the south is a positive feature to support both the large infiltration quantities of the sewage effluent and excellent attenuation of contaminants, such as ammonia and phosphorous.
5. The water table configuration and northerly groundwater flow direction will be utilized to maintain

the future sewage effluent plume on-site and to maximize the attenuative capability of the subsurface to ensure no detrimental impact to on-site and off-site groundwater and surface water receptors.

Respectfully submitted,
CHUNG & VANDER DOELEN ENGINEERING LTD.

William (Sandy) Anderson, M.Sc., P.Eng.
Senior Hydrogeologist and Engineer

APPENDIX A
Figures 1 to 3
Development Concept (GSP Group)



LEGEND

Campground Property

Representative Well
7550 Well Record Number
(37.8) (well depth in metres)
[0-18.3] [depth range of intermediate aquitard]
{2} {well capacity gpm per metre drawdown}

Map Source: 1998. Cambridge Ontario 1:50,000 Mapping, NTS Edition 9, 40P/8.

N

0 400 800m

Scale 1:20,000

Figure 1
Site Location & Existing Wells
Hydrogeological Assessment
Proposed Whistle Bare Campground Expansion
North Dumfries Township

Drawn By: SA	Date: Oct 28 2019	File No.: H19111

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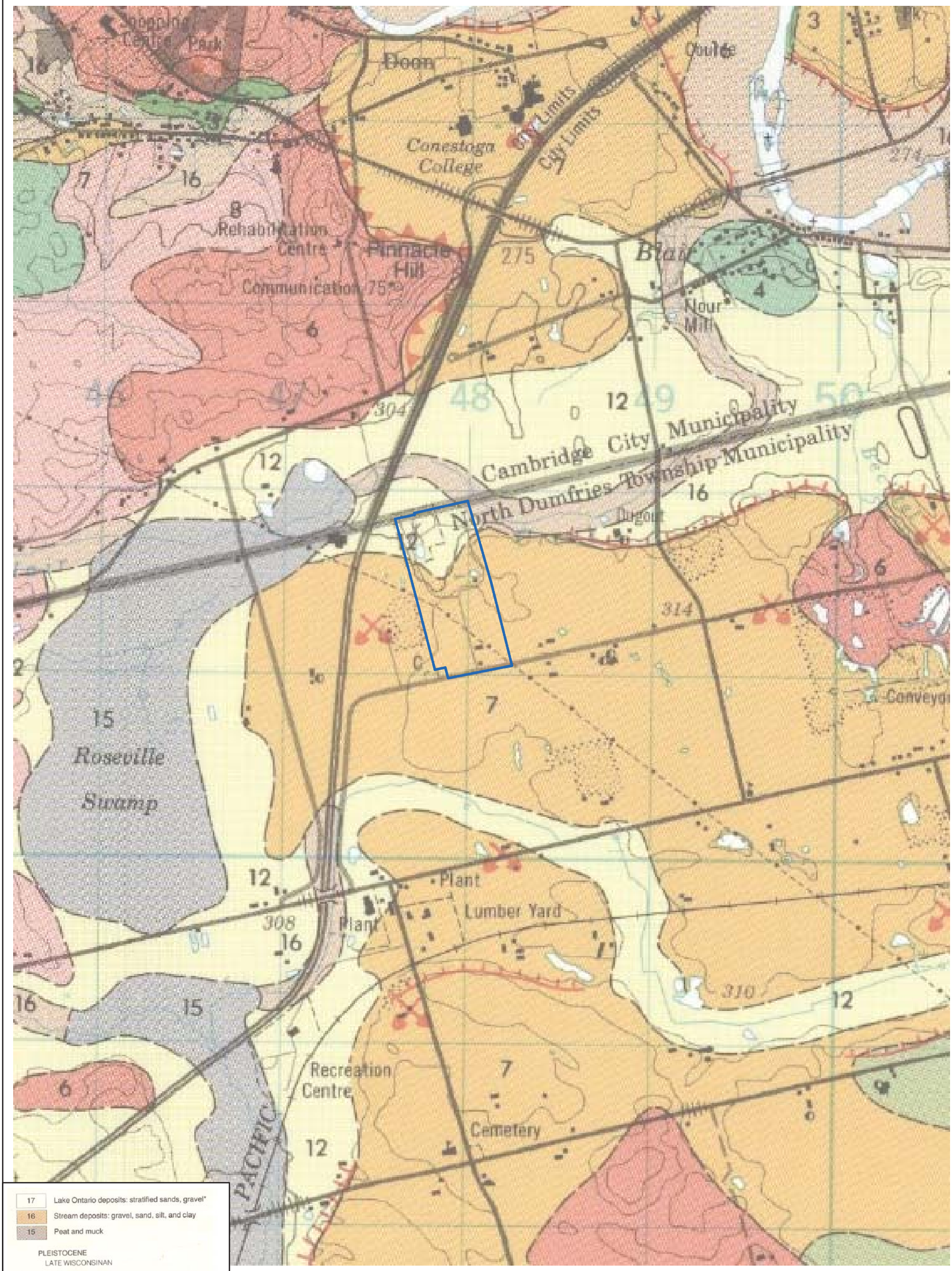
311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979



17 Lake Ontario deposits: stratified sands, gravel*
16 Stream deposits: gravel, sand, silt, and clay
15 Peat and muck

PLEISTOCENE
LATE WISCONSINAN

14 Alluvial fan gravel*
13 Beach gravel
12 Lacustrine and outwash sand
11 Lake deposits: stratified to varved clay, silt, and fine sand
10 Halton Till: clay or silt till
9 Outcrop complex: bouldery till and bedrock ridges
8 Ice-contact sand: kames and eskers
7 Outwash gravel
6 Ice-contact gravel: kames and eskers
5 Wentworth Till: stony, sandy, silt till
4 Port Stanley Till: silt to sandy silt till
3 Maryhill Till: clayey silt till
2 Catfish Creek Till**: stony, sandy, silt till

LEGEND

Campground Property

Map Source: P.F. Karrow, 1987. Quaternary Geology, Cambridge Area; Ontario Geological Survey, Map 2508.

N

0 400 800m

Scale 1:20,000

Figure 2
Quaternary Geology
Hydrogeological Assessment
Proposed Whistle Bare Campground Expansion
North Dumfries Township

Drawn By: SA	Date: Oct 28 2019	File No.: H19111

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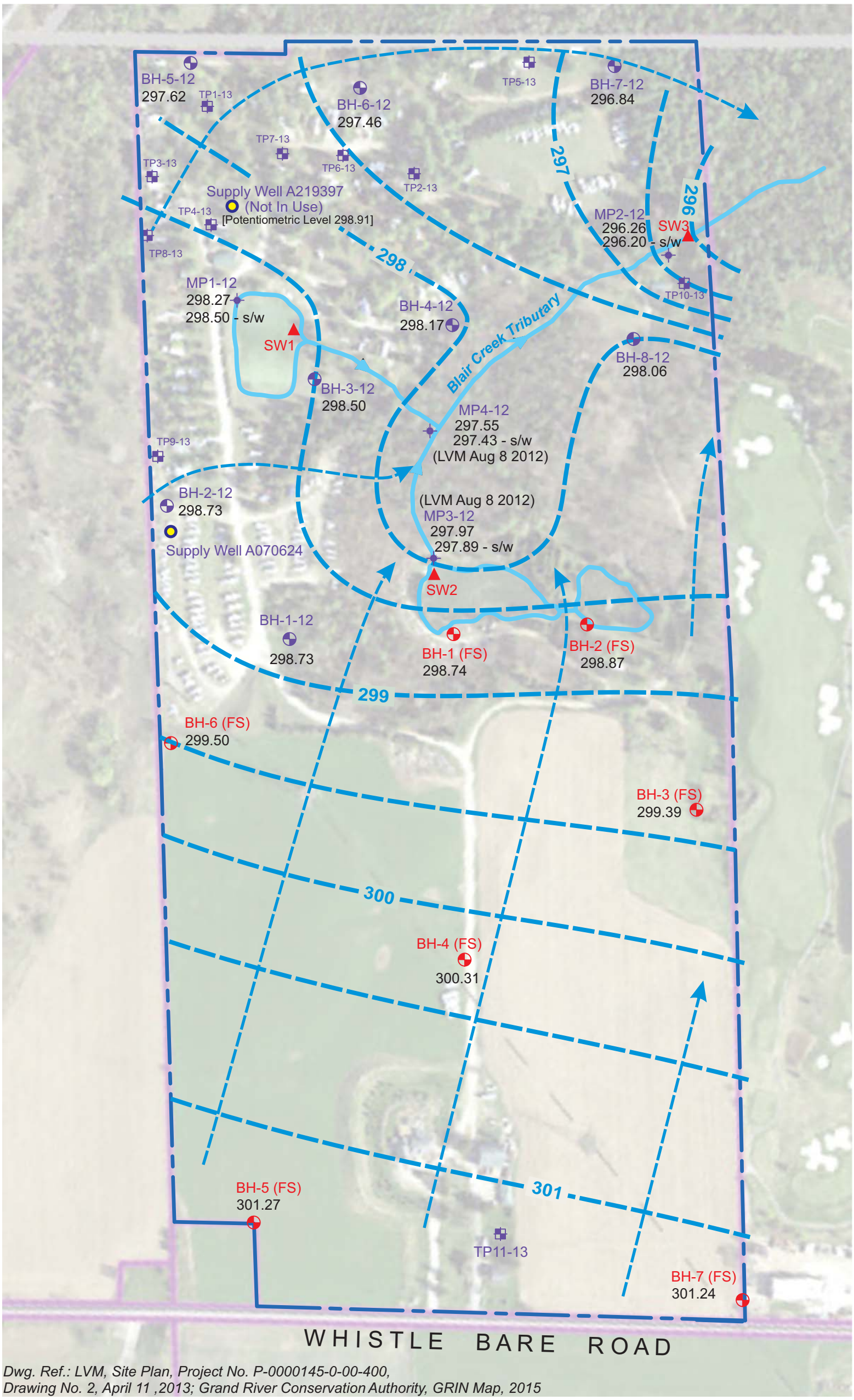

Dwg. Ref.: LVM, Site Plan, Project No. P-0000145-0-00-400, Drawing No. 2, April 11 ,2013; Grand River Conservation Authority, GRIN Map, 2015

Legend:

- Property Line
- Test Pit Location (LVM)
- Borehole Location (LVM)
- Mini-Piezometer Location (LVM)
- Borehole Location (FlowSpec)
- 301.24 — Water Level Elevation (mASL) - Aug 21 2019
- Surface Water Sampling Location
- Interpreted Water Table Contour (mASL) - Aug 21 2019
- Interpreted Shallow Groundwater Flow Direction

N

0 50 100

1:3,000

Figure 3
Water Table Contour (Aug 21, 2019)
Hydrogeological Assessment
Proposed Whistle Bare Campground Expansion
North Dumfries Township

Drawn By: SA	Date: Oct 28 2019	File No.: H19111

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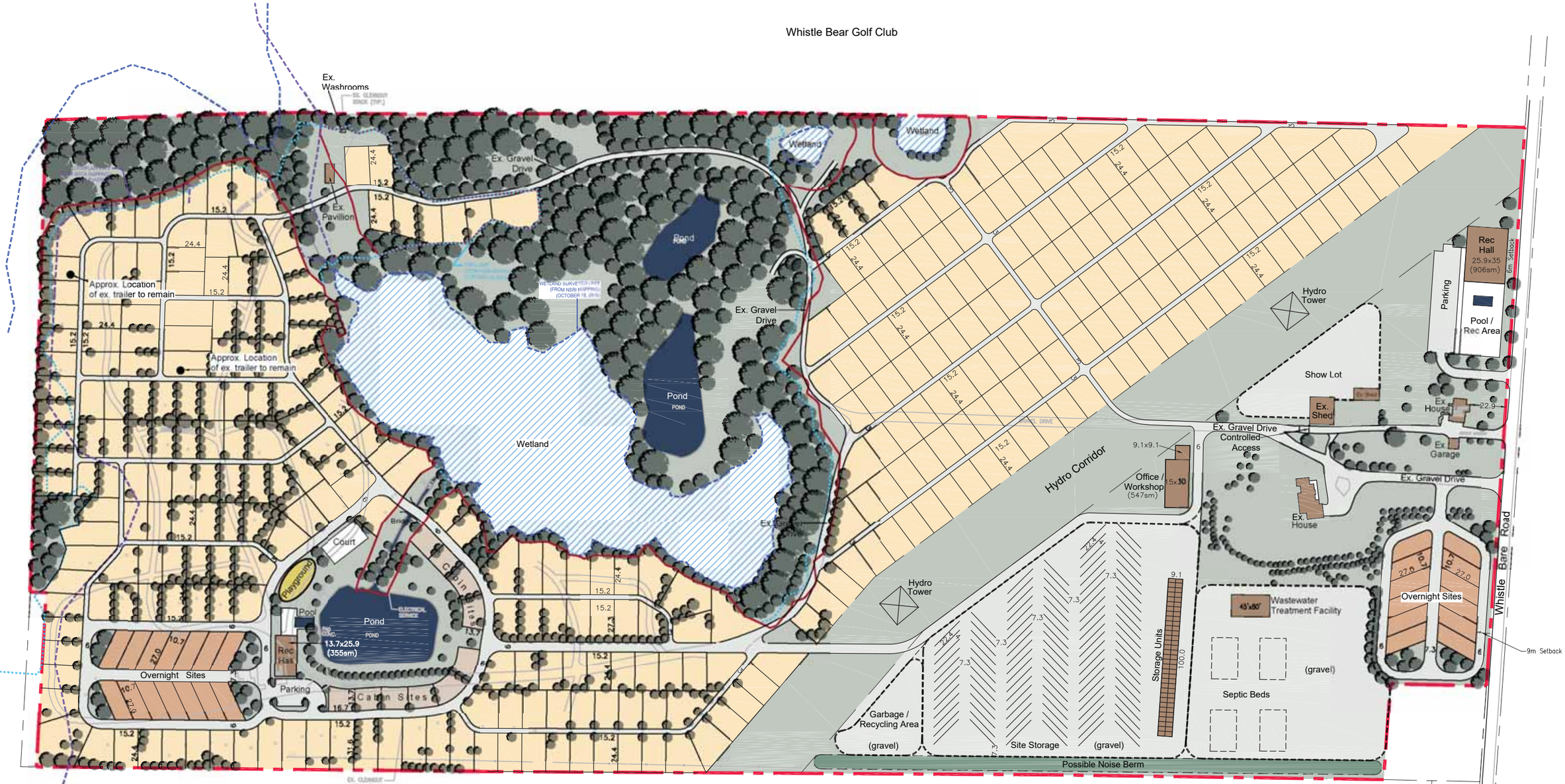
Whistle Bear Golf Club



Site Area: 38.2ha.
Development Area: 29.1ha.

Legend

- Floodplain (GRCA)
- ESPA Limit
- Wetland Boundary
- Development Limit

Regular Sites: 347
Cabin Sites: 10
Overnight Sites: 26
Total Sites: 383

0 10 50 150
5 25 Meters 100

NOTE: This concept has been prepared for general feasibility purposes only. Building code requirements and technical / architectural design have not been addressed.

