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## Hydrogeological Assessment and Terrain Analysis

Proposed Residential Development  
122 Old Mill Lane  
Appleton, Ontario

Prepared For

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## Report History

Paterson Group (Paterson) was retained by Southwell Homes Ltd. to update the Hydrogeological Study and Terrain Analysis for the proposed rural subdivision situated on the south shore of the Mississippi River, in the Village of Appleton, Ontario (Refer to Figure-1: Site Location Plan (Appendix 5)).

Since the initial release of the Hydrogeological Study and Terrain Analysis Report PH2723-REP.01 - Terrain Analysis and Hydrogeological Study dated November 13, 2015, the following regulatory authority comments and peer reviews have occurred:

- ❑ Mississippi Valley Conservation Authority (MVCA) review titled Terrain Analysis and Hydrogeological Study, project number 09-T-15005 dated May 18, 2015
- ❑ Mississippi Valley Conservation Authority Planning and Development Review Team comments titled Appleton Subdivision – Preliminary Comments, File number 09-T-15005 dated May 26, 2016
- ❑ Paterson Response to MVCA Review Comments dated May 18, 2016, Report number PH2723-LET.01. dated January 17, 2017
- ❑ Mississippi Valley Conservation Authority Memo titled Response to MVCA Review Comments dated May 18, 2016, Report number 09-T-15005 dated March 28, 2017
- ❑ Stantec Consulting Ltd. (Stantec) review titled Hydrogeological Review for a Redevelopment of a Brownfield, Appleton Subdivision, Part of Lot 4, concession 10, Geographic Township of Ramsay, Town of Mississippi Mills, Ontario, file number 160410034 dated September 11, 2017.
- ❑ Paterson Environmental Action Plan – Former Appletex Mill Property – 166-122 Old Mill Lane – Hamlet of Appleton, report number PE1114-MEMO.13 dated November 14, 2017
- ❑ Stantec Consulting Ltd. review titled Comments on Groundwater Sampling Program and Environmental Action Plan, Former Appletex Mill Property, Appleton, Ontario, file number 160410034 dated June 29, 2018
- ❑ Mississippi Mills review titled Appleton Subdivision 09-T-15005, dated August 14, 2018

- ❑ Lanark County Meeting notes titled Appleton Subdivision 09-T-15005 dated August 29, 2018
- ❑ JP2G Consultants Inc. (JP2G) peer review titled Peer Review of the Contaminated Site Related Documents – Proposed Residential Subdivision (Former Appletex Mill Property) – Appleton, Ontario, with file number 18-6061A dated September 28, 2018
- ❑ Mississippi Valley Conservation Authority Memo titled Status summary: Hydrogeological / private servicing review – Proposed subdivision at former Appletex Mill site, Project number 09-T-15005 dated October 9, 2018
- ❑ Mississippi Valley Conservation Authority Planning and Development Review Team review titled Appleton Subdivision, file number 09-T-15005 dated October 10, 2018
- ❑ Paterson Work Plan – Supplementary Hydrogeological Study and Assessment Work, file number PH4398-MEMO.01. dated October 15, 2021

## Executive Summary

Paterson Group (Paterson) was retained by Southwell Homes Ltd. to update the Hydrogeological Study and Terrain Analysis for the proposed rural subdivision situated on the south shore of the Mississippi River, in the Village of Appleton, Ontario (Refer to Figure-1: Site Location Plan (Appendix 5)).

The purpose of this study is to determine the suitability of the site for residential development on private services.

The subject property features a flat elevated area in the northeast and gently sloping land to the southwest. The remainder of the property is a floodplain of the Mississippi River and will remain undeveloped.

The subject property has a total area of 19.61 hectares (ha). The proposed subdivision occupies the southern portion of the property and covers an area of approximately 6.99 ha. The development involves 14 lots of variable size (0.40 ha to 0.57 ha with an average lot size of 0.43 ha) and a park. The lot layout, at the time of this submission is shown on Drawing No. PH4398-1-Lot Development Plan (see Appendix 5).

Fieldwork conducted by Paterson in 2008 and 2015 identified a variable thickness layer (0.5 to more than 1.55 metres) of sand and gravel fill over discontinuous native till, over bedrock. Available geological information (OGS, 2015) indicates that the site is underlain by horizontally bedded dolostone of the lower Ordovician Oxford Formation, which is part of the Beekmantown Group.

A topographic survey of the site was conducted by G.A. Smith Surveying Ltd. of Carleton Place Ontario in October 2014. Topographic contours are included on Drawing No. PH4398-2 – Test Hole Location Plan (Appendix 5).

Three (3) test wells (TW1, TW2 and TW3) were installed at the site in June, 2015. Test well locations are indicated on Drawing No. PH4398-2 - Test Hole Location Plan (Appendix 5). Pumping tests were conducted sequentially at each test well using the other test wells as observation wells. Each well was pumped at a constant rate of 91 L/min for six hours and was then allowed to recover. Drawdown observations during pumping and recovery were recorded manually and with electronic dataloggers. Pumping test data were analyzed using Aquifer Test Pro™ (V 2015.1) software.

Groundwater samples were collected at each well during the pumping tests. Samples were collected at three (3) hours and six (6) hours after the start of each test. Additional water quality sampling was conducted at five (5) neighboring offsite water supply wells. All groundwater samples were submitted for comprehensive testing of bacteriological, chemical and physical water quality parameters.

Paterson returned to site on June 23 and 24 2016 to collect additional groundwater samples from the onsite wells and select neighboring potable supply wells.

The analytical results for groundwater samples that were obtained from the three onsite test wells show that water quality at the site is acceptable and that there are no exceedances of the applicable health related parameter limits of the Ontario Drinking Water Standards (ODWS, 2003). Minor exceedances of the non-health related operational guidelines and aesthetic objectives were noted including hardness (TW1, TW2 and TW3), and TDS (TW1, TW3). These results are very similar to those obtained from the neighboring water supply wells that were tested.

Water quantity was assessed in terms of anticipated peak demand, long term safe yield and potential well interference. Peak demand based on four bedroom single family homes is estimated to be 18.75 L/min. Each test well was pumped at 114 L/min for six hours, in order to demonstrate that well yields at the proposed subdivision will be sufficient to handle peak demand loadings. A long term safe yield analysis indicates that well yields should be capable of yielding at least 3.6 times more water than the test pumping rate. A well interference model indicates a maximum anticipated drawdown of 1.3 m after 20 years of pumping at 3,000 L/day, which is approx. 10% of the available drawdown in the test wells.

Paterson personnel returned to site on December 7 and 8, 2021 to collect groundwater samples from TW1, TW2, and TW3. All groundwater samples collected were submitted for analytical testing of total metals, polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), benzene, toluene, ethylbenzene and xylene (BTEX), Dioxins and Furans. None of the samples submitted exceeded O.Reg 153 standards.

Future wells at the site should be constructed according to Ontario Regulation 903 and should be similar to the test wells that were installed and used as part of this investigation (i.e. 6.7 m steel casing to bedrock and depths of 20-25 m).

Raw water is expected to be relatively hard. Residential grade water softeners are recommended. Additional treatment to address TDS may be desired.

A predictive impact assessment for nitrates was conducted. The cumulative nitrate impact was calculated to be approximately 4.18 mg/L, which is well below the provincially mandated value of 10 mg/L. As such the impact of private sewage treatment systems on the drinking water aquifer will be acceptable.

Onsite sewage disposal needs can be accommodated by standard Class 4 sewage systems. The proposed Lot Development Plan (Drawing No. PH4398-1 - Lot Development Plan - Appendix 5) provides details of the proposed layout at each lot. Each home is to be serviced by a sewage system with a treatment capacity of 3,000 L/day.

The subject site is suitable for development as a residential subdivision at the proposed lot density. The hydrogeological recommendations contained within this report, if followed, will ensure that the development takes place in an effective manner, with a minimal impact on the natural environment.

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Appendix 5

Figure-1 - Site Location Plan

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Drawing PH4398-1- Lot Development Plan

Drawing PH4398-2 - Test Hole Location Plan

## 1.0 INTRODUCTION

### 1.1 Terms of Reference

Paterson Group (Paterson) was retained by Southwell Homes Ltd. to update the Hydrogeological Study and Terrain Analysis for a proposed rural residential subdivision situated on Part of Lot 4, Concession 10 in the geographic Township of Ramsay, Town of Mississippi Mills, Ontario. The property is situated on the south shore of the Mississippi River, in the Village of Appleton (Refer to Figure-1: Site Location Plan, located in Appendix 5).

The purpose of this study has been to ascertain and assess the specific terrain and hydrogeological conditions which currently exist beneath the subject property as they relate to the suitability of the site for residential development on private services.

This study was conducted in general accordance with Ontario Ministry of the Environment, Conservation and Parks (MECP) guidance as follows:

- Guideline D-5: Planning for Sewage and Water Services (August 1996).
- Procedure D-5-4: Technical Guideline for Individual On-site Sewage Systems: Water Quality Impact Risk Assessment (August 1996).
- Procedure D-5-5: Technical Guideline for Private Wells: Water Supply Assessment (August 1996).

The investigation involved the following components:

- Review of available information regarding the subject site, the proposed subdivision, and surrounding lands.
- Terrain analysis including a topographic survey, test hole investigation, soil texture analyses and review of previous subsurface investigations.
- Hydrogeological water supply analysis including well record search, installation of test wells, pumping tests, groundwater sampling, geological information review, aquifer analysis and water quantity assessment.
- Hydrogeological wastewater analysis including review of subdivision specific conditions and nitrate impact assessment.

