

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



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

TABLE OF CONTENTS

1.0	INTRODUCTION	2
2.0	BACKGROUND	2
3.0	SITE CHARACTERIZATION	3
3.1	TOPOGRAPHY & DRAINAGE	3
3.2	GEOLOGIC SETTING	3
3.3	HYDROGEOLOGIC SETTING	4
	3.3.1 Water Table Configuration	4
	3.3.2 Groundwater / Surface Water Interaction	5
	3.3.3 Groundwater Infiltration & Recharge	5
	3.3.4 Shallow Groundwater and Surface Water Quality	6
	3.3.5 Groundwater Use	7
	3.3.6 Water Receptors	
4.0	SITE SERVICING REQUIREMENTS & IMPACT ASSESSMENT	8
4.1	WASTEWATER SYSTEMS & POTENTIAL IMPACT OF EFFLUENT	8
4.2	WATER SUPPLY & POTENTIAL IMPACT OF WATER TAKING	9
4.3	POTENTIAL IMPACT TO GROUNDWATER RECHARGE	10
5.0	CONCLUSIONS & RECOMMENDATIONS	10
LIST OF	FIGURES & TABLES	
Figure 1	Site Location & Existing Wells Ap	ор А
Figure 2	Quaternary Geology Ap	ор А
Figure 3	Water Table Contour (August 21, 2019) Ap	эр А

APPENDICES

Appendix A	Figures 1 to 3 and Development Concept (GSP Group)
Appendix B	Water Well Records
Appendix C	LVM and FlowSpec Borehole Logs, Test Pit Logs & Grain Size Analyses
Appendix D	LVM and FlowSpec Water Level and Water Quality Data



INTRODUCTION

Part Lot 28, Conc 12, Township of North Dumfries

Page 2

January 9, 2020

FILE NO.: H19111

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

1.0

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.

<u>Upgradient Groundwater</u>. 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.

<u>Downgradient Groundwater</u>. 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.
- 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.



Page 9

- 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 <u>fully</u> 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 <u>local</u> 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.

- 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



January 9, 2020

Page 10

FILE NO.: H19111

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.

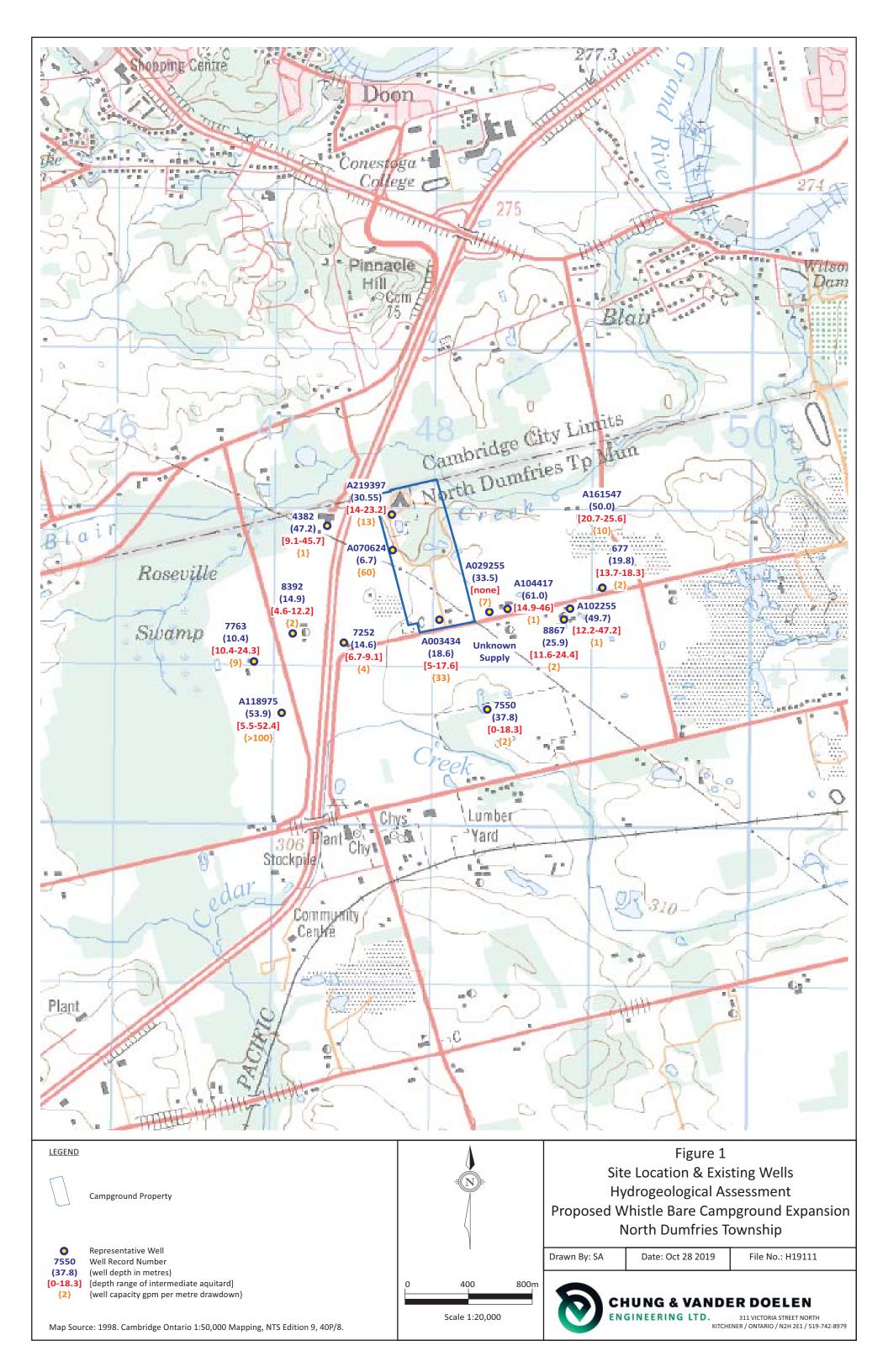


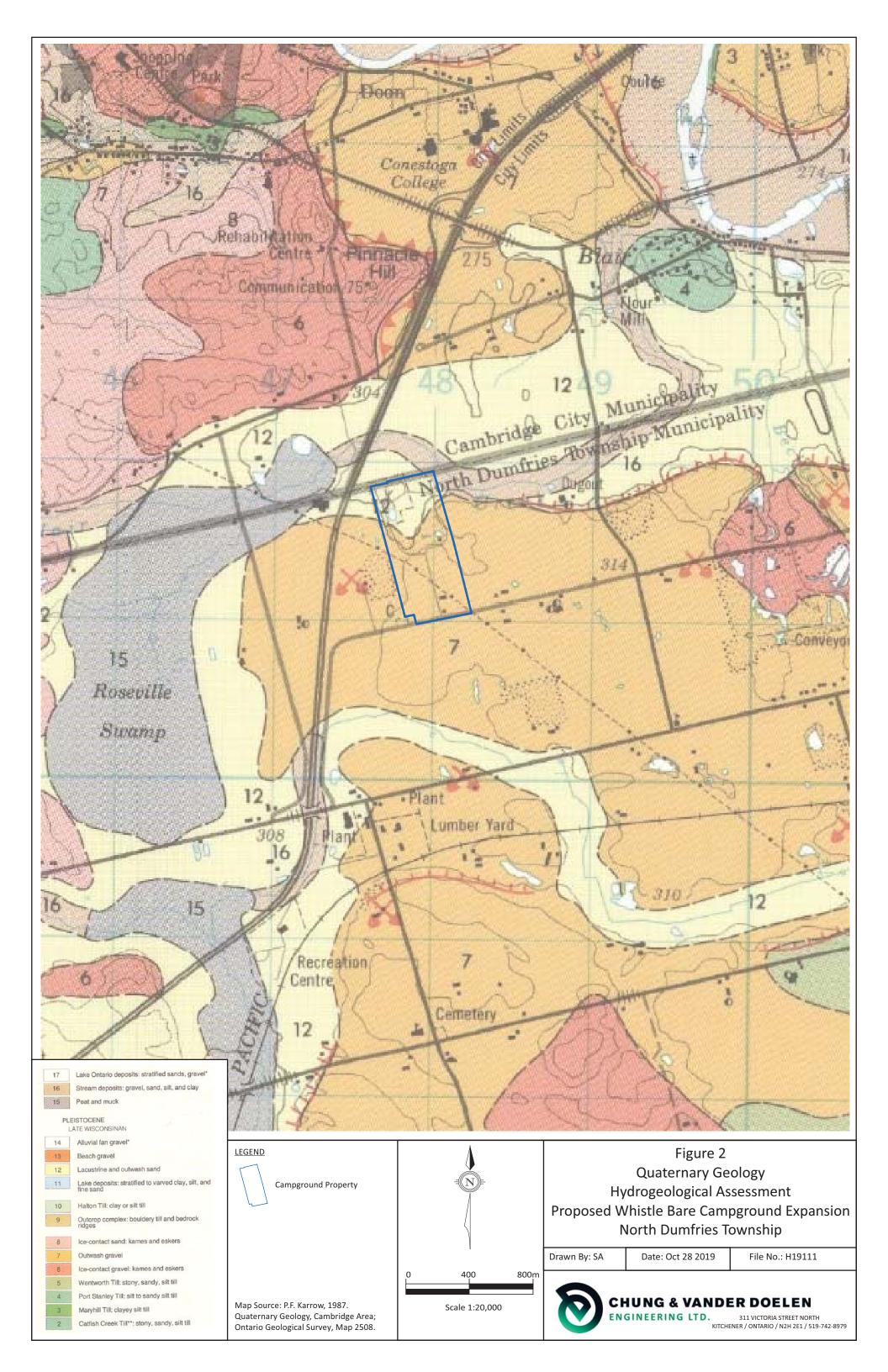
William (Sandy) Anderson, M.Sc., P.Eng. Senior Hydrogeologist and Engineer

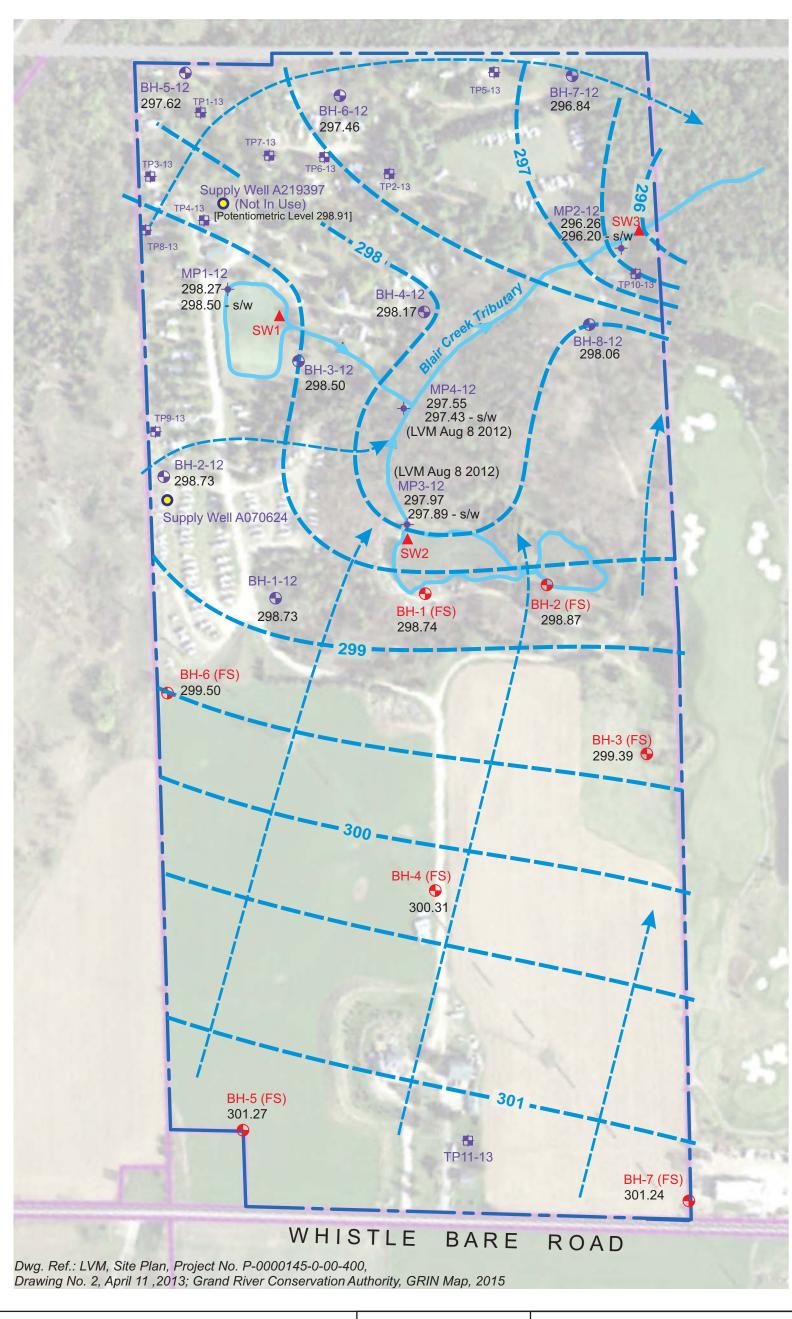


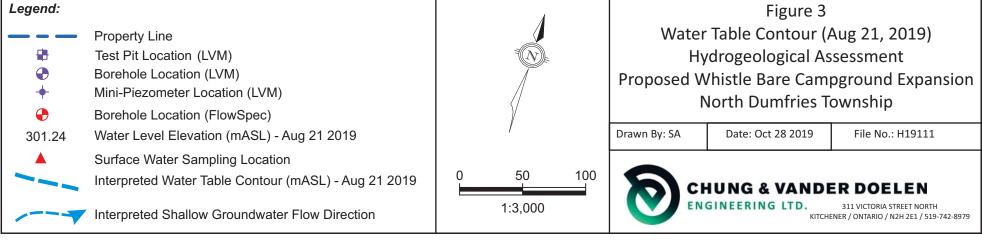
APPENDIX A
Figures 1 to 3
Development Concept (GSP Group)

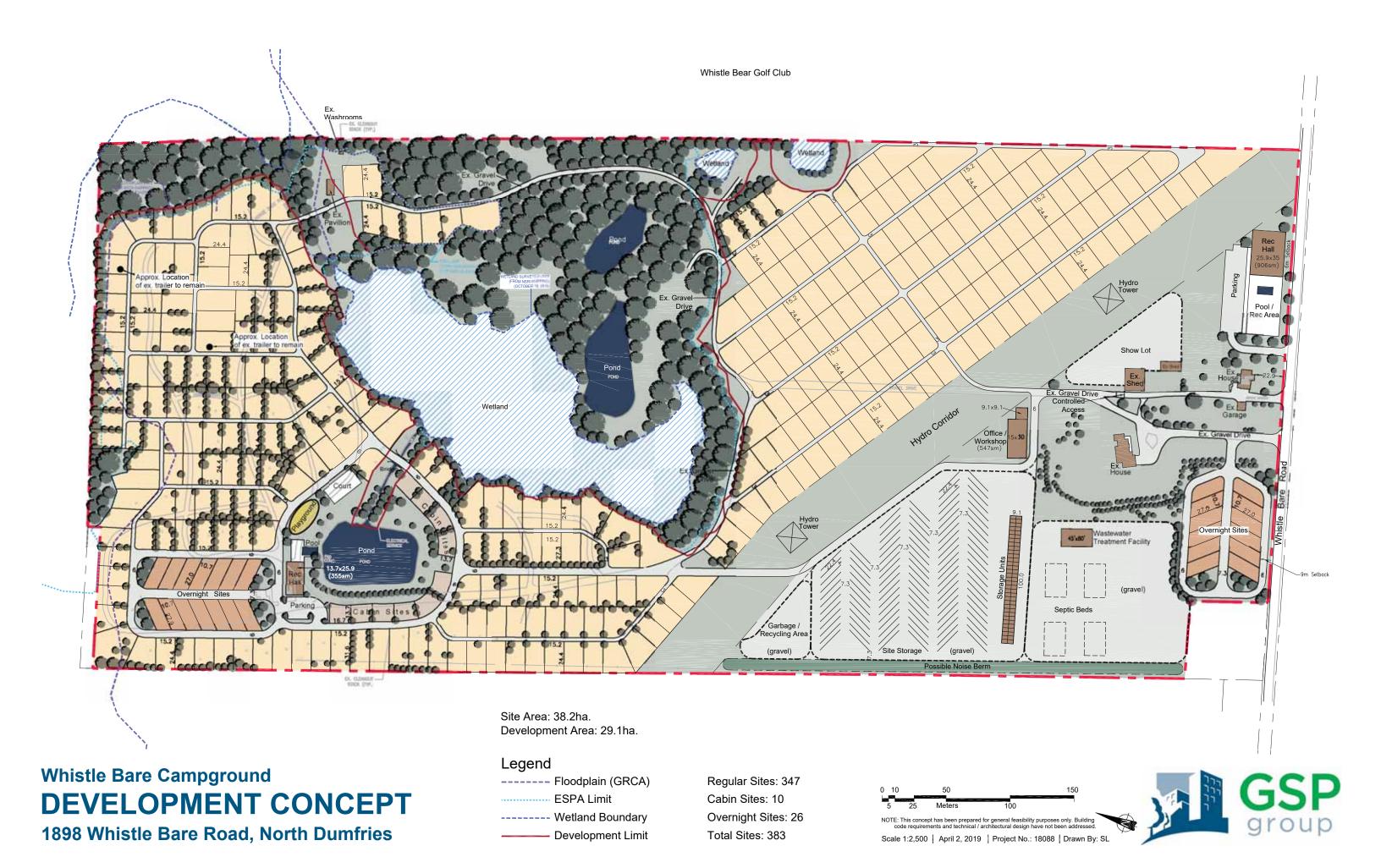












Hydrogeological Assessment Proposed Expansion of Whistle Bare CampgroundPart Lot 28, Conc 12, Township of North Dumfries

January 9, 2020 FILE NO.: H19111 Page B

APPENDIX B Water Well Records



UTM 17 5 4 9 0 2 0 E 5 R 4 8 0 1 2 6 0 N Ontario Water Resorted Elev. 4 R 4 0 3 0 WATER WELL Basin 2 3 County or District Market Con. 2 Lot 2 5 D	L REC	ORD	65 Nº 2000 / 200	677 47/5002 (65)
	7.7.	Pumping	T-1/4	
Inside diameter of casing Total length of casing Type of screen Bross 3 # X 6 in X 20 Shift Length of screen Depth to top of screen Diameter of finished hole Casing and Screen Record A Street Record A S	Static level Test-pumping range of the state of th	ate 60 pumping 60 pumping rate	h h est else	
Well Log		1977	C	r Record
Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
D.A	0	5	65	frek
Sond on the clay	45-60	4.6 60 7 65		
For what purpose(s) is the water to be used? Is well on upland, in valley, or on hillside: Drilling or Boring Firm Address Licence Number	road and	Location of the below show lot line. Indi	distances of we	
Name of Driller or Bord Address Date (Signature of Licensed Drilling or Boring Contractor) Form 7 15M-60-4138 OWRC COPY Nam 25' lorline	(Ran	errill R4) Mr 47 H	.s.£8	Halt.