Scale 1:2,500 | April 2, 2019 | Project No.: 18088 | Drawn By: SL

GSP group

Whistle Bare Campground

DEVELOPMENT CONCEPT

1898 Whistle Bare Road, North Dumfries

APPENDIX B
Water Well Records

40P8d

UTM 17 Z 549020 E
5 R 4801260 N
Elev. 4 R 1030

The Ontario Water Resources Commission Act

WATER WELL RECORD

65 No. 677

Basin 23
County or District Waterloo
Township, Village, Town or City N Dumfries
Con. 12 Lot 26
Date completed 7 (day) aug (month) 65 (year)
[redacted] ess RR2 Galt

Casing and Screen Record

Inside diameter of casing 6/4
Total length of casing 62+3ft screen
Type of screen Brass 3ft x 6¼ x 20 slot
Length of screen 3 ft
Depth to top of screen 62
Diameter of finished hole 5 in

Pumping Test

Static level 38
Test-pumping rate 15 G.P.M.
Pumping level 60
Duration of test pumping 1hr
Water clear or cloudy at end of test clear
Recommended pumping rate 10 G.P.M.
with pump setting of 60 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)
Pit	0	5	65	fresh
Sand	5	45		
Sand and [redacted] clay	45	60		
Sand	60	[redacted] 65		

For what purpose(s) is the water to be used? house
Is well on upland, in valley, or on hillside? upland
Drilling or Boring Firm W Parkhom
Address Smithville
Licence Number 1674
Name of Driller or Borer W Parkhom
Address Smithville
Date Aug 7/65
Wesley Parkhom
(Signature of Licensed Drilling or Boring Contractor)

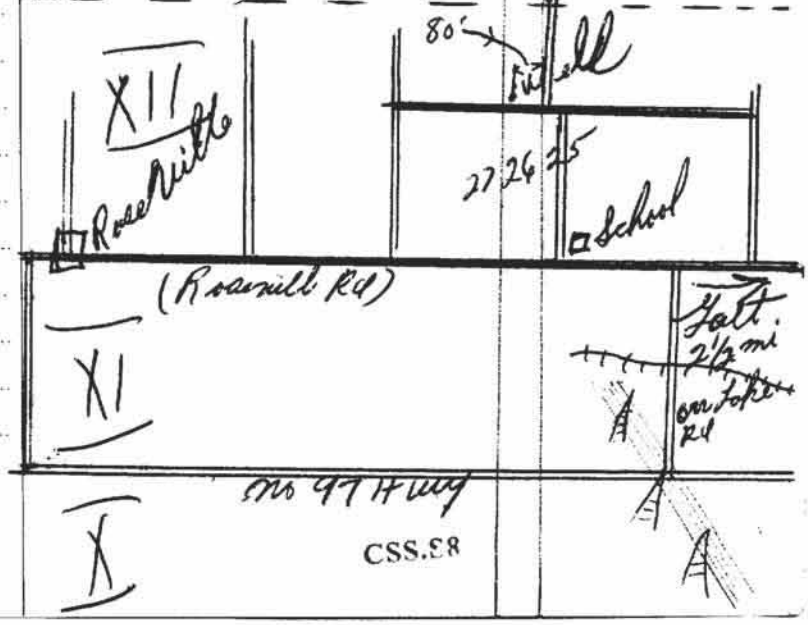
Form 7 15M-60-4138

OWRC COPY

50 ft N 15 Rd
Near 25' lot line

Location of Well

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



MINISTRY OF THE ENVIRONMENT

The Ontario Water Resources Act

WATER WELL RECORD

40 P/8 W

Ontario

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

11 | 6504382 | MUNICIP. 65001 | CON. CON | 12

COUNTY OR DISTRICT: Waterloo | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: N Dumfries City of Cambridge | COM. BLOCK, TRACT, SURVEY, ETC.: Lot 12 Beasley Old Survey | LOT: 29 | CON.: 12

OWNER (SURNAME FIRST): SCHIEDEL CONST. | ADDRESS: P.O. Box 128 Hespeler | DATE COMPLETED: DAY 29 MO Oct YR 75

21 | UTM ZONE: 17 | EASTING: 547320 | NORTHING: 4801590 5 | ELEVATION: 1005 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	dirty sand			0	30
Grey	Sandy clay			30	95
Grey	Hardpan			95	150
Grey	Gravel			150	155

31 | 003062867 | 009520581 | 015021H | 015521I

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0155	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	0155
6¼	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.)
10-13	14-17	
18-21	22-25	
26-29	30-33	

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER | PUMPING RATE: 0050 GPM | DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
004 FEET	150 FEET	1 ☐ PUMPING 2 ☒ RECOVERY	004 FEET	004 FEET	004 FEET	004 FEET

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

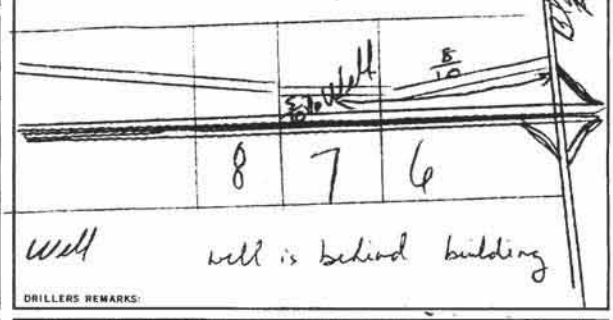
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING: 050 FEET | RECOMMENDED PUMPING RATE: 0040 GPM

GPM. / FT. SPECIFIC CAPACITY

LOCATION OF WELL

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

Well is at a new large steel building, 6 indoor tennis courts property is against Hwy #401 there is sign on Rd on north side opp 3/4 mile W of DOON



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: 07

1 ☐ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☒ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; ☐ OTHER TENNIS COURTS; ☐ 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: Wesley Packhorn | LICENCE NUMBER: 4208

ADDRESS: RR2 Ancaster

NAME OF DRILLER OR BORER: Wesley Packhorn | LICENCE NUMBER: 4208

SIGNATURE OF CONTRACTOR: Wesley Packhorn | SUBMISSION DATE: DAY 29 MO. Oct YR 75

OFFICE USE ONLY

DATA SOURCE 1 | CONTRACTOR 4208 | DATE RECEIVED 30 01 76

DATE OF INSPECTION: June 23/77 | INSPECTOR: EF

REMARKS:

P

WI

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 MOE 07-091

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 — 6507252 — MUNICIP 65001 — CON. CON 12

COUNTY OR DISTRICT: [redacted]
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: N DUMFRIES
CON. BLOCK, TRACT, SURVEY, ETC.: XII
LOT: 30
DATE COMPLETED: DAY 22 MO AUG YR 91
[redacted] RR#1 AYR ONT N0B1E0
ELEVATION: BC: BASIN CODE:

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
BROWN	STONES	BOULDERS, SAND	LOOSE	0	22
~~GREY BROWN~~ GREY	CLAY	STONES	HARD	22	30
BROWN	STONES	SAND BOULDERS	LOOSE	30	40
BROWN	GRAVEL		COARSE,	40	48

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
48	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
6 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	48
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	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.)

71 PUMPING TEST

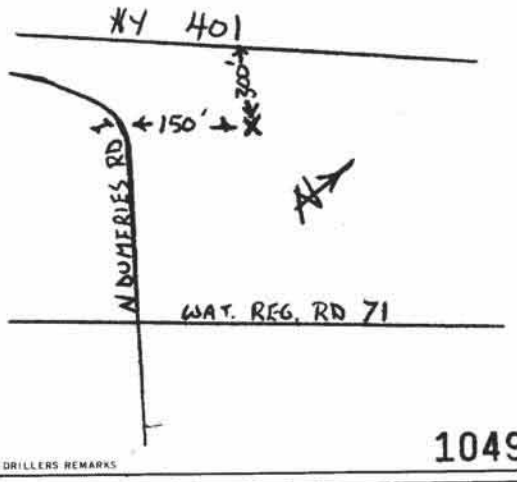
PUMPING TEST METHOD: 1 ☒ AIR 2 ☐ BAILER
PUMPING RATE: 10 GPM
DURATION OF PUMPING: 1 HOURS
STATIC LEVEL: 21 FEET
WATER LEVEL END OF PUMPING: 30 FEET
WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY

15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
21 FEET	— FEET	FEET	FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: 35 FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 35 FEET
RECOMMENDED PUMPING RATE: 10 GPM

LOCATION OF WELL

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



DRILLERS REMARKS: 104969

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: McLAUGHLIN WATER WELLS
WELL CONTRACTOR'S LICENCE NUMBER: 3518
ADDRESS: BOX 51 BRESLAU, ONT, N0B1M0
NAME OF WELL TECHNICIAN: DON McLAUGHLIN
WELL TECHNICIAN'S LICENCE NUMBER: T0349
SIGNATURE OF TECHNICIAN/CONTRACTOR: R. McLaughlin
SUBMISSION DATE: DAY 23 MO 09 YR 91

MINISTRY OF THE ENVIRONMENT COPY

OFFICE USE ONLY

DATA SOURCE
CONTRACTOR: 3518
DATE RECEIVED: FEB 27 1992
DATE OF INSPECTION
INSPECTOR
REMARKS: CSS.ES

FORM NO. 0506 (11/86) FORM 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 | 6507550 | MUNICIP 6500.1 | CON. CON. 1 1 2

COUNTY OR DISTRICT	TOWNSHIP BOROUGH CITY TOWN VILLAGE	CON BLOCK TRACT SURVEY ETC	LOT
[redacted]	N. Dumfries	XII	27

RR#2 Cambridge Ontario

DATE COMPLETED: DAY 31 MO Aug YR 93

RNG | 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
Brown	clay	gravel		0	20
Grey	silt	clay		20	60
Grey	sand	silt		60	115
Grey	gravel	sand & stones		115	124

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
120	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	DEPTH - FEET TO
6 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	188	0	120
5	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	Screen 2 Fitting	115	124
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
40	6 INCHES	3 FEET

MATERIAL AND TYPE: Stainless Steel

DEPTH TO TOP OF SCREEN: 120 FEET

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ AIR 2 ☐ BAILER	75 GPM	2 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
10 FEET	124 FEET		10 FEET	10 FEET	10 FEET	10 FEET

IF FLOWING GIVE RATE: GPM

PUMP INTAKE SET AT: FEET

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

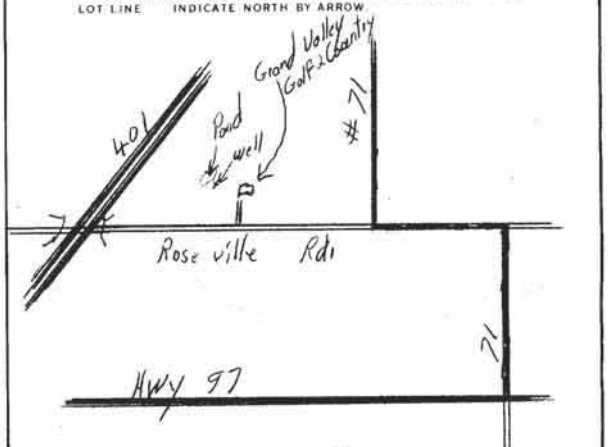
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP

RECOMMENDED PUMP SETTING: 50 FEET

RECOMMENDED PUMPING RATE: 50 GPM

LOCATION OF WELL

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



DRILLERS REMARKS

124248

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: Packham Well Drilling Inc. | WELL CONTRACTOR'S LICENCE NUMBER: 4207

ADDRESS: RR# 2 Ancaster Ont.

NAME OF WELL TECHNICIAN: Mervyn Packham | WELL TECHNICIAN'S LICENCE NUMBER: 10056

SIGNATURE OF TECHNICIAN / CONTRACTOR: Mervyn Packham | SUBMISSION DATE: DAY 31 MO Aug YR 93

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR: 4207 | DATE RECEIVED: JAN 04 1994

DATE OF INSPECTION | INSPECTOR

REMARKS: CSS.ES

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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 | 6507763 | MUNICIP 6500.1 | CON. C.O.N. | 12

COUNTY OR DISTRICT: [redacted] | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: [redacted]fries Twp. | CON. BLOCK, TRACT, SURVEY, ETC.: Con. 12 | LOT: 31

[redacted]. 2, Cambridge, Ontario N1R 5S3 | DATE COMPLETED: DAY 4 MO Jan. YR 95.

RNG | 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
	Topsoil			0	1
Brown	Sand	Gravel	Soft	1	16
Brown	Sand	Silt, Clay	Soft	16	28
Grey	Sand		Soft	28	34
Grey	Clay		Hard	34	80

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
34	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	DEPTH - FEET TO
6	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	31-8
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE-SLOT NO.	DIAMETER	LENGTH
# 8 slot	5.75 INCHES	3 FEET

MATERIAL AND TYPE: Stamless Steel Telescope | DEPTH TO TOP OF SCREEN: 31 FEET

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER | PUMPING RATE: 8 GPM | DURATION OF PUMPING: 1 HOURS ___ MINS

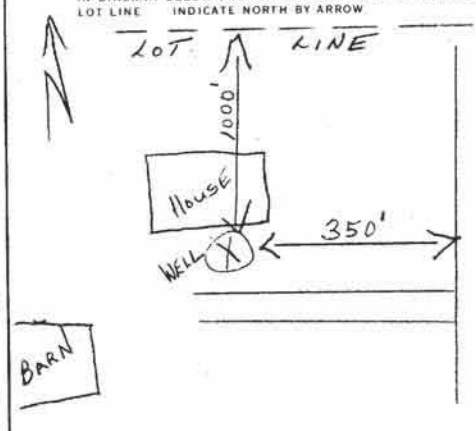
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
9 FEET	16 FEET	10 FEET	9 FEET	9 FEET	9 FEET

IF FLOWING, GIVE RATE: ___ GPM | PUMP INTAKE SET AT: 26 FEET | WATER AT END OF TEST: 1 ☐ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☐ DEEP | RECOMMENDED PUMP SETTING: 26 FEET | RECOMMENDED PUMPING RATE: 6 GPM

LOCATION OF WELL

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



DRILLERS REMARKS: 146022

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: Davidson Well Drilling Limited | WELL CONTRACTOR'S LICENCE NUMBER: 1737

ADDRESS: Box 486, Wingham, Ontario. N0G 2W0

NAME OF WELL TECHNICIAN: G. Reavie | WELL TECHNICIAN'S LICENCE NUMBER: T0156

SIGNATURE OF TECHNICIAN/CONTRACTOR: D. F. DAVIDSON / Per: J. C. Davidson | SUBMISSION DATE: DAY 23 MO Jan. YR 95.

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR: 1737 | DATE RECEIVED: JUL 11 1995

DATE OF INSPECTION | INSPECTOR

REMARKS: CSS.ES

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FORM NO. 0506 (11/86) FORM 9

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

6508392

Municipality 65001 Con. CON 12

County or District: Waterloo
Township/Borough/City/Town/Village: North Dumfries
Con block tract survey, etc.: 12
Lot: 30
Address: RR #2 Cambridge Ont.
Date completed: 11 day Feb month 99 year

21 | Northing | RC | Elevation | RC | Basin Code | ii | iii | iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
Brown	gravel			0	15
Clay	silt			15	40
Sand				40	49

31

32

41 WATER RECORD

Water found at – feet	Kind of water
42-47	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	Depth – feet To
6¼	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	188	0	40
5	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	Screen	37	49
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN: Sizes of opening (Slot No.) 12; Diameter 5 inches; Length 5 feet; Material and type: Stainless Steel; Depth at top of screen 42 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.)

71 PUMPING TEST

Pumping test method: 1 ☐ Pump 2 ☐ Bailer
Pumping rate: 20 GPM
Duration of pumping: 1 Hours 0 Mins
Water levels during: 1 ☐ Pumping 2 ☑ Recovery

Static level	Water level end of pumping	15 minutes	30 minutes	45 minutes	60 minutes
16 feet	49 feet	16 feet	16 feet	16 feet	16 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: feet
Recommended pump rate: GPM

LOCATION OF WELL

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

201117

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: Packham Well Drilling Inc
Well Contractor's Licence No.: 4207
Address: RR #2 Ancaster Ontario
Name of Well Technician: Mervyn Packham
Well Technician's Licence No.: T0058
Signature of Technician/Contractor: Mervyn Packham
Submission date: 11 day Feb mo 99 yr

MINISTRY USE ONLY
Data source
Contractor: 4207
Date received: MAR 15 1999
Date of inspection
Inspector
Remarks: CSS.ES9

0506 (07/94) Front Form 9

2 - MINISTER OF ENVIRONMENT & ENERGY COPY

Ontario Ministry of the Environment

The Ontario Water Resources Act
WATER WELL RECORD

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

11 — 6508867 — Municipality 65001 — Con. CON 12

19-01

County or District: WATERLOO

Township/Borough/City/Town/Village: NORTH DUMFRIES

Con block tract survey, etc.: CON 12

Lot: 26

[redacted]

Address: 1751 WHISTLEBARE RD. CAMBRIDGE. NIR-5S3

Date completed: 16 day 07 month 01 year

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
BROWN	SAND	STONES		0	38
GREY	CLAY			38	80
BROWN	GRAVEL	SAND	COARSE	80	85
			TOTAL DEPTH	85'	
		6" DRIVE SHOE			

41 WATER RECORD

Water found at - feet	Kind of water
85	1 [X] 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	Depth - feet To
6"	1 [X] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [ ] Open hole 5 [ ] Plastic	.188	+1	85
	1 [ ] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [ ] Open hole 5 [ ] Plastic			
	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

[X] Annular space [ ] Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0	25	BENTONITE

71 PUMPING TEST

Pumping test method: 1 [X] Pump 2 [ ] Bailer

Pumping rate: 12 GPM

Duration of pumping: 1 Hours 0 Mins

Static level	Water level end of pumping	Water levels during: 1 [X] Pumping 2 [ ] Recovery			
32 feet	50 feet	15 minutes: 45 feet	30 minutes: 50 feet	45 minutes: 50 feet	60 minutes: 50 feet

If flowing give rate: — GPM

Pump intake set at: — feet

Water at end of test: [X] Clear [ ] Cloudy

Recommended pump type: [ ] Shallow [X] Deep

Recommended pump setting: 55 feet

Recommended pump rate: 10-12 GPM

FINAL STATUS OF WELL

1 [X] 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

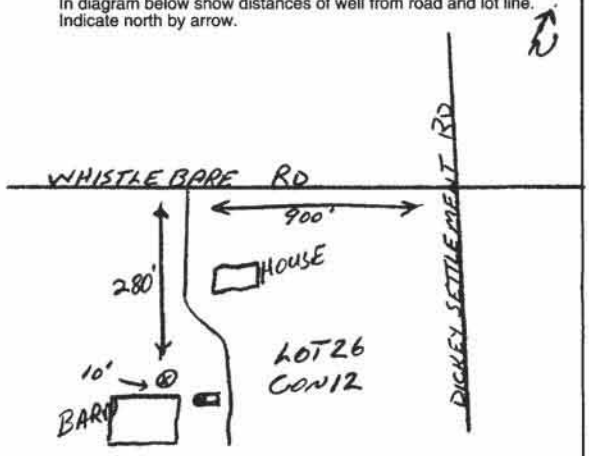
1 [X] Domestic 2 [X] Stock 3 [ ] Irrigation 4 [ ] Industrial 5 [ ] Commercial 6 [ ] Municipal 7 [ ] Public supply 8 [ ] Cooling & air conditioning 9 [ ] Not use 10 [ ] Other

METHOD OF CONSTRUCTION

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

LOCATION OF WELL

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



224155

Name of Well Contractor: GRAHAM WELL DRILLING LTD — Well Contractor's Licence No.: 2336

Address: RR#5 ROCKWOOD, ONT. N0B-2K0

Name of Well Technician: Jim Wilson — Well Technician's Licence No.: T-1924

Signature of Technician/Contractor: Robert H. Graham — Submission date: 30 day 04 mo 01 yr

MINISTRY USE ONLY

Data source: — Contractor: 2336 — Date received: JUN 11 2001

Date of inspection: — Inspector: —

Remarks: —

CSS.ES1

2 - MINISTRY OF THE ENVIRONMENT COPY

0506 (07/00) Front Form 9

Ontario Ministry of the Environment

Well Tag Number A 003434

A 00 34 34

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 65001 CON CON 12 LOT 29

Well Owner's Information and Location of Well Information

[redacted]

Address of Well Location (County/District/Municipality): Waterloo

Township: North Dumfries

Lot: 29

Concession: 12

RR#/Street Number/Name: 1912 Whistle Bare Rd.