## 2.0 SITE DESCRIPTION

### 2.1 Site Location

The subject site is a proposed residential development that occupies the eastern third of the subject property as indicated on Figure-1: Site Location Plan. The subject property has a total area of approximately 19.61 hectares (ha), and is located on the west side of Old Mill Lane, north of Apple Street in the Village of Appleton, Ontario. The property is situated on the south shore of the Mississippi River and is immediately adjacent to the Appleton Swamp.

The topography of the subject site slopes down towards the wetlands to the west. A small escarpment runs in a north-south direction along the western portion of the site. The escarpment separates the low lying swampy area to the west from the slightly elevated area to the east. The western portion of the property is located on the floodplain of the Mississippi River and will remain undeveloped.

### 2.2 Proposed Subdivision

The portion of the subject property that comprises the proposed subdivision (herein referred to as the 'subject site' or 'Site') encompasses a total area of approximately 6.99 hectares out of the 19.61 ha site area.

The current proposal calls for 14 residential lots and a park of variable sizes covering an area of approximately 6.06 ha within a total subdivision area of approximately 6.99 ha. Individual lot sizes range from 0.40 ha (Lot 1) to 0.57 ha (Lot 11), with the average lot size being 0.43 ha.

The lot layout, at the time of this submission is shown on Paterson Drawing PH4398-1 Lot Development Plan (see Appendix 5).

The development is intended to be serviced by individual water supply wells and Class 4 sewage disposal systems.

### 2.3 Surrounding Land Uses

Surrounding land uses within approx. 500 m of the proposed subdivision are described below:

- North
  - Mississippi River (open water).
  - Appleton Swamp (forest).

- ❑ East
  - Residential houses along Old Mill Lane.
  - Old Mill Lane right of way.
  - Mississippi River.
  - Residential houses on the east side of the river.
  - Agricultural land on the far side of the Mississippi.
- ❑ West
  - Appleton Swamp (forest).
  - A golf course (Mississippi Golf Club).
- ❑ South
  - Partial forest or unused / grazing land.
  - Residential houses.

All existing developments in the area utilize private individual water supply and onsite sewage systems.

Based on the available information, there are no obvious indicators of potential groundwater contamination present on the surrounding lands within 500 m of the subject property, which may negatively impact the proposed development.

A textile mill was previously located on the southern portion of the site. The former buildings were demolished and removed. A thorough environmental cleanup was conducted. Contamination issues at the site have been addressed and fully remediated (Paterson, 2010 and Paterson, 2022).

## 2.4 Potential Sources of Contamination

A textile mill (Appletex Woolen Mill) was previously located on part of the southern portion of the site. The mill was operated from around the middle of the last century until the early 1990s.

Potential sources of contamination associated with woolen mills include heavy metals (from the use of colored dyes), and chlorinated solvents (used to clean up dyes). Other potential environmental concerns at the former mill include hydrocarbons (from use of liquid fuels for heating), and PCBs (from old electrical transformers).

The following is a brief coverage of the environmental assessment history of the site:

- ❑ MOECC investigated a dam breach in 1990.

- ❑ A Phase I ESA by Dames and Moore in 1992 identified environmental concerns at the site including chemical discharge to lagoons, onsite storage of waste, liquid fuels handling, chemical storage and the presence of PCB containing equipment (limited sampling identified mercury at a concentration exceeding the provincial surface water limit in one of the ponds).
- ❑ MOECC investigated the site in 1993 and found the concentrations of some heavy metals (lead and strontium) in the ponds were above provincial limits.
- ❑ WESA conducted test pitting and installed three boreholes/monitoring wells in 1994. One test pit soil sample exceeded the remediation criteria for hexavalent chromium. PCB containing transformers were present. Analysis of bedrock groundwater samples did not identify any concerns. The report states that “no further action is recommended with regard to potential impacts on the groundwater regime arising from former industrial activities at the site”.
- ❑ A fire occurred at the mill building in November 1994. All PCB containing oil and equipment was subsequently removed from the site.
- ❑ In 2007, an oil spill occurred in the vicinity of the former heating plant.
- ❑ In 2007, two lagoons were breached resulting in further MOECC involvement. MOECC identified high concentrations of manganese in one sediment sample.
- ❑ Paterson conducted test pitting and installed three boreholes/monitoring wells in 2008 (Paterson, 2009). Heavy metals (lead and vanadium) exceeded the soil remediation criteria at three test pit locations. Petroleum hydrocarbons exceeded the soil remediation criteria at one location. Petroleum hydrocarbons exceeded the groundwater remediation criteria at two monitoring well locations. PAHs exceeded the groundwater remediation criteria at one boreholes/monitoring well location. PAHs were detected in soil in the vicinity of the former mill building. Petroleum hydrocarbon free product was identified at two of the Paterson monitoring well locations. Various metals (cadmium, chromium, copper, nickel and zinc) from the three former ponds exceeded the sediment standards.
- ❑ Paterson conducted a remediation program at the site from 2007 to 2010 (Paterson, 2010). Metals impacted surface soils (136 metric tons) were removed from several large areas including the area where the former ponds had been located. Petroleum hydrocarbon impacted soils (1,740 metric tons) were removed from one excavation in the vicinity of the former heating plant. A further 33,828 L of impacted groundwater was removed during the remediation program.

- ❑ Two (2) records of site condition (RSCs) were subsequently filed in the Environmental Site Registry (ESR) in 2010: RSC #97711 covers the bulk of the subject site and RSC #102721 is for the 30 m buffer area along the banks of the Mississippi River. The environmental condition of the subject property at the time the RSCs were filed, was in accordance with the then applicable 2004 MOECC Table 1 and Table 2 standards. The RSC's were filed prior to July 1, 2011, which is when the current regulation (O.Reg. 153/04 Records of Site Condition) came into effect.
- ❑ On March 16, 2018, two boreholes (BH1-18 and BH2-18) were placed on the subject property, within the former remedial area along the bank of the Mississippi River. Monitor Wells (MW) were installed in BH1-18 and BH2-18.
- ❑ On March 1, 2021 Paterson released a report PE1114-LET.03 dated March 1, 2021 which states that based on the findings of the groundwater programs, the groundwater has not been impacted by past on-site activities.

Based on a thorough review of all of the available environmental information about the site, the following list of 'contaminants of concern' were identified:

- ❑ Heavy metals (primarily copper, lead, mercury and chromium)
- ❑ Volatile Organic Compounds (VOCs)
- ❑ Petroleum Hydrocarbons (PHCs)
- ❑ Polycyclic Aromatic Hydrocarbons (PAHs)
- ❑ Polychlorinated Biphenyls (PCBs)

The risk to water quality in the bedrock aquifer from these contaminants is considered to be very small due to the massive nature of the upper bedrock.

In order to demonstrate that there has been no impact to the bedrock aquifer from the listed contaminants, a comprehensive program of groundwater sampling and analysis was conducted in June of 2016. All three onsite wells (TW1, TW2 and TW3) were fully purged and sampled on June 23 and 24, 2016. The groundwater samples were submitted to Exova Laboratories of Ottawa Ontario for analysis of the following suite of parameters:

- ❑ Subdivision supply (no bacteria)
- ❑ VOCs

- PHCs
- PAHS
- PCBs
- RVCA metals + hexavalent chromium

The 2016 analytical results were all non-detectible for VOCs, PHCs, PAHs and PCBs except for one low level detection of toluene on the sample from TW2 (and this is probably due to laboratory error). The toluene concentration is well below the maximum allowable concentration. The analytical results for general chemistry are consistent with previous findings from the same wells (i.e. elevated hardness and TDS). The analytical results from testing of metals were all either non-detectible or well below ODWS limits.

Due to Regulatory Authority Comments, the three onsite wells (TW1, TW2, and TW3) were fully purged until field parameters were noted to stabilize, and sampled on December 7 and 8, 2021. The groundwater samples were submitted to Eurofins Environment Testing Canada Inc. for analysis of the following suite of parameters:

- Benzene, Toluene, Ethylbenzene and Xylene (BTEX)
- Total Metals
- PAHS
- PCBs
- Dioxins and Furans

The results from the December 7 and 8, 2021 sampling program are all in compliance with the MECP O.Reg. 153 Table 1 and MECP Table 2 standards.

The comprehensive groundwater testing program did not identify any environmental concerns. The bedrock aquifer beneath the site has demonstrated that it can provide water that is safe and suitable for human consumption.



## 3.0 METHOD OF STUDY

### 3.1 Terrain Analysis

Subsurface investigations (drilling and test pitting) were conducted at the site in 2008, 2015 and 2018. Refer to Paterson Drawing No. PH4398-2 – Test Hole Location Plan, located in Appendix 5.

Five (5) boreholes were drilled in August and October, 2008 by Paterson (Paterson, 2009). A series of 21 test pits were excavated by Paterson in 2008. Test pit and auger hole graphical logs are included in Appendix 1. Borehole graphical logs are provided in Appendix 2.

A series of eight (8) hand auger test holes were completed at the site by Paterson on August 28 and 31, 2015 to further delineate subsurface soil conditions.

Additional test pitting was conducted at the site on August 18, 2016 in order to obtain overburden thickness information at specific locations across the site. Test pitting was completed using a backhoe. A total of 24 test pits were excavated to a maximum depth of 3 m below ground surface (i.e. maximum reach of backhoe).

