

Stormwater Management Report

**Grainboys Holdings Inc 3469 York Durham Line** 

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## STORMWATER MANAGEMENT REPORT

**Grainboys Holdings Inc.** 

3469 York Durham Line

**December 19, 2019** 

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# 1 Background

The Owner, Kresho Petrovich, is proposing the development of the new Grainboys Holdings Inc. facility at 3469 York Durham Line. A residential dwelling is located on the existing 36.3 ha site and is surrounded by primarily agricultural cropland and wooded areas (see Figure 1-1). St. Lawrence Grains & Farm Supply Ltd. Is located directly south of the subject site.



Figure 1-1: Site Location

Jewell Engineering Ltd. (JE) has prepared this SWM report to address the concerns for quality and quantity treatment with the proposed development. The site is subject to Oak Ridge Moraine guidelines and located in a headwater area of the Toronto and Region Conservation Authority (TRCA) watershed.

The proposed development of the new mill facility is considered a "major development" based on the *Oak Ridge Moraine Conservation Plan* (ORMCP). Additionally, the ORMCP states that the net developable area of the site is to be limited to 50 percent of the total site area. Impervious surfaces are also limited to 20 percent of the total site area.

According to Map 5 of the ORMCP Land Use Designations for the Township of Uxbridge, the site is classified as a "Natural Linkage Area" (see Figure 1-2). The purpose of this designation is to protect critical natural and open space linkages between the Natural Core Areas and along rivers and stream, maintain the quantity and quality of groundwater and surface water, and maintain the ecological integrity of the ORMCP area. Policies for development within Natural Linkage Areas are typically very



restrictive. This is reflected in the development limitations outlined above and the study objectives described in Section 2.

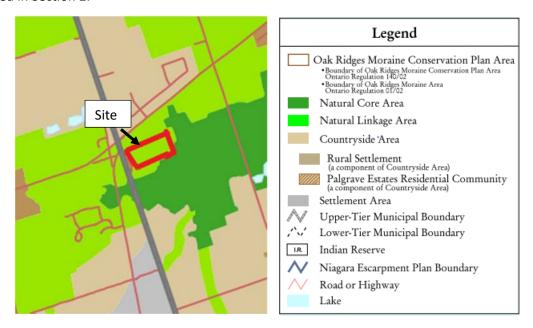


Figure 1-2: ORMCP Land Use Designation

The commenting agencies for the SWM plan include Toronto and Region Conservation Authority (TRCA) and the Township of Uxbridge. The subject site is within the Duffins Creek watershed.

# 2 Proposed Development

The proposed development plan is provided in Figure 2-1. The development includes construction of a new building and associated asphalt parking/driveways and concrete bins. Stormwater is proposed to be conveyed via sheet flow from the building and asphalt driveway/parking areas to a perimeter enhanced grass swale which directs drainage to a centralized SWM facility. External drainage from the north will be re-directed around the proposed development and outlet to the same location as the existing drainage.

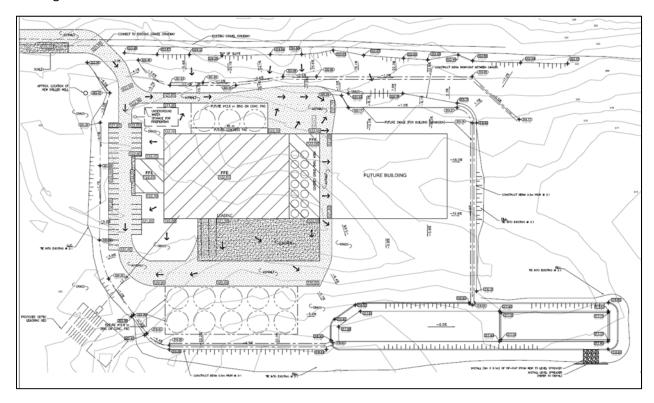


Figure 2-1: Proposed Development Plan

Site grading plans have been completed for the immediate proposed development as well as future expansions. This SWM report has been completed in consideration of the full build out (inclusive of the future expansions).



# 3 Study Objectives

The subject site falls within the Duffins Creek watershed in the TRCA area. The stormwater objectives summarized below were determined in accordance with the TRCA Stormwater Management Criteria 2002 and the 2012 Duffins Creek Hydrology Update by Aquafor Beech Ltd.

#### **Quantity Control Objectives**

To provide on-site storage for the development area to control post-development runoff to the designated quantity control release rates as defined in Appendix A of the TRCA Stormwater Management Criteria 2002 for the 2 to 100 year event for the 12 hour AES storm distribution.

#### **Quality Control Objectives**

To provide water quality treatment to the Enhanced objectives outlined in the Ministry of Environment's Storm Water Management Planning Design Manual, 2003.

#### **Sediment and Erosion Control during Construction**

- Retain 5mm on site to mitigate the release of sediment offsite
- Minimize the potential for erosion of soils and construction materials
- Protect planned infiltration facilities

#### Water Balance

To provide a site specific water balance analysis and maintain water recharge.



# 4 Methodology

This section is provided for the interested reader to gain an understanding of the hydrologic and hydraulic modelling methods used by JE during the course of the investigation.

The results of the analysis are presented in the following sections.

# 4.1 Hydrology

A hydrologic analysis was completed using HEC-HMS version 4.3. This hydrologic modeling software is developed by the U.S. Army Corps of Engineers and distributed freely.

HEC-HMS software can simulate the hydrologic response of catchment areas to rainfall inputs, including losses, storage, routing, diversions etc. HEC-HMS contains modelling tools for pumping systems, gridded inputs, snow melt and evapotranspiration routines.

A description of the HEC-HMS inputs follows.

#### 4.1.1 Precipitation

Precipitation inputs are supplied as hyetographs to the precipitation gages in HEC-HMS located in the *Time-Series Data Manager*. These inputs were derived using precipitation gauge statistics from Intensity-Duration-Frequency (IDF) curves using the MTO Look-Up tool (see Appendix C). In accordance with the TRCA Stormwater Management Criteria 2002 and the 2012 Duffins Creek Hydrology Update by Aquafor Beech Ltd., the 12hr AES storm was selected as the design storm for the 2 to 100 year events. The hyetograph provided in MTO Design Chart 1.03 for the last 12 hours of the Hurricane Hazel event was used for the regional event. The 4hr 25mm Chicago storm was used for the quality event.

# 4.1.2 Catchment Area

The site has a total area of 36.3 ha. JE used land contour information to delineate catchment boundaries for the site and external areas (see Appendix B). The Ontario Flow Assessment Tool was consulted to confirm extents of external drainage areas.

Pre development catchment 100 and post development catchments 200A & 200B represent the western portion of the site and external lands to the north which drain west to a tributary of Reesor Creek. These catchments contain a small portion of the existing/proposed driveway and grassed/cultivated lands. As there are no significant alterations proposed to the lands within this catchment, detailed analysis of the catchment has not been included in this report.

Pre development catchment 101 and post development catchments 201A & 201B represent the site's largest drainage area. The majority of the proposed development is expected to occur within this catchment (specifically 201A). These catchments drain south across adjacent lands before entering a tributary of Reesor Creek. Post development catchment 201B contains external and internal lands which will remain undisturbed by the development. Drainage from these lands has been routed around the proposed development and directed back to the pre-development outlet location.



The remainder of the site (catchment 102/202) will remain undisturbed and drains to the east to a tributary of Reesor Creek. Since this catchment will remain undisturbed, detailed analysis of the catchment has not been included in this report.

A catchment area summary is provided in the table below.

Table 4-1: Catchment Area Summary

Pre Devel	opment	Post Development		
Catchment	Area (ha)	Catchment	Area (ha)	
100	7.16	200A	6.01	
100	7.10	200B	1.17	
101	29.01	201A	3.74	
101	29.01	201B	25.25	
102	<u>3.95</u>	202	<u>3.95</u>	
Total Area	40.12	Total Area	40.12	

#### 4.1.3 Imperviousness

Imperviousness is a measure of how much hardening has occurred within the catchment. It is expressed as a percentage of the catchment area that is hardened by asphalt, roof, concrete, etc. which restricts water infiltration into the ground and results in higher runoff. Imperviousness was calculated for the pre & post development catchments as shown in table 4-2. Note that the overall imperviousness for the subject site is 7% which is less than the 20% allowed per the ORMCP.

#### 4.1.4 Runoff Coefficient

The runoff coefficient was calculated using a weighted average (see Equation 1). Individual areas and runoff coefficients are shown in Table 4-2 for the varying land covers that will occur after development of the new Grainboys Holdings Inc. facility.

Equation 1: Weighted Average Calculation for Runoff Coefficient

$$C_w = \frac{C_1 \times A_1 + C_2 \times A_2 + \dots C_n \times A_n}{A_1 + A_2 + \dots A_n}$$

Where:

C<sub>i</sub> = Runoff Coefficient for A<sub>i</sub>

A<sub>i</sub> = Land Area (ha) of Cover Type

Table 4-2: Catchment 101/201A & 201B Runoff Coefficient & Percent Impervious

	C	atchment 10	01	Catchment 201A			Catchment 201B		
Land Use	Area (Ha)	Selected RC (2yr)	RC x A	Area (Ha)	Selected RC (2yr)	RC x A	Area (Ha)	Selected RC (2yr)	RC x A
Pavement/ Concrete	0.00	0.90	0.00	1.08	0.90	0.97	0.00	0.90	0.00

Roofs	0.02	0.90	0.02	0.87	0.90	0.78	0.02	0.90	0.02	
Gravel	0.32	0.50	0.16	0.00	0.50	0.00	0.31	0.50	0.15	
Grass	0.00	0.20	0.00	1.79	0.20	0.36	0.00	0.20	0.00	
Cultivated (0-5%, Loam)	28.67	0.35	10.03	0.00	0.35	0.00	24.92	0.35	8.72	
Total	29.01	-	10.21	3.74	-	2.11	25.25	-	8.89	
Weighted RC	1 0.35			0.57			0.35			
Percent Impervious (%)	mpervious 1			52				1		

#### 4.1.5 Curve Number

Curve numbers (CNs) are used in the Soil Conservation Service (now known as the *National Resources Conservation Service*) methodology for estimating the proportion of precipitation that will runoff the lands and the portion that will infiltrate. CNs are a function of soil type, land cover, slope, and land use. The higher the CN – the greater the proportion of precipitation that is expected to runoff the lands. CNs are representative of the pervious portion of the watershed.

JE determined the CN using information from GHD's *Geotechnical Investigation Report* and the Agricultural Atlas tool developed by the Ministry of Agriculture, Food and Rural Affairs. The soil type at the site is Woburn Loam and is classified under Hydrologic Soils Group (HSG) B and are considered suitable for infiltration technologies.

JE used MTO Design Chart 1.09 to determine a CN of 78.



Figure 4-1: Soil Classification



In accordance with the TRCA Stormwater Management Criteria 2002, JE used the CN method in HEC-HMS modelling for simulation of losses. For the Hurricane Hazel regional event, the CN was adjusted to account for the saturated antecedent moisture conditions (AMCs) that would be present during the last 12 hours of the storm. The CN adjustment is calculated using MTO Design Chart 1.10. With the conversion to AMC III, a CN of 90 is used for the regional storm (see Appendix C).

#### 4.1.6 Initial Abstraction

Initial abstraction is the depth of precipitation input that is subtracted from the model and does not contribute to runoff. It may include interception by vegetation and infiltration or depression storage. A value of 5 was selected for the initial abstraction.

#### 4.1.7 Basin Lag

Basin lag time has been defined as the time from the centroid of rainfall excess to the centroid of the corresponding runoff hydrograph (USGS, 2012). This is an important measure in estimating the time of peak runoff.

The Natural Resources Conservation Service completed studies of basin lag time and it is generally accepted that the lag time can be estimated as 60 percent of the time of concentration (Hydrologic Modeling System HEC-HMS User's Manual, 2013).

The time of concentration is the time it takes for the drainage area to contribute to peak flows. It is determined following methods presented in the Ministry of Transportation Drainage Manual. JE analysed several methods of calculating the time of concentration to select the most appropriate as shown below.

#### **Time of Concentration**

**Kirpich** (channel flow) slope in m/m

Tc:  $0.0195L^{0.77}S^{-0.385}$ 

Airport (c<0.4, sheet flow) , slope in %

Tc:  $3.26*(1.1-C)*L^{0.5}/S_w^{0.33}$ 

Bransby Williams (c>0.4, channel flow), slope in %

Tc:  $0.057*L/(S_w^{0.2}xA^{0.1})$ 

Watt & Chow (1985)

Tc:  $0.000326(L/S^{0.5})^{0.79}$ 



Table 4-3: Time of Concentration

Catchment	Area (ha)	Watershed Length (m)	Slope (%)	Return Period	RC	Airport T <sub>c</sub> (min)	Bransby-Williams Tc (min)	Watt & Chow , Tc (min)	Kirpich	Selected T <sub>c</sub>	Channel Length (m)	Channel Slope	Pipe or Channel Flow T <sub>c</sub> (min)	Total Tc (min)	Lag Time T <sub>P</sub> (min)					
				2/5/10	0.35	45.8				58.8				58.8	35.3					
101	20.01	700	2.4	25	0.39	43.6	25.2 58.8	25.2	25.2			50.0	12.2	58.8	0	0.00	0.0	58.8	35.3	
101	29.01	1 790	3.4	50	0.42	41.5		58.8	12.2	58.8	0.00	0.0	58.8	35.3						
				100	0.44	40.4				58.8				58.8	35.3					
				2/5/10	0.57	25.3		27.0						15.0	9.0					
201A	2 7/1	245	1.3	25	0.62	22.7	11.7		27.0	27.0	27.0	27.0	27.0	7.3	15.0			0.0	0.0	0.0
201A	3.74	245	1.3	50	0.68	20	11.7		7.3	27.0 7.3	15.0			0.0	0.0	0.0				
				100	0.71	18.6									0.0	0.0				
			2/5/10 0.35	41								50.5	30.3							
201B	25.25	607	3.2	25	0.39	39	10.0	16.3	10.2	46.3	140	0.02	4.2	0.0	0.0					
2016	23.23	607	3.2	50	0.42	37.1	19.9	46.3	10.2	10.2 46.3	140	0.02	4.2	0.0	0.0					
				100	0.44	36.2								0.0	0.0					

# 4.2 Hydraulics

Hydraulic calculations were completed for the SWM facility outlet and overflow spillway and the grass swales that convey runoff to the SWM facility.

The broad-crested weir used for the overflow spillway was sized using Equation 2.

Equation 2: Broad-Crested Weir Formula

$$Q = 1.67LH^{3/2}$$

Where:

 $Q = Flow (m^3/s)$ 

L = Length of Weir (m)

H = Depth of flow (m)

The orifices used for the SWM facility outlet were sized using Equation 3.

Equation 3: Broad-Crested Weir Formula

$$Q = CAo(2gh)^{0.5}$$

Where:

 $Q = Flow (m^3/s)$ 

C = Coefficient of discharge (0.6)

Ao = Area of orifice opening  $(m^2)$ 

g = acceleration due to gravity (9.81m/s<sup>2</sup>)

H = Head measured from centroid of orifice (m)

JE sized the grassed swales using Manning's open channel flow (see Equation 4). A roughness value of 0.027 was used for a grass bottom.

Equation 4: Manning's Open Channel Flow

 $Q = 1/n AR^{2/3}S^{1/2}$ 

## Where:

n = roughness coefficient

 $A = area (m^2)$ 

R = hydraulic Radius (m)

S = slope

# 5 Hydrology

Jewell completed a hydrologic model based on HEC-HMS software in order to determine SWM facilities. The existing site generally drains in a southeast direction and a similar drainage path will be provided with the proposed development.

# 5.1 Summary of Catchment Properties

A summary of input parameters is provided in Table 5-1.

Table 5-1: Summary of Modelling Inputs

Catchment	Area (ha)	Initial Abstraction	CN	% Impervious	Lag Time (min)
101	29.01	5	78	1	35.3
201A	3.74	5	78	52	9
201B	25.25	5	78	1	30.3

# 5.2 Uncontrolled Post Development Peak Flows

Uncontrolled post Development Peak Flows are provided below. Detailed modelling outputs are provided in Appendix D. Post development flows have increased from the pre development flows due to the increase in impervious surfaces. Therefore, quantity control is required.

Table 5-2: Summary of Post Development Peak Flows

Storm Event	Catchment 201A	Catchment 201B
2-Year	0.078	0.272
5-Year	0.110	0.448
10-Year	0.133	0.575
25-Year	0.162	0.744
50-Year	0.184	0.875
100-Year	0.207	1.006

## **5.3 Quantity Control Release Rates**

Permissible quantity control release rates for catchment 201A (the development site) were determined using Unit Flow Equation 1 from the TRCA Stormwater Management Criteria Appendix A for the Duffins Creek Watershed. Allowable release rates for the 2 to 100 year events are provided below.

Table 5-3: Summary of Quantity Control Release Rates for Catchment 201A

Storm Event	Unit Flow Equation	Catchment 201A Area (ha)	Quantity Control Release Rate (m³/s)
2-Year	$Q_2 = 5.364 - 0.520*LN(Area)$		0.017
5-Year	Q <sub>5</sub> = 8.535 – 0.826*LN(Area)		0.028
10-Year	Q <sub>10</sub> = 10.729 – 1.036*LN(Area)	3.74	0.035
25-Year	Q <sub>25</sub> = 13.832 – 1.334*LN)Area)	3.74	0.045
50-Year	Q <sub>50</sub> = 16.132 – 1.549*LN(Area)		0.053
100-Year	Q <sub>100</sub> = 18.629 - 1.787*LN(Area)		0.061

# 6 Quantity Control

## 6.1 SWM Concept

The SWM concept is to use a dry pond for quantity treatment of runoff from catchment 201A. The SWM facility location is identified in Appendix A. All of the runoff from the development (catchment 201A) is conveyed to the SWM facility on the southeast side of the development via perimeter swales. JE designed the SWM facility to meet the quantity control objectives outlined by TRCA, that is, the facility must have sufficient storage to reduce post development peak flows to below the specified allowable release rates for catchment 201A.

#### 6.2 SWM Pond

The SWM facility was designed to provide sufficient storage to restrict post development flow to the specified allowable release rates in Table 5-3.

The table below specifies the proposed pond's "Elevation-Discharge-Storage" relationship.

Table 6-1: Proposed Pond Elevation-Discharge-Storage Relationship

Elevation (m)	Discharge (m3/s)	Storage (m3)
317.40	0.000	0
317.50	0.005	134
317.60	0.008	309
317.70	0.010	526
317.80	0.012	787
317.90	0.014	1088
318.00	0.020	1411
318.10	0.038	1748
318.20	0.049	2097
318.30	0.057	2458
318.40	0.169	2832
318.50	0.368	3218
318.60	0.624	3616

<sup>\*</sup>This table conservatively disregards discharge due to infiltration within the SWM facility, therefore quantity control will be sufficient even in frozen ground conditions

The pond outlet structure includes 2 orifices and a rectangular broad crested weir as detailed in the table below.

Table 6-2: Proposed Pond Outlet Structure

Outlet Type	Invert Elevation (m)	Orifice Diameter (m)	Weir Length (m)
-------------	----------------------	----------------------	-----------------

Orifice	317.40	0.1	-
Orifice	317.90	0.2	-
Weir	318.30	-	2.0

# 6.3 Controlled Post Development Peak Flows

The peak runoff from the development site (catchment 201A), with quantity control, are presented in the table below. Detailed modelling outputs are provided in Appendix D. Runoff from catchment 201A (the development site) will be directed to the stormwater management facility to receive quantity treatment. Runoff from catchments 200A & B, 201B, and 202 will continue to drain uncontrolled as they will remain undisturbed and therefore do not require treatment. As illustrated by the controlled post development flows listed below, the post development flows are less than the allowable release rates for the development area (catchment 201A) and the quantity control objectives are satisfied.

Table 6-3: Summary of Controlled Post Development Peak Flows (Catchment 201A)

Storm Event	Quantity Control Release Rate (m³/s)	Catchment 201A Controlled Peak Flow (m³/s)	Storage Elevation (m)	Storage Used (m³)
2-Year	0.017	0.013	317.85	0.939
5-Year	0.028	0.019	317.98	1.344
10-Year	0.035	0.029	318.05	1.583
25-Year	0.045	0.041	318.13	1.852
50-Year	0.053	0.048	318.19	2.060
100-Year	0.061	0.053	318.25	2.278

# 7 Conveyance

## 7.1 Swale Sizing

The site is within a headwater area of the Duffins Creek watershed and the SWM objective for external drainage is to receive and safely convey runoff.

Catchment 201A was further sub-divided to determine capacity requirements for the two grass swales around the perimeter of the proposed development. Swale A is located at the west and south side of the development site and Swale B is located on the east side of the site. Both swales convey runoff from the proposed development to the SWM facility on the southeast side of the development.

Catchment 201B was also subdivided to determine the capacity requirements of the swale (Swale C) required to divert external drainage from the north around the proposed development.

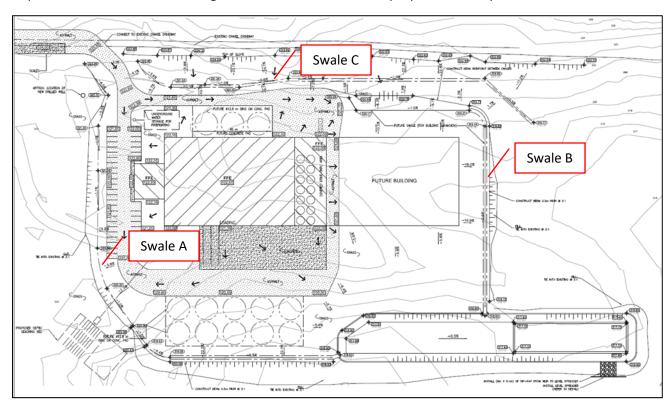


Figure 7-1: Conveyance Swales

As demonstrated by the table below, the channel flow capacity is greater than both the 100-yr and the Hurricane Hazel (regional event) design flow. Therefore, the swales are adequately sized.

Table 7-1: Swale Design

	Swale A	Swale B	Swale C
Catchment (ha)	1.5	2.25	7.58
CN	78	78	78

Imperviousness (%)	52	52	1
Tc (min)	9	9	15
100-Yr Design Flow (m <sup>3</sup> /s)	0.083	0.124	0.320
Hurricane Hazel Design Flow (m <sup>3</sup> /s)	0.217	0.326	1.06
V Swale			
Swale Slope (%)	1.0	1.0	
Swale Bottom Width (m)	0	0	
Swale Side Slopes	3:1	3:1	
Swale Depth (m)	0.3	0.4	
Swale Capacity (m³/s)	0.27	0.59	
Flatt Bottom Enhanced Swale			
Swale Slope (%)	0.5	0.5	0.6
Swale Bottom Width (m)	2.0	2.0	1.5
Swale Side Slopes	3:1	3:1	3:1
Swale Depth (m)	0.3	0.4	0.4
Swale Capacity (m <sup>3</sup> /s)	0.84	1.44	1.29

# 7.2 Overflow Spillway

A 2m wide broad-crested weir will be provided for an overflow spillway at the pond outlet. The purpose of the overflow spillway is to safely convey the regional event (Hurricane Hazel) through the SWM facility. The peak elevation in the SWM facility will be 318.54 under the Hurricane Hazel storm event. This is less than the top of pond elevation of 318.90 and less than the swale inlet elevation of 318.60.

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# 8 Quality Control

# 8.1 SWM Concept

JE designed the SWM facility to meet the quality control objectives outlined by TRCA, that is, Enhanced level protection must be provided.

A treatment train approach will be applied to this site to achieve water quality requirements. Runoff from the development site (catchment 201A) will be pre-treated by enhanced grass swales prior to discharging to the SWM facility. A portion of the dry pond SWM facility has been enhanced by perching the outlet and enhancing the bottom with clear stone and sand to improve the contact with the underlying soils, thereby creating an infiltration basin to provide quality treatment.

All runoff from the development site is conveyed to the SWM facility via two perimeter swales, identified as Swale A and Swale B in section 7.1 above. The downstream portion of each of these swales is designed as an enhanced swale for quality treatment.

#### 8.2 Enhanced Swales

The following guidance is provided in the Credit Valley Conservation 2010 Low Impact Development Stormwater Management Planning and Design Guide regarding enhanced grass swales:

- Longitudinal slope of 0.5-4% but less than 1% preferred
- Bottom width between 0.75 and 3.0m
- Soil infiltration rate 15mm/hr or higher
- Design velocity 0.5m/s or less for a 4hr 25mm Chicago storm
- Maximum flow depth of 100mm during 4hr 25mm Chicago storm

Accordingly, the downstream portions of swales A and B that have been designed as enhanced swales have slopes of 0.5% and flat bottom widths of 2.0m. A geotechnical investigation completed by GHD determined that an infiltration rate of 50mm/hr is appropriate for this site (see Appendix E).

Modelling of the Quality event (4hr 25mm Chicago storm) demonstrates velocities and flow depths as listed below:

Table 8-1: Proposed Infiltration Basin Elevation-Discharge-Storage Relationship

	Swale A	Swale B
Flow (m3/s)	0.086	0.129
Flow Velocity (m/s)	0.46	0.53
Flow Depth (mm)	83	105

Therefore the proposed swales satisfy the design criteria for enhanced swales.

## 8.3 Infiltration Basin

Table 8-1 shows the storage volume required for infiltration facilities to achieve an Enhanced protection level as outlined in the MOE 2003 SWM Planning and Design Manual. The amount of storage volume required is dependent on the impervious level. The development area (catchment 201A) is 52% impervious. Interpolation of the values provided in the MOE manual yields a requirement of 29m³/ha of storage for quality treatment via infiltration. The development area (catchment 201A) is 3.74ha, therefore a total storage volume of 110m³ is required to achieve Enhanced level protection for the development area.

Table 8-2: Storage Volume for Impervious Level to Achieve Enhanced Treatment with Infiltration SWM Practices

Percent Impervious	Storage Volume Required (m3/ha)
35	25
55	30
70	35
85	40

Per the MOE 2003 SWM Planning and Design Manual, infiltration basins should be used for drainage areas of less than 5ha. The development catchment area is 3.74ha, therefore, an infiltration basin is appropriate for this site.

The bottom of the infiltration basin is governed by the groundwater elevation which was documented at 315.7m to 315.8m in the location of the proposed infiltration basin (no bedrock was encountered within the test holes at the site). Per the MOE 2003 SWM Planning and Design Manual, infiltration basins must be separated from the groundwater table by a minimum of 1.0m. Therefore, the bottom of the infiltration basin was set at 317.10m, providing a 1.2m separation from the identified groundwater level.

The following guidance is provided in the Credit Valley Conservation 2010 Low Impact Development Stormwater Management Planning and Design Guide:

- the impervious drainage area to treatment facility area ratio should be between 5:1 and 20:1
- a maximum stone reservoir depth of 2m is recommended to prevent soil compaction

The SWM facility has been designed with a 0.5% slope on the pond bottom towards the east side. At the east end, a depressed area has been provided to serve as an infiltration basin. The infiltration basin will be 0.3m deep and will contain clear stone to a depth of 0.15m. The infiltration basin bottom area is  $1000 \text{m}^2$  which provides an impervious drainage area to treatment facility area ratio of 19:1. Accounting for a 40% void ratio in the clear stone layer yields a total storage volume of  $228 \text{m}^3$ . The basin storage exceeds the MOE requirement of  $110 \text{m}^3$ .

A geotechnical investigation completed by GHD determined that an infiltration rate of 50mm/hr is appropriate for this site (see Appendix E). TRCA guidelines describe the safety factor required to calculate a design infiltration rate. The purpose of this safety factor is to account for any compaction that occurs during construction and for uncertainties in infiltration capabilities. It is dependent on the soil type at the bottom of the SWM facility as well as the least permeable soil horizon within 1.5m below

the bottom of pond (Toronto and Region Conservation Authority, 2012). The bottom of pond is located within the till layer. The least permeable soil horizon within 1.5m below this elevation is also within the till layer, **therefore a safety factor of 2.5 is applied**. Accordingly, the design infiltration rate used in JE's HEC-HMS modelling of the SWM infiltration basin is 20 mm/hr.

The table below specifies the proposed infiltration basin's "Elevation-Discharge-Storage" relationship.

Table 8-3: Proposed Infiltration Basin Elevation-Discharge-Storage Relationship

Elevation (m)	Discharge (m3/s)	Storage (m3)
317.100	0.00000	0
317.101	0.00556	0.4
317.200	0.00557	41
317.300	0.00558	116
317.400	0.00559	228
317.401	4.50000	230

Modelling of the Quality event (4hr 25mm Chicago storm) demonstrates a drawdown time of approximately 15 hours. The ability to increase the drawdown time is restricted by the required impervious drainage area to treatment facility area ratio discussed above. The drawdown time provided is satisfactory.

The water quality treatment satisfies the quality objectives.

# 9 Sediment and Erosion Controls

### 9.1 SWM Concept

JE designed the SWM facility to meet the erosion control objectives outlined by TRCA, that is, 5mm must be retained on site.

An infiltration basin has been located on the east side of the SWM facility and will provide storage for erosion control protection.

#### 9.2 Infiltration Basin

The development area (catchment 201A) is 3.74ha, therefore a total storage volume of 187m<sup>3</sup> is required to achieve Erosion control protection for the development site.

The infiltration basin will be 0.3m deep and will contain clear stone to a depth of 0.15m. Accounting for a 40% void ratio in the clear stone layer yields a total storage volume of 228m³ which exceeds the Erosion control requirement of 187m³.

#### 9.3 Construction

Construction of the proposed development involves the movement of and exposure of soils and is typically protracted in time. There is a risk of erosion leading to sediment deposition into the downstream system. Typical sediment and erosion control measures include:

- Siltation fencing
- Strawbale check dams
- Rip-rap check dams

Controls are to be placed downstream of all active work areas and upstream of protected receivers. Controls should also be placed around stockpiles of topsoils and fill materials.

Typical OPSDs provide good instruction on the correct placement and construction of the controls. The controls provide some protection if they are properly maintained, but they should be considered last resort measures. The most effective means of control are those which prevent or reduce erosion at the source. This would include diligent stabilization of exposed areas immediately after grading is completed. Stabilization measures include sod, erosion blankets or rip-rap and filter cloth on steep slopes as well as topsoil and hydroseed on gently sloped areas (<10%).

A silt fence should be located along the south property line during the construction and be maintained until the lands have stabilized or as directed by the municipality.

# 10 Water Balance

#### **10.1 SWM Concept**

JE designed the SWM facility to meet the water balance objectives outlined by TRCA, that is, to maintain the pre development water balance.

The proposed development will reduce the overall pervious area on this site thereby reducing the infiltration of precipitation. Consequently, without mitigation there would be an impact to the water budget. GHD investigated the water balance and concluded the following:

Annual Precipitation 857.7mm/yr
Evapotranspiration 581.6mm/yr
Recharge Available 276.1mm/yr

The available recharge is split into infiltration and runoff. Over the site area of 36.3ha, total infiltration was calculated to be 51,387m<sup>3</sup>/yr (or 141mm/yr).

After development, the infiltration is estimated to be reduced to 49,463m³/yr. This is a total difference of 1,924m³ per year. The lost infiltration will contribute to increased runoff volume (estimated by GHD to increase by 13%). GHD recommended enhanced infiltration measures to mitigate the loss in infiltration and to reduce impacts from runoff.

An infiltration basin is proposed on the east side of the SWM facility and will provide infiltration for water balance objectives.

#### 10.2 Infiltration Basin

A simplified HEC-HMS model was developed to determine the potential increased infiltration strategy.

The precipitation statistics for Pearson International Airport were considered in the 1994 SWMP Design Manual. In total, there are 144 precipitation events per year. Of these, 55 were in excess of 5mm depth, 31 were in excess of 10mm depth, 14 exceeded 15mm depth and 4 exceeded 25mm. The distribution is shown in Figure 10-1.



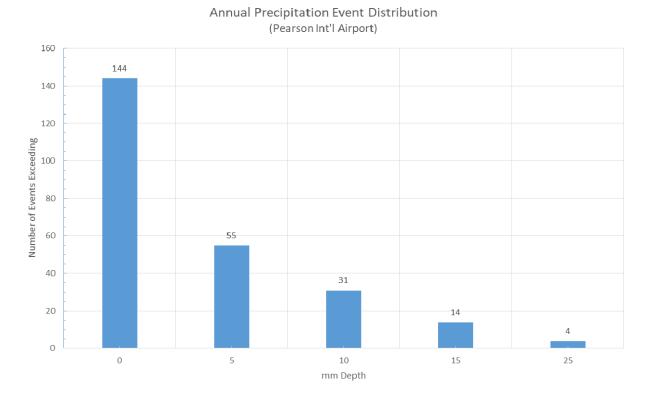


Figure 10-1: Precipitation Events by Depth at Pearson International Airport

The events were binned into five bins and supplied to the HEC-HMS model using the AES distribution. An average depth for each bin was estimated assuming the  $1/3^{rd}$  point for each bin. A total depth of annual precipitation of 860.8mm was simulated. This is slightly in excess of the amount estimated by GHD (857.7mm/yr) and will provide some conservatism. See Table X.

Using the five events, Jewell determined the infiltration potential for the basin by multiplying each event by the frequency of events per bin. In this way a simplified infiltration potential was found.

Greater Than (mm)	Up To (mm)	# of Events	1/3 rainfall depth (mm)	Interval Depth (mm)
0	5	89	1.7	151.3
5	10	24	6.7	160.8
10	15	17	11.7	198.9
15	25	10	18.3	183
25	75	4	41.7	166.8
Total		144		860.8

The Elevation-Storage-Discharge relationship for the infiltration basin is described previously in section 8.3. The simulation results show that in excess of 5,500m<sup>3</sup>/yr of infiltration may be provided within the

infiltration basin. The dry pond and basin occupy  $4,400\text{m}^2$ . With a conservative assumption of  $4,400\text{m}^2$  x  $141\text{mm} = 620\text{m}^3$  infiltration that would already be occurring over the pond area. Therefore, the assumed infiltration is  $5,500\text{m}^3 - 620\text{m}^3 = 4,880\text{m}^3/\text{yr}$ . This exceeds the  $1,921\text{m}^3/\text{yr}$  water balance target provided by GHD and therefore, the infiltration target is achieved.

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# 11 Maintenance

During the first 2 years of operation, the owner should complete a visual inspection of the complete stormwater management system after each significant storm event (approx. 4 times per year) with annual spring inspections thereafter. The owner is responsible for all inspection and maintenance requirements. The points below are a guide for inspection and maintenance practices.

**Vegetation Condition** – annual weed control including the removal of invasive species like purple loose strife, the spread of which is undesirable or does not provide a useful treatment function. Weed removal should be done by hand without the use of herbicides. Grass should be maintained in a healthy condition and should be kept at a height of approximately 150 mm.

- **Obstruction Occurrences** obstructions and garbage should be cleaned from the detention area, swales, and outlet structures.
- **Swales** all swales should be inspected for signs of erosion. Areas of erosion should be infilled and vegetated immediately.
- Sediment Removal We expect the need for sediment removal to be very infrequent. Based on Figure 6.2 (average impervious of 55%%) of the 2003 M.O.E. Storm Water Manual we expect a sediment removal frequency in excess of 20 years, however the detention area should be inspected annually for sediment accumulation. If sediment accumulation is greater than 50 mm, the sediment should be removed down to original design grade and natural vegetation restored. Should sediment need to be removed from the facility, it will need to be tested in accordance with M.O.E.C.P requirements. If it is determined to be non-hazardous, as is expected, it could be disposed on-site, or offsite in an area undergoing filling. Hazardous material would need to be transported to a sanitary landfill.
- Outlet Structure the outlet structure should be inspected for blockages and outlet erosion. All blockages and outlet erosion should be repaired immediately to ensure proper function of the outlet structure.

# 12 Conclusions

# 12.1 SWM Concept

The Owner, Kresho Petrovich, is proposing the development of the new Grainboys Holdings Inc. facility at 3469 York Durham Line. The subject site falls within the Duffins Creek watershed in the TRCA area. Perimeter swales will direct all runoff from the development area (catchment 201A) to a centralized SWM facility. The SWM facility consists of a dry pond with a perched outlet and enhanced bottom (clear stone and sand to improve the contact with the underlying soils) to create an infiltration basin.

# **12.2 Quantity Control**

Quantity treatment for the development area (catchment 201A) is provided by the dry pond. Runoff from catchments 200A & B, 201B, and 202 will continue to drain uncontrolled as they will remain undisturbed and therefore do not require treatment. JE designed the SWM facility to meet the quantity control objectives outlined by TRCA, that is, the facility must have sufficient storage to control post-development runoff to the designated quantity control release rates as defined in Appendix A of the TRCA Stormwater Management Criteria 2002 for the 2 to 100 year event for the 12 hour AES storm distribution.

The dry pond was designed with 2 orifices and a rectangular broad crested weir as detailed in the table below.

Table 12-1:	Pronosed	Pond C	)utlet St	ructure

Outlet Type	Invert Elevation (m)	Orifice Diameter (m)	Weir Length (m)
Orifice	317.40	0.1	-
Orifice	317.90	0.2	-
Weir	318.30	-	2.0

The dry pond limits post development flows to less than the allowable release rates for the development area (catchment 201A), therefore quantity control objectives are met.

The grassed swales and emergency spillway have been designed to convey the regional event.

## **12.3 Quality Control**

Quality treatment is provided via a treatment train approach. Runoff from the development site (catchment 201A) will be pre-treated by enhanced grass swales prior to discharging to the infiltration basin. JE designed the swales and SWM facility to meet the quality control objectives outlined by TRCA, that is, Enhanced level protection must be provided.

The enhanced swales were designed in accordance with Credit Valley Conservation 2010 Low Impact Development Stormwater Management Planning and Design Guide recommendations and have a longitudinal slope of 0.5% and flat bottom width of 2.0m.

The infiltration basin was designed in accordance with Credit Valley Conservation 2010 Low Impact Development Stormwater Management Planning and Design Guide recommendations. The infiltration basin has a bottom elevation of 317.10, is 0.3m deep, contains clear stone to a depth of 0.15m, and provides a storage volume of 228m³ which exceeds the MOE requirement of 110m³. Modelling of the Quality event (4hr 25mm Chicago storm) demonstrates a drawdown time of approximately 15 hours.

The water quality treatment satisfies the quality objectives.

#### **12.4 Erosion Control**

Erosion control protection is provided by the infiltration basin. JE designed the SWM facility to meet the erosion control objectives outlined by TRCA, that is, 5mm must be retained on site.

The development area (catchment 201A) is 3.74ha, therefore a total storage volume of 187m³ is required to retain 5mm on site. The infiltration basin will be 0.3m deep and will contain clear stone to a depth of 0.15m. Accounting for a 40% void ratio in the clear stone layer yields a total storage volume of 228m³ which exceeds the Erosion control requirement of 187m³. Therefore, erosion control requirements have been met.

#### 12.5 Water Balance

Water balance is provided by the infiltration basin. JE designed the SWM facility to meet the water balance objectives outlined by TRCA, that is, to maintain the pre development water balance.

GHD investigated the water balance and concluded that infiltration would be reduced by approximately 1,924m³ per year by the development. The lost infiltration will contribute to increased runoff volume (estimated by GHD to increase by 13%). GHD recommended enhanced infiltration measures to mitigate the loss in infiltration and to reduce impacts from runoff.

The infiltration basin is capable of infiltrating in excess of 4,880m<sup>3</sup>/yr of infiltration which exceeds water balance requirements.



The SWM plan meets the study objectives and demonstrates that stormwater runoff can be effectively managed within the available lands for the proposed development.

Prepared and Submitted by:



# 13 References

Ontario Ministry of the Environment. (2003). *Stormwater Management Planning and Design Manual.*Queen's Printer for Ontario.

Ontario Ministry of Transportation. (1997). Drainage Management Manual.

US Army Corps of Engineers. (2013). Hydrologic Modelling System HEC-HMS Manual.

Toronto and Region Conservation Authority. (2012). Stormwater management Criteria.

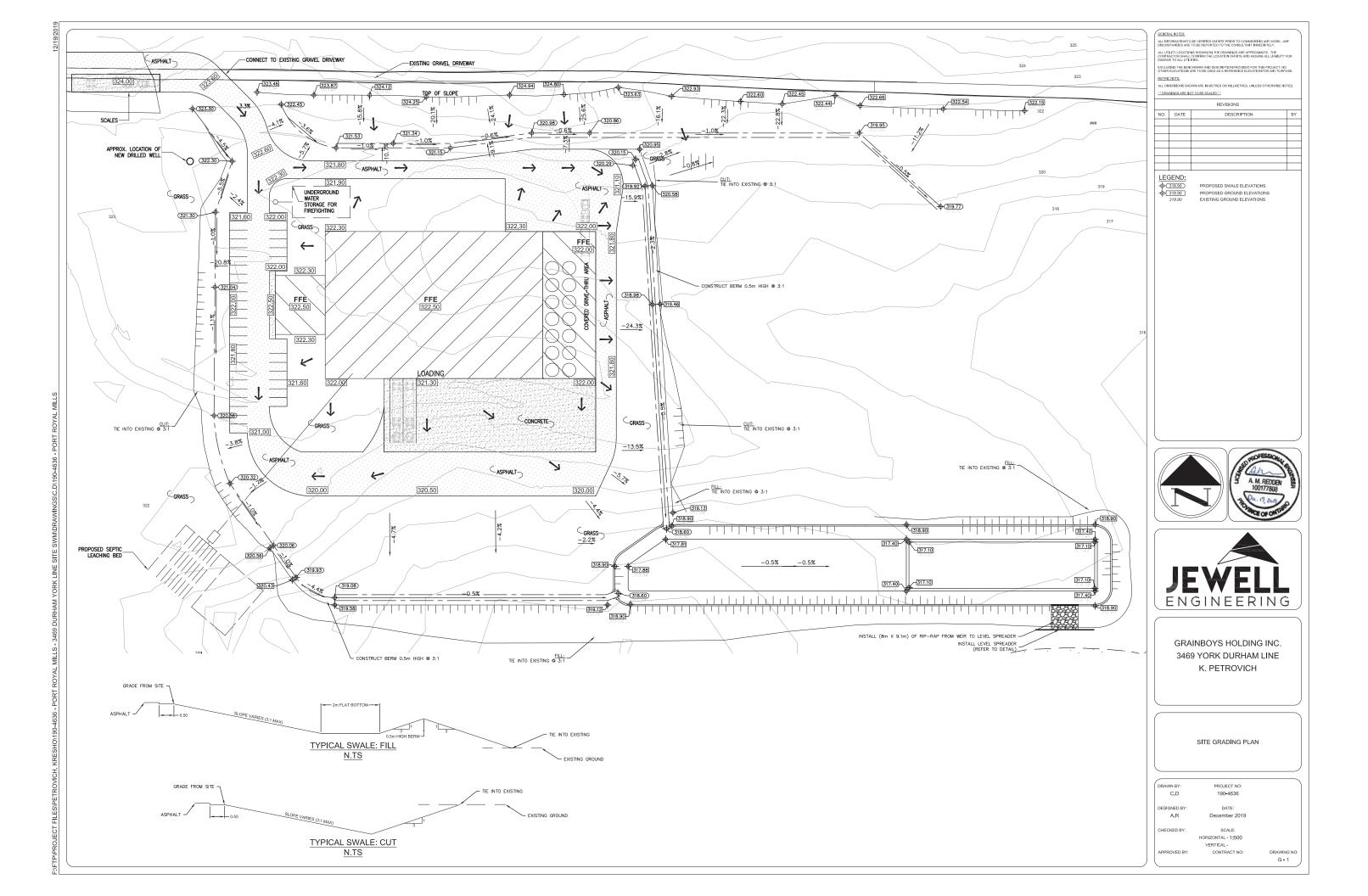
Credit Valley Conservation & Toronto and Region Conservation. (2010). Low Impact Development Stormwater Management Planning and Design Guide.

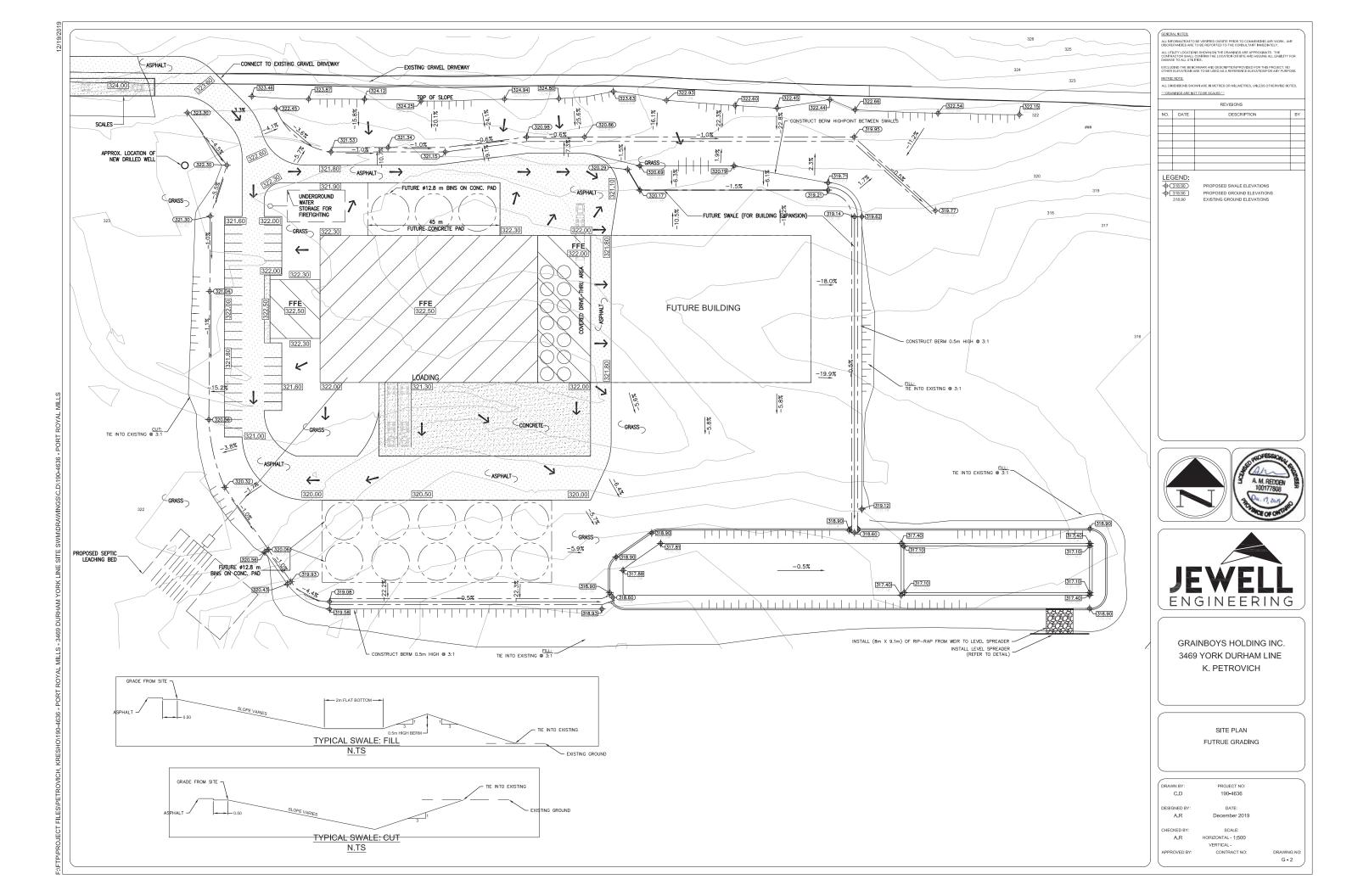
Aquafor Beech Limited. (2013). 2012 Duffins Creek Hydrology Update.

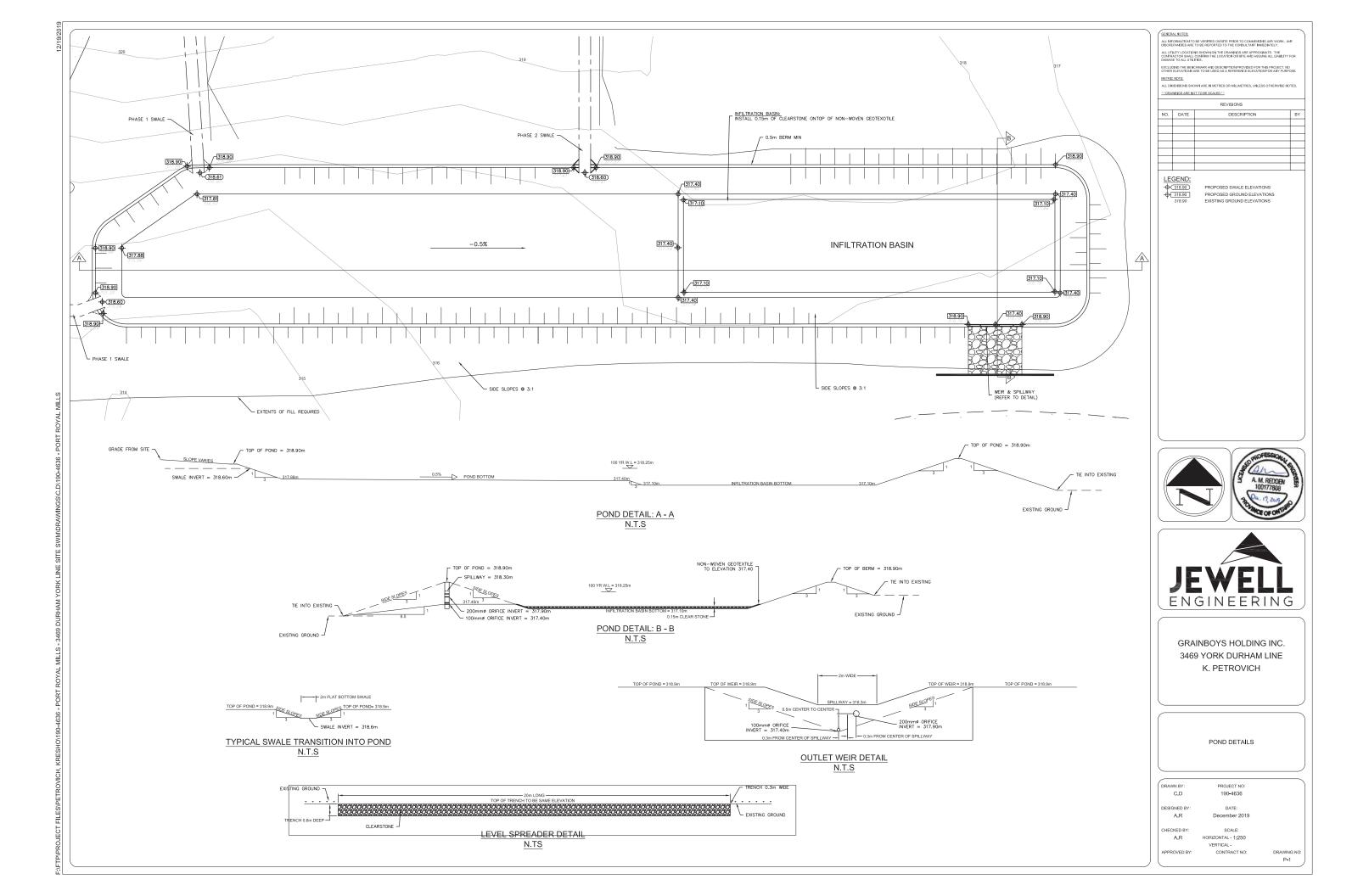
# **APPENDIX A**

**Proposed Site Plan Drawings** 





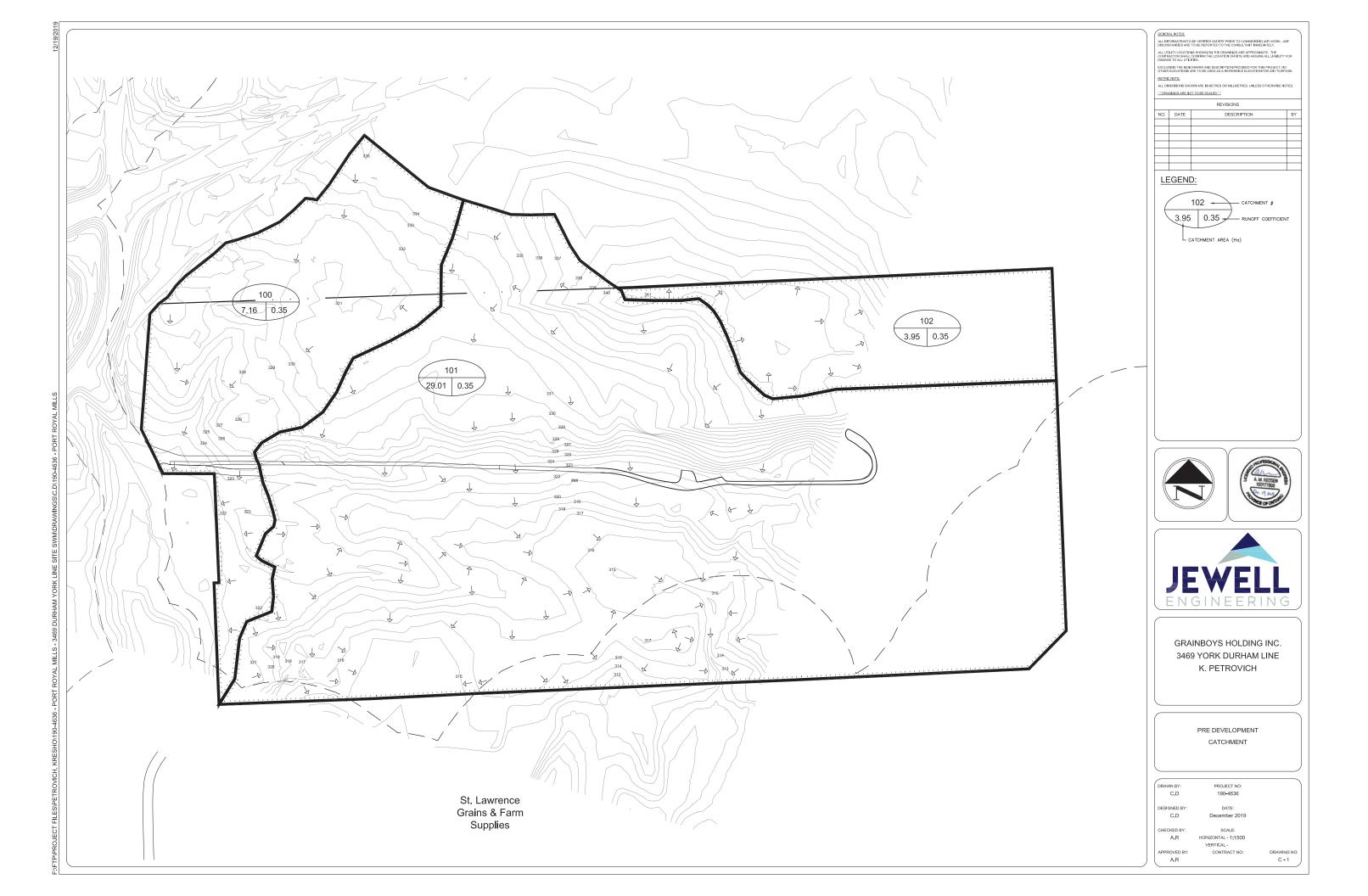


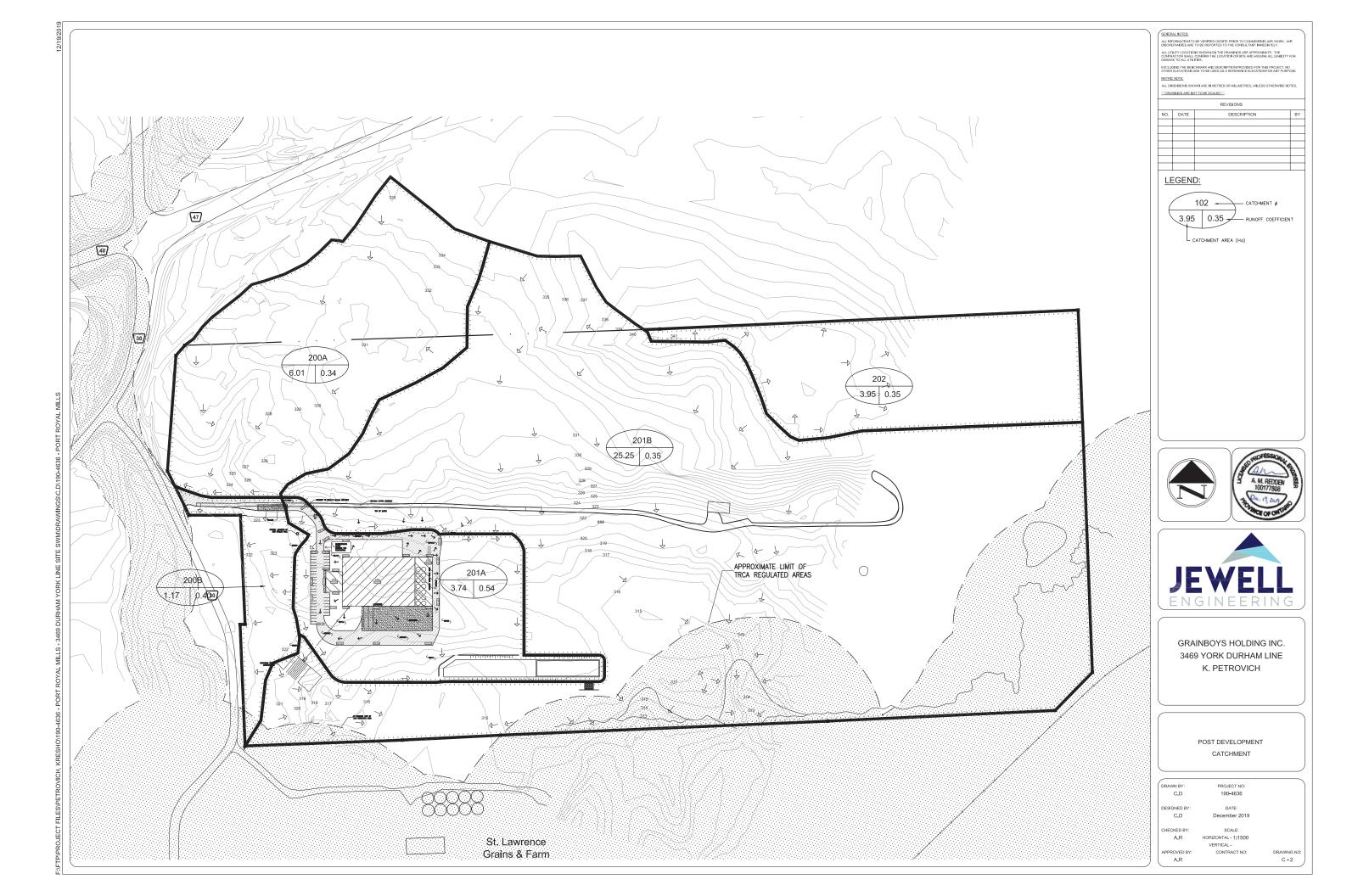


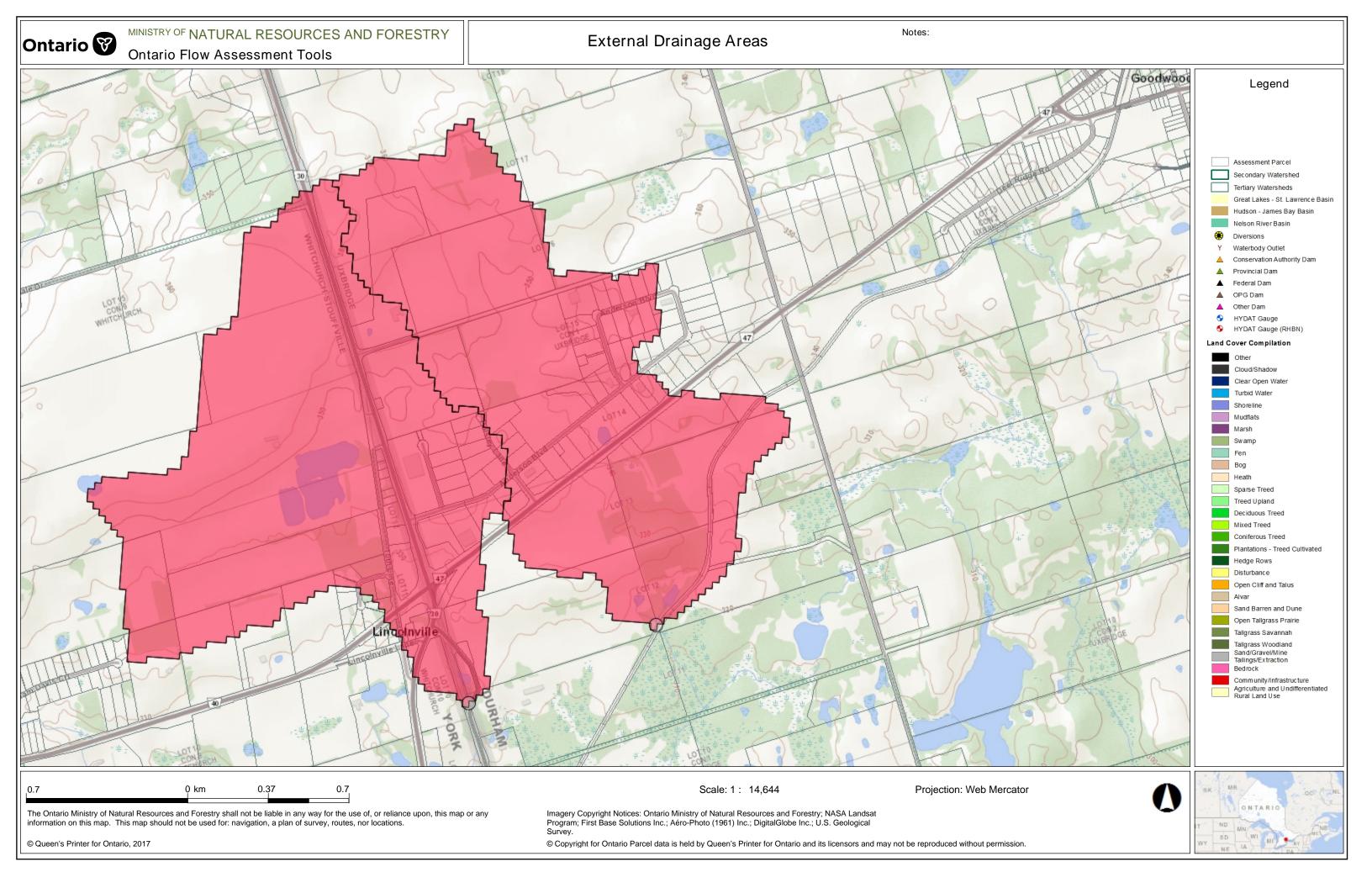
### **APPENDIX B**

**Catchment Area Drawings** 









### **APPENDIX C**

**IDF Curves/AMC Conversion** 





## **Active coordinate**

44° 0' 45" N, 79° 14' 14" W (44.012500,-79.237500)

Retrieved: Tue, 10 Dec 2019 13:10:12 GMT



#### **Location summary**

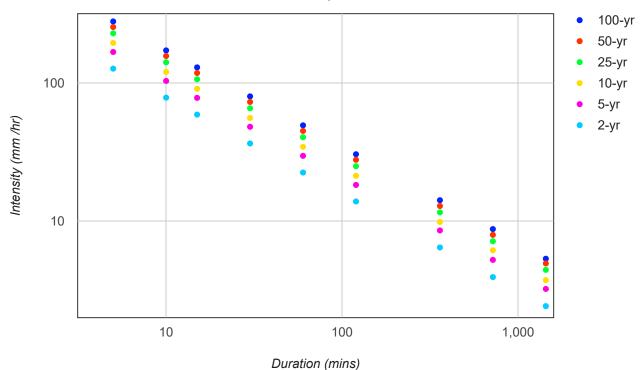
These are the locations in the selection.