City/Town/Village: Cambridge

Site/Compartment/Block/Tract etc.:

GPS Reading: NAD 83 Zone 17 Easting 548003 Northing 4801328

Unit Make/Model: Magellan Blazer12

Mode of Operation: Undifferentiated / Differentiated, specify / Averaged

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Metres To
brown	sand gravel			0	5
grey	gravel	clay		5	17.6
grey	gravel			17.6	18.6

Hole Diameter

Depth From	Metres To	Diameter Centimetres
+.5	18.6	15.9

Water Record

Water found at Metres: 18.6 m

Kind of Water: [X] Fresh [ ] Salty [ ] Gas [ ] Sulphur [ ] Minerals [ ] Other:

[ ] m [ ] Fresh [ ] Salty [ ] Gas [ ] Sulphur [ ] Minerals [ ] Other:

[ ] m [ ] Fresh [ ] Salty [ ] Gas [ ] Sulphur [ ] Minerals [ ] Other:

After test of well yield, water was: [X] Clear and sediment free [ ] Other, specify

Chlorinated [X] Yes [ ] No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Metres To
Casing				
15.9	[X] Steel [ ] Fibreglass [ ] Plastic [ ] Concrete [ ] Galvanized	188	+.5	18.6
	[ ] Steel [ ] Fibreglass [ ] Plastic [ ] Concrete [ ] Galvanized			
	[ ] Steel [ ] Fibreglass [ ] Plastic [ ] Concrete [ ] Galvanized			
Screen				
Outside diam	[ ] Steel [ ] Fibreglass [ ] Plastic [ ] Concrete [ ] Galvanized	Slot No.		
No Casing or Screen				
	[ ] Open hole			

Test of Well Yield

Pumping test method: Pump

Pump intake set at - (metres): 17

Pumping rate - (litres/min): 45

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping: 10.2 metres

Recommended pump type: [ ] Shallow [ ] Deep

Recommended pump depth: 15 metres

Recommended pump rate: 50 (litres/min)

If flowing give rate - (litres/min):

If pumping discontinued, give reason:

	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Static Level		19.9		19.9
1		10.1	1	10
2		10.1	2	19.9
3		10.1	3	19.9
4		10.2	4	19.9
5		10.2	5	19.9
10		10.2	10	19.9
15		10.2	15	19.9
20		10.2	20	19.9
25		10.2	25	19.9
30		10.2	30	19.9
40		10.2	40	19.9
50		10.2	50	19.9
60		10.2	60	19.9

Plugging and Sealing Record

[ ] Annular space [ ] Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	6	Bentonite	1.5

Method of Construction

[ ] Cable Tool [X] Rotary (air) [ ] Diamond [ ] Digging
[ ] Rotary (conventional) [ ] Air percussion [ ] Jetting [ ] Other
[ ] Rotary (reverse) [ ] Boring [ ] Driving

Water Use

[X] Domestic [ ] Industrial [ ] Public Supply [ ] Other
[ ] Stock [ ] Commercial [ ] Not used
[ ] Irrigation [ ] Municipal [ ] Cooling & air conditioning

Final Status of Well

[X] Water Supply [ ] Recharge well [ ] Unfinished [ ] Abandoned, (Other)
[ ] Observation well [ ] Abandoned, insufficient supply [ ] Dewatering
[ ] Test Hole [ ] Abandoned, poor quality [ ] Replacement well

Well Contractor/Technician Information

Name of Well Contractor: Packham Well Drilling Inc,

Well Contractor's Licence No.: 4207

Business Address (Street Number/Name, Township, etc.): R.R. # 2 Ancaster, Ont.

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

Well Technician's Licence No.: T0058

Signature of Technician/Contractor: X [signature]

Date Submitted: 2003 12 24

Location of Well

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

The well is at 1912 Whistle Bare Rd.

Audit No. Z 03518

Date Well Completed: 2003 12 24

Was the well owner's information package delivered? [X] Yes [ ] No

Date Delivered: 2003 12 24

Ministry Use Only

Data Source

Contractor: 4207

Date Received: APR 16 2004

Date of Inspection

Remarks

Well Record Number: 6509627

0506E (09/03)

Contractor's Copy [ ] Ministry's Copy [ ] Well Owner's Copy [ ]

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Ontario Ministry of the Environment

Well Tag Number: A 029255 / A029255

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]

RR#/Street Number/Name: Waterloo

City/Town/Village: North Dumfries

Site/Compartment/Block/Tract etc.: 27 12

GPS Reading: 1316 Dickie Settlement Rd.

NAD: 83 | Zone: 17 | Easting: 548302 | Northing: 4801340

Unit Make/Model: Cambridge

Mode of Operation: ☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Magellan Blazer12 .

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To
brown	sand grave	silt	.	0	20
grey	sand gravel	.	.	20	30
grey	sand gravel	.	.	30	33.5
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.

Hole Diameter

Depth From	Metres To	Diameter Centimetres
+2.5	32	15.9
31	33.5	13

Water Record

Water found at ___ Metres / Kind of Water

33 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				
15.9	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	188	+2.5	23.4
13	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Screen & Fittings 188	31	33.5
.	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized		.	.
Screen				
Outside diam	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
13.5		25	31.4	32.6
No Casing or Screen				
.	☐ Open hole		.	.

Test of Well Yield

Pumping test method: Pump

Pump intake set at - (metres): 32

Pumping rate - (litres/min): 54

Duration of pumping: 1 hrs 0 min

Final water level end of pumping: 13.4 metres

Recommended pump type: ☐ Shallow ☐ Deep

Recommended pump depth: 30 metres

Recommended pump rate: 60 (litres/min)

If flowing give rate - (litres/min):

If pumping discontinued, give reason:

	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Static Level		11.7		11.7
1	1	12.8	1	11.8
2	2	13.1	2	11.7
3	3	13.2	3	11.7
4	4	13.2	4	11.7
5	5	13.2	5	11.7
10	10	13.2	10	11.7
15	15	13.3	15	11.7
20	20	13.3	20	11.7
25	25	13.3	25	11.7
30	30	13.3	30	11.7
40	40	13.4	40	11.7
50	50	13.4	50	11.7
60	60	13.4	60	11.7

Plugging and Sealing Record

☑ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	6	Bentonite	1.5
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

Method of Construction

☐ Cable Tool ☑ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

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

Final Status of Well

☑ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Well Contractor/Technician Information

Name of Well Contractor: Packham Well Drilling Inc.

Well Contractor's Licence No.: 4207

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

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

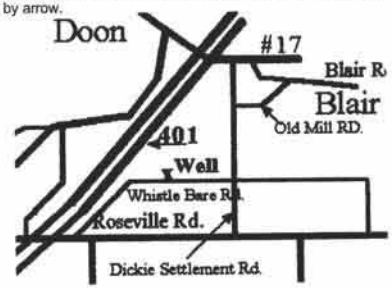
Well Technician's Licence No.: T0058

Signature of Technician/Contractor: X Mervyn Packham

Date Submitted: YYYY 2006 MM 03 DD 27

Location of Well

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



Audit No.: Z 42719

Date Well Completed: YYYY 2006 MM 03 DD 24

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

Date Delivered: YYYY 2006 MM 03 DD 24

Ministry Use Only

Data Source

Contractor: 4207

Date Received: APR 0 6 2006

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

Ontario Ministry of the Environment

Well Tag No. A 070624 (w)

A070624

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

Well Owner's Information

First Name	Last Name	E-mail Address	
	Sage Campgrounds Inc.	[redacted]	☐ Well Constructed by Well Owner

Mailing Address (Street Number/Name, RR)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
1912 Whistle Bare Rd. RR # 2	Cambridge	Ontario	N1R 5S3	519 623 2463

Part A Construction and/or Major Alteration of a Well

Address of Well Location (Street Number/Name, RR)	Township	Lot	Concession
1912 Whistle Bare Rd.	North Dumfries	29	12

County/District/Municipality	City/Town/Village	Province	Postal Code
Waterloo		Ontario	N1R 5S3

UTM Coordinates	Zone	Easting	Northing	GPS Unit Make	Model	Mode of Operation
NAD 8 3	17	547727	4801751	Magellan	Blaze12	☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

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

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	Depth (Metres) To
brown	silt	sand gravel		0	6
grey	gravel			6	6.7

Annular Space/Abandonment Sealing Record

Depth Set at (Metres) From	To	Type of Sealant Used (Material and Type)	Volume Placed (Cubic Metres)
0	6	Bentonite	.3

Method of Construction

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

Water Use

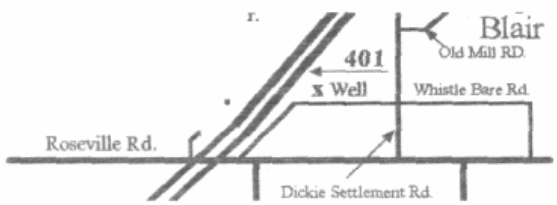
☑ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify _____

Status of Well

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

Location of Well

Please provide a map below showing:
- all property boundaries, and measurements sufficient to locate the well in relation to fixed points,
- an arrow indicating the North direction
- detailed drawings can be provided as attachments no larger than legal size (8.5" by 14")
- vidigital pictures of inside of well can also be provided



Date Well Completed (yyyy/mm/dd)	Was the well owner's information package delivered?	Date the Well Record and Package Delivered to Well Owner (yyyy/mm/dd)
2008/04/09	☑ Yes ☐ No	2008/04/09

Well Contractor and Well Technician Information

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

Business Address (Street No./Name, number, RR)	Municipality
1235 Trinity Road	Ancaster

Province	Postal Code	Business E-mail Address
Ontario	L9G3L1	packhamwelldrilling@gmail.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
905 648 2909	Packham Mervyn

Well Technician's Licence No.	Signature of Technician	Date Submitted (yyyy/mm/dd)
0058	Mervyn Packham	2008/06/19

Results of Well Yield Testing

Check box if after test of well yield, water was:
☑ Clear and sand free
☐ Cannot develop to sand-free state

If pumping discontinued, give reason:

Pumping test method: Pump

Pump intake set at (Metres): 6

Pumping rate (Litres/min): 80

Duration of pumping: _____ hrs + _____ min

Final water level end of pumping (Metres): 2.7

Recommended pump type: ☐ Shallow ☐ Deep

Recommended pump depth: 6 Metres

Recommended pump rate (Litres/min): 100

If flowing give rate (Litres/min):

Draw Down Time (Min)	Draw Down Water Level (Metres)	Recovery Time (Min)	Recovery Water Level (Metres)
Static Level	2.6	Static Level	
1	2.7	1	2.6
2	2.7	2	2.6
3	2.7	3	2.6
4	2.7	4	2.6
5	2.7	5	2.6
10	2.7	10	2.6
15	2.7	15	2.6
20	2.7	20	2.6
25	2.7	25	2.6
30	2.7	30	2.6
40	2.7	40	2.6
50	2.7	50	2.6
60	2.7	60	2.6

Water Details

Water found at Depth	Kind of Water
6.7 Metres ☐ Gas	☑ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Casing Used

☐ Galvanized ☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete

Screen Used

☐ Galvanized ☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete

No Casing and Screen Used

☐ Open Hole

Disinfected? ☑ Yes ☐ No

Casing and Well Details

Diameter of the Hole (Centimetres): 168 mm

Depth of the Hole (Metres): 6.7

Wall Thickness (Metres): 48 mm

Inside Diameter of the Casing (Metres): 159 mm

Depth of the Casing (Metres): 6.7

Ministry Use Only

Audit No.	Well Contractor No.
Z 79379	
Date Received (yyyy/mm/dd)	Date of Inspection (yyyy/mm/dd)
OCT 30 2008	
Remarks	

0506E (11/2006) Ministry's Copy

76-10

Ontario Ministry of the Environment

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. (Pl A102255

A102255

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1751 WHISTLEBARE RD.	NORTH DUMFRIES	26	12
County/District/Municipality	**City/Town/Village**	**Province**	**Postal Code**
WATERLOO	CAMBRIDGE	Ontario	N1R5S3
UTM Coordinates Zone / Easting / Northing	**Municipal Plan and Sublot Number**	**Other**	
NAD 83 / 17 548874 4801334			

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
BROWN	SAND	STONES		0	10
BROWN	SAND	GRAVEL		10	40
GREY	CLAY	SAND	FINE	40	155
BROWN	SAND		COARSE	155	160
BROWN	GRAVEL	SAND	COARSE	160	163
			TOTAL DEPTH	163 FT	

Annular Space

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

Method of Construction

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

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
6'/8	STEEL	.188	+2	163

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

Water Details

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

Hole Diameter

Depth (m/ft) From	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): 90 FT

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

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 79 FT

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

Recommended pump depth (m/ft): 90 FT

Recommended pump rate (l/min / GPM): 10-12 GPM.