Two boreholes (BH1-18 and BH2-18) were placed on the subject property on March 16, 2018, within the former remedial area along the bank of the Mississippi River. Monitoring Wells (MW) were installed in BH1-18 and BH2-18.

Test pit locations were recorded and the subsurface conditions, including the soil morphology and depth to the groundwater table (where encountered), were carefully observed and recorded as the test pits were advanced. Representative samples of the soils were recovered from the test pits. All samples were classified texturally in the field and sealed in proper containers for reference purposes and laboratory analysis. Soil sample depths are indicated on the Soil Profile and Test Data sheets provided in Appendix 1.

Four (4) representative soil samples from the hand auger drilling program conducted in August 2015 were submitted to the Paterson materials testing laboratory in Ottawa for grain size analysis. Results of the soil testing are provided on the Grain Size Distribution curves included in Appendix 1.

Three test pits (TP18, TP21 and TP22) encountered significant amounts of fabric waste. All of the soil and debris was subsequently removed from this area.

### 3.2 Well Record Search

A review of available MOECC Water Well Records within a 500 m radius of the site was undertaken as part this study. Water well record information was obtained directly from the MOECC water well records interactive GIS system located at:

<http://www.ontario.ca/environment-and-energy/map-well-records>.

Overburden thickness, depth of casing, aquifer interception points and reported well yields were reviewed in detail in order to assist in establishing a hydrogeological conceptual model for the site.

### 3.3 Surrounding Permit to Take Water (PTTW)

A search of the MECP Permit to Take Water database provided one active PTTW within 500 m of the subject site. Permit Number 0507-9D5Q5X, located approximately 85 m east of the subject site, has been registered to Canadian Hydro Developers Inc. and contains one source. The permit is provided as power production, with a maximum taking of 3,500,000,000 L/day. The permit expires on January 15, 2024.

A search of the MECP Environmental Activity and Sector Registry (EASR) database did not provide any active EASR's within 500 m of the subject site.

This water taking will not be affected by the proposed residential development on the subject site.

### 3.4 Test Well Installation

Three (3) test wells (TW1, TW2 and TW3) were installed at the subject site on June 22 and 23, 2015. The test well locations were selected to provide adequate coverage of aquifer conditions across the site and are suitably constructed to ensure an adequate prediction of the quality and quantity of groundwater that will be provided by future wells at the site. Test well locations are indicated on Drawing No. PH4398-2 - Test Hole Locations (Appendix 5).

The test wells were drilled by Air Rock Drilling Co. Ltd. (Well Contractor License No.1119). A technical representative from Paterson was present during the installation of well casing and grouting of the annular space for each test well. The MOECC Water Well Records for each test well are included in Appendix 2.

It is intended that the test wells will be used as private water supply wells for individual lots in the proposed subdivision. If for any reason one or more of the test wells cannot be utilized

for that purpose, the test well(s) should be abandoned according to the requirements of O.Reg. 903.

TEST WELLS SUMMARY						
Well ID	Year drilled	Depth to BR (m)	Casing depth (m)	Depth to water bearing fractures (m)	Total depth (m)	Recommended pumping rate (L/min)
TW1	2015	1.22	6.10	20	21.64	91+
TW2	2015	0.91	6.10	20	21.34	91+
TW3	2015	3.66	6.40	11.89 / 18.29	20.42	91+

*Table 1 - Test Wells Summary*

## TW1

A 248 mm diameter casing hole was advanced using a rotary tri-cone bit through the sandy overburden material to the limestone/dolostone bedrock, which was encountered at a depth of approximately 1.2 m bgs. The casing hole was advanced into the bedrock an additional 4.9 m to ensure that the casing was seated into competent (i.e. unfractured) bedrock.

A new 6.7 m long section of 152 mm diameter steel casing was installed in the casing hole. Casing stickup is approximately 0.6 m above ground surface. The annular space was grouted using a bentonite grout slurry pumped to the bottom of the annular space using pressure grouting equipment. The return of the grout to ground surface was visually observed by the Paterson representative. The casing installation and grouting of the annular space is considered to be in compliance with Ontario Regulation (O.Reg.) 903.

After the completion of the casing installation the open borehole was advanced using a 152 mm diameter air percussion button bit to a total depth of 21.6 m bgs.

The well contractor reported a significant influx of groundwater at a depth of 19.8 m bgs.

Following completion of the well installation Air Rock Drilling Co. Ltd. developed the well and conducted shock chlorination (disinfection) in accordance with O.Reg. 903.

A one hour constant rate pumping test was then carried out. A pumping rate of 91 L/min was based on the preliminary findings of the well contractor at the time of installation. The well contractor measured a drawdown of 0.38 m at the end of the one hour test.

## TW2

A 248 mm diameter casing hole was advanced using a rotary tri-cone bit through the sandy overburden material to the limestone/dolostone bedrock, which was encountered at a depth

of approximately 0.9 m bgs. The casing hole was advanced into the bedrock an additional 5.2 m to ensure that the casing was seated into competent bedrock.

A new 6.7 m long section of 152 mm diameter steel casing was installed in the casing hole. Casing stickup is approximately 0.6 m above ground surface. Grouting of the annular space was observed by the Paterson representative and is considered to be in compliance with O.Reg. 903. The borehole was advanced using a 150 mm diameter air percussion button bit to a total depth of 21.3 m bgs.

The well contractor reported a significant influx of groundwater at a depth of 19.5 m bgs.

Following completion of the well installation Air Rock Drilling Co. Ltd. developed the well and conducted shock chlorination (disinfection) in accordance with O.Reg. 903.

A one hour constant rate pumping test was then carried out. The chosen pumping rate 91 L/min resulted in a measured drawdown of 0.30 m at the end of the one hour test.

### **TW3**

A 248 mm diameter casing hole was advanced using a rotary tri-cone bit through unconsolidated sand and fill material to the limestone/dolostone bedrock, which was encountered at a depth of approximately 3.7 m bgs. The casing hole was advanced into the bedrock an additional 2.1 m to ensure that the casing was seated into competent bedrock.

A new 6.7 m long section of 152 mm diameter steel casing was installed in the casing hole. Casing stickup is approximately 0.6 m above ground surface. Grouting of the annular space was observed by the Paterson representative and is considered to be in compliance with O.Reg. 903. The borehole was advanced using a 150 mm diameter air percussion button bit to a total depth of 20.42 m bgs.

The well contractor reported a significant influx of groundwater at a depth of 18.3 m bgs.

Following completion of the well installation Air Rock Drilling Co. Ltd. developed the well and conducted shock chlorination (disinfection) in accordance with O.Reg. 903.

A one hour constant rate pumping test was the carried out. The chosen pumping rate of 91 L/min resulted in a measured a drawdown of 0.81 m at the end of the one hour test.

## **3.5 Pumping Tests**

Pumping tests were conducted sequentially at each test well using the other test wells as observation wells. The pumping tests were carried out following Air Rock's development of each well. All tests began with a static water level and involved pumping at a fixed rate

(+/- 5%) for six hours. Water levels were measured at the pumping well and observations wells at one minute intervals, and the pumped water was discharged far enough away from the test wells to ensure that artificial recharge did not occur.

Each of the test wells was pumped at a constant rate of 114 L/min for six hours and was then allowed to recover. The pumping discharge rates (114 L/min for each test) were selected to ensure a demonstrable reduction in potentiometric head (i.e. a lowering of the static water levels) within the water supply aquifer being tested. During the pumping test, the pumping rate was monitored at 60 minute intervals in order to ensure that the rate of discharge remained reasonable constant (i.e. < 5% variation).

Drawdown observations during pumping and recovery were recorded using manual measurements taken with an electronic water level tape. Electronic dataloggers (Schlumberger Micro-Diver™) were installed in each of the test wells prior to the test program. Full recovery was monitored using the dataloggers which were not removed from the wells until at least 24 hours after each pumping test.

Turbidity and free chlorine residual measurements were taken using a Hanna HI93414 Fast Tracker portable meter at the well head at regular intervals during each pumping test. No residual chlorine was detected at the time of water sample collection.

Field measurements of pH, temperature, conductivity and TDS were carried out during each test using an Extech™ ExStik II portable multi-meter. Field parameter results are included on the field test sheets in Appendix 4.

### **3.6 Groundwater Sampling**

Groundwater samples were collected at each well during the pumping tests. Samples were collected at 3 hours and 6 hours after the start of each test. Prior to collection of the pumping test water samples, the free chlorine residual was verified to be non-detectable using field test equipment.

Five (5) offsite water supply wells were also sampled as part of the investigation. The locations are indicated on Drawing No. PH4398-2 Test Hole Location (Appendix 5). A well and septic owner survey was conducted at offsite well locations in August, 2015.

All groundwater samples were submitted for comprehensive testing of bacteriological, chemical and physical water quality parameters consistent with standard 'Subdivision Assessment Package' suite of parameters. One sample from test well TW3 was submitted for analysis of metals and selected volatile organic compounds (VOCs).

No methane or other potentially explosive gases were encountered during the water supply assessment.

All samples were collected unfiltered and unchlorinated and were placed directly into clean bottles supplied by the analytical laboratory. Samples were placed immediately into a cooler with ice and were transported directly to the Exova laboratory in Ottawa. All samples were received by the laboratory within 24 hours of collection.

### **3.7 Topographic Survey**

A topographic survey of the site was conducted by G.A. Smith Surveying Ltd. of Carleton Place Ontario in October 2014. The survey information was used to develop the Lot Development Plan (Paterson Drawing PH4398-1) included in Appendix 5.