MINISTRY OF THE ENVIRONMENT

408/82

The	Ontario Water Resor	urces Act	
WATER	WELL	RECORD)

Ontario	I. PRINT ONLY IN			65043	82	65001 100	XV.	12
OWNER (SURNAME FIRST	yloo	TOWNS	ADDRESS STATE	Cityofa	a hong	COCK TRACT, SUNVEY, ETC.	2 29 PLETED 10	029
SCHIE	DEL C	ons/	NOTHING TO A	128 7	of soft	HASIN_CODE II	9 40 0	VR. 75
21	17 547	320	48 01 590	5 1005	Ş	23	1111	ليتيا
	L	OG OF O	VERBURDEN AND BED	ROCK MATERIA	ALS (SEE IN	STRUCTIONS)	en -	
GENERAL COLOUR	MOST COMMON MATERIAL		OTHER MATERIALS		GENERA	L DESCRIPTION	DEPTH	+ FEET
Brown	dity for	rel.	111211111111111111111111111111111111111				0	30
They	Sondy a	Luy					30	95
Male	Hadyon	/					95	150
My	Maul						150	15-5
	/						1-	
						2001		
$\overline{}$						10-00-00-0		
21) 1002-1	100/7 1000	170- 10	I Los Colos M	1 100 0 0000000000000000000000000000000	7 11	13 3 3 3 33	F. (C. 16)	V 1 1 1
31 0030	6128167 1009	52058	0/502/4	0/55211	اللل			
41 WATE	ER RECORD	51	CASING & OPEN HOL	E DECORD	_ SIZE : S	I OF OPENING 31-33 DIAME	TER 34-38 1	75 80 ENGTH 38-40
WATER OUND	KIND OF WATER	INSIDE	WALL	DEPTH - FEET	3	ADD 1 1000 C 2000 C	INCHES	FEET
٧٠ النظيم ١٠	FRESH 3 SULPHUR 14	DIAMES	MATERIAL THICKNESS INCHES	FROM TO 13-16	S MATER	IAL AND TYPE	DEFTH TO TOP OF SCREEN	41-44 80
1 50	FRESH 3 SULPHUR 19	LH	Z GALVANIZED 188	0 0/55		TO THE CONTRACT OF THE PARTY OF	terps or sull by	FEET
L.J.	SALTY 4 MINERAL	0/4	OPEN HOLE 19	20-23	61	PLUGGING & SEAL	7,0140	RD NT GROUT
	FRESH 3 SULPHUR 24		Z G GALVANIZED		FROM	10 MATERIAL AND		CKER ETC +
	FRESH 3 SULPHUR 28		OPEN HOLE	27-30	10-1			
	FRESH 3 SULPHUR 34 80		A GALVANIZED	107(07)	26-2			
	SALTY & MINERAL		A COPEN HOLE					
71 PUN ING TEST METHO	10.4	6	0 / 15-16 0 0 17-	18	L	CATION OF WEL	L	
STATIC	WATER LEVEL 25	EVELS DURIN	HOURS OF MI	ue. I	AGRAM BELO	W SHOW DISTANCES OF WELL	FROM ROAD A	ND //
15-00 4 19-21	PUMPING 22-24 IS MINUTES	30 MINUT	ES 45 MINUTES 60 MINUTES	-	, me	new large of well are north by arrow. new large of the court of present the is aign.	tullu	ulding.
004	150,004"	004	11 004 "1004 "	1/1/1/1	o at a	new rest pr	perty 1	2 ogun
SIVE BATE	32-41 PUMP INTAKE		V [] [1000	(6 ind	an los	there is sign	my ky	Red.
SN FELT FLOWING. GIVE SATE RECOMMENDED PUMP	TYPE RECONMENDED		-45 RECONNENDED 46-	THE PARTY OF THE P	not	sid up tu ma	000	W/Z
SO-53	DEEP SETTING		EET RATE OUTO GE	*	74	q		727
5	WATER SUPPLY	170.00				· · · · · · · · · · · · · · · · · · ·		Fish
STATUS	2 COBSERVATION WELL	L . []	ABANDONED, INSUFFICIENT SUPPLY ABANDONED, POOR QUALITY UNFINISHED			. 1)	8	1
OF WELL	4 D RECHARGE WELL	,,,				-	10	7
WATER -	2 D STOCK	5 CON	IICIPAL	-	-	1011		P
USE O	7 3 IRRIGATION 4 INDUSTRIAL	. T1 coo	LIC SUPPLY LING OR AIR CONDITIONING			8 7 1	n	46
- 5	OTHER TE	VHIS (LOURTS NOT USED		1		<u> </u>	
METHOD 2	2 ROTARY (CONVENT		BORING	well		12. 1 / 1	1-11:	1 #
OF O	1 D ROTARY (REVERSE	2.	DRIVING	WZ9	,	ull is behind	pulou	3 11
	s AIR PERCUSSION		2	DRILLERS REMAR				- 4
NAME OF WELL CO	NIRACIOR A	lh.	m 4208	DATA SOURCE	1 58 00	HAZOS DATE RECOSE	0012	6 53-68 80
O Longs	and the	jui	4200	SOURCE DATE OF INSPI	ECTION	INSPECTOR		0
A AME OF DRALER	OR HORER	111	LIGENCE NUMBER	S Cimi	23/	17 129		
NONTES AND ONLIER AND SIGNATURE OF CONTROL CON	ly fork	hos	n 4208			1 Design	P	
SIGNATURE OF CON	wholh	m	DAY 29 MO OUT YR 7	3+8			v	V1



The Ontario Water Resources Act WATER WELL RECORD

	1 PRINT ONLY IN S	ETACES PROVIDED ECT BOX WHERE APPLICABLE TOWNSHIP BOROUGH CITY TOWN VILLAGE	507252 65001	150N.	Lot_ 23-27
UNTY OR DISTRICT	had-sade	DUMFRIES	XII	ATE COMPLETED	30
		RHI AVA	2 11/4 110150	DAY 22_ MO AL	0
41	Wall Carl		ELEVATION NC BASIN CODE		بتبل
1	L(OG OF OVERBURDEN AND BEDROCK	MATERIALS I SEE INSTRUCTIONS		
ENERAL COLOUR	MCST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	FROM	H - FEET
	COMMON MATERIAL				
3 ROWN	STONES	BOULDERS, SAND	LOOSE	0	22
GREY	CLAY	STONES	HARD	22	30
BROWN	STONES	SAND BOULDERS	LOOSE	30	40
BROWN	GRAYEL		COARSE,	40	48
	H-0-10-	-			1
NATER FOUND AT - FEET 48 19-13 19-14 15-14 1 CONMINC TEST NI LEVEL JO-23 1 CONMINC GIVE RATE RECOMMENDED PI	FRESH 3 DSULPHUR 19 SALTY 4 DMINERALS GAS FRESH 3 DSULPHUR 24 SALTY 4 DMINERALS FRESH 3 DSULPHUR 25 SALTY 6 DGAS FRESH 3 DSULPHUR 25 SALTY 6 DGAS FRESH 4 DMINERALS SALTY 6 DGAS FRESH 2 DMINERALS SALTY 6 DGAS FRESH 2 DMINERALS SALTY 6 DGAS FRESH 2 DMINERALS SALTY 6 DGAS FUMPING BASE SALTY 6 DGAS SALTY 6 DG	INCHES MATERIAL INCREASS INCOME 10-11 ESTEEL 12 CANAVANIZED CONCRETE 4 COPEN HOLE 5 CONCRETE 4 CONCRETE 4 CONCRETE 4 CONCRETE 4 CONCRETE 5 CONCRETE 5 CONCRETE 5 CONCRETE 5 CONCRETE 6 CONCRETE 6	STIN FEET 10 MATERIAL AND TYPE 48 61 PLUGGING	WELL FROM ROAD	FEET CORD
STATUS OF WELL WATER	DOBSERVATION W CONTROL	y UNFINISHED	WAT. REG. R	15 01	
METHOD OF CONSTRUCT	37 + C SABLE TOOL 2 C HOTARY I CONVI		DRILLERS REMARKS	10	1496
E MCLAC	BRESLAU,	DUT, NOBIMO	SOURCE 35 18 DATE OF INSPECTION INSPECTOR	FEB 271	992
NO SIGNOTES	M'LAUGH M'LAUGH M'LAUGHTRACTOR	LIN SUBMISSION DAT 349 Alen DAY 23 NO. 09 VR 94	OFFICE	CS FORM NO. 05	SS.ES

Ministry of the Environment The Ontario Water Resources Act WATER WELL RECORD

Ontario		SPACES PROVIDED	ABLE 11	650	7550	6500 U	CON.	1112
COUNTY OR DISTRICT	1	TOWNSHIP BOROUG	Dimfrie	T _G	CON	X//	·c	27
			PAD P	hrida	Oto	90	ATE COMPLETED	993
		<u> </u>	i a rai	NC. CLEVATION		MASIN CODE	" "	
1 2	N 10 12	OG OF OVERBU	PDEN AND BED	BOCK MATE	RIAI S ISSE	NSIBILETIONS)		- 47
GENERAL COLOUR	MOST		ER MATERIALS	TOOK WATE		AL DESCRIPTION		FEET
B	COMMON MATERIAL		/				FROM	70
Drown	clay	grave	<u> </u>				20	40
Grey	5111	clay					11	
Grey	sand	5:77	12				60	115
Grey	grave/	Sand	slones				1/3	124
		1						
		-						
					- 12			
	-					-		
		-						-
	1462							
	11 1 1 11	- 1.1 . T T T		3.1/ 15	1.1.1.1	Fa. 3. 14 . 1 . 4	11 11. 1	1.1.1.1
31 11								
1 10	TER RECORD	51 CASIN	IG & OPEN HOI	- Minim	5171	54 -5: Of OPENING 31-3	3 DIAMETER 34-38	75 40 LENGTH 38-40
WATER FOUND	KIND OF WATER	INSIDE MATER	WALL	DEPTH - FEET	# #	40	G INCHES	3
18-13	FRESH 3 DSULPHUR SALTY 4 DMINERALS	INCHES	INCHES	FROM TO	100	tainless Step.	SEPTH TO TOP OF SCREEN	0 ,
100	FRESH 3 DSULPHUR	10-11 1 STEEL 2 GALVAI 64 4 GOPEN	HOLE 188	0 12	0 61		SEALING RECO	
10.11	SALTY 6 CIGAS	J. DPLASTI	ic (a)		20-23 DEPTH	SET AT FEET MATE		ENT GROUT
1	PRESH 3 DSULPHUR 4 DMINERALS DSALTY 6 DGAS	5 A DOPEN		115 12	74	10-13 14-17		20.0012/2012/201
	☐ FRESH 3 □ SULPHUR ** ☐ SALTY 6 □ GAS	EA-25 1 DSTEEL				8-21 22-25		
	FRESH 3 DSULPHUR 34 SALTY 6 DGAS	24-25 1 STEEL 2 GALYA 3 CONCA 4 OPEN 5 PLAST!	HIZED HETE HOLE		2	6-29 30-33 80		
PORPING TEST H			ION OF PUMPING			LOCATION OF	WELL	
71 × × 201	Z [] BAILER	75 cm 3	The state of the s	80			L	AND
STATIC LEVEL	WATER LEVEL 25 (ND OF WATER PUMPING 1 22-54 IS MINUTE	LEVELS DURING	2 X RECOVERY			GION SHOW DISTANCES OF	tit	
ST IS PLOWING GIVE BAYE	124 10	1020-31	10 10 10	-37		Vollad	0	
Z IF PLOWING	28-41 PUMP INTAK	1111	R AT END OF TEST	42	/	1 Golf i		
NECOMMENDED P	GPM RECOMMEND	744	CLEAR 1 CLOU		120	Pond II)	<u></u>	
☐ SHALLO	W N DEEP SETTING	50 FEET PATE	NG 5/	ru		By We L		4
10-53	W1		DIT THOUSANT THE COLUMN	-	M	f	1	
FINAL	WATER SUPPLY DESERVATION W	TELL . ABANDON	ED INSUFFICIENT SUPP ED POOR QUALITY	1	Ros	ie ville Rdi		
OF WELL	C. C	7 D UNFINISH						22
	SS-SE	S COMMERCIAL MUNICIPAL		11/				
WATER	FINDUSTRIAL	PUBLIC SUPPL	UR CONDITIONING	11	191.1	-7	1	l
	□ OTHER		□ NOT USED	_ _	AWY	97		_
METHOD			DIAMOND	9 3	,			
CONSTRUCT	TON SOTARY (AIR)		RIVING				12	4248
L Lucus es w			WELL CONTRACTO	DRILLERS	54	CONTRACTOR 19 62 DAT	ERECEIVED	61 68 80
1 1/1	han Thell I	illing Inc.	4207	N Seunc		4207	JAN 0 4 19	
ADDRESS RATINE OF WILLIAMS	2 12 +	nt		0 6472 0	T INSPECTION	INSPECTOR		
HE NAME OF WI	ELL TECHNICIAND	1 001.	WELL TECHNICIA		*1			
S SIGNATURE O	VYN Jackh	an submissio	1005 8	93 OFFICE			CSS	ES
Mer	vyer Fach	arn DAY 3	P NO OUG YR	23 0			0,5000	
MINISTRY	OF THE ENVIROR	NMENT COPY					FORM NO. 0506	THE OD FORM S



MINISTRY OF THE ENVIRONMENT COPY

The Ontario Water Resources Act WATER WELL RECORD

ntario .	1. PRINT ONLY IN S	SPACES PROVIDED	6	507763	10 1	ÇO'N'	1 1 1 1
DUNTY OR DISTRICT		TOWNSHIP, ROBOUGH CITY TOWN			Con. 12	Y Etc	31
			-	NUD		DATE COMPLETE	Jan. 95
		. 2, Cam		ntario NIR	#C BASIN CODE	DAT	HO YR -
21	10 12		<u> </u>	<u></u> [30 31		
	LC	G OF OVERBURDEN AND	BEDROCK				DEPTH - FEET
ENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIAL	s	G	ENERAL DESCRIPTION		FROM 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
34 10-13 ; 2 10-23 ; 2 10-23 ; 2 25-28 ; 2 20-33 ; 2	TRESH 3 SULPHUR 14	DIAM MATERIAL (**)	CHES PROM	10 SO	Stamless Stee Telescope	I OF	COMPAT CHOOL
STATIC LEVEL IN STATIC LEVEL LEVEL IN STATIC LEVEL LEVEL IN STATIC LEVEL LEVEL IN STATIC LEVEL	WATER LEVEL WATER LEVEL WATER LEVEL WATER LEVEL WATER LEVEL THE PUMP ING STATE WATER LEVEL WATER LEVEL STATE STATE WATER LEVEL STATE STATE	8 GPM 1 15-16 LEVELS DURING 2 2 20 RECC 22 22 22-31 32-34 ECT 9 FEET 9 FEET 26 FEET 1 CLEAR 2	17-18 WHYS PING OVERY 60 MINUTES 35-37 9 1161	V FOI LINE	LOCATION M BELOW SHOW DISTAN- INDICATE NORTH BY OT A	CES OF WELL FR ARROW INE	OM ROAD AND
FINAL STATUS OF WELL	A DOMESTIC	P UNFINISHED	LITY	14.	Men XX	350	₹
USE	4 D INDUSTRIAL D OTHER	COOLING OR AIR CONDITION NOT USE GORING INTIONAL	VING D	BARN			
OF CONSTRUC	TION ROTARY (REVER	SE) DETTING DETTING DETTING DETTING DETTING DETTING DETTING	OTHER	DRILLERS REMARKS	SE CONTRACTOR SE	AZ DATE MECEIVED	14602
David ADDRESS	son Well Drilling 86, Wingham, On	Limited 1737	NUMBER	SOURCE DATE OF INSPECTIO	1737	/ JUL '	1 1995
G. RE		TOI		OFFICE USE			CSS.ES

Print only in spaces provided.

Mark correct box with a checkmark, where applicable.

6508392

Municipality	Con.	
65001	CON	1112
44	15	29 22 3

County or District	Waterlan		Township	Borough/City	Town/Village	rips		Con bloc	ck tract surve	ey, etc. Lo	30
	and the transfer of the first		Address	P#2	Pan	hrin	lan 1	Out.	Date completed	11 F	6 3
1	<u> </u>		أيب	Northing		RC Eley	etion F	C Basin Code		Jan (II	iv I
	10			N AND BED	ROCK MA	TERIALS	(see instr	uctions)		Da	pth – fee
General colour	Most common materi	rial	Ot	her materials			Gen	eral description		From	To
Brown	gravel									0	15
Clay,	silt					-		-		15	40
Sand	-9					-				40	4
						-				1	
											-
		-	100					·			
					-						
	التناللينا		Lui	LILL	للبال	LLLL		HILL	ساليل		Ш
2 L WAT	TER RECORD	51	CASING 8	OPEN HOL	E RECOR	D 1	Sizes	of opening	31-33 Diameter	34-38 Leng	1 1 25
later found	Kind of water	Inside diam	Material	Wall thickness	Depth		(C1-41		~	inches 5)
0 10-12 1 12	Fresh	10-11 + []	Steel 12 Galvanized	inches	1,1011	13-16	0	ial and type	+ /	Depth at top	
15-18 1	Fresh 3 🗆 Sulphur 19	67:8	Concrete	188	0	40	5/6		ee/	70	feet
	Sany 6 Gas	17-18 1 []	Steel 19	Screen		30-23	61	☐ Annular space	NG & SEALIN	Abandonm	-
	Salty # Minerals Gas Gas Fresh 3 D Sulphur 29	5 :8	Concrete	It the	37	49	From	To Ma	terial and type (Ce	ement grout, be	entonite,
* D	Salty 6 Gas	24-25 1 🖸	Steel 26	J. Mings		27-30	16-21	22-25			
	Fresh 3 Sulphur 34 60 1 Salty 6 Gas	; D	Concrete Open hole Plastic				26-29	50-23 80			
Pumping test me		II-H Du	ration of pump	ing 7 17-18	1	- Commercia	1	OCATION O	E WELL		
Contra Invest W	Vater level 25	O GPM during □ Pu	mping 2	Aecovery		In diagrar		Onlynes,	well from ro	ad and lot l	ine.
19-21	nd or pumping		minutes 32-34	60 minutes 35-37		mundle f	orui by aire	N	401		
teet	47 leet /Leet leet leet Pump intake set	14 teet 1	le feet	/Le teet			,	<i>}[</i>		1	
	GPM	feet	☐ Clear commended	☐ Cloudy					•	Bla	1
☐ Shallow	pump setting		mp rate	GPM	_		Well	/	1		-
\$6-53	S OF WELL >				1) i		·· 9	#71 ~ (
INAL STATUS		, insufficient suppl	y * 🗍 Unfinis	shed cement well		٠)	//		1		
Water supple □ Observation	pply 5 Abandoned, on well 8 Abandoned.	(Other)									
INAL STATUS Water supple Observation	on well	(Other)				///	/	Rosavill	e Rd.		
Water supple Cobservation Cobservation Test hole Recharge VATER USE In Domestic	pply 5 Abandoned, on well 6 Abandoned, 7 Abandoned well 7 Dewatering 55-%	(Other)	▼ □ Not us		-	4		Rosevill	e Rd.		Г
Water sup	pply 5 Abandoned, on well 8 Abandoned, well 9 Dewatering 55-96 3 Commercial 6 Municipal 7 Public suppl	(Other)	* 🖸 Not us		-	4		Rosevill	e Rd.		Γ
Water supple 2 Observation Communication C	pply 5 Abandoned, on well 7 Abandoned, well 8 Dewatering	(Other)			-	4/		Rosevill	e Rd.	п	
Description Description	pply 5 Abandoned, con well 6 Abandoned well 7 Abandoned well 8 Commercial 6 Municipal 7 Public suppl 8 Cooling & al	(Other)	Other Driving Diggin	2 9	-	4	<u>/</u>	Rosevill		2011	13
Water supple 2 Observation 3 Test hole 4 Recharge VATER USE 1 Domestic 2 Stock 3 Irrigation 4 Industrial	pply 5 Abandoned, on well 7 Abandoned, well 8 Abandoned, well 8 Oewatering 55-56 Abandoned 6 Abandoned 7 Abandoned	(Other)	Other Driving Diggin	1	-	4		Rosevill		2011	.17
VATER USE Domestic Stock Industrial Cable tool Bestary (ce	pply 5 Abandoned, on well 9 Abandoned, well 9 Abandoned, well 9 Dewatering 9 Abandoned 9 A	(Other)	Other Other Other Other Other Other	2 9	> Date		56 Contracc	#4%	59-42 Date rec	eived	
Description	pply s Abandoned. Abandoned.	(Other)	Other Other Other Other Other Other	g g	O Date	ce	4	207		eived	
VATER USE Test hole	pply s Abandoned, s Abandoned, s Abandoned, s Abandoned, s Abandoned, s Commercial s Cooling & al Cooling & a	in (Other) In (Other) In (Other) In (Other) In (Other)	Other Other	or's Licence No.	O Date	of inspection	4	#4%	59-42 Date rec	eived	53-4
Light Water supplied	pply s Abandoned. Abandoned. Abandoned. B	in (Other) In (Other) In (Other) In (Other) In (Other)	Other Other	g g	Sour	of inspection	4	207	59-42 Date rec	eived	53-61