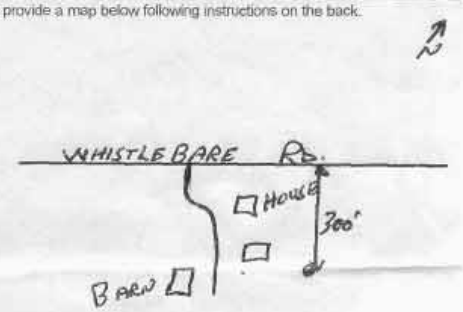
Well production (l/min / GPM): 12 GPM

Disinfected? ☒ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	28'			
1	37	1	69	
2	45	2	60	
3	53	3	52	
4	59	4	46	
5	63	5	40	
10	67	10	32	
15	71	15	28	
20	74	20	28	
25	76	25	28	
30	78	30	28	
40	79	40	28	
50	79	50	28	
60	79	60	28	

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.
JIM WILSON WELL DRILLING LTD	7385

Business Address (Street Number/Name)	Municipality
551 EBYCREST RD.	WATERLOO

Province	Postal Code	Business E-mail Address
ON	N2T4G8	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5196482412	WILSON JIM

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
T1924	Jim Wilson	2010/11/30

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	2010/11/04	2010/11/04

Ministry Use Only

Audit No. z115525

DEC 10 2010 Received

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Ministry's Copy

Ontario — Ministry of the Environment

Measurements recorded in: ☒ Metric ☐ Imperial

Well Tag No. (Place Sticker and/or Print Below): A104417

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	603489 Ontario INC		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
1316 Dickie Settlement Rd	Waterloo	ON	N3H4R8	5196502327

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1850 Whistle Bare Rd	North Dumfries	Pt 27	12

County/District/Municipality	City/Town/Village	Province	Postal Code
Waterloo		Ontario	N3H4R8

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	548532	4801220		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	sand Clay Gravel			0	14.93
Gray	Clay & sand			14.93	24.07
Gray	Clay sand & Gravel			24.07	46.02
	Gravel & stones			46.02	46.32
Gray	Clay & Bolders			46.32	58.82
Dark Gray	limestone			58.82	60.96
			DEPTH 200'		

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	7.30	Bentonite Grout	.35

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
15.9	steel	.48	+.91	60.04
15.6	open hole		60.04	60.96

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	60.04	22.8
60.04	60.96	15.6

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): 36.57

Pumping rate (l/min / GPM): 54.55

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 29.06

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

Recommended pump depth (m/ft): 36.57

Recommended pump rate (l/min / GPM): 28

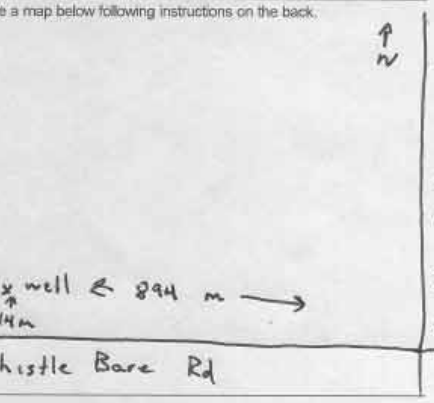
Well production (l/min / GPM):

Disinfected? ☒ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	14.18		29.06	
1	16.60	1	26.60	
2	17.72	2	24.58	
3	19.08	3	22.80	
4	20.10	4	21.30	
5	21.04	5	19.94	
10	23.93	10	15.58	
15	25.70	15	14.34	
20	26.56	20	14.18	
25	27.29	25	14.18	
30	27.08	30	14.18	
40	28.32	40	14.18	
50	28.78	50	14.18	
60	29.06	60	14.18	

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.
Well Initiatives	7221

Business Address (Street Number/Name)	Municipality
15 Townline	Orangeville

Province	Postal Code	Business E-mail Address
ON	L9W3R4	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5197630666	Losch Kim

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
7927	Kim Losch	2011/01/31

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	2011/01/14	2011/01/04

Ministry Use Only

Audit No. Z125317

Received FEB 04 2011

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Measurements recorded in: [X] Metric [ ] Imperial

Well Tag No. (Place Sticker and/or Print Below): A118975

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	Well Constructed by Well Owner
1226842	Ontario Inc.		[ ]

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
1056 Whistle Bare Rd.	Cambridge	ON	N1R5S3	5196234184

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1194 Kings Rd.	North Dumfries	31	12

County/District/Municipality	City/Town/Village	Province	Postal Code
Regional Municipality of Waterloo	Roseville	Ontario	N1R5S3

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	570510	4800718		

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
fill				0	1.21
Brown	sand + clay			1.21	5.48
Grey	Clay			5.48	25.60
Grey	Clay & stones			25.60	52.42
Brown	limestone			52.42	53.64

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	53.03	Neat Cement	1.01

Method of Construction

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

Well Use

[ ] Public [ ] Commercial [ ] Not used
[ ] Domestic [ ] Municipal [ ] Dewatering
[X] 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
15.9	steel	.148	+1.06	53.03
	open hole		53.03	53.64

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth (m/ft)	Kind of Water	Hole Diameter Depth From (m/ft)	Hole Diameter Depth To (m/ft)	Hole Diameter (cm/in)
53.64 (m/ft) [ ] Gas	Kind of Water: [ ] Fresh [X] Untested [ ] Other, specify	0	53.03	22.8
(m/ft) [ ] Gas	Kind of Water: [ ] Fresh [ ] Untested [ ] Other, specify	53.03	53.64	15.6
(m/ft) [ ] Gas	Kind of Water: [ ] Fresh [ ] Untested [ ] Other, specify			

Results of Well Yield Testing

After test of well yield, water was:
[ ] Clear and sand free
[ ] Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft)

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): 132

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

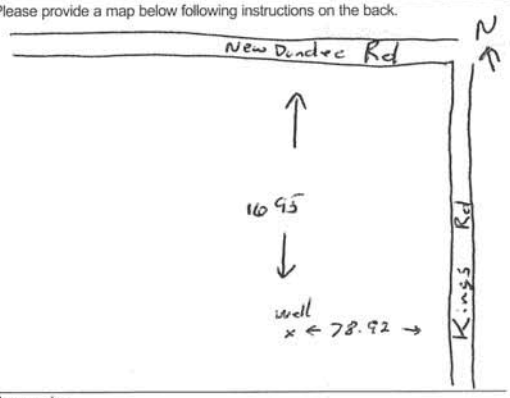
Well production (l/min / GPM)

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.
Well Initiatives Ltd	7221

Business Address (Street Number/Name)	Municipality
15 Townline Rd	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)
5198468289	Losch, Kim

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
9217	Kim Losch	2012 10 29

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
[ ] Yes [X] No		Audit No. Z159336
	Date Work Completed: 2012 10 22	Received NOV 22 2012

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Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. (Place Sticker and/or Print Below): A161547

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	Whistle Bear Golf Club		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
1316 Dickie Settlement Rd	Cambridge	ON	N3H4R8	5196502327

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1316 Dickie Settlement Rd	North Dumfries	25	12

County/District/Municipality	City/Town/Village	Province	Postal Code
Waterloo	Cambridge	Ontario	N3H4R8

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	548928	4801992		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Coarse Sand	Gravel	Packed	0	68
Brown	Clay	Silt	Soft	68	84
Brown	Gravel	Medium Sand	Cemented	84	128
Grey	Clay	Stones		128	137
Grey	Limestone		Weathered	137	139
Grey	Limestone		Porous	139	164

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	68	5% Bentonite Cement	43
68	139	Neat Cement	29

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6.625	Stainless Steel	0.188	+3	139
6.25	Open Hole		139	164

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	Kind of Water	
162 (m/ft) ☐ 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	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	68	10.75
68	139	9.75
139	164	6.25

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): 72

Pumping rate (l/min / GPM): 25

Duration of pumping: ____ hrs + ____ min

Final water level end of pumping (m/ft): 22

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

Recommended pump depth (m/ft): 75

Recommended pump rate (l/min / GPM): 25

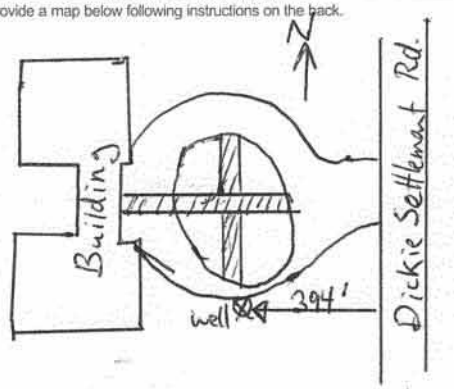
Well production (l/min / GPM): 35

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	14		22
1	15	1	19
2	15	2	18
3	16	3	16
4	16	4	15
5	17	5	14
10	19	10	14
15	20	15	14
20	22	20	14
25	22	25	
30	22	30	
40	22	40	
50	22	50	
60	22	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.
Contract Drilling Professionals Inc.	7161

Business Address (Street Number/Name)	Municipality
7 Wilson Ave Burford	Brant

Province	Postal Code	Business E-mail Address
ON	N0E1A0	corey@cdpgeothermal.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5194492356	Paterek, Corey

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
2989	Corey Paterek	2015 03 10

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
☐ Yes ☒ No		Audit No Z 185169
	Date Work Completed: 2014 09 24	Received JUL 14 2015

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Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☐ Imperial

Well Tag No. (Place Sticker and/or Print Below): 219397 Tag#: A 219397

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	WHISLE BEAR CAMP GROUNDS		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
1912 WHISTLE BARE RD	CAMBRIDGE	ONT	N1R5S3	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
	NORTH DUMFRIES	28	12

County/District/Municipality	City/Town/Village	Province	Postal Code
REGION OF WATERLOO		Ontario	

UTM Coordinates Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3 17	547722	4801980		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
BROWN	SILTY SAND			0	7ft
BROWN	SAND GRAVEL			7ft	46ft
GRAY	CLAY			46ft	76ft
GRAY	SAND FINE			76ft	94ft
GRAY	SAND MED			94ft	100ft

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	90ft	BENTONITE SLURRY	70gal

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
6¼	STEEL	.188	0	96ft

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
6¼	S.S	18	96ft	100ft

Status of Well

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

Water Details

Water found at Depth (m/ft)	Kind of Water	Gas	Other, specify
96-100ft	☒ Fresh ☐ Untested	☐	
	☐ Fresh ☐ Untested	☐	
	☐ Fresh ☐ Untested	☐	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	100ft	8.75in

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): 40ft

Pumping rate (l/min / GPM): 80gpm

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 20ft

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft): 40ft

Recommended pump rate (l/min / GPM): 60gpm

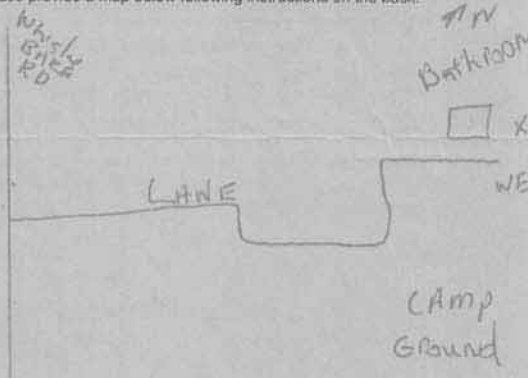
Well production (l/min / GPM)

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	0		
1		1	
2		2	
3		3	
4		4	
5	19ft	5	3ft
10	20ft	10	1ft
15		15	0ft
20		20	
25		25	
30		30	
40		40	
50		50	
60	20ft	60	0ft

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.
KEITH LANG WELL DRILLING INC	7154

Business Address (Street Number/Name)	Municipality	Province	Postal Code	Business E-mail Address
251 ELDON ST GODERICH		ONT	N7A3R9	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
	KEITH LANG

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
T446	K. Lang	

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No		2017 10 12

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Received

0506E (2014/11)

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Ontario Ministry of the Environment

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 ____ of ____

Well Owner's Information

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

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
1912 WHISTLE BARE RD	CAMBRIGE	ONT	N1R5S3	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
SAME	N. DUMFRIES	28	12

County/District/Municipality	City/Town/Village	Province	Postal Code
WATERLOO	CAMBRIGE	Ontario	N1R5S3

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	547728	4801752		

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
	PREVOUS BORED WELL			0	12 1/2

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	6	FILL	
6	7	BENTINITE CHIPS	
7	9	SLURRY	
9	9 1/2	BENTINITE PEA CHIP STONE	
9 1/2	12 1/2	PEA STONE	

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 DRILLED WELL ☐ Other, specify

Water Details

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

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)

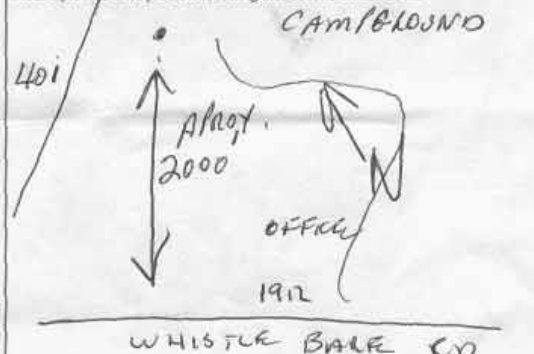
Well production (l/min / GPM)

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.



Comments:

Well Contractor and Well Technician Information

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

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

Province	Postal Code	Business E-mail Address
ONT	N3T6L4	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5197570041	BAETZ JOHN

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
333		

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No		2010 08 06

Ministry Use Only

Audit No. Z111995

Received OCT 08 2010

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APPENDIX C
Borehole Logs, Test Pit Logs & Grain Size Analyses

Ground Elevation: *300.48 m*

Borehole Number: **BH-1-12**

Job N°: *P-0000145-0-00-400*

Drill Date: *2012-04-24*

Project: *Sage Campground - Sewage Systems Assessment*

Field Tech: *R.McMillan*

Location: *1912 Whistle Bare Road, Township of North Dumfries, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		300.48			
	FILL: dark brown sandy silt (topsoil), moist		0.00 / 299.72			
	trace fine gravel		0.76 / 299.57			
1	***TOPSOIL:*** dark brown sandy silt, moist		0.91 / 298.96	SS-1	3-4 4	8
	some black peat layers, WTPL		1.52 / 298.65	SS-2	3-3 4	7
2	***SAND:*** loose to very loose brown fine to coarse sand, some silt, saturated		1.83	SS-3	2-2 2	4
3				SS-4	1-1 2	3
4			295.91			
	compact		4.57 / 295.45	SS-5	5-8 8	16
5	Borehole terminated at 5.03 m		5.03			
6						

Dynamic Cone: 20 40 60 80

Std Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200

Initial / Remold

Shear Strength (FV) kPa: 50 100 150 200

WP WL

Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

el. 298.72 m 2012-04-27

protective cover and concrete

bentonite seal

sand pack

50 mm pipe
1.52 m slotted screen

native cave

Reviewed by: *D.Morlock*

Drafted by: *S.Meteer*

Sheet: *1 of 1*

Notes: *Top of pipe elevation = 301.27 m*

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Vertical Scale = 1 : 40.0

EQ-09-Ge-72 R.1 18.02.2011

Ground Elevation: *301.19 m*

Borehole Number: **BH-2-12**

Job N°: *P-0000145-0-00-400*

Drill Date: *2012-04-24*

Project: *Sage Campground - Sewage Systems Assessment*

Field Tech: *R.McMillan*

Location: *1912 Whistle Bare Road, Township of North Dumfries, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		301.19			
	FILL: dark brown sandy silt (topsoil), moist		0.00 301.11 0.08			
	SAND AND GRAVEL: compact brown sand and gravel, trace silt, damp			SS-1	3-7 10	17
				SS-2	7-13 14	27
			298.90 2.29			
	SAND: compact brown fine to coarse sand, some gravel, damp		298.75 2.44	SS-3	5-8 8	16
	saturated			SS-4	7-10 9	19
				SS-5	5-5 5	10
				SS-6	6-9 10	19
			295.40 5.79			
	Borehole terminated at 5.79 m					

Dynamic Cone — Std Penetration — 20 40 60 80

Shear Strength (PP) kPa — Initial / Remold — Shear Strength (FV) kPa — 50 100 150 200

WP WL — Water Content (%) — 10 20 30

Groundwater Observations and Standpipe Details

el. 298.73 m 2012-04-27

protective cover and concrete

bentonite seal

sand pack

50 mm pipe
1.52 m slotted screen

native cave

Reviewed by: *D.Morlock*

Drafted by: *S.Meteer*

Sheet: *1 of 1*

Notes: *Top of pipe elevation = 301.92 m*

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Vertical Scale = 1 : 40.0

EQ-09-Ge-72 R.1 18.02.2011

Ground Elevation: *299.68 m*

Borehole Number: **BH-3-12**

Job N°: *P-0000145-0-00-400*

Drill Date: *2012-04-24*

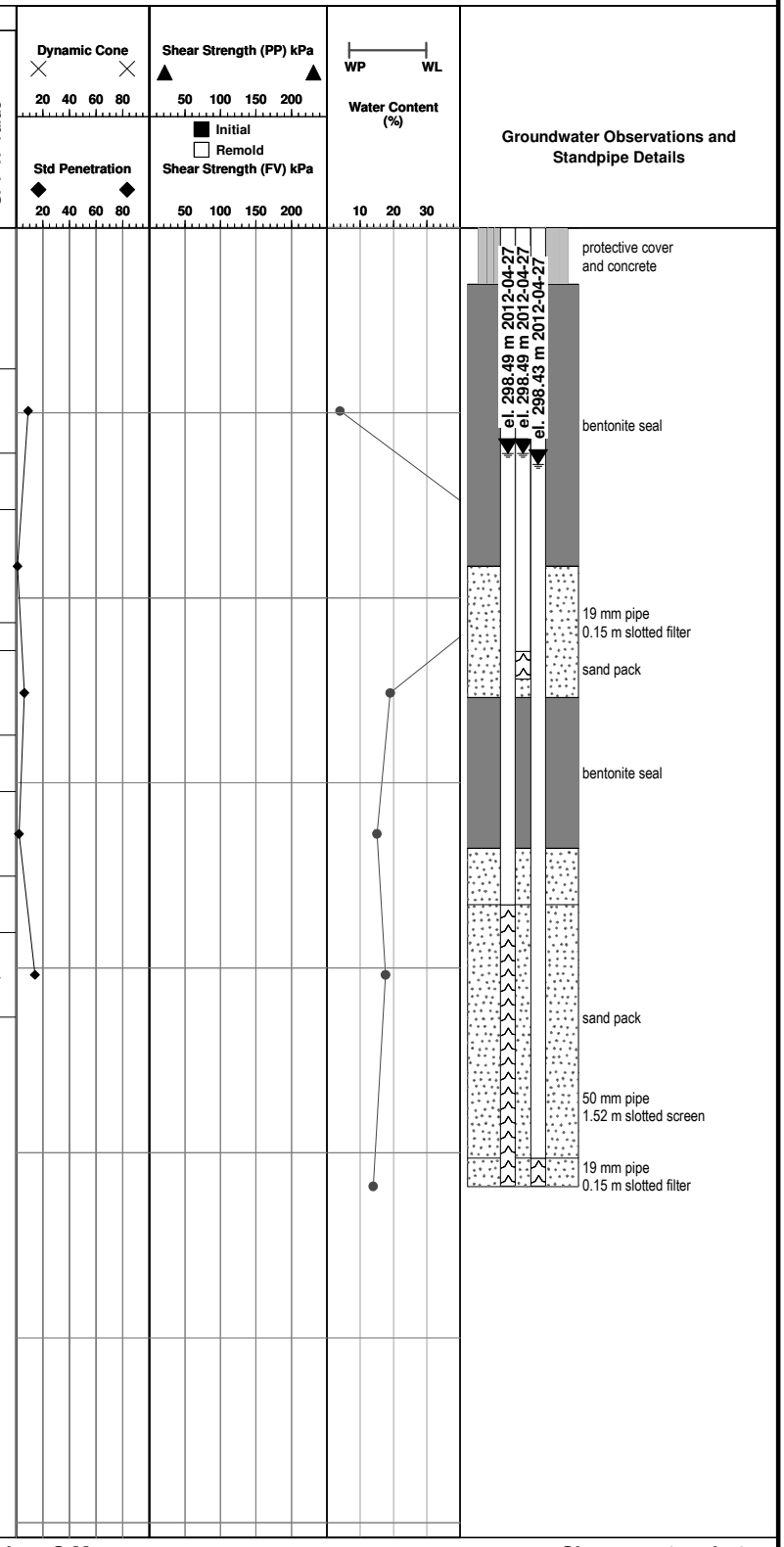
Project: *Sage Campground - Sewage Systems Assessment*