## 4.0 GEOLOGY AND HYDROGEOLOGY

### 4.1 Surficial Geology

The subsurface investigations conducted by Paterson identified a variable thickness layer of sand and gravel fill over discontinuous native till, over bedrock. Available Ontario Geological Survey (OGS) mapping suggest that the site is in an area of exposed Paleozoic Bedrock and Organic Deposits. This information conflicts with onsite observations from the subsurface investigations. Surficial soil delineation mapping data from the OGS Earth website is included in Figure-2: Surficial Soil Delineation Mapping (Appendix 5).

Based on the test pit and borehole program, overburden thickness across the site is variable with thickness typically ranging from bedrock at surface to 4.6 m. Several small isolated areas of bedrock outcrop occur at the site. Most of the site (more than 95%) is covered with native soil and/or clean fill material. Refer to the Soil Profile and Test Data sheets in Appendix 1 for the details of the soil profile at each test hole location. Textural soil classifications are provided in Appendix 1. Test hole locations are summarized on the Test Hole Location Plan (Drawing No. PH4398-2 in Appendix 5).

### 4.2 Bedrock Geology

Geological mapping information provided by OGS reveals that the site and immediate surroundings are underlain by dolostone and sandstone of the lower Ordovician Oxford Formation, which is part of the Beekmantown Group, as indicated in Figure-3: Bedrock Geology (Appendix 5).

A review of the available MOECC Water Well Records shows that wells in the surrounding area have encountered limestone and sandstone (please note that dolostone is often interpreted as limestone by drilling contractors as it has a very similar appearance and is often associated with limestone). Dolostone typically occurs due to magnesium replacement of the calcium in limestone during lithification, and is very common in the Ottawa region.

### 4.3 Hydrogeology

From a hydrogeological perspective, 'aquifer zones' within horizontally bedded carbonate strata are typically associated with bedding plane fracture zones and associated interconnected vertical and sub-vertical fracturing. Relatively unfractured layers behave like aquitards.

The locations of MOECC Water Well Records located within a 500 m radius of the site are included on Figure 4 - MECP Water Well Location Plan (Please note: well location accuracy

is variable based on the MOECC database). A total of 27 well records were identified within 500 m of the site, on the west side of the Mississippi River. Table 1: MOECC Water Well Records Summary (below) provides a summary of hydrogeological information obtained from the available well records.

MECP WATER WELL RECORDS SUMMARY								
Well Record ID	Year Drilled	Depth to Bedrock (m)	Casing Depth (m)	Depth to Water Bearing Fractures (m)		Total Depth (m)	Recommended Pumping Rate (L/min)	
Well Records located to the west of the Mississippi River								
3502099	1958	0.0	4.3	13.1		14.3	not provided	
3502100	1952	0.6	1.8	18.6		20.4	not provided	
3502101	1958	1.2	7.0	14.0		15.2	not provided	
3502129	1949	1.2	1.8	18.6		20.4	not provided	
3502130	1951	2.4	3.2	18.9		19.5	not provided	
3502135	1959	1.8	3.0	15.2		19.5	11.4	
3502138	not provided	3.0	3.7	20.7		22.3	not provided	
3502139	1961	3.7	4.0	27.1	34.1	38.1	132.5	
3502152	1964	1.5	3.7	21.3		21.3	45.4	
3503276	1972	0.6	7.6	29.9		31.4	68.2	
3503339	1973	0.3	7.6	8.2	19.5	19.8	18.9	
3503366	1973	0.6	6.7	18.3		19.5	90.9	
3503546	1973	0.9	7.6	18.3		19.5	136.4	
3504685	1977	0.9	6.7	19.8		22.9	22.7	
3504686	1977	1.2	6.7	21.0		22.9	22.7	
3504687	1977	1.2	6.7	28.0		30.5	22.7	
3504689	1977	0.6	6.7	20.7		22.9	22.7	
3504691	1977	0.9	6.7	21.0		22.9	26.5	
3504813	1977	0.6	6.7	35.7		37.8	40.9	
3505232	1977	1.2	6.7	20.7		22.9	not provided	
3505550	1979	0.6	7.0	15.8		20.7	94.6	
3507000	1984	0.9	6.1	18.3		19.8	68.2	
3507253	1985	3.0	6.1	19.2		19.8	26.5	
7235377	2014	Abandoning Record - PVC Well						
7244927	2015	1.2	6.1	19.5		21.6	91.0	
7244928	2015	0.9	6.1	19.5		21.3	90.9	
7244929	2015	3.7	6.4	11.9	18.3	20.4	91.0	

Table 2 - MECP Water Well Records Summary

Depth to bedrock varies from at ground surface to 3.7 m bgs in the available well records. The depth to significant water bearing fractures varies from 8.2 to 35.7 m bgs.



The pumping rates recommended by the drilling contractor at the time of well installation vary from 11 to 136 liters/minute (L/min). The average rate of pumping based on the available well records that included recommended pumping rates is 59 L/min.

The site is considered to be hydrogeologically sensitive due to bedrock occurring within 2 m of the ground surface. It should be noted that although the site is considered hydrogeologically sensitive, septic impacts were not observed in the groundwater analytical results from the pumping tests of the onsite wells. The presence of relatively shallow overburden and isolated bedrock outcrops will not promote higher than anticipated rates of infiltration due to the massive nature of the upper bedrock strata. No significant fracturing was identified in bedrock outcrops at the site. No karst related features were identified in outcrops at the site. The site is not located in an area of potential or inferred karst as determined by OGS.

#### **4.4 Neighbouring Water Quality**

Additional water quality sampling was conducted at five (5) offsite water supply wells. The wells that were sampled are all used for private domestic water supply at residences located along Old Mill Lane, Wilson Street and Apple Street, in close proximity to the subject site.

The locations of the offsite water wells that were sampled are included on Drawing No. PH4398-2 Test Hole Location (Appendix 5). Available Water Well Record information is included in Appendix 2.

A summary of the laboratory water quality results for the offsite sampling is presented in Table 2: Groundwater Geochemistry – Offsite Wells (below). Laboratory certificates of analysis are included for reference purposes in Appendix 3.

Analysis of the water quality data for the offsite water supply wells reveals that the aquifer has not been adversely impacted as a result of the existing development in the area. The development density of the existing lots that border the subject site along Old Mill Lane and Apple Street is approximately 7.2 lots/hectare. The proposed development density is approximately 0.7 lots/hectare, so the proposed development is unlikely to have a significant impact on groundwater quality.

Several exceedances of operational and aesthetic guideline limits are noted for Hardness, TDS, colour and DOC.

POTABLE SUPPLY WELL GEOCHEMISTRY - OFF-SITE WELLS								
PARAMETER	UNITS	ODWS		OFF-SITE WELL				
		LIMIT	TYPE	104 Old Mill	116 Old Mill	124 Wilson	119 Old Mill	110 Apple
				15-Dec-09	01-Feb-10	23-Dec-09	28-Aug-15	28-Aug-15
<b>MICROBIOLOGICAL</b>								
Escherichia Coli (E.Coli)	ct/100mL	0	MAC	0	0		0	0
Total Coliforms	ct/100mL	0	MAC	0	0		0	0
Heterotrophic Plate Count	ct/1mL			0	0			
Faecal Coliforms	ct/100mL			0	0			
Faecal Streptococcus	ct/100mL			0	0			
<b>GENERAL CHEMICAL - HEALTH RELATED</b>								
Fluoride	mg/L	1.5(2.4)	MAC	0.26	0.31	0.32	0.32	0.43
Nitrite	mg/L	1	MAC	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrate	mg/L	10	MAC	0.6	0.41	5.30	<0.10	1.23
Turbidity	NTU	1.0(5.0)	MAC/AO	0.2	0.3	0.1	0.6	0.1
Ammonia	mg/L			<0.02	<0.02		0.02	0.02
TKN	mg/L			<0.10	<0.10		<0.1	<0.1
<b>GENERAL CHEMICAL - AESTHETIC RELATED</b>								
Hardness	mg/L	100	OG	322	376		370	430
Ion Balance	unitless			1.04	1.01		1.04	0.98
TDS	mg/L	500	AO	417	487	832	506	611
Alkalinity	mg/L	500	OG	279	339	339	319	352
Chloride	mg/L	250	AO	19	32	177	50	84
Colour	TCU	5	AO	4	<2	3	18	16
Conductivity	uS/cm			641	749	1280	779	940
pH	unitless	6.5-8.5	AO	7.86	7.70	7.67	8.16	8.27
Sulphide	mg/L	0.05	AO	<0.01	<0.01		<0.02	<0.02
Sulphate	mg/L	500	AO	39	33	40	38	39
Calcium	mg/L			86	98		92	98
Iron	mg/L	0.3	AO	<0.03	<0.03		<0.03	<0.03
Potassium	mg/L			3	5		4	9
Magnesium	mg/L			26	32		34	35
Manganese	mg/L	0.05	AO	<0.01	<0.01		<0.01	<0.01
Sodium	mg/L	200	AO	17	20		33	30
Phenols	mg/L			<0.001	<0.001		<0.001	<0.001
Tannin & Lignin	mg/L			<0.1	<0.1	<0.1	0.2	<0.1
DOC	mg/L	5	AO	2.2	1.8		63.9	65.1

MAC=Maximum Allowable Concentration      AO = Aesthetic Objective      OG= Operational Guideline  
Shaded cell indicates an exceedance of the ODWS limit

Table 3 – Potable Supply Well Geochemistry - Offsite Wells

## 5.0 AQUIFER ANALYSIS

The results of the groundwater review and pumping tests performed on the test wells are presented in the following sections.