**IDF Curve:** 44° 0' 45" N, 79° 14' 14" W (44.012500,-79.237500)

#### Results

An IDF curve was found.





### **Coefficient summary**

IDF Curve: 44° 0' 45" N, 79° 14' 14" W (44.012500,-79.237500)

Retrieved: Tue, 10 Dec 2019 13:10:12 GMT

Data year: 2010 IDF curve year: 2010

Return period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
Α	22.4	29.6	34.4	40.4	44.9	49.3	
В	-0.699	-0.699	-0.699	-0.699	-0.699	-0.699	

### **Statistics**

### Rainfall intensity (mm hr<sup>-1</sup>)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	127.2	78.4	59.0	36.4	22.4	13.8	6.4	3.9	2.4
5-yr	168.1	103.6	78.0	48.1	29.6	18.2	8.5	5.2	3.2
10-yr	195.4	120.4	90.7	55.8	34.4	21.2	9.8	6.1	3.7
25-yr	229.5	141.4	106.5	65.6	40.4	24.9	11.5	7.1	4.4
50-yr	255.0	157.1	118.3	72.9	44.9	27.7	12.8	7.9	4.9
100-yr	280.0	172.5	129.9	80.0	49.3	30.4	14.1	8.7	5.3

### Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	10.6	13.1	14.8	18.2	22.4	27.6	38.4	47.3	58.3
5-yr	14.0	17.3	19.5	24.0	29.6	36.5	50.8	62.5	77.0
10-yr	16.3	20.1	22.7	27.9	34.4	42.4	59.0	72.7	89.5
25-yr	19.1	23.6	26.6	32.8	40.4	49.8	69.3	85.4	105.2
50-yr	21.3	26.2	29.6	36.4	44.9	55.3	77.0	94.9	116.9
100-yr	23.3	28.7	32.5	40.0	49.3	60.7	84.5	104.2	128.3

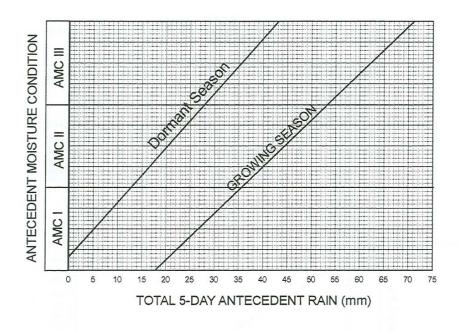
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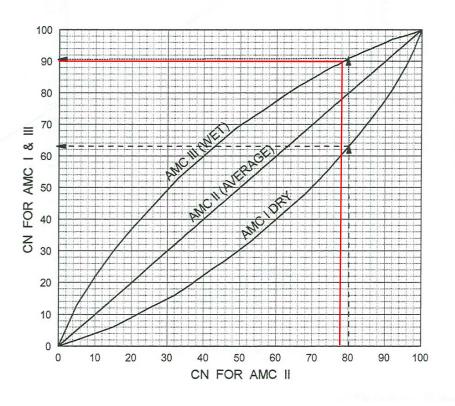
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Last Modified: September 2016

# **Design Chart 1.10: Antecedent Moisture Condition**





### **EXAMPLE**

AMC II CN = 80 AMC I CN = 63 AMC III CN = 91

### **APPENDIX D**

**HEC-HMS Modelling Outputs** 



Total Rainfall Dep	oth	47.3	62.5	72.7	85.4	94.9	104.2	Regional	Event
Hr	AES Distribution (%)	2 yr	5 yr	10 yr	25 yr	50 yr	100 yr	Hurricane Hazel Distribution (%)	Hurricane Hazel Depth (mm)
0	0	0.0	0.0	0.0	0.0	0.0	0.0	(75)	()
1	15	7.1	9.4	10.9	12.8	14.2	15.6	3	6
2	25	11.8	15.6	18.2	21.4	23.7	26.1	2	4
3	22	10.4	13.8	16.0	18.8	20.9	22.9	3	6
4	14	6.6	8.8	10.2	12.0	13.3	14.6	6	13
5	12	5.7	7.5	8.7	10.2	11.4	12.5	8	17
6	8	3.8	5.0	5.8	6.8	7.6	8.3	6	13
7	3	1.4	1.9	2.2	2.6	2.8	3.1	11	23
8	1	0.5	0.6	0.7	0.9	0.9	1.0	6	13
9	0	0.0	0.0	0.0	0.0	0.0	0.0	6	13
10	0	0.0	0.0	0.0	0.0	0.0	0.0	25	53
11	0	0.0	0.0	0.0	0.0	0.0	0.0	18	38
12	0	0.0	0.0	0.0	0.0	0.0	0.0	6	13
Total Depth		47.3	62.5	72.7	85.4	94.9	104.2	100	212

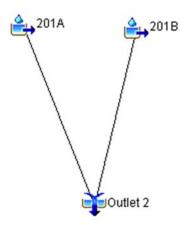
**Quality Event** 

Quality Event								
Time (hrs)	Intensity (mm/hr)	Depth (mm)						
0.00 0.08 0.17 0.25 0.33 0.42 0.50 0.58 0.67 0.75 0.83 0.92 1.00 1.08 1.17 1.25 1.33 1.42	0 1.73 1.83 1.94 2.07 2.23 2.41 2.64 2.92 3.28 3.74 4.41 5.41 7.1 10.69 23.51 68.86 29.9	0 0.14 0.15 0.16 0.17 0.19 0.20 0.22 0.24 0.27 0.31 0.37 0.45 0.59 0.89 1.96 5.74 2.49						
1.50	17.13	1.43						
1.58 1.67 1.75 1.83 1.92 2.00 2.08 2.17 2.25 2.33 2.42 2.50 2.58 2.67 2.75 2.83 2.92 3.00 3.08	12.05 9.35 7.68 6.55 5.73 5.1 4.61 4.21 3.88 3.61 3.38 3.18 3 2.84 2.7 2.58 2.47 2.37 2.28	1.00 0.78 0.64 0.55 0.48 0.43 0.38 0.35 0.32 0.30 0.28 0.27 0.25 0.24 0.23 0.22 0.21 0.20 0.19						
3.17 3.25 3.33 3.42 3.50 3.58 3.67 3.75 3.83 3.92 4.00	2.19 2.11 2.04 1.97 1.91 1.86 1.8 1.75 1.7 1.66 1.62	0.18 0.17 0.16 0.16 0.16 0.15 0.15 0.14 0.14 0.14						

## Water Balance

	Rainfall Depth	1.7	6.7	11.7	18.3	41.7
Hr	AES Distribution (%)	0-5	5-10	10-15	15-25	25-75
0	O O	0.0	0.0	0.0	0.0	0.0
1	15	0.3	1.0	1.8	2.7	6.3
2	25	0.4	1.7	2.9	4.6	10.4
3	22	0.4	1.5	2.6	4.0	9.2
4	14	0.2	0.9	1.6	2.6	5.8
5	12	0.2	0.8	1.4	2.2	5.0
6	8	0.1	0.5	0.9	1.5	3.3
7	3	0.1	0.2	0.4	0.5	1.3
8	1	0.0	0.1	0.1	0.2	0.4
9	0	0.0	0.0	0.0	0.0	0.0
10	0	0.0	0.0	0.0	0.0	0.0
11	0	0.0	0.0	0.0	0.0	0.0
12	0	0.0	0.0	0.0	0.0	0.0
Total Depth		1.7	6.7	11.7	18.3	41.7

# **Post Development Uncontrolled Model Schematic**





Project: Port Royal Mills Simulation Run: Post Unctrl 2yr 12hr AES CN

Start of Run: 01Jan2000, 00:00 Basin Model: Post Uncontrolled -End of Run: 01Jan2000, 14:00 Meteorologic Model: 2 yr 12 hr AES

Compute Time: 16Dec2019, 13:12:24 Control Specifications:Control 1

Hydrologic Element	Drainage Are (KM2)	æPeak Discha (M3/S)	r <b>ī</b> j <b>e</b> me of Peak	Volume (MM)
200A	0.0601	0.065	01Jan2000, 03:15	15.70
200B	0.0118	0.016	01Jan2000, 03:00	19.18
Outlet 1	0.0719	0.079	01Jan2000, 03:00	16.27
201B	0.2525	0.272	01Jan2000, 03:15	16.02
201A	0.0374	0.078	01Jan2000, 02:00	32.13
Outlet 2	0.2899	0.336	01Jan2000, 03:00	18.10

Project: Port Royal Mills Simulation Run: Post Uctl CN 5yr 12hr AES

Start of Run: 01Jan2000, 00:00 Basin Model: Post Uncontrolled -End of Run: 01Jan2000, 14:00 Meteorologic Model: 5 yr 12 hr AES

Compute Time: 16Dec2019, 13:12:16 Control Specifications:Control 1

Hydrologic Element	Drainage Are (KM2)	aPeak Discha (M3/S)	r <b>g</b> eme of Peak	Volume (MM)
200A	0.0601	0.107	01Jan2000, 03:15	25.67
200B	0.0118	0.025	01Jan2000, 03:00	29.73
Outlet 1	0.0719	0.131	01Jan2000, 03:00	26.34
201B	0.2525	0.448	01Jan2000, 03:15	26.04
201A	0.0374	0.110	01Jan2000, 02:00	44.87
Outlet 2	0.2899	0.541	01Jan2000, 03:00	28.47

Project: Port Royal Mills Simulation Run: Post Uctl CN 10yr 12hr AES

Start of Run: 01Jan2000, 00:00 Basin Model: Post Uncontrolled - End of Run: 01Jan2000, 14:00 Meteorologic Model: 10 yr 12 hr AES

Compute Time: 16Dec2019, 13:12:14 Control Specifications:Control 1

Hydrologic Element	Drainage Are (KM2)	aPeak Discha (M3/S)	r <b>g</b> eme of Peak	Volume (MM)
200A	0.0601	0.137	01Jan2000, 03:15	32.89
200B	0.0118	0.032	01Jan2000, 03:00	37.27
Outlet 1	0.0719	0.168	01Jan2000, 03:00	33.61
201B	0.2525	0.575	01Jan2000, 03:15	33.29
201A	0.0374	0.133	01Jan2000, 02:00	53.59
Outlet 2	0.2899	0.689	01Jan2000, 03:00	35.91

Project: Port Royal Mills Simulation Run: Post Uctrl CN 25yr 12hr AES

Start of Run: 01Jan2000, 00:00 Basin Model: Post Uncontrolled -End of Run: 01Jan2000, 14:00 Meteorologic Model: 25 yr 12 hr AES

Compute Time: 16Dec2019, 13:12:17 Control Specifications:Control 1

Hydrologic Element	Drainage Are (KM2)	æPeak Discha (M3/S)	r <b>ī</b> j <b>e</b> me of Peak	Volume (MM)
200A	0.0601	0.178	01Jan2000, 03:00	42.59
200B	0.0118	0.040	01Jan2000, 03:00	47.31
Outlet 1	0.0719	0.218	01Jan2000, 03:00	43.37
201B	0.2525	0.744	01Jan2000, 03:15	43.02
201A	0.0374	0.162	01Jan2000, 02:00	64.90
Outlet 2	0.2899	0.886	01Jan2000, 03:00	45.85

Project: Port Royal Mills Simulation Run: Post Uctrl CN 50yr 12hr AES

Start of Run: 01Jan2000, 00:00 Basin Model: Post Uncontrolled - End of Run: 01Jan2000, 14:00 Meteorologic Model: 50 yr 12 hr AES

Compute Time: 16Dec2019, 13:12:19 Control Specifications:Control 1

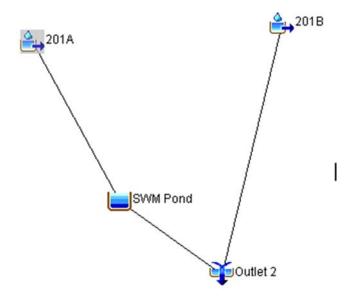
Hydrologic Element	Drainage Are (KM2)	aPeak Discha (M3/S)	r <b>g</b> eme of Peak	Volume (MM)
200A	0.0601	0.209	01Jan2000, 03:00	49.95
200B	0.0118	0.047	01Jan2000, 03:00	54.88
Outlet 1	0.0719	0.256	01Jan2000, 03:00	50.76
201B	0.2525	0.875	01Jan2000, 03:15	50.40
201A	0.0374	0.184	01Jan2000, 02:00	73.27
Outlet 2	0.2899	1.039	01Jan2000, 03:00	53.35

Project: Port Royal Mills Simulation Run: Post Unctl 100yr 12hr AES CN

Start of Run: 01Jan2000, 00:00 Basin Model: Post Uncontended of Run: 01Jan2000, 14:00 Meteorologic Model: 100 yr 12 hr Compute Time: DATA CHANGED, RECOMPUTE Control Specifications:Control 1

Hydrologic Element	Drainage Are (KM2)	aPeak Discha (M3/S)	r <b>ge</b> me of Peak	Volume (MM)
200A	0.0601	0.241	01Jan2000, 03:00	57.52
200B	0.0118	0.053	01Jan2000, 03:00	62.64
Outlet 1	0.0719	0.294	01Jan2000, 03:00	58.36
201B	0.2525	1.006	01Jan2000, 03:15	57.98
201A	0.0374	0.207	01Jan2000, 02:00	81.74
Outlet 2	0.2899	1.192	01Jan2000, 03:00	61.05

# **Post Development Controlled Model Schematic**





Project: Port Royal Mills Simulation Run: Post Ctrl CN 2yr 12hr AES

Reservoir: SWM Pond

Start of Run:01Jan2000, 00:00Basin Model:Post Ctrl - CNEnd of Run:01Jan2000, 14:00Meteorologic Model:2 yr 12 hr AESCompute Time:DATA CHANGED, RECOMPUTEControl Specifications:Control 1

Volume Units:MM

### Computed Results

Peak Inflow:0.078 (M3/S)Date/Time of Peak Inflow:01Jan2000, 01:45Peak Discharge:0.013 (M3/S)Date/Time of Peak Discharge01Jan2000, 06:30Inflow Volume:31.82 (MM)Peak Storage:0.939 (1000 M3)Discharge Volume14.70 (MM)Peak Elevation:317.851 (M)

Project: Port Royal Mills Simulation Run: Post Ctrl CN 5yr 12hr AES

Reservoir: SWM Pond

Start of Run:01Jan2000, 00:00Basin Model:Post Ctrl - CNEnd of Run:01Jan2000, 14:00Meteorologic Model:5 yr 12 hr AESCompute Time:DATA CHANGED, RECOMPUTEControl Specifications:Control 1

Volume Units:MM

### Computed Results

Peak Inflow:0.110 (M3/S)Date/Time of Peak Inflow:01Jan2000, 01:45Peak Discharge:0.019 (M3/S)Date/Time of Peak Discharge01Jan2000, 06:30Inflow Volume:44.47 (MM)Peak Storage:1.344 (1000 M3)Discharge Volume18.63 (MM)Peak Elevation:317.979 (M)

Project: Port Royal Mills Simulation Run: Post Ctrl CN 10yr 12hr AES

Reservoir: SWM Pond

Start of Run: 01Jan2000, 00:00 Basin Model: Post Ctrl - CN End of Run: 01Jan2000, 14:00 Meteorologic Model: 10 yr 12 hr AES

Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 1

### Volume Units:MM

### Computed Results

Peak Inflow: 0.133 (M3/S) Date/Time of Peak Inflow: 01Jan2000, 01:45
Peak Discharge: 0.029 (M3/S) Date/Time of Peak Discharge 01Jan2000, 06:15
Inflow Volume: 53.12 (MM) Peak Storage: 1.583 (1000 M3)
Discharge Volume 23.74 (MM) Peak Elevation: 318.051 (M)

Project: Port Royal Mills Simulation Run: Post Ctrl CN 25yr 12hr AES

Reservoir: SWM Pond

Start of Run: 01Jan2000, 00:00 Basin Model: Post Ctrl - CN End of Run: 01Jan2000, 14:00 Meteorologic Model: 25 yr 12 hr AES

Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 1

### Volume Units:MM

## Computed Results

Peak Inflow:0.162 (M3/S)Date/Time of Peak Inflow:01Jan2000, 01:45Peak Discharge:0.041 (M3/S)Date/Time of Peak Discharge01Jan2000, 06:15Inflow Volume:64.35 (MM)Peak Storage:1.852 (1000 M3)Discharge Volume32.12 (MM)Peak Elevation:318.130 (M)

Project: Port Royal Mills Simulation Run: Post Ctrl CN 50yr 12hr AES

Reservoir: SWM Pond

Start of Run: 01Jan2000, 00:00 Basin Model: Post Ctrl - CN End of Run: 01Jan2000, 14:00 Meteorologic Model: 50 yr 12 hr AES

Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 1

### Volume Units:MM

## Computed Results

Peak Inflow:0.184 (M3/S)Date/Time of Peak Inflow:01Jan2000, 01:45Peak Discharge:0.048 (M3/S)Date/Time of Peak Discharge 01Jan2000, 06:15Inflow Volume:72.65 (MM)Peak Storage:2.063 (1000 M3)Discharge Volume38.40 (MM)Peak Elevation:318.190 (M)

Project: Port Royal Mills Simulation Run: Post Ctrl CN 100yr 12hr AES

Reservoir: SWM Pond

Start of Run: 01Jan2000, 00:00 Basin Model: Post Ctrl - CN
End of Run: 01Jan2000, 14:00 Meteorologic Model: 100 yr 12 hr AES

Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 1

### Volume Units:MM

## Computed Results

Peak Inflow:0.207 (M3/S)Date/Time of Peak Inflow:01Jan2000, 01:45Peak Discharge:0.053 (M3/S)Date/Time of Peak Discharge01Jan2000, 06:15Inflow Volume:81.06 (MM)Peak Storage:2.278 (1000 M3)Discharge Volume:44.74 (MM)Peak Elevation:318.250 (M)

Project: Port Royal Mills Simulation Run: Swales - 100yr

Start of Run: 01Jan2000, 00:00 Basin Model: Swale Sizing End of Run: 01Jan2000, 14:00 Meteorologic Model: 100 yr 12 hr Compute Time: DATA CHANGED, RECOMPUTE Control Specifications:Control 1

Hydrologic Element	Drainage Are	æPeak Discha (M3/S)	r <b>g</b> ėme of Peak	Volume (MM)
Swale A	0.01500	0.083	01Jan2000, 02:00	81.74
Swale B	0.02250	0.124	01Jan2000, 02:00	81.74
Swale C	0.07575	0.320	01Jan2000, 03:00	57.98

Project: Port Royal Mills Simulation Run: Swales - Hazel

Start of Run: 01Jan2000, 00:00 Basin Model: Swale Sizing End of Run: 01Jan2000, 14:00 Meteorologic Model: Hurricane H Compute Time: DATA CHANGED, RECOMPUTE Control Specifications:Control 1

Hydrologic Element	Drainage Are (KM2)	₽eak Discha (M3/S)	r <b>g</b> ėme of Peak	Volume (MM)
Swale A	0.01500	0.217	01Jan2000, 10:00	197.68
Swale B	0.02250	0.326	01Jan2000, 10:00	197.68
Swale C	0.07575	1.064	01Jan2000, 10:00	182.46

Project: Port Royal Mills Simulation Run: Hurricane Hazel - Post Contr

Reservoir: SWM Pond

Start of Run: 01Jan2000, 00:00 Basin Model: Post Ctrl - Hazel End of Run: 01Jan2000, 14:00 Meteorologic Model: Hurricane Hazel

Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 1

### Volume Units:MM

### Computed Results

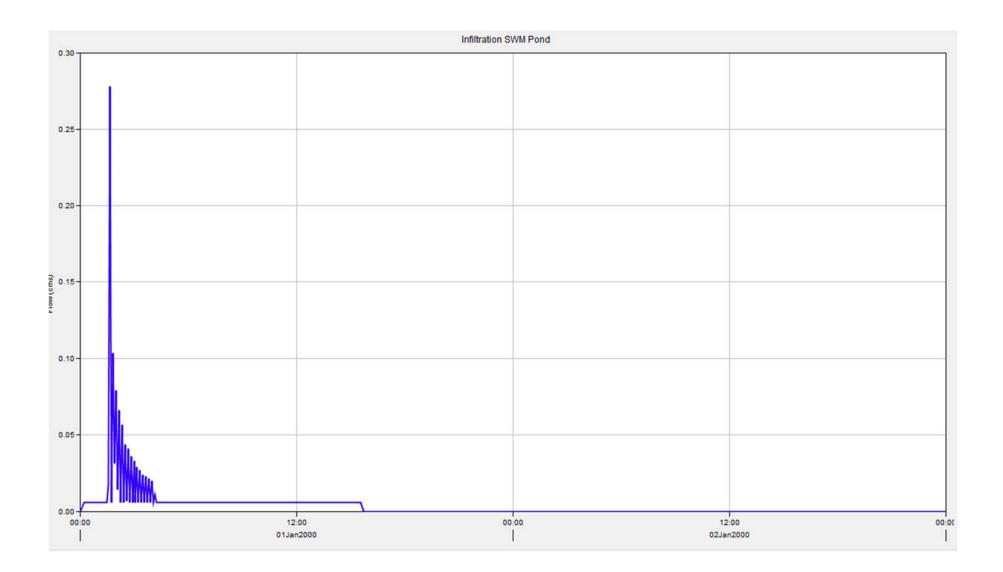
Peak Inflow:0.542 (M3/S)Date/Time of Peak Inflow:01Jan2000, 09:45Peak Discharge:0.459 (M3/S)Date/Time of Peak Discharge01Jan2000, 10:15Inflow Volume:197.42 (MM)Peak Storage:3.359 (1000 M3)Discharge Volume135.81 (MM)Peak Elevation:318.536 (M)

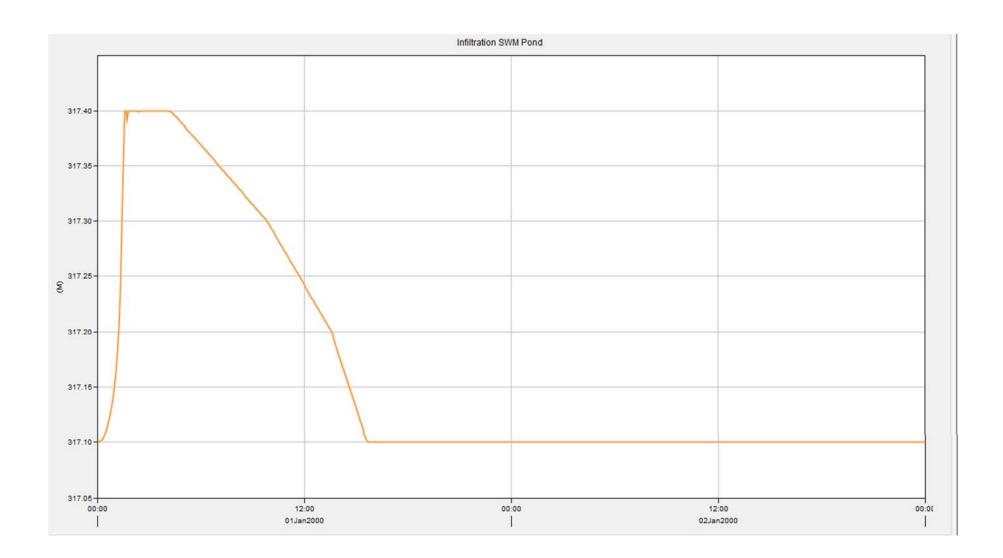
Project: Port Royal Mills Simulation Run: Swales - Quality

Start of Run: 01Jan2000, 00:00 Basin Model: Swale Sizing

End of Run: 03Jan2000, 00:00 Meteorologic Model: Quality Event 4hr 2! Compute Time: 17Dec2019, 13:08:58 Control Specifications:Control 2 - Quality

Hydrologic Element	Drainage Are (KM2)	æPeak Discha (M3/S)	r <b>g</b> ėme of Peak	Volume (MM)
Swale A	0.01500	0.086	01Jan2000, 01:30	15.11
Swale B	0.02250	0.129	01Jan2000, 01:30	15.11
Swale C	0.07575	0.084	01Jan2000, 01:40	4.58





Project: Port Royal Mills Simulation Run: Water balance 0-5 Pond Infl

Reservoir: Infiltration SWM Pond

Start of Run: 01Jan2000, 00:00 Basin Model: Post Ctrl w Infil in Pond End of Run: 03Jan2000, 00:00 Meteorologic Model: Water balance 0-5 Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 2 - Quality

Volume Units:MM

### Computed Results

Peak Inflow: 0.002 (M3/S) Date/Time of Peak Inflow: 01Jan2000, 01:50
Peak Discharge: 0.002 (M3/S) Date/Time of Peak Discharge01Jan2000, 02:00
Inflow Volume: 0.88 (MM) Peak Storage: 0.000 (1000 M3)
Discharge Volume0.88 (MM) Peak Elevation: 317.100 (M)

Project: Port Royal Mills Simulation Run: Water Balance 5-10 Infil Pon

Reservoir: Infiltration SWM Pond

Start of Run: 01Jan2000, 00:00 Basin Model: Post Ctrl w Infil in Pond End of Run: 03Jan2000, 00:00 Meteorologic Model: Water Balance 5-10 Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 2 - Quality

Volume Units:MM

### Computed Results

Peak Inflow:0.009 (M3/S)Date/Time of Peak Inflow:01Jan2000, 01:50Peak Discharge:0.006 (M3/S)Date/Time of Peak Discharge01Jan2000, 03:15Inflow Volume:3.50 (MM)Peak Storage:0.022 (1000 M3)Discharge Volume3.50 (MM)Peak Elevation:317.153 (M)

Project: Port Royal Mills Simulation Run: Water Balance 10-15 Pond Inf

Reservoir: Infiltration SWM Pond

Start of Run: 01Jan2000, 00:00 Basin Model: Post Ctrl w Infil in Pond End of Run: 03Jan2000, 00:00 Meteorologic Model: Water Balance 10-15 Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 2 - Quality

Volume Units:MM

### Computed Results

Peak Inflow:0.016 (M3/S)Date/Time of Peak Inflow:01Jan2000, 01:50Peak Discharge:0.006 (M3/S)Date/Time of Peak Discharge01Jan2000, 05:30Inflow Volume:6.35 (MM)Peak Storage:0.105 (1000 M3)Discharge Volume6.37 (MM)Peak Elevation:317.285 (M)

Project: Port Royal Mills Simulation Run: Water balance 15-25 Pond Inf

Reservoir: Infiltration SWM Pond

Start of Run: 01Jan2000, 00:00 Basin Model: Post Ctrl w Infil in Pond End of Run: 03Jan2000, 00:00 Meteorologic Model: Water balance 15-25 Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 2 - Quality

Volume Units:MM

### Computed Results

Peak Inflow:0.026 (M3/S)Date/Time of Peak Inflow:01Jan2000, 01:55Peak Discharge:0.022 (M3/S)Date/Time of Peak Discharge01Jan2000, 05:00Inflow Volume:10.51 (MM)Peak Storage:0.228 (1000 M3)Discharge Volume10.52 (MM)Peak Elevation:317.400 (M)

Project: Port Royal Mills Simulation Run: Water balance 25-75 Pond Inf

Reservoir: Infiltration SWM Pond

Start of Run: 01Jan2000, 00:00 Basin Model: Post Ctrl w Infil in Pond End of Run: 03Jan2000, 00:00 Meteorologic Model: Water balance 25-75 Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 2 - Quality

Volume Units:MM

## Computed Results

Peak Inflow:0.068 (M3/S)Date/Time of Peak Inflow:01Jan2000, 01:55Peak Discharge:0.126 (M3/S)Date/Time of Peak Discharge01Jan2000, 02:05Inflow Volume:27.64 (MM)Peak Storage:0.229 (1000 M3)Discharge Volume27.66 (MM)Peak Elevation:317.400 (M)

#### **APPENDIX E**

Geotechnical Investigation Report

GHD, October 2019





**Geotechnical Investigation Report** 

Proposed Agricultural Grain Milling Facility 3469 Concession Road 1 Uxbridge, Ontario

Report for Grainboys Holdings Inc.





# **Executive Summary**

This report presents the results of a geotechnical investigation that was conducted in support of the a proposed Agricultural Grain Milling Facility being considered for a site situated along the east side of Concession Road 1 (also known as York-Durham Line), south of Highway No. 47 near the urban area of Lincolnville, Ontario. The property encompasses and area of approximately 36.3 ha (89.7 acres). The planned development will consist of a main building, numerous storage bins, concrete loading apron, paved access driveway and parking areas. The building will be a two-storey structure without basement, i.e. slab-on-grade foundation. Municipal Servicing is not available to the Site, as such, the development will be privately serviced with a new drilled water well and septic system. GHD Limited (GHD) was retained by Grainboys Holdings Inc. (the Client) to complete this geotechnical investigation which includes a hydrogeologic component. The study has included a site inspection, advancement of boreholes, soil sampling, water level monitoring, a well survey to compliment a review of available Ministry of the Environment, Conservation and Parks (MECP) well records, hydraulic conductivity testing and a water balance evaluation based upon design information.

In summary, the proposed development area is generally comprised of a surficial layer of topsoil underlain by silty sand/sandy silt or clayey silt glacial till. Occasionally, a layer of silty sand was observed between the surficial topsoil layer and the glacial till. A permanent shallow groundwater table was not observed. It is our professional opinion that there will not be significant constraints for the proposed development area from the seasonal variations of groundwater as the water can be handled with appropriate engineering techniques. It is expected that groundwater will generally be below the depth of the future development, although seepage may be encountered in deeper excavations for foundations or services. Seepage is expected to be seasonal in nature. If short-term pumping of groundwater at volumes greater than 50,000 L/day and less than 400,000L/day is required during the construction stage, the EASR must be completed. In summary, the proposed Agricultural Grain Milling Facility is suitable from both a hydrogeologic and geotechnical perspective.

There are minor impacts expected to groundwater and surface water as a result of the future development provided that appropriate planning (i.e. incorporation of LIDs as supported by the water balance calculations), mitigation measures and proper construction techniques are considered. From a geotechnical perspective, the Site is suitable for construction of the proposed development including one to two-storey commercial building, associated servicing and paved access and parking areas.



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Appendix E Water Balance Calculations



## 1. Introduction

This report presents the results of a geotechnical investigation that was conducted in support of the a proposed Agricultural Grain Milling Facility being considered for a site situated along the east side of Concession Road 1 (also known as York-Durham Line), south of Highway No. 47 near the urban area of Lincolnville, Ontario. The property encompasses and area of approximately 36.3 ha (89.7 acres). The planned development will consist of a main building, numerous storage bins, concrete loading apron, paved access driveway and parking areas. The building will be a two-storey structure without a basement, i.e. stab-on-grade foundation. Municipal Servicing is not available to the Site, as such the development will be privately serviced with a new drilled water well and septic system. GHD Limited (GHD) was retained by Grainboys Holdings Inc. (the Client) to complete this geotechnical investigation which includes a hydrogeologic component.

The general location of the Site is illustrated on the Vicinity Plan, Figure 1. The location with respect to surrounding roads and land use is depicted on the Property Plan, Figure 2. Specific details of the Site and surrounding properties based on recent aerial photography is presented on the Plot Plan, Figure 3. A preliminary site plan (by Lassing Dibben Consulting Engineers Ltd. (Lassing Dibben)) depicting the proposed development is provided on the Concept Plan, Figure 4. The borehole locations are illustrated on the Test Hole Location Plans, Figures 5A and 5B. These plans and other figures can be reviewed in the Enclosures section.

# 2. Scope of Investigation

The purpose of the investigation was to define the prevailing hydrogeologic and geotechnical conditions at the Site. The hydrogeologic aspects of the study were completed to investigate the subsurface soil stratigraphy, groundwater movement, to assess groundwater supplies and evaluate potential impacts from the proposed development and related construction. The geotechnical investigation was conducted to provide recommendations relevant to earthwork construction, dewatering, foundation and slab on grade design, buried service installation and pavement structure. The following scope of work was performed to accomplish the foregoing purposes.

- 1. Reviewed available background information relevant to the Site such as geologic, physiographic and water resources reports and maps.
- Carried out an inventory of available well record data on file with the Ministry of the
  Environment, Conservation and Parks (MECP) for the immediate area to evaluate the
  physical characteristics of the aquifer complexes that underlie the region. A field survey of the
  general area was carried out to supplement the MECP data.
- 3. A walkover inspection was conducted to review surficial ground characteristics.



- 4. The subsurface conditions were explored by advancing, sampling and logging a total of fourteen (14) boreholes (six (6) of which were previously drilled as part of another investigation). The subsurface conditions were recorded and are summarized in detail in Appendix A. The boreholes were advanced to depths ranging from 3.5 to 6.6m. A monitoring well was installed in five (5) of the boreholes to facilitate water level measurements and further testing.
- 5. Falling and/or rising head (slug) tests were completed at two (2) monitoring well locations to evaluate hydraulic conductivity of the subsoils. The infiltration rate of the upper vadose zone was evaluated based on the soil type observed and in-situ testing.
- 6. Carried out laboratory analyses of materials encountered including grain size testing and moisture content determinations of representative soil samples.
- 7. Obtained a representative groundwater sample from two (2) of the monitoring wells that was submitted for chemical testing to determine background chemistry.
- 8. Completed a water balance that considers pre- and post-development conditions and evaluates groundwater baseflow conditions based on the current design.
- 9. Prepared a detailed report using engineering analyses of the acquired data outlining our conclusions and recommendations presented herein.

The boreholes were advanced using a track mounted drill rig equipped with continuous flight, solid stem power augers. Representative, disturbed samples of the strata penetrated were obtained using a split-barrel, 50mm outer-diameter (OD) sampler advanced by a 63.5 kg hammer dropping approximately 760 mm. The results of these standard penetration tests (SPT's) are reported as "N" values on the borehole logs at the corresponding depths. Samples were also obtained directly form augers cuttings.

Soil samples obtained from the test holes were inspected in the field immediately upon retrieval for type, texture, and colour. All test holes were backfilled following completion of the fieldwork. All samples were sealed in clean plastic containers and transported to the GHD laboratory for further visual-tactile examination, and to select appropriate samples for laboratory analysis.

## 3. Project Details

The preliminary conceptual plan is provided as Figure 4 (based on the Preliminary Site Layout provided by Lassing Dibben with electronic title "19-066 Site wContours.dwg"). Site statistics (also provided by Lassing Dibben) indicate that the overall area of the Site is 36.3 ha (89.7 acres). It is GHD's understanding that the proposed development will consist of a main building, numerous storage bins, concrete loading apron, paved access driveway and parking areas. The building will be a two-storey structure without basement, i.e. stab-on-grade foundation. Municipal Servicing is not available to the Site. As such, the development will be privately serviced with a new drilled water well and septic system. The target area of the tile bed for the septic system is illustrated on Figure 4.



## 4. Site Conditions

#### 4.1 General

The field program consisted of a site inspection, soils investigation, hydraulic testing, and measurement of water levels in the monitoring wells. The boreholes were drilled on June 26 and August 26, 2019. Borehole records and physical test results of representative soil samples are presented in Appendix A. A site reconnaissance was conducted by GHD prior to the subsurface investigation to observe the general surficial characteristics of the Site. The ground surface across the Site is rolling and generally sloping towards the south/southeast. Local relief across the Site is on the order of 25 to 26m.

#### 4.2 Subsurface

#### 4.2.1 Regional Physiography and Geology

The Property is situated in the physiographic region known as the Oak Ridges Moraine (Chapman and Putnam, 1984). The Oak Ridges Moraine is generally hilly, with a knob-and-basin relief typical of an end moraine. Overburden consists of a calcareous sandy till, with some deposits of gravel. As illustrated on the Figure 7, the Site exists within a kame moraine with drumlinized till plains approximately 0.8km further to the south. The surficial geology (Figure 8) can be described as glaciolacustrine-derived silty to clayey till within the Site. Small areas of organics/foreshore—basinal deposits encroach isolated areas near the east end and south-central perimeters of the Site. The Ontario Geological Survey information (Figure 9) indicates that the Quaternary geology for the area is the Halton till which is described as predominantly silt to silty clay matrix, high in matrix carbonate content.

A review of available MECP well records identified six (6) well records on the Site (including two (2) records for observation wells and test holes) and an additional forty-five (45) well records within 500m (including five (5) abandonment records and three (3) records for monitoring wells and test holes). The well records indicate the presence of sand and clay with stones which is interpreted to be glacial till with occasional gravel and/or sand layers. The well records considered are provided and shown in Appendix B. Physical and hydraulic data are presented on some of the MECP well records. The water well information is discussed in Section 5.1. GHD confirms that none of the wells (as published by the MECP website) actually occur within the Site.

#### 4.2.2 Local Geology

The subsurface stratigraphy was investigated by drilling fourteen (14) boreholes on June 26 and August 26, 2019. Monitoring wells were installed in five (5) of these boreholes to facilitate water level measurements and testing. The locations of the boreholes are illustrated on the Test Hole Location Plans, Figures 5A and 5B. Details of the subsurface conditions encountered are graphically presented in Appendix A. It should be noted that the boundaries between the strata have been inferred from the test hole observations and non-continuous samples. They generally represent a transition from one soil type to another, and should not be inferred to represent an exact plane of geological change. Further, conditions may vary between and beyond the test holes.



The soils encountered generally consisted of a surficial layer of topsoil underlain by silty sand/sandy silt till which graded into a clayey silt till at depth. Occasionally, a layer of silty sand/sandy silt was observed between the surficial topsoil layer and the glacial till. Isolated sand seams were encountered within the glacial till sporadically throughout the Site. A surficial layer of fill was encountered in boreholes BH-4 and BH-5. A surficial layer of topsoil was encountered in all boreholes with the exception of boreholes BH-4 and BH-5. Where encountered, the topsoil was observed to range from 200mm to 800mm in thickness. This soil was observed to be in a damp, loose state, with a silty, highly organic content. As such, it is expected to be devoid of any structural engineering properties.

A surficial layer of granular fill was observed in borehole BH-4 extending to 0.3m and was observed to be in a moist and compact in-situ state. An earth fill layer was observed at the surface in in borehole BH-5 and extended to approximately 2.3m. The earth fill generally consisted of silty sand, with gravel. The fill was observed to exist in a moist state with in-situ moisture contents that ranged from 11 to 17% by weight. SPT N values obtained from within the earth fill layers varied from 5 to 12 blows/300mm indicating a loose to compact in-situ state of relative density.

A layer of silty sand/sandy silt was observed below the topsoil in boreholes BH-105 and BH-106. Where penetrated, the silty sand was found to extend to about 1.5m. Moisture content tests conducted on samples of the silty sand yielded values ranging from approximately 4 to 12% moisture by weight indicating that it exists in a moist to wet state. SPT N values obtained from within the silty sand/sandy silt layer varied from 18 to 20 blows/300mm, indicating a compact in-situ state of relative density. A grain size distribution analyses conducted on a representative sample of the silty sand/sandy silt suggests the following composition: 2% gravel, 34% sand, and 64% silt and clay-sized particles (Unified Soil Classification System (USCS)).

Glacial till was encountered in all fourteen (14) boreholes. The till was brown to grey in color and generally consisted of sandy silt or clayey silt containing varying amounts gravel. Occasional cobbles were encountered in the till at some borehole locations. The till exists in a generally moist condition with moisture contents ranging from 4 to 25% moisture by weight. The consistency or density of the till is generally described as stiff to hard or loose to very dense based on SPT N values that ranged from 5 blows/300mm to over 100 blows/300mm. GHD notes that zones of loose till was observed in borehole BH-103 only (within the proposed new development) and it extended to approximately 4.6m depth at this location. Grain size distribution analyses conducted on five (5) representative samples of the till suggests the following compositional ranges: 0 to 8% gravel, 16 to 40% sand, and 53 to 84% silt and clay-sized particles (USCS). Hydrometer analyses conducted on three (3) of these samples suggest that the till contains 41 to 67% particles between 5 and 75  $\mu$ m in size.

A layer of sand was encountered at depths of 5.0 and 4.0 in boreholes BH-102 and BH-3, respectively. The sand layer extended to the full depth of the investigation in both of these boreholes. The sand layer was observed to be brown to grey in colour and existed in a generally wet condition with moisture contents ranging from 18 to 19% moisture by weight. SPT N values obtained from within the sand layer varied from 11 to 31 blows/300mm, indicating a compact to dense in-situ state of relative density.

A summary of the grain size data obtained from the various strata is presented in Table 4.1.



**Table 4.1 Grain Size Distribution Summary** 

			Grain Size I			
Location	Depth (m)	% Crovel	%Sand	%Fines		Observed Soil Unit
		%Gravel	%Sand	%Silt	%Clay	
BH-103, SS-6	3.8 - 4.3	6	38	41	15	Sandy Silt Till
BH-104, SS-2	0.8 - 1.4	0	31	53	16	Sandy Silt Till
BH-105, SS-2	0.8 - 1.4	2	34	6	4	Silty Sand/Sandy Silt
BH-107, SS3	1.5 - 2.0	0	16	67	17	Sandy Silt Till
BH-5, SS-3	1.5 - 2.0	3	40	57		Sandy Silt Fill
BH-6, SS-3	1.5 - 2.0	8	26	66		Sandy Silt Till

Notes: %Fines indicates silt and clay particles; grain size distribution based on Unified Soil Classification System.

#### 4.2.3 Groundwater

Groundwater seepage and/or accumulation was observed in nine (9) of the boreholes at depths ranging from 1.7 to 5.3m during the drilling operations. Monitoring wells were installed in five (5) boreholes (BH-103, BH-107, BH-1, BH-3, and BH-4) in order to facilitate monitoring of groundwater levels. A summary of the monitoring well details is provided in Table 4.2.

**Table 4.2 Summary of Monitoring Well Information** 

Location	Depth of Well (m)	Pipe Stick-Up (m)	Effective Well Screen Interval (m)	Water Seepage Depth (m)
BH-103	5.2	0.84	2.4 – 5.2	3.2
BH-107	6.1	0.93	2.4 - 6.1	
BH-1	4.6	0.90	3.0 - 4.6	
BH-3	4.6	1.00	3.0 - 4.6	4.0
BH-4	4.6	0.90	3.0 - 4.6	3.8

Groundwater potentiometric levels were measured on October 11, 2019 in the installed monitoring wells. The data has been plotted on Figure 6 and summarized in Table 4.3.

**Table 4.3 Potentiometric Water Level Summary** 

Location	Ground Elevation (m)*	Water Level (m) October 11, 2019	GW Elevation (m) October 11, 2019
BH-103	320.0	1.7	318.3
BH-107	322.5	5.3	317.2
BH-1	329	Dry	Dry
BH-3	316	0.2	315.8
BH-4	321	2.1	318.9

Notes: m = metres; GW = groundwater; (\*) Elevations interpreted from contours on Preliminary Site Layout provided by Lassing Dibben Consulting Engineers Ltd. entitled "19-066 Site wContours.dwg" where available or Google Earth. The elevations provided are for the purposes of evaluating groundwater elevation and flow direction and should not be relied upon as a legal survey or topographic elevation survey.



The potentiometric elevations range from 315.8 to 318.9m indicating a moderate horizontal gradient. Based on the water level data collected and the surrounding topography, the overall shallow groundwater flow direction is to the south. The direction of shallow groundwater movement is illustrated on the Groundwater Elevation plan, Figure 6. It is expected that groundwater seepage will be encountered intermittently at depths ranging from 2.3 to 5.2m (similar to what encountered during the subsurface explorations). It should be noted that groundwater levels are transient and tend to fluctuate with the seasons, periods of precipitation and temperature.

#### 4.2.4 Water Quality

A groundwater sample was collected from the monitoring well installed in BH-103 and BH-107 for the purpose of determining background water quality. The certificate of chemical analysis is presented in Appendix D. The water quality data are summarized and compared with the Ontario Drinking Water Standards (ODWS) in Table 4.4.

**Table 4.4 Water Quality Summary** 

	Monitor	ing Well	ODWS			
PARAMETER	BH-103	BH-107	MAC	IMAC	AO/OG	
Alkalinity (as CaCO <sub>3</sub> )	239	244			30 to 500	
Ammonia - Total	0.19	0.02				
Calcium	95.2	102				
Chloride	15.9	17.6			250	
Colour (T.C.U.)	< 2	< 2			5	
Conductivity (mS/cm)	542	607			-	
Copper	< 0.002	< 0.002			1.0	
Fluoride	< 0.1	< 0.1	1.5			
Hardness (as CaCO <sub>3</sub> )	315	349			80 to 100	
Iron	< 0.005	0.047			0.3	
Magnesium	18.8	22.9				
Manganese	0.076	0.125			0.05	
Nitrite (N)	< 0.1	< 0.1	1.0			
Nitrate (N)	< 0.1	3.9	10			
pH (units)	8.07	8.06			6.5 to 8.5	
Potassium	2.2	2.8		-		
Sodium	7.8	5.8		-	200	
Sulphate	42	66			500	
Turbidity (N.T.U.)	45.2	8.9	1		5	
Zinc	0.011	< 0.005		-	5.0	

Notes: All units in mg/L (i.e. parts per million) unless otherwise noted. MAC = maximum acceptable concentration (health related); IMAC = Interim MAC (insufficient data to establish MAC or not feasible to establish MAC to desired level); AO/OG = aesthetic objective or operational guideline (not health related). **Bolded value** exceeds ODWS.

The groundwater beneath the Site is relatively hard which is common in Southern Ontario due to overburden materials containing calcium. Manganese will sorb to soil particles and filtering can lower this parameter (if required). In general, the water quality is relatively good with no indication of organic pollution as evidenced by the lack of nitrite and low concentration of nitrate.



#### 4.2.5 Hydraulic Conductivity

Hydraulic conductivity (K) testing was completed at monitoring wells installed in boreholes BH-103 and BH-107 on September 11, 2019. The testing consisted of falling and/or rising head testing and was completed by introducing a one-metre long slug or adding potable water within the well, and then measuring the water levels using a data logger programmed to record readings at three (3) second intervals. The data was analyzed using AQTESOLV and the Bouwer-Rice solution for each test (see Appendix C for solution data).

The K values for the hydraulic conductivity testing range from on the order of 10<sup>-5</sup> to 10<sup>-6</sup> cm/sec. The K values from the test data indicate that the monitoring wells were screened within low hydraulic conductivity units. The hydraulic conductivity testing suggests that excavations within these soils are expected to yield low to little water. However, increased amounts of water may be expected when pockets or layers of sand and/or gravel are intersected.

#### 4.2.6 Infiltration Testing

For purposes of Low Impact Development strategies, infiltration data of the shallow site soils is presented in this section. In-situ constant head permeameter tests were conducted at a nominal depth of 0.6m at three (3) locations near boreholes BH-103, BH-105 and BH-107. The importance of infiltration is for the implementation of low impact development strategies (LIDs) to recharge precipitation into the ground at pre-development or near pre-development values. Infiltration testing was completed using an ETC Pask (constant head well) permeameter.

Based upon the infiltration testing conducted, the upper vadose zone has a field saturated hydraulic conductivity of 10<sup>-4</sup> cm/sec (Appendix C). The infiltration test results provide preliminary infiltration values for the Site and are indicative of silty sand/sandy silt material. Although LIDs can be applied to any soil type, additional testing should be considered at the detailed design stage when infiltration areas are known.

Based on the Supplementary Guidelines to the Ontario Building Code 2012, this correlates to an infiltration rate in the order of 50 mm/hr. It is noted, however, that slight variations in the soil stratigraphy may cause variations in the permeability of the soil in both vertical and horizontal orientations.

Based on the Low Impact Development Stormwater Management Planning and Design Guide, the infiltration rate used to design the infiltration facility must incorporate a safety correction factor that compensates for potential reductions in soil permeability due to compaction or smearing during construction, gradual accumulation of fine sediments over the lifespan of the infiltration facility and uncertainty in measured values when less permeable horizons exist within 1.5 m below the bottom of the infiltration facility.



# 5. Hydrogeology

The hydrogeology of the area is characterized by rolling to hilly topography of upper soils that generally consists of silty sand/sandy silt till with occasional layers/seams of sand. Seasonal water is expected to flow within the sandy layers. Limited vertical migration is expected within the till. Only a minor portion of the existing infiltration is expected to recharge the deeper aquifers that are confined below the till. Information regarding groundwater characteristics of the immediate area was obtained from an inventory of well records. A total of forty-five (45) well records were found to be available within 500m of the Site. The well records indicate the presence of sand and clay with stones which is interpreted to be glacial till with occasional gravel and/or sand layers. The well records considered are provided and shown in Appendix B.

## 5.1 Existing Local Water Supplies

Nearby surrounding lands are generally residential, agricultural (cash crops), agricultural grain processing facility, and undeveloped/treed areas. The compiled MECP information included six (6) abandonment records and three (3) records for monitoring wells/test holes. The well records considered are provided and shown in Appendix B. Physical and hydraulic data are presented on some of the MECP well records.

The well records indicate the presence of sand and clay with stones which is interpreted to be glacial till with occasional gravel and/or sand layers. The information indicates the presence of two (2) principal aquifer systems:

- 1. An unconfined/partially confined shallow water table system within the shallow sand/till tapped by shallow bored/dug wells in addition to the monitoring wells; and
- 2. Deeper overburden layers of sand and gravel within the till tapped by numerous drilled wells.

The groundwater was generally described as "fresh" in the well records reviewed (when indicated). The drilled overburden well records indicates that the wells extended to depths ranging from 42.0 to 93.0m and groundwater was encountered at depths ranging from 4.6 to 63.7m. The drilled overburden wells reportedly produce test yields 3.0 to 722.0 L/min. The MECP well data has been summarized in Table 5.1.