⟨∀⟩ Ontario Ministry of the Environment Print only in spaces provided. 6508867 Mark correct box with a checkmark, where applicable. 11 CONTINS 19-01 County or District Township/Borough/City/Town/Village Con block tract survey, etc. WATERLOO NORTH DUMPFRIES Car12 NIR-553 Date completed Address CAMBRIDGE. 1751 WHISTLEBARE RO. سلسليا ليالسيا لي لسايّ ليتتنيا LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions) Depth - feet Most common material Other materials From To BROWN SAND STONES 38 0 GREY CLAY 38 80 GRAVEL COARSE BROWN SAND 80 85 85' TOTAL DEPTH 6" DRINE SHOE 31 CASING & OPEN HOLE RECORD WATER RECORD 51 Sizes of opening (Slot No.) Water found at - feet Inside diam Wall thickness inches Depth - feet Kind of water Material From To inches ☐ Sulphur ☐ Minerals ☐ Gas 1 Steel
2 Galvanized
3 Concrete
4 Open hole
5 Plastic Material and type Depth at top of screen Fresh Salty 13-16 Sulphur Minerals Gas 85 1 ☐ Fresh 2 ☐ Salty 6" +1 .188 **PLUGGING & SEALING RECORD** Sulphur Minerals Gas 1
Steel I ☐ Fresh Z ☐ Salty ☐ Galvanized Depth set at - feet Galvanized
Concrete
Open hole
Plastic Material and type (Cement grout, bentonite, etc.) From To Sulphur Minerals Gas 1 ☐ Fresh 2 ☐ Safty 23 0 BENTONITE 1 Steel
2 Galvanized
3 Concrete
4 Open hole 27-30 30-33 1 ☐ Fresh 2 ☐ Satty 30-33 Duration of pumping O 17-18 Hours O Mins Pumping test method

Pump ≥ □ Bailer Pumping rate /2 LOCATION OF WELL In diagram below show distances of well from road and lot line. Indicate north by arrow. Water level end of pumping 1 X Pumping Water levels during ≥ ☐ Recovery 45 minutes 32-34 15 minutes 26-28 30 minutes 29-31 50 50 leet 50 teet 3 Z_{teet} 50 PUMPING Water at end of test Ž ☐ Cloudy **K** Clear GPM 43-45 Recommended pump type pump setting pump rate 55 feet 10-12 GPM NHISTLE BARE 5 Abandoned, insufficient supply 9 Unfinished
6 Abandoned, poor quality 19 Replacement well
7 Abandoned (Other)
8 Dewatering HOUSE 280 WATER USE 55-56 LOTZ6 5 Commercial
6 Municipal
7 Public supply
8 Cooling & air conditioning 9 Not use Domestic Stock ,0 CON12 3 ☐ Irrigation 4 ☐ Industrial METHOD OF CONSTRUCTION 57 Cable tool
Cable tool
Cable tool
Cable Todary (conventional)
About (reverse)
About (air) 5 Air percus
6 Boring
7 Diamond
8 Jetting 9 Driving
10 Digging
11 Other 224155

Name of Well Contractor GRAHAM WELL DRILLING A	Well Contractor's Licence No.
RR#5 ROCKWOOD, ONT.	NOB-ZKO
Name of Well Technician Wilson	T-1924
Signature of Technician Contractor	Submission date

Ϋ́	Data 56 Ci source	2336	JUN 1 1 2001
USE ONL	Date of inspection	Inspector	
MINISTRY	Remarks		CSS.ES1
			0506 (07/00) Front Form

Ministry of the Environment

Well Tag Number A 003434

Well Record
Regulation 903 Ontario Water Resources Act

page _

Instructions for Completing Form

4003434

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.

 All metre 	measure	ements s		on can be directed to 1/10 th of a metro		Management Coordina	ator at 416-23	35-6203.	
		CAN DESCRIPTION OF		Vell Information	MUN 650		ntry ose omy	12 LOT	29
Address of Wall	Location (f	County/Dio	trial/Maniela (III.)	7					
			trict/Municipality)	A.C.	ownship North Dumfries		Lot 29	Concession	
RR#/Street Num	ber/Name	stle Bar	e Rd.	L	City/Town/Village Cambridge	The state of the s	/Compartment		
GPS Reading	NAD 8 3	Zone 17	5.4800 3	Northing 4801328	Unit Make/Model Magellan Blaz	Mode of Operation: zer12 .	Undifferential Differentiated		aged
Log of Overb	ourden a	nd Bedr	ock Materials (s	see instructions)					
General Colour	Most co	mmon mat	erial	Other Materials		General Description		Depth	Metres

General Colour	Most common material	Other Materials	General Description	Depth N From	Metres To
brown grey	sand gravel gravel	clav		0 5 5 17	⁷ .6
grey	gravel			17.6 18	.6
eme et i g					
				1	
*		and necessaria			
		ar troops			

Hole Diameter		Cons	truction Rec	ord		Tes	t of W	ell Yield		
Depth Metres Diameter From To Centimetres +.5 18.6 15.9	Inside diam centimetres	Material	Wall thickness centimetres	Depth	Metres	Pumping test method Pump	-	aw Down Water Level Metres		ecovery Water Leve Metres
			Casing	1		Pump intake set at - (metres)	Static Level	19.9		19.9
	15.9	Steel Fibreglass	188	+.5	18.6	Pumping rate (litres/min) 45	1	10.1	1	10
Water Record	13.5	Plastic Concrete Galvanized	100	7.5	10.0	Duration of pumping	2	10.1	2	19.9
Water found at State Kind of Water m Kresh Sulphur Gas Salty Minerals		Steel Fibreglass Plastic Concrete				1_hrs +0min Final water level end of pumpin 0.2 etres	2	10.1	3	19.9
Other:		Galvanized Steel Fibreglass				Recommended pump type.	4	10.2	4	19.9
m Fresh Sulphur Gas Salty Minerals Other:		Plastic Concrete Galvanized		*		Recommended pump depth. 15 metres	5	10.2	5	19.9
m Fresh Sulphur	- 170		Screen	0147	-	Recommended pump	10	10.2	10	19.9
Gas Salty Minerals	Outside	Steel Fibreglass	Slot No.		1	rate. (litres/min)	15	10.2	15	19.9
Other:	diam	Plastic Concrete	SIOU NO.		1	If flowing give rate -	20	10.2	20	19.9
After test of well yield, water was		Galvanized		100		(litres/min)	25	10.2	25	19.9
X Clear and sediment free						If pumping discontin- ued, give reason.	30	10.2	30	19.9
Other, specify		No C	asing or Scr	een			40	10.2	40	19.9
Chlorinated X Yes No	× 5	Open hole					50	10.2	50	19.9
Accompany (2010) (2010) (2010)		1000 0 mg 29, 797 5					60	10.2	60	199

Other, spe	ecify		No Ca	sing or S	creen		ued, give reason.	40	10.2	40	19.9
Chlorinated 1	Y Yes	No · Op	en hole		167		11	50	10.2	50	19.9
, manifestour L	24 100		5700 8845][60	10.2	60	19.9
	Plugg	ing and Sealing Record	Annular	space [Abandonment		Location	of We	II.		
Depth set at -		aterial and type (bentonite slurry, n	neat cement slurry)		lume Placed		w show distances of well	frem roa	d, lot line	and bu	uilding.
From 6	To	Bentonite			ubic metres)	Indicate north b	Doo:	n)			
0 0	9	Denionite		1.5	,			- 1	X	#1	CONTRACTOR OF THE PARTY OF THE
		•					ᆛ	J		-	Bla
							Dodge Dr.		Z	~	Bla
		•							401	~	nd Mill Ri
		•			16711-2-2-1	#12/				Whistl	e Bare Ro
		Method of Const	truction				111	P	_		
Cable Tool	ŀŷ	Rotary (air)	Diamond		Digging	Rosev	ille Rd. We	ır1			
Rotary (con	nventional)	Air percussion	☐ Jetting		Other	ROBEY	mc Ad.		_/1	- 4	_
Rotary (rev	verse)	Boring	☐ Driving				Dickie Sett.	1 T	./		
		Water Use)			Th	e well is at 1912 V	Vhistle	Bare Rd.		
Domestic		☐ Industrial	Public Supply	6	Other	1		Maria de la composición dela composición de la composición de la composición dela composición dela composición dela composición de la composición de la composición de la composición de la composición dela composición de la composición dela composición de			
Stock		Commercial	☐ Not used	The sale	Janes - Charles				N 1954 175 MILL		
Irrigation		Municipal	Cooling & air	conditioning)	Audit No. 7	02510	ate Well	Completed	Y .	MM DI
		Final Status of					00010			53	12 2
Water Supp		Recharge well	Unfinished	Aba	ndoned, (Other)		WITCH S INTONTHOUGH	ate Deliv		YYY	MM DI
Observation		Abandoned, insufficient supply	Dewatering			package deliver	ed? X Yes No		- 0	3	12 2
Test Hole		Abandoned, poor quality	Replacement				Ministry U	lee Onli		-	
F 1000 II	011	Well Contractor/Technici			a Lisanes No	Data Source		Contracto		^	-
lame of	cknam	Well Drilling Inc,	V4:	207 actor	's Licence No.	Data Source		20110.000	42	U	7
Business Rd	Rs#12	Ancaster, Ont.				APR 1	6 2004 MM , DD D	ate of Ins	spection y	YYY	MM DI
		ackhamst name)	T	0058	's Licence No.	Remarks		Vell Reco	rd Number		
Signature of Te	echnician/(Contractor Constant	Date	Submitted	3 1/2 26		0. 137.13	6	509	62	7

Ministry of the Environment

Well Tag Number A 029255

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. LOT MUN CON Well Owner's Information and Location of Well Information

DD#/Ct-c-	Water	00			Îna	N - 500 - 524		Ť		Ť	7//7	
L'UMAN DILGE	t Number					North-DW	ngjes	Site/Compa	rament	/Block/Tra	act et	S.
CDC Pear	1316	Dickie Set	tlemen	t Rd.	orthing	Cambri	dge Mor	de of Operation: \bullet Undi	fferentia	ted (%	Aven	aned
GF3 Read	ing	813 17	54	8302 14	801340	151100010000000	02070500	Diffe		d, specify	y Avoir	agou .
Log of C	verbur	den and Be	drock M	aterials (see in	structions)	Magellar	1 Blazer12	di :(
General Co	olour 1	Most common n	naterial	Other I	Materials		Gene	ral Description		Dep		Metres
- terran				silt						_		
brov	2	sand gr								20		20 30
grey		Children Court of the								200		
grey		sand gr	avel				(30		33.5
		582					(%)			2.		*
		7.		12			VW					
				•								•
•		36		18						*		•
Н	ole Diam	eter		Co	nstruction Re	cord		Tes	t of W	ell Yield		
Depth	Metres	Diameter	Inside	30	Wall	Depth	Metres	Pumping test method	7.41	w Down	_	ecovery
From	То	Centimetres	diam	Material	thickness			1	Time V	Vater Level Metres	Time min	Water Lev Metres
+2.5	32	15.9	centimetres		centimetres	From	То		Static	wed es	171111	widues.
31	33.6	3223		Enals, Flank	Casing			(metres) 32 Pumping rate	Level	11.7	1	11.7
31	33.0	, 13		Steel Fibregla Plastic Concrete	760			(litres/min) 54	-	12.8	1	11.8
	Vater Rec	ord .	15.9	Galvanized	188	+2.5	23.4	Duration of pumping	2	13.1	2	11.7
Water foundat Metr	es / Kir	nd of Water		Steel Fibregla	ss Screen &			hrs min			0	
33 _{Gas}	Fresh		13	Plastic Concret	fittings	31	33.5	of pumping	3	13.2	3	11.7
Other:	Salty	Minerals		Galvanized	***************************************	- A	12202	Recommended pump	4	13.2	4	11.7
i m	Fresh	Sulphur		Steel Fibregla				Shallow Deep		13.2	_	1.1.7
Gas Other:	Salty	Minerals		Plastic Concret	В			depth. 30 metres	5	13.2	5	11.7
Other:	Fresh	Sulphur			Screen	-		Recommended pump	10	13 2	10	117
Gas	Salty		Outside	X Steel Fibregla				rate. (litresmin)	15	13.3	15	11.7
Other:			diam	Plastic Concret			The second	If flowing give rate - (litres/min)	20	13.3	20	11.7
	if well yield and sedime	, water was	13.5	Galvanized	25	31.4	32.6	If pumping discontin-	30	13.3	30	11.7
Other,		(241582)	10.0	No	Casing or So	reen		ued, give reason.	40	13.3	40	11.7
Chlorinate	d Wyos	No		Open hole				71.	50	13.4 13.4	50	11.7 11.7
Officialities	P. 100					-	<u> </u>		60	13.4	60	11.7
D-sh		ging and Sea			Mah	Abandonment ume Placed	In diagrams had	Location of low show distances of well from			and he	ildina
From	at - Metres To	Material and type	e (bentonite	slurry, neat cement slu		bic metres)	In diagram bei		om roa	z, jot iirie,	and bu	many.
0	6	Bentonite			1.5			Doon	$\mathcal{J}_{\mathcal{J}}$	#17		
2		- G T4/1001										air R
v .	-	348									R	air
								40	1	Old	Mill I	
		•			S.				Vell			
Cable T	anl	M Rotary (a	- 11 - 1	Construction Diamond		Digging		Whistle			_	7
THE RESERVE OF THE RE	ooi convention			☐ Jetting		Other		Roseville R	d. 1			
THE RESERVE OF THE PARTY OF THE	reverse)	Boring	incore.	☐ Driving				7	/			
Demost	i.e.	Industria	15,1515.11	er Use	mnlu	Other		Dickie Sett	tlemen	Rd.	l	
☐ Domest ☐ Stock	iG:	Commer		☐ Not used								
Irrigation	n :	Municipa		Cont.	& air conditioning		Audit No. 7	42719 Par	te Well	Completed	06	03 124
Water S	Supply	Recharge we		tus of Well	ad [] Aban	idoned, (Other)	Was the well	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	te Deliv		906.	MM DE
		Abandoned,	insufficient :	supply Dewater	ng	30,100, (00,101)	package delive			2	006	03124
		Abandoned,		Replace				Ministry Us	e Only	,		
Test H			actor/16	Cimilcian miorma	Well Contractor's	s Licence No.	Data Source		ntragion	0 0	ry	
	ell Contrac				and State of the same of the		1.1		7	& U	-	
Test H			Illna In	е.	4207		Data Bossica	1 toons in Day	te of Inc	nection	0000	484
Name of W	ackha	n Well Dr		e,	4207		Date Received	6 2006 Da	te of Ins	pection	m	MM DC
Name of W Business A	ackha arkha	n Well Dr Ancaster		е,	Well Technician	s Licence No.	APR C Remarks	6 2006		pection y	m	MM DC
Name of W Business A	ackha arkha	n Well Dr		e,	Well Technician	s Licence No.	APR C Remarks	6 2006		0. 22	my	MM DC