### 5.1 Static Conditions

Subsurface conditions are indicated in a cross-section which is included as Figure-5: Generalized North - South Site Cross-Section (Appendix 5). The cross-section shows bedrock and overburden units as well as static groundwater levels in the test wells. Static water level data is summarized in Table 4: Water Level Elevations (below).

<b>WATER LEVEL ELEVATIONS</b>					
Test Well ID	Date	Elevation Ground Surface (m)	Elevation Top of Casing (m)	Water Level Below Top of Casing (m)	Water Elevation (m)
TW1	08-Jul-15	129.00	129.46	11.13	118.33
	15-Jul-15			11.22	118.24
	07-Dec-21			11.12	118.34
TW2	08-Jul-15	126.89	127.39	9.06	118.33
	15-Jul-15			9.17	118.22
	08-Dec-21			8.83	118.56
TW3	08-Jul-15	123.93	124.33	5.97	118.36
	15-Jul-15			6.06	118.27
	08-Dec-21			5.94	118.39

Note: Elevations are calculated relative to assumed local elevation from topographic survey, and are not specifically accurate relative to mean sea level.

*Table 4 - Water Level Elevations*

Prior to the initiation of the pumping tests, water levels were measured in the three (3) test wells. The static groundwater levels were between 118.33 and 118.36 m above sea level (ASL) on July 8, 2015 prior to the pumping tests. The groundwater elevations suggest that groundwater flow in the bedrock is from south to north. The three wells were completed in the same geological unit (dolostone) and at relatively similar depths (Figure-5: Generalized North - South Site Cross-Section). This information is consistent with the expected direction of groundwater flow, which is towards the Mississippi River.

The horizontal hydraulic gradient in the shallow bedrock is estimated at be approximately 0.0003 based on an estimated head difference of 3 cm over 95 m.

## 5.2 Aquifer Characteristics

Table 5: Summary of Pumping Tests (below) provides a summary of the pumping test program including drawdown observed at each pumping well and at observation wells during pumping.

SUMMARY OF PUMPING TESTS					
Pumping Well ID	Pumping Rate (L/min)	Maximum Drawdown in Pumping Well (m)	Observation Well ID	Max Drawdown in Observation Well (m below top of casing)	Distance between Pumping Well and Observation Well (m)
TW1	114	0.53	TW2	0.23	140
			TW3	0.42	95
TW2	114	0.47	TW1	0.42	140
			TW3	0.4	206
TW3	114	0.77	TW1	0.42	95
			TW2	0.4	206

Note: Drawdown values calculated from manual field measurements taken during pumping tests

*Table 5 - Summary of Pumping Tests*

Pumping test data were analyzed using Aquifer Test Pro™ (V 2015.1) software. Drawdown data from dataloggers were analyzed using Theis (Theis, 1935), Theis with Jacob correction (Jacob, 1944) and Cooper-Jacob I (Cooper and Jacob, 1946) methods of analysis. Datalogger recovery data was analyzed using Theis (Theis, 1935).

All pressure data from the dataloggers was corrected for atmospheric pressure variations (i.e. barometric compensation) using Schlumberger Diver-Office™ software and a barometric pressure data logger that was deployed during the investigation.

The aquifer characteristics determined from the three pumping tests are summarized in Table 6: Summary of Aquifer Characteristics (below).

<b>SUMMARY OF AQUIFER CHARACTERISTICS</b>			
<b>Analysis</b>	<b>Well</b>	<b>Transmissivity (m<sup>2</sup>/d)</b>	<b>Storativity</b>
<b>Test 1</b>			
Theis	TW2	2.05E+02	3.05E-06
Theis	TW3	2.20E+02	4.39E-06
Theis Jacob	TW2	2.08E+02	3.20E-06
Theis Jacob	TW3	2.22E+02	4.64E-06
Cooper Jacob I	TW2	2.05E+02	3.05E-06
Cooper Jacob I	TW3	2.09E+02	5.87E-06
Theis Recovery	TW2	1.77E+02	
Theis Recovery	TW3	1.70E+02	
Test 1 Average		2.02E+02	4.03E-06
<b>Test 2</b>			
Theis	TW1	3.58E+02	1.00E-07
Theis	TW2	1.53E+02	1.00E-07
Theis Jacob	TW1	3.65E+02	1.00E-07
Theis Jacob	TW2	2.80E+02	1.37E-10
Cooper Jacob I	TW1	4.56E+02	5.39E-09
Cooper Jacob I	TW2	2.73E+02	1.17E-10
Theis Recovery	TW1	5.45E+02	
Theis Recovery	TW2	4.52E+02	
Test 2 Average		3.60E+02	5.09E-08
<b>Test 3</b>			
Theis	TW1	4.12E+02	1.00E-07
Theis	TW3	2.79E+02	1.00E-07
Theis Jacob	TW1	3.65E+02	1.00E-07
Theis Jacob	TW3	2.85E+02	1.00E-07
Cooper Jacob I	TW1	4.12E+02	1.00E-07
Cooper Jacob I	TW3	2.79E+02	1.00E-07
Theis Recovery	TW1	2.78E+02	
Theis Recovery	TW3	1.98E+02	
Test 3 Average		3.14E+02	1.00E-07
<b>Average for all tests</b>		<b>2.92E+02</b>	<b>1.39E-06</b>
<b>Worst case values</b>		<b>1.53E+02</b>	<b>1.17E-10</b>

Table 6 - Summary of Aquifer Characteristics

### 5.3 Groundwater Geochemistry Assessment

Water quality analysis data from the test wells is summarized in Table 7: Onsite Groundwater, General Geochemistry, and Table 8: Onsite Groundwater Geochemistry, Metals and VOCs (below). The analytical results for the six (6) groundwater samples that were obtained from the three onsite test wells show that water quality at the subject site is acceptable and that there are no exceedances of the applicable health related parameter limits of the Ontario Drinking Water Standards (ODWS).

TEST WELL GEOCHEMISTRY - ONSITE WELLS - GENERAL												
PARAMETER	UNITS	ODWS		TEST WELL								
		LIMIT	TYPE	TW 1			TW 2			TW 3		
				11-Jul-15		23-Jun-16	13-Jul-15		24-Jun-16	10-Jul-15		23-Jun-16
				3hr	6hr		3hr	6hr		3hr	6hr	
<b>MICROBIOLOGICAL</b>												
Escherichia Coli	ct/100mL	0	MAC	0	0	-	0	0	-	0	0	-
Total Coliforms	ct/100mL	0	MAC	0	0	-	0	0	-	0	1	-
<b>GENERAL CHEMICAL - HEALTH RELATED</b>												
Fluoride	mg/L	1.5(2.4)	MAC	0.39	0.32	0.41	0.33	0.31	0.33	0.43	0.43	0.4
Nitrite	mg/L	1	MAC	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrate	mg/L	10	MAC	0.72	0.73	1.36	0.16	0.23	0.7	0.93	1.16	0.48
Turbidity - Lab	NTU	1.0(5.0)	MAC/AO	2.7	0.2	0.1	1.0	1.6	0.5	0.2	0.2	0.3
Ammonia	mg/L			0.02	0.02	0.01	0.02	0.03	0.03	<0.05	<0.05	0.1
TKN	mg/L			<0.10	<0.10	0.2	0.20	0.10	0.20	0.14	0.33	0.3
<b>GENERAL CHEMICAL - AESTHETIC RELATED</b>												
Hardness	mg/L	100	OG	383	383	394	346	348	368	414	419	409
TDS	mg/L	500	AO	520	520	544	449	460	526	565	578	621
Alkalinity	mg/L	500	OG	329	343	358	322	316	327	358	369	439
Chloride	mg/L	250	AO	53	56	60	30	34	60	62	68	57
Colour	TCU	5	AO	<2	<2	<2	11	11	4	<2	<2	2
Conductivity	uS/cm			800	815	837	691	707	810	869	869	955
pH	unitless	6.5-8.5	AO	7.94	7.98	8.19	7.98	7.91	8.1	7.70	7.76	8.04
Sulphide	mg/L	0.05	AO	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sulphate	mg/L	500	AO	40	36	40	37	37	41	36	35	34
Calcium	mg/L			94	96	95	89	90	93	100	102	98
Iron	mg/L	0.3	AO	<0.03	<0.03	<0.03	0.18	0.16	0.1	<0.03	<0.03	<0.03
Potassium	mg/L			7	7	7	3	3	3	7	7	7
Magnesium	mg/L			36	37	38	30	30	33	40	40	40
Manganese	mg/L	0.05	AO	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01	0.02
Sodium	mg/L	200	AO	31	32	36	18	19	38	39	42	66
Phenols	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.001
Tannin & Lignin	mg/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2
DOC	mg/L	5	AO	75.4	71.2	1.6	70.3	73	2.4	2.3	2.1	3.5

MAC=Maximum Allowable Concentration      AO = Aesthetic Objective      OG= Operational Guideline  
Shaded cell indicates an exceedance of the ODWS limit

Table 7 – Test Well Geochemistry - Onsite Wells - General

The total coliform level in TW3 was 1 count/100 ml which exceeds the MAC of 0 counts/100 mL in the sample taken at the end of the six hour pumping test. Please note that the total coliform count was zero in the sample that was collected from TW3 after three hours of pumping. The result for the six hour sample is considered to be anomalous and is probably due to sample contamination at the time of sampling. MOE Guideline D-5-5 notes that total coliform counts of less than 6 counts/100 ml shall be considered as acceptable (MOE, 1996).