**Table 5.1 Summary of MECP Water Well Data** 

Total Number of Wells Inventoried: 45

Dug/Bored Wells: 2 (4%)

Drilled Wells (Overburden): 34 (76%)

Drilled Wells (Bedrock): 0 (0%)

Abandoned or other: 9 (20%)

Damamatana	Statistical Summary								
Parameters	Dug / Bo	red Wells	Drilled – C	Overburden	Drilled – Bedrock				
WELL YIELDS Range Average	7.6 – 37.9 L/min 22.7 L/min	2.0 – 10 lgpm 6.0 lgpm	11.4 – 2732.8 L/min 330.3 L/min	3 - 722 lgpm 87.3 lgpm	N/A N/A	N/A N/A			
REPORTED YIELDS	Frequency			uency	Frequency				
Not Reported Dry 0 to 1 Igpm 2 to 4 Igpm 5 to 9 Igpm ≥10 Igpm	0 0 1 0 0	0% 0% 50% 0% 0% 50%	5 0 0 1 6 23	14% 0% 0% 3% 17% 66%	0 0 0 0 0	0% 0% 0% 0% 0% 0%			
STATIC WATER  LEVELS  Range  Average	0.6 – 4.6 m 2.6 m	2.0 – 15.0 ft 8.5 ft	0.6 – 24.4 m 13.8 m m	2.0 – 80.0 ft 45.2 ft	N/A N/A	N/A N/A			
WATER ENCOUNTERED Range Average	7.6 – 8.2 m 7.9 m	25.0 – 27.0 ft 26.0 ft	4.6 – 63.7 m 32.9 m	15.0 – 209 ft 108.3 ft	N/A N/A	N/A N/A			
WELL DEPTH Range Average	8.8 – 9.1 m 9.0 m	29.0 – 30.0 ft 29.5 ft	12.8 - 93 m 38.8 m	42 - 305 ft 127.3 ft	N/A N/A	N/A N/A			

Notes: Data based on MECP well record information (see Appendix B). L/m represents litres per minute, Igpm indicates Imperial gallons per minute and m is metres.

The well records indicate that the overburden soils are generally comprised of till with varying amounts of clay, sand, gravel. To supplement the MECP well records reviewed, GHD staff conducted a well survey of the area to investigate where private wells may still be in use (Appendix B). Eleven (11) locations were surveyed as outlined in Appendix B.2.1. There were no drinking water wells identified in the survey of the area.

Information was collected during the survey from a total of eleven (1) homes close to the Site including the identification of five (5) dug/bored wells and three (3) drilled wells. At four (4) homes, no information was gathered. Homeowner interviewed during the well survey reported no water quality or quantity issues. One (1) homeowner reported a former domestic well that was removed in the 1990's.



#### **5.2** Source Water Protection Considerations

Where proposed developments are being planned, it is important to determine the presence of Significant Groundwater Recharge Areas (SGRAs) and Highly Vulnerable Aquifers (HVAs) in the area. These areas are protected under the Clean Water Act (2006). In general, SGRAs are defined as areas where water seeps into an aquifer from rain and melting snow, supplying water to the underlying aquifer. An HVA aquifer occurs where the subsurface material offers limited protection from contamination resulting from surface activities.

GHD considered the potential for SGRAs and HVAs by reviewing the "Source Protection Information Atlas" that is currently available through the MECP website. The published information is dated January 31, 2019. In general, there are no HVAs in close proximity to the Site (see Figure 10). Further, the subsurface investigation by GHD has indicated that the existing glacial till exhibits low hydraulic conductivity indicating that it has a relative lower contribution to underlying aquifer complexes.

As defined in the Clean Water Act (2006), an area is a significant groundwater recharge area if,

- the area annually recharges water to the underlying aquifer at a rate that is greater than the rate
  of recharge across the whole of the related groundwater recharge area by a factor of 1.15 or
  more; or,
- the area annually recharges a volume of water to the underlying aquifer that is 55% or more of
  the volume determined by subtracting the annual evapotranspiration for the whole of the related
  groundwater recharge area from the annual precipitation for the whole of the related
  groundwater recharge area.

The Site is within a SGRA with a vulnerability score of 6 (moderate to high) as shown on Figure 10. GHD notes that the planned development will cover a small portion of the Site (approximately 3%). In addition, it is GHD's opinion that based upon the low permeability of the glacial till found at the Site, it should not be a moderate or high SGRA. Nevertheless, the development will consider maintaining pre-development infiltration. Therefore, no impacts are expected to the SGRA.

# 6. Conclusions and Recommendations

Supporting data upon which our recommendations are based have been presented in the foregoing sections of this report. The following recommendations are governed by the physical properties of the subsurface materials that were encountered at the Site and assume that they are representative of the overall site conditions. It should be noted that these conclusions and recommendations are intended for use by the designers only. Contractors bidding on or undertaking any work at the Site should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction, and make their own interpretation of this factual data as it affects their proposed construction techniques, equipment capabilities, costs, sequencing, and the like.



Comments, techniques, or recommendations pertaining to construction should not be construed as instructions to the contractor. Based on the results of the geotechnical investigation, it is our professional opinion that the Site is suitable for the proposed Agricultural Grain Milling Facility and there is low potential for groundwater impact as a result of developing the Site. It is recommended that good construction and mitigation techniques must be used to minimize the potential for impact. Detailed conclusions and recommendations are presented in the following sections regarding the water balance and potential impacts to groundwater and surface water resources.

#### 6.1 Hydrogeology

#### **6.1.1** Water Balance Evaluation

An evaluation of the water balance was completed to compute the potential impacts that may occur in the recharge/discharge characteristics related to the proposed development. This evaluation is based upon a preliminary conceptual plan. The objective of the water balance is to illustrate that post-development infiltration within the developable area can meet or be close to pre-development values. The computations have used detailed parameters such as precipitation, regional evapotranspiration, infiltration and runoff. Weather data from King Smoke Tree weather station was selected as it was the closest weather station to the Site (~21.8km). The detailed calculations can be reviewed in Appendix E. The total Site area is 36.3ha based on information provided. The following is a summary of the expected pre-development water balance values for the proposed residential development based on the current information.

#### **Pre development Water Balance**

The pre-development water balance incorporated the existing soils, slope and ground cover areas. The infiltration factor for the area was calculated from the table of values presented in the "Land Development Guidelines" (MOEE, 1995). It is based on three sub-factors which are:

- Topography sub-factor;
- · Soil sub-factor; and
- Cover sub-factor.

The slope of the site will be considered as "rolling" (slope of 2.8 to 3.8m per km) to "hilly" (slope of 28m to 47m per km). The soils are generally comprised of sandy silt / silty clay till material and will be considered a medium combination of clay and as per the water balance calculations. Table 6.1 summarizes the expected pre-development water balance values for the Site.

#### **Table 6.1 Pre Development Summary**

Total Precipitation (King Smoke Tree):

Regional Evapotranspiration:

Recharge Available:

Area of Recharge Available (Site):

Total Water Surplus:

Total Estimated Infiltration:

Total Estimated Runoff:

- 857.7 mm/year

- 581.6 mm/year

- 276.1 mm/year

- 363,045 m²

- 101,535 m³/year

- 51,387 m³/year

- 50,148 m³/year

Based upon these values, the Site infiltrates on the order of 51,387m<sup>3</sup> per year (141 mm/year).



#### Post Development Water Balance (No Enhancements)

The computation of the water budget was repeated for the proposed development assuming no mitigation techniques, that is, runoff from impervious surfaces is unrecoverable and not infiltrated into the ground. The anticipated impact of the development is related to increased runoff from imperious surfaces, such as asphalt surface for the proposed access roads and the building rooftops. These are assumed to be impervious surfaces with zero infiltration capacity in this model. A summary of the computations is provided in Table 6.2.

#### **Table 6.2 Post Development Summary (No Enhancements)**

- 363.045 m<sup>2</sup> Area of Site: Impervious Surfaces: - 12,390 m<sup>2</sup> - 350.655 m<sup>2</sup> Area Available for Infiltration: - 106,016 m<sup>3</sup>/year **Total Water Surplus:** - 49,463 m<sup>3</sup>/year Total Estimated Infiltration: Infiltration % Difference (pre- vs. post-): - (-4%) (decrease) **Total Estimated Runoff:** - 56,553 m<sup>3</sup>/year Runoff % Difference (pre- vs. post-): - 13% (increase)

The impermeable surface area of proposed paved areas, concrete pads, receiving and scale areas and building rooftops was estimated based on the design drawing presented in Figure 4 and information provided by the Lassing Dibben. Under this scenario, the total infiltration volume decreased by 4% and runoff volume increased by 13%. Within the areas evaluated, the infiltration has reduced and the runoff increased versus the pre-development values. Groundwater base flow would be expected to decrease over time in this scenario. However, recharge via infiltration through the underlying till to the lower aquifer from these lands is expected to be minor. Based upon this scenario, mitigative strategies are required to minimize infiltration losses and reduce storm water runoff. The following section discusses the water balance after considering enhanced infiltration options.

#### Post Development Water Balance (Enhanced Infiltration)

The post-construction water budget computations were repeated considering enhanced infiltration options which are also known as Low Impact Development (LID) technologies. These technologies include and are not restricted to rainwater harvesting, downspout disconnection, infiltration trenches, vegetated filter strips, bioretention, permeable pavement, enhanced grass swales, dry swales and perforated pipe systems in order to balance the water budget and maintain any wetland features including nearby creeks. The shallow subsurface soils at the Site consist of silty sand / sandy silt / clayey silt till material. It is noted that LIDs can work in any soil type. The primary enhancement for this Site is to promote infiltration and to move water from impervious surfaces to areas where infiltration can occur.

The post-development water balance was modelled to include the disconnection of downspouts from storm sewers and directing water from the proposed building's roof top to sodded areas or undeveloped grass areas. A summary of the post-construction water budget with enhancements for infiltration is presented in Table 6.3.



#### **Table 6.3 Post Development Summary (With Enhanced Infiltration)**

Area of Site:

Total Water Surplus:

Total Estimated Infiltration:

Infiltration % Difference (pre- vs. post-):

Total Estimated Runoff:

Runoff % Difference (pre- vs. post-):

- 363,045 m²

- 106,016 m³/year

- 51,387 m³/year

- (0%) (nil)

- 54,628 m³/year

- 9% (increase)

Under this scenario, the total infiltration volume is maintained and runoff volume increased by 9% compared to pre development values. Within the areas evaluated, the infiltration and runoff amounts have improved compared to post development (no mitigation) numbers. However, a runoff volume increase of 9% is still present. Runoff increase compared with the pre-development conditions will need to be managed as per the storm water management plan.

It is expected that recharge via infiltration through the till to the lower aquifers is a small component and impacts to the groundwater aquifer are expected to be insignificant. It is our professional opinion that there would be minimal impact to the local groundwater regime and minimal impact to the down-gradient surface water regime from a quantity perspective.

#### 6.1.2 Impact on Groundwater Baseflow

The importance of the groundwater baseflow is that it provides discharge to water bodies, wells and may have some hydraulic functionality with the on-site features. Water balance calculations suggest that the infiltration to the subsurface can be kept near pre-development values if appropriate LID technologies are used. It is GHD's professional opinion that there is not expected to be a significant impact to the shallow groundwater baseflow that may be supplying baseflow to the down-gradient wetlands to the southeast of the Site.

#### 6.1.3 Impact on Surface Water Bodies

The impacts to surface water bodies are related to the reduction of the groundwater baseflow and water quality concerns related to human activities such as salting of paved areas, minor fuel and oil leaks, fertilizer application, etc. It is expected that there will be minor impacts to groundwater and neighbouring surface water bodies. Runoff from the development will be collected by an internal storm sewer system and treated using a stormwater management pond or other LID strategies. Further details are provided within the Functional Servicing Report regarding the stormwater management.



#### 6.1.4 Mitigation Measures

Several mitigative techniques have been recommended in order to address concerns relating to the potential for impact to the base flow. The impact and mitigation measures can be arranged into two (2) distinct categories: construction phase and operational phase. Prior to construction, storm water management techniques should be incorporated to control additional surface water runoff and permit enhanced infiltration into the surrounding ground. Storm water management techniques will minimize the potential for groundwater impact and also minimize the amount of silt or other fine-grained soil particles becoming mobile and entering into down-gradient areas.

The installation of strategically placed silt fences will filter any excess storm water runoff prior to entering the infiltration areas.

During the operational phase of the development, it is expected that storm water excess will be controlled as indicated in the Functional Servicing Report. It is recommended that all roof leader drains of the proposed building be allowed to drain onto the ground surface for infiltration. Swales may be required in some areas to divert the runoff water where required. Other LIDs will be required to reduce storm water runoff and will be evaluated by the detailed design.

#### 6.1.5 Servicing

Private services for water and septic disposal will be required for this Site. The following sections discuss water supply and septic waste disposal.

#### 6.1.5.1 Water Supply

#### **Groundwater Availability**

For residential developments, minimum well yield requirements are defined in MOE Procedure D-5-5. For this proposed commercial development, the Ontario Building Code will be used to estimate the design flows and well yield requirements. A constant rate pump test is recommended for this Site to confirm sufficient groundwater is available and that the water well does not interfere with other local users.

#### **Production Well Requirements**

It is recommended that the proposed development be serviced by a properly constructed drilled well. The drilled well is expected to be constructed at depths ranging from about 15m to nearly 50m. Large diameter (300 mm or greater) wells are not considered suitable as a source of water supply for this Site. The well installed should be in accordance with Regulation 903 of the Ontario Water Resources Act and incorporate the following design specifics.

1. The well must be developed by conventional techniques to obtain a minimum of 70% efficiency. It is recommended that a statement be provided that indicates the well is essentially sand-free (i.e. less than 5 mg/L sand). In addition, the statement should also include that the total drawdown in the well, comprising the pumping level plus the mutual interference from the other wells, is within a reasonable tolerance of the available drawdown.



2. A water sample must be collected from the new well and analyzed for the following (minimum) test parameters to meet the ODWS.

-Iron -Manganese -Nitrate -Sodium -Hardness -Turbidity

-Total Coliform -E. *coli* -Fecal Coliform

-Chloride -Total dissolved solids -Fluoride

3. It is recommended that the new, properly constructed well be pump tested by qualified hydrogeologic personnel prior to issuance of a building permit. The well should be pump tested to determine a safe long-term yield and short-term capacity to ensure uninterrupted water supply for the development and to ensure that adjacent properties will not be impacted. A report should be prepared by a Professional Engineer or Professional Geoscientist verifying individual pump testing data.

The use of a properly constructed drilled well that is adequately sealed and certified by qualified hydrogeological personnel should be sufficient to provide ample quantities of potable water while preserving the long term water quality of the existing aquifer complexes. Any existing wells on the Site including monitoring wells that will not be used should be abandoned in accordance with Regulation 903.

The use of groundwater heat pumps that extract water from the aquifer is not recommended. Geothermal drilling is unregulated and there are no mandatory requirements to seal boreholes that are drilled through or into aquifers. Therefore, unsealed or improperly sealed boreholes into the aquifer could put the water supply at risk.

#### 6.1.5.2 Septic Waste Disposal

#### General

The Preliminary Site Plan (by Lassing Dibben) indicates that a septic system will be installed for the planned building. In addition, Lassing Dibben have indicated that the planned development will generate less than 10,000 L/day of septic effluent per day. A detailed assessment of the suitability of the septic system is required to determine the potential impact of the sewage systems at the Site on groundwater resources. The Site is not considered to be hydrogeologically sensitive (Procedure D-5-4, MOE, 1996). The MECP dilution model was used to confirm that the projected post-development nitrate concentration meets the drinking water standard of 10 mg/L for nitrate. It is our professional opinion that the Site is suitable for the construction of the planned septic waste disposal system.

The overburden materials were investigated during the advancement of the 17 test holes. The boreholes generally encountered a surficial layer of topsoil, over till, generally consisting of sandy silt or silty sand and occasionally clayey silt. Minimal groundwater seepage and / or accumulation was observed in the boreholes during the drilling operations. In addition, bedrock was not encountered. The T-time of the underlying soil is estimated to be between 30 and 50 min/cm. Based upon the subsurface soils in the area of the proposed leaching bed, it is recommended that the waste disposal system be designed as a fully raised bed. A detailed review of the expected waste disposal impacts and recommendations are presented in the following sections.



#### **Developmental Impact**

For the purposes of calculating the potential impact of the planned development, the Ontario Building Code (OBC) was consulted to evaluate the design septic effluent loading rate. Based upon discussions with the Client, it is estimated that there will be up to twenty (20) employees involved in the proposed development. The OBC indicates an effluent flow generated for each employee of 75 L/day. Therefore, the proposed development will generate about 1,500 L/day. Based upon this calculation, the planned septic system is well below 10,000 L/day and would not require a MECP environmental compliance approval (ECA). The anticipated water use is expected to be at least ½ of the design criteria.

For the purposes of calculating the potential impact of the proposed commercial development, the estimated 1,500 L/day was used as the septic effluent loading rate for the Site. While most constituents in septic effluent are usually removed within a short distance of movement within soil, mobile constituents such as chlorides and nitrates will require sustained dilution to meet the drinking water standards of 10 mg/L N for nitrate. The MECP normally considers sewage from a Class 4 waste disposal system will contain 40 mg/L of nitrate. For the purpose of assessing the impact of projected nitrate loading, the dilution requirement of 4:1 was utilized in the impact computations.

A summary of the applicable parameters that were considered in the waste disposal evaluation and the computation of the projected nitrate concentration are presented below in Table 6.4. Sandy silt typically infiltrates on the order of 150 to 200 mm/year. A median value of 175 mm/year was selected for this nitrate impact assessment. The average background nitrate concentration (2.00 mg/L) as determined from monitoring wells at BH-103 and BH-107 was used in the nitrate impact assessment.

Using dilution only, the projected nitrate concentration generated from sewage at the Site is calculated to be 0.34 mg/L. The nitrate impact assessment indicates that nitrate impacts from septic effluent will not be an issue. The proposed development meets the 10 mg/L drinking water standard for nitrate.

#### **Table 6.4 Nitrate Impact Assessment Summary**

1.	Recharge rate (sandy silt)	175 mm/year
2.	Development area	36.3 hectares
3.	Background nitrate	2.00 mg/L
4.	Nitrate loading (40 mg/L x 1,500 L/day)	60,000 mg/day
5.	Projected nitrate concentration	0.34 mg/L

#### **Waste Disposal Requirements**

Based on the results of this assessment, the Site is suitable for a private septic waste disposal system. Fill may be required and drainage patterns and storm drainage will be re-directed and controlled as part of the storm water management plan. It is recommended that the septic system use a fully raised absorption trench leaching bed. The waste disposal system should meet Ontario Regulation 350/06 made under the Building Code Act, 1992 and incorporate the following design features.



- 1. Organics should be stripped from the area of the leaching bed and down-gradient mantle.
- 2. The exposed subgrade below the tile bed should be trimmed and scarified, and provided with a gentle slope of 0.5% in the direction of the mantle.
- 3. The tile bed should be constructed as a fully raised leaching type bed to the full height of at least 1m above existing grade. The raised bed should consist of clean, granular fill capable of providing an in-place percolation rate (T-time) of 4 to 8 min/cm.
- 4. The mantle should be constructed along the down-gradient margin of the raised bed. The mantle should extend along the full width of the bed and for a minimum of 15m down-gradient from the bed. The mantle should consist of similar granular fill raised to a minimum of 250mm above the surrounding grade. Surface runoff should be diverted away from the leaching bed by means of proper site drainage.
- 5. The waste disposal system should be kept clear of surface drainage swales, roof leader drains, and other sources of surface water.
- 6. The tile bed should be kept away from shade trees and a healthy cover of vegetation should be developed and maintained over the bed to promote evapotranspiration.
- 7. When sighting tile bed on sloping ground, it is recommended that procedures outlined in the Building Code be followed closely.
- 8. Minimum set back distances from septic tank (plus 2 times height raised):

-Building – 1.5m -Property line – 3m

-Drilled well – 15m -Open water course – 15m

9. Minimum set back distances from septic tile bed (plus 2 times height raised):

-Building – 5m -Property line – 3m

-Drilled well, properly sealed – 15m -Open water course – 15m

-Shallow well - 30m

10. The layout, design and construction of the waste disposal bed should be subject to inspection by experienced hydrogeologic personnel.

New technologies are available that can reduce the size of the footprint of the conventional septic system (if required). If other new technology septic system is incorporated into the design, it is recommended that the system be installed as per the Ontario Building Code.

#### **6.1.6 Dewatering for Construction**

Based on groundwater-related observations and the depth of excavations expected for this development, it is generally anticipated that groundwater seepage will be encountered. It is expected that pumping from collection sumps to an acceptable outlet will control this expected groundwater infiltration. However, should any excavations require more intensive dewatering or groundwater control, the use of filtered sumps, or other suitable method of dewatering and/or sheet piling is recommended.



For dewatering purposes, hydraulic conductivities on the order of about 10<sup>-5</sup> to 10<sup>-6</sup> cm/sec may be expected for the subgrade soils encountered in our boreholes. It should be noted that hydraulic conductivities can vary over a vertical and horizontal extent, and may be outside the stated range if pockets or seams of soils with different grain size (e.g. sand seams) are encountered. If short-term pumping of groundwater at volumes greater than 50,000 L/day and less than 400,000 L/day is required during the construction stage, the Environmental Activity Sector Registry (EASR) must be completed. The EASR streamlines the process and water pumping may begin once the EASR registration is completed, the fee paid and supporting document prepared. If water taking in excess of 400,000 litres/day is required, a Permit to Take Water (PTTW) must be obtained in advance. PTTW applications may take up to 90 working days for the MECP to review and approve. The actual rate of groundwater taking performed during construction will be a function of the final design, time of year, and the contractor's schedule, equipment, and techniques.

#### 6.2 Geotechnical

Supporting data upon which our recommendations are based have been presented in the foregoing sections of this report. The following recommendations are governed by the physical properties of the subsurface materials that were encountered and assume that they are representative of the overall Site conditions. It should be noted that these conclusions and recommendations are intended for use by the designers only. Contractors bidding on or undertaking any work at the Site should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction, and make their own interpretation of this factual data as it affects their proposed construction techniques, equipment capabilities, costs, sequencing, and the like. Comments, techniques, or recommendations pertaining to construction should not be construed as instructions to the contractor. It should be noted that where the Municipality has design standards that apply to specific aspects of this project, such standards shall take precedence over any corresponding dissimilar recommendations contained herein.

The soils encountered generally consisted of a surficial layer of topsoil underlain by silty sand/sandy silt or clayey silt glacial till. Occasionally, a layer of silty sand was observed between the surficial topsoil layer and the glacial till. Isolated sand seams were encountered within the glacial till sporadically throughout the Site. Groundwater seepage and/or accumulation was observed in nine (9) of the boreholes at depths ranging from 1.7 to 5.3m during the drilling. Groundwater level measurements obtained from the installed monitoring wells on October 11, 2019, ranged from 0.2 to 5.3 m (315.8 to 318.9 masl). The monitoring well installed in boreholes BH-1 was measured to be dry on October 11, 2019.

#### **6.2.1** Site Preparation and Excavation

Any and all topsoil, vegetation, fill, disturbed earth, organic and organic-bearing material is to be stripped and removed from the access roads and building envelope areas (including floor slab areas) prior to commencing earthwork construction. Overly loose, organic, or otherwise deleterious materials will require removal and replacement with an approved backfill material. The subexcavated surface must be proof rolled and/or approved by a member of GHD prior to placement of fill or foundations. Excavations should be carried out to conform to the manner specified in Ontario Regulation 213/91 and the Occupational Health and Safety Act and Regulations for Construction Projects (OHSA).



All excavations above the water table not exceeding 1.2 m in depth may be constructed with vertical, unsupported slopes. The soils encountered during this investigation are generally classed by OHSA as Type 3. As such, unsupported / unshored walls of excavations in these soils must be sloped to the bottom of the excavation, with a slope having a gradient of 1 horizontal to 1 vertical (1H:1V) or flatter, or be retained using a suitably designed shoring system.

It is expected that some of the excavation spoils may be suitable for reuse as trench and/or pavement subgrade backfill provided they are free of organics and at a moisture content that will permit adequate compaction (may require prior processing such as aeration to lower the moisture content). A final review and approval to reuse any soils should be made at the time of construction.

Prior to removing any excess soils from the Site, it is recommended that such materials be subjected to chemical testing to characterize the excess soils for handling and disposal purposes.

#### 6.2.2 Service Installation

The materials encountered during this investigation at the typical service invert elevation generally consist of silty sand/sandy silt or clayey silt glacial till. As such, normal compacted bedding material, placed in the Class "B" or Class "C" arrangement, is recommended for all underground services. The recommended bedding material is Granular "A" or 19 mm crusher run (angular) stone, as per Ontario Provincial Standard Specifications (OPSS). The minimum recommended bedding thickness for the underground services is 150mm. All bedding materials should be compacted to 98% of their Standard Proctor Maximum Dry Density (SPMDD).

It is recommended that cover backfilling of the underground services be accomplished using Granular "A", sand, or other suitable material as allowed by the Municipality's standards, to a minimum of 300mm above the pipe.

Compaction of this material should attain 100% SPMDD. It is expected that some of the excavated soils may be suitable for reuse as trench backfill, conditional upon suitable moisture content (within 2% of optimum), final review and approval by an experienced geotechnical engineer at the time of construction, and regular monitoring and inspection of such reuse throughout construction. Compaction of any native soil in service trenches is recommended to be a minimum of 98% of its SPMDD. The soils observed may require processing (such as aeration) to lower the moisture content to appropriate levels prior to being considered as backfill material.

#### **6.2.3 Foundation Design**

Relevant information for final design purposes including proposed final grades, finished floor elevations, and proposed underside of foundations were not available to GHD at the time of writing this report. As such, the recommendations contained in this Foundation section must be reviewed by GHD's geotechnical engineers once such development design parameters become available. Structural loading for the proposed agricultural grain milling facility building may be supported on strip and spread footings. The footings should be placed on the undisturbed, compact to very dense native soils or on engineered fill place directly on the undisturbed, compact to very dense native soils. Table 6.5 summarizes the depths to suitably competent native soil encountered in each borehole advanced within the proposed development area.



**Table 6.5** Depth to Competent Bearing Native Soil

Borehole ID	Depth (m to Competent Native Soil	Borehole ID	Depth (m) to Competent Native Soil
BH-101	0.9	BH-105	0.9
BH-102	1.5	BH-106	0.9
BH-103	0.9	BH-107	0.3
BH-104	0.9	BH-108	0.9

It is noted that a pockets of soft or loose soils were observed in borehole, BH-103 and may be present at other locations. If such soils are encountered at the foundation subgrade level, they must be subexcavated and replaced with engineered fill. For preliminary design purposes, it is recommended that footings constructed on compact to very dense native soils or engineered fill be proportioned and designed using the following bearing capacities presented in Table 6.6.

**Table 6.6 Preliminary Bearing Pressures for Foundation Design** 

	Bearing Pressure						
Parameter	Firm to Hard	Engineering Fill					
, arameter	Undisturbed Native Soils	Rock-based Fill <sup>(2)</sup>	Granular Fill <sup>(3)</sup>	Earth Borrow Fill <sup>(3)</sup>			
Factored Bearing Capacity at ULS (1)	130 kPa	210 kPa	170 kPa	130 kPa			
Bearing Capacity at SLS	90 kPa	150 kPa	120 kPa	90 kPa			

Notes: (1) Resistance factor  $\Phi$  =0.5 applied to the ULS bearing pressure for design purposes.

Any engineered fill upon which foundations are placed must be a minimum thickness corresponding to the notes that accompany the above table. Rock-based fill must be completely encapsulated with suitable filter fabric to minimize any migration of fine-grained particles from surrounding soils into the voids within the rock fill. Footings (and foundation walls) placed on engineered fill must be suitably reinforced; as a minimum, and where not already specified in the design drawings, this reinforcing should use 2 continuous runs of 15M rebar throughout the footings, and 2 runs of 15M rebar throughout near the top and bottom of the foundation walls. The following is recommended for the construction of any engineered fill for the footings:

- 1. Remove any and all existing vegetation, topsoil, fill, organics, and organic-bearing soils to the competent, undisturbed native soil from within the area of the proposed engineered fill.
- 2. The area of the engineered fill should extend horizontally 1m beyond the outside edge of the building foundations and then extend downward at a 1:1 slope to the competent native soil.

<sup>(2)</sup> At least 1m of Rock-based fill. Quality of material is to be approved prior to use as engineered fill.

<sup>(3)</sup> At least 0.3m of Granular or Earth Borrow fill. Quality of material is to be approved prior to use as engineered fill.



- 3. The base of the engineered fill area must be approved by a member of GHD prior to placement of any fill, to ensure that all unsuitable materials have been removed, that the materials encountered are similar to those observed, and that the subgrade is suitable for the engineered fill.
- 4. All engineered fill material is to be approved by GHD at the time of construction. Place approved engineered fill, in maximum 300 mm lifts, compacted to 100% of its SPMDD. Any fill material placed under sufficiently wet conditions should consist of an approved, rock-based fill, with the inclusion of appropriate geotextile fabric around the rock-based fill should the rock fill contain enough voids to warrant.
- 5. Full time testing and inspection of the engineered fill will be required, to ensure compliance with material and compaction specifications.

All exterior foundations and/or foundations in unheated areas, should be founded at least 1.2 m below the final adjacent grade for frost protection. Foundations and walls exposed to frost action should be backfilled with non-frost susceptible granular material, and positive drainage away from the structure should be ensured.

Under no circumstances should the foundations be placed above organic materials, loose, frozen subgrade, construction debris, or within ponded water. Prior to forming, all foundation excavations must be inspected and approved by a member of GHD's geotechnical group. This will ensure that the foundation bearing material has been prepared properly at the foundation subgrade level and that the soils exposed are similar to those encountered during this investigation.

For design purposes this site is conservatively classed as Site Class D for Seismic Site Response, in accordance with the Ontario Building Code.

For foundations constructed in accordance with the foregoing manner, total and differential settlements are estimated to be less than 25mm.

#### 6.2.4 Slab on Grade

The floor of the proposed building may be constructed as a normal slab-on-grade, on granular fill over native, inorganic subsoils. The floor slab should be formed over a base course consisting of at least 150 mm of Granular "A" material, compacted to a minimum of 100 % of its SPMDD. All grade increases or infilling below the Granular "A" should be constructed in accordance with the engineered fill steps provided in this report. All fill placed as engineered fill must be inspected, approved and compaction verified by personnel from GHD.

#### 6.2.5 Retaining Walls

It is recommended that free draining backfill to earth retaining walls be provided. The following soil parameters are recommended for purposes of retaining wall design.



**Table 6.7 Parameters for Lateral Earth Pressure Design** 

Soil Type	Unit Weight (kN/m³)	Angle of Internal Friction (φ)	Active Earth Pressure Coefficient (K <sub>a</sub> )	Passive Earth Pressure Coefficient (K <sub>p</sub> )	At-rest Earth Pressure Coefficient (K <sub>o</sub> )
Compact Sand Fill	20	32	0.31	3.2	0.47
Till	19	30	0.33	3.0	0.50

The recommended value for the coefficient for sliding friction between the soil and the concrete is 0.4. In addition to the above, hydrostatic forces must be taken into account in the design where the walls extend below the groundwater table. Also, any additional surcharge loading that will influence the wall must be taken into account in its design.

For earth retaining walls, it is recommended that for drainage purposes, perimeter drains be installed about the structures. The subdrains would serve to drain seepage water that infiltrates the backfill, intersect the groundwater and any seepage related to surficial-related water, and help relieve hydrostatic pressures due to high groundwater levels. The drains should consist of a perforated pipe, at least 150 mm in diameter, surrounded by crushed clear stone and suitable filter protection. The drain should discharge to a positive sump or other permanent frost free outlet.

#### 6.2.6 Pavement Design

Based on the results of this investigation, we would recommend the following procedures be implemented to prepare the proposed asphalt paved access way and parking areas for its construction.

- 1. Remove all asphalt, topsoil, fill, organics, organic-bearing materials and other deleterious materials from the planned pavement areas.
- 2. Inspect and proof roll the subgrade for the purpose of detecting possible zones of overly wet or soft subgrade. Any deleterious areas thus delineated should be replaced with approved granular material compacted to a minimum of 98% of its SPMDD.
- 3. Contour the subgrade surface to prevent ponding of water during the construction and to promote rapid drainage of the sub-base and base course materials.
- 4. To maximize drainage potential, 150mm diameter perforated pipe subdrains should be installed below any curb lines. The pipe should be encased in filter fabric and surrounded by clear stone aggregate. It is recommended that the subdrains discharge to a suitable, frost-free outlet.
- 5. Construct transitions between varying depths of granular base materials at a rate of 1:25 minimum.



The subgrade materials in the proposed pavement areas will generally consist of silty sand/sandy silt till, depending on the preferred method of construction and corresponding depths of subexcavation. The frost susceptibility of these soils is assessed as being generally moderate. The following minimum flexible pavement structures are recommended for new road construction.

**Table 6.8 Pavement Structure** 

Drofile	Material	Thickness (m	m)	In Conformance with OPSS	
Profile	Material	Light Duty	Heavy Duty	Form	
Asphalt Surface	H.L.3	40	40	1450	
Asphalt Base	H.L.8	50	50	1150	
Granular Base	Granular "A"	150	150	1010	
Granular Subbase	Granular "B"	300	450	1010	

The following steps are recommended for optimum construction of paved areas:

- 1. The Granular "A" and "B" courses should be compacted to a minimum 100 percent of their respective SPMDD's.
- 2. All asphaltic concrete courses should be placed, spread and compacted conforming to OPSS Form 310 or equivalent. All asphaltic concrete should be compacted to a minimum 92.0 percent of their respective laboratory Maximum Relative Densities (MRD's).
- 3. Adequate drainage should be provided to ensure satisfactory pavement performance.

It is recommended that all fill material be placed in uniform lifts not exceeding 200mm in thickness before compaction. It is suggested that all granular material used as fill should have an in-situ moisture content within 2 percent of their optimum moisture content. All granular materials should be compacted to 100 percent SPMDD. Granular materials should consist of Granular "A" and "B" conforming to the requirements of OPSS Form 1010 or equivalent.

The performance of the pavement structure is highly dependent upon the subgrade support conditions. Stringent construction control procedures should be maintained to ensure that uniform subgrade moisture and density conditions are achieved as much as practically possible. It is noted that the above recommended pavement structures are for the end use of the project. The most severe loading conditions on pavement areas and the subgrade may occur during construction. As such, during construction of the project the recommended granular depths may not be sufficient to support loadings encountered. Consequently, special provisions such as restricted lanes, half-loads during paving, etc. may be required, especially if construction is carried out during unfavorable weather.



#### 6.2.7 Stormwater Management Pond Design

It is GHD's understanding that the Storm Water Management (SWM) pond for the Site is targeted near the southern limits of the proposed development area as shown on Figure 4. Based on the soil conditions encountered during the investigation, it is expected that the bottom of the SWM pond will consist of native soils generally consisting of sandy silt / clayey silt till. Gradation testing on samples of these soils suggest the following compositional ranges: 0 to 8% gravel, 16 to 40% sand, and 53 to 84% silt and clay-sized particles (USCS). Hydrometer analyses conducted on three (3) these samples suggest that the till contains 41 to 67% particles between 5 and 75  $\mu$ m in size. Based on gradation results the hydraulic conductivity of such soils is expected to be on the order of about of  $10^{-5}$  to  $10^{-6}$  cm/sec. It is noted, however, that slight variations in the soil stratigraphy may cause variations in the permeability of the soil in both vertical and horizontal orientations.

Based on the soils observed, and depending on the final base elevation, it appears that construction of the SWM ponds in the glacial till may be feasible. Appropriate measures should be taken during construction to minimize any overland or near-surficial flow of water into the area. Groundwater seepage and/or accumulation was observed in nine (9) of the boreholes at depths ranging from 1.7 to 5.3m during the drilling operations. Groundwater level measurements obtained from the installed monitoring wells on October 11, 2019, ranged from 0.2 to 5.3 m (315.8 to 318.9 masl). Groundwater and surficial water inflow into the open SWM pond excavations is expected. However, this is generally expected to be controlled by pumping from within the excavation, along with further measures (if required) including up-gradient cutoff trenching with appropriate drainage outletting.

It is recommended that the SWM pond subgrade surfaces be proof rolled, and a representative of GHD approve the subgrade prior to construction of the berms. Construction of the berms may utilize excess site soils having a hydraulic conductivity of 10<sup>-5</sup> cm/sec (or less). Such operations should place soils in lifts no thicker than 150mm prior to compaction, and compacted to at least 95% SPMDD. The native, undisturbed till soils consisting predominantly of silt and clay would have a sufficiently low permeability where they could substitute for a liner.

Regardless, an inspection of the excavated and exposed SWM pond surfaces should be performed at the time of construction, to assess whether any discrete or localized areas of increased hydraulic conductivity are present within the exposed soils, in which case such areas may be lined with a more suitable (i.e., less hydraulically conductive) material or an impermeable geosynthetic membrane.

For the purpose of the proposed SWM pond, the soils observed should be stable from slip circle failure if sloped at 3 horizontal to 1 vertical (3H:1V) or flatter in the long term both above and below the water table. Between the stable water level and the expected high water level, it is recommended that the slopes be lessened to 4H:1V (or flatter) to guard against erosion by wavelet action. The native material will require vegetative root mass (or otherwise suitable erosion protection) to minimize erosional forces on exposed slopes.

Slopes and berms of the SWM pond should be constructed so as to reduce or eliminate the effects of surficial erosion. Features to do so may include slope vegetation, installation of erosion or gabion mats, rip rap, and/or other acceptable stabilizing features.



It is recommended that a regular maintenance program for the SWM Pond include monitoring of it for any potential slope erosion, degradation, or otherwise undesirable structural conditions. Should any such conditions become evident, immediate mitigative actions must be performed.

#### 6.2.8 General Recommendations

#### Wells

Any decommissioning of wells on-site must be performed by an appropriately licensed and experienced well contractor in compliance with Ontario Regulation 903.

#### **Test Pit During Tendering**

It is strongly recommended that test pits be excavated at representative locations of this Site during the tendering phase, with mandatory attendance of interested contractors. This will allow them to make their own assessments of the groundwater and soil conditions at the Site and how these will affect their proposed construction methods, techniques and schedules.

#### **Subsoil Sensitivity**

The native subsoils are susceptible to strength loss or deformation if saturated or disturbed by construction traffic. Therefore, where the subgrade consists of approved soil, care must be taken to protect the exposed subgrade from excess moisture and from construction traffic.

#### **Winter Construction**

The subsoils encountered across the site are frost-susceptible and freezing conditions could cause problems for the following reasons.

- 1. During winter construction, exposed surfaces intended to support foundations must be protected against freezing by means of loose straw and tarpaulins, heating, etc.
- 2. Care must be exercised so that any sidewalks and/or asphalt pavements do not interfere with the opening of doors during the winter when the soils are subject to frost heave. This problem may be minimized by any one of several means, such as keeping the doors well above outside grade, installing structural slabs at the doors, and by using well-graded backfill and positive drainage, etc.
- 3. Because of the frost heave potential of the soils during winter, it is recommended that the trenches for exterior underground services be excavated with shallow transition slopes in order to minimize the abrupt change in density between the granular backfill, which is relatively non-frost susceptible, and the more frost-susceptible native soils.

#### **Design Review and Inspection**

Due to the preliminary nature of the design details at the time of this report, we recommend that our firm be retained to review the foundation design and grading proposals when they are available. Geotechnical inspection and compaction testing must be carried out to ensure compliance with our recommendations.



## **6.3 Summary Conclusions**

In summary, the proposed development area is generally comprised of a surficial layer of topsoil underlain by silty sand/sandy silt or clayey silt glacial till. Occasionally, a layer of silty sand was observed between the surficial topsoil layer and the glacial till. A permanent shallow groundwater table was not observed. It is our opinion that there will not be significant constraints for the proposed development area from the seasonal variations of groundwater as the water can be handled with appropriate engineering techniques. It is expected that groundwater will generally be below the depth of the future development, although seepage may be encountered in deeper excavations or foundations.

Seepage is expected to be seasonal in nature. If short-term pumping of groundwater at volumes greater than 50,000 L/day and less than 400,000L/day is required during the construction stage, the EASR must be completed. In summary, the proposed Agricultural Grain Milling Facility is suitable from both a hydrogeologic and geotechnical perspective. The MECP well records indicate that wells in the area consist of both dug/bored and drilled types. The well survey in the immediate vicinity also confirmed dug/bored and drilled wells are in use. Impacts to existing domestic wells in the area are not expected based upon the proposed development and the large area of the Site (36.3ha).

There are minor impacts expected to groundwater and surface water as a result of the future development provided that appropriate planning (i.e. incorporation of LIDs as supported by the water balance calculations), mitigation measures and proper construction techniques are considered. From a geotechnical perspective, the Site is suitable for construction of the proposed development including one to two-storey commercial building, associated servicing and paved access and parking areas. Detailed recommendations are provided in previous sections of this report.

The following Statement of Limitations should be read carefully and is an integral part of this report. We trust this report meets your immediate needs. Should any questions arise regarding any aspect of our report, please contact our office.

Sincerely,

Sincerely,

LL RAMOS 100209777

Leandro Ramos, P.Eng.

David Workman, P.Geo.

Nyle McIlveen, P.Eng

lr//dw/nm



## 7. References

Chapman and Putnam, 1966. The Physiography of Southern Ontario, 2nd Edition. University of Toronto Press.

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Freeze, R. Allan and Cherry, John A. 1979. Groundwater.

Ministry of the Environment, Conservation and Parks, January 31, 2019. Source Protection Information Atlas, available online at www.ontario.ca.



## 8. Statement of Limitations

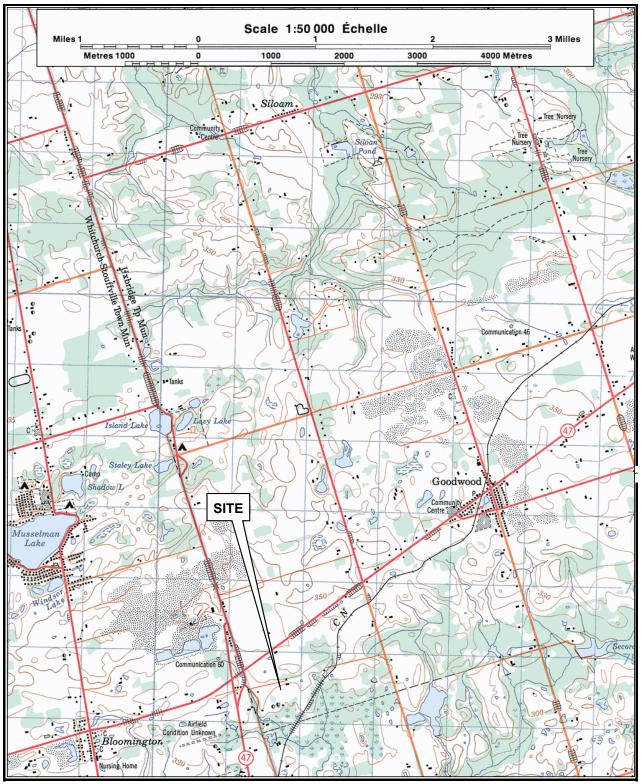
This report is intended solely for Grainboys Holdings Inc. in assessing the geotechnical and hydrogeologic aspects of the lands situated along the east side of Concession Road 1 (also known as York-Durham Line), south of Highway No. 47 near the urban area of Lincolnville, Ontario and is prohibited for use by others without GHD's prior written consent. This report is considered GHD's professional work product and shall remain the sole property of GHD. Any unauthorized reuse, redistribution of or reliance on the report shall be at the Client and recipient's sole risk, without liability to GHD. Client shall defend, indemnify and hold GHD harmless from any liability arising from or related to Client's unauthorized distribution of the report. No portion of this report may be used as a separate entity; it is to be read in its entirety and shall include all supporting drawings and appendices.

The recommendations made in this report are in accordance with our present understanding of the project, the current site use, ground surface elevations and conditions, and are based on the work scope approved by the Client and described in the report. The services were performed in a manner consistent with that level of care and skill ordinarily exercised by members of hydrogeological engineering professions currently practicing under similar conditions in the same locality. No other representations, and no warranties or representations of any kind, either expressed or implied, are made. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.

All details of design and construction are rarely known at the time of completion of a geotechnical or hydrogeological study. The recommendations and comments made in the study report are based on our subsurface investigation and resulting understanding of the project, as defined at the time of the study. We should be retained to review our recommendations when the drawings and specifications are complete. Without this review, GHD will not be liable for any misunderstanding of our recommendations or their application and adaptation into the final design.

It is important to emphasize that a soil investigation is, in fact, a random sampling of a site and the comments included in this report are based on the results obtained at the test hole locations only. The subsurface conditions confirmed at the test hole locations may vary at other locations. The subsurface conditions can also be significantly modified by the construction activities on site (ex. excavation, dewatering and drainage, blasting, pile driving, etc.). These conditions can also be modified by exposure of soils or bedrock to humidity, dry periods or frost. Soil and groundwater conditions between and beyond the test locations may differ both horizontally and vertically from those encountered at the test locations and conditions may become apparent during construction which could not be detected or anticipated at the time of our assessment. Should any conditions at the site be encountered which differ from those found at the test locations, we request that we be notified immediately in order to permit a reassessment of our recommendations. If changed conditions are identified during construction, no matter how minor, the recommendations in this report shall be considered invalid until sufficient review and written assessment of said conditions by GHD is completed.

# **Enclosures** GHD | Geotechnical Investigation, Agricultural Grain Milling Facility, 3469 Concession Rd 1, Uxbridge, ON | 11197394 (02)



Base map complied from Energy, Mines and Resources Canada Map 30M/15 published 1999. Air photography boundaries current as of 1996

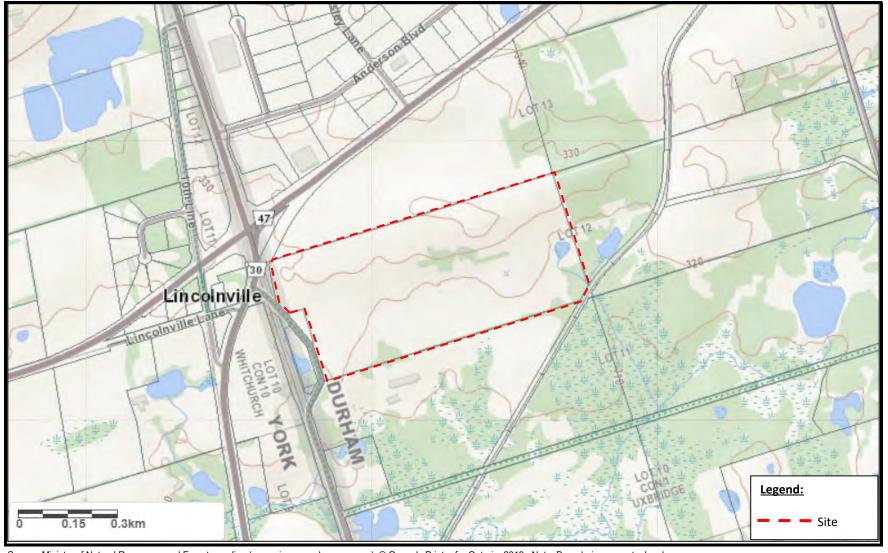
<u>Scale:</u> 1:50000 Coordinate System NAD 1983 UTM Zone 17





Grainboys Holdings Inc. 3469 Con Rd 1, Township of Uxbridge Geotechnical Investigation 11197394-02 October 2019

**Vicinity Plan** 



Source: Ministry of Natural Resources and Forestry, online (www.giscoeapp.lrc.gov.on.ca) © Queen's Printer for Ontario, 2019. Note: Boundaries are not a legal survey.

#### Scale:

Refer to Scale Bar Coordinate System: NAD 1983 UTM Zone 17





Grainboys Holdings Inc. 3469 Con Rd 1, Township of Uxbridge Geotechnical Investigation

**Property Plan** 

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Source: Ministry of Natural Resources and Forestry, online (www.giscoeapp.lrc.gov.on.ca) © Queen's Printer for Ontario, 2019. Note: Boundaries are not a legal survey.

#### Scale:

Refer to Scale Bar Coordinate System: NAD 1983 UTM Zone 17

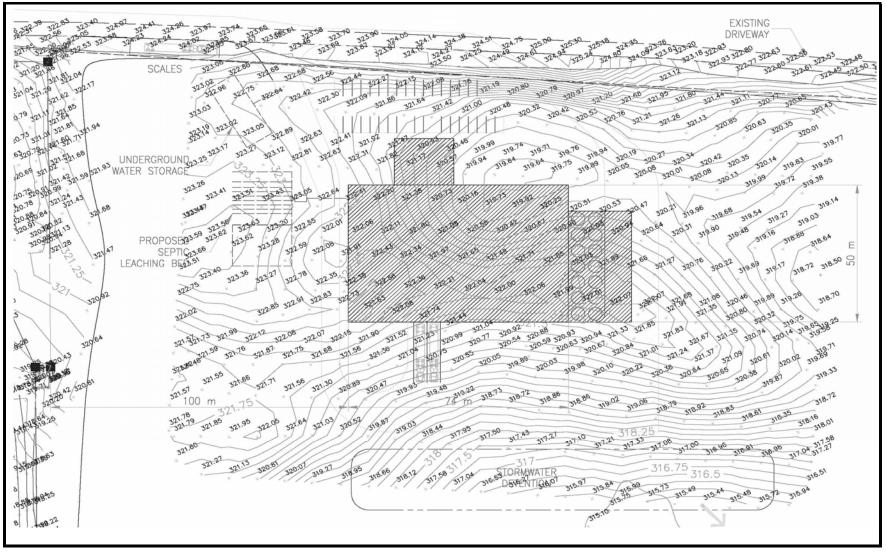




Grainboys Holdings Inc. 3469 Con Rd 1, Township of Uxbridge Geotechnical Investigation

Plot Plan

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Source: Preliminary Site Lavout provided by Lassing Dibben Consulting Engineers Ltd. with electronic title "19-066 Site wContours dwg"

#### Scale:

Not Determined Coordinate System: NAD 1983 UTM Zone 17

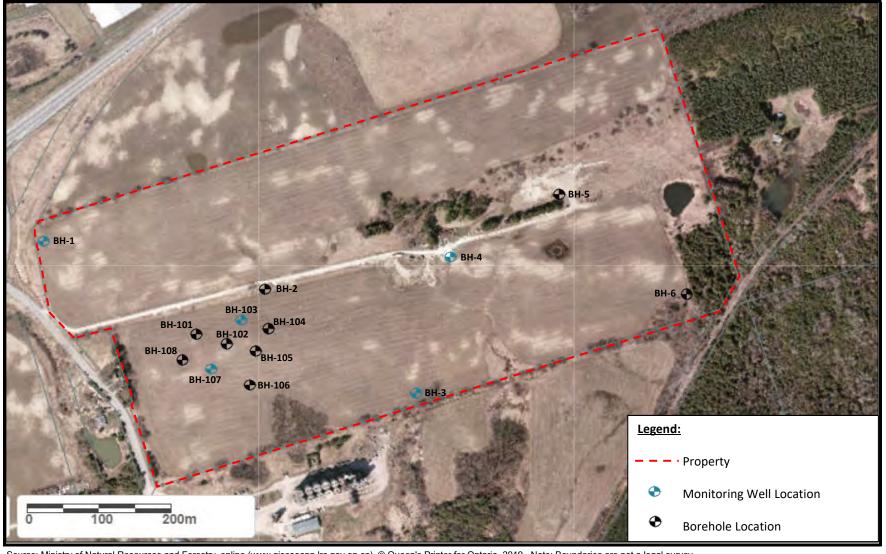




Grainboys Holdings Inc. 3469 Con Rd 1, Township of Uxbridge Geotechnical Investigation

**Concept Plan** 

11197394-02 October 2019



Source: Ministry of Natural Resources and Forestry, online (www.giscoeapp.lrc.gov.on.ca) © Queen's Printer for Ontario, 2019. Note: Boundaries are not a legal survey.

#### Scale:

Refer to Scale Bar Coordinate System: NAD 1983 UTM Zone 17





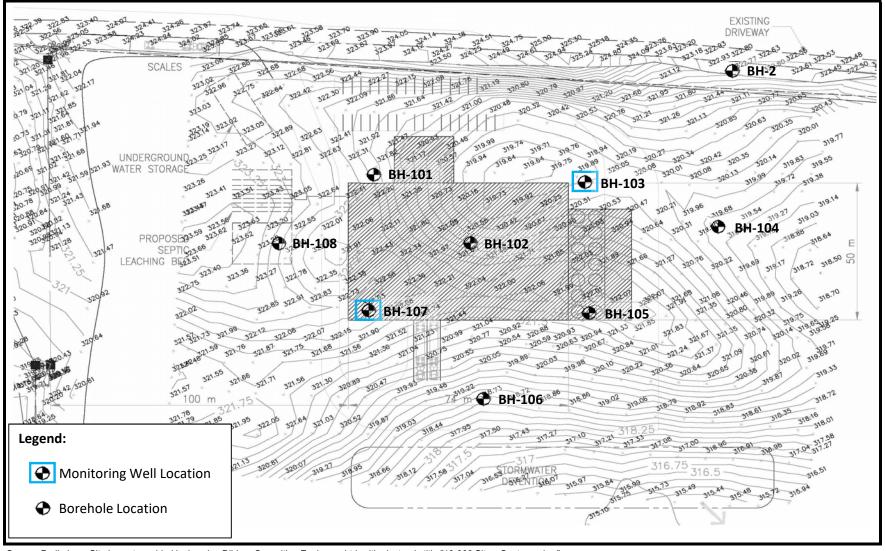
Grainboys Holdings Inc. 3469 Con Rd 1, Township of Uxbridge Geotechnical Investigation

**Test Hole Plan - Site** 

October 2019

11197394-02

**FIGURE 5A** 



Source: Preliminary Site Layout provided by Lassing Dibben Consulting Engineers Ltd. with electronic title "19-066 Site wContours dwg".

#### Scale:

Not Determined Coordinate System: NAD 1983 UTM Zone 17





Grainboys Holdings Inc. 3469 Con Rd 1, Township of Uxbridge Geotechnical Investigation

Test Hole Plan - Proposed Building

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FIGURE 5B



#### Scale:

Refer to Scale Bar Coordinate System: NAD 1983 UTM Zone 17

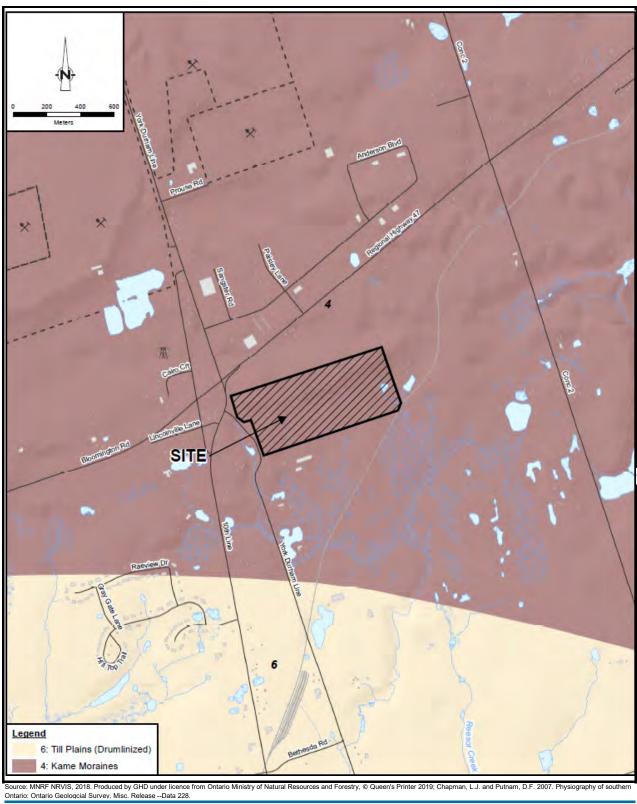




Grainboys Holdings Inc. 3469 Con Rd 1, Township of Uxbridge Geotechnical Investigation

**Groundwater Elevation** 

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Scale: Refer to Scale Bar Coordinate System NAD 1983 UTM Zone 17N

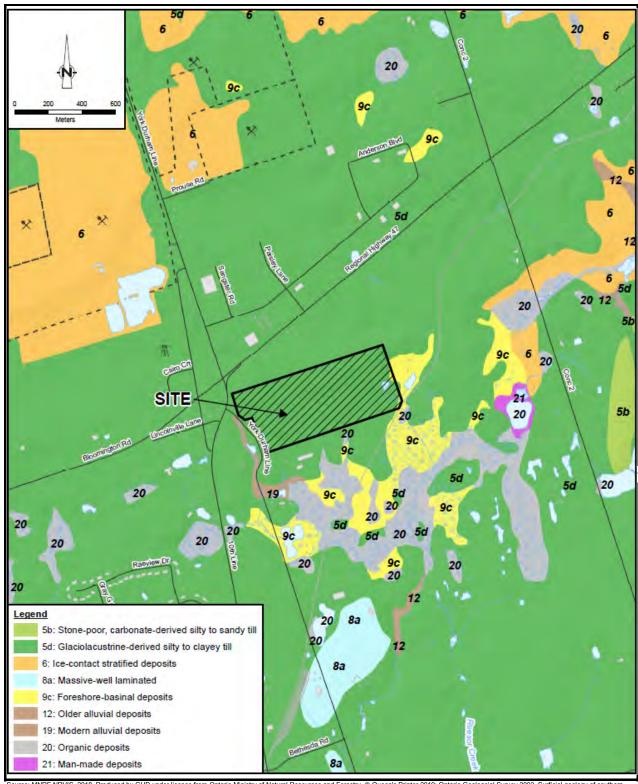




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**Physiography** 



Source: MNRF NRVIS, 2018. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2019; Ontario Geologcial Survey 2003. Surficial geology of southern Ontario; Ontario Geological Survey, Misc. Release -- Data 128.