Field Tech: *R.McMillan*

Location: *1912 Whistle Bare Road, Township of North Dumfries, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		299.68			
	FILL: dark brown sandy silt, moist		0.00 / 299.60 / 0.08			
1	loose brown fine to coarse sand, some silt, damp			SS-1	4-6 3	9
			298.46			
	PEAT: very soft black amorphous peat, WTPL		1.22			
			297.85	SS-2	0-0 1-2	1
2	***MARL:*** very soft grey marl, shells, WTPL		1.83			
			297.39			
	SAND: very loose to loose brown fine to coarse sand, saturated		2.29	SS-3	3-3 3	6
3			296.63			
	some silty sand layers		3.05	SS-4	2-1 1	2
			296.02			
	compact		3.66	SS-5	4-6 8	14
4						
5				SS-6		
			294.35			
	Borehole terminated at 5.33 m		5.33			
6						



Reviewed by: *D.Morlock*

Drafted by: *S.Meteer*

Sheet: *1 of 1*

Notes: *Top of pipe elevation = 300.54 m (50 mm), 300.56 m (19 mm upper), 300.52 m (19 mm lower)*

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Vertical Scale = 1 : 40.0

EQ-09-Ge-72 R.1 18.02.2011

Ground Elevation: *298.95 m*

Borehole Number: **BH-4-12**

Job N°: *P-0000145-0-00-400*

Drill Date: *2012-04-24*

Project: *Sage Campground - Sewage Systems Assessment*

Field Tech: *R.McMillan*

Location: *1912 Whistle Bare Road, Township of North Dumfries, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		298.95			
	FILL: brown silt, some sand, moist		0.00			
			298.04	SS-1	/WH	
1	***PEAT:*** very soft black amorphous peat, WTPL		0.91			
			297.43	SS-2	/WH	
	MARL: very soft light beige marl, saturated		1.52			
2				SS-3	/WH	
				SS-4	/WH	
3			295.37			
	SAND: loose brown fine to coarse sand, trace silt, saturated		3.58	SS-5	1-5 5	10
4				SS-6	3-3 3	6
			293.92			
5	Borehole terminated at 5.03 m		5.03			
6						

Dynamic Cone: 20 40 60 80

Std Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200

Initial / Remold

Shear Strength (FV) kPa: 50 100 150 200

WP WL

Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

protective cover and concrete

el. 298.34 m 2012-04-27

bentonite seal

sand pack

50 mm pipe
1.52 m slotted screen

native cave

Reviewed by: *D.Morlock*

Drafted by: *S.Meteer*

Sheet: *1 of 1*

Notes: *Top of pipe elevation = 299.70 m*

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Vertical Scale = 1 : 40.0

EQ-09-Ge-72 R.1 18.02.2011

Ground Elevation: *298.98 m*

Borehole Number: **BH-5-12**

Job N°: *P-0000145-0-00-400*

Drill Date: *2012-04-24*

Project: *Sage Campground - Sewage Systems Assessment*

Field Tech: *R.McMillan*

Location: *1912 Whistle Bare Road, Township of North Dumfries, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		298.98			
	TOPSOIL: dark brown sandy silt,moist		0.00 / 298.90 / 0.08			
	SAND: compact brown fine to coarse sand, trace silt and fine gravel, damp			SS-1	3-6 7	13
	saturated		297.76 / 1.22			
				SS-2	5-7 8	15
	loose		296.69 / 2.29			
				SS-3	2-2 4	6
				SS-4	2-4 6	10
	Borehole terminated at 3.81 m		295.17 / 3.81			

Dynamic Cone: 20 40 60 80
Std Penetration: 20 40 60 80
Shear Strength (PP) kPa: 50 100 150 200
Initial / Remold
Shear Strength (FV) kPa: 50 100 150 200
WP WL
Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

el. 297.64 m 2012-04-27

protective cover and concrete

bentonite seal

native cave
50 mm pipe
1.52 m slotted screen

Reviewed by: *D.Morlock*

Drafted by: *S.Meteer*

Sheet: *1 of 1*

Notes: *Top of pipe elevation = 299.71 m*

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Vertical Scale = 1 : 40.0

EQ-09-Ge-72 R.1 18.02.2011

Ground Elevation: *298.48 m*

Borehole Number: **BH-6-12**

Job N°: *P-0000145-0-00-400*

Drill Date: *2012-04-24*

Project: *Sage Campground - Sewage Systems Assessment*

Field Tech: *R.McMillan*

Location: *1912 Whistle Bare Road, Township of North Dumfries, Ontario*

Drill Method: *Hollow Stem Auger*

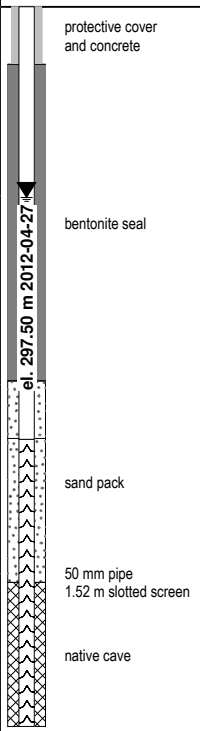
Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		298.48			
	FILL: brown sandy silt, some gravel, moist		0.00 / 297.57			
1	***PEAT:*** soft black amorphous peat		0.91 / 296.58	SS-1	1-1 1	2
				SS-2	/WH	
2	***MARL:*** very soft grey marl, WTPL		1.91 / 296.19			
	SAND: loose grey fine to coarse sand, trace silt and fine gravel, saturated		2.29	SS-3	3-2 9	11
3				SS-4	1-4 4	8
				AS-5		
	Borehole terminated at 3.81 m		294.67 / 3.81			
4						
5						
6						

Dynamic Cone — Std Penetration: 20 40 60 80

Shear Strength (PP) kPa — Initial / Remold — Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): WP WL; 10 20 30

Groundwater Observations and Standpipe Details



Reviewed by: *D.Morlock*

Drafted by: *S.Meteer*

Sheet: *1 of 1*

Notes: *Top of pipe elevation = 299.16 m*

LVM

Ground Elevation: *297.96 m*

Borehole Number: **BH-7-12**

Job N°: *P-0000145-0-00-400*

Drill Date: *2012-04-25*

Project: *Sage Campground - Sewage Systems Assessment*

Field Tech: *R.McMillan*

Location: *1912 Whistle Bare Road, Township of North Dumfries, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		297.96			
	TOPSOIL: dark brown silt, moist		0.00 / 297.65			
	SAND: compact brown silty fine to medium sand, moist		0.30 / 297.05			
1	saturated		0.91	SS-1	6-8 10	18
				SS-2	6-8 8	16
2				SS-3	4-7 11	18
	compact brown fine to coarse sand, trace silt and fine gravel, saturated		295.37 / 2.59			
3				SS-4	4-8 8	16
	Borehole terminated at 3.81 m		294.15 / 3.81			
4						
5						
6						

Dynamic Cone — Std Penetration — 20 40 60 80

Shear Strength (PP) kPa — Initial / Remold — Shear Strength (FV) kPa — 50 100 150 200

WP WL — Water Content (%) — 10 20 30

Groundwater Observations and Standpipe Details

el. 296.85 m 2012-04-27

protective cover and concrete

bentonite seal

sand pack
50 mm pipe
1.52 m slotted screen

Reviewed by: *D.Morlock*

Drafted by: *S.Meteer*

Sheet: *1 of 1*

Notes: *Top of pipe elevation = 298.73 m*

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Vertical Scale = 1 : 40.0

EQ-09-Ge-72 R.1 18.02.2011

Ground Elevation: *301.24 m*

Borehole Number: **BH-8-12**

Job N°: *P-0000145-0-00-400*

Drill Date: *2012-04-25*

Project: *Sage Campground - Sewage Systems Assessment*

Field Tech: *R.McMillan*

Location: *1912 Whistle Bare Road, Township of North Dumfries, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		301.24			
	TOPSOIL: dark brown silt, moist		0.00 / 301.04			
	SILT: loose brown silt, some sand, trace clay, roots, moist		0.20 / 300.63			
	stiff brown silt, some clay, DTPL		0.61	SS-1	3-4 5	9
1			299.72			
	compact brown silt, trace fine sand, moist		1.52	SS-2	4-6 6	12
2			298.95			
	SILT TILL: loose brown silt, some sand, trace clay and gravel, moist		2.29	SS-3	5-4 4	8
3			298.19			
	SILT: compact brown silt, saturated, dilatant		3.05	SS-4	5-6 6	12
			297.43			
	SILT / SAND: loose to compact brown silt / fine sand, saturated, dilatant		3.81	SS-5	3-4 4	8
4						
				SS-6	5-7 10	17
5			295.75			
	SILT TILL: dense brown silt, some sand, moist		5.49 / 295.45	SS-7	9-18 16	34
	Borehole terminated at 5.79 m		5.79			
6						

Dynamic Cone: Std Penetration — 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: Initial, Remold — 50 100 150 200

Water Content (%): WP, WL — 10 20 30

Groundwater Observations and Standpipe Details

- protective cover and concrete
- bentonite seal
- sand pack
- 19 mm pipe
- 0.91 m slotted filter
- 2012-04-27 upper standpipe dry
- el. 298.10 m 2012-04-27
- bentonite seal
- 50 mm pipe
- 1.52 m slotted screen
- sand pack

Reviewed by: *D.Morlock*

Drafted by: *S.Meteer*

Sheet: *1 of 1*

Notes: *MOE Well Tag No. A115242*
Top of pipe elevation = 302.14 m (19 mm upper), 302.06 m (50 mm lower)

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Vertical Scale = 1 : 40.0

EQ-09-Ge-72 R.1 18.02.2011

Test Pit Number: 1-13

Ground Elevation: *n/a*

Project: *Sage Campground - Sewage System Assessment*

Job No.: *P-0000145-400*

Location: *1912 Whistle Bare Road, Township of North Dumfries, ON*

Excavation Date: *April 30th, 2013*

Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Water Content (%) (WP – WL; 10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		0.00			
	FILL: dark brown silt (topsoil), moist; rootlets					
	rusty brown sandy silt, moist		-0.50			
	TOPSOIL: layer of brown silt, moist; roots					
	SILT/SAND: light brown silt, trace to some sand, moist					
1.00			-1.00			
	SAND: grey sand, trace to some silt, wet to saturated		-1.50	1		
	Test pit terminated at 1.9 m.					Upon completion of excacvation, test pit sidewalls stable.
2.00			-2.00			Free groundwater seepage encountered at 1.8 m.
			-2.50			

Reviewed by: *VM*

Drafted by: *BS*

Field Tech: *BS*

Sheet: *1 of 1*

Notes:

Test Pit Number: 10-13

Ground Elevation: *n/a*

Project: *Sage Campground - Sewage System Assessment*

Job No.: *P-0000145-400*

Location: *1912 Whistle Bare Road, Township of North Dumfries, ON*

Excavation Date: *May 1, 2013*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		0.00			
	TOPSOIL: dark brown sandy silt, damp to moist					
	SILT/SAND: rusty brown sand, some silt damp		-0.50			
1.00			-1.00			
	SAND: light brown sand, some gravel, trace silt, damp			1		
			-1.50			
2.00	Test pit terminated at 2.0 m.		-2.00			Upon completion of excacvation, test pit sidewalls stable. No groundwater seepage encountered.
			-2.50			

Reviewed by: *VM*

Drafted by: *BS*

Field Tech: *BS*

Sheet: *1 of 1*

Notes:

Test Pit Number: 11-13

Ground Elevation: *n/a*

Project: *Sage Campground - Sewage System Assessment*

Job No.: *P-0000145-400*

Location: *1912 Whistle Bare Road, Township of North Dumfries, ON*

Excavation Date: *May 1st, 2013*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		0.00			
	TOPSOIL: dark brown silt, moist; rootlets		-0.50			
	SAND AND GRAVEL: brown coarse sand and gravel, trace silt, damp			1		
1.00			-1.00			
			-1.50			
	Test pit terminated at 1.8 m.					Upon completion of excacvation, test pit sidewalls stable.
2.00			-2.00			No groundwater seepage encountered.
			-2.50			

Reviewed by: *VM*

Drafted by: *BS*

Field Tech: *BS*

Sheet: *1 of 1*

Notes:

Test Pit Number: 2-13

Ground Elevation: *n/a*

Project: *Sage Campground - Sewage System Assessment*

Job No.: *P-0000145-400*

Location: *1912 Whistle Bare Road, Township of North Dumfries, ON*

Excavation Date: *April 30th, 2013*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		0.00			
	TOPSOIL: dark brown silt, moist; rootlets					
	SILT/SAND: rusty brown silt and sand, moist; rootlets		-0.50	1		
1.00			-1.00			
	SAND: brown sand, trace silt and fine gravel, wet			1		
	saturated		-1.50			
	Test pit terminated at 1.6 m.					Upon completion of excacvation, test pit sidewalls caving. Free groundwater seepage encountered at 1.3 m.
2.00			-2.00			
			-2.50			

Reviewed by: *VM*

Drafted by: *BS*

Field Tech: *BS*

Sheet: *1 of 1*

Notes:

Test Pit Number: 3-13

Ground Elevation: *n/a*

Project: *Sage Campground - Sewage System Assessment*

Job No.: *P-0000145-400*

Location: *1912 Whistle Bare Road, Township of North Dumfries, ON*

Excavation Date: *April 30th, 2013*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		0.00			
	TOPSOIL: dark brown silt, damp to moist					
	SILT: rusty brown silt, some sand, moist; rootlets		-0.50			
	SAND: brown sand, trace to some silt, damp					
1.00			-1.00			
	trace silt, very moist		-1.50	1		
	saturated					
2.00			-2.00			
	Test pit terminated at 2.2 m.		-2.50			Upon completion of excacvation, test pit sidewalls stable. Free groundwater seepage encountered at 1.8 m.