All test wells were purged and resampled on June 23, 24 2016, at which point Colour and DOC were below the Procedure D-5-5 Guideline limits.

With respect to aesthetic objectives and operational guidelines, the analytical results indicate some minor exceedances of the non-health related guidelines and objectives as follows:

- Hardness (operation guideline) at TW1, TW2 and TW3.
- Total Dissolved Solids (aesthetic objective) at TW1 and TW3.

Laboratory determined turbidity levels were elevated at TW1 and TW2 after 3 hours of pumping at each location. The field turbidity measurement results were below Maximum Acceptable Concentration (MAC) limit, however, as were the 6 hour sample results (lab and field results). Turbidity results for the site are therefore considered to be acceptable.

Field parameter results for the final 3.5 hours of each test are shown graphically below:

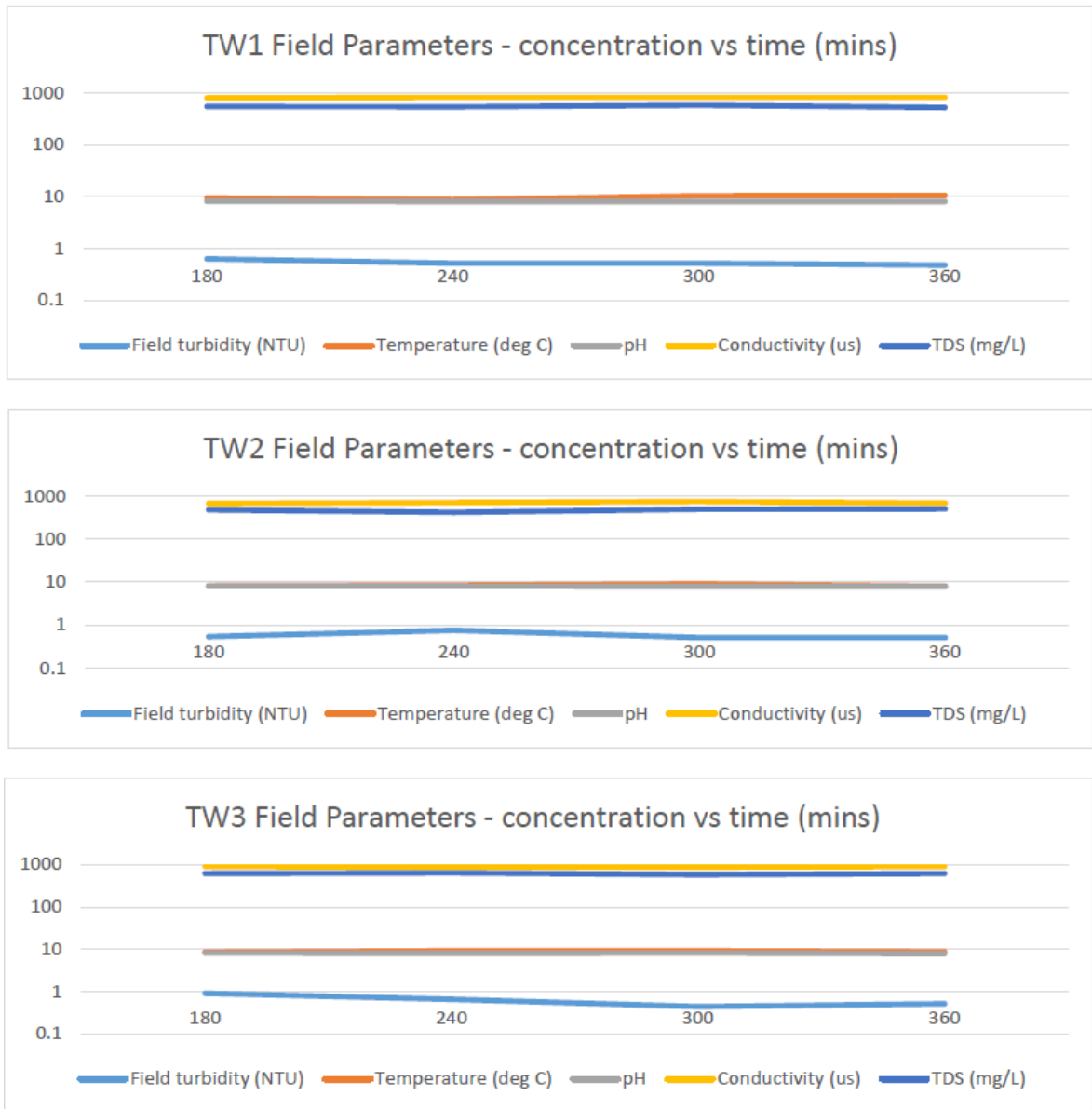


Figure 1 – Test Well Field Parameters

Hardness, an operational guideline, does not appear in the ODWS. Rather it appears in the Technical Support Documents for Drinking Water Standards, Objectives and Guidelines (Technical Support Documents) as a parameter with an operational guideline of 100 mg/L. At the measured concentrations, the water is considered to be moderately hard, which is typical of wells drilled throughout eastern Ontario.

Total dissolved solids (TDS) refers to the concentration of inorganic substances dissolved in water. The main constituents are typically chloride, sulphates, calcium, magnesium and bicarbonates. There are various levels of the constituents at a low level and it is not



anticipated that they will cause an issue with taste. A point of use reverse osmosis unit may be installed if a homeowner desires for drinking purposes. As such, no taste problems will occur when the system is used.

The Langelier Saturation Index (Langelier, 1936) is used to predict the calcium carbonate stability of water. It indicates whether the water will precipitate, dissolve, or be in equilibrium with calcium carbonate. The results of the Langelier calculation indicate the water is super saturated and tends to precipitate a scale layer of calcium carbonate (scale forming but non-corrosive). See Appendix 4 for calculation details.

The Ryznar Stability Index (Ryznar, 1944) uses a database of scale thickness measurements in municipal water systems to predict the effect of water chemistry. The RSI was developed from empirical observations of corrosion rates and film formation in steel water mains. The results of the RSI calculation indicates that scale will form. See Appendix 4 for calculation details.

Water quality analysis data for metals and VOC testing is summarized in Table 8 and Table 9 below.

TEST WELL GEOCHEMISTRY - ONSITE WELLS - METALS										
	ODWS			TW1		TW2		TW 3		
	LIMIT	TYPE		23-Jun-16	07-Dec-21	24-Jun-16	08-Dec-21	10-Jul-15	23-Jun-16	08-Dec-21
<b>METALS</b>										
Antimony	mg/L	0.006	IMAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	mg/L	0.025	IMAC	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	mg/L	1	MAC	0.22	0.21	0.27	0.24	0.21	0.24	0.23
Beryllium	mg/L			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	5	IMAC	0.15	0.15	0.14	0.13	0.14	0.15	0.13
Cadmium	mg/L	0.005	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.05	MAC	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium VI	mg/L			<0.010	<0.010	<0.010	<0.010	-	<0.010	<0.010
Copper	mg/L	1	AO	<0.001	0.002	<0.001	0.002	<0.001	<0.001	0.002
lead	mg/L	0.01	MAC	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury	mg/L	0.001	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Selenium	mg/L	0.01	MAC	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium	mg/L			2.33	-	2.33	-	2.40	2.36	-
Titanium	mg/L			<0.0001	-	<0.0001	-	<0.0001	<0.0001	-
Uranium	mg/L	0.02	MAC	0.003	0.002	0.002	0.002	0.002	0.003	0.003
Zinc	mg/L	5.0	AO	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

MAC=Maximum Allowable Concentration  
AO = Aesthetic Objective  
Shaded cell indicates an exceedance of the ODWS limit