Well Tag No. A 070624 W

Well Record

	wen	Record
Regulation 903	Ontario Water l	Resources Act
	Page	of

rst Name Sage Car	npgrounds Inc.			il Address	Province	Postal Code	ĪT		y Well	
	Street Number/Name, RR) NISTIE Bare Rd. RR Oction and/or Major Alter		mbridge		Ontario	N1R 5S				2463
ddress of Well L	ocation (Street Number/Name nistle Bare Rd.		North Du	umfrie	s	Lot 29		Concession	2	
Waterloc TM Coordinates)		City/Town/Village		Mode of	Operation:	Onta		Posta	K3\$3
NAD 8 3	Zone Easting 1 7 2 7 S 4 7 7 2 7	4801751	Magellan	Modella Bla	ze12 Differ	entiated, specify_	Ondine	emated	W AVE	rageu
General Colour	Most Common Material	Other Mat			General I	Description			Depth	(Metres)
brown	silt	sand gravel							0	6
grey	gravel								6	6.7
	8.0.									
										1.
								. =		
epth Set at (Mat	Annular Space/Abanc	Ionment Sealing Reco ealant Used	Volume	Placed	Check box if after te	Results of We est of well yield,		d Testing aw Down	F	Recovery
From To	(Material	and Type)	(Cubic N		water was: Clear and san		Time (Min)	Water Leve (Metres)	-	Water L
0 6	Bentonite		.3		☐ Cannot develo		Static	2.6	Static	(motio
					state If pumping disconting	nued, give reason:	Level 1	2.7	Level 1	2.6
								2.7	2	2.6
ž					Pumping test meth	nod	2	2.1	-	2.6
Method o	f Construction	Water	Use		Pump intake set a	t (Metres)	3	2.1	3	
Cable Tool	☐ Diamond ☐	Public Comn	nercial No	ot used	6		4	2.1	4	2.6
Rotary (Conver		Domestic Test H		ewatering onitoring	Pumping cate (Litre	es/min)	5	2.1	5	2.6
Rolary (Air)	☐ Digging ☐	Irrigation Coolin	ng & Air Conditioni	- 1	Duration of pumpi	ng	10	2.7	10	2.6
Air percussion Other, specify		Industrial Other, specify			hrs +	min	15	2.7	15	2.6
		s of Well			(Metres)	9 or pumping	20	2.7	20	2.6
Water Supply Replacement V	☐ Dewatering Well Vell ☐ Abandoned, Insuffice		vation and/or Monit tion (Construction)		Recommended pu		25	2.7	25	2.6
Test Hole	Abandoned, Poor V	Vater Quality Other			Shallow Recompended pu	Deep imp depth		27	-	2.6
Recharge Well	Abandoned, other,				Metr		30	2.7	30	2.6
	nap below showing:	on of Well			Recommended pu (Litres/min)		40	2.7	40	
an arrow indicatir	daries, and measurements suffi ng the North direction			ints,	If flowing give rate		50	2.1	50	2.6
detailed drawings	s can be provided as attachmen of inside of well can also be prov		e (8.5" by 14")		(Litres/min)		60	2.7	60	2.6
	and the pro-					Wate	r Detai	ils		
	r.	111 1 1	DIE.		Water found at D	Depth Kind	of Wate	er	ule t	
		Jan Slan	Blair		Water found at D		of Wate	Salty S	uiphur	Min
		Whistle E			Metres			Salty S	ulphur	Min
	11/	a vvia vvinsue i			Water found at D		of Wate	Salty S	Sulphur	Mir
Rosevil	le Rd.				Casing Used		_	Casing a		
	This	ie Settlement Rd.			Galvanized	Galvanized		ameter of the		
	■ LAICK	an appearable AGS.			Steel	Steef	_	epth of the Ho		
Date Well Comp	leted Was the well owner's inf	formation Date the We	all Record and Pac	kage	Fibreglass Plastic	Fibreglass Plastic			6.7	
(yyyy/mm/dd)	package delivered?	Delivered to	Well Owner (yyyys		Concrete	Concrete	W	all Thickness	Wetres 48 TY	m
wojug	Well Contractor and W	2000			No Casing a	nd Screen Used	1	side Diamete		
Packha	f Well Contractor	1	Well Contractor's Lic	cence No.	Open Hole		_			
	(Street No/Name, number, F		inality -	9	Disinfected?		De	epth of the Ca	sing (M	letres)
	rinity Road	- I muning	incaster			Ministr	y Use	Only		
Province Ontari	O L 9 G 3 L Busin	ess E-mail Address packhamwelldril	ling@gmail	.com	Audit No. Z 79	3379		Contractor No).	
			First Nines		Date Received (yyy	y/mm/dd)	Date o	f Inspection	yyyy/mr	n/dd)
905 64		ham Mervyr	1		OCT 3 0 2		100		7.15	
905 64	8 2909 Rame of Well Pack icence No. Signature of Techr	ham Mervyr	1 Date Submitted (y)	yy/mm/dd)	OCT 3 0 2					<u> </u>

Regulation 903 Ontario Water Resources Act

Measurements recorded in: Metric Mimperial

Page

	Nell Location (Street Number	0	0	To	woship WORTH Dur y/Town/Village	MPFRIES	26		oncessi	12	
County/Distric	ct/Municipality ATERLOO				y/Town/Village CAMBRIC unicipal Plan and Sublo	DOE		Onta Other		Postal N / R	Code 553
UTM Coordina NAD 8	ites Zone Easting	744	thing 8 0 1 3	34			11000000	00101		15.00	and the same of
General Colo	HARRIST TO SERVICE THE PARTY OF	CONTROL STREET	ment Seal		r Materials		ral Description			Dept	h (m/ft) To
		or many estimation		C	TONES					0	10
BROWN					PAVEL					10	40
GREY	CLAY	3			ND	Fin	F			40	155
-		_		0/7	NIS	GOAK				155	160
BROWN				SAI		COA				160	163
BROWN	GRAVE	4		SAI	VQ	007					1
							TOTAL	DE	PTH	163	7
					N. C. V.		Decide of Ma	II Vial	d Tastin		
Depth Set	at (m/fil)	Annular Type of Sea		arcure.	Volume Placed	After test of well yield	Results of We water was:	-	aw Down		ecovery
From	То	(Material an	d Type)		(m²/ft²)	Clear and sand Other, specify	free	Time (min)	Water Le		Water Lev (m/ft)
0	20 BE	NTON	ITE			If pumping discontinu	ed, give reason:	Static	28	,	
							- Now Occupantial	Level 1	37	1	10
						Pump intake set at a	(m/ft)	-	0.000	2	69
						90		2	45		60
Metho	od of Construction	N 1850		Well Us	0	Pumping rate (I/min.	/ GPM)	3	53		52
Cable Too	N □ Diamond	The second second		Commer		Duration of pumping	pm	4	59	4	46
Rotary (Co		Doi:		☐ Municipa ☐ Test Hol		1 hrs + 0		5	63	5	40
Boring	Digging	☐ Irrig		Cooling Cooling	& Air Conditioning	Final water level end	of pumping (m/ft)	10	67	10	32
Other, spe	BOTH AIR ROTAR	Y 100	ustnai ner, specify_	18		If flowing give rate (I		15	7/	111100	28
	Construction Re	cord - Cas	ing	MARINE	Status of Well		entre de la	20	74		28
Inside Diameter	Open Hole OR Material (Galvanized, Fibreglass,	Wall Thickness	Depth	-	Water Supply Replacement Well	Recommended pun	np depth (m/ft)	25	76		28
(cm/in)	Concrete, Plastic, Steel)	(cm/m)	From	To	Test Hole	90 F	np rate			The second second	
6/8	STEEL	188	72	163	Recharge Well Dewatering Wall	(Vmin / GPM)		30	78	>	28
					Observation and/or Monitoring Hole	Well production (I/m		40	177	40	28
					Alteration	/26-1	مہر	50	79	50	28
					(Construction) Abandoned	¥Yes □ No		60	79	60	28
	Construction Re	ecord - Scre	en	107 10	Insufficient Supply Abandoned, Poor		Map of W	ell i.o	cation		
Outside Diarmeter (cm/in)	Material (Plastic Galvanized Steel)	Slot No.	Depth From	(m/fi) To	Water Quality Abandoned, other, specify	Please provide a ma	p below following	instruct	tions on th	ne back.	2
					Other, specify						
Water found	Water Det at Depth Kind of Water	TITLE	Untested		ole Diameter		HISTLE BY		R	-	
	ff) ☐ Gas ☐ Other, spe		Juliusando	From	To (cm/in)		(. 1	THOUSE	9	
Water found	at Depth Kind of Water	Fresh	Untested					1] House	300	
	(ff) ☐ Gas ☐ Other spe ist Depth Kind of Water		11 Intested				m	1 6	7 6	1	
	(ff) Gas Other, spe		Donasino				BARN W	1			
	Well Contracto	r and Well	Technicia	And the second second							
Jim (ime of Well Contractor いいとののいと Idress (Street Number/Na	LLDRI	icino	-170 4	Contractor's Licence No. 7 3 8 5	Control of the Contro					
	EBYCREST Postal Code	Rs.	E-mail Add	(NATER LOD	// Comments:					
On Bus, Telephon	ne No. (inc. area code) Na	me of VJell T	echnicien (L	ast Name,	First Name)	information package 2 /	Package Deliver	12000	Mij Audit No	nistry Us	e Only
5 196 Well Technicia	482412 an's Licence No. Signature			ntractor Dat	e Submitted	delivered Date	Work Completed		Z	115	525
0506E (2007/12	Z) © Queen's Provint for Onto	m (U.	ulso.	- 2	Ministry's Copy		01011	07	Receive		

Well Tag No. (Place Sticker and/or Print Below) Well Record Ministry of the Environment Regulation 903 Ontario Water Resources Act A104417 Metric Imperial Measurements recorded in: Page Well Owner's Information Last Name / Organization First Name E-mail Address ☐ Well Constructed by Well Owner 603489 Ontario Municipality Mailing Address (Street Number/Name Telephone No. (inc. area code) Province Postal Code 1316 Dickie Settlement N3 N4 R 8 519 6 502327 Waterloo OW Well Location Address of Well Location (Street Number/Name) Township 1850 whistlebare North Dumfries 27 County/District/Municipality Province Postal Code Waterlas
UTM Coordinates Zone Easting Ontario N3H488 Municipal Plan and Sublot Number Northing NAD 8 3 1 7 5 4 8 5 3 2 4 8 0 1 2 20 Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form) Depth (m/ft) Most Common Material Other Materials General Description From Brown sand Clay Gravel 0 14.93 14.93 24.07 Gray Clay & sand 24.07 46.02 Gray Clay sand & Grand Grand & stones 46.02 46.32 Gray Clay & Bolders 46.32 58.82 58.82 60.96 Dank Gray limestone 200' PEPTH Annular Space Results of Well Yield Testing Depth Set at (m/ft) Type of Sealant Used (Material and Type) Volume Placed After test of well yield, water was: Draw Down Recovery (m^2/\hbar^2) Clear and sand free Time Water Level Time Water Level (min) Other, specify (mvlt) (m/ft) 7.30 0 Bentonite Grout . 35 If pumping discontinued, give reason: 14.18 29.06 Level 1 16.60 26.60 Pump intake set at (m/ft) 17.72 24.58 36.57 3 19.08 22.80 Pumping rate (Vmin / GPM) Method of Construction Well Use 54.55 Cable Tool Diamond Public 4 20.10 Not used 21.30 Commercial Duration of pumping Rotary (Conventional) Dewatering Jetting P Domestic Municipal | 5 21.04 Rotary (Reverse) I hrs + min 19.94 Driving Livestock Test Hole Monitoring | Boring Final water level end of pumping (m/fl) Digging Imigation Cooling & Air Conditioning 10 23.93 15.58 Air percussion Industrial 29.06 Other, specify Other, specify 25.70 If flowing give rate (I/min / GPM) 15 15 14.34 Construction Record - Casing Status of Well 26.56 20 14.18 Open Hole OR Material Depth (m/ft) Water Supply Wall Recommended pump depth (m/ft) Thicknes (Galvanized, Fibreglass, Concrete, Flastic, Steel) Replacement Well From To 36.57 27, 29 14.18 (cm/in) Test Hole Recommended pump rate (I/min / GPM) 7,91 Steel .48 Recharge Well 30 27.08 30 15.9 60.04 14.18 Dewatering Well 14.18 40 28.32 15.6 open hole Observation and/or Monitoring Hole 60.04 60.96 Well production (I/min / GPM) 14.18 50 28.78 Alteration (Construction) Disinfected? 60 29.06 14.18 Abandoned. Yes No Insufficient Supply Construction Record - Screen Abandoned, Poor Water Quality Map of Well Location **Dutside** Please provide a map below following instructions on the back Depth (m/ft) Material (Plastic, Galvanized, Steel) Diamete (cm/in) Abandoned, other specify 1 From To Other, specify Se Hlement Water Details Hole Diameter Water found at Depth Kind of Water: Fresh Untested Depth (m/ft) From 60.96(m/ft) Gas Other, specify 0 Water found at Depth Kind of Water: Fresh Untested 60.04 22.8 (m/ft) Gas Other, specify 60,04 60.96 Water found at Depth Kind of Water: Fresh Untested Ek! x well & 894 m -(m/ft) Gas Other, specify Hm Well Contractor and Well Technician Information D Business Name of Well Contractor Well Contractor's Licence No Whistle Bare Well Initiatives
Business Address (Street Number/Name) 7221 Municipality Comments: 15 Town line
Province Postal Code Business E-mail Address Orangevile 49W3R4 ON Well owner's Ministry Use Only Date Package Delivered Bus Telephone No. (inc. area code) Name of Well Technician (Last Name, First Name)
5 1 9 7 6 3 9 6 6 6 Losch Kim package delivered 20110114 Date Work Completed X Yes pero 0 4 2011 20110131 No 20110104 Loss Ministry's Copy

N ST	ntario	922450	vironment	Imperial	Well Tag	No. (Place Sticker a	nd/or Print Below)	Regulation	903 Onta	Well R	
	ner's Inform								ALIEN .		William (1)
First Name	CONTRACTOR CONTRACTOR			Organization	1		E-mail Address				onstructed Il Owner
Mailing Ad	dress (Street)	lumber/Nan	Ontar	01	nc.	lunicipality	Province	Postal Code		ephone No. (inc. a	area code)
103	56 Wh	istei	Sare	Kd.		Cambridge	OV	NIRS	235	19 6233	5418
Well Loc Address of	ation f Well Location	(Street Nur	nber/Name		Т	ownship u O	0,	Lot 21	Co	ncession	
119	94 Ki	ngs f	d			North Di	umtres	31	Province	Postal	Code
0	strict/Municipal	J	01:40	fWa	terbo	Roseville			Ontar	io NIF	3523
UTM Cook	nates Zone	Easting	(₁ N	orthing	N	lunicipal Plan and Subl	ot Number		Other		
Overburd		ck Materia	als/Abando	8 0 0	7 / 8 aling Reco	rd (see instructions on the	e back of this form)				
General C			on Materia	2000		er Materials		eral Description	C.	Dept From	h (<i>m/ft</i>) To
fill		_====								0	1.21
Brown	n Sa	nd x	clay							1.21	5,48
Gran	7	Clay	J							5.48	
Guas	6/2	, \$ 5	tones	5							52.43
Brown	m 1	imes?	lone							52.42	53.94
											-
				_							
							1	Results of We	all Viold	Testina	
Depth S	Set at (m/ft)		Type of Se	alant Used		Volume Placed	After test of well yield	, water was:	Draw	Down Re	ecovery
From	То		(Material a			(m³/ft³)	☐ Clear and sand ☐ Other, specify	free	Time W	/ater Level Time (m/ft) (min)	Water Level (m/ft)
0	53.03	Nea	t Cem	en t		1.01	If pumping discontinu	ed, give reason:	Static Level		
		-000 <u>-</u>							1	1	
							Pump intake set at (m/ft)	2	2	
	1000						Pumping rate (I/min /	(GPM)	3	3	
11000000	hod of Cons	Diamond	□ Pu	blic	Well Us		i dinping rate (inimin	. 75.00%	4	4	
	Conventional)	Jetting	⊡ Do	mestic	☐ Municipa	al Dewatering	Duration of pumping hrs +	min	5	5	
☐ Rotary (☐ Boring	(Reverse)	☐ Driving ☐ Digging		estock gation	☐ Test Hol ☐ Cooling	e	Final water level end		10	10	
☐ Air perci			100000000000000000000000000000000000000	dustrial her, specify_			160		15	15	
		truction Re	ecord - Ca			Status of Well	If flowing give rate (I/	min / GPM)	20	20	
Inside Diameter	Open Hole O (Galvanized,	R Material Fibreglass	Wall Thickness	- 2000000	(m/ft)	☑ Water Supply ☐ Replacement Well	Recommended pum	p depth (m/ft)	25	25	
(cm/in)	Concrete, Pla	stic, Steel)	(cm/in)	From	То	Test Hole	Recommended pum	p rate	200	30	
15.9	ste	el	148	1.06	53.03	Recharge Well Dewatering Well	(Vmin / GPM)	Macalen	30		
	open 1	ole		53.03	53-64	Observation and/or Monitoring Hole	Well production (I/mi	n / GPM)	40	40	
		ALCONE Y				Alteration (Construction)	Disinfected?		50	50	
					<u>.</u>	Abandoned, Insufficient Supply	Yes No		60	60	
Outside			ecord - Scr	T	(m/ft)	Abandoned, Poor Water Quality	Please provide a map	Map of W			
Diameter (cm/in)	Mater (Plastic, Galvar		Slot No.	From	To	Abandoned, other, specify	N		ew Dune		_ N
						эреспу			00110	ne ne	7/1
		all.	. 16			Other, specify			1		11
		Water Det	ails		Н	ole Diameter	il		1		
	nd at Depth Ki			Untested	Dept From	h (m/ft) Diameter To (cm/in)					
	n/ft) Gas and at Depth Kin			Untested	0	53.03 22.8			16 95		Ra
(n	n/ft) Gas C	Other, spe	cify		53.03	53.64 5.6			I.		
	nd at Depth Kinn/ft) Gas C			Untested					V	r.	33
111				Technicia	n Informat	ion			well	! ← 78.92 →	X
Business N	lame of Well Co		141			Contractor's Licence No.					
Business A	ddress (Street		me)		. Mu	nicipality	Comments:			1	11
15 Te	only nuc	Rd	0	ranger	ille						
Province	100	al Code		ද E-ma¶ Add ලෙබ ∪	P) I'm	tightles.com		Package Delivere	d	Ministry Use	Only
Bus.Telepho	one No. (inc. are	a code) Na	me of Well	Technician (I	ast Name,	First Name)	information package	I I		idit No.	
6 (9) Well Technic	8 4 6 8 2 cian's Licence No	Signature	∠ osc of Technicia	an and/or Co	K: ~	e Submitted	delivered Date \	Work Completed		z 159	1330
7 9	227	3		ort		0121029	N-No 20	1210	22	NOV 22	2012
0506E (2007/	/12) © Queen's	Printer for Onta	ario, 2007			Ministry's Copy					