<u>Scale:</u> Refer to Scale Bar Coordinate System NAD 1983 ÚTM Zone 17N

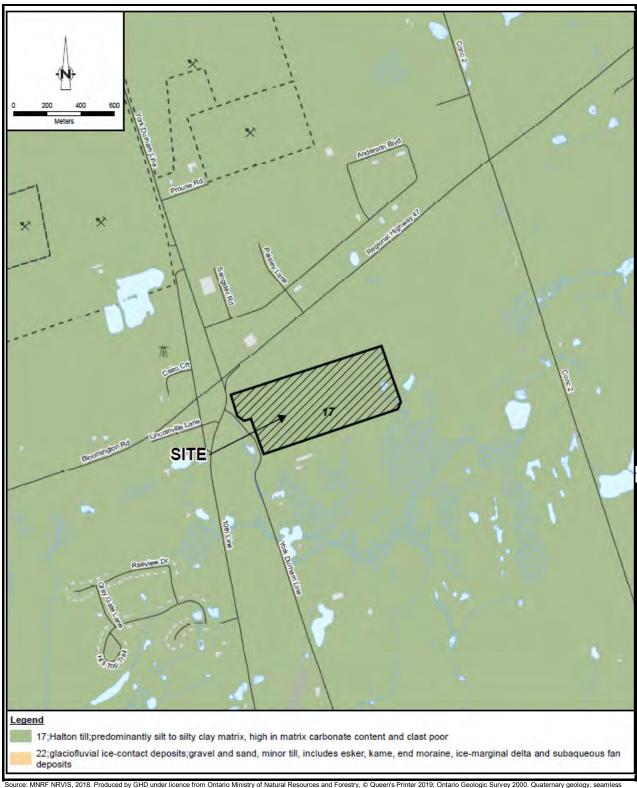




Grainboys Holdings Inc. 3469 Con Rd 1, Township of Uxbridge Geotechnical Investigation

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**Surficial Geology** FIGURE 8



Source: MNRF NRVIS, 2018. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2019; Ontario Geologic Survey 2000. Quaternary geology, seamless covereage of the Province of Ontario; Ontario Geological Survey, Misc. Release --Data set 14--Revised.

<u>Scale:</u> Refer to Scale Bar Coordinate System NAD 1983 UTM Zone 17N

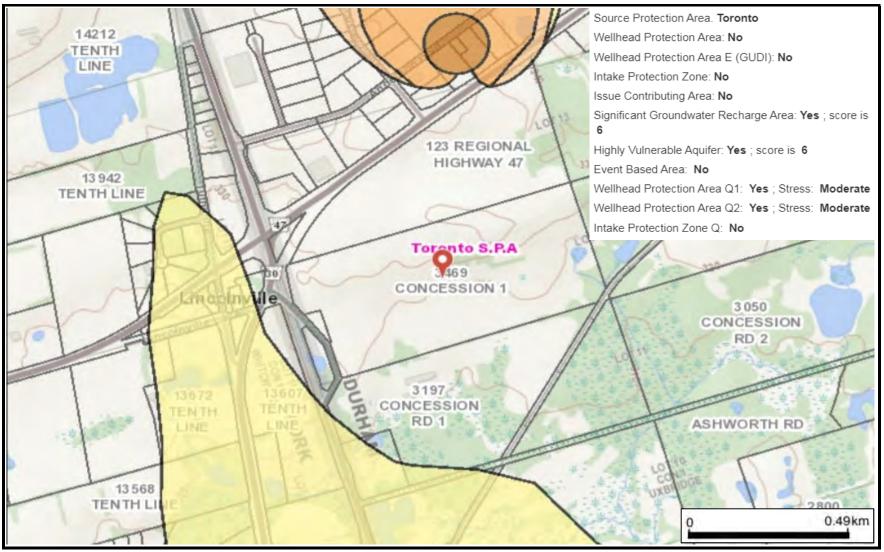




Grainboys Holdings Inc. 3469 Con Rd 1, Township of Uxbridge Geotechnical Investigation

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**Quaternary Geology** 



Source: Source Protection Information Atlas, Ministry of the Environmental, Conservation and Parks, © Queen's Printer for January 31, 2019.

#### Scale:

Refer to Scale Bar Coordinate System: NAD 1983 UTM Zone 17





Grainboys Holdings Inc. 3469 Con Rd 1, Township of Uxbridge Geotechnical Investigation

**Source Water Protection Map** 

FIGURE 10

11197394-02

October 2019

# Appendix A Soil Exploration Data

REFERENCE No.: 11197394-02 ENCLOSURE No.: \_ BOREHOLE No.: BH-101 BOREHOLE REPORT **ELEVATION:** 322.0 m Page: \_1\_ of \_1\_ **LEGEND** Grainboys Holdings Inc. CLIENT: \_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE ST LOGGED BY: E. Wierdsma DATE: 26 August 2019 - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons - WATER LEVEL NOTES: Ground surface elevation interpolated from preliminary site plan, electronic title "19-066 Site wContours.dwg" UTM: +/- 17T 649134E 4921219N m Below Existing Grade Blows per 3 in. / 15 cm Shear test (Cu) Penetration Stratigraphy Type and Number Moisture Content Recovery Sensitivity (S) □ Lab COMMENTS Depth Water content (%) W<sub>p</sub> W<sub>i</sub> Atterberg limits (%) **DESCRIPTION OF** SOIL AND BEDROCK X "N" Value (blows / 0.3 m) 0.0 % % Ν 10 20 30 40 50 60 70 80 90 ft m **GROUND SURFACE** TOPSOIL (600 mm) Borehole Open 5 **Upon Completion** 7 SS-1 25 10 12 1 10 2 0.6 TILL - Light Brown Silty Sand With Gravel, Moist, 4 Compact 5 1.0 SS-2 50 13 11 8 5 6 SS-3 50 10 10 4 6 2.0 7 - Grading Sand Seam at 5 8 5 SS-4 90 17 12 kО 7 EW,LR JK.GPJ GEOLOGIC.GDT 18/10/1 9 - 3.0 10-3 5 SS-5 100 12 15 10 11-13-4.0 BOREHOLE LOG GEOTECH 11197394-02-FLD-19-10-11-GINT BH LOGS, 14-15-4.6 Grey Clayey Silt, Very Stiff 11 SS-6  $0 \times$ 75 16 23 12 16-- 5.0 ₹ 17-WL - 5.2 m 8/26/2019 (Upon completion 18of drilling) 19-6.0 20-6.1 Trace Sand and Gravel 9 SS-7 90 13 29 0 20 21 6.6 **END OF BOREHOLE** 22

REFERENCE No.: 11197394-02 ENCLOSURE No.: BOREHOLE No.: BH-102 BOREHOLE REPORT **ELEVATION:** 320.8 m Page: \_1\_ of \_1\_ **LEGEND** Grainboys Holdings Inc. CLIENT: \_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE ST LOGGED BY: E. Wierdsma DATE: 26 August 2019 - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons - WATER LEVEL NOTES: Ground surface elevation interpolated from preliminary site plan, electronic title "19-066 Site wContours.dwg" UTM: +/- 17T 649141E 4920725N m Below Existing Grade Blows per 3 in. / 15 cm Shear test (Cu) Penetration Stratigraphy Type and Number Moisture Content Recovery Sensitivity (S) □ Lab COMMENTS Depth Water content (%) W<sub>p</sub> W<sub>i</sub> Atterberg limits (%) **DESCRIPTION OF** SOIL AND BEDROCK X "N" Value (blows / 0.3 m) 0.0 % % Ν 10 20 30 40 50 60 70 80 90 ft m **GROUND SURFACE** TOPSOIL (600 mm) 3 Borehole Open **Upon Completion** SS-1 50 13 4 7 1 5 2 0.6 TILL - Light Brown Silty Sand with Gravel, Moist, 2 Loose 4 1.0 SS-2 90 12 8  $^{\star}$ 4 4 5 1.5 3 Compact 6 SS-3 100 12 14 8 6 2.0 7 7 8 8 SS-4 90 12 17 þх 9 BOREHOLE LOG GEOTECH 11197394-02-FLD-19-10-11-GINT BH LOGS, EW,LR JK.GPJ GEOLOGIC.GDT 18/10/1 9 - 3.0 10-8 11 SS-5 100 27 11 16 3.4 11-Grey 13-4.0 14-15 4.6 Clayey Silt With Sand, Very 9 Stiff SS-6 0 100 15 26 X 17 16-▼ 5.0 5.0 WL - 5.0 m SAND - Brown Sand, Wet, 8/26/2019 17-Compact (Upon completion of drilling) 18-Groundwater seepage first 19encountered at 5.2 m 6.0 20-6.1 Dense 11 SS-7 100 19 31 þ 20 21 6.6 **END OF BOREHOLE** 22

REFERENCE No.: 11197394-02 ENCLOSURE No.: A-3 BOREHOLE No.: BH-103 BOREHOLE REPORT **ELEVATION:** 320.0 m Page: \_1\_ of \_1\_ **LEGEND** Grainboys Holdings Inc. CLIENT: \_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE ST LOGGED BY: E. Wierdsma DATE: 26 August 2019 - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons - WATER LEVEL NOTES: Ground surface elevation interpolated from preliminary site plan, electronic title "19-066 Site wContours.dwg" UTM: +/- 17T 648923E 4920861N m Below Existing Grade Blows per 3 in. / 15 cm Shear test (Cu) Penetration Stratigraphy Type and Number Moisture Content Recovery Sensitivity (S) COMMENTS □ Lab Depth Water content (%) W<sub>p</sub> W<sub>l</sub> Atterberg limits (%) **DESCRIPTION OF** SOIL AND BEDROCK — m — 0.84 m X "N" Value (blows / 0.3 m) RQD CONE 0.0 % % Ν 10 20 30 40 50 60 70 80 90 ft m **GROUND SURFACE** TOPSOIL (600 mm) 4 SS-1 25 16 6 10 1 2 0.6 TILL - Light Brown to Grey Sandy Silt With Clay, Moist, 3 Compact 4 1.0 SS-2 100 18 10 6 4 1.2 Wet 5 1.5 Trace Gravel, Moist Y WL - 1.7 m 5 SS-3 100 16 10 жο 5 09/11/2019 6 2.0 7-2.3 Loose, Wet 8 2 SS-4 100 14 8 NO 6 EW,LR JK.GPJ GEOLOGIC.GDT 18/10/1 9 3.0 10-3.0 3 Grey Sandy Silt With Clay, BH-103, SS-6: Trace Gravel, Loose 1 SS-5 0 6% Gravel 5 15 5  $\times$ 4 11-38% Sand 56% Silt and Clay 41% between 5-75 μm Groundwater 13-2 - 4.0 seepage first SS-6 100 12 7 5 encountered at 3.2 m BOREHOLE LOG GEOTECH 11197394-02-FLD-19-10-11-GINT BH LOGS, 14-Borehole cave in to 3.2 m 15-2 7 SS-7 100 10 9 16-- 5.0 17-50 mm diameter 5.3 3 monitoring well Very Stiff 18installed to 5.2 m SS-8 75 12 12 19-6.0 20-6 10 SS-9 100 12 28 18 21 6.6 **END OF BOREHOLE** 22

REFERENCE No.: 11197394-02 ENCLOSURE No.: A-4 BOREHOLE No.: BH-104 **BOREHOLE REPORT** ELEVATION: \_\_\_ 3<u>19.6 m</u> Page: \_1\_ of \_1\_ LEGEND Grainboys Holdings Inc. CLIENT: \_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE ST LOGGED BY: E. Wierdsma DATE: 26 August 2019 - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons - WATER LEVEL NOTES: Ground surface elevation interpolated from preliminary site plan, electronic title "19-066 Site wContours.dwg" UTM: +/- 17T 648750E 4920942N m Below Existing Grade Blows per 3 in. / 15 cm Shear test (Cu) Penetration Moisture Content Stratigraphy Type and Number Recovery Sensitivity (S) □ Lab **COMMENTS** Depth Water content (%) W<sub>p</sub> W<sub>i</sub> Atterberg limits (%) **DESCRIPTION OF** SOIL AND BEDROCK X "N" Value (blows / 0.3 m) 0.0 % % Ν 10 20 30 40 50 60 70 80 90 ft m **GROUND SURFACE** TOPSOIL (600 mm) 4 SS-1 75 10 5 9 1 5 0.6 2 TILL - Light Brown Sandy Silt, With Clay, Moist, 3 BH-104, SS-2: Compact 5 7 0% Gravel 1.0 75 SS-2 16 12 XO 31% Sand 69% Silt and Clay 4 53% between 5-75 5 9 SS-3 100 15 16 7 6 2.0 7-2.3 5 Grey, Mottled 8 9 SS-4 100 20 11 11 BOREHOLE LOG GEOTECH 11197394-02-FLD-19-10-11-GINT BH LOGS, EW.LR JK.GPJ GEOLOGIC.GDT 18/10/1 9 - 3.0 10-2 6 SS-5 100 10 12 6 11-3.5 END OF BOREHOLE Borehole Open and Dry Upon Completion 13-4.0 14-15 16-- 5.0 17-18-19-6.0 20-21 22

REFERENCE No.: 11197394-02 ENCLOSURE No.: A-5 BOREHOLE No.: BH-105 BOREHOLE REPORT **ELEVATION:** 321.8 m Page: \_1\_ of \_1\_ **LEGEND** Grainboys Holdings Inc. CLIENT: \_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE ST LOGGED BY: E. Wierdsma DATE: 26 August 2019 - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons - WATER LEVEL NOTES: Ground surface elevation interpolated from preliminary site plan, electronic title "19-066 Site wContours.dwg" UTM: +/- 17T 648932E 4821260N m Below Existing Grade Blows per 3 in. / 15 cm Shear test (Cu) Penetration Stratigraphy Type and Number Moisture Content Recovery Sensitivity (S) □ Lab COMMENTS Depth Water content (%) W<sub>p</sub> W<sub>i</sub> Atterberg limits (%) **DESCRIPTION OF** SOIL AND BEDROCK X "N" Value (blows / 0.3 m) 0.0 % % Ν 10 20 30 40 50 60 70 80 90 ft m **GROUND SURFACE** TOPSOIL (800 mm) Borehole Open and 5 Dry Upon SS-1 25 9 6 11 1 Completion 6 2 8.0 1 SILTY SAND - Light Brown 5 Silty Sand, Moist, Compact 1.0 18 SS-2 100 12 13 4 1.5 5 9 TILL - Light Brown Silty 6 Sand With Gravel, Trace SS-3 100 12 0X 7 6 6 Clay, Moist, Compact 2.0 7 4 8 7 SS-4 100 18 11 11 BOREHOLE LOG GEOTECH 11197394-02-FLD-19-10-11-GINT BH LOGS, EW,LR JK.GPJ GEOLOGIC.GDT 18/10/1 9 3.0 10-6 BH-105, SS-2: 8 SS-5 100 2% Gravel 11 26 18 11-34% Sand 64% Silt and Clay - Grading Sand Seam at 3.5 m 13-4.0 14-15 12 SS-6 80 12 34 22 16-4.9 Trace Gravel, Dense - 5.0 17-18 19-- 6.0 20-6.2 37 Grey Clayey Silt With Sand, SS-7 100 14 72 0 34 21 Moist, Hard 6.6 **END OF BOREHOLE** 22

REFERENCE No.: 11197394-02 ENCLOSURE No.: A-6 BOREHOLE No.: BH-106 BOREHOLE REPORT ELEVATION: 318.7 m Page: \_1\_ of \_1\_ **LEGEND** Grainboys Holdings Inc. CLIENT: \_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE ST LOGGED BY: E. Wierdsma DATE: 26 August 2019 - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons - WATER LEVEL NOTES: Ground surface elevation interpolated from preliminary site plan, electronic title "19-066 Site wContours.dwg" UTM: +/- 17T 648843E 4921149N m Below Existing Grade Blows per 3 in. / 15 cm Penetration Index Shear test (Cu) Stratigraphy Type and Number Moisture Content Recovery Sensitivity (S) □ Lab **COMMENTS** Depth Water content (%) W<sub>p</sub> W<sub>i</sub> Atterberg limits (%) **DESCRIPTION OF** SOIL AND BEDROCK X "N" Value (blows / 0.3 m) 0.0 % % Ν 10 20 30 40 50 60 70 80 90 ft m **GROUND SURFACE** TOPSOIL (800 mm) Borehole Open 4 **Upon Completion** SS-1 100 10 4 8 1 3 2 8.0 2 SILTY SAND - Light Brown 8 Silty Sand, Moist, Compact 1.0 SS-2 20 80 4 0 12 4 1.5 5 TILL - Light Brown Silty 6 Sand With Gravel, Trace SS-3 100 10 13 7 6 Clay, Moist, Compact 2.0 7 5 - Grading Sand Seam at 8 8 2.3 m SS-4 90 18 17 X 9 BOREHOLE LOG GEOTECH 11197394-02-FLD-19-10-11-GINT BH LOGS, EW.LR JK.GPJ GEOLOGIC.GDT 18/10/1 9 3.0 10-3.0 WL - 3.0 m 4 Grey, Wet 8/26/2019 11 SS-5 100 (Upon completion 10 24 13 11of drilling) 3.5 END OF BOREHOLE 13-4.0 14-15 16-- 5.0 17-18-19-6.0 20-21 22

REFERENCE No.: 11197394-02 ENCLOSURE No.: A-7 BOREHOLE No.: BH-107 BOREHOLE REPORT **ELEVATION:** 322.5 m Page: \_1\_ of \_1\_ **LEGEND** Grainboys Holdings Inc. CLIENT: \_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE LOGGED BY: E. Wierdsma ST DATE: 26 August 2019 - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons - WATER LEVEL NOTES: Ground surface elevation interpolated from preliminary site plan, electronic title "19-066 Site wContours.dwg" UTM: +/- 17T 648706E 4921331N m Below Existing Grade Blows per 3 in. / 15 cm Shear test (Cu) Penetration Stratigraphy Type and Number Moisture Content Recovery Sensitivity (S) **COMMENTS** □ Lab Water content (%) Atterberg limits (%) **DESCRIPTION OF** SOIL AND BEDROCK — m — 0.93 m X "N" Value (blows / 0.3 m) RQD CONE 0.0 % % Ν 10 20 30 40 50 60 70 80 90 ft m **GROUND SURFACE** TOPSOIL (200 mm) Borehole Open and 0.2 9 TILL - Light Brown Sandy Dry Upon SS-1 50 17 26 4 1 Silt, With Gravel, Moist, Completion 12 Compact 2 3 5 1.0 SS-2 10 9 11 6 5 BH-107, SS-3: 11 SS-3 0 0% Gravel 75 16 25 14 6 16% Sand 2.0 84% Silt and Clay 67% between 5-75 7 4 - Grading Sand Seam at 8 7 2.3 m SS-4 100 12 15 bx. 8 EW,LR JK.GPJ GEOLOGIC.GDT 18/10/1 9 3.0 10-3.0 8 Mottled 11 SS-5 100 14 26 0 15 11-3.7 12 Cobbles and Boulders (Inferred from Augers 13-Grinding) - 4.0 BOREHOLE LOG GEOTECH 11197394-02-FLD-19-10-11-GINT BH LOGS, 14-15 4.9 16 SS-6 100 8 37 22 16-Grey, Dense - 5.0 17-WL - 5.3 m 09/11/2019 18-19-6.0 20-50 mm diameter 19 monitoring well SS-7 100 13 41 22 21 installed to 6.1 m **END OF BOREHOLE** 22

REFERENCE No.: 11197394-02 ENCLOSURE No.: A-8 BOREHOLE No.: BH-108 BOREHOLE REPORT **ELEVATION:** 322.8 m Page: \_1\_ of \_1\_ LEGEND Grainboys Holdings Inc. CLIENT: \_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE ST LOGGED BY: E. Wierdsma DATE: 26 August 2019 - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons - WATER LEVEL NOTES: Ground surface elevation interpolated from preliminary site plan, electronic title "19-066 Site wContours.dwg" UTM: +/- 17T 648690E 4921084N m Below Existing Grade Blows per 3 in. / 15 cm Shear test (Cu) Penetration Moisture Content Stratigraphy Type and Number Recovery Sensitivity (S) □ Lab **COMMENTS** Depth Water content (%) W<sub>p</sub> W<sub>i</sub> Atterberg limits (%) **DESCRIPTION OF** SOIL AND BEDROCK X "N" Value (blows / 0.3 m) 0.0 % % Ν 10 20 30 40 50 60 70 80 90 ft m **GROUND SURFACE** TOPSOIL (600 mm) Borehole open 6 upon completion SS-1 50 14 7 13 1 8 0.6 2 TILL - Light Brown Silty Sand With Gravel, Compact, 4 Moist 5 1.0 SS-2 100 10 11 6 4 5 6 SS-3 100 17 13 11 6 2.0 7-2.3 5 With Clay, Wet  $\blacksquare$ WL - 2.4 m 8 6 SS-4 100 17 11 kο 8/26/2019 5 BOREHOLE LOG GEOTECH 11197394-02-FLD-19-10-11-GINT BH LOGS, EW.LR JK.GPJ GEOLOGIC.GDT 18/10/1 9 - 3.0 10-3 Groundwater 5 seepage first SS-5 100 Ø 14 14 9 encountered at 11-3.5 2.3 m END OF BOREHOLE (Upon completion of drilling) 13-4.0 14-15-16-- 5.0 17-18-19-6.0 20-21 22



Cli	ent:					(	Grair	nbo	ys ⊦	lol	ding	ıs In	С					Lab	no.:					S	S-1	9-79	9			
Pro	oject	t/Site:		34	469 (	Cond	cess	ion	Rd	1,	Uxb	oridg	je ,	Ont	ario	ı		Proj	ect :	no.:				111	1973	394-	-02			
	Bor	ehole no.:						В	3H-1	03								Samp	ole n	0.:				S	S-6					
	Dep	oth:						3.8	-4.3	m								Enclo	sure	e:				ļ	<b>4-</b> 9					
Percent Passing	100 90 80 70 60 50 40 30																							•					0 - 10 - 20 - 30 - 40 - 50 - 60 - 70	Percent Retained
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			(	Clay	& Sil	t				I		F:-			S	and	edi	1	0			Gravel								
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Pe	Performed by: Zoe Mathu							urin	rin			Date:		September 4, 2019																
Ve	rified by:							5	Sulland				Date: September 6, 201			19														



Client:			Grainboys Ho	oldings Inc	;		Lab no.:	SS-19-79				
Projec	t/Site:	3469 Con	cession Rd 1	, Uxbridge	e , Ontai	rio	Project no.:	1	11197394-02			
Вог	rehole no.:		BH-104	4			Sample no.:		SS-2			
De	pth:		0.8-1.4m	1			Enclosure:		A-10			
90 80 70 60 40 40 20 100 100 100 100 100 100 100 100 100										0 10 20 30 50 Au		
0	.001	0.01		0.1		1		10		100		
				Diam	eter (mm)					٦		
		Clay & Silt		Fine	e	Sand Mediu	ım Coarse	Fine	Coarse	-		
			Uni	fied Soil C	classifica	tion Syst	em		•			
		Soil Descr		Gr	avel	Sand		Clay & Silt				
					0	31		69				
Remar	ks:											
Perfor	med by:		Zoe Mat	athurin			Date:	September 4, 2019				
Verifie	erified by:				-		Date:	September 6, 2019				



Cli	ent:		Grainboys Ho	oldings Inc			Lab no.:		SS-19-79		
Pro	oject/Site:	3469 (	Concession Roa	ad 1, Uxbri	idge, Ol	N	Project no.:	1	1197394-02		
	Borehole no.:		BH-105				Sample no.:		SS-2		
	Depth:		0.8-1.2n	n			Enclosure:		A-11		
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						Sand		Gr	avel	]	
		Clay & Silt		Fine		Mediu		Fine	Coarse		
			Uni	ified Soil C	Classifica	tion Syst	em				
		Soil Des	cription		Gr	avel	Sand		Clay & Silt		
					2	34		64			
Re	marks:										
Pe	formed by:		Zoe Mat	athurin			Date:	Oct	October 17, 2019		
Ve	rified by:	Sullan			Date:	October 18, 2019					



Client:				Gra	ainbo	ys H	oldii	ngs	Inc				Lab no.:				SS-19-79								
Project/Site	te:	3	3469 C	onces	sion	Rd 1	I, U	xbrio	dge ,	Ont	tario	ı		Proj	ect ı	10.:			1	1197	7394	1-02			
Borehol	le no.:				Е	3H-10	7							Sam	ple n	0.:				SS-	3				
Depth:	-				1.5	-2.0n	n							Enclo	osure	): _				A-1	2				
100   90   90   90   90   90   90   90																			•					0 10 20 30 40 40 50 60 70 80 90 90	Percent Retained
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							Γ				Si	and							G	ravel					
		Cla	y & Silt			Un	ifica		Fine il Cla	ecifi	Catio		ediu		Coa	rse		Fin	е		Coa	rse	7		
	Ur						11160	1 30	. 016	133111	Catio	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	уз	tem											
Soil Description					Gravel						Sar	nd				Clay	& S	ilt							
										0				16	3					84					
Remarks:	Remarks:																								
Performed	Performed by: Zoe Mat						athurin				Date:				September 4, 2019										
Verified by	<b>^</b>				Surra				Date: September 6, 2019			19													

REFERENCE No.: 11197394-01 ENCLOSURE No.: \_\_\_ A-13 BOREHOLE No.: BH-1 BOREHOLE REPORT **ELEVATION**: Existing Grade Page: \_1\_ of \_1\_ LEGEND Grainboys Holdings Inc. CLIENT: \_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE ST LOGGED BY: E. Wierdsma DATE: 26 June 2019 - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons - WATER LEVEL NOTES: m Below Existing Grade Blows per 6 in. / 15 cm Penetration Index Shear test (Cu) △ Field Recovery Moisture Content Stratigraphy Type and Number Sensitivity (S) ☐ Lab **COMMENTS** ○ Water content (%)

Atterberg limits (%) **DESCRIPTION OF** SOIL AND BEDROCK — m — 0.90 m X "N" Value (blows / 0.3 m) RQD ft 0.0 % % 10 20 30 40 50 60 70 80 90 m **GROUND SURFACE** SILTY SAND - Dark Brown Dry on 07/04/2019 2 Silty Sand, Moist, Compact 3 SS-1 60 18 5 1 4 Dry on 09/11/2019 0.6 2 TILL - Light Brown Sandy Silt with Gravel and Clay, 3 Moist, Compact 3 1.0 6 SS-2 90 11 9  $\phi$ 10 5 8 7 7 SS-3 90 14 14 6 10 2.0 9 8 11 11 SS-4 100 22 11 10 9 BOREHOLE LOG GEOTECH 11197394-01-FLD-PHASE 2 BH LOGS EW JK.GPJ GEOLOGIC.GDT 16/10/19 - 3.0 10-6 9 SS-5 9 70 12 18 11-3.7 12 Occasional Cobbles 13-- 4.0 14-15-21 13 SS-6 100 38 0 7 25 16-- 5.0 5.0 END OF BOREHOLE End of Borehole 17open and dry after drilling 18-19-6.0 20-21 22

REFERENCE No.: 11197394-01 ENCLOSURE No.: A-14 BOREHOLE No.: BH-2 **BOREHOLE REPORT** ELEVATION: \_\_\_ 322.8 m Page: \_1\_ of \_1\_ **LEGEND** Grainboys Holdings Inc. CLIENT: \_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE LOGGED BY: E. Wierdsma ST DATE: 26 June 2019 - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons - WATER LEVEL NOTES: Ground surface elevation interpolated from preliminary site plan, electronic title "19-066 Site wContours.dwg" m Below Existing Grade Blows per 3 in. / 15 cm Shear test (Cu) Penetration Stratigraphy Type and Number Moisture Content Recovery Sensitivity (S) □ Lab **COMMENTS** Water content (%) W<sub>p</sub> W<sub>i</sub> Atterberg limits (%) **DESCRIPTION OF** SOIL AND BEDROCK X "N" Value (blows / 0.3 m) 0.0 % % Ν 10 20 30 40 50 60 70 80 90 ft m **GROUND SURFACE TOPSOIL** - Topsoil with 0.2 15 Rootlets SS-1 60 9 8 23 1 SILTY SAND - Dark Brown 7 Silty Sand, Moist, Compact 2 8.0 TILL - Light Brown Sandy 3 3 Silt with Gravel and Clay, 1.0 4 SS-2 60 22 7 Moist, Loose 3 5 2 3 4 SS-3 75 23 7 6 4 2.0 2 8 2 5 0 SS-4 60 7 25 10 9 BOREHOLE LOG GEOTECH 11197394-01-FLD-PHASE 2 BH LOGS EW JK.GPJ GEOLOGIC.GDT 16/10/19 3.0 10-3.0 10 Mottling 6 SS-5 8 75 10 14 11-13-4.0 14-15 4.6 Wet Borehole open to 9 4.6 m after drilling. 6 16-SS-6 100 11 15 Water up to 4.3 m 5.0 after drilling. 5.2 17-END OF BOREHOLE 18-19-6.0 20 21 22

REFERENCE No.: 11197394-01 ENCLOSURE No.: \_\_ A-15 BOREHOLE No.: BH-3 **BOREHOLE REPORT ELEVATION**: Existing Grade Page: \_1\_ of \_1\_ LEGEND Grainboys Holdings Inc. CLIENT: \_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE ST LOGGED BY: E. Wierdsma DATE: 26 June 2019 - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons - WATER LEVEL NOTES: m Below Existing Grade Blows per 6 in. / 15 cm Penetration Index Shear test (Cu) △ Field Recovery Moisture Content Stratigraphy Type and Number Sensitivity (S) **COMMENTS** Water content (%)
W<sub>p</sub> W<sub>l</sub> Atterberg limits (%) □ Lab **DESCRIPTION OF** SOIL AND BEDROCK — m — 1.00 m X "N" Value (blows / 0.3 m) RQD 0.0 % % Ν 10 20 30 40 50 60 70 80 90 ft m **GROUND SURFACE** SILTY SAND - Dark Brown 1 WL - 0.2 m Silty Sand, Moist, Loose 9/11/2019 SS-1 60 29 3 4 1 1 0.6 2 TILL - Light Brown Sandy Water level within Silt with Gravel and Clay, 2 stick-up on Moist, Compact 4 07/04/2019 1.0 4 SS-2 100 15 8 No 6 5 6 9 SS-3 11 100 13 20 6 12 2.0 7 5 8 2.4 9 Grey 11 SS-4 100 15 20 0\* 13 9 BOREHOLE LOG GEOTECH 11197394-01-FLD-PHASE 2 BH LOGS EW JK.GPJ GEOLOGIC.GDT 16/10/19 - 3.0 10-AS-5 14 11-4.0 13-4.0 SAND - Grey Fine Sand, Wet, Compact 14-15-4 7 SS-6 100 18 11 kο 16-7 - 5.0 5.0 END OF BOREHOLE 17-Borehole open after drilling 18-19-6.0 20-21 22

REFERENCE No.: 11197394-01 ENCLOSURE No.: \_\_\_\_ A-16 BOREHOLE No.: BH-4 BOREHOLE REPORT **ELEVATION:** Existing Grade Page: \_1\_ of \_1\_ LEGEND Grainboys Holdings Inc. CLIENT: \_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE LOGGED BY: E. Wierdsma DATE: 26 June 2019 ST - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons ▼ - WATER LEVEL NOTES: m Below Existing Grade Blows per 6 in. / 15 cm Penetration Index Shear test (Cu) △ Field Stratigraphy Type and Number Moisture Content Recovery Sensitivity (S) **COMMENTS** □ Lab ○ Water content (%)

Atterberg limits (%) **DESCRIPTION OF** SOIL AND BEDROCK — m — 0.90 m X "N" Value (blows / 0.3 m) RQD 0.0 % % Ν 10 20 30 40 50 60 70 80 90 ft m **GROUND SURFACE** FILL - Brown Sand and 5 Gravel, Moist, Compact 0.3 SS-1 50 14 4 9 1 SILTY SAND - Grey Silty 4 Sand with Gravel, Moist, 0.6 2 Compact TILL - Light Brown Sandy 2 with Gravel and Clay, Moist, 3 - 1.0 Compact 5 SS-2 40 14 8 NO 5 5 6 9 SS-3 6 60 13 15 6 10 2.0 WL - 2.1 m 7-7/04/2019 2.3 12 Mottling 8 14 20 SS-4 40 12 34 WL - 2.02 m 19 9 09/11/2019 BOREHOLE LOG GEOTECH 11197394-01-FLD-PHASE 2 BH LOGS EW JK.GPJ GEOLOGIC.GDT 16/10/19 - 3.0 10-13 16 3.4 SS-5 23 100 39 11-8 Grading Grey 24 3.7 12 Occasional Cobbles 3.8 19 13-45 - 4.0 SS-6 70 10 77 32 14-15-Borehole open 15 |<sub>50=5"</sub>|100+ after drilling. SS-7 100 10 Φ 16-- 5.0 5.0 **END OF BOREHOLE** 17-18-19-- 6.0 20-21 22

ENCLOSURE No.: \_\_\_\_ REFERENCE No.: 11197394-01 A-17 BOREHOLE No.: BH-5 **BOREHOLE REPORT ELEVATION:** Existing Grade Page: \_1\_ of \_1\_ **LEGEND** Grainboys Holdings Inc. CLIENT: \_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE LOGGED BY: E. Wierdsma DATE: 26 June 2019 ST - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons - WATER LEVEL NOTES: m Below Existing Grade Blows per 6 in. / 15 cm Penetration Index Shear test (Cu) △ Field Stratigraphy Recovery Moisture Content Type and Number Sensitivity (S) **COMMENTS** □ Lab Depth ○ Water content (%)

Atterberg limits (%) **DESCRIPTION OF** SOIL AND BEDROCK X "N" Value (blows / 0.3 m) RQD 0.0 % % Ν 10 20 30 40 50 60 70 80 90 ft m **GROUND SURFACE** FILL - Brown Silty Sand with 5 Gravel, Moist, Compact 7 SS-1 60 11 12 1 6 2 3 2 - 1.0 3 SS-2 × 0 60 17 5 4 4 1.2 Dark Brown Sandy Silt 5 1.5 2 with Clay, trace Gravel BH-5, SS-3 2 3% Gravel 4 SS-3 6 90 12 6 40% Sand 6 57% Silt and Clay 2.0 7-2.3 5 TILL - Light Brown Sandy 8 12 Silt with Gravel and Clay, Mottling, Moist, Compact 11 SS-4 100 12 23 b X 17 9 BOREHOLE LOG GEOTECH 11197394-01-FLD-PHASE 2 BH LOGS EW JK.GPJ GEOLOGIC.GDT 16/10/19 - 3.0 10-9 13 SS-5 16 100 29 11-11 3.7 12 END OF BOREHOLE Borehole open after drilling. 13-- 4.0 14-15-16-- 5.0 17-18-19-- 6.0 20-21 22

REFERENCE No.: \_\_\_\_\_ 11197394-01 ENCLOSURE No.: \_\_\_\_ A-18 BOREHOLE No.: BH-6 **BOREHOLE REPORT ELEVATION**: Existing Grade Page: \_1\_ of \_1\_ **LEGEND** Grainboys Holdings Inc. CLIENT: \_\_  $\boxtimes$  ss - SPLIT SPOON PROJECT: 3469 Concession Road 1, Township of Uxbridge AS - AUGER SAMPLE ST LOGGED BY: E. Wierdsma DATE: 26 June 2019 - SHELBY TUBE ■ CS - CORE SAMPLE DRILLING COMPANY: Strong Soil Search Inc. METHOD: Solid Stem Augers and Split Spoons ▼ - WATER LEVEL NOTES: \_ m Below Existing Grade Blows per 6 in. / 15 cm Penetration Index Shear test (Cu) △ Field Moisture Content Stratigraphy Type and Number Recovery Sensitivity (S) **COMMENTS** □ Lab ○ Water content (%)

Atterberg limits (%) **DESCRIPTION OF** SOIL AND BEDROCK X "N" Value (blows / 0.3 m) 0.0 % % Ν 10 20 30 40 50 60 70 80 90 ft m **GROUND SURFACE** SILTY SAND - Dark Brown 1 Silty Sand, Loose, Moist SS-1 40 28 2 3 1 3 0.6 2 TILL - Light Brown Sandy Silt with Gravel and Clay, 1 Mottling, Moist, Compact 3 1.0 6 SS-2 90 12 9 æ 7 4 5 3 BH-6, SS-3 8 8% Gravel SS-3 11 90 13 19 6 26% Sand 13 66% Silt and Clay 2.0 7-6 8 2.4 8 **Grading Grey** 10 18 SS-4 100 ЮX 13 10 9 BOREHOLE LOG GEOTECH 11197394-01-FLD-PHASE 2 BH LOGS EW JK.GPJ GEOLOGIC.GDT 16/10/19 - 3.0 10-8 13 SS-5 100 27 0 14 14 11-3.5 END OF BOREHOLE End of Borehole 12 open and dry 13-- 4.0 14-15-16-- 5.0 17-18-19-- 6.0 20-21 22

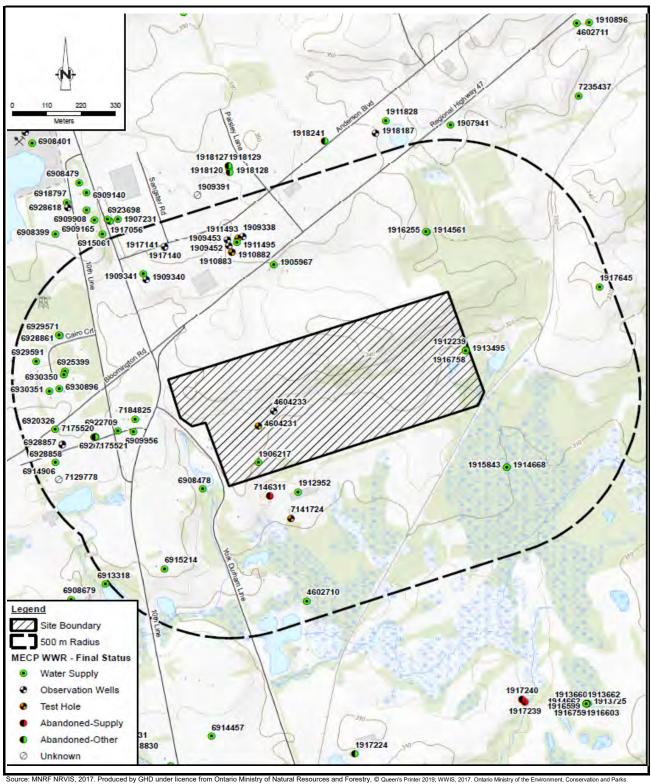


Clie	nt:	Grainboys Ho	oldings Inc.	La	ab no.:	SS-	19-52		
Proj	ect/Site:	3469 Concession Rd. 1,	Township of Uxb	ridge Pr	roject no.:	11197	'394-01		
	Borehole no.:	BH-5		Sa	ample no.:	SS-	3		
	Depth:	1.5-2.1n	n	Er	nclosure:	A-1	9		
Percent Passing	90							0 10 20 30 40 50 60	Percent Retained
	10							90	
	0.001	0.01	0.1 Diameter (mm	) 1		10		100	
		Clay & Silt	Fine	Sand Medium	Coarse	Gravel Fine	Coarse		
		Ur	lified Soil Classific			· I			
		Soil Description	G	ravel	Sand	Clay	& Silt		
				3	40		57		
Rem	arks:								
Perf	ormed by:	Josh St	ıllivan		Date: July 10, 2019				
Veri	fied by:	2	Sullan		<b>Date:</b> July 10, 2019				



Clie	ent:	Grainboys Holdings Inc.	Lab no.:	SS-19-52			
Pro	ject/Site:	3469 Concession Rd 1, Township of Uxbridge	Project no.:	11197394-01			
	Borehole ne	o.: BH-6	Sample no.:	SS-3			
	Depth:	1.5-2.1m	Enclosure:	A-20			
Percent Passing	100 90 80 70 60 40 30 20				0 10 20 30 40 Fercent Retained 60 70 80 90		
	0.001	0.01 0.1	1	10	100		
		Diameter (mm)					
		Clay & Silt Fine M	ledium Coarse	Gravel Fine Coarse			
		Unified Soil Classification S	System				
		Soil Description Gravel	Sand	Clay & Silt			
		8	26	66			
Rer	narks:						
Per	formed by	: Josh Sullivan	Date:	July 10, 2019			
Ver	ified by:	Je Sun	Date:	Date: July 10, 2019			

# Appendix B MECP Well Records and Well Survey



Source: MNRF NRVIS, 2017. Produced by GHU under licence from Untano Ministry of Natural Resources and Forestry, © Queen's Printer 2019; WWIS, 2017. Ontario Ministry of the Environment, Conservation and Par (Accessed January 2017).

#### Scale:

Refer to Scale Bar Coordinate System: NAD 1989 UTM Zone 17N





Grainboys Holdings Inc. 3469 Con Rd 1, Township of Uxbridge Geotechnical Investigation

MECP Well Inventory Map

11197394-02 October 2019

FIGURE B.1

#### APPENDIX B.2: WELL SUMMARY - BORED / DUG WELLS

Well Record Summary Project No.: 11197394-02

3469 Concession Road 1, Township of Uxbridge, Ontario

I	MECP	Well	Wate	r Found	Stati	c Level	Pump	Rate	Well [	Depth	Comments
	Well No.	Use	Feet	Metres	Feet	Metres	Igpm	L/min	Feet	Metres	
Ι	1912952	Domestic	27	8.2	2	0.6	10	37.9	30	9.1	clay to 27', sand to 30'
	6908478	Domestic	25	7.6	15	4.6	2	7.6	29	8.8	Topsoil to 1', sandy clay to 22', gravel to 25', clay to 29'

Number of wells = 2

	Wate	r Found	Stati	c Level	Pump	Rate	Well Depth		
	Feet	Metres	Feet	Metres	lgpm	L/min	Feet	Metres	
AVERAGE	26.0	7.9	8.5	2.6	6.0	22.7	29.5	9.0	
MAXIMUM	27.0	8.2	15.0	4.6	10.0	37.9	30.0	9.1	
MINIMUM	25.0	7.6	2.0	0.6	2.0	7.6	29.0	8.8	

#### APPENDIX B.3: WELL SUMMARY - DRILLED OVERBURDEN WELLS

Well Record Summary Project No.: 11197394-02 3469 Concession Road 1, Township of Uxbridge, Ontario

MECP	Well	Water	Found	Stati	c Level	Tes	t Rate	Well	Depth	Comments
Well No.	Use	Feet	Metres	Feet	Metres	Igpm	L/min	Feet	Metres	
1905967	Livestock	60.0	18.3	58.0	17.7	6.0	22.7	78.0	23.8	Clay with stones to 44', sand to 78'
1906217	Commercial	79.0	24.1	79.0	24.1	8.0	30.3	92.0	28.0	Clay and sand to 12', sand and silt to 29', clay till to 36', sand ans stones to 92'
190938	Industrial	156.0	47.5					214.0	65.2	sandy clay to 23', sand and stones to 137', sabdy clay to 143', sand to 156', stones with sand to 214'
1909340	Commercial	209.0	63.7	80.0	24.4	25.0	94.6	222.0	67.7	Sand and silt to 9', clay and sand to 12', sand and stones to 119', clay to 161', sand and stones to 222'
1909341	Commercial	201.0	61.3	80.0	24.4	18.0	68.1	222.0	67.7	Sand and silt to 9', clay and sand to 12', sand and stones to 119', clay to 161', sand and stones to 222'
1909452	Not Used	196.0	59.7			10.0	37.9	214.0	65.2	sand with stones and clay to 137', clay and tones to 156', stones with sand to 214'
1909453	Not Used	196.0	59.7			10.0	37.9	215.0	65.5	sand with stones and clay to 137', clay and tones to 156', stones with sand to 215'
1910882	Industrial	170.0	51.8	69.0	21.0	535.0	2025.0	197.0	60.0	Topsoil to 1', clay to 33', silty gravel to 112', gravel to 118', clay to 182', sand stones to 192', gravel to 197'
1911495	Industrial	153.0	46.6	70.0	21.3	722.0	2732.8	200.0	61.0	clay and stones to 31', gravel to 44', sand and stones to 84', gravel to 194', clay and stones to 198', silty gravel to 200'
1912239	Domestic	115.0	35.1	33.0	10.1	15.0	56.8	118.0	36.0	clay to 15', sand to 60', gravel to 67', sand to 118'
1913495	Domestic	114.0	34.7	60.0	18.3	9.0	34.1	118.0	36.0	Topsoil to 2', clay with sand and stones to 52', sand and gravel to 58', silty clay to 95', silt to 114', sand to 118'
1914668	Domestic	81.0	24.7	6.0	1.8	20.0	75.7	88.0	26.8	clay to 81', sand to 88'
1915843	Domestic	156.0	47.5	40.0	12.2	15.0	56.8	158.0	48.2	Topsoil to 2', clay till to 75', clayey silt to 154', clay to 156', sand to 158'
1916255	Domestic	89.0	27.1	50.0	15.2	10.0	37.9	89.0	27.1	clayey sand to 40', sand to 89'
1916758	Domestic	146.0	44.5	37.0	11.3	12.0	45.4	154.0	46.9	sandy clay to 28', sand to 3', sandy clay to 48', silty sand with stones to 96', clay to 133', sand and stones to 154'
4602710	Domestic	82.0	25.0	17.0	5.2	3.0	11.4	82.0	25.0	clay and stones to 18', clay to 42', sand and clay to 70', sand to 82'
4604231	Not Used	15.0	4.6					140.0	42.7	well abandonded due to artisian conditions
4604233	Not Used	34.0	10.4	2.0	0.6			305.0	93.0	Clay to 11', sand to 34', clay to 253', gravely clay to 305'
6909956	Domestic	39.0	11.9	40.0	12.2	8.0	30.3	50.0	15.2	clay to 18', sandy gravel to 39', sand to 50'
6914906	Domestic	40.0	12.2	-		5.0	18.9	60.0	18.3	clay to 15', gravel to 30', sand to 60'
6915214	Domestic	100.0	30.5	16.0	4.9	5.0	18.9	138.0	42.1	dug well to 30', sand to 35', clayey gravel to 42', sandy clay to 130', sand to 138'
6920326	Domestic	80.0	24.4	54.0	16.5	15.0	56.8	93.0	28.3	clay to 6', sand to 32', clay to 80', sand to 93'
6922709	Domestic	51.0	15.5	30.0	9.1	10.0	37.9	64.0	19.5	sandy clay to 18', sand to 32', gravel to 37', sand to 64'
6925399	Domestic	100.0	30.5	55.0	16.8	10.0	37.9	100.0	30.5	Topsoil to 1', clay to 21', gravel to 24', sandy clay to 50', gravel to 58', sandy clay to 74', silt to 100', sand to 108'
6928857	Not Used							137.0	41.8	well not used
6928858	Not Used		-	-		-		65.0	19.8	Topsoil to 2', silty clay and gravel to 38', sand and gravel to 65'
6928861	Unknown		-	-		452.0	1710.8	60.0	18.3	Gravel to 1', silt sand to 3', silty sand and gravel to 50', gravel to 60'
6929571	Unknown	-	-			618.0	2339.1	65.0	19.8	gravel to 3', topsoil to 5', silty clay to 15', silty sand and gravel to 53', gravel to 65'
6929591	Domestic	170.0	51.8			10.0	37.9	170.0	51.8	sand to 10', clay to 25', sand and gravel to 170'
6930350	Domestic	111.0	33.8			12.0	45.4	115.0	35.1	Topsoil to 1', silty sand to 24', clay to 33', sand and gravel to 115'
6930351	Domestic	111.0	33.8	-		12.0	45.4	115.0	35.1	Topsoil to 1', silty sand to 24', clay to 33', sand and gravel to 115'
6930896	Domestic	112.0	34.1			12.0	45.4	116.0	35.4	Topsoil to 1', silty sand to 24', clay to 33', sand and gravel to 116'
7129778	Domestic	45.0	13.7	40.0	12.2	7.0	26.5	45.0	13.7	clay to 32', gravely sand to 45'
6930350	Domestic	111.0	33.8	-		12.0	45.4	115.0	35.1	Topsoil to 1', silty sand to 24', clay to 33', sand and gravel to 115'
7184825	Domestic	36.0	8.8	34.0	10.4	12.0	45.4	42.0	12.8	sand and clay to 4', clay and gravel to 21', gravel and sand to 36', sand to 42'

Number of wells: 35

		Water	Found	Stati	c Level	Pump	Rates	Well Depth		
_		Feet Metres		Feet	Metres	gpm	L/min	Feet	Metres	
ı	AVERAGE	108.3	32.9	45.2	13.8	87.3	330.3	127.3	38.8	
	MAXIMUM	209.0	63.7	80.0	24.4	722.0	2732.8	305.0	93.0	
	MINIMUM	15.0	4.6	2.0	0.6	3.0	11.4	42.0	12.8	

### APPENDIX B.4: WELL SUMMARY - DRILLED OVERBURDEN WELLS

Well Record Summary
Project No.: 11197394-02
3469 Concession Road 1, Township of Uxbridge, Ontario

MECP	Well	Wate	r Found	Stati	c Level	Tes	t Rate	Well	Depth	Comments
Well No.	Use	Feet	Metres	Feet	Metres	Igpm	L/min	Feet	Metres	
1910883	Test Hole							240.0	73.2	Topsoil to 1', clay to 33', silty gravel to 112', gravel to 118', clay to 182', sand stones to 192', gravel to 197'
1911493	Test Hole							225.0		Clay with stones to 31', gravel to 44', sand and stones to 84', gravel to 194', clay and stones to 198', silty gravel to 204', clay and silt to 225'
1917140	Abandonded		-	-		-		222.0	67.7	Abandonment record
1917141	Abandonded			-	-	-		122.0	37.2	Abandonment record
1917645	Abandonded							162.0	49.4	Abandonment record
6928859	Abandonded				-			529.0	161.2	Abandonment record
7141724	Monitoring Well							28.0	8.5	Fill to 4', clay to 28'
7146311	Abandonded							98.0	29.9	Abandonment record

Number of wells: 8

	Water Found		Stati	c Level	Pump	Rates	Well Depth	
	Feet	Metres	Feet	Metres	gpm	L/min	Feet	Metres
AVERAGE	0.0	0.0	0.0	0.0	0.0	0.0	203.3	62.0
MAXIMUM	0.0	0.0	0.0	0.0	0.0	0.0	529.0	161.2
MINIMUM	0.0	0.0	0.0	0.0	0.0	0.0	28.0	8.5



### MINISTRY OF THE ENVIRONMENT

The Ontario Water Resources Act

## WATER WELL RECORD 3103

Ontario  1. PRINT ONLY IN 2 2. CHECK  CORR	SPACES PROVIDED	190596	7 19.012	CON. 101
COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN VILLAGE		CON., BLOCK, TRACT, SURVEY, I	ETC. LOT THE
	RX3 S	touff v. 1	10	DAY 15 MO. YR
	75000	ELEVATION  S // O O	E ASIN SODE	" " " " " " " " " " " " " " " " " " " "
LO	OG OF OVERBURDEN AND BEDR	.5 Z6	(SEE INSTRUCTIONS)	47
GENERAL COLOUR MOST COMMON MATERIAL	OTHER MATERIALS		GENERAL DESCRIPTION	DEPTH · FEET FROM TO
Prown ( by	with stones			0 14
FOUND CHAY grav				14 15
Prown Sand	with stines			12 47
Frown Sana				
S.e.		<u> </u>		
		,		
(3) DOI 4605/2 DOIS	16/1	0078628		ا لىلىلىلىلىا ا
32 WATER RECORD	CASING & OPEN HOLE	RECORD -	SIZE(S) OF OPENING 34-3	13 ONOT 250-36 LENGTH 39-40
WATER FOUND KIND OF WATER	INSIDE WALL THICKNESS	RECORD  DEPTH - FEET  ROH TO  13-16	06.0	2/ INCHES 05 FEET DEPTH TO TOP 41-44   00
10-13 1 THE FRESH 31 SULPHUR 14	10-11 I D STEEL 12	1 1000	Starnless	0073 FEET
15-16 1   FRESH 3   SULPHUR 19 2   SALTY 4   MINERAL	3 CONCRETE 4 OPEN HOLE	\		SEALING RECORD
20-23 1	17-18 1	20-23	DEPTH SET AT - FEET MATE FROM TO MATE	ERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
25-28 1   FRESH 3   SULPHUR 28 2   SALTY 4   MINERAL	4 _ OPEN HOLE	27-30	18-21 22-28	
30-33 t   FRESH 3   SULPHUR 34 BO 2   SALTY 4   MINERAL	2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE		26-29 30-33 80	
PUMPING TEST METHOD 10 PUMPING RATE	11-14 DURATION OF PUMPING		LOCATION OF	WELL
1 Pump 2 Bailer DOO6  STATIC WATER LEVEL END OF PUMPING WATER LE	GPM   HOURS   MINS  1   PUMPING 2   RECOVERY	IN DIAGRA LOT LINE.	M BELOW SHOW DISTANCES O	
	30 MINUTES 45 MINUTES 60 MINUTES 38-37			
19-21 22-24 IS MINUTES 26-26  OF B FEET FEET FEET  OF FEET FEET  OF FEET FEET  OF FEET FEET  OF FEET FEET FEET  OF FEET FEET FEET FEET FEET FEET FEET FE	ET AT WATER AT END OF TEST 42		Huylimay	<b>47</b>
GPM GPM RECOMMENDED PUMP TYPE RECOMMENDED PUMP PUMP	FEET 1 DELEAR 2 CLOUDY 43-45 RECOMMENDED 46-49	Vious	28	1
SHALLOW WEEP SETTING	FEET PUMPING ONE GPM.	appr.	1 7 3	
FINAL SA I WATER SUPPLY	8 ABANDONED, INSUFFICIENT SUPPLY	d = (	vetting Born	
STATUS   2   OBSERVATION WELL 3   TEST HOLE 4   RECHARGE WELL	- 6 ABANDONED, POOR QUALITY 7 UNFINISHED	3 3		7.7
BB-88 1 □ DOMESTIC 2 □ STOCK	\$ COMMERCIAL  B MUNICIPAL	Jol 1		777
USE 02   IRIGATION   INDUSTRIAL   OTHER	7   PUBLIC SUPPLY 8   COOLING OR AIR CONDITIONING 9   NOT USED		And the second s	*
1 D CABLE TOOL	NOT USED  BORING	:		<i>:</i>
METHOD  2	ONAL) 7 DIAMOND  8 DETTING	·		
DRILLING   1   ROTARY (AIR)   5   AIR PERCUSSION	1 DRIVING	DRILLERS REMARKS:		
NAME OF WELL CONTRACTOR	LICENCE NUMBER	DATA SOURCE  DATE OF INSPECTION	22/8 DAY	0387"
ADDRESS  ADDRESS  NAME OF DRILLER OF TORER  CALL  ADDRESS  AND ADDRESS  AND ADDRESS  AND ADDRESS  AND ADDRESS  AND ADDRESS  AND ADDRESS  A	Pex 6E	l w l	INSPECTOR	
NAME OF DRILLER OF TORER	LICENCE NUMBER	REMARKS:	· · · · · · · · · · · · · · · · · · ·	P
SIGNATURE OF CONTRACTOR	SUBMISSION DATE DAY / 7 MO. 411 YR. S.		aly 06/2/63	w <sub>I</sub>
MINISTRY OF THE ENVIR	<del></del>	106	100g 6 172/63	FORM 7 07-091