Table 8 – Test Well Geochemistry – Onsite Wells – Metals

TEST WELL GEOCHEMISTRY - ONSITE WELLS - VOCs								
PARAMETER	UNITS	TW1		TW2		TW3		ODWS LIMIT
		23-Jun-16	07-Dec-21	24-Jun-16	08-Dec-21	23-Jun-16	08-Dec-21	
<b>Volatile Organic Compounds</b>								
1,1,1,2-tetrachloroethane	ug/L	<0.5	-	<0.5	-	<0.5	-	-
1,1,1-trichloroethane	ug/L	<0.4	-	<0.4	-	<0.4	-	-
1,1,2,2-tetrachloroethane	ug/L	<0.5	-	<0.5	-	<0.5	-	-
1,1,2-trichloroethane	ug/L	<0.4	-	<0.4	-	<0.4	-	-
1,1-dichloroethane	ug/L	<0.4	-	<0.4	-	<0.4	-	-
1,1-dichloroethylene	ug/L	<0.5	-	<0.5	-	<0.5	-	14 <sup>MAC</sup>
1,2-dichlorobenzene	ug/L	<0.4	-	<0.4	-	<0.4	-	200 <sup>MAC</sup> / 3 <sup>AU</sup>
1,2-dichloroethane	ug/L	<0.2	-	<0.2	-	<0.2	-	5 <sup>MAC</sup>
1,2-dichloropropane	ug/L	<0.5	-	<0.5	-	<0.5	-	-
1,3-dichlorobenzene	ug/L	<0.4	-	<0.4	-	<0.4	-	-
1,4-dichlorobenzene	ug/L	<0.4	-	<0.4	-	<0.4	-	5 <sup>MAC</sup> / 1 <sup>AU</sup>
Benzene	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5 <sup>MAC</sup>
Bromodichloromethane	ug/L	<0.3	-	<0.3	-	<0.3	-	-
Bromoform	ug/L	<0.4	-	<0.4	-	<0.4	-	-
Bromomethane	ug/L	<0.5	-	<0.5	-	<0.5	-	-
c-1,2-Dichloroethylene	ug/L	<0.4	-	<0.4	-	<0.4	-	-
c-1,3-Dichloropropylene	ug/L	<0.2	-	<0.2	-	<0.2	-	-
Carbon Tetrachloride	ug/L	<0.2	-	<0.2	-	<0.2	-	5 <sup>MAC</sup>
Chloroform	ug/L	<0.5	-	<0.5	-	<0.5	-	-
Dibromochloromethane	ug/L	<0.3	-	<0.3	-	<0.3	-	-
Dichlorodifluoromethane	ug/L	<0.5	-	<0.5	-	<0.5	-	-
Dichloromethane	ug/L	<4.0	-	<4.0	-	<4.0	-	50 <sup>MAC</sup>
Ethylbenzene	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.4 <sup>AU</sup>
m/p-xylene	ug/L	<0.4	-	<0.4	-	<0.4	-	-
Methyl Ethyl Ketone (MEK)	ug/L	<10	-	<10	-	<10	-	-
Methyl Isobutyl Ketone (MIBK)	ug/L	<10	-	<10	-	<10	-	-
Methyl Tert Butyl Ether (MTBE)	ug/L	<2	-	<2	-	<2	-	-
Monochlorobenzene	ug/L	<0.2	-	<0.2	-	<0.2	-	80 <sup>MAC</sup> / 30 <sup>AU</sup>
o-xylene	ug/L	<0.4	-	<0.4	-	<0.4	-	-
Styrene	ug/L	<0.5	-	<0.5	-	<0.5	-	-
t-1,2-Dichloroethylene	ug/L	<0.4	-	<0.4	-	<0.4	-	-
t-1,3-Dichloropropylene	ug/L	<0.2	-	<0.2	-	<0.2	-	-
Tetrachloroethylene	ug/L	<0.3	-	<0.3	-	<0.3	-	30 <sup>MAC</sup>
Toluene	ug/L	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	24 <sup>AU</sup>
Trichloroethylene	ug/L	<0.3	-	<0.3	-	<0.3	-	5 <sup>MAC</sup>
Trichlorofluoromethane	ug/L	<0.5	-	<0.5	-	<0.5	-	-
Vinyl Chloride	ug/L	<0.2	-	<0.2	-	<0.2	-	2 <sup>MAC</sup>
Xylene; total	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	300 <sup>AU</sup>

Table 9 – Test Well Geochemistry – Onsite Wells – VOCs

## 5.4 Water Quantity Assessment

An analysis of the suitability of the aquifer to supply the proposed development was carried out using the method summarized in Procedure D-5-5 Technical Guideline for Private Wells: Water Supply Assessment (MOE 1996).

#### **5.4.1 Peak Demand Water Usage**

Procedure D-5-5 indicates that a per-person water requirement of 450 L/day is to be used. The peak demand, which is determined as occurring over a 120 minute period each day, results in a peak demand rate of 3.75 L/min per person.

Procedure D-5-5 suggests the utilization of the number of bedrooms plus one, to determine the minimum number of people per house. It is anticipated that each lot will have one single family home with approximately four bedrooms per home. Using the Procedure D-5-5 methodology, the number of persons per home is determined to be five (5), so the total peak demand rate per home is 18.75 L/min. The pumping rates chosen for each of the pumping tests (114 L/min at each test well location) is well above the average peak demand value, so the current and future wells in the proposed subdivision will be sufficient to handle peak demand loadings.

#### **5.4.2 Long Term Safe Yield**

A determination of the long term safe yield (i.e. Q20 pumping rate) of each well was calculated using the method described by Maathius & van der Kamp (2006). For comparison purposes safe yield was also calculated using the Fervolden method (Fervolden, 1959) as described in Maathius & van der Kamp, 2006. The inputs and results of the calculation are presented in Table 10 (below).

<b>20 Year Safe Yield</b>			
<b>Transmissivity Calculated Using</b>	<b>TW1</b>	<b>TW2</b>	<b>TW3</b>
Theis	358	205	220
Theis	365	208	222
Theis Jacob	121	205	209
Theis Jacob	545	177	279
Cooper Jacob I	412	153	285
Cooper Jacob I	365	280	159
Theis Recovery	181	118	198
Theis Recovery	278	192	229
<b>Average Transmissivity (m<sup>2</sup>/d)</b>	328	192	225
Average Test Pumping Rate (L/min)	113.6	113.6	113.6
Average Test Pumping Rate (m <sup>3</sup> /day)	164	164	164
Available Drawdown (m)	11.12	15.97	11.97
Drawdown at 100 mins (m)	0.41	0.41	0.74
Maximum Test Drawdown (m)	0.57	0.44	0.77
Drawdown at 20 years (extrapolated)	2.1	1.59	1.83
% of available drawdown	18.9%	2.8%	6.4%
Specific Capacity (L/min/m)	199	258	148
Q20 safe well yield (m <sup>3</sup> /day) <sub>Farvolden</sub>	1744	1468	1288
Q20 safe well yield (m <sup>3</sup> /day) <sub>Maarthus &amp; van der Kamp</sub>	606	1150	749
Q20 safe well yield (L/min) <sub>Maarthus &amp; van der Kamp</sub>	421	799	520

Farvolden, 1959

Maathius & van der Kamp, 2006

*Table 10 – 20 Year Safe Yield*

The results of the 20 year safe yield analysis indicate that the test wells could be pumped at much higher rates than what is required for normal domestic use. The lowest sustainable yield (Q20 = 421 L/min at TW1) is 3.6 times greater than the test pumping rate, and 22.5 times more than the peak demand rate of 18.75 L/min.

It is anticipated that the homes in the proposed subdivision will require a maximum water requirement of 2,250 L/day for all uses. As such, the installation of 14 more domestic water supply wells on the 6.99 ha subdivision will be sustainable.

### 5.4.3 Potential Well Interference

Results from the pumping test program show that drawdown was observed at the observation wells during each test. Measured drawdowns and distances from each pumping well are included in Table 5: Summary of Pumping Tests (above).

It is anticipated that a total of 14 individual water supply wells (including the three existing test wells) will be used at the proposed subdivision. The lot sizes vary from approx. 0.40 to 0.57 ha. The well spacing will vary according to lot size and the locations of wells on each lot. There will be no clustering of wells as there will be one well on each lot. Considering the inherent intermittent nature of pumping, potential well interference is anticipated to be negligible.

A potential well interference model was used to reflect a hypothetical stress test scenario for drawdown at the site. The model assumes a series of 28 wells arranged in a concentric circular array. Each well is pumping continuously at a rate of 3,000 L/day, over a period of 20 years.

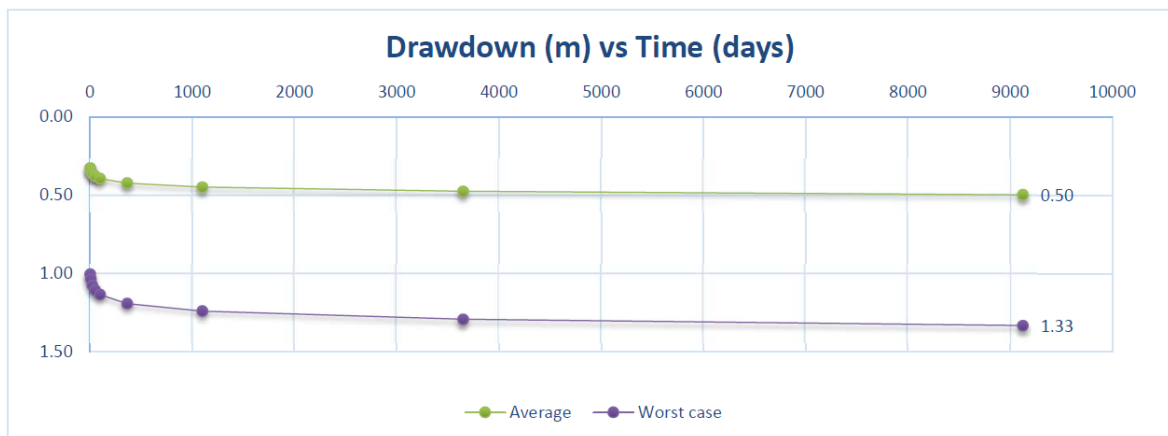


Figure 2 - Maximum Anticipated Drawdown

Analytical model worksheets are presented in Appendix 4. Calculations were based on average and worst case values for Transmissivity and Storativity (as presented in Table 6).

When average values of Transmissivity and Storativity are used the maximum anticipated drawdown based on a total of 28 wells pumping continuously for 20 years at 3,000 L/day, is 0.50 m.

When worst case values of Transmissivity and Storativity are used the maximum anticipated drawdown for 28 wells pumping continuously for 20 years at 3,000 L/day, is 1.33 m.

Available drawdown at the test wells varies from 11.12 to 15.97 m (average = 13.02 m). The worst case maximum drawdown after 20 years of pumping represents a removal of approximately 10% of the available drawdown. The conclusions reached using this model are consistent with the 20 year safe yield values in Table 8: Aquifer Characteristics (above).

Based on this analysis, the proposed use of well water in the subdivision will not result in unacceptable water quantity interference conflicts between onsite and offsite well users.