Reviewed by: *VM*

Drafted by: *BS*

Field Tech: *BS*

Sheet: *1 of 1*

Notes:

Test Pit Number: 4-13

Ground Elevation: *n/a*

Project: *Sage Campground - Sewage System Assessment*

Job No.: *P-0000145-400*

Location: *1912 Whistle Bare Road, Township of North Dumfries, ON*

Excavation Date: *April 30th, 2013*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		0.00			
	TOPSOIL: dark brown silt, some gravel, damp					
	SILT/SAND: brown to light brown sand and silt, moist		-0.50			
1.00	***SAND:*** brown sand, some gravel, trace silt, very moist		-1.00	1		
	saturated					
	Test pit terminated at 1.4 m.		-1.50			Upon completion of excacvation, test pit sidewalls caving. Free groundwater seepage encountered at 1.2 m.
2.00			-2.00			
			-2.50			

Reviewed by: *VM*

Drafted by: *BS*

Field Tech: *BS*

Sheet: *1 of 1*

Notes:

Test Pit Number: 5-13

Ground Elevation: *n/a*

Project: *Sage Campground - Sewage System Assessment*

Job No.: *P-0000145-400*

Location: *1912 Whistle Bare Road, Township of North Dumfries, ON*

Excavation Date: *April 30th, 2013*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		0.00			
	TOPSOIL: dark brown silt, moist; rootlets					
			-0.50			
	SILT/SAND: rusty brown silt and sand, moist					
	SAND: brown sand, trace silt, very moist					
	saturated					
1.00			-1.00	1		
	Test pit terminated at 1.4 m.					Upon completion of excacvation, test pit sidewalls caving.
			-1.50			Free groundwater seepage encountered at 0.9 m.
2.00			-2.00			
			-2.50			

Reviewed by: *VM*

Drafted by: *BS*

Field Tech: *BS*

Sheet: *1 of 1*

Notes:

Test Pit Number: 6-13

Ground Elevation: *n/a*

Project: *Sage Campground - Sewage System Assessment*

Job No.: *P-0000145-400*

Location: *1912 Whistle Bare Road, Township of North Dumfries, ON*

Excavation Date: *May 1st, 2013*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		0.00			
	TOPSOIL: dark brown silt, moist; rootlets					
	SILT/SAND: rusty brown silt and sand, moist; rootlets		-0.50			
1.00	***SAND:*** brown sand, trace silt, moist		-1.00			
	saturated			1		
	Test pit terminated at 1.5 m.		-1.50			Upon completion of excacvation, test pit sidewalls caving. Free groundwater seepage encountered at 1.2 m.
2.00			-2.00			
			-2.50			

Reviewed by: *VM*

Drafted by: *BS*

Field Tech: *BS*

Sheet: *1 of 1*

Notes:

Test Pit Number: 7-13

Ground Elevation: *n/a*

Project: *Sage Campground - Sewage System Assessment*

Job No.: *P-0000145-400*

Location: *1912 Whistle Bare Road, Township of North Dumfries, ON*

Excavation Date: *May 1st, 2013*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		0.00			
	TOPSOIL: dark brown silt, moist; roots					
	SILT/SAND: rusty brown silt and sand, moist		-0.50			
	SAND: brown sand, trace silt, very moist					
1.00	saturated		-1.00			Upon completion of excacvation, test pit sidewalls caving.
	Test pit terminated at 1.3 m.					Free groundwater seepage encountered at 1.0 m.
2.00			-1.50			
			-2.00			
			-2.50			

Reviewed by: *VM*

Drafted by: *BS*

Field Tech: *BS*

Sheet: *1 of 1*

Notes:

Test Pit Number: 8-13

Ground Elevation: *n/a*

Project: *Sage Campground - Sewage System Assessment*

Job No.: *P-0000145-400*

Location: *1912 Whistle Bare Road, Township of North Dumfries, ON*

Excavation Date: *May 1st, 2013*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		0.00			
	TOPSOIL: dark brown silt, moist; rootlets					
	SILT/SAND: rusty brown silt and sand, moist		-0.50			
1.00			-1.00			
	SAND: brown sand, trace silt and gravel, moist		-1.50			
	Test pit terminated at 1.8 m.					Upon completion of excacvation, test pit sidewalls stable.
2.00			-2.00			Minor groundwater seepage encountered at 1.7 m.
			-2.50			

Reviewed by: *VM*

Drafted by: *BS*

Field Tech: *BS*

Sheet: *1 of 1*

Notes:

Test Pit Number: 9-13

Ground Elevation: *n/a*

Project: *Sage Campground - Sewage System Assessment*

Job No.: *P-0000145-400*

Location: *1912 Whistle Bare Road, Township of North Dumfries, ON*

Excavation Date: *May 1st, 2013*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		0.00			
	TOPSOIL: dark brown silt, moist; rootlets					
	SILT/SAND: rusty brown silt and sand, moist					
	brown		-0.50			
1.00			-1.00			
	SAND AND GRAVEL: brown coarse sand and gravel, trace silt, damp			1		
			-1.50			
2.00	Test pit terminated at 2.0 m.		-2.00			Upon completion of excacvation, test pit sidewalls stable. No groundwater seepage encountered.
			-2.50			

Reviewed by: *VM*

Drafted by: *BS*

Field Tech: *BS*

Sheet: *1 of 1*

Notes:

Ground Elevation: *298.81 m*

Borehole Number: **MP-1-12**

Job N°: *P-0000145-0-00-400*

Drill Date: *2012-04-26*

Project: *Sage Campground - Sewage Systems Assessment*

Field Tech: *D.Souter*

Location: *1912 Whistle Bare Road, Township of North Dumfries, Ontario*

Drill Method: *Hand Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		298.81			
	SAND AND GRAVEL: brown silty sand and fine gravel, very moist		0.00 / 298.56			
	saturated		0.25 / 297.90			
1	Mini-piezometer terminated at 0.91 m		0.91			
2						
3						
4						
5						
6						

Dynamic Cone / Std Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200 — Initial / Remold

Water Content (%): WP WL; 10 20 30

Groundwater Observations and Standpipe Details

el. 298.30 m 2012-04-26

native backfill

sand pack
19 mm pipe
0.61 m slotted screen

Reviewed by: *D.Morlock*

Drafted by: *M.Smith*

Sheet: *1 of 1*

Notes: *Top of pipe elevation = 300.46 m*

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Vertical Scale = 1 : 40.0

EQ-09-Ge-72 R.1 18.02.2011

Ground Elevation: *296.67 m*

Borehole Number: **MP-2-12**

Job N°: *P-0000145-0-00-400*

Drill Date: *2012-04-26*

Project: *Sage Campground - Sewage Systems Assessment*

Field Tech: *D.Souter*

Location: *1912 Whistle Bare Road, Township of North Dumfries, Ontario*

Drill Method: *Hand Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value	Groundwater Observations and Standpipe Details
	Ground Elevation		296.67				
	TOPSOIL: black silt, some organics, wet		0.00 / 296.06				
1	***SAND:*** brown silty sand, some fine gravel, saturated		0.61 / 294.84				native backfill; el. 296.32 m 2012-04-26; 19 mm pipe; 0.91 m slotted screen; sand pack
2	Mini-piezometer terminated at 1.83 m		1.83				
3							
4							
5							
6							

Dynamic Cone: 20 40 60 80

Std Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200

Initial / Remold

Shear Strength (FV) kPa: 50 100 150 200

WP WL

Water Content (%): 10 20 30

Reviewed by: *D.Morlock*

Drafted by: *M.Smith*

Sheet: *1 of 1*

Notes: *Top of pipe elevation = 298.21 m*

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Vertical Scale = 1 : 40.0

EQ-09-Ge-72 R.1 18.02.2011

Ground Elevation: *298.21 m*

Borehole Number: **MP-3-12**

Job N°: *P-0000145-0-00-400*

Drill Date: *2012-04-26*

Project: *Sage Campground - Sewage Systems Assessment*

Field Tech: *D.Souter*

Location: *1912 Whistle Bare Road, Township of North Dumfries, Ontario*

Drill Method: *Hand Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		298.21			
	PEAT: dark brown peat, numerous roots, wet		0.00			
			297.75			
	brown organic peat, wet to saturated		0.46			
			293.33			
	Mini-piezometer terminated at 4.88 m		4.88			

Dynamic Cone — Std Penetration — 20 40 60 80

Shear Strength (PP) kPa — Initial / Remold — Shear Strength (FV) kPa — 50 100 150 200

WP WL — Water Content (%) — 10 20 30

Groundwater Observations and Standpipe Details

el. 297.65 m 2012-04-26

19 mm pipe
1.52 m slotted screen

native backfill

Vertical Scale = 1 : 40.0

Reviewed by: *D.Morlock*

Drafted by: *M.Smith*

Sheet: *1 of 1*

Notes: *Top of pipe elevation = 299.11 m*

LVM

Ground Elevation: *297.88 m*

Borehole Number: **MP-4-12**

Job N°: *P-0000145-0-00-400*

Drill Date: *2012-04-26*

Project: *Sage Campground - Sewage Systems Assessment*

Field Tech: *D.Souter*

Location: *1912 Whistle Bare Road, Township of North Dumfries, Ontario*

Drill Method: *Hand Auger*

SOIL PROFILE		SAMPLE								
Depth (m)	Description	Symbol	Elevation (m) Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value	Dynamic Cone / Std Penetration (20 40 60 80)	Shear Strength (PP) kPa / Initial / Remold / Shear Strength (FV) kPa (50 100 150 200)	Water Content (%) WP WL (10 20 30)	Groundwater Observations and Standpipe Details
	Ground Elevation		297.88							
	PEAT: dark brown peat, numerous roots, wet		0.00							
			297.42							
	brown organic peat, wet to saturated		0.46							
1										
2										19 mm pipe 1.52 m slotted screen native backfill
3										
4										el. 297.42 m 2012-04-26
			293.00							
5	Mini-piezometer terminated at 4.88 m		4.88							
6										

Reviewed by: *D.Morlock*

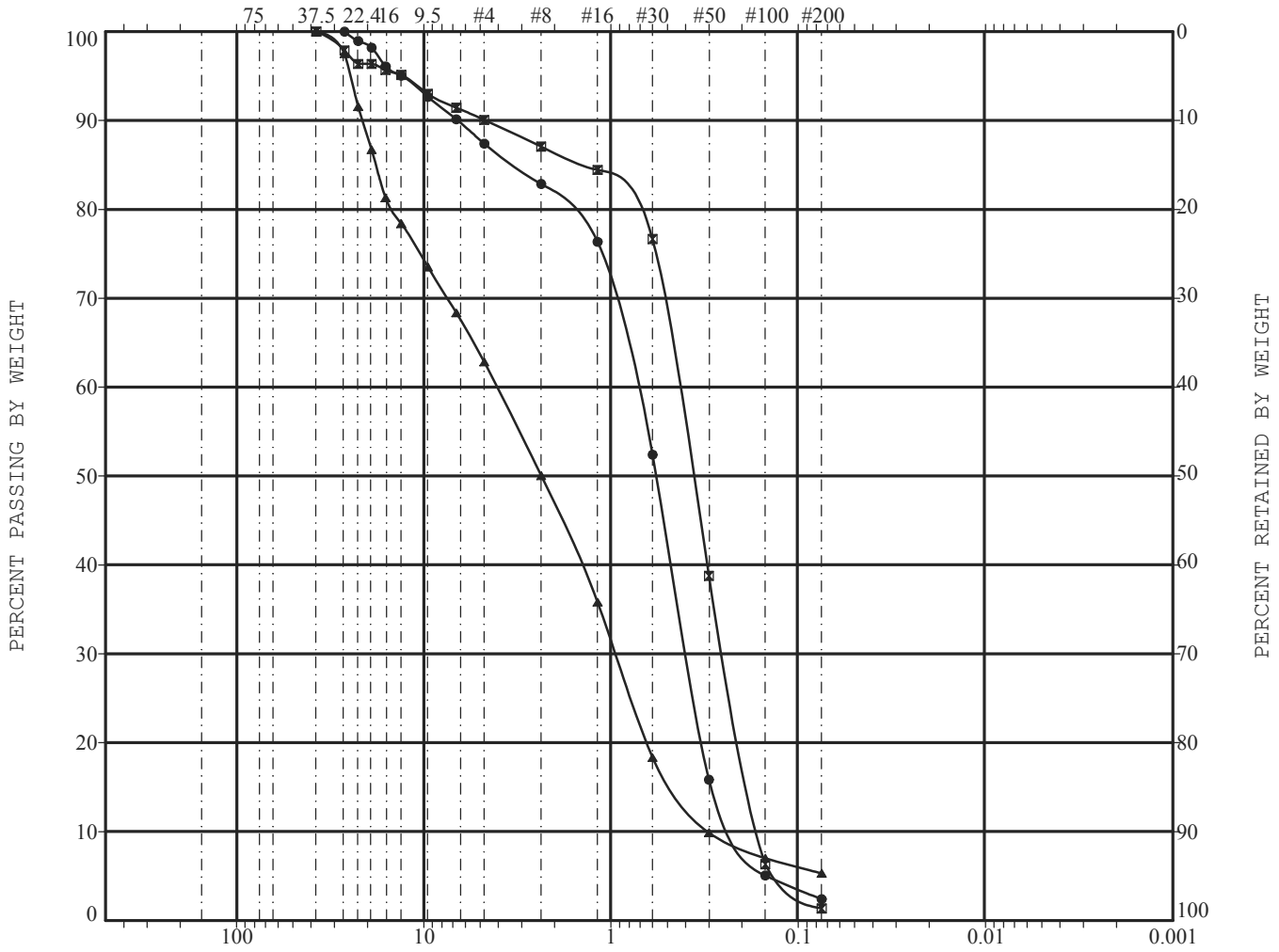
Drafted by: *M.Smith*

Sheet: *1 of 1*

Notes: *Top of pipe elevation = 298.85 m*

UNIFIED SOIL CLASSIFICATION

COBBLES	*GRAVEL*		*SAND*			*SILT OR CLAY*
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN MILLIMETRES			U.S. STANDARD SIEVE No.			HYDROMETER



PROJECT Sage Campground - Sewage System Assessment

LOCATION 1912 Whistle Bare Road, Township of North Dumfries, ON JOB NO. P-0000145-400

CURVE ID	BOREHOLE/ TEST PIT	SAMPLE NO.	DEPTH (m)	SOIL DESCRIPTION
●	TP4-13	1	0.8 - 1.1	SAND, some Gravel, trace Silt
⊠	TP10-13	1	1.1 - 1.4	SAND, some Gravel, trace Silt
▲	TP11-13	1	0.6 - 0.9	SAND and GRAVEL, trace Silt

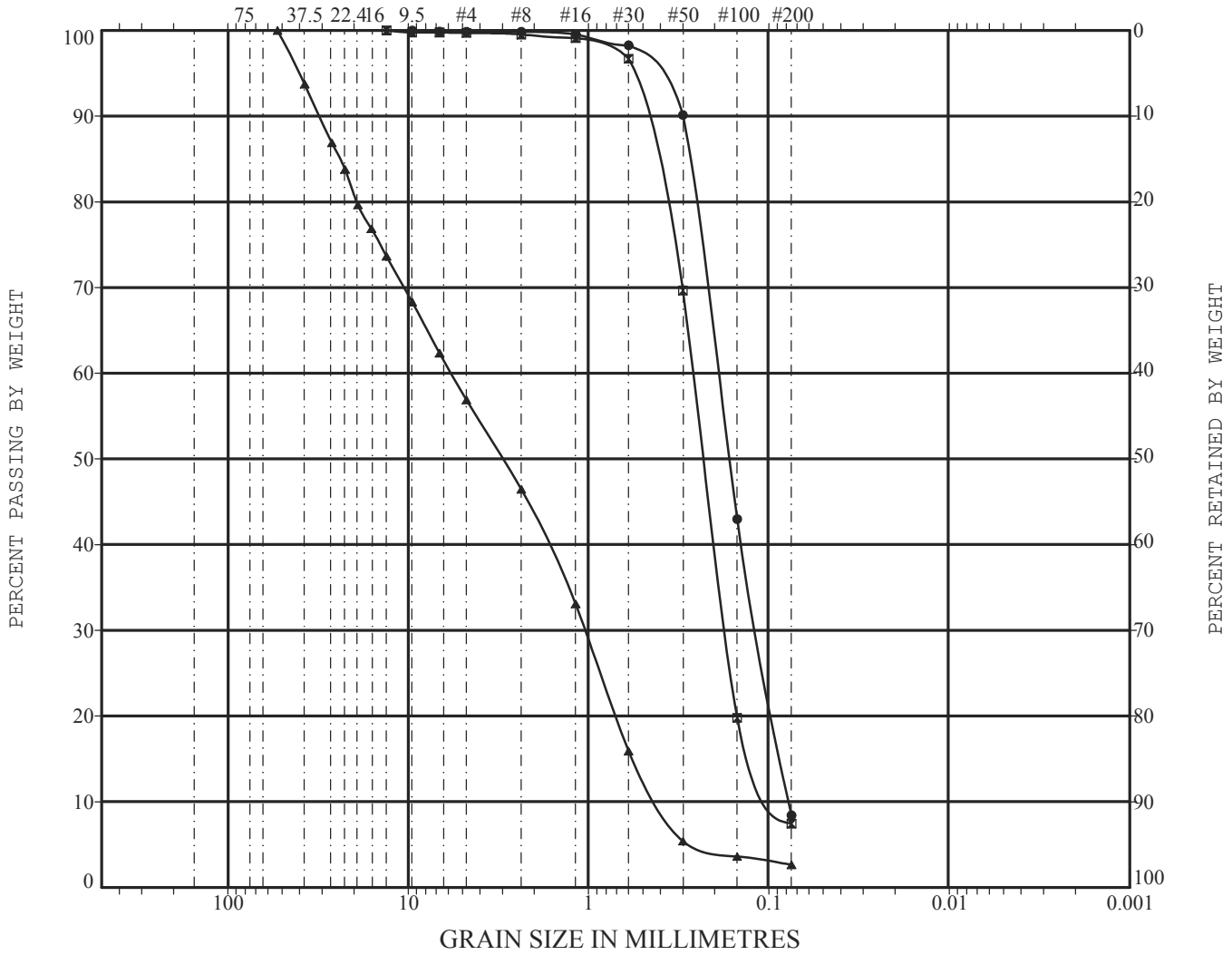
REMARKS

LVM

Figure No. 1

UNIFIED SOIL CLASSIFICATION

COBBLES	*GRAVEL*		*SAND*			*SILT OR CLAY*
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN MILLIMETRES			U.S. STANDARD SIEVE No.			HYDROMETER