Ontario	Z. CHECK 🗵 CORI	SPACES PROVIDED	1	9062	17	19012	CON		101
COUNTY OR DISTRICT		TOWNSHIP BOROUGH, CITY, TOWN, VILL	AGE .		CON	BLOCK TRACT, SURVEY	. ETC	:	O/R 25-27
		Stouth	ille	<i>,</i>	······································		DATE COMPLETE	.09	
- <del></del>	ميانيو سادوا	874350	5	1025	5	AASIN CODE		## 	IV 1
	L(	OG OF OVERBURDEN AND BE	25	K MATERIA	30	INSTRUCTIONS)			
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS			GENE	RAL DESCRIPTION		DEPTH FROM	- FEET
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Brown	and	stoner silt	2/				/:	2	29
Blue	day	sand & sil	7.				a	9	36
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Ley	sand	stones si	O	,			5	フ	62
Ley	sand,	stones	, 1	ct	lan	<u> </u>	6	2	84
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1 2 10	TER RECORD	CASING & OPEN HO	LL L	CORD	Size	St OF OPENING 3	DIAMETER	34-30	75 AO
WATER FOUND AT - FEET	KIND OF WATER	INSIDE WALL. DIAM MATERIAL THICKNESS	DEP	TH - FEET	田	ERIAL AND TYPE	960	INCHES	<b>3</b> ‴
79"	FRESH 7 SULPHUR 14 SALTY 4 MINERAL	10-11 1 STEEL 12	FACM	10	SCR	رگ الله	OF SC	07	7 11-41 10 FEET 10
	FRESH 3   SULPHUR <sup>19</sup>   SALTY 4   MINERAL	64 CONCRETE 188	. 9	079	61	PLUGGING	& SEALING	RECO	
20-23	) FRESH <sup>3</sup> □ SULPHUR <sup>24</sup>	17-18   STEEL 19   CALVANIZED		20-23	DEPTH FROM	SET AT - FEET	TERIAL AND TYPE	CEME	NT GROUT
	SALTY 4 MINERAL  FRESH 3 SULPHUR 29	CONCRETE  OPEN HOLE			10	0-13 14-17			
2 🗆	SALTY 4   MINERAL	24-25 1		27-30	11	5-21 22-25			
	FRESH 3 SULPHUR <sup>34 &amp;0</sup> SALTY 4 MINERAL	3 GONCRETE 4 GOPEN HOLE			26	-29 10-33 80			
PUMPING TEST MET	HO PUMPING RATE	/	7-18		L	OCATION OF	WELL		
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+02"	PUMPING  22-24 IS MINUTES  (Chi-2)	2 D RECOVERY  13 MINUTES 45 MINUTES 50 MINUT  17 9 29-31 9 32-34 9 93	ES . 17	/	ĺ		<b></b>		1
IF FLOWING.	FEET FEET	FEET FEET	FEET 42	/		47	HUNV	,	DA
FEET FLOWING GIVE RATE OOO (	· • · · · · · · · · · · · · · · · · · ·	FEET 1 CLEAR 2 CLOU	l i			<del></del>	700)	1	
RECOMMENDED PUN	PUNP	7 PUMPING X	6-49 GPM	ollo		ik .			ļ
50-53					1	1/.		2	7
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STATUS OF WELL	TEST HOLE RECHARGE WELL	7 □ UAFINISHED		makh	g was i	Pickering		V	
i	DOMESTIC 2 STOCK	5 M COMMERCIAL 6 MUNICIPAL		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		1	,		
WATER USE 0.		7 D PUBLIC SUPPLY  • COOLING OR AIR CONDITIONING			ř	110	0 —	<del>-3</del> (8)	
<del> </del>	OTHER	• ☐ NOT USED	4		F		e//m -	^	
METHOD	CABLE TOOL						1/ki -	<del>/</del>	
OF DRILLING	P GROTARY (REVERSE)  TOTARY (AIR)  A GROTARY (AIR)	■ □ JETTING 2 □ DRIVING			1				
NAME OF WELL C	ONTRACIOR /	LICENCE NUMBER	<b>-</b>   -	DATA		ONTRACTOR 59-62 DA	TE BEČEINED		29 00 100
5 Mils	a states he	elg J to 5459	ONIC	SOURCE		5459	L HELEITED	3 8	43-68 60
ACTOR ACTOR	+ Stoulkin	llotho	ساا	ı (	THOM:	INSPECTOR		v	<u> </u>
NAME OF STILL	and the	LICENCE HUMBER	CE US				<u></u>		<del>!/-}</del>
SIGNATURE OF CO	ONTRACTOR .	SUBMISSION DATE	OFFICE	100	on a	06/1/8	CSS.S8		
MININA	MU WILLEN	/IRONMENT COPY	<u> </u>	150	<del>5,007</del>	00/7/00			-477 FORM 7



Ontario	_	SPACES PROVIDED  RECT BOX WHERE APPLICABLE  1 2	19	09338	22 23 24
COUNTY OR DISTRICT	2. Creek (2) Cox	TOWNSHIP, BOROUGH, CITY, TOWN, VILL	GE	CON BLOCK TRACT, SURVEY ETC	13"
OWNER (SURNAME FIL	RST)	T. ADDRESS	01.	FFUILLE DAY 25	4" 88
420	CONSILL EASTING	CION RAFF Z	3/000	ATION RC AASIN CODE	01 18
21	1 12	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	<u> </u>	30 31	
	L	OG OF OVERBURDEN AND BE	DROCK MA	ATERIALS (SEE INSTRUCTIONS)	DEPTH · FEET
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y sun	Tare .	and white of	NI-		156 214
Iney _	SCANA	panis in the second	1		
31   1 +	.     ,   ,   ,     , .				ا ليليليلل
32	<u> </u>		عيا ليل	بيا لتلتلبلنينيا ليلتلبلل	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
41 W/	ATER RECORD	51 CASING & OPEN H	OLE RECO	RD SIZE STOF OF OPENING 31-33 DIAME	6 20
WATER FOUND	KIND OF WATER	INSIDE WALL DIAM MATERIAL FA:CRNESS INCHES INCHES	DEPTH -	MATERIAL AND TYPE	DEPTH TO TOP 41-44 34
1 1 1 1 1	FRESH 3 SULPHUR SALTY 4 MINERALS	10-11 1 STEEL 12		1×9 S	187 FEET
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L	FRESH 3 DSULPHUR 2	17-18 1 USTEEL 2 UGALVANIZED		DEPTH SET AT - FEET MATERIAL AND	TYPE (CEMENT GROUT LEAD PACKER ETC.)
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	SALTY 6 GAS	4 80 3 □ CONCRETE 4 □ OPEN HOLE 5 □ PLASTIC		26-29 30-33 60	
PUMPING TEST I	METHOA 10 PUMPING I			LOCATION OF WEL	L
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STATIC LEVEL	WATER LEVEL END OF WATE PUMPING -ET E2-24 IS MINU	R LEVELS DURING RECOVERY	NUTES 1	LOT LINE INDICATE NORTH BY ARROW.	
153	189 189	TES 30 MINUTES 78-20 / 8 921-24 / 8 951-24 / 8 951-24	79.27	<b>)</b>	
Z IF FLOWING.	EET FEET SO-47 PUMP INT	ARE SET AT WATER AT END OF TEST			
IF FLOWING. GIVE RATE  RECOMMENDED	GPM PTYPE RECOMME	D FEET 1 CLEAR 1 C	LOUDY	CON	
☐ SHALL	OW DEEP SETTING	PUMPING FEET RATE	GPM		
\$0-53			==   {	_	
FINAL STATUS	WATER SUPPLY OBSERVATION	WELL # ABANDONED POOR QUALITY	UPPLY	LoT13	
OF WELL	L 4   RECHARGE WE	7 UNFINISHED LL 9 DEWATERING		<b>1</b>	
	1 DOMESTIC	S COMMERCIAL  MUNICIPAL		3	400'
WATER	3   IRRIGATION 4   INDUSTRIAL	7 DEBLIC SUPPLY  • COOLING OR AIR CONDITIONING	'	3 M'	X 400'
	O OTHER	• □ NOT USED	-	47 HWC	- <del></del>
METHO	1 V 10 11 11			47 400	07770
OF CONSTRUC	TION 4 B ROTARY (REVI	9 DRIVING			37772
T	AL CONTRACTOR	ON DIGGING OTH	CTOR'S	OATA 58 CONTRACTOR 59-62 DATE RECEIV	
0.1.//	an Mater	Welle Ha 545	ONLY	5459 SEP	2 7 1988
D X	2101	Lullo Och	11 11	DATE OF INSPECTION INSPECTOR	
H H NAME OF	WELL ECHNIS AN	WELL TECHN	ICIAN'S UI	AEMARKS	
CONTRACTOR	OF TECHNICIAN/CONTRACT	SUBMISSION DATE	OFFICE		_
[///	Miam 1	iller DAY MO	YR		<u>حری کی کی</u>
MINIS	TRY OF THE ENVI	RONMENT COPY			Sami No. 9990 (117 00) ( Onw

# Ministry of the Environment

The Ontario Water Resources Act

### WATER WELL RECORD

Ontario	1. PRINT ONLY IN S	SPACES PROVIDED  ECT BOX WHERE APPLICABLE  1 2	19093	40 [ 90,12]	15 22 23 24
COUNTY OF DISTRICT	7	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE		CON . BLOCK TRACT, SURVEY	ETC LOT 25-27
OWNER (SURNAME FIRS	an and	ADDRESS OF TO	W-01.	·	DATE COMPLETED 78-53
AYS	ZONE EASTING	NORTHING R	suffer	RC BASIN CODE	OAY MO YRU
21	ZONE EASTING	17 18 24	26	30 31	
	LC	OG OF OVERBURDEN AND BEDR	OCK MATERIA	LS (SEE INSTRUCTIONS)	
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS		GENERAL DESCRIPTION	DEPTH - FEET FROM TO
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1 July	July 18 18 18 18 18 18 18 18 18 18 18 18 18	DANOS			
31					
32				54	1   1   1   1   1   1   1   1   1   1
	TER RECORD	51 CASING & OPEN HOLI			DIAMETER 94-38 LENGTH 39-40
WATER FOUND AT - FEET	KIND OF WATER	INSIDE DIAM MATERIAL THICKNESS INCHES INCHES	DEPTH - FEET FRUM TO	MATERIAL AND TYPE	DEPTH TO TOP 41-44 30
1209" : 2	y FRESH 3 □ SULPHUR " SALTY 4 □ MINERAL	JOSH 1 DYSTEEL 12	5 209	<u>s</u>	J / FEET
	FRESH <sup>3</sup> SULPHUR <sup>19</sup> SALTY <sup>4</sup> MINERAL	CS CONCRETE / DD	1	1 20031110	& SEALING RECORD
20-23 1	FRESH <sup>3</sup> SULPHUR <sup>24</sup>	17-18   STEEL 19   E GALVANIZED	70.23	FROM TO	TERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
ZS-28 1 [	SALTY 4   MINERAL   FRESH 3   SULPHUR 29	3   CONCRETE   4   OPEN HOLE   26	27.30	10-13 14-17	
* [	] ŞALTY 4	Z4-Z5 1 STEEL Z6 2 GALVANIZED 3 CONCRETE		26-29 30-53 80	
2 0	SALTY 4 MINERAL	■ □ OPEN HOLE			
71 PUMPING TEST ME	10 PUNPING RAT	15   4 15-16 2 (No.		LOCATION O	F WELL
STATIC LEVEL	WATER LEVEL 25 END OF WATER	GPM HOURS HING LEVELS DURING 2 RECOVERY	IN D	IAGRAM BELOW SHOW DISTANCES LINE INDICATE NORTH BY AR	DUM MUNICIPAL PROPERTY OF THE
TEST & C	PUMPING  22:24 IS MINUTES		7,	9	CANI
	SE-41 PUMP INTAKE		iτ	<i>"</i> ")	
IF FLOWING. GIVE RATE  RECOMMENDED PU	GPM 2	OF FEET , CLEAR 2 CLOUDS		T.	0 Lol 13
RECOMMENDED PU	MP TYPE RECOMMENDS PUMP SETTING	ED 43-45 RECOMMENDED 46-4 PUMPING FEET RATE GP	11	2	
30-53			<u> </u>	A C	CON1  LOT 13  Charaction  ell # 2
FINAL	WATER SUPPLY OBSERVATION WE	S ABANDONED, INSUFFICIENT SUPPLY		7 770	ell#d
STATUS OF WELL	3 TEST HOLE 4 RECHARGE WELL	7 UNFINISHED		3	
	3-56   DOMESTIC	5 COMMERCIAL	1	0	
WATER	S STOCK S RRIGATION INDUSTRIAL	6   MUNICIPAL 7   PUBLIC SUPPLY 8   COOLING OR AIR CONDITIONING			-V 47
USE	OTHER	9 NOT USED		+/1	NY 47
METHOD	CABLE TOOL ROTARY (CONVE	6 BORING NTIONAL) 7 DIAMOND			
OF DRILLING	P ROTARY (REVERS	SE) # 🔲 JETTING 9 🗎 DRIVING		·	
	5 AIR PERCUSSION	4 4-	DRILLERS REMA		DATE RECEIVED 63-66 RG
	contractor Later 9	Welle Lift 5459	DATE OF INS	5459	SEP 2 2 1988
ADDRESS A	0 /2 //	W. Wa Ond	DATE OF INS	PECTION INSPECTOR	
MANE OF DRILL	LER OR BORES	LICENCE NUMBER	NE MAPKS		
ADDRESS  NAME OF ORIGINAL OF STREET	CONTRACTOR	SUBMISSION DATE	OFFICE		
Will	lian W	CRON DAY NO YR			C S S - S - S - S - S - S - S - S - S -
MINISTR	Y OF THE ENVIRO	NMENT COPY			FUHM NO. 0505—4—// FUHM



### The Ontario Water Resources Act

### WATER WELL RECORD

STATE OF THE PROPERTY OF THE P	Ontario Env	ironment	SPACES PROVIDED	1909341 🟋	00.121 con.
THE COURT OF THE C	_		RECT BOX WHERE APPLICABLE	10	
LOG OF OVERBURDEN AND BEDROCK MATERIALS SEE NATIONAL SECURIORS  SETTING AND SECURIORS  OTHER WATERIALS  OTHE	1 11 6	HAM	BRIDGE		70
CORPO FOR SURFACE AND SECRET STATES OF STATES			RAHZ	Stouffielde	DAY 12 NO 7 YR 88
### CLASAL DECENTION   1997	1 2	M 10 12	HING R		CODE "" III IV
STATE		LC	OG OF OVERBURDEN AND BEDR	OCK MATERIALS ISEE INSTRUC	TIONS)
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MATER RECORD   SI CASING & OPEN HOLE RECORD   WATER RECORD   WAT	I som		Low		201200
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WATER RECORD  WITH FOUND   STATE   STA					
AND   CONTROL	1 2 10	TER RECORD	SASING R OPEN HOLE	SIZE (5) OF OPE	65 75 80 NING 31-33 DIAMETER 34-36 LENGTH 39-40
Second Control   Seco	WATER FOUND		INSIDE WALL THICKNESS	DEPTH - FEET W	- INCHES
Second   S	100119		12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	.2 10	OF SCREEN
POST     PRESENT	75-18 1 🗆	FRESH 3 SULPHUR 19	GALVANIZED ONCRETE		LUGGING & SEALING RECORD
STATIC   STATUS   SUPPLIED   SU	20.23	FRESH 3   SULPHUR 24	E GALVANIZED		MATERIAL AND TYPE
PROPRIES   S   SULPHUR	25-26 1	FRESH 3   SULPHUR 29	4 DPEN HOLE		
PINAL STATUS OF WELL  STATUS O	30-33	FRESH 3 SULPHUR 34 90	2 GALVANIZED		
TI   POWER   BALLER   ON					
END C WATER LEVELS DURING 2 SECURING 2 SECUR	71   <i>  </i>	2 D BAILER	GPM		
TECH FEET TECT TECT TECT TECT TECT TECT TECT	LEVEL	END OF WATER LI	Z RECOVERY		
TILLING    TOTAL   PUMP INTACE SET AT   ACTE AT END OF TEST   AS		201 204	Q 0**   J 0 /***  Q 0 ***	133	W.
SHALLOW B DEEP SETTING STATE COME  FINAL STATUS OF WELL  STOCK  MECHANGE WILL  STOCK  MINICIPAL  STOCK  STOCK  MINICIPAL  STOCK  STOCK  MINICIPAL  STOCK  STO	F FLOWING,	38-41 PUMP INTAKE S	WATER AT END OF TEST 42	#/	, , , , , , , , , , , , , , , , , , ,
WATER USE    STOCK   MUNICIPAL	RECOMMENDED PUN	P TYPE RECOMMENDED	43-45 RECOMMENDED 46-49 PUMPING	7	Well #2
WATER USE    STOCK   MUNICIPAL	1 1	LE DEEP SETTING	FEET. RATE GPM	7	Deat 1
WATER USE    STOCK   MUNICIPAL				$\mathcal{I}$	CONC
WATER USE    STOCK   MUNICIPAL		3 TEST HOLE		8	60T13
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METHOD OF 3 ROTARY (CONVENTIONAL) 7 DIAMOND OF 3 ROTARY (REVERSE) 8 DETTING DRILLING 4 ROTARY (AIR) 9 DRIVING  DRILLERS REMARKS:  NAME OF WELL/CONTRACTOR 53-62 DATE RECEIVED 2 2 1988 63.68 FO ADRESS NAME OF DRILLERS REMARKS:  DATE OF INSPECTION  NSPECTOR  NSPECTOR  SUBMISSION DATE		4 🔲 INDUSTRIAL	■ COOLING OR AIR CONDITIONING	1	
METHOD OF OF OF OF DRILLING    ROTARY (REVERSE)   A   JETTING   ROTARY (RIP)   PRIVING   DRILLING   AIR PERCUSSION    DATA   SOURCE   DATA   SOURCE   SOURCE		57			HWYT
NAME OF VELL/CONTRACTOR  NAME OF VELL/CONTRACTOR  ADBRESS  NAME OF DRILLERS REMARKS:  DRILLERS REMARKS:  DATA SOURCE  SP CONTRACTOR 59-62 DATE RECEIVED 2 2 1988 53 68 80  GATE OF INSPECTION INSPECTI		2 N ROTARY (CONVENT 3 NOTARY (REVERSE	IONAL) 7 🖟 DIAMOND 4 🗎 JETTING		
ADRESS HAVE OF DAYLLER OF BORRE  NAME OF CONTRACTOR  SUBMISSION DATE  SUBMISSION DATE  SOURCE	DRILLING		9 DRIVING	DRILLERS REMARKS:	
ADRRESS  A TOP DESCRIPTION  INSPECTION  IN	1 10 11	ONTRACTOR ON A DA	Valo Hickerce NUMBERS	DATA SOURCE 58 CONTRACTOR	5 9 SEP 2 2 1988 53.61 FO
NAME OF DRIVER OF CONTRACTOR  SUBMISSION DATE  DAY  MO	ADBRESS D R 4	VF Mil	Lo Can	w	
SIGNATURE OF CONTRACTOR  SUBMISSION DATE  LL  O  CSS. GS	HATHE OF DANGLES	MOR BORE	LICENCE NUMBER	S REMARKS	
	S SIGNATURE OF CO	ONTRACTOR / ).	SUBMISSION DATE	FIG.	
MINISTRY OF THE ENVIRONMENT COPY  FORM NO. 0506—4—77 FORM 7	Will	cam (Nu	ABA DAY MO YR	0	C SS - (S) FORM NO. 0506-4-77 FORM 7

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	Ministry		-		Th	e Ontario	Water Resourc	es Act	
[ <b>?</b> ?]	of the			W/A	<b>TER</b>	: WI	ELL I	RECC	ORD
	Environment	utim	井丿				MILITARY TO THE PARTY OF THE PA	CON.	
Ontario	1.	PRINT ONLY IN SP	ACES PROVIDED	11	190	9452	[1,9,0,1,2		12 23 74
COUNTY OR DIS		CHECK 🗵 CORREC	T BOX WHERE APPLICABLE TOWNSHIP, BOROUGH	E 1 2 CITY, TOWN, VILLAGE		CON	BLOCK TRACT SURVEY	ETC	LOT 25-27
n	RHAI	N	UXB	RIDG	E		CONI	<del>-</del>	13
OWNER (SURN	THE FIRST	100 PA	ADDRESS	1 66	///			DATE COMPLETED	17"88
454	7790 July	EASTING	HORTHING	10WFTV	RC ELEVATIO	N RC	BASIN CODE	DAT	17
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		LOC	G OF OVERBURE	DEN AND BEDF	ROCK MATE	RIALS (SEE	INSTRUCTIONS		
GENERAL CO	U ALIA I	OST MATERIAL	OTHER	MATERIALS		GENER	RAL DESCRIPTION	DE FROM	PTH · FEET TO
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32		<u></u>	نيا لـــالـــالـــــا	<u>.,  a ;1</u>			54	55 31-33   DIAMETER 34-	75 80 38 LENGTH 39-40
41	WATER RECO	ORD	51 CASING	& OPEN HOL	E RECORD	Z (st	OF NO 1	Q <sub>INCH</sub>	C^-
WATER FOUND AT - FEET		ATER	INSIDE DIAM MATERIA INCHES	WALL THICKNESS INCHES	FRUM T	ျပုု	TERIAL AND TYPE	DEPTH TO TO SERVEN	''' <i>'19"</i> "   "
196	TO SHEET 40	□SULPHUR □ Minerals □ Gas	10-11 1 DOFEEL 2 DEALVANIZ	12	<b>~</b> //		22		//6 <sub>reer</sub>
19.	10   FRESH 3	SULPHUR 19 INTERALS	3 CONCRET	E	0 /9	6 61	PLUGGIN	G & SEALING RE	CORD
20-1	A LI SALIT 6	GAS 24	17-18 1 DSTEEL	19		20-21 DEPTH	SET AT FEET		CEMENT GROUT AD PACKER, ETC 1
	2 SALTY 6	□ MINERALS □ GAS	2 GALVANI 3 CONCRET 4 OPEN HO	TE	1		10-13 14-17		
25-	T U THESH 4	SULPHUR ZE L	5 □ PLASTIC	2.5		27-30	18-21 22-25		
30-1	33 1 PRESH 3	SULPHUR 34 RC	2 GALVANI 3 CONCRET 4 DOPEN HO	re   ,	5		26-29 30-33 80		
	2 SALTY 6	□ GAS	5 PLASTIC						
II 7 1 I	PUMP 2 BAILER	10 PUMPING RATE	GPW Z	N OF PUMPING 15-16 17 Hours MI	7-18		LOCATION O	F WELL	
STA	ATIC WATER LEVEL	25	VELS DURING	1 DUMPING		IN DIAGRAM BE	LOW SHOW DISTANCE NDICATE NORTH BY A	S OF WELL FROM RO. RROW.	AD AND
TEST	VEL PUMPING	1-24 IS MINUTES	1	PRECOVERY INUTES & 60 MINUTES 12-34 31	s 5-37	<b>/</b>	JB. WEL	1 6 1 1	
	FEET / 96,	24-24 EET FEE	T FEET	FEET F	💆	1	) D. WEF		
Z IF FLOW	YING, 3	8-41 PUMP INTAKE S		AT END OF TEST		,			
IF FLOW GIVE RA	ENDED PUMP TYPE	GPM RECOMMENDED	43-45 RECOMM		).49				
	SHALLOW   DEEP	PUMP SETTING	FEET RATE		~m \ \Z				BA2
50-53					$\exists \mid a \mid$			•	0 2
FIN	MAL	WATER SUPPLY OBSERVATION WELL		, INSUFFICIENT SUPPL	EM			<u>.</u>	0 B # 2 - 0 B # 1 + 3 W E L L
STA OF V	TUS   , 🗀	TEST HOLE RECHARGE WELL	7 UNFINISHEO		18			•	1.11
	\$5-36 1 🗅	DOMESTIC	5 COMMERCIAL					• 1	k3 WELL
	( -	IRRIGATION	A   MUNICIPAL  PUBLIC SUPPLY					·	
บเ	SE ' -	OTHER	■ ☐ COOLING OR AIR	NOT USED					
<b></b>	57 1 0	CABLE 100L	• D BO	RING	$\exists      $		# 47	TWG.	
	HOD   z 🚁/	ROTARY (CONVENT ROTARY (REVERSE	IONAL) 7 🔲 BIA	MOND			# 47	) · · ·	7789
	RUCTION 4 -	ROTARY (AIR) AIR PERCUSSION	• □ DRI	IVING	DOULERS	REMARKS	•	3	1103
l Name :	OF WELL CONTRACTOR		2 510	WELL CONTRACTO	R'S DATA	51		DATE RECEIVED	*13-64 40
	ilson's Wat		Limited	5459		RCE	5459	NOV 16	1988
ADDRE	:\$\$				1   ш	OF INSPECTION	INSPECTOR		
E R.	B. # 4/ S	toy Evill	e, Ontario	TAA 7X5		APRE			
CONTRA	Hadro	CONTRACTOR	SUBMISSION	DATE TO TO	OFFICE				
0 5	) P P TECHNICIAN	///://	DAY	MO YR	_    o				5.25
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	irognient viatro	n#2	VVA			MUNICI	-	CON.	
Ontario	I, PRINT ONLY IN S	PACES PROVIDED ECT BOX WHERE APPLICA	11 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	190	9453		3015	15	22 23 74
COUNTY OR DISTRICT	2. CHECK ES COM	TOWNSHIP, BOROUG	H. CITY, TOWN, VILLAGE	سير :		CON BLOCK, TI	ACT, SURVEY, E	TC	13
OWNER (SURNAME FIL	AM.	ADDRESS	BRIDG	· E	,		10 N 1	DATE COMPLETED	17" 85
454	790 JAN 6	U.S. SORTHING	Toutfu	ILLE ELEVATION	<del>)</del>	RC BASIN CO		DAY CO HO	
21	10 11	11 11		15 12		30 31			- 4
	LC	G OF OVERBUR	DEN AND BEDR	OCK MAT					DEPTH - FEET
GENERAL COLOUR	MOST COMMON MATERIAL	ОТНЕ	R MATERIALS		GI	ENERAL DESCI	RIPTION	FR	ON 10
Braun	sand	stores	clay		<del> </del>			/0	7 7
Brann_	ound	otogea	<u>, L</u>						7 129
Brown	suga	Nocks "	elones				<del></del>	12	9 152
Exey_	elpy	alones	1.4					15	2 2/5
May	otheres	Rand +	while	ay					<u> </u>
	•		<u></u>	<u>v</u>					
						<b></b>			
<u> </u>					-				
31				لسال	444	سالت			
32	<u></u>	بالليليال		43		SIZE (S) OF OPER	NING 3	65 DIAMETER	34-38 LENGTH 39-4
41 WA	ATER RECORD	INSIDE	G & OPEN HOLE	RECORD		(SLOT NO )	25_	$\mathcal{Q}$	NCHES FEE
AT - FEET	KIND OF WATER	DIAM MATER	INCHES	FROM	S S S S S S S S S S S S S S S S S S S	MATERIAL AND	77	DEPTH OF SCR	10 TOP 41-41 EEN 96 FEET
110	SALTY 4 MINERALS 6 GAS	2 10-11 1 0 STEEL 2 10 GALVAN 3 0 CONCRI 4 0 OPEN 1	ETE     1	0 /	961	51 P	LUGGING	& SEALING	
2	SALTY 6 GAS	17-16 1 DSTEEL	19		20-23	DEPTH SET AT	FEET MA	TERIAL AND TYPE	(CEMENT GROUT LEAD PACKER ETC.)
2	SALTY 6 GAS	2 GALVAN 3 CONCR 4 OPEN 1 5 OPLASTI	ETE HOLE			10-13	14-17		
1	☐ FRESH 3 ☐ SULPHUR 17 4 ☐ MINERALS ☐ SALTY 6 ☐ GAS	24-25 1 GSTEEL 2 GALVAI	26		27-30	18-21	22-25		
	FRESH 3 SULPHUR 345 SALTY 6 GAS	3 CONCR 4 OPEN ( 5 PLASTI	IOLE !	<u>l_</u>		26-29	30-33 80		
71 PUMPING TEST N	$\mathcal{H}   \mathcal{A}  $	E 11-14 DURAT	ION OF PUMPING			LOCA	TION OF	WELL	
1 PUMP	WATER LEVEL 45	GPM	HOURS MIN		IN DIAGRAI	M BELOW SHO	W DISTANCES ORTH BY ARE	OF WELL FROM	ROAD AND
ES	2) 23-24 15 MINUTES		RECOVERY MINUTES 60 MINUTES 31-34 35-		Λ			11 #2	
	1/9/6 1	EET FEET	FEET FEI			0 .	. W~	•	
FE FLOWING. GIVE RATE  RECOMMENDED O	GPM.		CLEAR & CLOUD		l				
RECOMMENDED O	PUMP TYPE RECOMMENDS PUMP OW DEEP SETTING	ED 43-45 RECOM PUMPI FEET RATE	IMENDED 46- NG GP	12 11					nAA2
50-33								•	• 08 # 2 • 08 # 1 • #3 WEL
FINAL	1 WATER SUPPLY 2 OBSERVATION WI	ELL       ABANDONE	D. INSUFFICIENT SUPPLY D POOR QUALITY	1 7					. 00 H
STATUS OF WELL	1 1 1 1201 11022	7   UNFINISH 9   DEWATERIA		7					• #3WEK
	1 DOMESTIC	S COMMERCIAL  MUNICIPAL		00					
WATER USE	3   IRRIGATION 4   INDUSTRIAL	7 PUBLIC SUPPL  O COOLING OR A						(1) C	
	57	• 🗆	<u> </u>				n H	<i>W</i> -	
METHOD OF	CABLE TOOL  2 M ROTARY (CONVE	NTIONAL) 7 🗍 🛭	MOND	$\parallel \perp$		# 4			3778 <b>8</b>
CONSTRUCT	_	9 🗆 D	RIVING IGGING DOTHER	DRILLER	S REMARKS				
h L	LL CONTRACTOR		WELL CONTRACTOR	Y 500	A IRCE	SO CONTRACT	-59"	NOV 1 E	1988
Wilso Address	on's Water Wells		5459	1101	E OF INSPECTIO		INSPECTOR	MUY I C	1300
	# 4 Stouffvil	le, Ontario		- 1 1	IANKS				
SIGNATURE OF NAME OF N	Jadrock	() SUBMISSIO	TO STORY	OFFICE					
Sight of the state	li is and Illish	DAY DAY	MO YR	_   E				<u> </u>	CC5.625
MINIST	RY OF THE ENVIR	ONMENT COPY						FORM N	O. 0506 (11/86) FORM



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COUNTY OR DISTRICT	2. enzek Es cokk	TOWNSHIP, BOROUGH, CITY, TOWN VILLAGE		į.	BLOCK TRACT, SURVEY ETC	LC	13
Durham	IST) 28-47	Uxbridge			n. 1	OMPLETED 46	1-53
	ntario Ltd.	R.R.#2, Stouffvil	1e, Ontari	LO RC	DAY	01 <sub>M0</sub> 08	<u>v<sub>R</sub>90</u>
21	ZONE EASTING	HORTHING NC	L			<u> </u>	1 1 27
,	4 10 12 LC	OG OF OVERBURDEN AND BEDRO	CK MATERIAL	S (SEE IN	NS1RUCTIONS I		
GENERAL COLOUR	MOST	OTHER MATERIALS			AL DESCRIPTION	DEPTH -	FEET TO
	COMMON MATERIAL					0	1
Brown	Top soil					1	10
Brown	Clay					10	33
Gray	Clay	stones				33	44
Gray	Grave1	silty				44	112
Gray	Silty Sand	stones				112	118
Gray	Gravel	.1.				118	182
Gray	Clay	stones, silt, gravel				182	192
Gray	Sand stones					192	197
Gray	Gravel						
		Finished depth 197 ft.		1 1			<u> </u>
31				· │ · ↓ ↓ ↓ ↓ │	<del>▎▗▗▗</del> ▗▗▗ ┇╻╻╷┇╏╻╏╻╏╷┃┇	<del></del>	
32	1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	51 CASING & OPEN HOLE	PECORD -	SIZE (	54 S) OF OPENING 31-33	DIAMETER 34-38 L	75 E0 ENGTH 39-40
41 WA	KIND OF WATER	INSIDE WALL	DEPTH - FEET	圖  1:	3 #25,12 #50	10 INCHES	25 FEET
AT - FEET	34	INCHES INCHES	13-16	SCF	S.S.	OF SCREEN 16	11"
170-1936	SALTY 4 DMINERALS  UNTESTED GAS  TERESH 3 DSULPHUR	1 MSTEEL 2 GALVANIZED 3 GCONCRETE 4 GOPEN MOLE .250 +	2 1691	61	PLUGGING & S	EALING RECO	RD
z	SALTY 6 GAS	10 4 OPEN HOLE .250 +	20-23	DEPTH	SET AT - FEET MATERIA	I CEME	NT GROUT
	FRESH 3 SULPHUR "" SALTY 6 GAS	2 GALYANIZED 3 GONCRETE 4 GOPEN HOLE		35	B-13 14-17		
	FRESH 3 SULPHUR 29 SALTY 6 SAS	5   PLASTIC   26   1   5   5   5   5   5   5   5   5   5	27.30	1	8-21 22-25		
10.13	FRESH 3 SULPHUR 34	2 □ GALVANIZED 3 □ CONCRETE 4 □ OPEN HOLE		30	6-29 30-33 80	cement v fill	
	BALTY 6 GAS	TE D-14 QURATION OF PUMPING		<del></del>	LOCATION OF W		
71 PUMPING TEST M	2 GAILER	535 GPM 72 15-16 17-18 MISS					
STATIC LEVEL	WATER LEVEL 25 END. OF WATER PUMPING	LEVELS DURING PUMPING	IN DIA	AGRAM BEL INE IN	LOW SHOW DISTANCES OF V DICATE NORTH BY ARROW.	VELL FROM ROAD A	, l
15 40 30	21 22-24 15 NINUTE:	.28 29-31 عديد 29-31 a					$\frac{1}{2}$
	118 50 111 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	eer feer feer					,
GIVE RATE	GPM	154 FEET 1 DECLEAR 2 CLOUBY	ETY	#30			
RECOMMENDED	PUMP TYPE RECOMMEND PUMP OW TO DEEP SETTING	154 FEET RATE GPM	647	-			
50-53			]		< by mile =	<b>?</b> •	
FINAL	I WATER SUPPLY 2 OBSERVATION W	S ABANDONED, INSUFFICIENT SUPPLY	<b>]</b>		€ ky mile =	A 300 /	
STATUS OF WELL	3 TEST HOLE	7 UNFINISHED				<b>↓</b> <u> </u>	
	SS-56   DOMESTIC	5 COMMERCIAL	11	_	l	4wy #47	j
WATER	2 STOCK 3 IRRIGATION	6 MUNICIPAL 7 PUBLIC SUPPLY 8 COOLING OR AIR CONDITIONING			ħ	$\omega_1$	!
USE	4 📉 INDUSTRIAL	9 NOT USED					
METHOD	57 CABLE TOOL	6   BORING					
OF	3 ROTARY (REVER	=======================================			#1 on Bonord	8	7163
CONSTRUC	AIR PERCUSSION		DEC TOST	KS METT	#1, on Record		
1 1	LL CONTRACTOR	WELL CONTRACTOR'S	DATA	5.8	2662 N	OV 3 0 199	0
G. Ha	ert & Sons Well		SOURCE OF INSP	ECTION	ROYJEGEN	<u>o i y a 199</u>	· <del></del>
Box 8	850 R.R.#1. Fe	nelon Falls, Ontario					
E Charli	ie Duggan	Elekte Mandel	OFFICE				
O SIGNATURE	OF TECHNICIAN/CONTRACTOR	SUBMISSION DATE  DAYMOYR	₽				5.65
	ficho Mid I Te					FORM NO. 0506	(11/86) FORM 9



	SPACES PROVIDED 11	191088	3 19012 60	D.W. I Q.L.
2. CHECK 🖾 CORI	TOWNSHIP, BOROUGH CITY, TOWN, VILLAGE		con BLOCK, TRACT, SURVEY ETC	13
	ge (TW#		DATE CO	APLETED 48-53
	.#2, Stouffvi	11e, Ontario	DAY	17 MO 07 YR 90
Z M 10 12	12 18 24	26	30 31	45
L	OG OF OVERBURDEN AND BEDR	OCK MATERIALS	(SEE INSTRUCTIONS)	DEPTH - FEET
GENERAL COLOUR COMMON MATERIAL	OTHER MATERIALS		GENERAL DESCRIPTION	FROM TO
Brown Top Soil				0 1
Brown Clay				1 10
Gray Clay	Stones			10 33
Gray Gravel silty				33 44
Gray Silty Sand	Stones			44 112
Gray Gravel	<u> </u>		<i>"</i>	112 118
Gray Clay stones s	silty			118 182 182 192
Gray Sand Stones				192 207
Gray Gravel			ston	
Gray Clay	Stones	Hard dr	rilling layers clyy	238 240
Gray Stones				230 240
. 31				
WATER RECORD	51 CASING & OPEN HOLE	RECORD	SIZE(S) OF OPENING 31-33 DIS	METER 34-38 LENGTH 39-40
MATER FOUND KIND OF WATER	INSIDE WALL FHICKNESS INCHES INCHES	DEPTH - FEET	MATERIAL AND TYPE	DEPTH TO TOP A1-44 30 OF SCREEN
10-13   FRESH 3 SULPHUR 2 SALTY 4 MINERALS 6 GAS	10-17 1 STEEL 2 GALVANIZED	13-16	<u> </u>	FEET
15-10   FRESH 3 SULPHUR 19	3 COMCRETE 4 DOPEN HOLE 5 DPLASTIC		61 PLUGGING & SE	
2 SALTY 6 GAS  20-23 1 FRESH 3 SULPHUR 4 MINERALS	17-18 1	20-23	DEPTH SET AT - FEET MATERIAL I	AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
25-28   FRESH 3   SULPHUR 25	3 CONCRETE 4 OPEN HOLE 5 PLASTIC		10-13 14-17	
2 SALTY 6 GAS	24-25   1   STEEL   26	27.30	18-21 22-25	
2 SALTY 6 GAS	4 DPEN HOLE 5 DPLASTIC		<u> </u>	
71 PUMPING TEST METHOD 10 PUMPING R.	15-16 17-1		LOCATION OF WE	LL
1 PUMP 2 BAILER  SIATIC WATER LEVEL 25 END OF WATER	GPMMINSMIN  1 ☐ PUMPING  R LEVELS DURING  2 ☐ RECOVERY	IN DIAG	RAM BELOW SHOW DISTANCES OF WE E INDICATE NORTH BY ARROW.	LL FROM ROAD AND
EEVEL PUNPING  10-21 22-24 15 MINUT:				Ŋ
	FEET FEET FE			· 1
IF FLOWING. 38-41 PUMP INTA GIVE MATE  GPM  RECOMMENDED PUMP TYPE  RECOMMENDED PUMP TYPE  PUMP	FEET 1 CLEAR 2 CLOUDS	<u>                                     </u>	130	
RECOMMENDED PUMP TYPE RECOMMEN PUMP  STALLOW DEEP SETTING	DED		1	
50-53		]	= /4 mide ->	
FINAL 1 WATER SUPPLY 2 OBSERVATION W				300'
STATUS STEST HOLE OF WELL A PECHARGE WEL	7 🔲 UNFINISHED			
SS-SE I DOMESTIC	5 COMMERCIAL  B MUNICIPAL	11	Yw H	#47
WATER  3   IRRIGATION  USE   INDUSTRIAL	7 PUBLIC SUPPLY D COOLING OR AIR CONDITIONING		,,	
OTHER	9 NOT USED			
METHOD 2 ROTARY (CONV	■ BORING FENTIONAL) 7 □ DIAMOND			077000
OF DE ROTARY (REVEI	DRIVING	I <b>i</b>	87/63 for finished ho	ole 8/096
AIR PERCUSSIO	WELL CONTRACTOR	DRILLERS REMARKS	58 CONTRACTOR 59-62 DATE RECE	IVED 63-64 80
G. Hart & Sons Well	LICENCE NUMBER	SOURCE	2662 NO	OV 3 0 1990
G. Hart & Sons Well  ADDRESS  BOX 850, R.R.#1, Fer  NAME OF WELL TECHNICIAN  Charlie Duggan  SIGNATURE OF TECHNICIAN/CONTRACTO		llwl	FION INSPECTOR	<del></del>
NAME OF WELL TECHNICIAN	WELL TECHNICIAN LICENCE NUMBER	S AEMARKS		
Charlie Duggan SIGNATURE OF TECHNICIAN/CONTRACTO	DR SUBMISSION DATE			_
Clark water	DAY MO YR			FORM NO. 0506 (11/86) FORM 9



GENERAL COLOUR MOST COMMON MATERIAL OTHER MATERIALS GENERAL DESCRIPTION FROM  Brown Clay Stones & Boulders  Brown Gravel 3  Brown Sand Stones 4	DEPTH FEET  TO  O 31  B1 44  B4 84  B4 160  B0 184  B4 194  B4 198
OWNER (SURNAME FIRST)  454790 Ontario Ltd.  R.R.#2, Stouffville, Ontario  LOG OF OVERBURDEN AND BEDROCK MATERIALS SEE INSTRUCTIONS)  LOG OF OVERBURDEN AND BEDROCK MATERIALS SEE INSTRUCTIONS  GENERAL COLOUR COMMON MATERIAL OTHER MATERIALS GENERAL DESCRIPTION FROM  Brown Gravel  Brow	07 VR 90
454790 Ontario Ltd.  R.R.#2, Stouffville, Ontario  Control Ltd.  R.R.#2, Stouffville, Ontario  R.R.#2, Stouffvil	DEPTH FEET  TO  O 31  S1 44  S4 160  S0 184  S4 194  S4 198
LOG OF OVERBURDEN AND BEDROCK MATERIALS SEE INSTRUCTIONS)  GENERAL COLOUR COMMON MATERIAL OTHER MATERIALS GENERAL DESCRIPTION FROM  Brown Clay Stones & Boulders  Brown Gravel Dry Water Bearing Cloudy 18  Brown Gravel Water Bearing 19  Gray Clay stones 19  Gray Clay Silt Stones 20  Gray Clay Silt Stones 20  Common Material Scription From Sand Stones 19  Water Bearing Cloudy 18  Gray Clay Stones 20  Gray Clay Silt Stones 20  Common Material Scription From Sand Stones 19  Water Bearing Cloudy 18  Gray Clay Stones 20  Gray Clay Silt Stones 20  Common Material Scription From Sand Stones 19  Water Bearing Cloudy 18  Gray Clay Silt Stones 20  Common Material Scription From Sand Stones 19  Water Bearing Cloudy 19  Water Bearing 19  Gray Clay Silt Stones 20  Common Sand Stones 20  Common Material Scription From Sand Stones 19  Water Bearing 19  Common Sand Stones 20  Common Material Scription Scription Sand Scription Sand Scription Sand Sand Scription Sand Sand Sand Sand Sand Sand Sand San	рерти гест м го 0 31 81 44 84 160 60 184 84 194 94 198
GENERAL COLOUR COMMON MATERIAL OTHER MATERIALS GENERAL DESCRIPTION FROM  Brown Clay Stones & Boulders  Brown Gravel  Brown Gravel Dry  Brown Gravel Water Bearing 16  Gray Clay stones  Gray Clay Silt Stones  Cray Clay Silt Stones  Cray Clay Silt Stones  Common Material S	0 31 31 44 34 84 34 160 30 184 34 194
GENERAL COLOUR COMMON NATERIAL OTHER MATERIALS GENERAL DESCRIPTION FROM  Brown Clay Stones & Boulders  Brown Gravel  Brown Gravel Dry  Brown Gravel Water Bearing 16  Gray Clay stones  Gray Clay Silt Stones  Cray Clay Silt Stones  Common Naterial Stones  General Description From  From  Gravel 3  A Water Bearing 16  Water Bearing 19	0 31 31 44 34 84 34 160 30 184 34 194
Brown Clay Stones & Boulders  Brown Gravel Dry 8  Brown Gravel Dry 8  Brown Gravel Water Bearing 16  Gray Clay stones Water Bearing 19  Gray Clay stones Cray Clay Silt Stones 20	0 31 81 44 84 84 84 160 80 184 84 194 94 198
Brown         Clay         Stones & Boulders           Brown         Gravel         3           Brown         Gravel         Dry           Brown         Gravel         Water Bearing         16           Brown         Gravel         Water Bearing cloudy         18           Gray         Clay stones         19           Gray         Clay Silty         Water Bearing         19           Gray         Clay Silt         Stones         20	81     44       84     84       84     160       80     184       84     194       94     198
Brown         Gravel         4           Brown         Gravel         Dry         8           Brown         Gravel         Water Bearing         16           Brown         Gravel         Water Bearing cloudy         18           Gray         Clay stones         Water Bearing         19           Gray         Clay Silt         Stones         20           Gray         Clay Silt         Stones         20	34     84       34     160       50     184       34     194       94     198
Brown         Sand         Stones         4           Brown         Gravel         Dry         8           Brown         Gravel         Water Bearing         16           Brown         Gravel         Water Bearing cloudy         18           Gray         Clay stones         Water Bearing         19           Gray         Clay Silt         Stones         20	34 160 50 184 34 194 94 198
Brown         Gravel         Dry         8           Brown         Gravel         Water Bearing         16           Brown         Gravel         Water Bearing cloudy         18           Gray         Clay stones         19           Gray         Gravel silty         Water Bearing         19           Gray         Clay Silt         Stones         20	50 184 84 194 94 198
Brown         Gravel         Water Bearing         16           Brown         Gravel         Water Bearing cloudy         18           Gray         Clay stones         19           Gray         Gravel silty         Water Bearing         19           Gray         Clay Silt         Stones         20	34 <u>194</u> 94 <u>198</u>
Brown         Gravel         Water Bearing cloudy         18           Gray         Clay stones         19           Gray         Gravel silty         Water Bearing         19           Gray         Clay Silt         Stones         20	94 198
Gray         Clay stones         19           Gray         Gravel silty         Water Bearing         19           Gray         Clay Silt         Stones         20	
Gray Clay stones  Gray Gravel silty Water Bearing 19  Gray Clay Silt Stones 20	
Gray Gravel Silty Water Best 200 Gray Clay Silt Stones 200	40   ///
Gray Clay Sift Stones	
Gray Clay Stones 2.	
	24 225
	<del></del>
	1111
	1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
	54-52 LENGTH 39
WATER RECORD  S1 CASING & OPEN HOLE RECORD  INSIDE OIAM INCINES FRUM TO OF SCREET  10-13 LO FREEN 3 DEMAND TE	O TOP 41-44
2 ONLEANS 10-11 1 OSTEEL	FEET
15-16 1 PLUGGING & SEALING F	RECORD
2 SALTY 6 GAS 17-16 1 STEEL 19 20-23 DEPTH SET AT - FEET MATERIAL AND TYPE	(CEMENT GROUT LEAD PACKER, ETC.)
20-23 1   PRESH 3   SULPHUR 24   2   GALVANIZED   5   6   GAS   4   OPEN HOLE   10-13   14-17	
25-26 1   FRESH 3   SULPHUR 29   5   PLASTIC   27-30   18-21   22-25   1   GREST   4   MINERALS   24-25   1   GREST   26   27-30   18-21   22-25	-
30-33 1 FRESH 4 INTERPALS 1 STEEL 2 GALYANIZED 3 CONCRETE 26-29 30-33 80	
2   SALTY 6   GAS   5   PLASTIC	
71 PUMPING TEST METHOD 10 PUMPING RATE 11-14 DURATION OF PUMPING  15-16 17-18  10 PUMP 2 Deller GPM HOURS MINS	
STATIC WATER LEVELS DURING 1 PUMPING IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM F	ROAD AND
LEVEL PUMPING - RELUVERY	N
SECOMMENDED PUNP TYPE  15 - 22 - 24	个
Z IF FLOWING. 38-41 PUMP INTAKE SET AT WATER AT END OF TEST 42 GIVE RATE	
GOM FEET 1 CLEAR & CLOUDY  RECOMMENDED PUNP TYPE RECOMMENDED 43-45 PUNP: ING  SHALLOW DEEP SETTING FEET RATE GPM	
SHALLOW DEEP SETTING FEET MALE	•
50-55	
FINAL 1   WATER SUPPLY 5   ABANDONED INSUFFICIENT SUPPLY 260	
STATUS ST	
OF WELL   RECHARGE WELL   DEWAYERING   HWY # 4	7
WATER 5   MUNICIPAL   STOCK 5   MUNICIPAL	· ·
USE 4 SE INDUSTRIAL # COOLING OR AIR CONDITIONING  CONTRACT  OTHER  OTHER  OTHER	
57 1 CABLE TOOL 6 BORING	نع يادره
METHOD 2 GROTARY (CONVENTIONAL) 7 GDIAMOND OF 3 GROTARY (REVERSE) 3 GJETTING	8712
CONSTRUCTION 4 BA ROTARY (AIR) 9 DRIVING 5 AIR PERCUSSION DIGGING OTHER DRILLERS REMARKS	
DATA SE CONTRACTOR'S DATA SE CONTRACTOR SESS DATE RECEIVED	63-64
NAME OF WELL CONTRACTOR	1992
A HOLE OF DOING MOTE WITTING HOUSE TOOK	
G. HATE & BORS WELL DITITING LEGI. 2002  DATE OF INSPECTION INSPECTION  OF OR D. D. H. 1. F I. S. D. 1. C. D. D. H. 1. F I. S. D.	
ADDRESS  Box 850, R.R.#1, Fenelon Falls, Ontario  Well TECHNICIAN'S  REMARKS	
ADDRESS  Box 850, R.R.#1, Fenelon Falls, Ontario  Well TECHNICIAN'S  REMARKS	*.
ADDRESS  Box 850, R.R.#1, Fenelon Falls, Ontario  NAME OF WELL TECHNICIAN  Charlie Duggan  SIGNATURE OF TECHNICIAN/CONTRACTOR  SUBMISSION DATE  DAY NO YR.	C 55, B



Ontario Environment  I. PRINT ONLY IN	SPACES PROVIDED 11	7 1	911495	1,2 CON.	0,1
2. CHECK 🗵 CORI	TOWNSHIP, BOROUGH, CITY, TOWN, VII	<u></u>	CON , BLOCK, TRACT	SURVEY ETC	LOT 25-27
Durham	Uxbridge		con.1	DATE COMPLETED	13
owner (surname first) 28-47 454790 Ontario Ltd.	R.R.#2, Stouff	fville,	Ontario	DAY 24 NO 09	vr. <u>91</u>
ZONE EASTING	NOATHING	RC.	ELEVATION RC. BASIN CODE		
1 Z N 10 12	OG OF OVERBURDEN AND B	ZEDROCK	MATERIALS (SEE INSTRUCTION	S)	
MOST MOST	OTHER MATERIALS		GENERAL DESCRIPT	DEPT	1 · FEET
GENERAL COLOUR COMMON MATERIAL	C. C. D. Line			0	31
Brown Clay	Stones & Boulders			31	44
Brown Gravel	Channa			44	84
Brown Sand	Stones			84	160
Brown Gravel			water bearing	160	184
Brown Gravel			Water Bearing	184	194
Brown Gravel Gray Clay Stones				194	198
				198	200
Gray Gravel Silty					
	* Production Well				
31   1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	* Production well				
32		 		لىللىنىا لىلىل	يا لِيا
41 WATER RECORD	51 CASING & OPEN	HOLE RE	CORD SIZE ST OF OPENING SLOT NO 3	į.	LENGTH 39-40
WATER FOUND KIND OF WATER	INSIDE WALL DIAM MATERIAL THICKNE	55	TO MATERIAL AND TYP	E DEPTH TO TOP	47 FEET
153 2 SALTY 4 MINERALS	10-11 1 1 12 STEEL 12	_	33-16 Ø		.53 👊
15-18 1 OF FRESH 3 SULPHUR 19	20 Securities 25	0 + 1	152 61 PLU	GGING & SEALING REC	ORD
200 UNTESTED GAS	17-14 1 STEEL 19 2 GALVANIZED		20-23 DEPTH SET AT FEET		MENT GROUT PACKER, ETC )
2 5ALTY 6 GAS	12 CONCRETE 4 OPEN HOLE 5 PLASTIC	0 + 2	152 0 0 15	Cement Grout	
2 SALTY 6 GAS	24-25 1 STEEL 2 GALVANIZED			2-25	
30-33 L FŘESH 3 SULPHUR 38 2 SALTY 6 GAS	3 DONCRETE 4 DOPEN HOLE 5 DPLASTIC		26-29 3	0-33 80	
71 PUMPING TEST METHOD 10 PUMPING R	1		LOCATI	ON OF WELL	
1 X PUMP 2 U BAILER WATER LEVEL 28	722 GPM 24 HDURS	17-18 MINS		ISTANCES OF WELL FROM ROAD	AND
LEVEL PUMPING	R LEVELS DURING 2 RECOVER ES   30 MINUTES   45 MINUTES   60 M	RY MINUTES	LOT LINE INDICATE NOR	A 1	
	131.58 132.28" 13	28		N	
IF FLOWING. 38-41 PUMP INTA	KE SET AT WATER AT END OF TEST	4Z CLOUDY		1	
RECOMMENDED PUMP TYPE RECOMMEN	DED AS AS DECOMMENDED	46-47	1		
SHALLOW TO DEEP SETTING	141. FEET PUMPING RATE 7	722 GPM	b. mil	•	
EIRLAI SA 1 M WATER SUPPLY	& ABANDONED, INSUFFICIENT	SUPPLY	CTY/Ad. / 14 mil	·	
STATUS 2 OBSERVATION S	VELL 6 ABANDONED POOR QUALITY 7 UNFINISHED		C14 /di	1360'	
OF WELL . RECHARGE WEL	L DEWATERING 5 COMMERCIAL		430		
WATER 2 STOCK 3 D IRRIGATION				<b>V</b>	
USE A NOUSTRIAL	■ COOLING OR AIR CONDITIONING ■ NOT USED	·		HWY #47	
57 1 CABLE TOOL				•	
METHOD Z ROTARY (CONV	RSE) & UETTING		*See Well Record#871	21 T¥2	0000
CONSTRUCTION   ROTARY (AIR)	9   DRIVING N   DIGGING   OTH	11	DRILLERS REMARKS	13	<u> 16920</u>
NAME OF WELL CONTRACTOR	WELL CONTR	RACTOR'S MBER	DATA SOURCE	B 22 DATE RECEIVED	41-44 B
G G Hart & Sons Well	Drilling Ltd. 2662			BZ JULO6 19	<b>52</b>
Box#850, R.R.#1, Fen		NICIAN'S	SE		
Box#850, R.R.#1, Ferr NAME OF WELL TECHNICIAN Cecil Johnston SIGNATURE OF TECHNICIAN/CONTRACTO	WELL TECHT LICENCE NU T-0275	JMBER	uı		
SIGNATURE OF TECHNICIAN/CONTRACTO	R SUBMISSION DATE		OFFICE		5.65.5
MINISTRY OF THE ENVIR	RONMENT COPY	YR	· · · · · · · · · · · · · · · · · · ·		6 (11/86) FORM

The Ontario Water Resources Act

### WATER WELL RECORD

Ontario	ronment	SPACES PROVIDED 11	1912239	 ),N, , , ,    O,1				
COUNTY OR DISTRICT	<u></u>	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	UKBY (CLQ) CON. 1 PLAN4OR	. 6 LOT 25-27 -1326 12				
DIIDIYA	V DECTON	HYBRIDGE TWP. (	DATE COM	DI ETER				
		HING RC	2ND CON. RD. DAY 1	9 Mo 10 YR 94				
1 2	M 10 12	17 10 24 25	26 31 31					
		OG OF OVERBURDEN AND BEDRO		DEPTH - FEET				
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	0 15				
BROWN	SAND		LOOSE	15 60				
GRAY	GRAVEL		PACKED	60 67				
GRAY	SAND		FINE	67 115				
GRAY	SAND		MED.	115 118				
		-						
:								
31								
32	14 15 21			75 45				
WATER FOUND	TER RECORD	51 CASING & OPEN HOLE P	DEPTH - FEET # 12	5 34-38 LENGTH 39-40				
115_11 & X	FRESH 3 SULPHUR	DIAM MATERIAL THICKNESS FRO	OC WARREN TO TAKE	DEPTH TO TOP 41-44 30 OF SCREEN 115				
	GAS IS USE OF THE STATE OF THE	61 1 0KTEEL 2 GALVANIZED 3 GONGRETE 4 GOPEN HOLE	107 61 PLUGGING & SEA					
2	SALTY 6 GAS  FRESH 3 SULPHUR	5 □ PLASTIC   17-18   1 EXTEEL   19	20-23 DLPTH SET AT - FEET MATERIAL AN	CEMENT GROWT				
25.20	SALTY 6 GAS  FRESH 3 GSULPHUR	5 2 GALVANIZED 3 GONCRETE 4 GOPEN HOLE 5 GPLASTIC	107 115 10-13 N-17					
30.11	SALTY 6 GAS	1 STEEL 26 26 2 GALVANIZED 3 CONCRETE	27-30 18-21 22-25 28-29 30-33 80					
2	SALTY 6 GAS	4 DOPEN HOLE 5 DPLASTIC						
71 PUMPING TEST MET	THOO AIR 10 PUMPING RAT 20	E 11-14 DURATION OF PUMPING 17-18 GPM 10-15 HOURS NINS	LOCATION OF WE	LL				
STATIC LEVEL	PUMPING	1 X PUMPING 2 G RECOVERY	IN DIAGRAM BELOW SHOW DISTANCES OF WELL LOT LINE INDICATE NORTH BY ARROW.	FROM ROAD AND				
33 "·2"	117 117	$\begin{bmatrix} 1 & 1 & 2^{2} & 3 \\ 1 & 1 & 7 \end{bmatrix}$		-				
FEET FLOWING, GIVE RATE	39-41 PUMP INTAKE		<b>1</b> .	11				
RECOMMENDED PU	MP TYPE RECOMMENDE	D 43-45 RECOMMENDED 46-49	//	1				
SO-53	/ 12 DEEP SETTING 8 (	)-100 FEET   RATE   0-15   GPH		Ti				
FINAL	1 25 WATER SUPPLY 2 OBSERVATION WE	S ABANDONED INSUFFICIENT SUPPLY		12 Va				
STATUS OF WELL	TEST HOLE  TEST HOLE  RECHARGE WELL	7 UNFINISHED  DEWATERING		/ \				
	DOMESTIC STOCK	S COMMERCIAL  MUNICIPAL	N // /					
WATER USE	IRRIGATION INDUSTRIAL	7 PUBLIC SUPPLY  6 COOLING OR AIR CONDITIONING						
	S7 CABLE TOOL	*   NOT USED	1					
METHOD OF	2 X ROTARY (CONVEN	TIONAL) 7 DIAMONG  E) DIAMONG	we" 0 ← 170 →					
CONSTRUCTION	ON 4   ROTARY (AIR)   AIR PERCUSSION	9   DRIVING   OTHER	DRILLERS REMARKS	144668				
NAME OF WELL		WELL CONTRACTOR'S LICENCE NUMBER 4738	DATE OF INSPECTION  SE CONTRACTOR S9.62 DATE RECEIVE A TO SOURCE  OATE OF INSPECTION  DATE OF INSPECTION					
EARL	GOODWOOD ON		l m					
NAME OF WELL	L TECHNICIAN	WELL TECHNICIAN'S LICENCE NUMBER	O RENARKS					
SIGNATURE OF	SAUDER	T-0016  SUBMISSION DATE	OFFICE					
MINISTRY	OF THE ENVIRON	MENT COPY		ORM NO. 0506 (11/86) FORM 9				