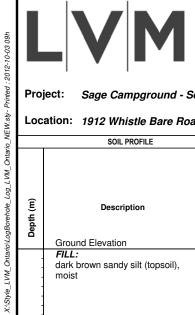
Po	Ontario	O Minist	try of nvironmen		Well Ta	No. (Place Sticke	er and/or Print Below	A Charles	on 903 Ontario		Record
Measurer	ments recor	rded in:	Metric 🔀	(Imperial	H	101)	7 /	V	Pa	ige [of /
Well Ov	vner's Inf	ormation			A SERVE			THE PERSON NAMED IN			
First Nam	e			Organizatio		10011	E-mail Addre	ess			Constructed
Mailing Ac	ddress (Stre	et Number/Na		TIE B	ear 6	Ult Club Municipality	Province	Postal Cod	e Telenho	ne No. (inc.	ell Owner
	6 Pi	ckic S	CO PACIFIC	ment	α	Cambridg	111111111111111111111111111111111111111	N3H4		650	1.77
131	6 D	tion (Street Nu	mber/Name	Lent	Rd	Township North City/Town/Village	unfiles	Lot 25	Conces	12	
UTM Coon	dinates Zon	Nater	008/	lorthing		Municipal Plan and S	nd se		Ontario Other	1000 to 1000	Code H4 R8
-		drock Materi	als/Aband	onment Se	aling Reco	ord (see instructions or	the back of this form)				
General (Colour	Most Comr	mon Materia	i .	Otl	ner Materials	G	ieneral Descriptio	n	Dep From	th (m/ft) To
Bro	na	Course	San	1	61	avel	D	acked		0	68
Bra	n×h	Clan		,	5	Tt '		Soft		68	84
Bro	2-0-	Grah	P		Mo	die Soud	(en a to	1	84	128
lanes	-	Clar			5%	Michael Col		mon		128	197
Con	7	1200	-1-		21	~~ 5	Wene	Va. 1		-0	126
6/2	7	Jime	SPILE				WEAT	ney		137	137
Gren	٦ –	Line	Store				P.	oran 5		139	164
- 1	D-Table 8		Annula	r Space				Results of W	ell Yield Testi	ng	
Depth S From	Set at (m/lt)		Type of Se (Material a		, J. 14	Volume Placed (m³/ff³)	After test of well y		Draw Down		ecovery Water Level
0		-0/2			- 1	117	Other, specif		(min) (m/ft		(m/ft)
	68			te Cem		95	If pumping discon	tinued, give reason	Static Level 14	!	22
68	139	Nea	t Co	ment		29			1 1	- 1	19
							Pump intake set	at (m/ft)	2 10	- 2	10
							72		15		18
Met	thod of Co	nstruction			Well Us	ie .	Pumping rate (l/n		3 /6	3	16
☐ Cable T		Diamono	I □ Pi	iblic	X Comme	rcial Not used		fara.	4 /6	4	15
PERSONAL PROPERTY AND ADDRESS OF THE PARTY AND	(Conventiona	The Property Continues of the	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	omestic vestock	☐ Municip ☐ Test Ho		19	min min	5 17	5	14
Rotary ((Neverse)	☐ Driving ☐ Digging	1	gation	The State of the Owner of the Owner of	& Air Conditioning		nd of pumping (m/ll	10 /9	10	111
Air perc				fustrial her, specify			72		//		17
C) Oliver, a	MANAGED A.	nstruction R		- West Control		Status of Well	If flowing give rate	e (I/min / GPM)	15 20		14
Inside	Open Hol	e OR Material	Wall	-	h (<i>m/ft</i>)	Water Supply	Recommended p	ump depth (m/ft)	20 22	20	14
Diameter (cm/in)		ed, Fibreglass, Plastic, Steel)	Thickness (cm/in)	From	To	Replacement We	75		25 22	25	
6.625	Stainles	· S/- 1	0.188	+3	139	Test Hole Recharge Well	Recommended p	ump rate	30 27	30	
		Street West Committee	Cirap			Dewatering Well	2		40 72	40	
6.25	Open 1	tole	leikini.	139	164	Observation and/o	Well production (Vmin / GPM)	2	7	
						Alteration (Construction)	Disinfected?	>	50 2	2 50	W
		KANS S			T A	Abandoned,	Yes No		60 2	60	V
	C	onstruction R	ecord - Scr	en	_	Insufficient Suppl			/ell Location	Tumi sv	
Outside Diameter		laterial	Slot No.		n (m/ft)	Water Quality Abandoned, other	The second section of the second	map below following	instructions on the	ne back.	Ť
(cm/in)	(Plasec, Ga	Ivanized, Steel)		From	То	specify specify			- 4	À	13
				18		Other, specify	-		_	1	150
				u sull					77	\	14
Water four	nd at Denth	Water Det		Untested	+	th (m/ft) Diamet	er L	154		-	- Per
110	n/ft) ☐ Gas			omesion	From	To (cm/in,		ligin a	17/1/11/1		Settle
Water four	nd at Depth	Kind of Water		Untested	0	68 10.7		13	1	/	1
	n/ft) Gas			The second	68	139 9.75		N B	FM)		15
	nd at Depth	Kind of Water		Untested	139	164 6.25				3941	Dickie
		ell Contracto		Technicia	101				well see	-1-1-1	0
Business N	lame of Wel) (1 .		ell Contractor's Licence N	0.	200			1 = 1
Contr			ofessi	orals la		741/6	0 0				1 .
· ·	1	et Numbel/Na	f. /		Mu	Boant	Comments:				
Province	150h /	ostal Code		E-mail Add		. 1	100				
6/V	1	IBEIA		es@c		thermaloca		te Package Deliver		nistry Use	Only
Bus. Telepho	ane No. (inc.			Technician (I			information package	proportional	Audit No	Z 181	5169
S (9	7 7 7 2	No. Signature	raters	R and or Co	core	la Submitted	delivered Da	te Work Completed			
2 6	89) Juliante	- F	A STATE OF CO	2	315 0210		01409	24 11	JL 14	2015
0506E (2007)	12) © Quee	n's Printer for Ont	007) /	Ministry's Co	10	1011			

Ministry of the Environment Well Tag No Place Sticker and/or Print Relow)
Tag#: A 219397 Well Record Ontario and Climate Change Regulation 903 Ontario Water Resources Act Measurements recorded in: Metric Imperial Page Well Owner's Information Last Name / Organization ☐ Well Constructed by Well Owner WHISLE BEAR CAMP GROUNDS
Mailing Address (Street Number/Name) Municipality Province Postal Code Telephone No. (inc. area code) CAMBRIDGE NER553 Well Location Address of Well Location (Street Number/Name) NORTH DUMPRIES County/District/Municipality City/Town/Village: Postal Code Ontario UTM Coordinates Zone , Easting Northing Municipal Plan and Subjet Number Other NAD | 8 | 3 | 17 | | 5 | 4 7 7 2 2 | 4801980 Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form, General Colour Most Common Material Depth (m/fi) Other Materials General Description From BROWN. SAND GRAVEL 7ft 46ft GRAY CLAY SAND FINE 76ft94ft 94ft 100ft Annular Space Results of Well Yield Testing Type of Sealant Used (Material and Type) Depth Set at (m/ft) Volume Placed After test of well yield, water was. Recovery Time | Water Leve $(m^2/f!^2)$ Clear and sand free Time | Water Level (min) Other, specify (mvft) (m/tt)If pumping discontinued, give reason Level 70gal # 1 Pump intake set at (m/lt) 2 2 3 3 Pumping rate (I/min / GPM) Method of Construction Well Use 80gpm Diamond Public
Domestic 4 4 Cable Tool ☐ Commercial ☐ Not used Duration of pumping Rotary (Conventional) Jetting Municipal | □ Dewatering 5 Rotary (Reverse) 1 hrs + () min 5 Driving Livestock Test Hole ☐ Monitoring Boring Digging ☐ Irrigation Cooling & Air Conditioning Final water level end of pumping (m/ll) 10 ☐ Air percussion ☐ Other, specify ☐ Industrial 20ft Other, specify 15 15 If flowing give rate (Vmin / GPM) Construction Record - Casing Status of Well 20 20 Open Hole OR Material (Galvanized Fibreglass, Concrete, Plastic, Steel) Water Supply Depth (m/ft) Wall Recommended pump depth (m/lt) Thicknes (cm/ln) Replacement Well 40ft 25 25 To From Test Hole Recommended pump rate (Vmin / GPM) 60 g pm Recharge Well 30 30 Dewatering Well 40 40 Observation and/or Monitoring Hole Well production (l/min / GPM) 50 50 Alteration Disinfected? (Construction) Abendoned, Insufficient Supply 60 60 Yes No Construction Record - Screen Map of Well Location Abandoned, Poor Please provide a map below following instructions on the back Depth (m/tt) Water Quality Material Diameter Slot No Abandoned, other, (Plastic Gatyanized Steel From (cm/in) specify 18 0 96Et 100 Other, specify Water Details Hole Diameter Water found at Depth Kind of Water: [X Fresh [] Untested Depth (m/ft) Diameter 0-1 (m/n) Gas Other, specify From (cm/in) 100ft0.75 Water found at Depth Kind of Water: Fresh Untested (m/ft) Gas Other, specify Water found at Depth Kind of Water: Fresh Untested (m/ft) Gas Other, specify CAMP Well Contractor and Well Technician Information Business Name of Well Contractor CEITH LANG WELL DRILLING INC 7154 Business Address (Street Number/Name) Municipality 51 ELDON ST GODERICH Postal Code Business E-mail Address N7 A3 R9 Well owner's information Ministry Use Only Date Package Delivered Audit No. Z2 1 Bus Telephone No. (inc. area code) Name of Well Technician (Last Name, First Name) package delivered Well Technician's Licence No. Signature of Technician and/or Contractor Date Submitted Date Work Completed Yes 2017 10 12 □ No T446 Well Owner's Copy