PROJECT Sage Campground - Sewage System Assessment

LOCATION 1912 Whistle Bare Road, Township of North Dumfries, ON JOB NO. P-0000145-400

CURVE ID	BOREHOLE/ TEST PIT	SAMPLE NO.	DEPTH (m)	SOIL DESCRIPTION
●	TP3-13	1	1.5 - 1.8	SAND, trace Silt
⊠	TP6-13	1	1.2 - 1.5	SAND, trace Silt
▲	TP9-13	1	1.1 - 1.4	SAND and GRAVEL, trace Silt

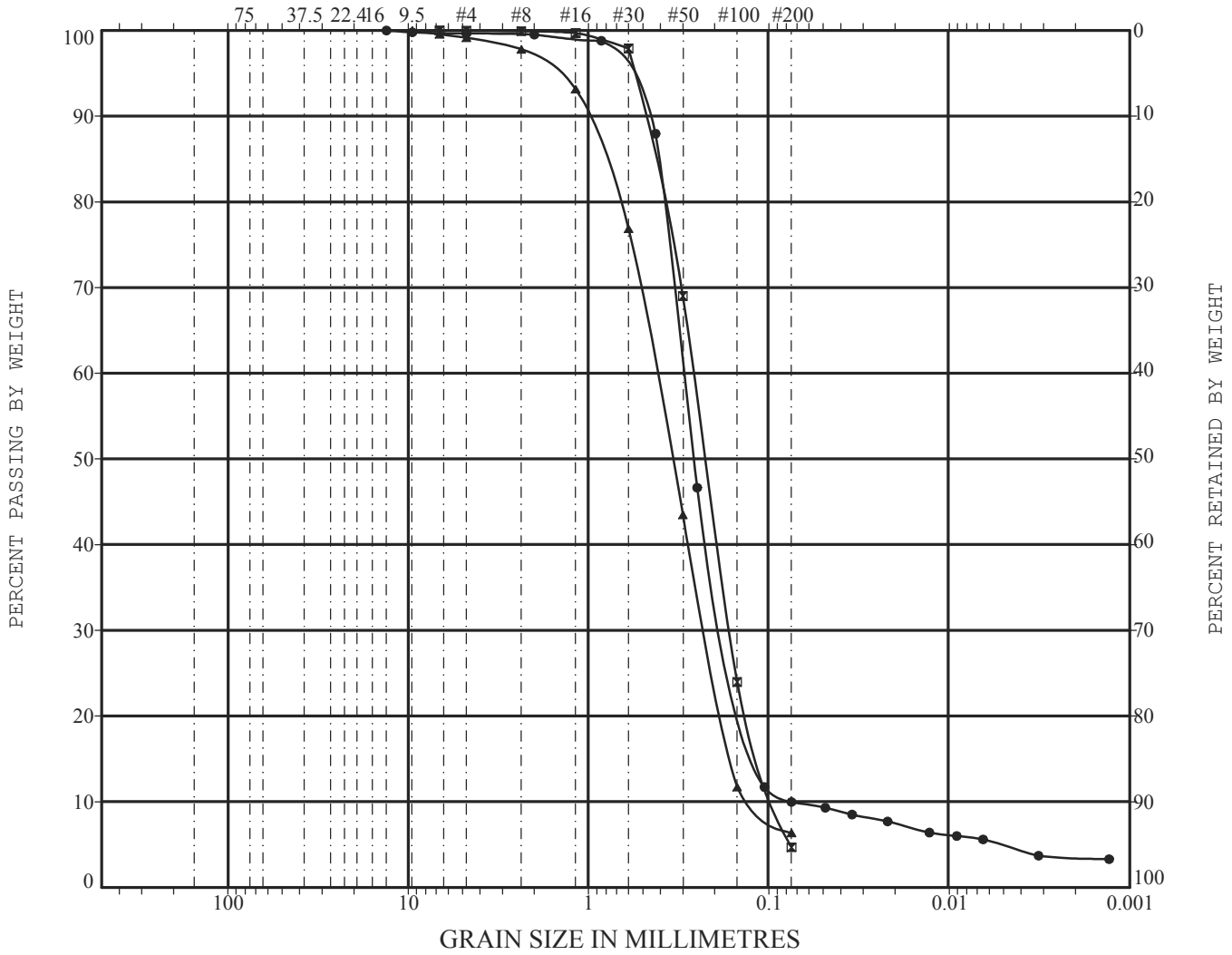
REMARKS

LVM

Figure No. 2

UNIFIED SOIL CLASSIFICATION

COBBLES	*GRAVEL*		*SAND*			*SILT OR CLAY*
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN MILLIMETRES			U.S. STANDARD SIEVE No.			HYDROMETER



PROJECT Sage Campground - Sewage System Assessment

LOCATION 1912 Whistle Bare Road, Township of North Dumfries, ON JOB NO. P-0000145-400

CURVE ID	BOREHOLE/ TEST PIT	SAMPLE NO.	DEPTH (m)	SOIL DESCRIPTION
●	TP1-13	1	1.5 - 1.8	SAND, trace Silt
⊠	TP2-13	1	0.3 - 0.6	SAND, trace Silt
▲	TP5-13	1	0.9 - 1.2	SAND, trace Silt and Gravel

REMARKS

LVM

Figure No. 3

FlowSpec ENGINEERING

Borehole Number: 1

Project No.: 00009-2
Ground Surface Elevation: 299.76 m
Top-of-Pipe Elevation: 300.52 m
Date: October 2, 2017

Project: Whistle Bare Campground
Location: 1912 Whistle Bare Road, Township of North Dumfries

Depth (m):	Elevation (m):	SOIL STRATIGRAPHY:	SAMPLE: Spoon (Type and No.):	Blow Count (150 mm):	SPT "N" Value:	GROUNDWATER MEASUREMENT AND DETAILS OF MONITORING WELL INSTALLATION:
0	299.76	Ground Surface Elevation:				steel box
		TOPSOIL: Dark brown silty sand, moist				
1	299.46	*SILTY SAND*: Brown silty sand, some gravel, moist				groundwater elev. = 298.98 m May 17, 2019
2	298.24	mixed peatmoss, moist	SS-1	1 1	n/a	bentonite
			SS-2	1	n/a	
3	297.47	*MARL*: Loose, white marl, saturated	SS-3	1	n/a	
4			SS-4	1	n/a	filter sand 1.52 m slotted screen
5	295.19	Monitoring well terminated at 4.57 m	SS-5	1	n/a	native cave
6						
7						
8						
9						
10						
11						
12						
13						
14						

Notes:

Field Technician: DFIII
Drafted by: DFIII
Reviewed by: DM

FlowSpec ENGINEERING

Borehole Number: 2

Project No.: 00009-2
Ground Surface Elevation: 299.98 m
Top-of-Pipe Elevation: 300.77 m
Date: October 2, 2017

Project: Whistle Bare Campground
Location: 1912 Whistle Bare Road, Township of North Dumfries

Depth (m):	Elevation (m):	SOIL STRATIGRAPHY:	SAMPLE: Spoon (Type and No.):	Blow Count (150 mm):	SPT "N" Value:	GROUNDWATER MEASUREMENT AND DETAILS OF MONITORING WELL INSTALLATION:
0	299.98	Ground Surface Elevation:				steel box
		TOPSOIL: Dark brown silty sand, moist				
	299.68	*SILTY SAND AND GRAVEL*: Loose, brown silty sand and gravel, very moist				
1			SS-1	4-4 2-1	6	groundwater elev. = 299.09 m May 17, 2019
	298.76	mixed peatmoss, moist				
2			SS-2	1	n/a	bentonite
	297.69	*SAND:* Loose, fine to medium sand, trace silt, saturated; occasional seams of sand and gravel	SS-3	4-4 5-4	9	
3						
	296.93	reddish brown, trace to some silt	SS-4	2-2 4-6	6	
4						filter sand 1.52 m slotted screen
	295.41	Monitoring well terminated at 4.57 m	SS-5	3-6 7-8	13	
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						

Notes:

Field Technician: DFIII
Drafted by: DFIII
Reviewed by: DM

FlowSpec ENGINEERING

Borehole Number: 3

Project No.: 00009-2
Ground Surface Elevation: 301.21 m
Top-of-Pipe Elevation: 301.97 m
Date: October 2, 2017

Project: Whistle Bare Campground
Location: 1912 Whistle Bare Road, Township of North Dumfries

Depth (m):	Elevation (m):	SOIL STRATIGRAPHY:	SAMPLE: Spoon (Type and No.):	Blow Count (150 mm):	SPT "N" Value:	GROUNDWATER MEASUREMENT AND DETAILS OF MONITORING WELL INSTALLATION:
0	301.21	Ground Surface Elevation:				steel box
		TOPSOIL: Dark brown silty sand, moist				
	300.91	*SAND AND GRAVEL*: Loose, brown sand and gravel, some silt, very moist to wet	SS-1	4-4 2-1	6	
1	299.99	wet; seams of silt, some sand and clay, saturated	SS-2	1	n/a	groundwater elev. = 299.72 m May 17, 2019
2	299.38	mixed peatmoss, saturated	SS-3	1	n/a	bentonite
3						
4						
5	296.49	*SANDY SILT*: Loose, brown sandy silt, trace clay and gravel, saturated	SS-4	1-1 2-3	3	filter sand 1.52 m slotted screen
6	295.11	*SAND AND GRAVEL*: Loose, brown sand and gravel, trace silt, saturated	SS-5	2-2 3-4	5	
7		Monitoring well terminated at 6.1 m				
8						
9						
10						
11						
12						
13						
14						

Notes:

Field Technician: DFIII
Drafted by: DFIII
Reviewed by: DM

FlowSpec ENGINEERING

Borehole Number: 4

Project No.: 00009-2
Ground Surface Elevation: 310.53 m
Top-of-Pipe Elevation: 311.60 m
Date: October 4, 2017

Project: Whistle Bare Campground
Location: 1912 Whistle Bare Road, Township of North Dumfries

Depth (m):	Elevation (m):	SOIL STRATIGRAPHY:	SAMPLE: Spoon (Type and No.):	Blow Count (150 mm):	SPT "N" Value:	GROUNDWATER MEASUREMENT AND DETAILS OF MONITORING WELL INSTALLATION:
0	310.53	Ground Surface Elevation:				steel box
1	309.77	*SAND*: Compact, brown medium to coarse sand, some gravel, trace silt, moist				
2			SS-1	8-8 9-12	17	
3	307.48	seams of fine to medium sand, moist	SS-2	12-11 7-8	18	
4						
5	305.96	*SAND AND GRAVEL*: Compact, brown medium to coarse sand and gravel, trace silt, moist	SS-3	18-26 27-13	53	bentonite
6			SS-4	13-15 21-18	36	
7	303.98	very moist				
8			SS-5	23-35 21-24	56	
9						
10	301.39	frequent cobbles	SS-6	16-50	50/150 mm	groundwater elev. = 300.66 m May 17, 2019
11	299.86	rusty brown to brown, saturated	SS-7	13-15 21-18	36	
12						filter sand
13			SS-8	6-8 13-13	21	1.52 m slotted screen
14	296.81	grey Monitoring well terminated at 13.72 m	SS-9	10-11 13-21	24	

Notes:

Field Technician: DFIII
Drafted by: DFIII
Reviewed by: DM

FlowSpec ENGINEERING

Borehole Number: 5

Project No.: 00009-2
Ground Surface Elevation: 311.07 m
Top-of-Pipe Elevation: 311.95 m
Date: October 3, 2017

Project: Whistle Bare Campground
Location: 1912 Whistle Bare Road, Township of North Dumfries

Depth (m):	Elevation (m):	SOIL STRATIGRAPHY:	SAMPLE: Spoon (Type and No.):	Blow Count (150 mm):	SPT "N" Value:	GROUNDWATER MEASUREMENT AND DETAILS OF MONITORING WELL INSTALLATION:
0	311.07	Ground Surface Elevation:				steel box
2		*SAND AND GRAVEL*: Compact, light brown medium to coarse sand and gravel, trace silt, occasional cobbles, moist	SS-1	9-9 16-28	25	
3	308.02	seams of brown fine to medium sand, moist	SS-2	10-13 13-15	26	
5			SS-3	22-32 22-21	54	bentonite
6	304.97	frequent cobbles, moist to very moist	SS-4	9-11 10-10	21	
8	303.45	very moist	SS-5	9-12 6-8	18	
10	301.93	occasional cobbles	SS-6	20-26 27-50	53	groundwater elev. = 301.67 m May 17, 2019
11	300.40	grey, saturated	SS-7	25-27 30-16	57	filter sand
13						1.52 m slotted screen
14	297.35	Monitoring well terminated at 13.72 m				

Notes:

Field Technician: DFIII
Drafted by: DFIII
Reviewed by: DM

FlowSpec ENGINEERING

Borehole Number: 6

Project No.: 00009-2
Ground Surface Elevation: 304.58
Top-of-Pipe Elevation: 305.54
Date: October 4, 2017

Project: Whistle Bare Campground
Location: 1912 Whistle Bare Road, Township of North Dumfries

Depth (m):	Elevation (m):	SOIL STRATIGRAPHY:	SAMPLE: Spoon (Type and No.):	Blow Count (150 mm):	SPT "N" Value:	GROUNDWATER MEASUREMENT AND DETAILS OF MONITORING WELL INSTALLATION:
0	304.58	Ground Surface Elevation:				steel box
1		*SILT AND SAND*: Loose, brown silt and sand, moist				
			SS-1	4-2 2-4	4	
2	302.60	*SAND*: Loose, light brown sand, trace silt, moist				bentonite
3	301.53	*SAND AND GRAVEL*: Compact, brown sand and gravel, trace to some silt, frequent cobbles, moist	SS-2	12-16 12-19	28	
4						groundwater elev. = 300.07 m May 17, 2019
5	300.01	very moist	SS-3	12-10 13-18	23	
6	298.48	*SILTY SAND*: Compact, brown silty fine sand, trace clay, saturated	SS-4	14-21 20-33	41	
7						filter sand
8			SS-5	16-11 23-36	34	1.52 m slotted screen
9	295.44	some silt	SS-6	6-11 20-23	31	
10		Monitoring well terminated at 9.14 m				
11						
12						
13						
14						

Notes:

Field Technician: DFIII
Drafted by: DFIII
Reviewed by: DM

FlowSpec ENGINEERING

Borehole Number: 7

Project No.: 00009-2
Ground Surface Elevation: 312.12
Top-of-Pipe Elevation: 313.10
Date: October 4, 2017

Project: Whistle Bare Campground
Location: 1912 Whistle Bare Road, Township of North Dumfries

Depth (m):	Elevation (m):	SOIL STRATIGRAPHY:	SAMPLE: Spoon (Type and No.):	Blow Count (150 mm):	SPT "N" Value:	GROUNDWATER MEASUREMENT AND DETAILS OF MONITORING WELL INSTALLATION:
0	312.12	Ground Surface Elevation:				steel box
2		*SAND AND GRAVEL*: Compact, brown medium to coarse sand and gravel, trace silt, frequent cobbles, moist	SS-1	7-16 14-14	30	bentonite
3			SS-2	13-22 17-20	39	
5			SS-3	10-16 17-16	33	
6	306.02	brown to light brown	SS-4	14-25 22-23	47	
8			SS-5	26-39 32-21	71	
9	302.98	grey, very moist	SS-6	22-25 50	50 150 mm	
11			SS-7	9-9 8-9	17	groundwater elev. = 301.56 m May 17, 2019
12	300.99	saturated				filter sand
13			SS-8	10-15 15-18	30	1.52 m slotted screen
14	298.40	Monitoring well terminated at 13.72 m				

Notes:

Field Technician: DFIII
Drafted by: DFIII
Reviewed by: DM

APPENDIX D
LVM and FlowSpec
Water Level and Water Quality Data

TABLE 101

GROUNDWATER MEASUREMENTS

Sage Campground - Sewage Systems Assessment
1912 Whistle Bare Road, Township of North Dumfries, Ontario