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Municipality	Con.					
19012	CON	1 !	1		0	١
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Co	ounty or Distric	0/		Township	/Borough/City				Con block	tract surve	ey, etc. Lo	25.27
				Address	Z	labr	elge		<u> </u>	On   Date	28	12 8 98
					Northing		RC Elev	Vation RC	Basin Code	completed		nonth year
21	2	T M 18		OVERBURA	S AND DE	DOCK MA	25 28 TEDIAL C	30	31		1	
G	eneral colour	Most common male		OVERBURDE OI	ther materials	THUCK MA	HIALS	•	description			pth - feet
	Baour	slau			<del> </del>			sale	+		From	27
	Grey	sand		<u> </u>				men	/		27	30
	- 194+ - 194+											
**	-											
	a.				<u>.</u>							
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31							·					·
32		4 15 21	<u> </u>		1.1.1.	]	11111		11:1	L L L		75 60
	ter found	FER RECORD Kind of water	51 Inside diam	CASING &	OPEN HOL Wall thickness	E RECORD	$\overline{}$	Sizes of or (Slot No.)	pening 3	1-33 Diameter	34-38 Leng	<b>&gt;</b> .
<b> </b>	, ,	Fresh 3 Sulphur 14	inches	Steel 12	inches	From	To 16	Material ar	id type		Depth at top	of screen 30
٥	<u> </u>	Fresh 3 Sulphur 19	6/4 :	☐ Galvanized ☐ Concrete ☐ Open hole	.188		21	6	<u> </u>	ز	27	feet
-		Salty 4 Minerals Gas  Fresh 3 Sulphur 24	17-1B L	☐ Plastic ☐ Steel 19 ☐ Galvanized			20-21	61	PLUGGING Annular space	& SEALIN	G RECOR	
_	2 🗆	Salty 6 Gas	3	Concrete Copen hole Plastic				Depth set at -	To Mater	ial and type (Ce	ment grout, be	-
		Fresh 3 Sulphur 23 Salty 4 Minerals 6 Gas	24-25 1	☐ Steel 26 ☐ Galvanized			27 - 30	18-21	22-25	Hole	slug	•
		Fresh 3	3	☐ Concrete ☐ Open hole ☐ Plastic				26 58	30-33 80			
	Pumping test m		<del></del>	Duration of pumple	***			100				
$\vdash$	, ☐ Pump 2 Static level	/ater level 25			☐ Recovery		n diagram	below show d	ATION OF		ad and lot l	ne.
1S	) 19-21	nd or partiping	0 minutes		60 minutes		ndicate no	orth by arrow.			10	
PUMPING TEST	feet If flowing give ra	1eet 1eet 1eet 1	1eet	1/1	/// feet				#47	Hwy	, , ,	
	Recommended	GPM 2C	feet	Clear  Recommended	□ Cloudy				,	7_1L	1159	E
-	,	Deep pump setting		pump rate	7 GPM			$\angle$	,	7-65 2 MH	475	พ
_	SAL SZÁTUS	S OF WELL 54				•			4	7-64 8- <b>74</b> 980		
1	Water sup Doservation	nlv ⟨□ Abandoned.	poor quality	pply e ☐ Unfinish 10 ☐ Replace			, V	1		980	) EL	
	4  Recharge	well 8 Dewatering	( <b>,</b>			17	Y			\		
WA	TER USE : Domestic 2 Stock	55-56 5		9 ☐ Notuse		1	/				K	
	2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial	s ☐ Municipal / ☐ Public suppl s ☐ Cooling & ai		10 ☐ Other				ų,			60 '	
ME	THOD OF C	ONSTRUCTION *						17		office		8666
	Dable tool Rotary (co	5 ☐ Air percussion some serventional) 6 ☐ Boring	Xn .	□ Driving     □ Digging				l'a	! !			ATORS
	4 ☐ Rotary (ai	verse) 7 Diamond  T) 8 Diamond  Jetting		₁ □ Other				` \		<u> 166</u>	905	
Nam	ne of Well Control	ictor / / / /	111+	Well Contractor	's Licence No.	Data source		Contracctor	E 0	59-62 Date rece		63-68 80
Add	Welse ress	mo Walu W	ellad k	n 1	154	Date o	f inspection	5 <del>4</del>	spector	SEP	1 1 1	996
Neur	ne of Well Techni	cian Kann	idy i	Well Technician	's Licence No.	S Remar	ks I	<u> </u>	- <del>i</del>	•		
Sian	nature of Technic	n Rennie		7033	9	RINISTRY US	•	\$		₹ <sup>r</sup>	7	r orphical
Ľ	Tota	whilson		day mo	° 96	\$		<u> </u>			<b>ころろ</b> 506 (07/94) Fi	. RS

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Municipality	Con.	
19013	CON	

County or Distric	cl O	Township/Borough/C	its/FormA filling				22 23
,			rbride e	Con	block tract surve	ey, etc. Lo	*/ つ ゚゙
		Address	5rd	Pas	Date	25 1	, <del></del>
		Northing	RC EI	evation RC Basin	Completed	day m	nonth yes
1-2	) : M ip	17 18	24 25 26	39 31	<u> </u>	<u></u>	المنط
General colour	Mantanana	LOG OF OVERBURDEN AND BE		S (see instructions)			
General colour	Most common materia	Dother material	5	General descrip	otion	From	pth – feet To
Block	100-oil		,			0	2
Brown	Clay	Sond + Lto	res		-	7	20
Brown	Clay	Sandy				20	52
Brown	Sond & Gro	vel				52	58
Brown	Class	Sand + Stor	es			50	60
Greet	Class	Silt				15	9~
Grece	Silt	3.027		***		9,-	1111
Green	Sand		E	` _		11/1	119
(	SIL		7.2	<del></del>		1/7	118
o reg						118	<del> </del>
						-	-
31						<u> </u>	
32						<u>- 1   1   1   1   1   1   1   1   1   1 </u>	التنا
10	TER RECORD	51 CASING & OPEN HO	LE RECORD		65	.	75
Water found at - feet	Kind of water	Inside diam Material Wall thickness	Depth - feet	Sizes of opening (Slot No.)	1-33 Diameter	34-38   Lengt	-
10-13 ; 2	Fresh 3 Sulphur 14	inches inches	From To	Material and type		Depth at top of	ofscreen ≭
<del></del>	Salty 6 Gas  Fresh 2 Sulphur 19	2 Galvanized   188	0115	<u></u> \$.5.	<u> </u>	115	feet
	Salty 6 Gas	/ 5 Plastic		61 PLUG	GING & SEALING	G RECOR	D
1	Fresh 3 Sulphur 24 Minerats Salty 6 Gas	17-18   1 □ Steel 19   2 □ Galvanized   3 □ Concrete	20.23	Annular s		Abandonme	
<u> </u>	Fresh 3 🗆 Suiphur 29	□ Open hole     □ Plastic		From To	Material and type (Cer	nent grout, be	ntonite, etc.)
<del></del>	Salty 4 Minerals 6 Gas	24-25 1 Steel 26 2 Galvanized	27-30	8-21 Z 6-17	Bensea	<u></u>	
1 1 -	] Fresh 3 ☐ Sulphur 34 60 ☐ Minerals ☐ Gas	□ Concrete □ Copen hole □ Plastic		26 29 30~33 8	0		
Pumping test m		H-14 Duration of pumping	7				
71 1 Pump 2	Bailer 9	GPM	1	LOCATION		1	
Static level e	nd of pumping Water levels du		In diagram Indicate n	n below show distance orth by arrow.	s of well from roa	dand lot ijr	ie.
If flowing give ra	22-24 15 minutes 26-28 30 r	minutes 45 minutes 60 minutes 35-31		47		con	
feet /	te 38-41 Pump intake set at	OO feet /OO feet /OO feet Water at engl of test 42					
Recommended	GPM Become	feet Clear Cloudy	11 n	/	)		
	pump type Recommended pump setting	43-45 Recommended 46-49 pump rate			. ]	سد	<del>}_</del>
50-53		feet GPM	] /		1	17	
FINAL STATUS	ply <sub>5</sub> ☐ Abandoned, ins	sufficient supply s 🔲 Unfinished				1.	
2 ☐ Observation 3 ☐ Test hole 4 ☐ Recharge	≀ 🗋 Abandoned (Ot			1			
<u>-</u>	Well 8 Donates lig		ŀ				. At the same of
WATER USE Domestic		g 🔲 Notused					
2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial	s ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air co	10 Other					
				THOUSE			
Cable tool		₃ □ Driving	85 ->				
2 ☐ Rotary (co 3 ☐ Rotary (rev	nventional) 6 🛘 Boring verse) 7 🖨 Diamond	10 Digging	- 🗓 💉	200'		A = = :	4
₄ ☐ Rotary (air	2 a ☐ Jetting		HYDRO POLE			947	<u> </u>
Name of Well Contra	ictor / 1/1/11	Well Contractor's Licence No.	Data .	58 Contracctor	59-62 Date receiv		63-68 80
Wilsen	Waler Wills	40 5459	Data source	$\perp 5459$	JAN		
1 48to	affirly C	27	Date of inspection	Inspector	٠.		
Name of Well Technic	The state of the s	Well Technician's Licence No.	Remarks	1,	· · · · · · · · · · · · · · · · · · ·	1	M
Signature of Technici	to his after	Submission date	Date of inspection  Remarks		(100.00		2,
	etablesa	Gey mo yr			CSS.S8		
2 - MINIGT	DV OF ENDAROND	MENT & ENERGY CO	-11		05	06 (07/94) Fro	nt Form 9

0506 (11/98) Front Form 9

of the

## The Ontario Water Resources Act WATER WELL RECORD

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Municipality	Con.		I Dali
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					10 14 1		22 23 24					
County or District	· · · · · · · · · · · · · · · · · · ·	1 /1 // 1	Township/Borough/City/Town/Village Con block tract survey, etc. LC									
		Address	Date									
		Northing	RC	ncl com Elevation RC	Basin Code ii	d day	month year					
21	W 10	2 57 18	24 25	26 30	31	بيبي	111147					
	LOG O	F OVERBURDEN AND BEDR	OCK MATERIA	LS (see instructio	ns)	Doni	th - feet					
General colour Most	common material	Other materials		General o	description	From	To					
Black Top	Soil					0	2					
Brown Cla	ry	Sand + Stone	9			マ	48					
Erey Clas	an .	Silty				48	75					
6 ley 5%	et	Clan			75	143						
Grey Silt	+ Sand + Gra	rul /				143	15-4					
Green Clas	es ,			Soft		154	156					
En Brown 1	Sand			<i>,</i>		156	158					
Gree Ck	lay	Stone				150						
	/											
		i i										
31												
32	21	1	J L4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			لبللب	75 80					
41 WATER RECOR	D 51	CASING & OPEN HOLE R		Sizes of or		1	gth 39-40					
at - feet Kind of V	diam inches Sulphur 14	Material thickness inches	From To	(Skot No.)  Material ar	/2 6 nd type	inches Oepth at top	of screen 30					
56 2 Salty 6	] Minerals ] Gas	1 Steel 12 2 Galvanized 3 Concrete	_   .	.     ->	<b>5</b> .	156	41-44 feet					
2 Gelby 4 G	Sulphur 19 Minerals Gas	4 □ Open hole 5 □ Plastic /88	0 /5	61 F	PLUGGING & SEALIN	IG RECORE	<u> </u>					
20-23 1   Fresh 4	Sulphur 24 Minerals	1 Steel 1 Galvanized 3 Concrete			Annular space	☐ Abandon	nent					
25-28   Fresh 3	] Gas ] Sulphur 29	Concrete     Open hole     Plastic		From 10-13	To Material and type (	•						
2 🗆 Safty 6	Minerals 24-25 Gas	1 Steel 28 2 Galvanized		27-30 0 7	e bro	6 nont						
I Flesh 4 E	] Sulphur 34 60 ] Minerals ] Gas	3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic		26-29	30-33 80							
Pumping test method 10	Pumping rate 11-											
71 1 Pump 2 Bailer	#5 GPI	Accounts the same and the same	In di		ATION OF WELL distances of well from	road and lo	t lind.					
Static level end of pumping  19-21 22-24	Water levels during	1	Indic	ate north by arrow.			1					
S 40 feet 20 feet	15 minutes 30 minutes 29-	1 1		)		2r Cos	4					
If flowing give rate 38-41	Pump intake set at	Water at end of test 42	1	۱ *	~ 400°		,					
Hecommended pump type	Recommended 43-	1 100011 KII O 1000	] '	•		·	ا۸					
Shallow Deep	pump setting /40 fe	pump rate /5 GPM					T = T					
FINAL STATUS OF WEL	L 54			'			11					
<sup>1</sup> ☑ Water supply <sup>2</sup> ☐ Observation well	<ul> <li>Abandoned, insufficient</li> <li>Abandoned, poor qualit</li> </ul>					ا ي						
3 ☐ Test hole 4 ☐ Recharge well	7  Abandoned (Other) 8  Dewatering					1 Km						
WATER USE	55-56	n C Nac					1					
1 Domestic 2 Stock 3 Irrigation	5 Commercial 6 Municipal 7 Public supply	9   Not use				ļ						
4 🔲 Industrial	8 Cooling & air conditioning	ng				. 1						
METHOD OF CONSTRUC	CTION 57	9 🗆 Dahdon		Webb R	d	Α						
<ul> <li>2</li></ul>	6 □*Boring 7 □ Diarnond	9 Driving 10 Digging 11 Other				000						
4 ☐ Rotary (air)	8 Detting					238	ან <b>ა</b>					
Name of Well Contractor		Well Contractor's Licence No.	Data	58 Contractor	59-62 Date re		ついしつ <sub>284 80</sub>					
Wilson Water	Wells 41	5459	Source Date of inspe		59 M	AY 0 9	2002**					
K4 stanto	ilk		I SE CHINSP									
Name of Well Technician		Well Technician's Licence No.	Remarks			CS	S.ES					
Signature of Technician Contracto	7	Submission date	Remarks				U.L.C					
recelle	eer	day 75 m04 yr 02	2			0506 (07/0	0) Front Form !					
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0506 (06/02) Front Form 9

County or District		Township/Borough/City/To UXBRIDGE	own/Village		Con block	tract survey		25-27 12&1
		Address of Well Location 123 Hwy - 47	7 Uxb	ridge, ON		Date completed	26 1 m	l 02 onth year
21	Zone U	Easting Northing	R L L	1 1 1 1 1 1	RC Basin Code	ii	iii	iv
1 2		PF OVERBURDEN AND BEDRO	OCK MATE		octions)		Donth	1 - feet
General colour	Most common material	Other materials		Gen	eral description		From	То
Brown	Sand	Clay		Layered	·	••	0	40
Brown	Sand			Medium			40	55
Brown	Sand			Medium,	Clean		55	89
				•	·			
-								
	.,			•				
			_					-
31			لسبال					النجا
32 10 10 11 WATE	15 ER RECORD 51	CASING & OPEN HOLE R	J LILLI RECORD			65 1-33 Diameter	34-38 Leng	75 8th 39-40
Water found at - feet	Kind of water Inside	Wall Material thickness	Depth - f	то   Ш	4 <sup>(A)</sup> & 10	6		5 feet
	Fresh 3 Sulphur 14 10-1	1 Steel 12 2 Galvanized		1 1 1 -	erial and type hnson S/	's	Depth at top	of screen 3 3 41-44 feet
	Fresh 3 Sulphur 19	3 □ Concrete 4 □ Open hole 5 □ Plastic	0	83	PLUGGING	& SEALING	RECORD	
20-23 1	Fresh 3 Sulphur 24	<sup>8</sup> 1 □ Steel <sup>19</sup> 2 □ Galvanized 3 □ Concrete		20-23	Annular space		□ Abandonm	ent
25-28 1	Salty 6 Gas  Gas  Fresh 3 Sulphur 29  Fresh 4 Minerals	4 ☐ Open hole 5 ☐ Plastic		From <b>7</b> /9	То	Packe	•	
20.50	J Sality 6 ☐ Gas	2 Galvanized 3 Concrete		27-30		reen n		
	☐ Flesh 4 ☐ Minerals ☐ Salty 6 ☐ Gas	4  Open hole 5  Plastic		28	20° 0	Bensea	1	
Pumping test n	netho TR <sup>0</sup> Pumping rate 11	-14 Duration of pumping  M 17-18 Hours Mins	<b></b>		LOCATION OF	WELL		
Static level	Nater level 25 Water levels during	1 Pumping 2 ☐ Recovery		n diagram below s ndicate herth by a	show distances o rrow.	of well from r	oad and lo	t line.
50 feet	75 feet feet 30 minutes 26-28	45 minutes 32:34 60 minutes 35:37 feet feet 75 feet		J.				الما
If flowing give r	ate 38-41 Pump intake set at	Water at end of test 42		£.				la
Recommended	pump type Recommended 4	feet Clear Cloudy  3-45 Recommended 48-49 pump rate 1		4				
☐ Shallow	ADeep pump seaming 73	pump rate 10 GPM		00	Hwy.	.17		
FINAL STATU		nt supply 9 🗆 Unfinished		<i></i>	1	_ <del></del>		<del></del>
<sup>2</sup> ☐ Observati <sup>3</sup> ☐ Test hole	on well 6 Abandoned, poor qual 7 Abandoned (Other)				TO THE	હે		
	S5-56		/		we'	Bain		
Domestic  Stock	5 ☐ Commercial 6 ☐ Municipal	9 Dot use						
3 □ Irrigation 4 □ Industrial	<ul> <li>7 □ Public supply</li> <li>5 □ Cooling &amp; air condition</li> </ul>	ning						
METHOD OF	CONSTRUCTION 57  5	<sup>9</sup> ☐ Oriving						
<sup>2</sup> ☐ Rotary (o <sup>3</sup> ☐ Rotary (re	onventional) <sup>6</sup> Boring everse) <sup>7</sup> Diamond	10 Digging					)	92
⁴ <b>X</b> Rotary (a	ir) <sup>6</sup> ☐ Jetting			<u> </u>			<u> 2554</u>	-
Name of Well Cont Roger B	oadway Ent., Ltd	Well Contractor's Licence No. 1413	Data source	58 Confrac	413	59-62 Date rece	1 6 20	02 63-68 8
Address	Sutton West, ON		Date o	finspection	Inspector	,,,,,,,		· <del>-</del>
Name of Well Techn	nician	Well Technician's Licence No.	Hemar Remar	ks	<u> </u>		<del></del>	
Grant B		Submission date 26 11 02	JINIS			CSS	S.ES	2

Submission date

2 - MINISTRY OF ENVIRONMENT AND ENERGY COPY

<sub>yr</sub>02

Ministry of Environment

### The Ontario Water Resources Act WATER WELL RECORD

0506 (06/02) Front Form 9

and Energy Print only in spaces provided. Municipality Con. 1916758 Mark correct box with a checkmark, where applicable. 11 Township/Berough/City/Town/Village Con block tract survey, etc. Lot County or District آ2 m Date /6 03 completed month Basin Code 21 +++1 LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions) Depth - feet General colour From 6 28 28 <u>33</u> 3*3* 33 WATER RECORD CASING & OPEN HOLE RECORD 51 41 Water found at - feet Inside diam inches Wall thickness Depth - feet SCREEN Kind of water То inches 1 Steel
2 Galvanized
3 Concrete
4 Open hole
5 Plastic □ Sulphur
□ Minerals
□ Gas Fresh 22 146 ₂ ☐ Salty 88 O ☐ Sulphur ☐ Minerals + □ Fresh PLUGGING & SEALING RECORD 61 2 G Saltv □ Gas 1 Steel
2 Galvanized
3 Concrete
4 Open hole
5 Plastic 20-23 ı ☐ Fresh 2 Galty From Gas Sulphur Minerals Gas 1 🗆 Fresh σ 1 Steel
2 Galvanized
3 Concrete
4 Open hole
5 Plastic 27-30 2 Salty 1 ☐ Fresh 2 ☐ Salty 30-33 Pumping test method
Pump 2 Ba ູ່ຊ LOCATION OF WELL Mins 2 | Bailer In diagram below show distances of well from road and lot line. Water level Water levels during Pumping 2 ☐ Recovery Static level Indicate north by arrow. end of pumpir 42.9 42.8 3 <del>4</del>2.73 PUMPING If flowing give rate Clear GPM □ Cloudy 43-45 Recommended pump type pump rate Deep ☐ Shallow GPM FINAL STATUS OF WELL 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ∑ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 16 ☐ Replacement Water supply
 □ Observation well ☐ Test hole
☐ Recharge well WATER USE 55-56 Commercial
 Municipal
 Public supply
 Cooling & air conditioning 9 ☐ Notuse 10 🗆 Qther ... METHOD OF CONSTRUCTION 57 5 Air percussion
6 Boring
7 Diamond
8 Jetting Cable tool
Rotary (conventional)
Cable tool
Rotary (reverse)
Rotary (air) 9 ☐ Driving
10 ☐ Digging
11 ☐ Other... 264185 5 4 ONLY OCT 2 1 2003 source Date of inspection USE ( MINISTRY Remarks CSS ES!

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Casing and Screen Record		Pumpin		
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Total length of casing \$2	Test-pumping r	ate 3		G.P.M.
Type of screen Alot # 6 Johnson steinles stell	= :: :			
Length of screen				
Depth to top of screen 6.7				
Diameter of finished hole 4" 1 D. NIPPLE				
	with pump setting	ng of 72	feet belo	G.P.M.
Well Log	1	3 ,	1	r Record
Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water
Surface clay of stone	0	18		
and the second	18	42		
	, ,	The state of the s		
fine sand to day	42	70		
den fin sand	70	82	\$2	fresh
For what purpose(s) is the water to be used?		Location		
Is well on upland, in valley, or on hillside?	-		distances of we icate north by	
Drilling or Boring Firm & Bouling	1	17HW	×	
Address Lutton 2655		1	ine.	
Licence Number 2019	1 1	1	رسر ر	140
Name of Driller or Borer M. L. Boulway			5n x 30	7,500
Address Cutton			1 .275mi	The state of the s
Date 02 8166			1	0 7/0
(Signature of Licensed Drilling of Boring Contractor)		44-44		<del>+</del> 9
Form 7 15M-60-4138	-++-	).	Y	CSS.S8
O W R C COPY	ŀ *			

### The Ontario Water Resources Commission Act ATER WELL RECORD 4604231 MUNICIP. 46009 CON. 10 115 1. PRINT ONLY IN SPACES PROVIDED 2. CHECK CORRECT BOX WHERE APPLICABL TOWNSHIP, BOROUGH, CITY, TOWN DIZ ONTARIO Ux82106E DATE COMPLETED ENTURYCITY 12 Sheppard QUE 21 241 AND BEDROCK MATERIALS (SEE INSTRUCTIONS) MOST OTHER MATERIALS DEPTH GENERAL DESCRIPTION 1 フォ bookled 1 1 agrotelastagin lagarbagining laggistagin basilagi 90.7.3.2.9.50609 908/609/1/0st 1/4020st/// 1 1 1 1 54 51 CASING & OPEN HOLE RECORD WATER RECORD DEPTH KIND OF WATER WALL THICKNESS MATERIAL MATERIAL AND TYPE 015 FRESH 2 SALTY 3 🗌 SULPHUR NA 4 - MINERAL GALVANIZED 3 SULPHUR 4 MINERAL 1 🗆 FRESH ☐ CONCRETE 61 PLUGGING SEALING RECORD 2 SALTY DEPTH SET AT - FEET 1 STEEL (CEMENT GROUT, LEAD PACKER, ETC.) 1 🗆 FRESH 3 🗆 SULPHUR MATERIAL AND TYPE GALVANIZED 2 🗆 SALTY 4 MINERAL 3 ☐ CONCRETE OPEN HOLE 1 ☐ FRESH 3 - SULPHUR N 22-25 4 | MINERAL 1 ☐ STEEL GALVANIZED ↑ 🔲 FRESH 3 | SULPHUR 3 CONCRETE 4 MINERAL 2 SALTY LOCATION OF WELL WATER LEVEL END OF PUMPING 1 PUMPING THE MAS BAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW. STATIC LEVEL WATER LEVELS DURING 30 MINUTES 29-3 60 MINUTES 35-3 FEET FEET 0003 1 CLEAR RECOMMENDED PUM RECOMMENDED PUMP SETTING SHALLOW 14 FEET RATE A CANDWHEAD FORTH SITE 1 WATER SUPPLY **FINAL** OBSERVATION WELL 6 ABANDONED, POOR QUALITY **STATUS** 3 TEST HOLE 4 RECHARGE WELL OF WELL 5 COMMERCIAL 1 DOMESTIC 6 MUNICIPAL 7 PUBLIC SUPPLY 2 STOCK WATER 3 ☐ iRRIGATION USE 09 AIR CONDITIONING ☐ OTHER NOT USED LOCABLE TOOL 6 [] BORING METHOD ROTARY (CONVENTIONAL) 7. DIAMOND OF DRILLING ROTARY (REVERSE) 4 - ROTARY (AIR) 9 DRIVING 5 AIR PERCUSSION 0 11269°° ONLY 280 office lec . USE OFFICE

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		The Ontario	Water Reso	ources Com	mission Act			~-
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Water mañagement in	Omeria 1. PRINT ONLY IN S 2. CHECK X CORRE	PACES PROVIDED ECT BOX WHERE APPLICABLE	11	4604	233 MUNICIP.	0,0,9 6	$d_{N_{1}}$	1 101
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	LO	OG OF OVERBURDE	N AND BEDRO	OCK MATERIA	ALS (SEE INSTRUCTIO	NS)		
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41 WATE	R RECORD	51 CASING &		43	54	65 /2/5 <sup>31-33</sup> DIAN	IETER 34-38	75 80 LENGTH 39-40
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20-23 1   F 2   S 25-28 1   F 2   F	SALTY 4   MINERAL  FRESH 3   SULPHUR  FRESH 3   SUL	10-11 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 17-18 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 11-14 DURATION OF OOO 2 GRM. MC LEVELS DURING 3 SMINUTES 3 SMINUTES 3 SMINUTES 4 MINUTES	26  PUMPING 5-16 DURS PUMPING RECOVERY ES 32-34 FEET FEET FEET FEET FEET FEET FEET	27-30 27-30	DEPTH SET AT - FEET FROM TO 10-13 14 22-28-29 30-28-29 10-13 14 12-28-29 10-13 14-28-29 10-13	MG & SEA MATERIAL AN 17 25 33 80 N OF WE STANCES OF WELL FO	ALING RID TYPE LEAD	FEET  ECORD  MENT GROUT, PACKER, ETC.)
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2   3   1   F   2   5   5   5   5   5   5   5   5   5	SALTY 4   MINERAL  FRESH 3   SULPHUR  FRESH 3   SUL	10-11 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 17-18 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 11-14 DURATION OF OOO 2 OF STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 11-14 DURATION OF FEET 4 STEEL 4	PUMPING 5-16 NINS. PUMPING PUMPING RECOVERY ES SO MINUTES 32-34 SO MINUTES 32-34 FEET DO OF TEST 42 IR 2 LOUDDY D 46-49 GPM.  UFFICIENT SUPPLY	27-30 27-30	DEPTH SET AT - FEET FROM TO 10-13 14 22-28-29 30-28-29 10-13 14 12-28-29 10-13 14-28-29 10-13	MG & SEA MATERIAL AN 117 225 333 80 N OF WE TANCES OF WELL FI Y ARROW.	ALING RID TYPE LEAD	FEET ECORD MENT GROUT, PACKER, ETC.)
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2   3   1   F   2   5   5   5   5   5   5   5   5   5	SALTY 4   MINERAL  FRESH 3   SULPHUR 19  FRESH 3   SULPHUR 24  FRESH 3   SULPHUR 25  FRESH 3   SULPHUR 26  FRESH 3   SULPHUR 34 80  FRESH 3   SULP	10-11   STEEL   2   GALVANIZED   3   CONCRETE   4   OPEN HOLE   3   OPEN HOLE	PUMPING 5-16 NINS. PUMPING PUMPING RECOVERY ES SO MINUTES 32-34 SO MINUTES 32-34 FEET DO OF TEST 42 IR 2 LOUDDY D 46-49 GPM.  UFFICIENT SUPPLY	27-30 27-30	DEPTH SET AT - FEET FROM TO 10-13 14 22-28-29 30-28-29 10-13 14 12-28-29 10-13 14-28-29 10-13	MG & SEA  MATERIAL AN  17  25  33  80  N OF WE  STANCES OF WELL FI Y ARROW.	LL ROM ROAD AND	FEET ECORD MENT GROUT, PACKER, ETC.)
2   3   1   F   2   5   5   5   5   5   5   5   5   5	SALTY 4   MINERAL  FRESH 3   SULPHUR 19  SALTY 4   MINERAL  FRESH 3   SULPHUR 24  SALTY 4   MINERAL  FRESH 3   SULPHUR 34 80  FRESH 3   SULPHUR 34	10-11 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 17-18 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE  11-14 DURATION OF OOO 2 OF STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE  11-14 DURATION OF OOO 2 OF STEEL 2 GALVANIZED 3 STEEL 2 GALVANIZED 3 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE  11-14 DURATION OF OOO 2 OF STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE  CEPAL OF STEEL 43-45 PRECOMMENDED PRING RATE  C CAPACITY  S ABANDONED, INSI 6 ABANDONED, INSI 6 ABANDONED, POO 7 UNFINISHED	PUMPING 5-16 NINS. PUMPING PUMPING RECOVERY ES SO MINUTES 32-34 SO MINUTES 32-34 FEET DO OF TEST 42 IR 2 LOUDDY D 46-49 GPM.  UFFICIENT SUPPLY	27-30 27-30	DEPTH SET AT - FEET FROM TO 10-13 14 22-28-29 30-28-29 10-13 14 12-28-29 10-13 14-28-29 10-13	MG & SEA  MATERIAL AN  17  25  33  80  N OF WE  TANCES OF WELL FI Y ARROW.	LL ROM ROAD AND	FEET  ECORD  MENT GROUT, PACKER, ETC.)
2   3   1   F   2   5   5   5   5   5   5   5   5   5	SALTY 4   MINERAL  FRESH 3   SULPHUR 19  SALTY 4   MINERAL  FRESH 3   SULPHUR 24  SALTY 4   MINERAL  FRESH 3   SULPHUR 25  SALTY 4   MINERAL  FRESH 3   SULPHUR 34 80  FRES	10-11   STEEL   2   GALVANIZED   3   CONCRETE   4   OPEN HOLE   2   GALVANIZED   3   CONCRETE   4   OPEN HOLE   24-25   1   STEEL   2   GALVANIZED   3   CONCRETE   4   OPEN HOLE   24-25   1   STEEL   2   GALVANIZED   3   CONCRETE   4   OPEN HOLE   24-25   1   STEEL   2   GALVANIZED   3   CONCRETE   4   OPEN HOLE   24-25   1   STEEL   2   GALVANIZED   3   CONCRETE   4   OPEN HOLE   3   OPEN HOLE	PUMPING  26  PUMPING  17-18  OURS  PIMPING  RECOVERY  ES  SO MINUTES  S2-34  S35-37  FEET  FEET  O OF TEST  42  R  CLOUDY  O 46-49  GPM.  UFFICIENT SUPPLY  OR QUALITY	27-30 27-30	DEPTH SET AT - FEET FROM TO 10-13 14 22-28-29 30-28-29 10-13 14 12-28-29 10-13 14-28-29 10-13	MG & SEA  MATERIAL AN  17  25  33  80  N OF WE  TANCES OF WELL FI Y ARROW.	LL ROM ROAD AND	FEET  ECORD  MENT GROUT, PACKER, ETC.)
2   3   1   F   2   5   5   5   5   5   5   5   5   5	SALTY 4   MINERAL  FRESH 3   SULPHUR 24  SALTY 4   MINERAL  FRESH 3   SULPHUR 25  FRESH 3   SULPHUR 34 80  FRESH 3   SULP	10-11   STEEL   2   GALVANIZED   3   CONCRETE   4   OPEN HOLE   2   OPEN HOLE   2   OPEN HOLE   2   OPEN HOLE   OP	PUMPING  26  PUMPING  17-18  OURS  PIMPING  RECOVERY  ES  SO MINUTES  S2-34  S35-37  FEET  FEET  O OF TEST  42  R  CLOUDY  O 46-49  GPM.  UFFICIENT SUPPLY  OR QUALITY	27-30 27-30	DEPTH SET AT - FEET FROM TO 10-13 14 22-28-29 30-28-29 10-13 14 12-28-29 10-13 14-28-29 10-13	MG & SEA  MATERIAL AN  17  25  33  80  N OF WE  TANCES OF WELL FI Y ARROW.	LL ROM ROAD AND	FEET  ECORD  MENT GROUT, PACKER, ETC.)
15-18   1   F   2   S   20-23   1   F   2   S   S   2   S   S   S   S   S   S	SALTY 4   MINERAL  FRESH 3   SULPHUR 24  SALTY 4   MINERAL  FRESH 3   SULPHUR 24  SALTY 4   MINERAL  FRESH 3   SULPHUR 34 80  FRESH 5   SULPHUR 34 80  FRESH 6   SULPHUR 34 80  FRESH 6   SULPHUR 34 80  FRESH 6   SULPHUR 34 80  FRESH 7   SULPHUR 34	10-11 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 17-18 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE  11-14 DURATION OF CFM STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE  11-14 DURATION OF 11-15 COMMERCIAL 43-45 RECOMMENDED PUMPING FEET 1 CLEAN 43-45 RECOMMENDED FOR ABANDONED, INSU 6 ABANDONED, INSU 6 MUNICIPAL 7 PUBLIC SUPPLY 8 COOLING OR AIR CON 9 NO 0 NOLL 0 BORING 0 BORING 0 DIAMOND	PUMPING 5-16 OURS 17-18 OURS 17-18 OURS 17-18 OURS 17-18 OURS 18-16 OURS 18-1	27-30 27-30	DEPTH SET AT - FEET FROM TO 10-13 14 22-28-29 30-28-29 10-13 14 12-28-29 10-13 14-28-29 10-13	MG & SEA  MATERIAL AN  17  25  33  80  N OF WE  TANCES OF WELL FI Y ARROW.	LL ROM ROAD AND	FEET  ECORD  MENT GROUT, PACKER, ETC.)
15-18   1   F   2   S   20-23   1   F   2   S   S   S   S   S   S   S   S   S	SALTY 4   MINERAL  FRESH 3   SULPHUR 19  SALTY 4   MINERAL  FRESH 3   SULPHUR 24  SALTY 4   MINERAL  FRESH 3   SULPHUR 34 80  FRESH 3   SULPHUR 34	10-11 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 17-18 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE  11-14 DURATION OF CFM STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE  11-14 DURATION OF 11-15 COMMERCIAL 43-45 RECOMMENDED PUMPING FEET 1 CLEAN 43-45 RECOMMENDED FOR ABANDONED, INSU 6 ABANDONED, INSU 6 MUNICIPAL 7 PUBLIC SUPPLY 8 COOLING OR AIR CON 9 NO 0 NOLL 0 BORING 0 BORING 0 DIAMOND	PUMPING 5-16 OURS 17-18 OURS 17-18 OURS 17-18 OURS 17-18 OURS 18-16 OURS 18-1	27-30 27-30	DEPTH SET AT - FEET FROM TO 10-13 14 22-28-29 30-28-29 10-13 14 12-28-29 10-13 14-28-29 10-13	MG & SEA  MATERIAL AN  17  25  33  80  N OF WE  TANCES OF WELL FI Y ARROW.	LL ROM ROAD AND	FEET  ECORD  MENT GROUT, PACKER, ETC.)
15-18   1   F   2   S   20-23   1   F   2   S   S   S   S   S   S   S   S   S	SALTY 4   MINERAL  FRESH 3   SULPHUR 24  FRESH 3   SULPHUR 25  FRESH 3   SULPHUR 26  FRESH 3   SULPHUR 27  FRESH 3   SULPHUR 34 80  FRESH 3   SULP	10-11   STEEL   2   GALVANIZED   3   CONCRETE   4   OPEN HOLE   2   OPEN HOLE   3   OPEN HOLE   3   OPEN HOLE   3   OPEN HOLE   3   OPEN HOLE   4   OPEN HOLE	PUMPING 5-16 OURS 17-18 OURS MINS. PUMPING RECOVERY RECOVERY 10 OF TEST 42 R 2 [L CLOUDY D 46-49 GPM.  UFFICIENT SUPPLY DR QUALITY  ROLLING OT USED	13-16 3-4 20-23 27-30 27-30 DRILLERS REMARKS	DEPTH SET AT - FEET FROM TO 10-13 14 22-23 30:	MG & SEA  MATERIAL AN  17  25  33  80  N OF WE  STANCES OF WELL FI Y ARROW.	LL ROM ROAD AND	FEET  ECORD  MENT GROUT, PACKER, ETC.)
15-18   1   F   2   S   20-23   1   F   2   S   S   S   S   S   S   S   S   S	SALTY 4   MINERAL  FRESH 3   SULPHUR 24  FRESH 3   SULPHUR 25  FRESH 3   SULPHUR 26  FRESH 3   SULPHUR 27  FRESH 3   SULPHUR 34 80  FRESH 3   SULP	10-11   STEEL   2   GALVANIZED   3   CONCRETE   4   OPEN HOLE   3   GALVANIZED   3   GALVANI	PUMPING 5-16 DORS MINS PUMPING RECOVERY 532-34 FEET FEET DOF TEST 42 R 2 [L CLOUDY D 46-49 GPM.  UFFICIENT SUPPLY DR QUALITY  ROTUSED	DATA	DEPTH SET AT - FEET FROM TO 10-13 14 22-26-29 30:	MG & SEA  MATERIAL AN  17  25  33  80  N OF WE  TANCES OF WELL FI Y ARROW.	LL ROM ROAD AND	FEET  ECORD  MENT GROUT, PACKER, ETC.)
15-18   1   F   2   S   20-23   1   F   2   S   S   20-23   1   F   2   S   S   S   S   S   S   S   S   S	SALTY 4   MINERAL  FRESH 3   SULPHUR 24  FRESH 3   SULPHUR 25  FRESH 3   SULPHUR 26  FRESH 3   SULPHUR 27  FRESH 3   SULPHUR 34 80  FRESH 3   SULP	10-11   STEEL   2   GALVANIZED   3   CONCRETE   4   OPEN HOLE   3   GALVANIZED   3   GALVANI	PUMPING 5-16 OURS 17-18 OURS MINS. PUMPING RECOVERY RECOVERY 10 OF TEST 42 R 2 [L CLOUDY D 46-49 GPM.  UFFICIENT SUPPLY DR QUALITY  ROLLING OT USED	DRILLERS REMARKS	61 PLUGGI  DEPTH SET AT - FEET  FROM TO  10-13 14  22- 26-29 30-  LOCATIC  RAFRAM BELOW SHOW PIS  LINE. INDICATE NORTH B	MG & SEA  MATERIAL AN  17  25  33  80  N OF WE  STANCES OF WELL FI Y ARROW.	LL ROM ROAD AND	FEET  ECORD  MENT GROUT, PACKER, ETC.)
TIS-18   1   F   2   S   2   S   2   S   2   S   S   S	SALTY 4   MINERAL  FRESH 3   SULPHUR 24  FRESH 3   SULPHUR 25  FRESH 3   SULPHUR 26  FRESH 3   SULPHUR 27  FRESH 3   SULPHUR 34 80  FRESH 3   SULP	10-11 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 17-18 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 11-14 DURATION OF COMMERCIAL 43-45 RECOMMENDED FEET 1 CLEAN 43-45 RECOMMENDED FEET AT  FEET 1 CLEAN 43-45 RECOMMENDED FEET ATE  C CAPACITY  S ABANDONED, INSU 6 ABANDONED, POO 7 UNFINISHED  S COMMERCIAL 6 MUNICIPAL 7 PUBLIC SUPPLY 8 COOLING OR AIR CON 9 NO  6 BORING ONAL) 7 DIAMOND 8 JETTING 9 DIAMOND 8 JETTING 9 DRIVING	PUMPING  19  26  PUMPING  5-16  PUMPING  17-18  PUMPING  RECOVERY  ES  80 MINUTES  32-34  FEET  D OF TEST  42  R  21 CLOUDY  D 46-49  GPM.  UFFICIENT SUPPLY  DR QUALITY  MIDITIONING  DT USED	DRILLERS REMARK	61 PLUGGI  DEPTH SET AT - FEET  FROM TO  10-13 14  22- 26-29 30-  LOCATIC  RAFRAM BELOW SHOW PIS  LINE. INDICATE NORTH B	MG & SEA  MATERIAL AN  17  25  33  80  N OF WE  TANCES OF WELL FI Y ARROW.	LL ROM ROAD AND	FEET  ECORD  MENT GROUT, PACKER, ETC.)
TINAL STATIC LEVEL  USA  RECOMMENDED PUMP SHALLOW  50-93  FINAL STATUS OF WELL  STATUS OF WELL	SALTY 4   MINERAL  FRESH 3   SULPHUR 24  FRESH 3   SULPHUR 25  FRESH 3   SULPHUR 26  FRESH 3   SULPHUR 27  FRESH 3   SULPHUR 34 80  FRESH 3   SULP	10-11 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 17-18 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 11-14 DURATION OF COMMERCIAL 43-45 RECOMMENDED FEET 1 CLEAN 43-45 RECOMMENDED FEET AT  FEET 1 CLEAN 43-45 RECOMMENDED FEET ATE  C CAPACITY  S ABANDONED, INSU 6 ABANDONED, POO 7 UNFINISHED  S COMMERCIAL 6 MUNICIPAL 7 PUBLIC SUPPLY 8 COOLING OR AIR CON 9 NO  6 BORING ONAL) 7 DIAMOND 8 JETTING 9 DIAMOND 8 JETTING 9 DRIVING	PUMPING 5-16 DORS MINS PUMPING RECOVERY 532-34 FEET FEET DOF TEST 42 R 2 [L CLOUDY D 46-49 GPM.  UFFICIENT SUPPLY DR QUALITY  ROTUSED	DRILLERS REMARKS  DATA OF INSPECT	61 PLUGGI  DEPTH SET AT - FEET  FROM TO  10-13 14  22- 26-29 30-  LOCATIC  RAFRAM BELOW SHOW PIS  LINE. INDICATE NORTH B	MG & SEA  MATERIAL AN  17  25  33  80  N OF WE  STANCES OF WELL F  Y ARROW.  59-62 DATE RECEIVE  CC	LL ROM ROAD AND	FEET  ECORD  MENT GROUT, PACKER, ETC.)
TINAL STATIC LEVEL  USA  RECOMMENDED PUMP SHALLOW  50-93  FINAL STATUS OF WELL  STATUS OF WELL	SALTY 4   MINERAL  FRESH 3   SULPHUR 24  FRESH 3   SULPHUR 25  FRESH 3   SULPHUR 26  FRESH 3   SULPHUR 27  FRESH 3   SULPHUR 34 80  FRESH 3   SULP	10-11 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 17-18 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 3 COMMERCIA 4 OPEN HOLE 4 OPEN HOLE 4 OPEN HOLE 5 GAM STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 4 OPEN HOLE 5 GALVANIZED 6 ABANDONED 7 STEEL 6 STEEL 6 MINITES 6 ABANDONED, INSU 6 ABANDONED, POO 7 UNFINISHED  5 COMMERCIAL 6 MUNICIPAL 7 PUBLIC SUPPLY 8 COOLING OR AIR CON 9 NO  6 BORING ONAL) 7 DIAMOND 8 JETTING 9 DRIVING	PUMPING  19  26  PUMPING  5-16  DURS  PUMPING  RECOVERY  ES  SO MINUTES  32-34  FEET  D OF TEST  42  R  CLOUDY  D  46-49  GPM.  UFFICIENT SUPPLY  DR QUALITY  NDITIONING  TUSED  ICENCE NUMBER  3397	DRILLERS REMARKS  DATA OF INSPECT	61 PLUGGI  DEPTH SET AT - FEET  FROM TO  10-13 14  22- 26-29 30-  LOCATIC  RAFRAM BELOW SHOW PIS  LINE. INDICATE NORTH B	MG & SEA  MATERIAL AN  17  25  33  80  ON OF WE  STANCES OF WELL FIT ARROW.	LL ROM ROAD AND	FEET  ECORD  MENT GROUT, PACKER, ETC.)
TINAL STATIC LEVEL  IF FLOWING GIVE RATE  WATER USE  OF  WATER USE  OF  NAME OF WELL	SALTY 4   MINERAL  RESH 3   SULPHUR 19  SALTY 4   MINERAL  RESH 3   SULPHUR 24  SALTY 4   MINERAL  RESH 3   SULPHUR 34 80  FRESH 3   SULPHUR 34 80  F	10-11 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 17-18 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 24-25 1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 3 CONCRETE 4 OPEN HOLE 4 OPEN HOLE 4 OPEN HOLE 5 GAM STEEL 6 ABANDONED 6 ABANDONED, INSU 6 ABANDONED, POO 7 UNFINISHED 5 COMMERCIAL 6 MUNICIPAL 7 PUBLIC SUPPLY 8 COOLING OR AIR CON 9 NO ONAL) 6 BORING ONAL) 7 DIAMOND 8 JETTING 9 DRIVING	PUMPING  19  26  PUMPING  5-16  DURS  PUMPING  RECOVERY  ES  SO MINUTES  32-34  FEET  D OF TEST  42  R  CLOUDY  D  46-49  GPM.  UFFICIENT SUPPLY  DR QUALITY  NDITIONING  TUSED  ICENCE NUMBER  3397	DRILLERS REMARK	61 PLUGGI  DEPTH SET AT - FEET  FROM TO  10-13 14  22- 26-29 30-  LOCATIC  RAFRAM BELOW SHOW PIS  LINE. INDICATE NORTH B	MG & SEA  MATERIAL AN  17  25  33  80  N OF WE  STANCES OF WELL F  Y ARROW.  59-62 DATE RECEIVE  CC	LL ROM ROAD AND	FEET  ECORD  MENT GROUT, PACKER, ETC.)

DUT: 11.7 2 6 4 13 8 4 E	3	1036	A/	100 WATER 100 100 100 100 100 100 100 100 100 10	8478
Basin or District To	rchue ownship	RECO CK- Stou Village, To	RDURCE	(#36) .	el)3
Let /3	ate com	اللا ما	ay 43/	touffvir	Jean)
Casing and Screen Record			Pumping	Test	
Inside diameter of casing 3# Total length of casing.	Test-		e	3	G.P.M.
Type of screen					
Length of screen	Wate	er clear or clo	udy at end of	test Ale	ar
Depth to top of screen  Diameter of finished hole 34	Dog	mmended n	umping rate	7 feet below	G.P.M.
Well Log					Record Kind of water
Overburden and Bedrock Record		From ft.	To ft.	Depth(s) at which water(s) found	(fresh, salty, sulphur)
Dack Topsail sandy		0			
- At the state of			9		
yellow sandy stay		9	22		
as and of soulders 6-12"		22	25	25	pesh
grave of sources		- 45	29	<del> </del>	/
grey clay		رين	de /		
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  Address  Date  Address  Date		In diagra road and	am below sho	of Well w distances of wondicate north by  7 9 7 9 7 8 CON/6	arrow.
(Signature of Licensed Drilling or Boring Contractor)  Form 7 10M-62-1152  OWRC COPY		e acestes			.S.58

The Ontario Water Resources Commission Act

	WATER WEL		b
Water agreement in Optorio ( BUINT O)	aty IN SPACES PROVIDED 11	6909956 MUNICIP. GOO.	M 1 22 23 24
2. CHECK COUNTY OR DISTRICT	CORRECT BOX WHERE APPLICABLE 1 2 TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON, BLOCK, TRACT, SURVEY, ETC.	0/0
V	TouF FVi	DATE COM	7 MO. 004 YR. 70
	Jour PV	ELEVATION 5 RC. BASIN CODE II	<u>III</u> <u>IV</u>
i 2 M 10 / 10	LOG OF OVERBURDEN AND BEDROO	26 30 31 /	
GENERAL COLOUR COMMON MATE	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM TO
brown cla	v Some stan	es surface	0' 18'
brown grav	el some sands	loose	18' 39'
brown sand	d coarse	/oose	
			<u> </u>
31 Dansdash2	] <u>aa396 11 a9   aosta and                                      </u>		75 80
32 10 14 15 (41) WATER RECOI	21 51 CASING & OPEN HOLE	RECORD SIZE(5) OF OPENING 31-33 DIA	METER 34-38 LENGTH 39-40
WATER FOUND KIND OF WATE	R INSIDE WALL THICKNESS FR	OM TO MATERIAL AND TYPE	DEPTH TO TOP 41-44 80 OF SCREEN
	JUPHUR 14  3410-13 1 1 STEEL 12 INERAL  12 GALVANIZED  SECONCRETE  25	61 PLUGGING & SE	ALING RECORD
2 SALTY 4 □ M	ULPHUR 4 OPEN HOLE  17-18 1 STEEL  19	DEPTH SET AT - FEET MATERIAL A	CEMENT GROUT.
2 □ SALTY 4 □ N	ULPHUR   2 □ GALYANIZED	10-13 14-17	
2 SALTY 4 □	AINERAL 24-25 1 STEEL 26	27-30 18-21 22-25 26-29 30-33 80	
2 SALTY 4 □ I	SULPHUR 34 BC 3 CONCRETE 4 OPEN HOLE	LOCATION OF W	Ell
PUMPING TEST METHOD 10	PUNPING RATE 11-14 DURATION OF PUNPING 15-16 17-18  April 15-16 MINS. MINS.	LOCATION OF W	FROM ROAD AND
STATIC WATER LEVEL END OF PUMPING	WATER LEVELS DURING  1 PUMPING 2 RECOVERY 15 MINUTES 30 MINUTES 60 MINUTES 60 MINUTES 30 AL 25 A	LOT LINE. INDICATE NORTH BY ARROW.	FROM ROAD AND COUNT
19-21 22-24 19-21 PEFT PEFT	26-28 29-31 32-34 35-37 FEET FEET FEET FEET		ounty of Count
Z IF FLOWING, 38-4	PUMP INTAKE SET AT WATER AT END OF TEST 42  FEET 1 CLEAR 2 CLOUDY		6011
RECOMMENDED PUMP TYPE  SHALLOW DY DEEP	RECOMMENDED 43-45 RECOMMENDED 46-45 PUMP PUMPING PUMPING RATE COMMENDED FEET RATE COMMENDED FEET RATE	//	19
G	PM./FT. SPECIFIC CAPACITY	CONIO 40TO 50'	į.
FINAL CONS	ER SUPPLY 5 ABANDONED, INSUFFICIENT SUPPLY SERVATION WELL 6 ABANDONED, POOR QUALITY THOUS 7 UNFINISHED	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
OF WELL 4□ REG	HARGE WELL		
WATER 3 IRR	ICK 6 MUNICIPAL  IGATION 7 PUBLIC SUPPLY	* severitin	و الم
USE O/ 4 - IND	USTRIAL 8 COOLING OR AIR CONDITIONING OTHER 9 NOT USED	1	70'
	SIE TOOL 6 GORING TARY (CONVENTIONAL) 7 DIAMOND		14707
OF 3 RO	TARY (REVERSE) 8 ☐ JETTING  TARY (AIR) 9 ☐ DRIVING  R PERCUSSION	DRILLERS REMARKS:	/
NAME OF WELL CONTRACTOR	LICENCE NUMBER	DATA 58 CONTRACTOR 59-62 DATE R	270770
O Wilson W	Later Wells Limited 459	DATE OF INSPECTION INSPECTOR	
NAME OF DRILLER OR BOREN	Hornley LICENCE NUMBER	REMARKS:	( )
SIGNATURE OF CONTRACTOR	Saudes SUBMISSION DATE William DAY 20 MO 07 YR7	O O O O O O O O O O O O O O O O O O O	J.B.
171 / 1 . / //	7 17 1/ 2) L 10 10 0 ( ve/ )	<u> </u>	

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### The Ontario Water Resources Commission Act

	The Ontario W						
	VATER V	N EI	6914	_	MUNICIP	CON.	
Vater management in Ontario 1. PRINT ONL  2. CHECK   DUNTY OR DISTRICT	Y IN SPACES PROVIDED  CORRECT BOX WHERE APPLICABLE  TOWNSHIP, BOROUGH, CITY,	TOWN VILLAGE			69 009 , BLOCK, TRACT, SURVEY,	CQ N	22 23
YORK	Whitchick			9	- Con	DATE COMPLETED A	8010
	R1-S	TOUF	FVICE	1= .		DAY 29 MO	<u> 2 / 2</u>
	7.4.	3570		<u> </u>	BASIN CODE 2#		
MOST	LOG OF OVERBURDEN		ROCK MATER	RIALS (SEE	INSTRUCTIONS)	DEP	TH — FEET
COMMON MATERIA	OTHER MATE	RIALS		GENER	AL DESCRIPTION	FROM	T0
Allow of	<i>i</i> ,					15	32
1 and						30	46
april 1						40	42
		<del></del> -					
	2030 11 0040	<b>                                    </b>	1 100 Kd 13	<b>%</b> _			111
10 :4 15	1 32				54	1 65	1 1
WATER RECORD	CASING & O	PEN HOL	E RECORE	Z SIZE (SLOT	s) OF OPENING OF O	33 0 250	LENGTH 3
AT - FEET KIND OF WATER  AT - FEET SIND OF WATER		THICKNESS	FROM TO	J WATE	RIAL AND TYPE	DEPTH TO TO	-
2 SALTY 4 MINERA 15-18 1 FRESH 3 SULPHU	L 2 GALVANIZED 3 CONCRETE	\$			LUGGING &	SEALING I	RECORD
20-23 1 FRESH 3 SULPHU	17-18 1 ☐ STEEL 19 R 2 ☐ GALVANIZED		20-	DEPTH FROM	SET AT - FEET MATE		CEMENT GROUT, D PACKER, ETC
2 SALTY 4 MINERA 25-28 1 FRESH 3 SULPHU	R 29 4 OPEN HOLE		27-	_    +>	3-21 22-25		
2 SALTY 4 MINERA  30-33 1 FRESH 3 SULPHU 2 SALTY 4 MINERA	R 34 80 2 GALVANIZED 3 CONCRETE			26	29 30-33 80		
PUMPING TEST METHOD 10 PUMPIN		MPING	<u></u>		OCATION OF	WELL	
STATIC WATER LEVEL 25		SOO MINS	7   "	N DIAGRAM BEI	LOW SHOW DISTANCES OF CATE NORTH BY ARROW.		D
LEVEL PUMPING	2 R 20 R	BECOVERY 60 MINUTES 34 35-3	7		N		
FEET FEET IF FLOWING, 38-41 PUMP I	FEET FEET FEET NTAKE SET AT WATER AT END OF		ज <b>ा</b>		1		
GPM.  RECOMMENDED PUMP TYPE RECOM	FEET 1 CLEAR MENDED 43-45 RECOMMENDED	2☐ CLOUDY		BLOMIN	VYTON SHITE	ROAD	. a
SHALLOW DEEP SETTING	FEET PUMPING RATE  SPECIFIC CAPACITY	GPM.	<u>. </u>		160	13. MA	GIPP I PC
FINAL 54 1 X WATER SUP	PLY <sup>5</sup> ABANDONED, INSUFF		<u>י</u> עוד			"Stre	Ē
STATUS   2 OBSERVATION   3 TEST HOLE   4 RECHARGE	7 UNFINISHED	QUALITY		,		ني	
55-56 I DOMESTIC	5 COMMERCIAL 6 MUNICIPAL		1	٤.		5	
WATER  USE    IRRIGATION   4 □ INDUSTRIAL	7  PUBLIC SUPPLY 8  COOLING OR AIR COND!			<del>Q</del>		J.	
□ OTHER_	9 □ NOT ( 6 □ BORING	USED	1	8			
	NVENTIONAL) 7 DIAMOND		1 1			f	
OF 3 □ ROTARY (RI					_	f	
OF 3 ROTARY (RI 4 ROTARY (AI 5 AIR PERCUS	R) 9 □ DRIVING SION		DRILLERS REM		S	1	
OF 3 ROTARY (RI 4 ROTARY (AI 5 AIR PERCUS	R) 9 □ DRIVING SION □ LICE	nce humber	DATA	58 C	****	27	′ ე <sup>63-68</sup>
OF DRILLING    A   ROTARY (AI   ROTARY (AI   ROTARY (AI   S   AIR PERCUS   NAME OF WELL CONTRACTOR   TO M   M   TO M   TO M     ADDRESS   ADDRESS   TO W   T	SION  9 DRIVING  LICE  5	417	DATA SOURCE  DATE OF IN	58 C	ONTRACTOR 59-62	) *?**() 27	
OF 3 ROTARY (RI 4 ROTARY (AI 5 AIR PERCUS	SION  9 DRIVING  LICE  5		DATA SOURCE  DATE OF IN  REMARKS:	58 C	INSPECTOR	27	′ () "°°° P

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The Ontario Water Resources Act 3103£.