easurem	Intario		vironment	Imperial	N	0 TAG		Regulatio	n 903 O	ntario Wa Page		ources Ac
Vell Ow	mer's Infor	mation	STATE OF						THE P			1866
irst Name			3 A G F	Organization	PGA	OUND INC	E-mail Address	5		1		Constructed II Owner
ailing Ad	dress (Street				, - 10	Municipality	Province	Postal Code	1	elephone		area code)
912	WHISE	TK B	ARE	- Rr)	Municipality CAMBRIGK	ONT	NIRS	53		111	
ell Loc			DERVIE									Manual C
dress of	f Well Location	124	nber/Name)			N. DUMPER	11	Lot 28		Concession 1 2		
ounty/Dis	SAM / strict/Municipa					City/Town/Village	(M)	0.0	Provinc		Postal	Code
	WATE					CAMBR	16K		Onta			N 553
	dinates Zone			orthing		Municipal Plan and Subk	ot Number		Other			
	8 3 17											
-	-	The state of the s		-	-	ord (see matructions on the her Materials	TANK DESCRIPTION OF THE PARTY O	1.0			Dept	th (m/ft)
eneral C		Most Comm					Ge	neral Description			From	To
	/	REVO	V 5	130	NRD	WELL			-		0	100
	- 10											
										-		
-			-	-								
										1		
			Annular	Space	11 11 11 11			Results of W	ell Viele	Testing	4	
Depth S	Set at (m/ft)	THE REAL PROPERTY.	Type of Sea		0 1100	Volume Placed	After test of well yiel			w Down	P111	ecovery
From	To		(Material an			(m²/ft ^s)	Clear and sand			Water Lev		Water Leve
0	6	FILL	-				Other, specify	Comment of the Commen	(min) Static	(ms/ft)	(min)	(m/ft)
	75	BENTIN	1.+6	CH.0	4		If pumping discontin	rued, give reason	Level			
9	70					-	1		1		11	
10	95	SLUKA	DIE	EMIP	3) ON	¥	Pump intake set at	(myn)	2	1	2	
92	125	PEA	STO					1		/		
		manufacture and the second			Well U		Pumping rate (l/mir	1 CPIA	1 3	/	3	
Meth	had at Can	suucuon				50	Turnipring rate farms	ar ar my		1		
Cable To		Dolamond	□ Pa	Talle	☐ Comm	The second second			4	/	4	
Cable To	ool (Conventional)	Diamond Jetting	□ Do	mestic	Comme	ercial Not used pal Dewatering	Duration of pumpir	ng \	4		4 5	
Cable To Rosay (900	Diamond Disting Driving	Do Liv	mestic restock	Commo	pal Dewatering	Duration of pumplr	ng min	1	/	5	
Cable To Rotary (Rotary (Boring Au perci	ool (Conventional) (Newport)	Diamond Jetting	□ Do	restock gation fustrial	Commo	ercial Not used pal Dewatering	Duration of pumpir	ng min	1			
Cable To Rotary (Rotary (Boring	Conventional (Conventional (Researce) sussion specify	Diamond Disting Driving Digging	Do	mestic restock gation justnat her, specify	Commo	ercial Not used pal Dewstering Manitoring & Air conditioning	Duration of pumplr	ng min d of pumping (mit	1	/	5	
Cable To Robary (Robary (Boring All perca Other, s	Constant Cons	Jetting Diving Digging	Do Liv	mestic restock gation justnal her specify	Comm	ercial Not used pal Dewstering Manitoring & Air conditioning	Duration of pumpir hrs + Final water level on If flowing give rate	ng min d of pumping (min (Vmin / GPM)	1	/	5 10	
Cable To Robery (Robery (Boring A) perci Other, s Inside Diameter	Constant Cons	Jetting Driving Digging Struction Ri OR Material	Do Liv	mestic restock gation justnat her specify Deptr	Commo	ercial Not used pal Dewstering Sea Air Conditioning Sea Air Conditioning Status of Well Water Supply	Duration of pumple hrs + Final water level and	ng min d of pumping (min (Vmin / GPM)	10	/	5 10 15 20	
Cable To Robery (Robery (Boring A) perci Other, s Inside Diameter	Constant Cons	Jetting Diving Digging Struction Re	Do Liv	mestic restock gation justnal her specify	Comm	Status of Well Water Supply Replacement Well Test Hole	Duration of pumple hrs + Final water level on If flowing give rate Recommended pu	min d of pumping (min (l/min / GPM)	10 20 25		5 10 15 20 25	
Cable To Rosay (Rotary (Boring A) perci Other, s Inside Diameter	Constant Cons	Jetting Driving Digging Struction Ri OR Material	Do Liv	mestic restock gation justnat her specify Deptr	Comm	Status of Well Water Supply Replacement Well Test Hole Recharge Well	Duration of pumpir hrs + Final water level on If flowing give rate	min d of pumping (min (l/min / GPM)	10		5 10 15 20	
Cable To Rosay (Rotary (Boring A) perci Other, s Inside Diameter	Constant Cons	Jetting Driving Digging Struction Ri OR Material	Do Liv	mestic restock gation justnat her specify Deptr	Comm	Status of Well Water Supply Replacement Well Test Hole Recharge Well Dewatering Well	Duration of pumpin hrs + Final water level en If flowing give rate Recommended pu Recommended pu (Vmin / GPM)	min d of pumping (min (Vmin / GPM) imp depty (m/it) imp rate	10 20 25		5 10 15 20 25	
Cable To Rosay (Rotary (Boring A) perci Other, s Inside Diameter	Constant Cons	Jetting Driving Digging Struction Ri OR Material	Do Liv	mestic restock gation justnat her specify Deptr	Comm	Status of Weil Water Supply Replacement Weil Test Hole Recharge Weil Dewatering Monitoring 8 Air Sugitioning	Duration of pumpir hts + Final water level en If flowing give rate Recommended pu	min d of pumping (min (Vmin / GPM) imp depty (m/it) imp rate	10 20 25 30 40		5 10 15 20 25 30 40	
Cable To Rosay (Rotary (Boring A) perci Other, s Inside liameter	Constant Cons	Jetting Driving Digging Struction Ri OR Material	Do Liv	mestic restock gation justnat her specify Deptr	Comm	Status of Well Status of Well Water Supply Replacement Well Test Hole Recharge Well Observation and/or Monitoring Hole Alteration	Duration of pumpin hrs + Final water level en If flowing give rate Recommended pu Recommended pu (Vmin / GPM)	min d of pumping (min (Vmin / GPM) imp depty (m/it) imp rate	10 20 25 30 40 50		5 10 15 20 25 30 40 50	
Cable To Rosay (Rotary (Boring A) perci Other, s Inside liameter	Constant Cons	Jetting Driving Digging Struction Ri OR Material	Do Liv	mestic restock gation justnat her specify Deptr	Comm	Status of Well Water Supply Replacement Well Test Hole Recharge Well Dewatering Well Alteration (Construction) Abandoned,	Duration of pumpin hrs + Final water level and If flowing give rate Recommended pu Recommended put (I/min / GPM) Well production (I/r	min d of pumping (min (Vmin / GPM) imp depty (m/it) imp rate	10 20 25 30 40		5 10 15 20 25 30 40	
Cable To Rosay (Rotary (Boring A) perci Other, s Inside liameter	Conventional Conve	Jetting Driving Digging Struction Ri OR Material	Do Liv	mestic restrick gatton justrial her; specify Depti From	Comm	Status of Well Water Supply Replacement Well Pewatering Status of Well Water Supply Replacement Well Pest Hole Recharge Well Dewatering Well Observation and/or Montoring Hole Alteration (Construction)	Duration of pumpin his + Final water level and If flowing give rate. Recommended pu Recommended pu (Vimin / GPM) Well production (Viv.) Disinfected?	min d of pumping (min (l/min / GPM) imp depth (m/ft) imp rate min / GPM)	10 25 30 40 50 80		5 10 15 20 25 30 40 50 60	
Cable Ti Robary (Robary (Boring A) Perci Other, s Inside Isameter (cm/m)	Conventional (Conventional Ussion Ussion Open Hole (Galvanized Concrete, P	Jetting Jetting Dirving Digging Struction R OR Material Fibreglass Jastic Steel)	Do Liv	mestic restrick gatton userial serial period	Committee Commit	sercial Dewatering Dewatering Dewatering Monitoring as Air Supply Replacement Well Test Hole Dewatering Well Dewatering Well Observation and/or Monitoring Hole Airscration (Construction) Abandoned, Insufficient Supply Water Quality	Duration of pumpin hts + Final water level end of flowing give rate. Recommended put Recommended put (Vimin / GPM) Well production (Viv. Disinfected?	min d of pumping (min (l/min / GPM) imp depth (m/ft) imp rate min / GPM)	10 25 30 40 50 60 Vell Loc	ons on the	5 10 15 20 25 30 40 50 60	
Cable To Robary (Robary (Robary) Boring Appercu Other, a Inside Itameter (cm///R)	Conventional (Conventional Ussion Ussion Open Hole (Galvanized Concrete, P	Clamond Detting Driving Digging Struction Re OR Material J. Fibroglass Dassic, Steel)	Do Liv	mestic restrick gatton usbridge gatton usbridge gatton usbridge gatton g	Committee Municipal Munici	sercial Dewatering Dewatering Dewatering Monitoring & Air Conditioning 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, speedly	Duration of pumpin his + Final water level and If flowing give rate. Recommended pu Recommended pu (Vimin / GPM) Well production (Viv.) Disinfected?	min d of pumping (min (l/min / GPM) imp depth (m/ft) imp rate min / GPM)	10 25 30 40 50 60 Vell Loc		5 10 15 20 25 30 40 50 60	vo
Cable To Robary (Robary (Robary) Boring Appercu Other, a Inside Itameter (cm///R)	Conventional (Conventional Ussion Ussion Open Hole (Galvanized Concrete, P	Jetting Jetting Dirving Digging Struction R OR Material Fibreglass Jastic Steel)	Do Liv	mestic restrick gatton userial serial period	Committee Commit	Status of Well Water Supply Replacement Well Test Hole Dewarding Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, insufficient Supply Abandoned, other, specify OMULICO	Duration of pumpin hts + Final water level end if flowing give rate. Recommended pu (l/min / GPM) Well production (l/r Disinfected? Yes \(\sqrt{No} \) Please provide a m	min d of pumping (min (l/min / GPM) imp depth (m/ft) imp rate min / GPM)	10 25 30 40 50 60 Vell Loc	ons on the	5 10 15 20 25 30 40 50 60	vo
Cable To Robary (Robary (Robary) Boring Appercu Other, a Inside Itameter (cm///) Controller (cm///) Contr	Conventional (Conventional Ussion Ussion Open Hole (Galvanized Concrete, P	Jetting Jetting Dirving Digging Struction R OR Material Fibreglass Jastic Steel)	Do Liv	mestic restrick gatton userial serial period	Committee Commit	sercial Dewatering Dewatering Dewatering Monitoring & Air Conditioning 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, speedly	Duration of pumpin his + Final water level and If flowing give rate. Recommended pu Recommended pu (Vimin / GPM) Well production (Viv.) Disinfected?	min d of pumping (min (l/min / GPM) imp depth (m/ft) imp rate min / GPM)	10 25 30 40 50 60 Vell Loc	ons on the	5 10 15 20 25 30 40 50 60	vo
Cable To Robary (Robary (Robary) Boring Appercu Other, a Inside Itameter (cm///) Controller (cm///) Contr	Conventional (Conventional Ussion Ussion Open Hole (Galvanized Concrete, P	Struction R. OR Material I, Fibreglass, Dastic, Steel)	Do Liv	mestic restrick gatton userial serial period	Committee Commit	Status of Well Water Supply Replacement Well Water Supply Recharge Well Dewatering Water Supply Replacement Well Test Hole Recharge Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, insufficient Supply Abandoned, Poor Water Quality October Specify October Specify	Duration of pumpin hts + Final water level end if flowing give rate. Recommended pu (l/min / GPM) Well production (l/r Disinfected? Yes \(\sqrt{No} \) Please provide a m	min d of pumping (min (l/min / GPM) imp depth (m/ft) imp rate min / GPM)	10 25 30 40 50 60 Vell Loc	ons on the	5 10 15 20 25 30 40 50 60	vo
Cable T Robert R	Contentional Conventional Ussion Specify Contentional Open Hole (Galvanized Concrete, P	Struction R. OR Material (Fibreglass, Steel) Water Det	Do Liv Irin Irin Irin Irin Irin Irin Irin Irin	mestic restrick gatton users in a second part of the second part of th	Committee Commit	Status of Well Water Supply Replacement Well Test Hole Dewarding Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, insufficient Supply Abandoned, other, specify OMULICO	Duration of pumpin hts + Final water level end if flowing give rate. Recommended pu (l/min / GPM) Well production (l/r Disinfected? Yes \(\sqrt{No} \) Please provide a m	min d of pumping (min (l/min / GPM) imp depth (m/ft) imp rate min / GPM)	10 25 30 40 50 60 Vell Loc	ons on the	5 10 15 20 25 30 40 50 60	vo
Cable T Research Rese	Contentional Conventional Ussion Specify Constitution Open Hole (Galvanized Concrete, P Col (Plastic, Galvanized Concrete, P	Struction R. OR Material (Fibreglass, Steel) Water Det Kind of Water	Do Liv Irin Irin Irin Irin Irin Irin Irin Irin	mestic restrick gatton users in a second part of the second part of th	Committee Commit	Status of Well Water Supply Replacement Well Water Supply Replacement Well Test Hole Recharge Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality Abandoned other, specify Other, specify Other, specify Hole Diameter	Duration of pumpin hts + Final water level end if flowing give rate. Recommended pu (l/min / GPM) Well production (l/r Disinfected? Yes \(\sqrt{No} \) Please provide a m	min d of pumping (min (l/min / GPM) imp depth (m/ft) imp rate min / GPM)	10 25 30 40 50 60 Vell Loc	ons on the	5 10 15 20 25 30 40 50 60	vo
Cable To Robary (Robary (Robar	Contentional Conventional Ussion Specify Contentional Open Hole (Galvanized Concrete, P	Struction R OR Material (Fibreglass, Sheet) Water Det Kind of Water Other, spe	Do Liv Into Into Into Into Into Into Into Into	mestic restricts gatton gatton gatton gatton gatton gatton gatton from Depti From Depti From Depti From Depti From Depti From	Committee Commit	Status of Well Water Supply Replacement Well Test Hole Recharge Well Dewatering Well Observation and/or Monitoring Hole Alteration Construction) Abandoned, Insufficient Supply Abandoned, Other, apecify Other Specify Hole Diameter	Duration of pumpin hts + Final water level end if flowing give rate. Recommended pu (l/min / GPM) Well production (l/r Disinfected? Yes \(\sqrt{No} \) Please provide a m	min d of pumping (min (l/min / GPM) imp depth (m/ft) imp rate min / GPM)	10 25 30 40 50 60 Vell Loc	ons on the	5 10 15 20 25 30 40 50 60	VO
Cable T Research Rese	Conventional (Conventional (Conventional (Conventional (Conventional Conventional (Conventional Conventional (Conventional Conventional	Struction R OR Material (Fibreglass, Sheet) Water Det Kind of Water Other, spe Kind of Water	Do Liv Inn Inn Inn Inn Inn Inn Inn Inn Inn In	mestic restricts gatton gatton gatton gatton gatton gatton gatton from Depti From Depti From Depti From Depti From Depti From	Committee Commit	Status of Well Water Supply Replacement Well Test Hole Recharge Well Dewatering Well Observation and/or Monitoring Hole Alteration Construction) Abandoned, Insufficient Supply Abandoned, Other, apecify Other Specify Hole Diameter	Duration of pumpin hts + Final water level end if flowing give rate. Recommended pu (l/min / GPM) Well production (l/r Disinfected? Yes \(\sqrt{No} \) Please provide a m	min d of pumping (min (l/min / GPM) imp depth (m/ft) imp rate min / GPM)	10 25 30 40 50 60 Vell Loc	ons on the	5 10 15 20 25 30 40 50 60	Vo
Cable T Rober (Rober) Rober (R	Conventional (Conventional (Conven	Struction Report Struct	ecord - Cas Wall Thickness (crain) ecord - Scre Slot No	mestic restrick gather specify gather specify being Depth From Depth From Unitested Unitested	Committee Commit	Status of Well Water Supply Replacement Well Test Hole Recharge Well Dewatering Well Observation and/or Monitoring Hole Alteration Construction) Abandoned, Insufficient Supply Abandoned, Other, apecify Other Specify Hole Diameter	Duration of pumpin hts + Final water level end if flowing give rate. Recommended pu (l/min / GPM) Well production (l/r Disinfected? Yes \(\sqrt{No} \) Please provide a m	min d of pumping (min (l/min / GPM) imp depth (m/ft) imp rate min / GPM)	10 25 30 40 50 60 Vell Loc	ons on the	5 10 15 20 25 30 40 50 60	VO
Cable To Robary (Robary (Robary (Boring) Boring (Other, a Inside I	Consequential Convention of Co	Struction Report Struct	ecord - Cas Wall Thickness (cerelin) ecord - Scree Slot No	mestic restrick gather specify gather specify being Depth From Depth From Unitested Unitested	Committee Commit	Status of Well Water Supply Replacement Well Test Hole Recharge Well Dewatering Well Observation and/or Monitoring Hole Alteration Construction) Abandoned, Insufficient Supply Abandoned, Other, apecify Other Specify Hole Diameter	Duration of pumpin hts + Final water level end if flowing give rate. Recommended pu (l/min / GPM) Well production (l/r Disinfected? Yes \(\sqrt{No} \) Please provide a m	min d of pumping (min (l/min / GPM) imp depth (m/ft) imp rate min / GPM)	10 25 30 40 50 60 Vell Loc	ons on the	5 10 15 20 25 30 40 50 60	VO
Cable To Robary (Rob	Core (Conventional) Core (Conventional) Core (Conventional) Core (Galvanized Concrete, P Col (Plastic, Galvanized Concrete, P) (Plastic, Galvanized Concrete, P) (Plastic, Galvanized Concrete, P) (Col (Conventional) (Col (Conventiona	Struction Roor Diagrams Struction Roor Material (Fibreglass Itasic, Steel) Water Det Water Det Kind of Water Other, spe Kind of Water	ecord - Scree Slot No ails Fresh city Fresh	mestic restock gatton during the series of t	Communication of multiple of m	Status of Weil Status of Weil Water Supply Replacement Weil Dewatering Weil Water Supply Replacement Weil Test Hole Recharge Weil Dewatering Weil Observation and/or Monitoring Hole Abandoned, Poor Visiter Guality Abandoned, Other, specify Other, specify Hole Diameter pth (m/ti) To Jiameter To Jiameter To Jiameter	Duration of pumple his + Final water level and If flowing give rate. Recommended pu Recommended pu (Vimin / GPM) Well production (Viv.) Disinfected? Yes No	min d of pumping (min / GPM) Imp depth (min / GPM) Imp rate Imp rate Map of M Imp below following A fact 2000	10 20 25 30 40 50 60 Veil Locg instruction	ons on the	5 10 15 20 25 30 40 50 60 Factor Control Contr	
Cable To Robary (Rob	Core (Conventional Conventional	Struction Representation Representat	Do Liv Im	mestic restock gatton during the series of t	Communication of multiple of m	Status of Well Status of Well Water Supply Replacement Well Pewatering Well Water Supply Recharge Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Poor Water Quality Abandoned, other, apacity Other, specify Hole Diameter pth (m/tt) I Diameter (continuity) Hole Diameter pth (m/tt) I Diameter (continuity)	Duration of pumple his + Final water level and If flowing give rate. Recommended pu Recommended pu (Vimin / GPM) Well production (Viv.) Disinfected? Yes No	min d of pumping (min (l/min / GPM) imp depth (m/ft) imp rate min / GPM)	10 20 25 30 40 50 60 Veil Locg instruction	ons on the	5 10 15 20 25 30 40 50 60 Factor Control Contr	
Cable To Robary (Rob	Contention of Convention of Co	Struction Representation Representation Relating Driving Digging Driving Digging Driving Relation Relating Driving Relation Relat	ecord - Case Wall Thickness (cm/ln) ecord - Scree Slot No.	mestic restock gatton during the series of t	Communication (m/ft) To Deg From	Status of Well Status of Well Water Supply Replacement Well Water Supply Recharge Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, insufficient Supply Abandoned, offer, specify Other Specify Hole Diameter pth (m/ft) To Confin	Duration of pumple his + Final water level and If flowing give rate. Recommended pu (Vmin / GPM) Well production (Vnin / GPM) Disinfected? Yes No	min d of pumping (min / GPM) Imp depth (min / GPM) Imp rate Imp rate Map of M Imp below following A fact 2000	10 20 25 30 40 50 60 Veil Locg instruction	ons on the	5 10 15 20 25 30 40 50 60 Factor Control Contr	
Cable To Robert (Robert (Rober	Core (Conventional Conventional	Struction Representation Representation Relating Driving Digging Driving Digging Driving Relating to the Relating Relating to the Relating Steel) Water Det Relating Other, specific Other, specific Other, specific Contractor Contractor Driving of Water Determined Relating Other, specific Other, specific Contractor Driving Other, specific Contractor Driving Other, specific Number/National Driving Driving Driving Driving Driving Driving Driving Relating Driving Driving Relating Driving Driving Relating Driving Driving Relating Driving Dri	ecord - Cas Wall Thickness (cm/in) ecord - Cas Wall Thickness (cm/in) ecord - Scre Slot No atils Fresh coify Fresh coify er and Well The coify me)	mestic mestick gatter was the control of the contro	Committee Commit	Status of Well Water Supply Replacement Well Water Supply Replacement Well Dewatering Water Supply Replacement Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality Abandoned, Other, specify Other, Specify Other, Specify Hole Diameter pth (m/tt) To Diameter To Carrinn	Duration of pumple his + Final water level and If flowing give rate. Recommended pu Recommended pu (Vimin / GPM) Well production (Viv.) Disinfected? Yes No	min d of pumping (min / GPM) Imp depth (min / GPM) Imp rate Imp rate Map of M Imp below following A fact 2000	10 20 25 30 40 50 60 Veil Locg instruction	ons on the	5 10 15 20 25 30 40 50 60 Factor Control Contr	
Cable To Robary (Robary (Robar	Contention of Convention of Co	Struction Representation Representation Relating Driving Digging Driving Digging Driving Relation Struction Relation Driving Other, specific Other, specific Contractor Cont	ecord - Case Wall Thickness (cm/ln) ecord - Scree Slot No atils The Fresh Slot No The	mestic restock gatton during the series of t	Communication (m/ft) To Description in Information (M/ft) M M M M M M M M M M M M M M M M M M	Status of Well Status of Well Water Supply Replacement Well Water Supply Recharge Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, insufficient Supply Abandoned, offer, specify Other Specify Hole Diameter pth (m/ft) To Confin	Duration of pumple his + Final water level and If flowing give rate. Recommended pu (Vmin / GPM) Well production (Vnin / GPM) Disinfected? Yes No	min d of pumping (min / GPM) Imp depth (min / GPM) Imp rate Imp rate Map of M Imp below following A fact 2000	10 20 25 30 40 50 60 Veil Locg instruction	ons on the	5 10 15 20 25 30 40 50 60 Factor Control Contr	
Cable To Robary (Robary (Robar	Contention of Convention of Co	Struction R. OR Material Fibreglass, Plastic, Steel) Water Det Grand of Water Other, specified	ecord - Cas Wall Thickness (cm/in) ecord - Scree Slot No Business Business	mestic restrick gatter was the control of the contr	Communication (m/ft) To Description in Information (M/ft) M M M M M M M M M M M M M M M M M M	Status of Well Water Supply Replacement Well Water Supply Replacement Well Dewatering Water Supply Replacement Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality Abandoned, Other, specify Other, Specify Other, Specify Hole Diameter pth (m/tt) To Diameter To Carrinn	Duration of pumpin hts + Final water level end if flowing give rate. Recommended pu (l/min / GPM) Well production (l// Disinfected? Yes No Please provide a m	min d of pumping (min / GPM) Imp depth (min / GPM) Imp rate Imp rate Map of M Imp below following A fact 2000	10 20 25 30 40 50 60 FF 1912 R E	ons on the	5 10 15 20 25 30 40 50 60 Factor Control Contr	00
Cable T Robert R	Consequence of Control	Struction Rights of Water Den Grand of Water Den Grand of Water Other, specified of Water Other,	ecord - Cas Wall Thickness (cm/in) Slot No atils Fresh Cify The Short	mestic restricts gatton gatton gatton gatton gatton gatton fer specify sing Depti From Depti From Depti From Depti From Depti From Gattonicia Gattonicia (Control of the Control of the Co	Committee Commit	Status of Well Water Supply	Duration of pumple hts + Final water level end if flowing give rate. Recommended pu Recommended pu (l/min / GPM) Well production (l// Disinfected? Yes No Please provide a m	min d of pumping (min / GPM) Imp depth (min / GPM) Imp rate Imp rate Imp of M Imp of	10 20 25 30 40 50 80 FF 1912 R 6	ons on the	5 10 15 20 25 30 40 50 60 FAOJA	Only
Cable T Robert (Robert Robert	Consequence of Well (Plastic Street of Well (Plastic S	Struction Representation Representat	ecord - Case Wall Thickness (cardin) ecord - Scre Slot No Slot No Business Heresh Business Heresh Business	mestic restrick gather specify gather specify per	Commission (m/ft) To Determine the firest Name Last Name 6)	Status of Well Status of Well Water Supply Replacement Well Dewatering Well Water Supply Replacement Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Guality Abandoned Other, specify Outled Other, specify Hole Diameter pth (m/tl) Jiameter	Duration of pumpin hts + Final water level end if flowing give rate. Recommended pu (l/min / GPM) Well production (l// Disinfected? Yes No Please provide a m L49 I Comments:	min d of pumping (min / GPM) Imp depth (min / GPM) Imp rate Map of M sap below following After 2000	10 20 25 30 40 50 60 60 FF 1912 & E	ons on the Am / E	5 10 15 20 25 30 40 50 60 FAOJA	0
Cable Ti Rober (Rober) Rober	Consequence of Control	Struction Representation Representat	ecord - Case Wall Thickness (cardin) ecord - Scre Slot No Slot No Business Heresh Business Heresh Business	mestic restrick gather specify gather specify per	Commission of (m/ft) To Determine the from the following the firess of	Status of Well Status of Well Water Supply Replacement Well Dewatering Well Water Supply Replacement Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Guality Abandoned Other, specify Outled Other, specify Hole Diameter pth (m/tl) Jiameter	Duration of pumple hts + Final water level and If flowing give rate. Recommended pul (Vmin / GPM) Well production (V/ Disinfected? Yes No Please provide a m	min d of pumping (min / GPM) Imp depth (min / GPM) Imp rate Map of M sap below following After the control of	10 20 25 30 40 50 80 FF 1912 C/	ons on the Am / E	5 10 15 20 25 30 40 50 60 FAOJA	only

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

Hollow Stem Auger **Drill Method:**

	SOIL PROFILE	T		SAM	PLE		Γ			1								
Depth (m)	Description Ground Elevation	Symbol	සු Elevation (m) සූ Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value	20 l	0 40	60 80 netration 60 80	\ 	50 10	ength (PP) 10 150 20 Initial Remold ength (FV)	Ma D0 LkPa		er Coi (%)		(Groundwater Observations and Standpipe Details
-	FILL: dark brown sandy silt (topsoil), moist		0.00															protective cover and concrete
1-	trace fine gravel TOPSOIL: dark brown sandy silt, moist	***************************************	299.72 0.76 299.57 0.91	SS-1	3-4 4	8										•	298.72 m 2012-04-27	
2-	some black peat layers, WTPL SAND: loose to very loose brown fine to	***************************************	298.96 1.52 298.65 1.83	SS-2	3-3 4	7	- •							4			i√ el. 298.7	bentonite seal
-	coarse sand, some silt, saturated			SS-3	2-2 2	4	•											
3-				SS-4	1-1 2	3	-										13333333333	sand pack 50 mm pipe 1.52 m slotted screen
- - - - 4-																	33333333	
-	compact		295.91 4.57	SS-5	5-8 8	16	-											native cave
5	Borehole terminated at 5.03 m	**************************************	295.45 5.03		0													
6																	=	
-																		
Rev	iewed by: <i>D.Morlock</i>				Drat	fted k	y:	S.II	Netee	 								Sheet: 1 of 1

Notes: *Top of pipe elevation = 301.27 m*



X:\Style_LVM_Ontario\LogBorehole_Log_LVM_Ontario_NEW.sty- Printed : 2012-10-03 09h

Ground Elevation: 301.19 m **Borehole Number:** BH-2-12

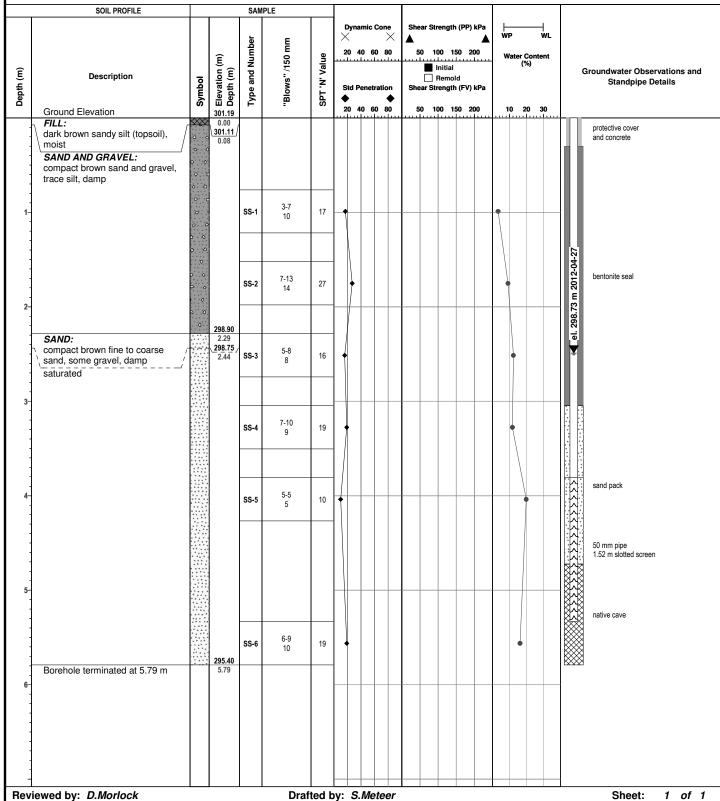
> Job N°: P-0000145-0-00-400

> **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

Hollow Stem Auger **Drill Method:**



Notes: Top of pipe elevation = 301.92 m



V:\Style_LVM_Ontario\LogBorehole_Log_LVM_Ontario.sty- Printed: 2013-11-04 11h

Ground Elevation: 299.68 m **Borehole Number:** BH-3-12

> Job N°: P-0000145-0-00-400

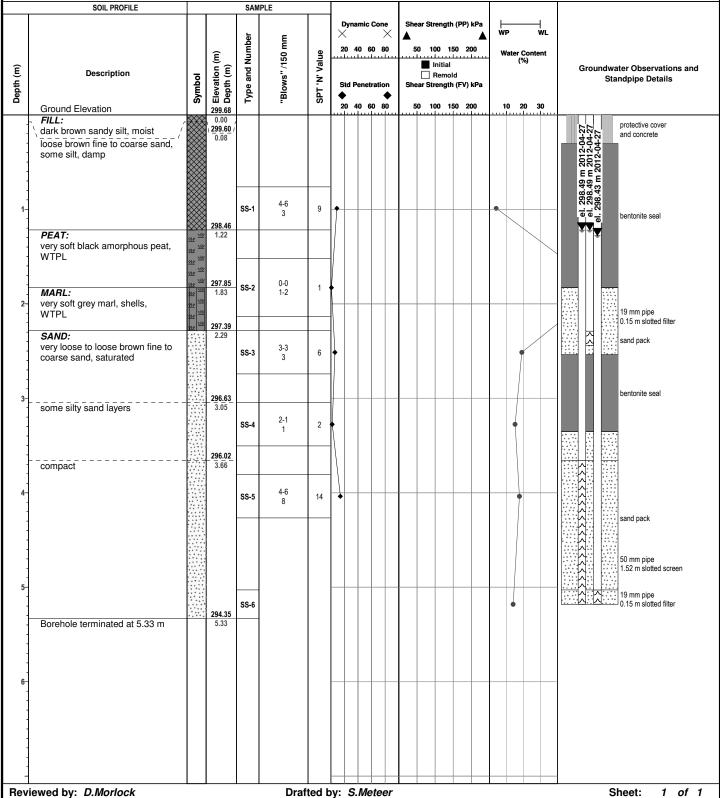
> **Drill Date:** 2012-04-24

Sage Campground - Sewage Systems Assessment Project:

Field Tech: R.McMillan

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

Hollow Stem Auger **Drill Method:**



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

of 1 Sheet:



X:\Style_LVM_Ontario\LogBorehole_Log_LVM_Ontario_NEW.sty- Printed : 2012-10-03 09h

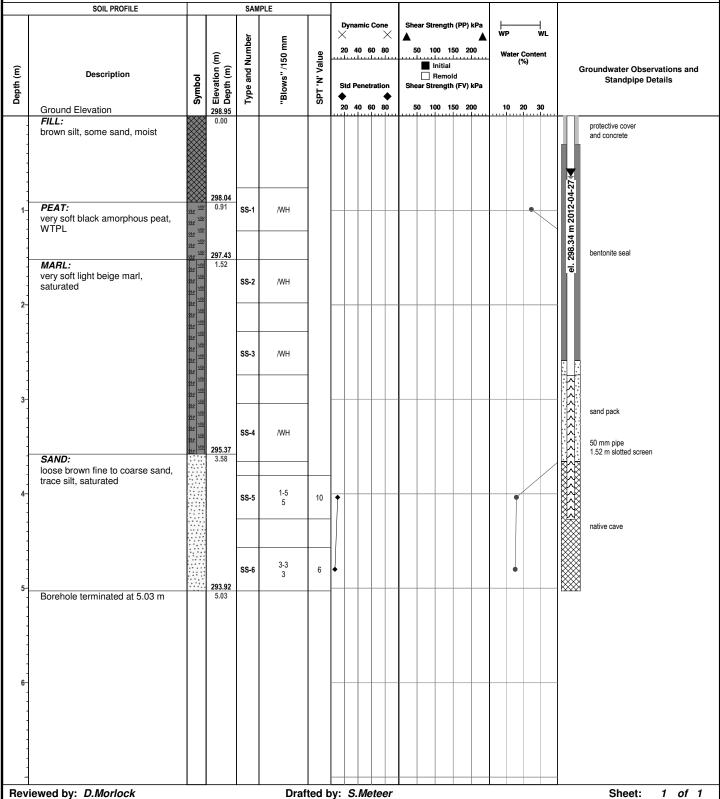
BH-4-12 Ground Elevation: 298.95 m **Borehole Number:**

> Job N°: P-0000145-0-00-400

> **Drill Date:** 2012-04-24

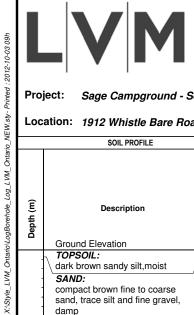
Project: Sage Campground - Sewage Systems Assessment Field Tech: R.McMillan

Hollow Stem Auger **Drill Method:** Location: 1912 Whistle Bare Road, Township of North Dumfries, Ontario



Notes: Top of pipe elevation = 299.70 m

Drafted by: S.Meteer



Ground Elevation: 298.98 m **Borehole Number:** BH-5-12

> Job N°: P-0000145-0-00-400

> **Drill Date:** 2012-04-24

> > R.McMillan

Project: Field Tech: Sage Campground - Sewage Systems Assessment

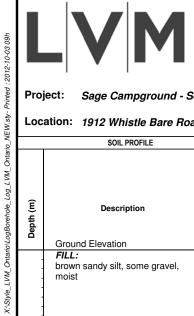
Hollow Stem Auger **Drill Method:** Location: 1912 Whistle Bare Road, Township of North Dumfries, Ontario

	SOIL PROFILE			SAM			, 									ii wetiic	Tionen etem Auger
Depth (m)	Description Ground Elevation	Symbol	SE Elevation (m) SE Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value	> 2 s	td Pe	nic Co	80 	50	In R	0 150 nitial	FV) kPa		WL r Content (%)	Groundwater Observations and Standpipe Details
-	TOPSOIL: dark brown sandy silt,moist SAND: compact brown fine to coarse sand, trace silt and fine gravel, damp		0.00 298.90 0.08														protective cover and concrete
1-			297.76	SS-1	3-6 7	13									1		5 bentonite seal
-	saturated		1.22	\$S-2	5-7 8	15	-										¥
2-	loose		296.69 2.29		0.0												
-				SS-3	2-2 4	6											native cave
3-				SS-4	2-4 6	10										•	50 mm pipe 1.52 m slotted screen
- - - 4-	Borehole terminated at 3.81 m		295.17 3.81														
5																	
-																	
6																	
-																	
Rev	iewed by: <i>D.Morlock</i>				Dra	fted b	by:	S.I	Wete	er							Sheet: 1 of 1

EQ-09-Ge-72 R.1 18.02.2011

Vertical Scale = 1:40.0

Notes: *Top of pipe elevation = 299.71 m*



Borehole Number: Ground Elevation: 298.48 m 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

Hollow Stem Auger **Drill Method:**

П	SOIL PROFILE			SAM	PLE	1													
Deptin (m)	Description Ground Elevation	Symbol	ន្ធ Elevation (m) s Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value	× 20	40 d Pen	60 8 etratio	× 20 ± 5 m ♦	50 Shea	100 Initi Ren	150 200 al	▲	WP Water	Cont (%)			Groundwater Observations and Standpipe Details
-	FILL: brown sandy silt, some gravel,		298.48 0.00				<u></u>			<u> </u>	<u>Ţ</u>				<u></u>	<u> </u>	<u> </u>		protective cover and concrete
1-	PEAT: soft black amorphous peat	新	297.57 0.91	SS-1	1-1 1	2												el. 297.50 m 2012-04-27⊪<	bentonite seal
-	WAR:	27 24 27 24 27 24 27 24	296.58	SS-2	/WH													. 297.50 m	
2-	MARL: very soft grey marl, WTPL SAND:	20 20 20 20 20 20 20 20 20 20 20 20 20 2	1.91 296.19 2.29															o	
	loose grey fine to coarse sand, trace silt and fine gravel, saturated			SS-3	3-2 9	11	•											*****	sand pack
3														+					50 mm pipe 1.52 m slotted screen
				SS-4	1-4 4	8	•								•				native cave
4-	Borehole terminated at 3.81 m		294.67 3.81	AS-5												•			
5																			
6																			
-																			

Notes: Top of pipe elevation = 299.16 m



X:\Style_LVM_Ontario\LogBorehole_Log_LVM_Ontario_NEW.sty- Printed : 2012-10-03 09h

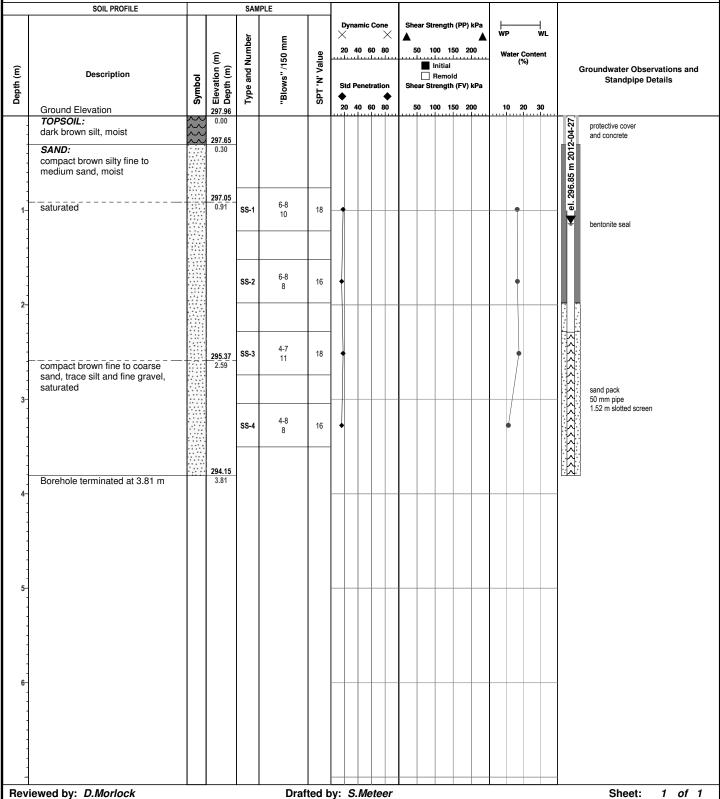
Ground Elevation: 297.96 m **Borehole Number:** BH-7-12

> Job N°: P-0000145-0-00-400

> **Drill Date:** 2012-04-25

Project: Sage Campground - Sewage Systems Assessment Field Tech: R.McMillan

Hollow Stem Auger **Drill Method:** Location: 1912 Whistle Bare Road, Township of North Dumfries, Ontario



Notes: Top of pipe elevation = 298.73 m



X:\Style_LVM_Ontario\LogBorehole_Log_LVM_Ontario_NEW.sty- Printed : 2012-10-03 09h

Ground Elevation: 301.24 m **Borehole Number:** BH-8-12

> Job N°: P-0000145-0-00-400

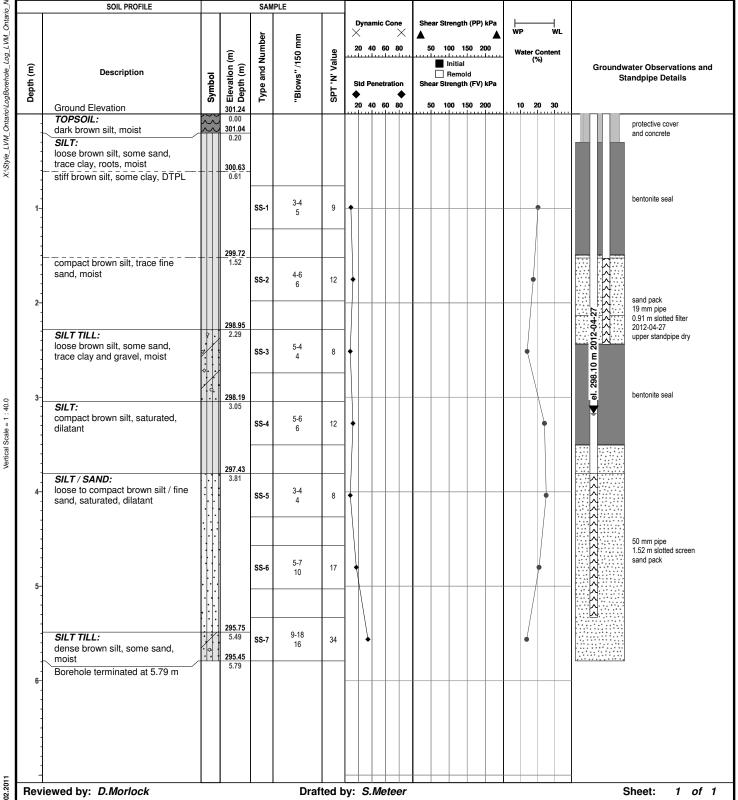
> 2012-04-25 **Drill Date:**

Project: Sage Campground - Sewage Systems Assessment

Field Tech: R.McMillan

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

Hollow Stem Auger **Drill Method:**



EQ-09-Ge-72 R.1 18.02.201

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



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

Test Pit Number: 1-13

Ground Elevation: n/a

Job No.: P-0000145-400

Excavation Date: April 30th, 2013

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

Reviewed by: VM Field Tech: BS

Notes:

Drafted by: BS



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

Test Pit Number: 10-13

Ground Elevation: n/a

Job No.: P-0000145-400

Excavation Date: May 1, 2013

	SOIL PROFILE			SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP Water Content (%)	Groundwater Observations and Measurements (m)
0.00 —	Ground Elevation TOPSOIL: dark brown sandy silt, damp to moist		0.00			
- - - -	SILT/SAND: rusty brown sand, some silt damp		-0.50 — - - -			
1.00 —	SAND: light brown sand, some gravel, trace silt, damp		-1.00 — - - -	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 Field Tech: BS

Notes:

Drafted by: BS



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

Test Pit Number: 11-13

Ground Elevation: n/a

Job No.: P-0000145-400

Excavation Date: May 1st, 2013

	SOIL PROFILE			SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP WL Water Content (%)	Groundwater Observations and Measurements (m)
0.00 —	Ground Elevation TOPSOIL: dark brown silt, moist; rootlets		0.00 - - - -0.50			
1.00	SAND AND GRAVEL: brown coarse sand and gravel, trace silt, damp		-1.00—	1		
-			-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 Field Tech: BS

Notes:

Drafted by: BS



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

Test Pit Number: 2-13

Ground Elevation: n/a

Job No.: P-0000145-400

Excavation Date: April 30th, 2013

	SOIL PROFILE			SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP WL 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 Field Tech: BS

Notes:

Drafted by: BS



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

Test Pit Number: 3-13

Ground Elevation: n/a

Job No.: P-0000145-400

Excavation Date: April 30th, 2013

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

Reviewed by: VM Field Tech: BS

Notes:

Drafted by: BS Sheet: 1 of 1



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

Test Pit Number: 4-13

Ground Elevation: n/a

Job No.: P-0000145-400

Excavation Date: April 30th, 2013

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

Reviewed by: VM Field Tech: BS

Notes:

Drafted by: BS



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

Test Pit Number: 5-13

Ground Elevation: n/a

Job No.: P-0000145-400

Excavation Date: April 30th, 2013

	SOIL PROFILE			SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP WL Water Content (%)	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 — -			
-	SAND: brown sand, trace silt, very moist		_			
1.00-	saturated		-1.00 — -	1		
-	Test pit terminated at 1.4 m.		-			Upon completion of excacvation, test pit
-	lest pil terminated at 1.4 m.		-1.50 —			sidewalls caving. Free groundwater seepage encountered
-			-			at 0.9 m.
2.00			-2.00 —			
-			-			
-			_			
-			-2.50			

Reviewed by: VM Field Tech: BS

Notes:

Drafted by: BS



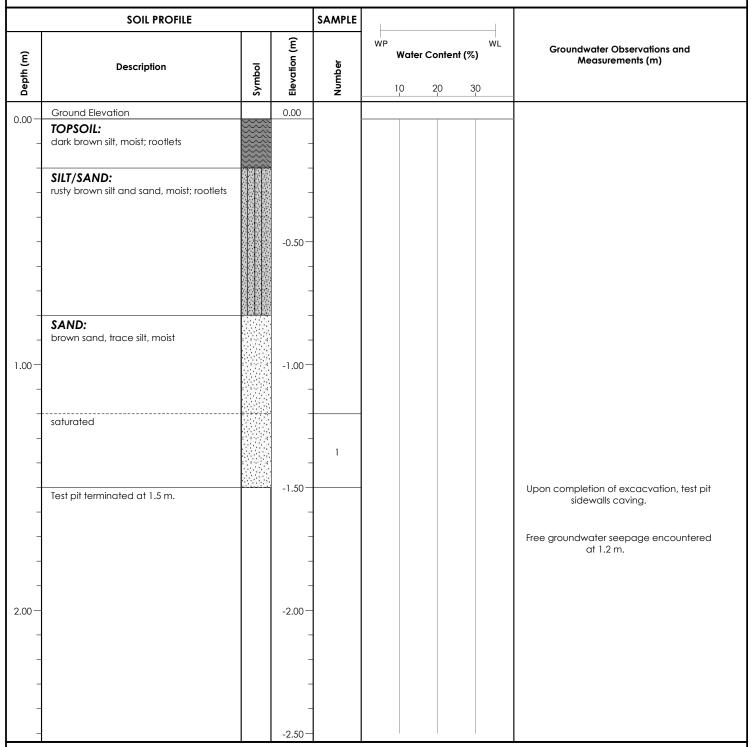
Location: 1912 Whistle Bare Road, Township of North Dumfries, ON

Test Pit Number: 6-13

Ground Elevation: n/a

Job No.: P-0000145-400

Excavation Date: May 1st, 2013



Reviewed by: VM Field Tech: BS

Notes:

Drafted by: BS



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

Test Pit Number: 7-13

Ground Elevation: n/a

Job No.: P-0000145-400

Excavation Date: May 1st, 2013

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

Reviewed by: VM Field Tech: BS

Notes:

Drafted by: BS



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

Test Pit Number: 8-13

Ground Elevation: n/a

Job No.: P-0000145-400

Excavation Date: May 1st, 2013

	SOIL PROFILE			SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	Water Con	Groundwater Observations and Measurements (m)
0.00 —	Ground Elevation TOPSOIL: dark brown silt, moist; rootlets		0.00			
-	SILT/SAND: rusty brown silt and sand, moist		-0.50 — -0.50 —			
1.00 —			-1.00 — 			
-	SAND: brown sand, trace silt and gravel, moist		-1.50 — -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.
-	pylowed by: VM		-2.50			Drafted by BS

Reviewed by: VM Field Tech: BS

Notes:

Drafted by: BS



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

Test Pit Number: 9-13

Ground Elevation: n/a

Job No.: P-0000145-400

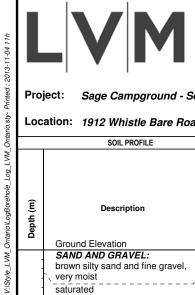
Excavation Date: May 1st, 2013

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

Reviewed by: VM Field Tech: BS

Notes:

Drafted by: BS



Borehole Number: Ground Elevation: 298.81 m 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