				(mbGround)		(mbGround)		(mbGround)	
Borehole Number	Ground Surface Elevation (mASL)	Top of Pipe Elevation (mASL)	Pipe Diameter (mm)	April 27, 2012		July 3, 2012		August 8, 2012	
				Groundwater Elevation ~~(mbTOP)~~	Groundwater Elevation (mASL)	Groundwater Elevation ~~(mbTOP)~~	Groundwater Elevation (mASL)	Groundwater Elevation ~~(mbTOP)~~	Groundwater Elevation (mASL)
1-12	300.48	301.27	50	1.76	298.72	1.94	298.54	2.04	298.44
2-12	301.19	301.92	50	2.46	298.73	2.66	298.53	2.78	298.41
3-12	299.68	300.54	50	1.19	298.49	1.36	298.32	1.47	298.21
3-12 (upper)	299.68	300.56	19	1.19	298.49	1.33	298.35	1.34	298.34
3-12 (lower)	299.68	300.52	19	1.25	298.43	1.25	298.43	1.49	298.19
4-12	298.95	299.70	50	0.61	298.34	0.78	298.17	0.86	298.09
5-12	298.98	299.71	50	1.34	297.64	1.49	297.49	1.57	297.41
6-12	298.48	299.16	50	0.98	297.50	1.15	297.33	1.23	297.25
7-12	297.96	298.73	50	1.11	296.85	1.27	296.69	1.33	296.63
8-12 (upper)	301.24	302.14	19	dry	dry	dry	dry	dry	dry
8-12 (lower)	301.24	302.06	50	3.14	298.10	3.37	297.87	3.48	297.76
MP-1	298.81	300.46	19	0.51	298.30	0.68	298.13	0.76	298.05
SW-1	--	--	--	--	298.51	--	298.34	--	298.22
MP-2	296.67	298.21	19	0.35	296.32	0.44	296.23	0.46	296.21
SW-2	--	--	--	--	296.26	--	296.22	--	296.19
MP-3	298.21	299.11	19	0.56	297.65	0.26	297.95	0.24	297.97
SW-3	--	--	--	--	297.90	--	297.88	--	297.89
MP-4	297.88	298.85	19	0.46	297.42	0.34	297.54	0.33	297.55
SW-4	--	--	--	--	297.51	--	297.44	--	297.43

Notes:

1. MP = mini-piezometer

2. SW = surface water adjacent the mini-piezometer

Groundwater Elevations

Date: June 28, 2019

Monitoring Well ID	Ground Surface Elevation (m)	Top of Pipe Elevation (m)	21-Apr-17		20-Oct-17		18-Sep-18		17-May-19	
			Water Level (mbTOP)	Groundwater Elevation (m)	Water Level (mbTOP)	Groundwater Elevation (m)	Water Level (mbTOP)	Groundwater Elevation (m)	Water Level (mbTOP)	Groundwater Elevation (m)
BH3-12	299.68	300.54	1.76	298.78	2.12	298.42	2.11	298.43	1.82	298.72
BH4-12	298.95	299.70	1.20	298.50	1.41	298.29	1.40	298.30	1.14	298.56
BH-1 (FS)	299.76	300.52	--		1.87	298.65	1.77	298.75	1.54	298.98
BH-2 (FS)	299.98	300.77	--		1.98	298.79	1.91	298.86	1.68	299.09
BH-3 (FS)	301.21	301.97	--		2.68	299.29	2.68	299.29	2.25	299.72
BH-4 (FS)	310.53	311.60	--		11.48	300.12	11.47	300.13	10.94	300.66
BH-5 (FS)	311.07	311.95	--		10.96	300.99	10.93	301.02	10.28	301.67
BH-6 (FS)	304.58	305.54	--		6.22	299.32	6.19	299.35	5.47	300.07
BH-7 (FS)	312.12	313.10	--		12.05	301.05	12.09	301.01	11.54	301.56

Whistle Bare Campground
1912 Whistle Bare Road, Township of North Dumfries
File No.: 00009-2

Table 1 - Summary of 2019 Water Levels and Elevations

Monitoring Well ID	Ground Surface Elevation (m)	Top of Pipe Elevation (m)	17-May-19			21-Aug-19			2019 Spring - Summer Fluctuation (m)
			Water Level (mBTOP)	Water Level (mBGS)	Elevation (m)	Water Level (mBTOP)	Water Level (mBGS)	Elevation (m)	
BH1-12	300.48	301.27				2.54	1.75	298.73	
BH2-12	301.19	301.92				3.19	2.46	298.73	
BH3-12	299.68	300.54	1.82	0.96	298.72	2.04	1.18	298.50	0.22
BH4-12	298.95	299.70	1.14	0.39	298.56	1.53	0.78	298.17	0.39
BH5-12	298.98	299.71				2.09	1.36	297.62	
BH6-12	298.48	299.16				1.70	1.02	297.46	
BH7-12	297.96	297.96				1.89	1.89	296.07	
BH8-12 (lower)	301.24	302.06				4.00	3.18	298.06	
MP-1	298.81	300.46				2.19	0.54	298.27	
SW at MP-1	--	--				1.96		298.50	
MP-2	296.67	298.21				1.95	0.41	296.26	
SW at MP-2	--					2.01		296.20	
New Drilled Well	299.14	299.80				0.89	0.23	298.91	
BH-1 (FS)	299.76	300.52	1.54	0.78	298.98	1.78	1.02	298.74	0.24
BH-2 (FS)	299.98	300.77	1.68	0.89	299.09	1.90	1.11	298.87	0.22
BH-3 (FS)	301.21	301.97	2.25	1.49	299.72	2.58	1.82	299.39	0.33
BH-4 (FS)	310.53	311.60	10.74	9.67	300.86	11.29	10.22	300.31	0.55
BH-5 (FS)	311.07	311.95	10.28	9.40	301.67	10.68	9.80	301.27	0.40
BH-6 (FS)	304.58	305.54	5.47	4.51	300.07	6.04	5.08	299.50	0.57
BH-7 (FS)	312.12	313.10	11.54	10.56	301.56	11.86	10.88	301.24	0.32

MP = Mini-piezometer

SW = surface water adjacent the mini-piezometer

Levels Measured by FlowSpec

Surface Water Chemistry

Date: June 28, 2019

SW1 - Rec. Pond

Parameter (mg/L)	21-Apr-17	20-Oct-17	18-Sep-18	17-May-19
Field pH	--	7.97	8.30	8.18
Field Temperature (°C)	11.8	17.3	24.9	16.5
Unionized Ammonia	--	0.0006	0.0051	0.0009
Total Ammonia Nitrogen	0.127	<0.020	0.046	0.02
Nitrate-Nitrogen	1.53	2.95	1.62	1.84
Nitrite-Nitrogen	0.033	0.031	0.023	0.020
Total Kjeldahl Nitrogen (TKN)	0.60	0.53	0.63	0.38
Total Nitrogen	2.16	3.51	2.27	2.24
Total Phosphorus	0.0074	0.0036	0.0091	0.0036
E. Coli (CFU/100 mL)	2	1	0	0
Total Coliforms (CFU/100 mL)	3000	90	10	140

SW2 - Head Pond

Parameter (mg/L)	21-Apr-17	20-Oct-17	18-Sep-18	17-May-19
Field pH	--	7.93	8.31	7.82
Field Temperature (°C)	11.9	16.4	24.4	15.8
Unionized Ammonia	--	0.0032	0.0090	0.0019
Total Ammonia Nitrogen	0.076	0.126	0.090	0.102
Nitrate-Nitrogen	3.25	1.87	0.029	3.59
Nitrite-Nitrogen	0.047	0.035	<0.010	0.056
Total Kjeldahl Nitrogen (TKN)	0.67	1.08	0.86	0.75
Total Nitrogen	3.97	2.99	0.89	4.40
Total Phosphorus	0.0066	0.0208	0.01	0.0055
E. Coli (CFU/100 mL)	4	4	34	0
Total Coliforms (CFU/100 mL)	5000	1700	240	200

SW3 - Downstream Creek

Parameter (mg/L)	21-Apr-17	20-Oct-17	18-Sep-18	17-May-19
Field pH	--	7.88	7.55	8.01
Field Temperature (°C)	10.8	13.1	15.6	15.3
Unionized Ammonia	--	0.0004	0.0002	0.0008
Total Ammonia Nitrogen	0.036	<0.020	<0.020	0.030
Nitrate-Nitrogen	3.53	4.23	5.98	4.54
Nitrite-Nitrogen	0.016	<0.010	<0.010	0.021
Total Kjeldahl Nitrogen (TKN)	0.96	0.41	0.38	0.55
Total Nitrogen	4.51	4.64	6.36	5.11
Total Phosphorus	0.0197	0.0032	0.0061	0.0107
E. Coli (CFU/100 mL)	22	20	23	6
Total Coliforms (CFU/100 mL)	7000	67	960	910

Note: Highlighted values exceed the PWQO

Groundwater Chemistry

Date: June 28, 2019

BH3-12

Parameter (mg/L)	21-Apr-17	20-Oct-17	18-Sep-18	17-May-19
Field pH	--	7.12	7.51	7.81
Field Temperature (°C)	8.6	15.2	16.4	10.0
Unionized Ammonia	--	0.0001	0.0005	0.0001
Total Ammonia Nitrogen	<0.020	0.025	0.051	<0.010
Nitrate-Nitrogen	4.58	4.35	5.15	7.13
Nitrite-Nitrogen	<0.010	<0.010	<0.010	<0.010
Total Kjeldahl Nitrogen (TKN)	0.64	0.41	1.8	<15
Total Nitrogen	5.22	4.76	7.0	<15
Total Phosphorus	0.0211	2.43	6.11	2.41
E. Coli (CFU/100 mL)	<2	<10	2830	<2
Total Coliforms (CFU/100 mL)	100	<10	>200000	200

BH4-12

Parameter (mg/L)	21-Apr-17	20-Oct-17	18-Sep-18	17-May-19
Field pH	--	7.86	7.40	7.93
Field Temperature (°C)	11.3	13.4	14.3	11.7
Unionized Ammonia	--	0.0129	0.0001	0.0004
Total Ammonia Nitrogen	<0.020	0.749	0.023	0.02
Nitrate-Nitrogen	6.00	6.68	6.02	7.27
Nitrite-Nitrogen	<0.010	0.027	<0.010	<0.010
Total Kjeldahl Nitrogen (TKN)	0.70	3.21	8.9	<150
Total Nitrogen	6.70	9.92	14.9	<150
Total Phosphorus	0.0221	1.60	2.74	5.94
E. Coli (CFU/100 mL)	<2	<100	<2	0
Total Coliforms (CFU/100 mL)	100	59000	1600	20

BH-1 (FS)

Parameter (mg/L)	21-Apr-17	20-Oct-17	18-Sep-18	17-May-19
Field pH	--	7.50	7.33	7.57
Field Temperature (°C)	--	13.6	13.6	10.6
Unionized Ammonia	--	0.0002	0.0002	0.0001
Total Ammonia Nitrogen	--	0.024	0.033	<0.010
Nitrate-Nitrogen	--	3.66	5.06	5.89
Nitrite-Nitrogen	--	0.016	<0.010	<0.010
Total Kjeldahl Nitrogen (TKN)	--	1.92	3.2	3.1
Total Nitrogen	--	5.60	8.3	9.0
Total Phosphorus	--	0.14	0.631	0.305
E. Coli (CFU/100 mL)	--	<10	0	0
Total Coliforms (CFU/100 mL)	--	42000	800	<10

Note: Highlighted values exceed the ODWS

Groundwater Chemistry

Date: June 28, 2019

BH-2 (FS)

Parameter (mg/L)	21-Apr-17	20-Oct-17	18-Sep-18	17-May-19
Field pH	--	7.70	7.15	7.34
Field Temperature (°C)	--	13.6	14.6	10.6
Unionized Ammonia	--	0.0002	0.0002	0.0000
Total Ammonia Nitrogen	--	<0.020	0.050	<0.010
Nitrate-Nitrogen	--	7.08	8.54	7.40
Nitrite-Nitrogen	--	<0.010	<0.010	<0.010
Total Kjeldahl Nitrogen (TKN)	--	0.29	<1.5	1.7
Total Nitrogen	--	7.37	8.5	9.1
Total Phosphorus	--	0.908	3.50	1.55
E. Coli (CFU/100 mL)	--	<100	<2	0
Total Coliforms (CFU/100 mL)	--	<1000	100	<10

BH-3 (FS)

Parameter (mg/L)	21-Apr-17	20-Oct-17	18-Sep-18	17-May-19
Field pH	--	6.85	6.50	7.39
Field Temperature (°C)	--	14.3	15.4	8.6
Unionized Ammonia	--	0.0120	0.0050	0.0231
Total Ammonia Nitrogen	--	6.540	5.600	5.69
Nitrate-Nitrogen	--	<0.020	<0.020	0.022
Nitrite-Nitrogen	--	0.015	<0.010	<0.010
Total Kjeldahl Nitrogen (TKN)	--	8.43	27	21.4
Total Nitrogen	--	8.45	27	21.4
Total Phosphorus	--	13.5	12.3	12.9
E. Coli (CFU/100 mL)	--	<10	<10	<2
Total Coliforms (CFU/100 mL)	--	2800	<10	<10

BH-4 (FS)

Parameter (mg/L)	21-Apr-17	20-Oct-17	18-Sep-18	17-May-19
Field pH	--	7.43	7.30	7.85
Field Temperature (°C)	--	16.50	14.1	11.6
Unionized Ammonia	--	0.0002	0.0004	0.0002
Total Ammonia Nitrogen	--	<0.020	0.083	0.015
Nitrate-Nitrogen	--	2.51	4.2	3.23
Nitrite-Nitrogen	--	<0.010	<0.010	<0.010
Total Kjeldahl Nitrogen (TKN)	--	0.33	<15	1.9
Total Nitrogen	--	2.84	<15	5.1
Total Phosphorus	--	6.48	2.07	2.40
E. Coli (CFU/100 mL)	--	<100	<2	<2
Total Coliforms (CFU/100 mL)	--	2000	59000	40

Note: Highlighted values exceed the ODWS

Groundwater Chemistry

Date: June 28, 2019

BH-5 (FS)

Parameter (mg/L)	21-Apr-17	20-Oct-17	18-Sep-18	17-May-19
Field pH	--	7.49	7.34	7.74
Field Temperature (°C)	--	12.6	13.7	11.1
Unionized Ammonia	--	0.0001	0.0001	0.0001
Total Ammonia Nitrogen	--	<0.020	0.022	<0.010
Nitrate-Nitrogen	--	7.45	8.65	3.35
Nitrite-Nitrogen	--	<0.010	<0.010	<0.010
Total Kjeldahl Nitrogen (TKN)	--	4.5	<15	3.4
Total Nitrogen	--	12.0	<15	6.8
Total Phosphorus	--	9.99	4.52	6.41
E. Coli (CFU/100 mL)	--	<10	<2	0
Total Coliforms (CFU/100 mL)	--	<1000	700	<10

BH-6 (FS)

Parameter (mg/L)	21-Apr-17	20-Oct-17	18-Sep-18	17-May-19
Field pH	--	7.66	7.37	8.03
Field Temperature (°C)	--	13.0	14.1	8.7
Unionized Ammonia	--	0.0004	0.0001	0.0004
Total Ammonia Nitrogen	--	0.038	<0.020	<0.020
Nitrate-Nitrogen	--	8.81	5.28	4.13
Nitrite-Nitrogen	--	<0.010	<0.010	<0.010
Total Kjeldahl Nitrogen (TKN)	--	1.16	<15	28
Total Nitrogen	--	9.97	<15	32
Total Phosphorus	--	3.77	7.71	102
E. Coli (CFU/100 mL)	--	<10	<2	<2
Total Coliforms (CFU/100 mL)	--	600	<100	20

BH-7 (FS)

Parameter (mg/L)	21-Apr-17	20-Oct-17	18-Sep-18	17-May-19
Field pH	--	7.38	7.60	7.74
Field Temperature (°C)	--	12.5	15.4	14.2
Unionized Ammonia	--	0.0012	0.0013	0.0004
Total Ammonia Nitrogen	--	0.229	0.121	0.030
Nitrate-Nitrogen	--	8.04	9.13	8.30
Nitrite-Nitrogen	--	<0.010	<0.010	<0.010
Total Kjeldahl Nitrogen (TKN)	--	0.47	<15	4.0
Total Nitrogen	--	8.51	<15	12.3
Total Phosphorus	--	4.04	4.61	3.35
E. Coli (CFU/100 mL)	--	<10	<2	0
Total Coliforms (CFU/100 mL)	--	4000	<100	<10

Note: Highlighted values exceed the ODWS