FORM NO. 0506-4--77

Intario	ironment 1. Print only in Spaci 2. Check ⊠ Correct I	OOX WHERE APPLICABLE	691521	10 14 15	9N	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
OUNTY OR DISTRICT		TOWNSHIP, BOROUGH, CITY, TOWN, VILL		CON , BLOCK, TRACT, SURVEY, ETC	00	9
		.R.#3 ST	UFFVILLE	DATE	5 MO OCT	.53 <b>-</b> yr. <u>7</u>
<del>2,</del>	M CALL	1NG 7.400.0	5 7025	SC MASIN CODE "		iy J J
7		OF OVERBURDEN AND BE	DROCK MATERIAL			
ENERAL COLOUR	MOST COMNON MATERIAL	OTHER MATERIALS		GENERAL DESCRIPTION	DEPTH -	FEET TO
				DUG WELL	0	<b>3</b> 0
BROWN	SAND			LOOSE	30	35
GRAY	GRAVEL	CLAY		LOOSE	35	42
GRAY	CLAT	SAND		SOFT	42	108
GRAY	CLAY	SAND		HARD	108	130
GRAY	SAND		MEDIUM	WATERBEARING	130	138
100	2011221 1 1 1 2020V	1001aH   1 K2 2 21911 11N1	170 IA ( A \$12 IA \$15	4 ISF 10.130140.5 <b>128</b> 1731 1	<u> </u> ୦ / ୫ <i>ହ</i> ାଅ <b>ନ୍ତ</b> ୍ରମ	
31 \ \(\alpha\)(\alpha\)			1. 11 11.1	<u> </u>	PA PARAMETER	
10	ATER RECORD	CASING & OPEN H	OLE RECORD	SIZE(S) OF OPENING	1	75 NGTH
TER FOUND	KIND OF WATER	NSIDE WALL DIAM MATERIAL THICKNESS	DEPTH - FEET FROM TO	S ISLOT NO C / (-	DEPTH TO TOP	<u>ે3</u>
	FRESH 3 SULPHUR 14 SALTY 4 MINERAL	10-11 15-STEEL 12 188	<b>—</b>	JOHNSON S. STEEL	135	FEET
13-14	FRESH 3 SULPHUR 19 SALTY 4 MINERAL	G GALVANIZED  CONCRETE  GOPEN HOLE	.	61 PLUGGING & S	EALING RECO	RD
20-23 (	FRESH 3 SULPHUR 24	17-18   STEEL 19   2   GALVANIZED	20-23	PEPTH SET AT - FEET MATERIAL FROM TO		T GROUT
	SALTY 6 MINERAL 29 SULPHUR 29	CONCRETE OPEN HOLE		10-13 14-17		
2	SALTY 4 MINERAL	24-25 1 STEEL 26 2 GALVANIZED	27-30	16-21 22-25 26-29 30-33 80		
י ו	FRESH 3 SULPHUR SALTY 4 MENERAL	3 CONCRETE 4 OPEN HOLE		26-24 30-33		
PUMPING TEST N	2 BAILER CO15	1)-14 DURATION OF PUMPING O1 15-16 OC	17-10	LOCATION OF W	ELL'	
STATIC	WATER LEVEL 25 END OF WATER LEVE	GPM HOURS	_ MIN2 }	GRAM BELOW SHOW DISTANCES OF W NE INDICATE NORTH BY ARROW.	ELL FROM ROAD AN	iD
016	PUMPING -21 22-24 IS MINUTES 26-28	30 MINUTES 45 MINUTES 60 MIN 29-31 32-34	17 ES 35-37 Bloc	ominaton, S.K. 11	Hwy 47	7
	FEET CAOFEET		9 1111	4		
IF FLOWING. GIVE RATE	GPM	FEET 1 CLEAR 2 CL	I	1 1	$\wedge$	
RECOMMENDED SHALL	PUMP TYPE RECOMMENDED PUMP OW DEEP SETTING ZE	43-45 RECONNENDED OC OS PUMPING RATE	GPM	.150	, i	
50-53					N	
FINAL	1 WATER SUPPLY 2 OBSERVATION WELL	S ABANDONED, INSUFFICIENT SU B ABANDONED POOR QUALITY	PPLY			
STATUS OF WELL	1 TEST HOLE 1 RECHARGE WELL	7 UNFINISHED	.6	Shill set it		
	2 D STOCK	COMMERCIAL MUNICIPAL			/	
WATER USE		PUBLIC SUPPLY COOLING OR AIR CONDITIONING		1112		
	OTHER	• □ NOT USED		W. areka		
METHOD	· _ · ·			The mi		
OF DRILLING	G POTARY (REVERSE)  ROTARY (AIR)  AIR PERCUSSION	■ □ JETTING ■ □ DRIVING		The same of the sa		
NIME OF WE	LL CONTRACTOR	LICENCE NUMBE	DRILLERS REMARK	× -	CEUVED PA	000
	ELL DRILLING	4738	Source	1 4738 2	9"117	9
ADDRESS  ADDRESS  ADDRESS  ANAME OF DRI  FARL  SIGNATURE OF	h RD. STOUFFVILI	`. <b>.</b> ₽:	DATE OF INSPE	CTION INSPECTOR		
NAME OF DRI	LLER OR SORER SAUDER		REMARKS			-
SIGNATURE O		SUBMISSION DATE	70	css.	88 Polis	
carl	Saucler	DAY 27 NO	*/ P 1/2/ 1/2	six a profession	191 T	



Ontario	1. PRINT ONLY IN	SPACES PROVIDED	692033	26 63009	<u>CON109</u>
COUNTY OR DISTRICT		TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	TOUFEIN	CON BLOCK TRACT SURVEY E	TC LOT 39-27
		STO	a 1 - 6 2011	**	DAY L MO 10 YR FF 86
		NG NG	C ELEVATION	RC BASIN CODE	69 In 109
1 2.	¥ 10 12	OG OF OVERBURDEN AND BEDR	OCK MATERIAL	S (SEE INSTRUCTIONS)	47
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS		GENERAL DESCRIPTION	DEPTH - FEET FROM TO
Brown	6-124	F184			0 6
Brown	STAN	F1218			6' 32'
Blue	GLZY				32' 80'
Blue	Stnd	GOBTSE			80' 73'
	<b>H</b>			<i>f</i> .	
	-			//	
31			للسللم		ا للبلبلبيا ا
32			DEPOSED 1	SIZE S OF OPENING SI-3	85 75 80 3 DIAMETER 34-38 LENGTH 39-40
WATER FOUND	TER RECORD	51 CASING & CONTHOLE	DEPTH - FEET	W TOLON TOLON	6 INCHES H FEET
7 x P.13 1 8	FRESH 3 SULPHUR TA	10-11 1 STEEL 12	FROM 10	MATERIAL AND TYPE	DEPTH TO TOP 41-44 30 OF SCREEN
15-18 1	6 GAS  FRESH 3 SULPHUR 19	2 D GALVANIZED 3 D CONCRETE 4 D OPEN HOLE 5 D PLASTIC	0 79 [	61 PLUGGING 8	SEALING RECORD
20-23 1	FRESH 3 SULPHUR 24	17-18 1 STEEL 19	20-23	DEPTH SET AT - FEET MATE	ERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC)
	FRESH 3 SULPHUR 29	3 CONCRETE 4 COPEN HOLE 5 PLASTIC			nseal T
<del></del>	SALTY 6 GAS  FRESH 3 GSULPHUR 14 M	24-25 1 STEEL 26 2 GALVANIZED 3 CONCRETE	27-30	18-21 22-25 26-29 30-33 80	Holf Plub
1 5	SALTY 6 GAS	4 OPEN HOLE 5 OPLASTIC	]		
71 PUMPING TEST ME	BAILER SUMPING RATI	E B-14 DURATION OF PUNPING  17-18  5PM	, ·	LOCATION OF	
STATIC LEVEL	PUMPING	EVELS DURING PUMPING 2 RECOVERY	IN DIAG	RAM BELOW SHOW DISTANCES OF INDICATE NORTH BY ARRO	
יין אר דונאר אייייין אר	80 60	1 7/ 23-31 8 32-34 1 35-33	11	:	4
Z IF FLOWING	38-41 PUMP INTAKE	SET AT WATER AT END OF TEST 48		1111	TX
IF FLOWING.  GIVE RATE  RECOMMENDED PL	GPM		<del>,</del>	VIII	ارا
SHALLON	W DEEP SETTING	O FEET RATE /5 GPN	<u>-</u>		4/1
FINAL	MATER SUPPLY	S ABANDONED, INSUFFICIENT SUPPLY			$\mathcal{N}$
STATUS OF WELL	Z OBSERVATION WES	LL 6 ABANDONED POOR QUALITY 7 DUNFINISHED DEWATERING			
1	S-Se 1 DOMESTIC	5 COMMERCIAL			1000
WATER	2 STOCK 3 IRRIGATION 4 INDUSTRIAL*	Municipal     Public Supply     Cooling or air conditioning		500'	
	OTHER	NOT USED	BLOO	#10007	- Hwy 42-
METHOD OF	1 CABLE TOOL 2 ROTARY (CONVEN 3 ROTARY (REVERSE			MINGTON	- Hwy 47-
CONSTRUCT		DIGGING OTHER	DRILLERS REMARKS	/′	43190
NAME OF WELL		WELL CONTRACTOR	S) DATA	SE CONTRACTOR 52-52 DATE	E RECEIVED 81-06 80
ADDRESS	ntey Well	Drilling 7407	DATE OF INSPECT	2 4 U	APR 2 7 1989
A A A A	LL TECHNICIAN COM	md 1-1, W WELL TECHNICIAN'S			
CONTRACTOR OF WE STORY OF WE S	BIShop TECHNICIAN/CONTRACTOR	SUBMISSION DATE	OFFICE	, we see	
Bell	Bisko	DAY NO. YR.	Ö		•
MINISTRY	OF THE ENVIRON	MENT COPY			FORM NO. 0506 (11/86) FORM 9



The Ontario Water Resources Act

### WATER WELL RECORD

Ontario	1. PRINT ONLY IN S	PACES PROVIDED  CCT BOX WHERE APPLICABLE	11 (	392270	)9 <u>690</u> 0	) <u>ଜ୍ୟୁତ୍ୟ</u>	ــــــــــــــــــــــــــــــــــــــ	1110
COUNTY OR DISTRICT	1	TOWNSHIP, BOROUGH CITY	TOWN STLAGE	week	CON . BLOCK, TRACT, SI	URVEY ETC		"O""
			1144			DATE COMPLE	TED 7"	94
		NG NG	NCI TI	ELEVATION	ec. BASHN CODE	DAY		iv .
1 2	10 12	1 1,5	24 25	26	36 31			47
	L C Most	G OF OVERBURDEN	<u> </u>	K MAIERIAL	GENERAL DESCRIPTION	<u> </u>	DEPTH -	
GENERAL COLOUR	COMMON MATERIAL	OTHER MAT	A		GENERAL BESCRIPTION		FROM	18
Brown	Clay	sand	<u> </u>				18	32
//	Sand		<u>.                                    </u>	_			32	37
	graver			100	zrol		37	46
11	Navo	clas	L		arsl		46	5/
Brown	Agad	- Xuy		10	arsl		51	64
(C)								
							-	
			· <u>-</u>					
			·					
	<u> </u>		9 1 1 1 1 1	111	1 11 11	1 1 1 1		1 1 1
31   111			<u>                                     </u>	<u> </u>	<del>▗▋▗</del> ▍ <del>▗▗▋</del> ▗▎▗╏┇▗▗▗╏┆	<u>                                     </u>	<u> </u>	
1 2 10	TER RECORD	51 CASING &	OPEN HOLE R	ECORD	SIZE(S) OF OPENING	31-33 DIAMETE	P 34-31 L	75 40 ENGTH 39-40
WATER FOUND AT - FEET	KIND OF WATER	INSIDE MATERIAL		EPTH - FEET	MATERIAL AND TYPE		INCHES DEPTH TO TOP	41-44 30
	SALTY 6 GAS	10)11 1 DSTEEL 2 GALVANIZED	2	13-16	S5 S5		61	FEET
15-18 1	FRESH 3 SULPHUR 4 MINERALS SALTY 6 GAS	3 CONCRETE 4 COPEN HOLE 5 PLASTIC	188 0			GING & SEALI	_	
20-23 1	FRESH 3 SULPHUR 24	17-18 1 STEEL 2 GALVANIZED	•	20-23	FROM TO	MATERIAL AND	TYPE LEAD PA	NT GROUT CKER. ETC >
25-28 1	FRESH 3 SULPHUR 4 MINERALS	3 CONCRETE 4 OPEN HOLE 5 PLASTIC	6	27.30	O 10-12 Q O 16-17	Bolepl	ug	
30.23	SALTY 6 GAS  FRESH 3 SULPHUR 34 SU  MINERALS	1 STEEL 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE		}	26-29 39-33	80		
PUMPING TEST MI	SALTY 6 GAS	5 PLASTIC	PUMPING		10017101	N OF WELL		
171!!	2 STRAILER 2	() / 15	- a 1		GRAM BELOW SHOW DIST	ANCES OF WELL		ND.
STATIC LEVEL	PUNPING	LEVELS DURING 2 C	PUMPING .	LOT LI			KOM KOND A	
30°	55 45	1 7 0 1 2 2	5 60 MINUTES 1-31 557 FEET FEET				N	
IF FLOWING,	FET FET FE FE STATE STAT	SET AT WATER AT END	OF TEST 42	1	2		<b>分</b> 。	
IF FLOWING.  GIVE RATE  RECOMMENDED P	UMP TYPE RECOMMENDE	PEET						
SHALLO	DW DEEP SETTING	S FEET RATE	<b>СРМ</b>	F	20-X			
FINAL	1 WATER SUPPLY	S ABANDONED, INSL		(4	15	•		
STATUS OF WELL	# OBSERVATION WE # TEST HOLE # RECHARGE WELL	LL 6 ABANDONED POO 7 UNFINISHED DEWATERING	R QUALITY	LINCO	LNVILLE	LANE		
	SS-SE 1 DOMESTIC	5 COMMERCIAL						
WATER USE	STOCK IRRIGATION INDUSTRIAL		DITIONING		ر ا	Hw4		
, J.S.E.	OTHER	3   NO				1		
METHOD			,		\	`		
OF CONSTRUCT	ION   ROTARY (REVERS	1 DRIVING	OTHER	DRILLERS REMARK			14	1506
NAMEZOF WELL	LEONTRACTOR #	<i>M</i>	L CONTRACTOR'S	DATA	SA CONTRACTOR	9 DATE PICELIVED		61-56 40
	lan waly	will 3	459	DATE OF INSPEC	545		1 2 199	<b>F</b>
TO PARTY	Stoube	lle	· · · · · · · · · · · · · · · · · · ·	N REMARKS				
CONTRACTOR	m Konon	0 7	LL TECHNICIAN'S		,			
SIGNATUME	TEGHNICIAN/CONTIACTOR	SUBMISSION DATE	7 ,94	OFFICE				
1//	Y OF THE ENVIRON	<del></del>				FOI	RM NO. 0506 (	11/86) FORM 9

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0506 (11/98) Front Form 9

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(R) (	ntario	Ministry of	Well Tag Number (Place		nt number below)		We	ell Record
(A)	ricario	the Environment	_ A 0015	01 _		Regulation 903	Ontario Wat	er Resources Act
			1654664	•				page of
	s for Comple		A001501		l de e e e e Di			
• For use	in the <b>Provinc</b>	e <b>of Ontario</b> only. This completed in full to avo	s document is a perma id delays in processing	anent <b>iega</b> i a. Further i	nstructions and	ease retain for futur explanations are ava	e reference: allable on the l	back of this form.
<ul> <li>Questing</li> </ul>	ns regarding o	ompleting this applicati	ion can be directed to	the Water	Well Managem	ent Coordinator at	416-235-620	)3.
All me	tre measurem	ents shall be reported	l to 1/10 <sup>th</sup> of a metre.			Ministry Use	e Only	
		blue or black ink only.	Mali kafassaskiasa	MUN	co			LOT
First Name	er's Informatic	on and Location of V	<b>ve</b> ti intormation Mai		s (Street Numbe	r/Name, RR,Lot,Cond	ession)	
1 113t Hairie	York Re	ion	C/	•	er Hims	Ltd 1091 Gd	orham St	
County/Distri	ict/Municipality	Township	/City/Town/Village		ovince Postal	Code Tele	phone Numbe	ir (include area code)
Address of M	All Location (Co.	ntv/District/Municipality)	ark Set Tow	vnship	ntario L31	Lot	Con	cession
Addressorv		in an Assiron Multiorpanty)			ch-Stouf	fville 10	) 5	9 .
RR#/Street I	umber/Name			City/Town/Vi		Site/Compa	artment/Block/	Tract etc.
Linco	lnville	Lane Zone Easting	Northing L	Jnit Make/M	odel Mode	of Operation: Und	lifferentiated	Averaged
GPS Readin	Y 1 1	Zone Easting 17 640937		Magell			erentiated, specify	
Log of Ov		Bedrock Materials (	see instructions)	7				
General Colo	ur Most comn	on material	Other Materials		General	Description		Pepth aviolet
Black	Topsoi	ı.				**	C	2
Brown		clay & gravel				· · · · · · · · · · · · · · · · · · ·	2	2 11
Brown	Silty	sand & gravel	trace clay			· :	]	11 21
Brown	Silty	4.7					5	21 26
Brown		sand & gravel						26 37
Brown	1 1	gravel				<u></u>		37 94
Grey	Silty		gravel			bearing	•	94 110
Grey	· · · · · · · · · · · · · · · · · ·	gravel	RIBAGI		water	bearing		110 113
Grey	sand		e gravel		water b	earing earing		113 126
Grey		gravel	<u> </u>		water b			137
	e Diameter		Construction Reco	rd			t of Well Yiel	
Depth	Metros Diamel	er Inside Mate	Wall	Depth	-Metre	Pumping test method	Draw Down	Recovery Vel Time Water Level
From	137 6"	diam Mate	thickness continuities	From	То		THE PROGOS	min Metres
- V	13/ 0		Casing			Pump intake set at - (metres)	Static Level 39	
		Incho X Steel				Pumping rate -	1	1
			- -	+3	107	(litres/min)		
	ter Record	Galvanize	-   N. H. A.I.I.	<del>.</del>		Duration of pumpinghrs + min	2	2
Water found at Metres	Kind of Wate	Steel _	Fibreglass			Final water level end	3	3
m [	Fresh Sulph	,     .       -   -				of pumpingmetres	18,77 % 1	
Gas Other:	Salty Mine	L.   Galvanize		-		Recommended pump type.	4	4
m [	Fresh Sulph	jurill   ⊟ ; ⊟	Fibreglass			Shallow Deep		
Gas (	Salty Mine	als Plastic Galvanize	<u>-</u>			Recommended pump depthmetres	5	5
	Fresh Suiph		Screen			Recommended pump	10	10
☐ Gas	Salty Mine		Fibreglass Slot No.			rate. (litres/min)	15	15
Other:		Plastic		107	137	If flowing give rate -	20	20
	vell yield, water wa sediment free	S Galvanize	SCH 40		10.	(litres/min) If pumping discontin-	30	30
Other, sp	-		No Casing or Scre			ued, give reason.	40	40
		☐ Open hol					50	50
Chlorinated	Yes No	Open noi	•		لــــــــــــــــــــــــــــــــــــــ		60	60
				andonment		Location		
Depth set at	Metro Material an	d type (bentonite slurry, neat c	ment slurry) etc. Volum (cubic	e Placed metres)	In diagram below Indicate north by	show distances of well f	rom foad, lot line	e, and building.
137	1 1	ica Sand		-%	maisais north by	Carrow.		INT
	1 1	tonite Chips		· · · · · · · · · · · · · · · · · · ·				114
97	1	tonite Slurry	. R Chi-			Blooming	<i>stor</i>	
2	O Cem		a Childre			The state of the s	وموده ومراسب ومراجع فيتوانين ميزيدون والمتعادي ومواديون	
- 44	- Jem							line
		Method of Construct	ion	· -		lincolnvill	1000	
Cable Tool	Rot			Digging		III LON IVIII		The same of the sa
Rotary (co				Other 🛹				
Rotary (re	erse) 🔲 Boi	ing ,L	Driving —	<del></del>		and the second		
☐ Domestic	☐ Ind		Public Supply	Other			*	***
Stock	□c₀	nmercial 📉	Not used —	· · · · · · · · · · · · · · · · · · ·	14.7		. 14. # 0	
Irrigation	∐Mu	nicipal Final Status of We	Cooling & air conditioning		Audit No. 7	18670	ite Well Complet	003   112 01
Water Sur	noiv Rechard			ned, (Other)	Was the well ow		te Delivered	YYYY MM DD
Observation	n well	ned, insufficient supply	Dewatering		package delivere	d? Yes No		
Test Hole		hed, poor quality  Contractor/Technician	Replacement well	4	<u> </u>	Ministry Us	e Only	
Name of Well		Politiacion (#Clinician	Well Contractor's L	icence No.	Data Source		entractor 26	<b>362</b>
G. Hart	& Sons	Well Drilling	Lat T-2662		Port 5			
Business Add	ress (street name, r	umber, city etc.) enelon Falls	Ç.		Date Received	R 2 U 2005	ite of Inspection	YYYY MM DD
Name of Well	Technician (last na		Well Technician's L	icence No.	Remarks	A FORM OF	ell Record Numb	
Watso	n,Bryan	<u> </u>	T-2441	,				arabias is
	echnician/Contract		Date Submitted YYYY	MM DD			*	
0506E (09/03)		Contractor's Co	opy Ministry's Copy	Well Ow	ner's Copy	Cette :	formule est dis	sponible en français
	1	ı	· · · · · · · · · · · · · · · · · ·					

(R) (	ntario	Ministry of	Well Tag Number	A 001502	1	Well R	
		the Environment	A001502		Regulation 903 (	Ontario Water Reso page _	of
	s for Comple in the Province	_	s document is a permar	nent <b>legal</b> document. P	ــا 'lease retain for future	reference.	
All Sec.	tions <b>must</b> be d	completed in full to avo	id delays in processing.	Further instructions an	d explanations are avail-	lable on the back of	this form.
		ompleting this applicated to the shall be reported to the shall be repo	ion can be directed to the	ne Water Well Manage	ment Coordinator at 4	16-235-6203.	-
		plue or black ink only.			Ministry Use	Only	
Well Owne	r's Informatio	on and Location of V	veli information		ON	LOT	
First Name	Region	Last Name	Mailiu C / C	ng Address (Street Numb Jagger Hims	er/Name, RR,Lot,Conce	ssion) <b>Tham St</b>	
	ct/Municipality	Township	/City/Town/Village			hone Number (include	e area code)
·		News	narket	Ontario		1	·
Address of W		nty/District/Municipality)	Town	ship L <b>tchurch-Stou</b>	ffville 10	Concession	
	umber/Name	<u>, , , , , , , , , , , , , , , , , , , </u>		ty/Town/Village		tment/Block/Tract etc	c.
Lincol	nville L	ane	NI_UL:	nit Make/Model Mod	e of Operation: Undiffe	erentiated Avera	
GPS Reading		Zone Easting 1,7 640936	Northing Ur 487,4629	fagellan	• ',,	entiated, specify	
Log of Ov	rburden and	Bedrock Materials (	see instructions)		. Feb.		
General Colo	r Most comm	on material	Other Materials	Gener	al Description	Depth From	To
Black	Topsoi	1			·	0	2
Brown	Silty	Clay & Grave		A		2	13
Brown	Silty	sand & Grave	l Trace Clay		·	13	19
Brown	I I	sand & Grave				19	28
Brown		sand & Crave	l Trace Clay		·	28	38
Brown	Sand &	Grave1		water be	aring	38	65
		100					.,,
	-				-		į.
	Diameter		Construction Record	1		of Well Yield	
Depth	To Game	Moto	rial Wall	Depth Metres	Pumping test method		ecovery Water Level
O	65 6"	diam Wate	sentingites	From To		min Metres min	Metres
CARGO TO THE STATE OF THE STATE		locken	Casing		11 4 4 4 5 1.	Static evel 39	
		2" Steel	Fibreglass Sch 40		Pumping rate - (litres/min)	1 1	
14/04			Concrete	+3 %0	Duration of pumping	2 2	
Water found at Metres	er Record / Kind of Water	Galvanize	Fibreglass		hrs + min		
	Fresh Sulph	<b>   </b>	·		Final water level end of pumping metres	3 3	
Gas Other:	Salty Miner		•		Recommended pump	4 4	
	Fresh Sulph	Steel	- ·		type. Deep		
☐ Gas	Salty Miner	I I Dioctic	, , ,		Recommended pump depthmetres	5 5	
Other:	Fresh Sulph		Screen		1 <u></u>	10 10	
Gas	∐ Freshi Sulph Salty Miner				rate. (litres/min)	15 15	
Other:		diam Plastic	Concrete	40 65		20 20 25 25	<u> </u>
ex	ell yield, water was sediment free	2 Galvanize	sch 40	40 65	If pumping discontin-	30 30	
Other, spe	cify		No Casing or Scree	n , .	J.I.	40 40	
Chlorinated	Yes No	Open hol	е		11 . ⊢	50 50	
L	Discoving	Saaling Baserd	Annular space Abar	ndonment	Location of	60 60	
Depth set at -	Metres Material and	Sealing Record  type (bentonite slumy, neat of	ment slumy) etc Volume I	Placed In diagram belo	w show distances of well fror		ilding.
From	10	a Sand	(cubic m	etres) Indicate north b	y arrow.	[	1
	···	nite Chips			Blomingh		17
21		onite Slurry			Burney		n
2	0 Cemer					l l	12:-
		Method of Construct	ion		lincolny	101900	,_,, <u>;;</u>
Cable Tool				99"'9			. •
Rotary (con			Jetting O Driving ——	tner			
		Water Use					
☐ Domestic ☐ Stock	☐ Indu	l ————	Public Supply O	ther		T. Services	. ,
☐ Irrigation		icipal 🛅	Cooling & air conditioning	Audit No. Z	10672 Date	Well Completed	MM DD
184-1 5	(h. [**] B!	Final Status of Wel	<del> </del>		IUU I J	2003	12 81
Water Supposervation	well Abandor	ed, insufficient supply 🔲 i	Unfinished Abandone Dewatering	d, (Other) Was the well of package deliver	WITCH S II NOTITION	Delivered YYYY	MM DD
Test Hole	Abandor	ed, poor quality	Replacement well		Ministry Use	Only	
Name of Well	Contractor	ontractor/Technician I	Well Contractor's Lice	ence No. Data Source	Contr	ractor C C O	
G. Har	t & Sons	Well Drillin				2662	
Business Addr	ess (street name, no Box 850	umber, city etc.) Fenelon Fall:	OntarioKOM 1	L NO Date Received	APŘÝ Z W ZŮŮŠ Date	of Inspection YYYY	MM DÖ I
Name of Well	echnician (last nan		Well Technician's Lice T-2441	ence No. Remarks		Record Number	
Signature of Ti	a, Bryan chnician/Contracto	The state of the s	Date Submitted	MM DD		and the second of the second o	4. T
x Clau	e det	A CONTRACT OF THE PROPERTY OF				<del></del>	
0506E (09/03)		Contractor's Co	ppy 🔲 Ministry's Copy 🔲	Well Owner's Copy	Cette for	mule est disponible	en français

<b>B</b> (	<b>)</b> nt	ario	Ministry o and Ener		nment	¥ù.		i.	The		<i>Water F</i> R WEL	Marin, Marine	
		ces provide		us amplisa	.bla					Municipal	lity Con.		
Mark con	rect box	( with a che	ckmark, whe	re applica	ible.	11 2	SHE	ET los	2	10	14 15	<u>                                     </u>	22 23 24
County of York	11	1				p/Borough/City/T church-S				Con block	tract survey		t <sup>25-27</sup>
Owner's <b>Yor</b>		sion **	<sup>47</sup> . Fl	irst Name		of Well Location		ite 30	1.Newmark	cet,ON	Date completed		10 03 nonth year
21	Se and Service Services	ISSUE .	UT		asting 641: 043	Northing 4874	658	RC Ele	vation RC	Basin Code	A band <sub>i</sub> o	ned Ο	B 110 0
1 .2			<b>"</b>	10 17	F OVERBURDE	N AND BEDR	OCK MA	TERIALS (				Depti	n - feet
General	<del>-</del>		common mate	erial	Oi	her materials		,	General o	description	•••	From	То
Brow	+	Topso	clay &	oreve	eoma es	nd lense	•			·		3	3 28
Brown	₩		& gravel		some si			dry				28	43
Brow	1		gravel					<del></del>	<b>@</b> 50*			43	98
Gray		Silty	sand					wat	er bearin	ng		98	113
Gray		Sand	& gravel	L				wat	<b>erbeari</b> ng	3		113	140
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Gray			& gravel		E						·	246	248
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31				1111			1						لا لىلى
32		4 15	21		32	11111	43		<u> </u>		55		75 80
41 Water for		R RECOR		51 Inside diam	CASING & C	Wall thickness	Depth	- feet	Sizes of o (Slot No.)	pening 3	1-33 Diameter	34-38 Leng	th 39-40 feet
at - feet	[0 13 1 E	¬ ~ ~ 4	Sulphur 14 Minerals	inches 6 4		inches 2 . 280	From -7	To 13-16	Material a	nd type		Depth at top	of screen 30
	15-18-1	□ Fresh 3 [	Gas Sulphur 19 Minerals	61/4	3  Concrete 4  Open hole 5  Plastic	.280	+3	525			4.0541.010	DECODE	feet
	000	□ Salty 6	J Gas J Sulphur 24	17-18	1 Steel 2 Galvanized	9		20-23		Annular space	& SEALING	Abandonn	
*	nd na	□ Salty 6 0	Minerals Gas Sulphur 29	6	3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic		525	529	From 10/10	To Mate	rial and type (Ce	ment grout, be	
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	2 [	☐ Salty 6	Minerals Gas Sulphur <sup>34</sup>	24-25 10	2 Galvanized	Dage		27-30	5289	7 Be	ntonit		
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Stati	cievei	Water level and of pumping			1 Pumping	2 ☐ Recovery			m below show north by arrow		of well from r	oad and lo	t line.
IG TEST	19-21	22-24	15 minutes 26-28	30 minutes	45 minutes 32-34 feet feet	60 minutes 35-37	7					1	
If flow	feet   ving give	feel 38-41 GPM	Pump intake s	et at	Water at end of			Bloom	instan			<del> </del>	
Hecor	nmended	pump type	Recommender pump setting	d 43	Recommender pump rate					Va k 10	nkam	Pac F	ed.30
50-53				I	eet	GFW				in	nkan-	N=3.	
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3 🖏	Doservat Test hole Recharge		7 ☐ Abandone 8 ☐ Dewaterin	d (Other)	цу 🗀 пери	acement wen				<del>, ,</del>		4	
WATER	USE Domestic		55-56 5 Commerc	ial	9 Not I	ise		21	LANE	II.e			
2 🗆 3 🗆	Stock Irrigation Industrial	i	6 ☐ Municipal 7 ☐ Public sug 8 ☐ Cooling &	opły	9 Not L 10 🗀 Othe	r		•					
		CONSTRU		. air contollior									)
1 D	Cable too	ol conventional)	5 ☐ Air percus 6 ☐ Boring	ssion	<sup>9</sup> ☐ Drivin	ing						1	
3 🗖	Flotary (r Flotary (a	everse)	<ul> <li>7 ☐ Diamond</li> <li>B ☐ Jetting</li> </ul>	1	<sup>11</sup> ☐ Othe	1.45					4	<u> 2677</u>	00
	Well Cont		ell Dril	lino l	L .	ctor's Licence No.	ONIC SOU	a rce	58 Contractor 2	662	59-62 Date rece	APR 2	0 2005
Address			n Falls,			-	Dail Dail	e of inspection		Inspector	1 4	**	
	Well Tech	nician			Well Technic	cian's Licence No.	≱ Rei	narks	· · · · · · · · · · · · · · · · · · ·	· <del>- •</del>			
		iclan/Contract	1.00	· · · · · · · · · · · · · · · · · · ·	Submission	date	LSINIM						
2 - 1	MINIS	TRY OF		IMENT	AND ENER		<u> </u>		det .			0506 (06/0	2) Front Form

Environment Print only in spaces provided.

Mark correct box with a checkmark, where applicable. WATER WELL RECORD

County or District	SHIET SE						
York		Township/Borough/City/Town/Yillage Whitchurch-Stouffville		tract survey, etc.	1		
Owner's sumame York Region	First Name	Address of Jagger Hims.	Con. 9		10		
TOTA REGION		1091 Gorham St., Ste 301, Newmarke	r ON	Date 21 completed	10	03	
1 .	Zone Easting	Northing	C, ON	. day	month	yea	
إساسا				•			

General colour	44	OG OF OVERBURDEN AND BEDROCK MAT	tHIALS (see instructions)		
General colour	Most common material	Other materials	General description	Depth - feet	
		** Continued from Page 1		From	То
Gray	Sandy Clay & gra	ave			<u> </u>
Gray	Silty clay			261	271
Gray	Sandy clay & gra		sticky	271	290
Gray	Sandy clay & gra	ave.	hard	290	353
				353	493
Gray	Sandy clay	some gravel, some silt l	enses	493	504
Dark Gray Gray	**************************************	some gravel		504	521
	Silt	some sand, gravel & c	lay	521	524
Black	Shale			524	529
					329
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(&) C	ntario	Ministry of the Environment	Well Tag Number	A 018	2493				ecord		
		The Environment	A018493			Regulation 903	Ontario Wa	ter Rese			
Instructio	ns for Compl	eting Form	101043J			SHEETIS	13	page _	_ of _ <b>5</b>		
		ce of Ontario only. The completed in full to avoid				ease retain for future	e reference		thic form		
<ul> <li>Quest</li> </ul>	ons regarding of	completing this applicat	tion can be directed to						triis torrii.		
		ents shall be reported blue or black ink only.	d to 1/10 <sup>th</sup> of a metre.			Ministry Use	Only				
Well Own	<u> </u>	on and Location of \		MUN	Ç			LOT			
First Name	egionm	Last Name	Mai C/6	ling Address	s (Street Numbe	r/Name, RR,Lot,Conc	ession)				
County/Distr	ict/Municipality	1 5 : :	p/City/Town/Village	Pro	ovince Posta	Ltd 1091 Go Code Telep	hone Numb	er (includ	te 30 e area code)		
Address of V	Vell Location (Co.	New unty/District/Municipality)	market Tow	nship O	ntario	Lot		cession			
YORK	\$	, , , , , , , , , , , , , , , , , , ,		•	rch-Stou	The second secon					
	Number/Name iro Court	Lot 10	C	ity/Town/Vi	llage	Site/Compa	rtment/Block	Tract et	c.		
GPS Readin		Zone Easting 17 640929		Init Make/M		·	fferentiated rentiated, specif	Aver	aged		
Log of Ov		Bedrock Materials		sa Retti	an	Dillei	remiated, specir	<u>y</u>			
General Colo	ur Most comr	non material	Other Materials		Genera	Description		epth From	Metre To		
Grey	Gravel				fil			0	1		
Brown	Silty S	——————————————————————————————————————	organics					1	3		
Brown	Silty S	and & Gravel					·	3	5		
Brown Grey	Silty (	lay & Gravel lay & Gravel		. #				5	143		
Brown		and & Gravel	<u> </u>			<u> </u>		144	18-		
Brown	Silty (		**************************************		<u>.</u>			18	<u>27</u> 47		
Brown			gravel gravel					27 47	50		
Brown	Gravel		y sand	,				50	60		
	e Diameter		Construction Reco	rd			of Well Yie	<del></del>			
Depth From	Metres Diame	er Inside diam Mate	Wall thickness	Depth	Wetres	Pumping test method	Draw Dowr Time Water Le		ecovery Water Level		
Ö	21 10	Leantimetros	continuentes	From	То	- 44.000	min Metres	s min	Metres		
21		K 14	Casing			(metres)	Level 38 . t	5	60.3		
		Steel Plastic	Fibreglass Concrete 0.259	<b>+3</b>	132	Pumping rate - (litres/min) 452gp	1 91 1	1 1	00.3		
Wa Water found	ter Record	Galvanizo	J 001101010	Duration of pumping 24 hrs + min	2 91.8	2	59.7				
at <del>Metre</del> s	Kind of Wate		Fibreglass			Final water level end	3 91 0	3	59.3		
Gas	Salty Mine		- !			of pumping netres  Recommended pump					
Other:	Fresh: Sulph		Fibreglass			type. ☐ Shallow ☐ Deep	4 92.3				
Gas Other:	Salty	I II I Discript	Concrete			Recommended pump depth. 120 fretres	5 92.4	, 5	59.2		
Other	Fresh Sulph		Screen			Recommended pump	10 92.5	10	58.9		
Gas Other:	Salty Mine		]Fibreglass Slot No.	132	166	rate. (litres/min) If flowing give rate -	15 92 9		58.9 58.7		
	vell yield, water wa	S Plastic	-  aa * -			(litres/min)	20 <b>92 9</b> 25 <b>92 9</b>		58.6		
Clear and Other, sp	sediment free	6 # Galvanize	No Casing or Screen	<del>)</del>		If pumping discontin- ued, give reason.	30 92 9				
		Open hel		911			40 <b>92 9</b> 50 <b>93 0</b>				
Chlorinated	Yes No	Open hol		· · · · · · · · · · · · · · · · · · ·			60 93 0				
Depth set at -		Sealing Record	74-1	endonment Placed	In diagram below	Location o		e, and bu	ildina.		
From	To Iviateria ai	d type (bentonite slurry, neat 6	erneric siurry) etc. (cubic	metres)	Indicate north by	arrow.		1	-		
0	21 Beni	onite Slurry			Vair	Lifting 200 on Per Minu	to 300	-tv	ork!		
	Note that the second		A-1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		13 4 000.0				ork/ xurham		
				÷ .		<b>Ø</b>			ine Zea Rd		
								- \ \'	30		
Cable Too	Rot	Method of Construct ary (air)		Digging		Carro	1 5- line	e \			
Rotary (co	nventional) 🗖 Air	percussion		Other	Bloo	nington	Work York	"			
Rotary (rev	verse)Bot	Water Use	Driving		Regis	रतं भेग					
□ Domestic □ Industrial □ Public Supply □ Other □ Stock □ Commercial □ Not used □ Other □ Not used											
Irrigation		nicipal 🔲	Cooling & air conditioning		Audit No. 7	19710 Date	Well Complete	ed YYYY,	MM DD		
☐ Water Sug	ply Recharg	Final Status of We	II ∌ Unfinished ☐ Abandon	ned, (Other)	Was the well ow	TICE S INIOITIALION	Delivered	MAT I	12 22 MM DD		
Observation	n well 🔲 Abando	ned, insufficient supply	Dewatering Replacement well		package delivere	d? Yes No					
	Well	Contractor/Technician	nformation		Data Saures	Ministry Use					
Name of Well		Well Beille	Well Contractor's Line	cence No.	Data Source	Con		66	2		
		Well Brillin jumber, city etc.)		107	Date Received APR	2 0   2005	e of Inspection	YYYY	MM DD		
4	II .	nelon Falls ne, first name)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	cence No.	Remarks	Wel	Record Numb	per			
Signature of	Bryan echnician/Contract	or _	Date Submitted YYYY	MM DD							
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<b>6</b>	)ntaria	Ministry of		l Tag Number	(Place sticker and	print number below)			Wel	I R	ecord
	ntario	the Environ		A018493	f		Regulation	003 Onte	rio Water	Reso	
• For us	ns for Compl e in the Provin	ce of Ontario	only. This doc	cument is a pe	ermanent le	gal document. P	lease retain for fu	ු ් ture refe	erence.		_
<ul><li>All Set</li><li>Quest</li></ul>	ctions <b>must</b> be ions regarding	completed in f completing this	ull to avoid de application c	lays in proces an be directed	ssing. Furthed to the Wat	r instructions an	d explanations are ment Coordinator	available	on the ba	ck of	this form.
• Please	tre measurem print clearly in	blue or black	ink only.				Ministry	Jse Only	<del>, , , , , , , , , , , , , , , , , , , </del>		
Well Own First Name	er's Informat	on and Loca		Information	MUN Mailing Addr	ess (Street Numb	on RR,Lot,Co	ncessio	n)	LOT	
	Region ict/Municipality		Township/City	Town/Village			s Ltd 1091 al Code To				uite 3 area code)
	Vell Location (Co	unty/District/Mur		Ket	Township	Ontario		11	Conce		
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General Cold Brown	<u> </u>	mon material  Gravel	Othe	r Materials	\	Genera	al Description		Fro	m	T₀ \
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Brown Brown	Silt Silt		some f	ine san	A l	vet vater	bearing		61 81		88 108
Brown	Silt					andy clay		wet [		08	116
Brown	Sand						hearing	<del></del>	11:		131 138
Brown Brown	Sand & Sand	Gravel	some gr	avel			bearing baring		13	T	141
Brown	Sand & Blameter	Grave1		onstruction F	Record		bearing	est of V	14 Vell Yield	1	145
Depth	Metres Diame	t mside	Material	Wall	Depth	Metres	Pumping test meth	od Dr	aw Down Water Level		scovery Water Level
FIOIII	TO SOME	tres diam centimetres		centimetre	- I	То	Pump intake set at	min - Static	Metres	min	Metres
			Steel Fibre	Casing glass			(metres) Pumping rate - (litres/min)	Level 1		1	
	ter Record		Plastic Conc	rete			Duration of pumpin	<u> </u>		2	
Water found at Metres	Kind of Wat	<del>! </del>	Steel Fibre	· [			Final water level en			3	
Gas Other:	Salty Mine		Galvanized Steel Fibre				Recommended pur			4	
☐ m ☐ Gas	Fresh Sulp		Plastic Conc	<b>"</b>			Recommended pur	np 5		5	*
Other:   m	Fresh Sulp		Galvanized	Screen			Recommended pur	np 10	:	10	
Gas Other:	Salty Mine	diam	Steel Fibre	- 1			(litres/min) If flowing give rate			15 20	
Clear and	well yield, water	<b>as</b>	Galvanized				(litres/min)  If pumping discontinued, give reason.			25 30	
Other, sp			Open hole	No Casing or	Screen	· ·		40 50	· :	,50	
Omornaco		d Sealing Reco	rd	nnular space	Abandonmen	t ]	Location	60 n of We	<u> </u>	60	
Depth set at From		nd type (bentonite s			olume Placed cubic metres)	In diagram belo Indicate north b	w show distances of we y arrow.	il from ro	ad, lot line, a	and bu	ilding.
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Cable Too	) XiRo	Method of ( tary (air)	Construction Diamo	nd	Digging	7			·		
☐ Rotary (co ☐ Rotary (re		percussion ring	☐ Jetting ☐ Driving		Other	_		7.			
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☐ Water Su	· · · · · · · · · · · · · · · · · · ·		Unfinis		andoned, (Othe	r) Was the well or package deliver	wner's information	Date Deli	vered Y	1047 1047 1048	MM 00
Test Hole	Abande	ned, mounicient si ned, poor quality Contractor/Ted	Replac	cement well			Ministry				
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P.O. I	ress (street name, <b>850 F</b>	number, city etc.) enelon F	alls Ont	KOM 1N		Date Received	R~2~0 2005°	Ĭ	spection Y	YYY	MM DD
	Technician (last na , <b>Bryan</b> Technician/Contrac		3.70		an's Licence No.	Remarks		Well Rec	ord Number	. " .	
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(8) C	)r	itai	rio		inistry of e Environme	nt	Well Tag	Number	(Place s	sticker and prin	nt number l	oelow)	Red	gulation	903 (	) Onta			ecord
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					<b>f Ontario</b> on	v. Thi	s docum	ent is a p	ermar	nent lega	I docun	nent. P	lease reta	irt}-t ain för f	uture`	Ş ç fefi	erence.		
All Sec	ctio	ns mu	ıst be	bomi	pleted in full	o avo	id delays	in proce	ssing.	. Further i	nstructi	ons and	d explanat	ions are	avail:	able	on the ba	ick of	this form.
• Quest	ions	rega	rding d	omp	leting this ap	plicat	ion can b	e directe	d to th	he Water	Well M	anager	nent Coo	rdinato	rat 4	16-2	235-6203		
• Please	e pr	int cle	arly in	blue	or black ink	only.	10 1710	O) Z IIIe					ı İ	Ministry	Use (	Onl	У		
Well Own	ier'	s Info	rmati	on a	nd Locatio	n of V	Vell Info	rmation	1 1	MUN			ON			<u>.:</u>	السياسي	LOT	
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York R County/Dist					To	wnship	/City/Tow	n/Village	-	<u> </u>	ovince		l Code						area code)
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Address of \	Well	Locati	ion (Cou	inty/l	District/Municip	oality)		.*	Town	nship i <b>itchu</b>	rch-	Stou	ffv11		Lot		Conce	ssion	
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		Reco	rd		-	alvaniz							Duration		· L	2		2	
Water found at Metres	<b>s</b> /	Kind	of Wate	r		teel	Fibreglass						Final wa	s + ter level		3	<u> </u>	3	
m		resh	Sulpi			_	Concrete						of pump	ng	etres	3		13	
Gas Other:	₽':	Salty	Mine	rais		Salvaniz							Recomm			4		4	
m	۱	resh	 Sulpi	ur .		I	Fibreglass						type.	nallow 🔲				ļ <u></u>	<u> </u>
Gas Other:		Salty	Mine	rals	Count	riastic Salvaniz	Concrete						depth.		etres	5	-	5	<u> </u>
m	H.	resh	Sulpi	 nur				Screen	 }				Recomm	ended p	ump	10		10	
Gas	<u> </u>		Mine		Outside 🖂	Steel [	Fibreglass	Slot No	).					res/min)		15		15	
Other: After test of	الصدا	uiold v	vator wa		diam	lastic	Concrete						If flowing	give rat es/min)		20 25	<u> </u>	20 25 <sub>~</sub>	
Clear and		-		ן ו		Salvaniz	ed						If pumpin	g discon		30		30	. **.
Other, sp	ecif	/					No C	asing or	Scree	n			ued, give	reason.	<b>⊢</b>	40		40	
Chlorinated	Ε,	· res	No			pen ho	е								Ŀ	50 60		50 60	
<u> </u>	E			_					7 6-			-	] [				<u> </u>	1 00	
Deoth set at					aling Record (bentonite slumy	- nont o	Annula		Abai Volume	ndonment Placed	In diag	ram belov	w show dista	Locat			ad, lot line,	and bu	ilding,
From	To	).	ateriai ai	u type	(Deritorine siuri)	, near c	SITION (SIGIL)	,, cac.	(cubic n	netres)	Indicat	e north by	у апоw.						_
	+		-																
-	4	+																	
	1						.,		****				•						
	₩				· · · · · · · · · · · · · · · · · · ·													1	
	₩		•	M	ethod of Con	etruci	ion								4				
Cable Too			Ro				Diamond			Digging		•	ń		ż				
Rotary (co					ission		Jetting			Other				. 4	u.7				
Rotary (re	vers	e)	Bo	ing	Water U		Driving							, , , , , , , , , , , , , , , , , , ,					
☐ Domestic			∏Ind	ustria			Public Sup	oly .		Other									
Stock			<u></u>				Not used	ir condition			4		4 64		Date	ام/۸۱	Completed		
Irrigation	#-		Mu	пстра	Final Status			ir condition	ıı ıy		Audit N	<b>7</b> 0. <b>Z</b>	78	bb/	Jale		Completed	nu 1	الم الم
☐ Water Su	7117 -		Recharg	r	11		Unfinished	_	bandone	ed, (Other)			wner's infom			Deli	vered Y	77Y	MM DD
☐ Observation	71.	ell 🔲		'	nsufficient suppl poor quality	_	Dewatering Replaceme				packag	e delivere	ed?	Yes N	10				
I I est HOR	9	نـــا			ractor/Techn									Ministr					
Name of Wel				1.1			W	ell Contract		ence No.	Data S	ource			Cont	racto	or		]
G.Har Business Add	res	& S	ODS	We.	11 <b>Dr11</b>	L1n <sub>1</sub>	z LTd	26	<u>0 Z</u>		Date R	eceived	YYYY	MM DD	Date	of Ir	spection y	/YYY	MM DD
P.O.	Bo	x 8	50 F	en	elon Fa	ils	Ont	KOM 1	NO										ران
Name of Wel	I Tec	hnician	ı (last na	me, fi	rst name)	-	[W	ell Technici -2441	an's Lic	ence No.	Remai	ks			Well	Rec	ord Number		
Watso Signature of	Teci	nician/	Contract	or			De	te Submitted	YYYY	MM . DD	4.4		:*			j	•		
x Cl	æ		ين كن		5		*					<u> </u>	- V.	0.2	44.		lo a=4 -4*	27-1	
0506E (09/03	)				Contrac	tor's C	ору 🔲 М	linistry's C	ору 🗀	] Well Ow	ner's Co	ру 🗌		Ce	ette foi	mul	e est dispo	nible	en français

	nistry of Environment	ag Number	A 018	3508	Regulation 903		Vell Re	
Instructions for Completing	Form	A018508	3	:			page <u>2</u>	of <u>2</u> ·
<ul> <li>For use in the Province of</li> <li>All Sections must be comple</li> <li>Questions regarding comple</li> </ul>	<b>Ontario</b> only. This docur	vs in processin	a. Further i	nstructions and	i explanations are ava	allable on th	e back of t	his form.
All metre measurements:     Please print clearly in blue of	shall be reported to 1/1	Oth of a metre.	THE TYPIC	Tron managen	Ministry Use			
Well Owner's Information ar	nd Location of Well In	formation	MUN		ON PRINCE PRINCE	Jession)	LOT	
Tork Region	ast Name				r/Name, RR Lot Conc	ornam phone Numl		
County/District/Municipality	Township/City/To Newmark		c	ovince Posta Ontario				
Address of Well Location (County/Di York RR#/Street Number/Name	istrict/Municipality)	¥	wnship <b>hitchu</b> City/Town/Vi	rch-Stou illage	ffv111e Lot 1 Site/Comps	1	oncession 9 k/Tract etc	· · · · · · · · · · · · · · · · · · ·
Cairo Court GPS Reading NAD Zone	Easting No	orthing	Unit Make/M		e of Operation: Und	ifferentiated	Avera	ged
8 3 17 Log of Overburden and Bed	640926 4	874992	Magel	lan	Diffe	erentiated, spe	cif	
General Colour Most common ma		/aterials		Genera	Description		Depth From	Metres To
BrownerSandy Sil	t .			water be	aring		65	95
Brown Silty Sand	the state of the s	Market and the second		water be	*		95 114	114 129
Brown Sand Brown Sand	some si	11:	!	water be			129	134
	d & Gravel			water be	aring		134	136
Brown Sand & Gr				water be	<u> </u>		136	146
Brown Sand Brown Sand & GR	some gr	avel		water be			146 151	1663
Brown Sand & GR Grey m Sandy Cla		*FINISHI	ED DEPT	TH 164,6			1661	170
Hole Diameter  Depth Metres Diameter		nstruction Rec			Tes Pumping test method	t of Well Y		ecovery
From To Centimetres	Inside diam Material	Wall thickness	Depth From	Metres To	Trumping test moules	Time Water	Level Time	
	centimetres	Casing	FIGIN	10	Pump intake set at -	Static Level	11111	
	Steel Fibregla	53	į į		Pumping rate - (litres/min)	1	1	
Water Record	Plastic Concret	9			Duration of pumping	2	2	
Water found / Kind of Water at Metres /	Steel Fibregla	l			Final water level end	3	3	
Gas Salty Minerals	Plastic Concret	8		;	of pumpingmetres  Recommended pump		4	
Other: Sulphur	Steel Fibregla Plastic Concret				type. Shallow Deep Recommended pump	o	5	
Gas Salty Minerals Other:	Galvanized				depthmetres	3		
☐ rn ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals	Outside Steel Fibregla	Screen ss Slot No.			Recommended pump rate. (litres/min)	10	1.0 15	The state of the s
Other:	diam Plastic Concret	i .	_		If flowing give rate - (litres/min)	20 25	20 25	3
Clear and sediment free	Galvanized	Coolean or San			If pumping discontinued, give reason.	30 40	30 40	
Chlorinated Yes No	Open hole	Casing or Scr	een		1	50	50	
		ular space	bandonment	<u> </u>	Location	of Well	60	
Depth set at - Metres   Material and type	(bentonite slurry, neat cement slu	Volum	ne Placed c metres)	In diagram belo	w show distances of well t		line, and bu	ilding.
Trom 10				maiode north	y allow.			
			:		and the second second			
			;		er en			
Cable Tool Rotary (a)	ethod of Construction ir)	ı <u> </u>	Digging					
Rotary (conventional) Air percu	ssion		Other			•		
□ Domestic □ Industrial	Water Use	unohy –	Other	]				į
Stock Commerc	oial ∏ Not used			Audit No	00701	ate Well Com	pleted	
	Final Status of Well				22724 D	ate Delivered	2005	07 22 MM DD
	nsufficient supply 🔲 Dewater	_	loned, (Other)	package deliver			ŸYYY	
Well Contr	ractor/Technician Informa	ation		Doto Source	Ministry Us			
Name of Well Contractor  G. Hart & Sons W	ell Drilling I	Well Contractor's	Licence No.	Data Source		26	62	
P.O. Box 850 Fe	r, city etc.) nelon Falls On	t KOM IN	10	Date Received	2 1 2005	ate of Inspecti		MM DD
Name of Well Technician (last name, fin	st name)	Well Technician's T-2441	· ***	Remarks	W	ell Record Nu	ımber	
Signatura of Technician/Contractor	28	Date Submitted YYY	Y MM DD			· · · · · · · · · · · · · · · · · · ·		
0506E (09/03)	Contractor's Copy ☐	Ministry's Copy	√  Well O	wner's Copy 🗌	Cette	formule est	disponible	en français

	linistry of ne Environm	Well Tag	Number	A 032	909	Regulation 90	)3 Ontari	Well R	
Instructions for Completin	a Form	:	40520	100	. !				of
• For use in the Province of	f Ontario o	nly. This docume	nt is a perma	anent lega	I document. P	ر lease retain for futu	ire refere	ence.	
<ul> <li>All \$ections must be com</li> <li>Questions regarding com</li> </ul>	oleting this a	application can be	directed to	g. Further i the Water	nstructions and Well Manager	d explanations are av nent Coordinator a	/ailable o t 416-23	n the back of 5-6203.	f this form.
<ul> <li>All metre measurements</li> <li>Please print clearly in blue</li> </ul>			of a metre.			Ministry U	se Only		
Well Owner's Information			mation	MUN	C	ON /		LOT	
		1			7				
RR#/S/reet Number/Name	6	<u> </u>		ity/Town/M	lchurc	// Site/Comp	partment/E	Block/Tract et	ic.
GPS Reading NAD Zone	Easting	We T Northin	na U	Jnit Make/M	odel Wode	of Operation: Ur	differentiate	ed 🔽 Aver	aged
8 <sub>1</sub> 3 7		P53 48 74	906	MAGEI	AN	•	ferentiated,	specify	
General Colour Most common		Other Mate			Genera	l Description		Depth From	Metres
BROWN SAND					So	FT	· , <u></u>	0	10
GREY CIAY					<u> Şo</u>	<del>F</del> T		lo	25
BROWN SAND		(Dails	a		•	NE		56	115
BROWN SAND		GRAVE	<u> </u>		<u> </u>	WE		112	170
							<u> </u>		
· · · · · · · · · · · · · · · · · · ·	•								
The state of the s				-	i		<u> </u>		
Hole Diameter		Constr	uction Reco	rd	Fect	Te	st of Wel	l Yield	
Depth thetres Diameter	Inside	Material	Wall	Depth	Metres	Pumping test method	Draw	Down R	lecovery
From To Centimetres	diam centimetres	-	thickness centimetres	From	То	S	ہے min	ater Level Time Metres min	Water Level Metres
162' 170' 5"			Casing			Pump intake set at -		50'	
102 170 3		Steel Fibreglass Plastic Concrete		0	163'	Pumping rate -	1 . 6	7.5 1	
Water Record Water found at , Metres		Galvanized			105	Duration of pumping hrs +mi	2 <b>(</b>	1.5 2	
at Metres / Kill of Water		Steel Fibreglass Plastic Concrete				Final water level end of pumping	3 6	1.5 3	
Gas Salty Minerals Other:		Galvanized	-			Recommended pump		15 4	
☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals	· · · · · · · · · · · · · · · · · · ·	Steel Fibreglass				type. ☐Shallow ☑ Dee Recommended pump		1. 7 5	
Other:		Galvanized	8			depthmetre	s		
m Fresh Sulphur Gas Salty Minerals	Outside	Steel Fibreglass	Slot No.			rate. (litres/min)	15 6	1.5 10	
After test of well yield, water was	diam	Plastic Concrete -		163	170	If flowing give rate - (litres/min)	20	20 25	
Clear and sediment free			#19	<del></del>	110	If pumping discontinued, give reason.	30 6	30	
Chlorinated X Yes No		Open hole	sing or Scree	<b>∌</b> [1			50	50	
							60 6	60	
Plugging and Sea		Annular :	Volume	Placed metres)		Location v show distances of well		lot line, and bu	ilding,
O 6M. RENTO	INITE &	SENSEAL	(CUDIC I	ineues)	Indicate north by				12
						The Chill	<u> </u>		/ N
					66	-1 0		77	1
						a distribution		S.	
M Cable Tool	ethod of Co	nstruction Diamond		Digging	Latt	8 ()		2	2
Rotary (conventional) Air perci		☐ Jetting ☐ Driving		Other				± 3	
	Water t				٠,			玉	의
✓ Domestic Industria  Stock Commer	cial	☐ Public Supply ☐ Not used	T	Other		MINGTON RD			
☐ Irrigation ☐ Municipa	Final Status	Cooling & air	conditioning	:-	Audit No. Z	35788 <sup>D</sup>	ate Well Co	ompleted YYYY	MM 1 08
Water Supply Recharge we Observation well Abandoned,	ll nsufficient supp	Unfinished Dewatering	Abandon	ned, (Other)		vner's information D	ate Delivere	, , , , , ,	MM DD
Test Hole Abandoned,	<del></del>	Replacement		· -		Ministry U			
Name of Well Contractor			Contractor's Lic	cence No.	Data Source	C	ontractor	459	
Business Address (street name numb	r, city etc.)	70UFFVIIE			Pat NOV'VEZ	4 2005 D	ate of Inspe	ection YYYY	MM DD
Name of Well/Technician (last name, fi		Well	Technician's Li	cence No.	Remarks		ell Record	Number	<u> </u>
Signature of Technician/Contractor		Date	Submitted YYYY	10 07					
0506E (09/03)		ctor's Copy Min	istry's Copy		ner's Copy 🔲	Cette	formule e	st disponible	en français