Hand Auger **Drill Method:**

	SOIL PROFILE			SAM	PLE															
Depth (m)	Description Ground Elevation	Symbol	SE Elevation (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value	× 20	40 6	60 80	< 0 •	50	10 III li	0 15 nitial Remole	0 200	▲	er Co (%)	WL ntent		G	iroundwater Observations and Standpipe Details
	SAND AND GRAVEL: brown silty sand and fine gravel, very moist saturated	0 0	298.81 0.00 298.56 0.25				1111			***	••••			****	***			XXXXXX	7.5€	native backfill
1-	Mini-piezometer terminated at 0.91 m		297.90 0.91															××××	el. 298.30 m 2012-04-	sand pack 19 mm pipe 0.61 m slotted screen
2																				
3-																				
4-																				
5																				
6																				
	iewed by: <i>D.Morlock</i>				Draf															Sheet: 1 of 1

Notes: Top of pipe elevation = 300.46 m



V:\Style_LVM_Ontario\LogBorehole_Log_LVM_Ontario.sty- Printed: 2013-11-04 11h

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

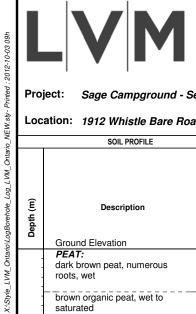
Field Tech: D.Souter

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

Drill Method: Hand Auger

Description TopSolt: SAND: SAND: Sand: Mini-piezometer terminated at 1.83 m. Description Description	Т	SOIL PROFILE			SAME	PLE	l														
Disck sit, some organics, wet SAND: Disck sit, some fine	Deptn (m)		Symbol	g Elevation (m) g Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value	× 20	40 6	SO 80	< •	50	In Rar Street	0 15 hitial emolo	0 200 d (FV) kPa	w	ater C	Contei 6)	nt	G	Groundwater Observations and Standpipe Details
SAND: Drown silty sand, some fine gravel, saturated 284.84. Mini-piezometer terminated at 1.83 1.83 m 1.83 m 1.83 m	_	TOPSOIL:		0.00				<u></u>	'		-	<u>.</u>	<u>.</u>		···-		آ		·····		
Mini-piezometer terminated at 1.83 m sand pack	1-	SAND: brown silty sand, some fine	***	296.06 0.61																296.32 m 2012-04-26⊪€	native backfill
	2-	Mini-piezometer terminated at 1.83 m		294.84 1.83																\$3333333	
4-	-																			3333	seiru paux
	3-																				
	4-																				
6-	5																				
	6								-												

Notes: Top of pipe elevation = 298.21 m



Borehole Number: Ground Elevation: 298.21 m MP-3-12

> Job N°: P-0000145-0-00-400

> **Drill Date:** 2012-04-26

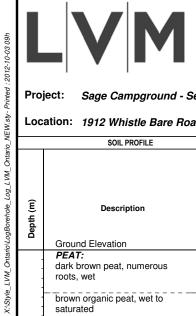
Project: Sage Campground - Sewage Systems Assessment Field Tech: D.Souter

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

Hand Auger **Drill Method:**

	SOIL PROFILE			SAM	IPLE					T									
Depth (m)	Description Ground Elevation	Symbol	용 Elevation (m) 는 Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value	× 20	40 6	50 80	< •	50	100 Ini Re	150 itial emold ngth (PP) kPa 200 FV) kPa 200	ater (%	W Conter 6)	it	G	roundwater Observations and Standpipe Details
1-	PEAT: dark brown peat, numerous roots, wet brown organic peat, wet to saturated	***************************************	0.00															.65 m 2012-04-26 i€	
2-		***************************************																el. 297	19 mm pipe 1.52 m slotted screen native backfill
3-		*************																	
4-	Mini-piezometer terminated at		293.33 4.88																
5	4.88 m																		
-	iewed by: <i>D.Morlock</i>				Draf														Sheet: 1 of

Notes: Top of pipe elevation = 299.11 m



Borehole Number: Ground Elevation: 297.88 m 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

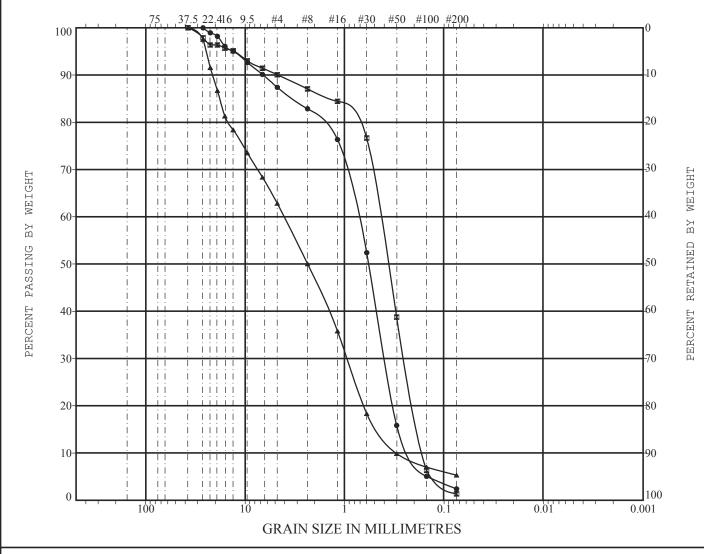
Hand Auger **Drill Method:**

Depth (m)	SOIL PROFILE Description	Symbol	Elevation (m) Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value	× 20 Std ◆	40 6	0 80	· .	50	100 Init Rer Stren	150 ial nold gth (F	·V) kPa	ater (°	Conte %)		Gr	oundwater Observations ar Standpipe Details	nd
1de	Ground Elevation PEAT: dark brown peat, numerous roots, wet brown organic peat, wet to saturated Mini-piezometer terminated at 4.88 m	and	297.88	Туре	юв	SPT	•	40 6	4	١.		100			0 2	20	30	el. 297 42 m 2012-04-26 i◀	19 mm pipe 1.52 m slotted screen native backfill	
-	iewed by: <i>D.Morlock</i>					ited k													Sheet: 1 of	

Notes: Top of pipe elevation = 298.85 m

UNIFIED SOIL CLASSIFICATION

COBBLES	GRA	<i>VEL</i>		SAND)	SILT OR CLAY
COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILI OK CLAI
U.S. SIEVE S	IZE IN MILI	IMETRES	U.S	. STANDARD	SIEVE No.	HYDROMETER



PROJECT <u>Sage Campground - Sewage System Assessment</u>

LOCATION <u>1912 Whistle Bare Road, Township of North Dumfries, ON</u>

JOB NO. <u>P-0000145-400</u>

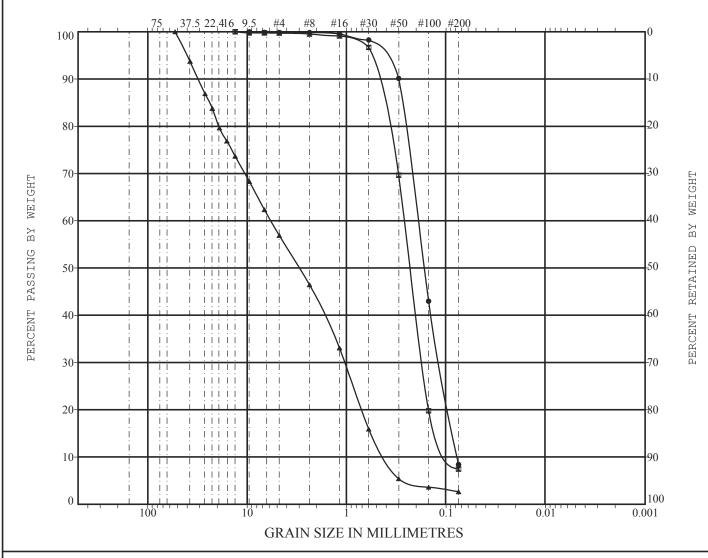
CURVE	BOREHOLE/	SAMPLE	DEPTH	
ID	TEST PIT	NO.	(m)	SOIL DESCRIPTION
•	TP4-13	1	0.8 - 1.1	SAND, some Gravel, trace Silt
	TP10-13	1	1.1 - 1.4	SAND, some Gravel, trace Silt
A	TP11-13	1	0.6 - 0.9	SAND and GRAVEL, trace Silt

REMARKS_



UNIFIED SOIL CLASSIFICATION

COBBLES	GRA	<i>VEL</i>		SAND)	SILT OR CLAY
COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILI OK CLAI
U.S. SIEVE S	IZE IN MILI	IMETRES	U.S	. STANDARD	SIEVE No.	HYDROMETER



PROJECT <u>Sage Campground - Sewage System Assessment</u>

LOCATION <u>1912 Whistle Bare Road, Township of North Dumfries, ON</u>

JOB NO. <u>P-0000145-400</u>

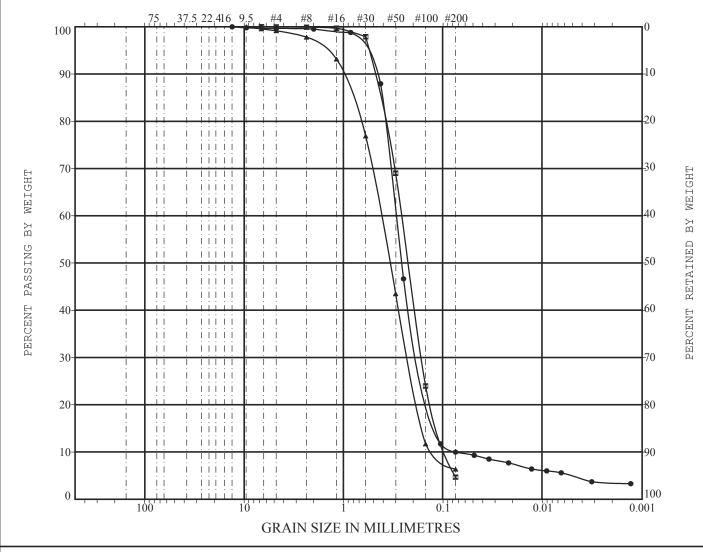
CURVE	BOREHOLE/	SAMPLE	DEPTH	
ID	TEST PIT	NO.	(m)	SOIL DESCRIPTION
•	TP3-13	1	1.5 - 1.8	SAND, trace Silt
	TP6-13	1	1.2 - 1.5	SAND, trace Silt
A	TP9-13	1	1.1 - 1.4	SAND and GRAVEL, trace Silt

REMARKS_



UNIFIED SOIL CLASSIFICATION

COBBLES	GRA	<i>VEL</i>		SAND)	SILT OR CLAY
COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILI OK CLAI
U.S. SIEVE S	IZE IN MILI	IMETRES	U.S	. STANDARD	SIEVE No.	HYDROMETER



PROJECT <u>Sage Campground - Sewage System Assessment</u>

LOCATION <u>1912 Whistle Bare Road, Township of North Dumfries, ON</u>

JOB NO. <u>P-0000145-400</u>

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

REMARKS_





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:	Spoon SA (Type and No.): d	Blow Count :: (150 mm):	SPT "N" Value:	AND	DUNDWATER MEASUREMENT D DETAILS OF MONITORING LL INSTALLATION:
0	299.76	Ground Surface Elevation:				$\coprod \coprod$	steel box
_		TOPSOIL: Dark brown silty sand, moist					
1 —	299.46	<u>SILTY SAND</u> : Brown silty sand, some gravel, moist				<u> </u>	groundwater elev. = 298.98 m May 17, 2019
2 —	298.24	mixed peatmoss, moist	SS-1	1 1	n/a		bentonite
	297.47	MARL: Loose, white marl, saturated	SS-2	1	n/a	<u> </u>	X
3 —	201.41	WAYE. 2005e, Wille Hall, Saturated	SS-3	1	n/a		filter sand
4 —			SS-4	1	n/a		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:



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

		SOIL STRATIGRAPHY:	SAMPI	ı F·		GRO	UNDWATER MEASUREMENT
Depth (m):	Elevation (m):	SOL STIGNATION.	Spoon S (Type and No.):	Blow Count (150 mm):	SPT "N" Value:	AND	DETAILS OF MONITORING L INSTALLATION:
0	299.98	Ground Surface Elevation:				${ m I\hspace{1em}I}$	steel box
_		<u>TOPSOIL</u> : Dark brown silty sand, moist					
1 —	299.68	<u>SILTY SAND AND GRAVEL</u> : Loose, brown silty sand and gravel, very moist	SS-1	4-4	6	-	groundwater elev. = 299.09 m
_	298.76	mixed peatmoss, moist	<u> </u>	2-1		- 1	May 17, 2019
2 —	2000		SS-2	1	n/a	Ш	bentonite
3 —	297.69	<u>SAND:</u> Loose, fine to medium sand, trace silt, saturated; occasional seams of sand and gravel	SS-3	4-4 5-4	9		
J	296.93	reddish brown, trace to some silt	SS-4	2-2 4-6	6		Channel .
4 —							filter sand 1.52 m slotted screen
5 —	295.41	Monitoring well terminated at 4.57 m	SS-5	3-6 7-8	13	ME M	
-							
6 —							
7 —							
8 —							
9 —							
10-							
11—							
-							
12—							
13—							
14—							

Notes:



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:	Spoon S (Type and No.): W	Blow Count :: (150 mm):	SPT "N" Value:	AN	OUNDWATER MEASUREMENT D DETAILS OF MONITORING ELL INSTALLATION:
0	301.21	Ground Surface Elevation:				Ш	steel box
		<u>TOPSOIL</u> : Dark brown silty sand, moist	1				
_	300.91	<u>SAND AND GRAVEL</u> : Loose, brown sand and gravel, some silt, very moist					
1 —		to wet	SS-1	4-4	6		
	299.99	wet; seams of silt, some sand and clay, saturated	├	2-1			groundwater elev. = 299.72 m
			SS-2	1	n/a	1 -	May 17, 2019
2 —	299.38	mixed peatmoss, saturated					II '
			SS-3	1	n/a		bentonite
					1,,,		
3 —						**	X

4 —							XX
I							
]				1-1		▓⊨	
5 —	296.49	SANDY SILT: Loose, brown sandy silt, trace clay and gravel, saturated	SS-4	2-3	3		ilter sand
						灩	1.52 m slotted screen
							XX
6 —						₩E.	₩
-	295.11	SAND AND GRAVEL: Loose, brown sand and gravel, trace silt, saturated	SS-5	2-2 3-4	5		
l _ =				3-4		-	
7 —		Monitoring well terminated at 6.1 m					
		•					
8 —							
"							
9 —							
_							
10—							
11—							
10							
12—							
13—							
∃							
14—							
] =							
	ı I		ı			1	

Notes:



Project No.: 00009-2

Ground Surface Elevation: 310.53 m Top-of-Pipe Elevation: 311.60 m

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

Date: October 4, 2017

Project: Whistle Bare Campground

Location: 1912 Whistle Bare Road, Township of North Dumfries

		<u>'</u>					,	
Depth (m):	Elevation (m):	SOIL STRATIGRAPHY:	Spoon Syoon (Type and No.): W	Blow Count :: (150 mm):	SPT "N" Value:	GROUNDWATER MEASUREMENT AND DETAILS OF MONITORING WELL INSTALLATION:		
0	310.53	Ground Surface Elevation:	0, 0	ш 🔾			steel box	
1 —	309.77	<u>SAND</u> : Compact, brown medium to coarse sand, some gravel, trace silt, moist	SS-1	8-8 9-12	17			
3 —	307.48	seams of fine to medium sand, moist	SS-2	12-11 7-8	18			
5 — - - 6 —	305.96	SAND AND GRAVEL: Compact, brown medium to coarse sand and gravel, trace silt, moist	SS-3	18-26 27-13	53		bentonite	
7 —	303.98	very moist	SS-4	13-15 21-18	36			
8 —			SS-5	23-35 21-24	56			
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		filter sand	
12			SS-8	6-8 13-13	21		*** *** *** *** *** *** ***	
13— — — — 14—	296.81	grey	SS-9	10-11	24		1.52 m slotted screen	
		Monitoring well terminated at 13.72 m		13-21				
Note	es:							



Project No.: 00009-2

Ground Surface Elevation: 311.07 m Top-of-Pipe Elevation: 311.95 m

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

Date: October 3, 2017

Project: Whistle Bare Campground

Location: 1912 Whistle Bare Road, Township of North Dumfries

		· · · · · · · · · · · · · · · · · · ·					<i>'</i>	
Depth (m):	Elevation (m):	SOIL STRATIGRAPHY:	Spoon S (Type and No.): W	Blow Count :: (150 mm):	SPT "N" Value:	AN	ROUNDWATER MEASUREMENT ND DETAILS OF MONITORING /ELL INSTALLATION:	
0	311.07	Ground Surface Elevation:	-				steel box	
1 —		<u>SAND AND GRAVEL</u> : 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 — - 7 —	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	<u>*</u>	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					hand	
Not	es:							



Project No.: 00009-2

Ground Surface Elevation: 304.58 Top-of-Pipe Elevation: 305.54

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

Date: October 4, 2017

Project: Whistle Bare Campground

Location: 1912 Whistle Bare Road, Township of North Dumfries

		•					
Depth (m):	Elevation (m):	SOIL STRATIGRAPHY:	Spoon S (Type and No.): W	Blow Count :: (150 mm):	SPT "N" Value:	AND	DUNDWATER MEASUREMENT D DETAILS OF MONITORING LL INSTALLATION:
0	304.58	Ground Surface Elevation:				Щ	steel box
1 —		<u>SILT AND SAND</u> : Loose, brown silt and sand, moist	SS-1	4-2	4		
2 —	302.60	SAND: Loose, light brown sand, trace silt, moist	-	2-4		11 1	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	H	
4 —				12-10		- - - -	groundwater elev. = 300.07 m
5 —	300.01	very moist	SS-3	13-18	23	II	May 17, 2019
6 —	298.48	<u>SILTY SAND</u> : Compact, brown silty fine sand, trace clay, saturated	SS-4	14-21 20-33	41		
' =							filter sand
8 —			SS-5	16-11 23-36	34		
9 —							1.52 m slotted screen
	295.44	some silt	SS-6	6-11 20-23	31		
10		Monitoring well terminated at 9.14 m		20-23		-	
11							
12—							
13— — — — 14— — —							
Note	es:						



Project No.: 00009-2

Ground Surface Elevation: 312.12

Project: Whistle Bare Campground Top-of-Pipe Elevation: 313.10 Location: 1912 Whistle Bare Road, Township of North Dumfries Date: October 4, 2017

ROUNDWATER MEASUREMENT ID DETAILS OF MONITORING ELL INSTALLATION: steel box	
= 301.56 m	
een	

January 9, 2020 FILE NO.: H19111 Page D

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)

				(IIIDGIOGIIG)		(IIIDGIOUIIU)		(ITIDOTOUTIU)		
	Ground	Tan of Dina		April 2	7, 2012	July 3	, 2012	August 8, 2012		
Borehole Number	Surface Elevation (mASL)	Top of Pipe Elevation (mASL)	Pipe Diameter (mm)	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

	Ground	Top of	21-	-Apr-17	20	-Oct-17	18-	18-Sep-18		17-May-19	
Monitoring Well ID	Surface Elevation (m)	Pipe Elevation (m)	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	

File No.: 00009-2

Table 1 - Summary of 2019 Water Levels and Elevations

				17-May-1	.9		21-Aug-19		2019 Spring - Summer Fluctuation (m)
Monitoring Well ID	Ground Surface Elevation (m)	Top of Pipe Elevation (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

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

Flow Spec

Date: June 28, 2019

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

Groundwater Chemistry

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

Flow Spec

Date: June 28, 2019

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

Groundwater Chemistry

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

Date: June 28, 2019

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

Flow Spec