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Instructions	s for Completir	ng Form	A	035529					page _	of
<ul><li>All Section</li><li>Question</li><li>All metric</li><li>Please p</li></ul>	ons <b>must</b> be cor	npleted in fing this the state or black in t	ull to avoid delay application can reported to 1/10 nk only.	s in processing be directed to the of a metre.	. Further	instructions an r Well Manage	Please retain for fut d explanations are a ment Coordinator a	vailable on at 416-23	n the back of	f this form.
Well Owner	3 IIIIOIIIIatiOII	and Local	TION OF AAGIL ISSU	ormation					201	1 1
	mber/Name Cairo Cour	rt			Ltchu ty/Town/\	rch-Stou /illage	· · · · · · · · · · · · · · · · · · ·		9 Block/Tract et	с.
GPS Reading	NAD Zor 8 3 17				it Make/N <b>1age 1</b>		of Operation: 🔲 u	ndifferentiate ifferentiated,		aged
Log of Over General Colour	burden and Be	edrock Ma	terials (see ins	tructions)					•	
Black	Most common	material	Other M	aterials		Genera	al Description		Depth From	Metres To
Brown	Topsoil Sand		silt						0	<u>1</u> 24
Brown	Clay			ome grave	1	Force Miner 12		en e	24	33
Brown	Sand			cobbles		der at 7	2 <del>t</del> t		33	72
Brown	Gravel		sand		we				72	86
Brown	Sand								86	115
	Diameter		Cons	struction Record	i		Ţe	st of Wel	l Yield	
1	To Diameter	Inside diam	Material	Wall thickness	Depth	- MARIES /	Pumping test metho		Down Roter Level Time	ecovery Water Level
< * <b>O</b>	20 10"	CONTINUES		continuencs TNCHES	From	To '	Pump  Pump intake set at	min N	min	-Metres//
20 1	.15 6"	INCHES	Touris -	Casing			(matte) 100ft Pumping rate -	• Level -	8.3 1	54.5
		1 17	Steel Fibreglass Plastic Concrete	.188	+21/2	111	(litres/min)12gpff	1		
Water Water Water found at	Record Kind of Water		Galvanized		T 4 7	111	Duration of pumping hrs + m		7.7 2	54.4
111	Fresh Sulphur	1 1	Steel Fibreglass Plastic Concrete				Final water level end	3 5	8.8 3	54.4
Gas Other:	Salty Minerals		Galvanized				of pumping Recommended pump	6 4 <b>5</b>	8.8 4	54.5
m	Fresn Sulpnur		Steel Fibreglass Plastic Concrete				Shallow Dee	-p	8.8 5	54.3
Gas U	Salty Minerals		Galvanized				Recommended pumi depth. metre			
	Fresh Sulphur	Outside (s		Screen		· ·	Recommended pump rate. (litras/min)	10 5	8.7 10 8.7 15	54.3 54.3
Other:		I diam	Steel Fibreglass Plastic Concrete	Slot No.			If flowing give rate -	20 5	8.7 20	54.3
Clear and se	yield, water was diment free	6	Galvanized	8	111	115	(litres/min) If pumping discontin-	25 5	8.7 25 8.7 30	54.3 54.3
Other, specif	ý		No (	Casing or Screer	1		ued, give reason.	40 5	8.7 40	54.3
Chlorinated 💆	Yes No		Open hole				·	50 <b>5</b>	<b>8.7</b> 50 60	54.3 54.3
	Plugging and Se				donment		Location		8 8 8 8	
	0 Ivialeriai airu typ		rry, neat cement slury	/) etc. Volume F (cubic m		In diagram below Indicate north by	v show distances of well v arrow.	from road,	lot line, and bui	ilding.
20 6	6 Bensea O Holep1	1, Ez-	mud			1			1	
		· — a	·					- (		
						7	CAIRO CR	<del>'</del> /	Ctyl	Rd.
			· · · · · · · · · · · · · · · · · · ·	4.7				100	1 39	7
Cable Tool	M Rotary (	lethod of Co	onstruction  Diamond		gging		169	1		
Rotary (conve	· = · · · · · · · · · · · · · · · · · ·	ussion	☐ Jetting ☐ Driving	O			01	01		
		Water					Bloomingtoni	M. I		
Domestic Stock	☐ Industria ☐ Comme		☐ Public Supp ☐ Not used	oly . Ot	ther				· ·	
Irrigation	Municip		Cooling & a	ir conditioning		Audit No. Z	45694 °	ate Well Co	mpleted 2006 ii	0'5 <sub> </sub> 1°9
Water Supply		əll	Unfinished	Abandone	d, (Other)	Was the well ov	vner's information D	ate Delivere		MM DD
Observation v	Abandoned,	· · · · ·	Replaceme	nt well		package delivere				
Name of Well Co			nician Informatio		nce No.	Data Source	Ministry U	ontractor	00	,
	ntractor Sons We s (street name, numb		Lling Ltd	. 2662		Date Received		26 ate of Inspec	OZ	Mu n
	s (street name, numb Fenelon chnician (last name, f		• ON	Jan en anders and a second		Date Received	7 2006			MM DD
Turnbul	.l James	ırşt name)	* *	rell Technician's Lice	ence No.	Remarks	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	ell Record l	Number	
Signature of Tech	hnician/Contractor		Da	ite Submitted YYYY	MM DD					
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(R) (1)	nta		Ministry o	, , ,	II Tao Number (Pio		number below)	<b>7</b>	. ".	Well	Record
			the Enviro		<b>д 035</b> : .035530	500		Regulation S	03 Ontario	Water Re	sources Ad
<ul><li>All Sect</li><li>Questio</li></ul>	in the ions r	Province nust be con garding con	of Ontari mpleted in apleting th	ـــــا o only. This do o full to avoid de ols application o	cument is a pern elays in procession be directed to	ng. Further o the Water	instructions an	Please retain for fut d explanations are a ment Coordinator a	vailable or	the back.	
<ul> <li>All met</li> </ul>	re me	asurement learly in blu	ts shall b	e reported to 1	1/10 <sup>th</sup> of a metre	•		Ministry U		<u> </u>	
Well Owne	r's In	formation	and Loc	ation of Well	Information	MUN	С	ON		LOT	-
Vork											
York RR#/Street No				4		City/Town/V			t . 1 1 partment/B	9 llock/Tract	etc.
GPS Reading		NAD Zor		ng	Northing	Unit Make/N	fodel Mode		5 ndifferentiate	1 <b>X</b> Av	eraged
Log of Ove		8:3 177 len and Bo		0895 laterials (see	4874806 I	Mage1	lan		ifferentiated,		
General Colour	_	lost common	<del></del> -		er Materials		Genera	al Description		Depth From	Netres To
Black	_	opsoil						·		0	1 1 2
Brown Gray		lay lay	ga saga da		gravel		<b>计数型系统</b> 1.50m	natura in an es	- 1 > 10 May Ships	1 2	17
Brown	+	ind		some g	ravel gravel				,	17 35	35 40
Brown		and		gravel	Staver					40	52
Brown		lay		sand						52	65
Brown	Se	and		some g	ravel		·			6.5	115
		·					·				
	Diame			C	onstruction Rec	ord		l	est of Well	Yield	
Depth A	To //	Diameter Centimetes	Inside diam	Material	Wall thickness	Depth	-Motros	Pumping test metho			Recovery ne Water Leve
0	20	10	centimetres		Continetres TNCHES	From	To '	Pump intake set at		6 mi	n Motros
20	115	6"	INCHE	Steel Fibre	Casing			Pumping rate -	Level 4	8.1 1	45.2
Wate	r Rec	ord	61	Plastic Conci		+2 <del>1</del>	111	(litroc/min) 12g; Duration of pumping		8 <sub>*</sub> 1 <sub>2</sub>	46.2
Water found at Metres _	/ Kin	d of Water		Steel Fibres	glass			hrs + m Final water level end	in		<b></b>
1/1 to//5	Fresh Salty	Sulphur Minerals		Plastic Conci	rete			of pumping			
Other	_	7€0 □ Sulphur		Steel Fibre	glass			Recommended pum type. Shallow Dec	` <del> -</del>	8.1 4	46.2
Gas C	Salty	Minerals		Plastic Conci	rete			Recommended pum	p 5 4	<b>8.1</b> 5	46.2
1 — =	Fresh	Sulphur	2.11		Screen		<del>'</del>	Recommended pum	P 10 4	8.1 <sub>10</sub> 8.1 <sub>15</sub>	
Gas Cother:	Salty	Minerals	Outside diam	Steel Fibre				(litree/min)  If flowing give rate -	20 4	8.0 20	45.2
After test of we	-		6	Galvanized	20	111	115	(litres/min)	30 4	8.0 25 8.1 30	
Other, spec	fy				No Casing or Scr	een		ued, give reason.		8.1 40 8.1 50	
Chlorinated X	Yes	□ No		Open hole						8.1 60	<del></del>
Depth set at - M		ging and Se		ord A	· · · · · · · · · · · · · · · · · · ·	oandonment ne Placed	In diagram below	Location w show distances of well		lot line, and h	milding
From 20	To #	Bensea			(cubic	metres)	Indicate north by		wom rous,		
4	0	Holep1		<del></del> -			N				الم
							1			chyl	ลี
								cale	CRT	3/	1
				Construction					*	\$	
Cable Tool				☐ Diamor		Digging Other			-1		
Rotary (rever	(se)	Boring	Wat	☐ Driving er Use				<u>Ø'</u>			
Domestic Stock		☐ Industri		☐ Public ☐ Not us		Other			ing ton		
Irrigation		Municip		Cooling	g & air conditioning		Audit No. <b>Z</b>	45695 °	ate Well Co	2006	05 23
Water Suppl Observation	=	Recharge w	ell insufficient s	Unfinis		oned, (Other)	Was the well ov package delivere	71101 0 1111011110011	ate Delivere	1 1111	MM DD
Test Hole		Abandoned,	poor quality	· · · · = · · · · ·	ement well			Ministry U	se Only		
Name of Well C	ontracto	or		illing L	Well Contractor's L	icence No.	Data Source		26	62	,
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	ntario	the Environr	ment	4 03553!	5 -		Regulation 903 Onta		
Instruction	s for Complet	ing Form	A	035535				page _	of
For use     All Section	in the <b>Province</b> ons <b>must</b> be co	of Ontario o	only. This docum	nent is a perman	ent l <b>ega</b> Further i	l document. Pl	ease retain for future refe l explanations are available	erence.	this form
<ul> <li>Questior</li> </ul>	ns regarding co	inpleting this	application can	be directed to th	e Water	Well Managen	nent Coordinator at 416-2	235-6203.	uns ioini.
	e measuremen print clearly in b		<b>eported to 1/10</b> nk only	" of a metre.			Ministry Use Only		
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Water found	/ Kind of Water	61	Steel Fibreglass		743	112	hrs + min	50 6 -	40.4
//2 m//6/4	Fresh Sulphur Salty Minerals		Plastic Concrete				of pumping to makes	<b>52.5</b> 3	48.4
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Other:	Fresh Sulphur		Galvanized	Screen	····		Recommended pump 10	10	
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Name of Well Co	ontractor & Sons V	ell Dri	lling Ltd	veli Contractor's Lice 2662	nce No.	Data Source		DOW	
	ss (street name, nur <b>0. Fenel</b> c		ON	-		NOV ()		spection YYYY	MM DD
Name of Well Te	echnician (last name 11. James	first name)	· W	/ell Technician's Lice T−3089	nce No.	Remarks	Well Reco	ord Number	<u> </u>
	chnician/Contractor	d ···	Da	ate Submitted YYYY	MM DD				
2509€ (09/03)	a wo	Contra	actor's Copy 🔲 N	//linistry's Copy ☐	Well Own	ner's Copy 🔲	Cette formule	est disponible	en français
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#### Well Record

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UTM Coord	dinates	Zone Easting		orthing		Municipal Plan and Su	blot Number	**************************************	Other			11127
. *************************************	8 3 en and					ord (see instructions on	the back of this	form)				
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Meti	hod o	f Construction			Well U		Pumping	HO rate (I/min / GPM)	3		3	
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Rotary (6		e) Driving	Live	mestic estock	☐ Municip	ole Monitorin	hr.	s+ mín	5		5	
☐ Boring ☐ Air percu		Digging	Irrig	ustrial	☐ Cooling	g & Air Conditioning	Final Wate	r level end of pumping (m/īt) <b>HO</b>			10	
Other, sp	pecity	Construction R		er, specify _		Status of Well	If flowing (	give rate (l/min / GPM)	15		15	
Inside Diameter		n Hole OR Material vanized, Fibreglass,	Wall Thickness	Depth	n ( <i>m/īl</i> )	☐ Water Supply ☐ Replacement Wel		ended pump depth (m/h)	25	2771 A 2011 A 11 A 11 A 11 A 11 A 11 A 11 A	20 25	
(cm/in)		orete, Plastic, Steel)	(cm/in)	From	To	Test Hole Recharge Well	Recomme	HO ended pump rate	30		30	
	) † c	عدا	_219_	0	4a	Dewatering Well	(Vmin / GP	<u> </u>	40	2000 A A A A A A A A A A A A A A A A A A	40	
		//////////////////////////////////////				☐ Observation and/o ☐ Monitoring Hole ☐ Alteration	Well prodi	uction (I/min / GPM)	50		50	MI 1111 1111111111111111111111111111111
			·/////////////////////////////////////		·	(Construction)	Disinfected Yes		60		60	
		Construction R	ecord - Scre	en		Insufficient Supply  Abandoned, Poor		Map of W				
Outside Diameter (cm/in)	(Plasti	Material ic, Galvanized, Steel)	Słot No.	Depth From	n ( <i>m/fit)</i>   To	Water Quality Abandoned, other		ovide a map below following	instruct	ions on the b	ack.	
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		<u></u>			1	Other, specify		Blooming ton			**************************************	Andrew Andrew Andrew Management
Mater four	od at D	Water Det	*************	````\\\usessa		lole Diameter				E	j	
45 (11)	n/ft) [	epth Kind of Water Gas Other, <i>spe</i>	cify		From	To (cm/in)	<u> </u>	Lincolnville L	<u>ane</u>	<u> </u>	•	
		epth Kind of Water Gas Other, <i>spe</i>		Untested			_	ख्र		B	)	
Water foun	nd at D	epth Kind of Wate	r: Fresh	Untested						10		
(m	n/ft)	Gas Other, spe		Technicia	n Informa	ition		1-1-1		describition of different		
•		Well Contractor				ell Contractor's Licence N	D.					
		Street Number/Na			М	unicipality	Comments	5:		1		<u></u>
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905	ле <b>№</b> . <b>7</b> 1 <b>2</b> 1.	(inc. area code) Na 2 5 3 , 2 cence No. Signature	Boadwa	y Gyan	asi ivame,	riist Name)	package delivered	Y Y Y Y M M M  Date Work Completed	0 0	San and san an		130
Well Technic	ian's Lic \   フ	cence No. Signature	Technicia	n and/or Co	ntractor Da	te Submitted	Yes No		il o	SE Received		0 (1113
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Nell Technician's Licenses

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

Wall Tan No. (Place Sticker and/or Print Below)

095335

095335

Well Record

Regulation 903 Ontario Water Resources Act

of Page

Well Local	tion Vell Location (Street Num	ber/Name)	117355E11255	Township	Lot	(	Concession		
3199 4	or K-Durham L			City/Town/Village Stouffuille		Province		Postal	Code
UTM Coordin	1 7 / 11.1./	69US	ng 1714131819	Municipal Plan and Sub	lot Number	Other			
	n and Bedrock Materia					1000		Dent	th ( <i>m/ft</i> )
General Co		on Material	C	Other Materials	General Description			From	To U
Brown					moist			11-	16-
Brown			San		moist wet			16	22-
Brown	1 .		390	101	wet			22-	28-
Grey	clay				001			A 11	
		Annular Sp	pace		Results of W	ell Yiel	d Testing		
Depth Se	et at (m/ft)	Type of Sealar (Material and 1	nt Used	Volume Placed (m²/ft²)	After test of well yield, water was:		aw Down Water Leve		ecovery Water Level
28	24- Sano		(уре)	(m/n/)	Other, specify	(min) Static	(m/ft)	(min)	(m/ft)
NISS-	1- Bento	7 7 1	- 1		If pumping discontinued, give reason	Level 1		1	
1	o Sand, F	lushmont	, Concrete	2	Pump intake set at (m/ft)	2		2	
	APPENDED ASSESSMENT				Pumping rate (l/mln / GPM)	3	L. Street	3	
Cable To	nod of Construction	Public	Well Com			4		4	
Rotary (	Conventional)	☐ Dome	estic Mun	de Dewaterin	hre + min	5		5	
☐ Rotary (I☐ Boring	Digging	☐ Irrigat	ion Coo	ling & Air Conditioning	Final water level end of pumping (m/	10		10	
Other, s		☐ Indust			If flowing give rate (I/min / GPM)	15		15	
	Construction R	ecord - Casin	-M	Status of Well		20	7.5	20	
Inside Diameter	Open Hole OR Material (Galvanized, Fibreglass,	Wall Thickness	Depth (m/ft) From To	☐ Water Supply ☐ Replacement Wel	Recommended pump depth (m/ft)	25		25	
(cm/in)	Plastic Steel)	(cm/in) Sch 40	33	Test Hole Recharge Well	Recommended pump rate (l/min / GPM)	30		30	
	PIASIL	3CH 70	<b>PW</b> 0	☐ Dewatering Well		40		40	
				Observation and/o	Well production (I/min / GPM)	50		50	
				Alteration (Construction)	Disinfected?  Yes No	60		60	
	Construction R	acard Screen		Abandoned, Insufficient Supply	Man of \	Vell Lo	cation		
Outside	Material		Depth (m/ft)	Abandoned, Poor Water Quality	Please provide a map below following			back.	
Diameter (cm/in)	(Plastic, Galvanized, Steel)	Slot No.	From 23	Abandoned, other specify					
2	Plastic	10	28 梅	Other, specify	See				
					map				
Mater form	Water De		Untested	Hole Diameter Depth (m/ft) Diamete					
	n/ft) Gas Other, spe		Fro	m To (cm/in)					
	nd at Depth Kind of Wate		Untested 28	8 0 8					
Water fou	n/ft) Gas Other, spend at Depth Kind of Water m/ft) Gas Other, spend	r: Fresh	Untested						
[/			echnician Infor						
0 0 1	Name of Well Contractor			Well Contractor's Licence N	0,				
Business /	Address (Street Number/Na			Municipality	Comments:				
Province	Vorfinch DR Postal Code	Units (	4-8 E-mail Address	North York					
OA	/ MIZINILY	12 Jason	@ Profiles	drilling com	Well owner's Date Package Delive	ered		stry Us	se Only
Bus.Teleph	one No (inc ame code) No	ame of Well Te	chnician (Last Na	me First Name)	information package delivered Y Y Y Y M N		Audit No.	110	069
Well Techni	6506444 cian's Licence No. Signature	JIOCH I	Jusori	Jp. 1. 0. 1	Yes Date Work Complete	bed	4447	19	2010

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MAR 1 9 2010

Yes No

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First Name

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0506E (12/2007)

Well Record

Ministry of Well Tag No. (Place Sticker and/or Print Below) the Environment Regulation 903 Ontario Water Resources Act A 088308 Page ☐ Metric Imperial Measurements recorded in: Well Owner's Information E-mail Address ☐ Well Constructed Last Name / Organization by Well Owner naemo Municipality Mailing Address (Street Number/Name) Telephone No. (inc. area code) Postal Code Well Location Concession Address of Well Location (Street Number/Name) Township Postal Code Province City/Town/Village County/District/Municipalit Ontario Other Municipal Plan and Sublot Numb Easting Northing NAD 8 3 17 64116024874462 Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form) Depth (m/ft) Most Common Material General Description Other Materials From Bentonite Slurry 85 Hole Plus 88 Silica sand Results of Well Yield Testing Annular Space Recovery After test of well yield, water was: Volume Placed (m³/ft³) Type of Sealant Used Depth Set at (m/ft) Water Level Time Water Level Clear and sand free (Material and Type) (min) (m/ft) (min) (m/ft) Other, specify Static If pumping discontinued, give reason: Level 1 1 Pump intake set at (m/ft) 2 2 3 3 Pumping rate (Vmin / GPM) Method of Construction Well Use 4 4 ☐ Not used ☐ Diamond ☐ Public Commercial Cable Tool Duration of pumping Jetting Domestic Municipal Dewatering Rotary (Conventional) 5 5 hrs + min Monitoring Rotary (Reverse) Driving Livestock Test Hole Final water level end of pumping (m/ft) Cooling & Air Conditioning ☐ Digging ☐ Irrigation 10 Boring 10 ☐ Industrial Air percussion 15 15 Other, specify Other, spec If flowing give rate (Vmin-/ GPM) Construction Record - Casing Status of Well 20 20 Depth (m/ft) ☐ Water Supply Recommended pump depth (m/ft) Inside Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel) Wall Thickness Diameter (cm/in) 25 25 Replacement Well (cm/in) Test Hole Recommended pump rate (Vmin / GPM) 30 30 Recharge Well Dewatering Well 40 40 Observation and/or Monitoring Hole Well production (I/min / GPM) 50 50 Alteration Disinfected? (Construction) 60 60 Yes No Abandoned, Insufficient Supply Map of Well Location Construction Record - Screen Abandoned, Poor Please provide a map below following instructions on the back. Water Quality Depth (m/ft) Outside Material Slot No. Abandoned, other (Plastic, Galvanized, Steel) specify Blooming ton Other, specify Hole Diameter Water Details Depth (m/ft) Water found at Depth Kind of Water: Fresh Untested From (cm/in) (m/ft) Gas Other, specify Water found at Depth Kind of Water: Fresh Untested Scale (m/ft) Gas Other, specify Water found at Depth Kind of Water: Fresh Untested (m/ft) Gas Other, specify Well Contractor and Well Technician Information Well Contractor's Licence No. Business Name of Well Contractor Business Address (Street Number/Name) 5 4 5 9 Municipality Comments: 13787 Huy 48 Stouper. 16 Postal Code Business E-mail Address Ministry Use Only Well owner's information OL Date Package Delivered 64A7X3 Bus.Telephone No. (inc. area code) Name of Well Technician (Last Name, First Name) package delivered 9056404369 Ferguson En.2
Well Technician's Licence No. Signature of Technician and/or Contractor Date Submitted Date Work Completed Yes JUN 0 8 2010

No

20100510

20100511

A113019 Well Tag ow) Well Record Ministry of Regulation 903 Ontario Water Resources Act the Environment All3019 Page [ Imperial Metric Measurements recorded in: Address of Well Location (Street Number/Name) Whit-stouff 10 10 Linconville County/District/Municipality City/Town/Village Stanffville Municipal Plan and Sublot Number Postal Code Province Ontario 4441744 YOFK UTM Coordinates Zone NAD 8 3 17 6411/69/48/7/40 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 General Colour 5and/6 0 hangl Brown Comenter Results of Well Yield Testing Annular Space After test of well vield, water was: Draw Down Volume Placed Recovery Type of Sealant Used Depth Set at (m/fl) Clear and sand free Time (Material and Type) Time Water Level Water Level  $(m^3/ft^3)$ (m/fl) (min) (m/ft) Other, specify 4 Bans Statio 32.2 If pumping discontinued, give reason: 52 616 Level 1 Pump intake set at (m/ft) 3 Pumping rate (I/min / GPM) Well Use Method of Construction 10 Commercial Not used Cable Tool □ Diamond ☐ Pµblic Duration of pumping ☑ 0amestic Municipal Dewatering Rotary (Conventional) ☐ Jetting hrs + Ob min 5 5 Test Hole Driving Livestock Monitoring Rotary (Reverse) Final water level end of pumping (m/fl) Boring Digging Irrigation Cooling & Air Conditioning 3 4.2 FT If flowing give rate (I/min / GPM) Air percussion Industrial 15 15 Other specify Other, specify Construction Record - Casing Status of Well 20 20 Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel) Depth (m/ft) Water Supply Recommended pump depth (m/ft) Inside Wall Diameter (cm/in) Thickness (cm/in) 38 FT
Recommended pump rate Replacement Well 25 To From Test Hole 30 20 Recharge Well 0 (l/min / GPM) .138 Dewatering Well 40 Observation and/or Well production (//min / GPM) Monitoring Hole 50 Alteration (Construction) 60 Yes ☐ No Abandoned, Insufficient Supply Map of Well Location Construction Record - Screen Abandoned, Poor provide a map below following instructions on the back. Water Quality Depth (m/fl) Outside Slot No Diamete (Plastic, Galvanized, Steel) Abandoned, other From Τσ (cm/in) specify 36 57ain(65) ,010 Š Other, specify Hole Diameter Water Details  $\Diamond$ Depth (m/fi) Diameter Water found at Depth Kind of Water: 🛂 (cm/in) 36 (m/fl)  $\square$  Gas  $\square$  Other, specify Water found at Depth Kind of Water: Fresh Untested (m/ft) Gas Other, specify Lincoin Ville Water found at Depth Kind of Water: Fresh Untested (m/ft) Gas Other, specify Well Contractor and Well Technician Information Business Name of Well Contractor le Baranics (Street Number/Name) Well Drilling

Well owner's information

package delivered

Yes

No

Date Package Delivered

2012 069

1206

Date Work Completed

Ministry Use Only

z128286

MAUG 0 2 2012

Audit No.

Signature of Technician and/or

Business E-mail Address

area code) Name of Well Technician (Last Name, First Mame)

73 42 Boran SE DALE

No. Signature of Technician and/or Contractor Date Submitted

Vivian Postal Code



Source: Compiled from Google Earth. Aerial photo dated May 7, 2005.

#### Scale:

Refer to Scale Bar Coordinate System: NAD 1983 UTM Zone 17





Grainboys Holdings Inc. 3469 Con Rd 1, Township of Uxbridge Geotechnical Investigation

**Well Survey Locations** 

11197394-02 October, 2019

**Appendix B.5** 

#### **APPENDIX B.6: WATER WELL INFORMATION SURVEY**

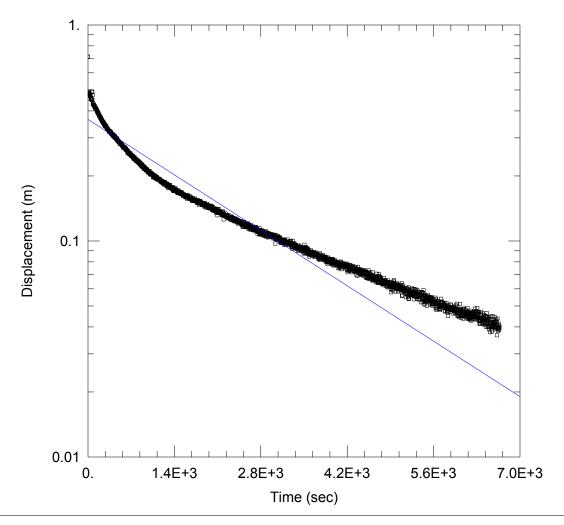
PROJECT: 11197394-02

LOCATION: 3469 Concession Road 1, Uxbridge, ON

DATE: October 15, 2019

Address	Well ID	_	Northing (m)	Well Type	Top of Well (m)	Water Level (m)	Depth (m)	Quality	Quantity	Comments
3469 York Durham Line	L-1	641844	4874834	Dug	0.6	5.25	7.9	No Issues	No Issues	Water quality tested when property was sold. Record 1906217
3210 York Durham Line	L-2	641391	4874548	Dug				No Issues	No Issues	Record 6908478
3199 York Durham Line	L-3	641683	4874508	Dug		-	8.2	No Issues	No Issues	Commercial use well
3197 York Durham Line	L-4	641523	4874387	Abandoned						Former domestic well, removed in 90's
3229 York Durham Line	L-5	641400	4874618					No Issues	No Issues	Resident not home. No casing observed
3003 York Durham Line	L-6	641483	4874186	Drilled		1	25	No Issues	No Issues	Record 4602710
3889 York Durham Line	L-7	640948	4875781	-	-	1		No Issues	No Issues	Resident identifed a drilled well. Unable to access
14001 10th Line	L-8	640979	4875329	Drilled		-		No Issues	No Issues	No information provided by resident
13672 10th Line	L-9	641006	4874407	Dug	-	ı	7.9	No Issues	No Issues	Installed in the 60's
13383 10th Line	L-10	641452	4873797	Dug		-	8.2	No Issues	No Issues	No information provided by resident
13357 10th Line	L-11	641272	4873765	Drilled						Resident not home. Drilled well casing observed.

## Appendix C Hydraulic Conductivity Data



#### BH-103 FALLING HEAD TEST

Data Set: I:\...\BH-3 Falling Head Test.aqt

Date: 10/02/19 Time: 11:48:50

#### PROJECT INFORMATION

Company: GHD

Client: Grainboys Holdings Inc.

Project: 11197394-02

Location: 3469 Conc. Road 1, Uxbridge ON

Test Well: BH-103

Test Date: September 11, 2019

#### **AQUIFER DATA**

Saturated Thickness: 3.62 m Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (BH-3)

Initial Displacement: 0.7126 m

Total Well Penetration Depth: 3.62 m

Casing Radius: 0.025 m

Static Water Column Height: 3.62 m

Screen Length: 1.5 m Well Radius: 0.025 m

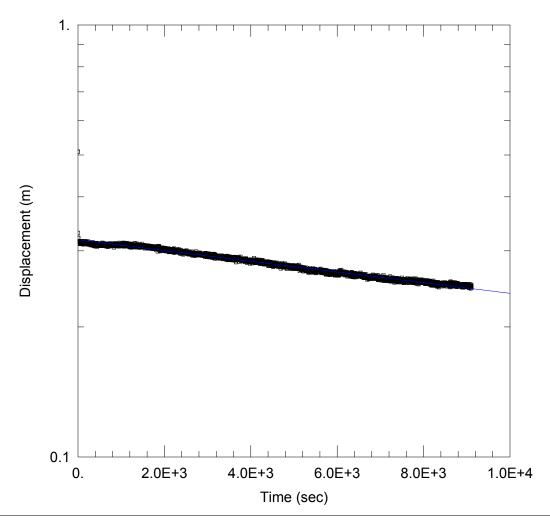
#### SOLUTION

Aquifer Model: Unconfined

K = 3.247E-5 cm/sec

Solution Method: Bouwer-Rice

y0 = 0.3654 m



#### BH-103 RISING HEAD TEST

Data Set: I:\...\BH-3 Rising Head Test.aqt

Date: 10/02/19 Time: 11:50:24

#### PROJECT INFORMATION

Company: GHD

Client: Grainboys Holdings Inc.

Project: 11197394-02

Location: 3469 Conc. Road 1, Uxbridge ON

Test Well: BH-103

Test Date: September 11, 2019

#### AQUIFER DATA

Saturated Thickness: 3.62 m Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (BH-3)

Initial Displacement: 0.5091 m

Total Well Penetration Depth: 3.62 m

Casing Radius: 0.025 m

Static Water Column Height: 3.62 m

Screen Length: 1.5 m Well Radius: 0.025 m

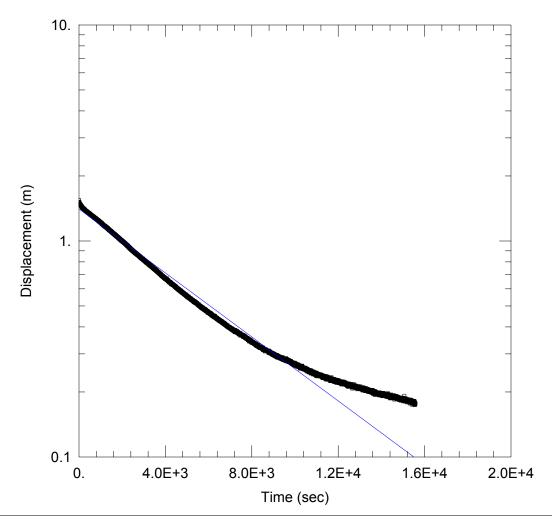
#### SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 2.192E-6 cm/sec

y0 = 0.3181 m



#### BH-107 FALLING HEAD TEST

Data Set: I:\...\BH-7 Falling Head Test.aqt

Date: 10/02/19 Time: 11:51:03

#### PROJECT INFORMATION

Company: GHD

Client: Grainboys Holdings Inc.

Project: 11197394-02

Location: 3469 Conc. Road 1, Uxbridge ON

Test Well: BH-107

Test Date: September 11, 2019

#### AQUIFER DATA

Saturated Thickness: 0.67 m Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (BH-7)

Initial Displacement: 1.542 m

Total Well Penetration Depth: 3. m

Casing Radius: 0.025 m

Static Water Column Height: 0.67 m

Solution Method: Bouwer-Rice

Screen Length: 3. m Well Radius: 0.025 m

#### SOLUTION

Aquifer Model: Unconfined

K = 2.656E-5 cm/sec

y0 = 1.407 m

#### **Appendix C: Infiltration Testing (in-situ)**

**Project No.** 11197394-02 **Date: September 11, 2019** 

**Equipment:** ETC Pask Permeameter

 Location:
 BH-103
 BH-105
 BH-107

 Depth of hole:
 0.6 m
 0.6 m
 0.6 m

Test 1			Test 1	Test 1		
Elapsed Time Permeameter Level		Elapsed Time	Permeameter Level	Elapsed Time	Permeameter Level	
(minutes)	(cm)	(minutes)	(cm)	(minutes)	(cm)	
0.167	42.2	0.167	41.4	0.167	41.5	
1	42.2	0.33	40.6	0.5	41	
2	41.8	0.5	40.4	1	40.5	
3	41.5	0.66	40.0	2	39.6	
4	41.1	0.83	39.7	3	38.8	
5	40.7	1	39.4	4	38	
6	40.4	2	37.9	5	37.2	
7	40.0	3	36.6	6	36.3	
8	39.6	4	35.4	7	35.5	
9	39.3	5	34.3	8	34.7	
10	38.9		33.2	9	34	
12	38.2	7	32.1	10	33.1	
14	37.6	8	31.1	12	31.6	
16	36.9	9	30.1	14	30	
18	36.3	10	29.2	16	28.3	
20	35.7	11	28.3	18	26.6	
22	35.1	12	27.2	20	25	
24	34.4	13	26.3	22	23.3	
26	33.8	14	25.4	24	21.6	
		15	24.5	26	19.8	
		16	23.6	28	18.1	
		17	22.8	30	16.5	
		18	21.9			
		19	21			
		20	20.1			
		21	19.3			
		22	18.4			

 Quasi Steady Flow Rate ® (cm/min)
 0.3
 0.9
 0.9

 Field-saturated Hydraulic
 Conductivity (Ksf) (m/sec)
 1.60E-06
 4.80E-06
 4.80E-06
 4.80E-06

## Appendix D Analytical Data



### **CERTIFICATE OF ANALYSIS**

**Final Report** 

C.O.C.: G93290 **REPORT No. B19-29037** 

**Report To: Caduceon Environmental Laboratories GHD Limited** 

110 West Beaver Creek Rd Unit 14

Richmond Hill ON L4B 1J9

Tel: 289-475-5442 Fax: 289-562-1963

JOB/PROJECT NO.: Uxbridge/11197394-02

P.O. NUMBER: WATERWORKS NO.

Attention: Eric Wierdsma DATE RECEIVED: 12-Sep-19

Waterloo Ontario N2L 3X2 Canada

455 Phillip Street,

DATE REPORTED: 19-Sep-19 SAMPLE MATRIX: Groundwater

			Client I.D.		BH-3	BH-7	Dug Well	
			Sample I.D.		B19-29037-1	B19-29037-2	B19-29037-3	
			Date Collect	ed	11-Sep-19	11-Sep-19	11-Sep-19	
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
pH @25°C	pH Units		SM 4500H	13-Sep-19/O	8.07	8.06	7.70	
Conductivity @25°C	µmho/cm	1	SM 2510B	13-Sep-19/O	542	607	807	
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	13-Sep-19/O	239	244	363	
Hardness (as CaCO3)	mg/L	1	SM 3120	17-Sep-19/O	315	349	450	
Chloride	mg/L	0.5	SM4110C	13-Sep-19/O	15.9	17.6	42.5	
Fluoride	mg/L	0.1	SM4110C	13-Sep-19/O	< 0.1	< 0.1	0.5	
Nitrite (N)	mg/L	0.1	SM4110C	13-Sep-19/O	< 0.1	< 0.1	< 0.1	
Nitrate (N)	mg/L	0.1	SM4110C	13-Sep-19/O	< 0.1	3.9	0.1	
Sulphate	mg/L	1	SM4110C	13-Sep-19/O	42	66	21	
Colour	TCU	2	SM 2120C	18-Sep-19/O	< 2	< 2	< 2	
Turbidity	NTU	0.1	SM 2130	18-Sep-19/O	45.2	8.9	11.1	
Ammonia (N)-Total	mg/L	0.01	SM4500- NH3-H	13-Sep-19/K	0.19	0.02	< 0.01	
o-Phosphate (P)	mg/L	0.002	PE4500-S	13-Sep-19/K	0.013	< 0.002	0.005	
Potassium	mg/L	0.1	SM 3120	17-Sep-19/O	2.2	2.8	0.9	
Sodium	mg/L	0.2	SM 3120	17-Sep-19/O	7.8	5.8	9.4	
Calcium	mg/L	0.02	SM 3120	17-Sep-19/O	95.2	102	159	
Magnesium	mg/L	0.02	SM 3120	17-Sep-19/O	18.8	22.9	12.8	
Iron	mg/L	0.005	SM 3120	17-Sep-19/O	< 0.005	0.047	< 0.005	
Copper	mg/L	0.002	SM 3120	17-Sep-19/O	< 0.002	< 0.002	< 0.002	
Manganese	mg/L	0.001	SM 3120	17-Sep-19/O	0.076	0.125	0.170	
Zinc	mg/L	0.005	SM 3120	17-Sep-19/O	0.011	< 0.005	0.024	
Anion Sum	meq/L		Calc.	17-Sep-19/O	6.12	7.02	8.93	
Cation Sum	meq/L		Calc.	17-Sep-19/O	6.71	7.31	9.43	
% Difference	%		Calc.	17-Sep-19/O	4.62	2.02	2.72	

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an \* Site Analyzed=K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill, B-Barrie

Christine Burke Lab Manager



**GHD Limited** 

455 Phillip Street,

Waterloo Ontario N2L 3X2 Canada

Attention: Eric Wierdsma

### **CERTIFICATE OF ANALYSIS**

**Final Report** 

C.O.C.: G93290 **REPORT No. B19-29037** 

**Report To: Caduceon Environmental Laboratories** 

110 West Beaver Creek Rd Unit 14

Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

JOB/PROJECT NO.: Uxbridge/11197394-02 DATE RECEIVED: 12-Sep-19

DATE REPORTED: 19-Sep-19 P.O. NUMBER: SAMPLE MATRIX: Groundwater WATERWORKS NO.

			Client I.D.	_	BH-3	BH-7	Dug Well	
			Sample I.D.		B19-29037-1	B19-29037-2	B19-29037-3	
			Date Collect	ed	11-Sep-19	11-Sep-19	11-Sep-19	
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Ion Ratio	AS/CS		Calc.	17-Sep-19/O	0.912	0.960	0.947	
Sodium Adsorption Ratio	-		Calc.	17-Sep-19/O	0.190	0.135	0.193	
TDS(ion sum calc.)	mg/L	1	Calc.	17-Sep-19/O	326	381	465	
Conductivity (calc.)	µmho/cm		Calc.	17-Sep-19/O	603	677	845	
TDS(calc.)/EC(actual)	-		Calc.	17-Sep-19/O	0.602	0.627	0.576	
EC(calc.)/EC(actual)	-		Calc.	17-Sep-19/O	1.11	1.11	1.05	
Langelier Index(25°C)	S.I.		Calc.	17-Sep-19/O	0.984	1.00	0.999	

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an \* Site Analyzed=K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill, B-Barrie

Christine Burke Lab Manager

## Appendix E Water Balance Calculations

#### **Appendix E.1**

#### Water Budget(Thornthwaite Method) - Average Values\*

Weather Station: King Smoke Tree

Climate Station: 6154142			Elevation:	352 masl	Distance Awa	ay:	~ 21.8 km		
Month	Mean	Heat	Potential	Daylight	Adjusted	Total	Surplus	Deficit	
	Temperature	Index	ET	Correction	ET	Precipitation			
	(°C)		(mm)	Factor	(mm)	(mm)	(mm)	(mm)	
January	-7.4	0	0	0.82	0	51.7	51.70		
February	-6.1	0	0	0.82	0	46	46.00		
March	-1.5	0	0	1.03	0	51.2	51.20		
April	6	1.32	27.29	1.1	30.02	64.9	34.88		
May	12.5	4.00	59.98	1.25	74.97	87.1	12.13		
June	17.7	6.78	87.11	1.27	110.63	84.8	0.00	25.83	
July	20.5	8.47	101.97	1.29	131.55	86.4	0.00	45.15	
August	19.6	7.91	97.18	1.15	111.75	88.4	0.00	23.35	
September	15.3	5.44	74.50	1.04	77.48	84.2	6.72		
October	8.6	2.27	40.15	0.94	37.74	72.9	35.16		
November	2.2	0.29	9.30	8.0	7.44	84.6	77.16		
December	-3.7	0	0	0.78	0	55.5	55.50		
TOTAL	7.0	36.5	497.5		581.6	857.7	370.4	94.3	
TOTAL WATER SURPLUS: 276.1 mm									

#### Notes:

King Smoke Tree weather station utilized: 43° 52' N, 78° 50' W

\*Average values of precipitation were used. Average values of temperature were also used.

Water budget adjusted for latitude and daylight

Total Water Surplus is calculated as total precipitation minus adjusted potential evapotranspiration

Total Moisture Surplus is calculated as total precipitation minus actual evapotranspiration Formulas utilized:

 $I = (T_i/5)^{1.514}$ 

E=0 when T<sub>i</sub><0 °C

 $E=16(10T_i/I_{tot})^a$  when  $0<T_i<26.5$  °C

 $E=-415.85+32.24T_{i}-0.43T_{i}^{2}$  when  $T_{i}>26.5$  °C

 $a=6.7x10^{-7}I^{3}-7.71x10^{-5}I^{2}+1.79x10^{-2}I+0.49$ 

a = 1.072892197

**Appendix E.2**Water Budget Pre-Development

Catchment Designation	T	T			
, and the second	Rooftops	Open Area	Treed Area	Driveway - Gravel	Total
Area (m²)	250	343895	16000	2900	363045
Pervious Area (m²)	0	343895	16000	2900	362795
% Pervious	0%	95%	4%	0.8%	99.9%
Impervious Area (m²)	250	0	0	0	250
% Impervious	0.1%	0%	0%	0%	0.1%
	INFILTR	ATION FACTO	DRS		
Topography Infiltration Factor	0	0.15	0.2	0.25	
Soil Infiltration Factor	0	0.25	0.25	0.25	
Land Cover Infiltration Factor	0	0.1	0.2	0	
MECP Infiltration Factor	0	0.5	0.65	0.5	
Actual Infiltration Factor	0	0.5	0.65	0.5	
Runoff Coefficient	1	0.5	0.35	0.5	
Runoff from Impervious Surfaces*	0.8	0	0	0.8	
		PER UNIT AR		1 = 2	
Precipitation (mm/yr)	858	858	858	858	858
Run On (mm/yr)	0	0	0	0	0
Other Inputs (mm/yr)	0	0	0	0	0
Total Inputs (mm/yr)	858	858	858	858	858
		(PER UNIT A			1
Precipitation Surplus (mm/yr)	686	276	276	686	280
Net Surplus (mm/yr)	686	276	276	686	280
Evaportranspiration (mm/yr)	172	582	582	172	578
Infiltration (mm/yr) Rooftop Infiltration (mm/yr)	0 172	138 0	179 0	343 0	141 0.1
Total Infiltration (mm/yr)	172	138	179	343	142
Runoff Pervious Areas	0	138	97	343	138
Runoff Impervious Areas	515	0	0	0	0.4
Total Runoff (mm/yr)	515	138	97	343	138
Total Outputs (mm/yr)	858	858	858	858	858
Difference (Inputs - Outputs)	0	0	0	0	0
2e.e.(pa.te	INPUT	S (VOLUMES	_		
Precipitation (m³/yr)	214	294959	13723	2487	311384
Run On (m³/yr)	0	0	0	0	0
Other Inputs (m³/yr)	0	0	0	0	0
Total Inputs (m³/yr)	-				
rotai inputs (m /yr)	214	294959	13723	2487	311384
D : '( (' O ) ( 3( )		TS (VOLUME		4000	101505
Precipitation Surplus (m³/yr)	172	94956	4418	1990	101535
Net Surplus (m³/yr)	172	94956	4418	1990	101535
Evaportranspiration (m³/yr)	43	200003	9305	497	209848
Infiltration (m³/yr)	0	47478	2872	995	51345
Rooftop Infiltration (m³/yr)	43	0	0	0	43
Total Infiltration (m³/yr)	43	47478	2872	995	51387
Runoff Pervious Areas (m³/yr)	0	47478	1546	995	50019
Runoff Impervious Areas (m³/yr)	129	0	0	0	129
Total Runoff (m³/yr)	129	47478	1546	995	50148
Total Outputs (m³/yr)	214	294959	13723	2487	311384
Difference (Inputs - Outputs)	0	0	0	0	0

Appendix E.3 Water Budget Post-Development - No Mitigation Strategies

Catchment Designation	SITE									
_	New Building Rooftop	New Concrete Pads	New Asphalt Areas	Existing Rooftops	Remaining Open Areas	Remaining Treed Areas	Remaining Gravel Driveway	Total		
Area (m²)	4700	1370	6070	250	331755	16000	2900	363045		
Pervious Area (m²)	0	0	0	0	331755	16000	2900	350655		
% Pervious	0%	0%	0%	0%	91.4%	4%	1%	96.6%		
Impervious Area (m²)	4700	1370	6070	250	0	0	0	12390		
% Impervious	1.3%	0.4%	1.7%	0.1%	0%	0.0%	0.0%	3.4%		
·		INF	ILTRATION FAC	CTORS	•					
Topography Infiltration Factor	0	0	0	0	0.15	0.2	0.25			
Soil Infiltration Factor	0	0	0	0	0.25	0.25	0.25			
Land Cover Infiltration Factor	0	0	0	0	0.1	0.2	0			
MECP Infiltration Factor	0	0	0	0	0.5	0.65	0.5			
Actual Infiltration Factor	0	0	0	0	0.5	0.65	0.5			
Runoff Coefficient	1	1	1	1	0.5	0.35	0.5			
Runoff from Impervious Surfaces*	8.0	0.8	0.8	8.0	8.0	8.0	0.6			
		INP	JTS (PER UNIT	AREA)						
Precipitation (mm/yr)	858	858	858	858	858	858	858	858		
Run On (mm/yr)	0	0	0	0	0	0	0	0		
Other Inputs (mm/yr)	0	0	0	0	0	0	0	0		
Total Inputs (mm/yr)	858	858	858	858	858	858	858	858		
			PUTS (PER UNI							
Precipitation Surplus (mm/yr)	686	686	686	686	276	276	515	292		
Net Surplus (mm/yr)	686	686	686	686	276	276	515	292		
Evaportranspiration (mm/yr)	172	172	172	172	582	582	343	566		
Infiltration (mm/yr)	0	0	0	0	138	179	257	136		
Rooftop Infiltration (mm/yr)	0	0	0	172 172	0	0 179	0	0		
Total Infiltration (mm/yr) Runoff Pervious Areas	0	0	0	0	138 138	97	257 257	136 132		
Runoff Impervious Areas	686	686	686	515	0	0	0	23		
Total Runoff (mm/yr)	686	686	686	515	138	97	257	2 <u>5</u> 156		
Total Outputs (mm/yr)	858	858	858	858	858	858	858	858		
Difference (Inputs - Outputs)	0	0	0	000	0	0	0	0		
Difference (inputs Cutputs)	Ü	_	NPUTS (VOLUM		Ü	Ü	Ū			
Precipitation (m³/yr)	4031	1175	5206	214	284546	13723	2487	311384		
Run On (m³/yr)	0	0	0	0		1	0	0		
Other Inputs (m³/yr)	0	0	0	0	0	0	0	0		
			-							
Total Inputs (m <sup>3</sup> /yr)	4031	1175 <b>O</b> I	5206 JTPUTS (VOLU	214 MES)	284546	13723	2487	311384		
Precipitation Surplus (m³/yr)	3225	940	4165	172	91604	4418	1492	106016		
Net Surplus (m³/yr)	3225	940	4165	172	91604	4418	1492			
	*	235		43		1		106016 205368		
Evaportranspiration (m³/yr) Infiltration (m³/yr)	806		1041	0	192942	9305	995			
\ , ,	0	0	0		45802	2872	746	49420		
Rooftop Infiltration (m³/yr)	0	0	0	43	0	0	0	43		
Total Infiltration (m³/yr)	0	0	0	43	45802	2872	746	49463		
Runoff Pervious Areas (m³/yr)	0	0	0	0	45802	1546	746	48094		
Runoff Impervious Areas (m³/yr)	3225	940	4165	129	0	0	0	8458		
Total Runoff (m³/yr)	3225	940	4165	129	45802	1546	746	56553		
Total Outputs (m³/yr)	4031	1175	5206	214	284546	13723	2487	311383		
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0		

Areas based upon site statistics provided by Lassing Dibben Consulting Engineers Ltd. by email on October 15, 2019

Notes:

\*Evaporation from impervious areas and gravel areas was assumed to be 20% and 40% of precipitation, respectively  $25\%\ \text{of}$  available precipitation from existing rooftops is assumed to infiltrate.

**Appendix E.4**Water Budget Post-Development - With Mitigation Strategies

Catchment Designation	SITE									
	New Building Rooftop	New Concrete Pads	New Asphalt Areas	Existing Rooftops	Remaining Open Areas	Remaining Treed Areas	Remaining Gravel Driveway	Total		
Area (m²)	4700	1370	6070	250	331755	16000	2900	363045		
Pervious Area (m²)	0	0	0	0	331755	16000	2900	350655		
% Pervious	0%	0.0%	0%	0%	91.4%	4%	1%	96.6%		
Impervious Area (m²)	4700	1370	6070	250	0	0	0	12390		
% Impervious	1.3%	0%	1.7%	0.1%	0%	0.0%	0.0%	3.4%		
'	4	INF	ILTRATION FAC					-		
Topography Infiltration Factor	0	0	0	0	0.15	0.2	0.25			
Soil Infiltration Factor	0	0	0	0	0.25	0.25	0.25			
Land Cover Infiltration Factor	0	0	0	0	0.1	0.2	0			
MECP Infiltration Factor	0	0	0	0	0.5	0.65	0.5			
Actual Infiltration Factor	0	0	0	0	0.5	0.65	0.5			
Runoff Coefficient	1	1	1	1	0.5	0.35	0.5			
Runoff from Impervious Surfaces*	0.8	0.8	0.8	0.8	0.8	0.8	0.6			
			UTS (PER UNIT		0.0	0.0	0.0			
Precipitation (mm/yr)	858	858	858	858	858	858	858	858		
Run On (mm/yr)	0	0	0	0	0	0	0	0		
Other Inputs (mm/yr)	0	0	0	0	0	0	0	0		
Total Inputs (mm/yr)	858	858	858	858	858	858	858	858		
, , ,		OUTF	PUTS (PER UNI	T AREA)						
Precipitation Surplus (mm/yr)	686	686	686	686	276	276	515	292		
Net Surplus (mm/vr)	686	686	686	686	276	276	515	292		
Evaportranspiration (mm/yr)	172	172	172	172	582	582	343	566		
Infiltration (mm/yr)	0	0	0	0	138	179	257	136		
% Rooftop runoff reg'd to balance	59.7%									
Rooftop Infiltration (mm/yr)	410	0	0	172	0	0	0	5		
Total Infiltration (mm/yr)	410	0	0	172	138	179	257	142		
Runoff Pervious Areas	0	0	0	0	138	97	257	132		
Runoff Impervious Areas	277	686	686	515	0	0	0	18		
Total Runoff (mm/yr)	277	686	686	515	138	97	257	150		
Total Outputs (mm/yr)	858	858	858	858	858	858	858	858		
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0		
	-	II	NPUTS (VOLUN	IES)			-			
Precipitation (m³/yr)	4031	1175	5206	214	284546	13723	2487	311384		
Run On (m³/yr)	0	0	0	0	0	0	0	0		
Other Inputs (m³/yr)	0	0	0	0	0	0	0	0		
Total Inputs (m³/yr)	4031	1175	5206	214	284546	13723	2487	311384		
. , , , ,			UTPUTS (VOLU							
Precipitation Surplus (m³/yr)	3225	940	4165	172	91604	4418	1492	106016		
Net Surplus (m³/yr)	3225	940	4165	172	91604	4418	1492	106016		
Evaportranspiration (m <sup>3</sup> /yr)	806	235	1041	43	192942	9305	995	205368		
	1		+							
Infiltration (m <sup>3</sup> /yr)	0	0	0	0	45802	2872	746	49420		
Rooftop Infiltration (m <sup>3</sup> /yr)	1925	0	0	43	0	0	0	1968		
Total Infiltration (m <sup>3</sup> /yr)	1925	0	0	43	45802	2872	746	51387		
Runoff Pervious Areas (m³/yr)	0	0	0	0	45802	1546	746	48094		
Runoff Impervious Areas (m³/yr)	1300	940	4165	129	0	0	0	6534		
Total Runoff (m³/yr)	1300	940	4165	129	45802	1546	746	54628		
Total Outputs (m <sup>3</sup> /yr)	4031	1175	5206	214	284546	13723	2487	311383		
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0		

#### Notes:

Areas based upon site statistics provided by Lassing Dibben Consulting Engineers Ltd. by email on October 15, 2019

<sup>\*</sup>Evaporation from impervious areas and gravel areas was assumed to be 20% and 40% of precipitation, respectively 25% of available precipitation from rooftops is assumed to infiltrate.

**Appendix E.5**Water Budget Summary

	SITE										
PARAMETER	Pre- Development	Post-Development No Mitigation	Difference Pre- vs. Post-	Post-Development Rooftop Mitigation							
INPUTS (VOLUMES)											
Precipitation (m <sup>3</sup> /yr)	311384	311384	0%	311384	0%						
Run On (m³/yr)	0	0	0%	0	0%						
Other Inputs (m <sup>3</sup> /yr)	0	0	0%	0	0%						
Total Inputs (m³/yr)	311384	311384	0%	311384	0%						
		<b>OUTPUTS (VOLUME</b>	S)								
Precipitation Surplus (m³/yr)	101535	106016	4%	106016	4%						
Net Surplus (m³/yr)	101535	106016	4%	106016	4%						
Evapotranspiration (m³/yr)	209848	205368	-2%	205368	-2%						
Infiltration (m <sup>3</sup> /yr)	51345	49420	-4%	49420	-4%						
Rooftop Infiltration (m³/yr)	43	43	0%	1968	4488%						
Total Infiltration (m <sup>3</sup> /yr)	51387	49463	-4%	51387	0%						
Runoff Pervious Areas (m³/yr)	50019	48094	-4%	48094	-4%						
Runoff Impervious Areas (m³/yr)	129	8458	6474%	6534	4978%						
Total Runoff (m³/yr)	50148	56553	13%	54628	9%						
Total Outputs (m <sup>3</sup> /yr)	311384	311383	0%	311383	0%						

To maintain pre-development infiltration values;

59.7%

of post-development rooftop runoff needs to be infiltrated.



# about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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