## **6.0 DEVELOPMENT CONSIDERATIONS**

### **6.1 Site Development**

An adequate water supply aquifer of sufficient quality and quantity is located beneath the subject property and can be intercepted by private wells drilled in accordance with Ontario Regulation 903.

### **6.2 Future Water Well Construction**

Drilled wells completed in the bedrock aquifer should be used for water supply in the proposed development. The wells should be drilled by a suitable experienced, MECP licensed well contractor. All wells must be completed in accordance with O.Reg. 903. Due to the hydrogeologically sensitive nature of the site, a separation distance of 30 m between any proposed well location and the septic bed components, possible stormwater management ponds, and any other sources of contamination is recommended.

Future well design recommendations are based on potential hydrogeological sensitivities, potential connections to the river and the water table depths.

Future wells should be drilled to depths of between 20 m and 25 m. This will ensure that the wells are completed in the same aquifer and will eliminate any potential for cross contamination between aquifers. The casing hole should extend into sound bedrock at least 0.3 m as per O.Reg. 903, and a minimum casing length of 6.7 meters below grade should be installed.

The minimum depth for future wells is 10 m. A minimum well depth is specified in order to ensure new wells that encounter water bearing fractures at shallow depths are drilled deep enough to accommodate long term potentiometric fluctuations in the 'shallow bedrock aquifer zone'.

The measured yields of future wells will probably be in excess of 100 L/min. If any future well at the proposed subdivision is found to have a yield of less than 22 L/min consideration should be given to extending the well a further 10 m in order to providing additional storage.

At each well location the casing should be installed and grouted in place utilizing either a neat cement grout or sodium bentonite grout slurry pumped from the bottom of the annular space to the ground surface in accordance with O.Reg. 903. The creation of the casing hole, the installation of the casing and the grouting of the annular space should be inspected by a qualified Professional Engineer or Professional Geoscientist.

Each well should be developed by surging or pumping until the water is developed to a sand free state at the time of construction in accordance with O.Reg. 903. If the water is observed to be cloudy at the completion of the prescribed well development, extended well development should be performed until all visible turbidity is removed.

Chlorine should be introduced at the completion of well development in sufficient quantity to produce a free chlorine residual of at least 50 mg/L (ppm). The chlorine should be mixed with the standing water in the casing using a procedure that will result in complete mixing of the chlorine over the entire depth of the well.

Each well should be completed with a submersible pump, pitless adaptor and vermin proof well cap. All such mechanical work connected to the well is to be completed by a qualified well contractor possessing a valid Class 4 pump installer's license. After completion of the mechanical work in the well, the well should be disinfected as described above.

The grading around each well casing should be slightly elevated within 3 m in all directions from the casing to direct surface runoff away from the well. Each well casing should project a minimum of 400 mm above the mounded soil.

Due to the hydrogeologically sensitive nature of the site, a separation distance of 30 m between any proposed well location and the septic bed components and any other potential sources of contamination is recommended. New wells should be accessible for future repair and replacement and as such have been located in front and side yards. This has been shown on Paterson drawing PH4398-1 – Lot Development Plan, attached in appendix 5.

There are currently no concerns regarding connectivity between wells and the river. Further groundwater sampling has demonstrated that DOC does not occur at elevated concentrations in the onsite wells, so there is no evidence to suggest connectivity with the river.

### **6.3 Water Treatment**

The water within the bedrock aquifer displays elevated hardness which can be readily and suitably conditioned to reduce this aesthetic parameter. A standard residential grade water softener can be installed to remove the hardness in the raw water. Conventional water softeners will introduce sodium into the water supply, and it may be appropriate to bypass the water softener with a separate tap for drinking water.

The Langelier Saturation Index (LSI) and Ryznar Stability Index (RSI) were calculated for the three test wells (Appendix 4). The results indicate that scale formation should be minimal.



TDS is primarily comprised of the inorganic substances dissolved in water including chloride, sulphates, calcium, magnesium and bicarbonates. The palatability of drinking water with TDS above 500 mg/L may be unacceptable. Reverse osmosis treatment or Distillation Treatment can be used to remove TDS if raw water is considered to be unpalatable by the end user. Point of use systems (at kitchen sink) are recommended due to the relatively high cost of whole house reverse osmosis treatment, if desired by the user.

The elevated DOC noted at TW1 and TW2 (2015 results) is considered to be a laboratory error. Further development of the wells were completed and an additional sample in 2016 provided results below the aesthetic objective of 5 mg/L.

Elevated color analysis results from the pumping test at TW3 are slightly above the treatment limit indicated in MOE Guideline D-5-5. A resample was taken and was found to be below the treatment limits of D-5-5. Color in groundwater is usually associated with the mineral content of the bedrock aquifer material, but could also be associated with an organic source. Health Canada (2015) notes that color is primarily an aesthetic concern and indicates that a suitable aesthetic limit of 15 TCU should be used. Carbon filter treatment may be sufficient to reduce color to an acceptable level. Other effective methods for treating color include coagulation, distillation, and settling. Previous results indicating elevated color at TW2 are considered to be anomalous. Further development of the wells resulted in significant improvements in the color concentration.

## **6.4 Predictive Impact Assessment for Nitrates**

The groundwater within the bedrock aquifer should be protected from sewage system effluent by the available overburden and the massive layer of Oxford Formation dolomite above the shallowest point of groundwater interception.

The general overburden groundwater flow direction will be controlled by the site topography, and will mostly flow to the north and northwest, towards the Appleton Swamp.

### **Procedure D-5-4: Three - Step Assessment Process**

MECP procedure D-5-4 stipulates the use of a three-step assessment process which is outlined in the MECP document “D-5-4 Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment”. The three-step assessment process looks at Lot Size Considerations, System Isolation Characteristics, and Contaminant Attenuation Considerations.

#### *Step 1 - Lot Size Considerations*

As the proposed lot severance will create 14 lots of varying size (0.40 ha to 0.57 ha) with the average lot size of approximately 0.43 ha, which is less than the one hectare, the proposed lot severance does not meet this consideration.

### *Step 2 - System Isolation Characteristics*

Where lot sizes are less than one hectare in size, the consultant is responsible for assessing the potential risk to the groundwater. The guideline asks that the consultant demonstrate system isolation using multiple lines of evidence.

As the overburden was determined to be less than 2 m during the subsurface investigations, it was determined that the residential development does not meet the requirements for system isolation.

Due to the general groundwater flow direction of north and northwest, the contaminant attenuation zone for the proposed residential development would extend off-site towards the Appleton Swamp. The effluent would be naturally attenuated within the adjacent properties without negative impacts on the present or potential reasonable use (residential buildings) of the area properties.

### *Step 3 – Contaminant Attenuation Considerations*

In order to demonstrate that private services would adequately support the proposed residential development, a predictive nitrate impact assessment for the subject site was completed. The values shown in the Predictive Nitrate Impact Assessment attached to this report are summarized below.

<input type="checkbox"/> Site area	19.61 ha
<input type="checkbox"/> Impervious area %	7.0 %
<input type="checkbox"/> Daily sewage flow	1.0 m <sup>3</sup>
<input type="checkbox"/> Concentration of nitrate in effluent (Value based on typical effluent concentration)	40 mg/L
<input type="checkbox"/> Surplus Water (The surplus water value was estimated based on Environment Canada Climate Office values with a soil type comprised of clay loam (Urban Lawns) and anthropogenic sources.)	342 mm/year
<input type="checkbox"/> Combined infiltration factor based on:	0.70
<input type="radio"/> Topography infiltration factor 0.25	
<input type="radio"/> Soil texture infiltration factor 0.30	
<input type="radio"/> Cover infiltration factor 0.15	

The topography infiltration factor of 0.25 is based upon an average of rolling land with average slope of 2.8 to 3.8 m/km for the proposed development and flat land with a average slope of less than 0.6 m/km.

The soil texture infiltration factor was based upon an average of “medium combinations of clay and loam” with a value of 0.2 and “Open Sandy Loam” with a value of 0.4, which is a reasonable generalization based upon the site investigations and available geological mapping.

The “vegetative cover infiltration factor” was calculated as 0.15 based upon an average of the value for cultivated land (0.1) and the value for Woodland (0.2).

The calculation for a standard septic system results in a predicted nitrate concentration of 4.2 mg/L nitrate concentration for the subject site, using a value of 40 mg/L nitrate concentration within the effluent. This value was based upon using a standard septic flow value of 1,000 L/day for the daily sewage flow.

Nitrate concentrations in the onsite wells are recorded to be below 1.4 mg/L. As such, additional loading will be well below the provincially mandated limit of 10 mg/L. It is Paterson`s opinion that the proposed development will meet the regulatory requirements for nitrate dilution. The detailed analyses for these sections appears in Appendix 4.

Groundwater within the bedrock aquifer should be protected from sewage system effluent by the available overburden and the massive nature of the upper bedrock units.

The cumulative nitrate impact for this subdivision has been calculated to be 4.2 mg/L. Nitrate concentrations in onsite and offsite wells are typically non-detectible or below 1.2 mg/L, so the additional loading will be well below the provincially mandated limit of 10 mg/L. As such, it is Paterson`s opinion that the proposed development will meet the regulatory requirements.

Groundwater samples were collected at three offsite well locations (see table below) in June 2016. Since the direction of groundwater flow in the bedrock aquifer is probably towards the north (based on the relative locations of the Mississippi and Ottawa Rivers) the concentration of nitrates in 139 Apple Street can be considered to be representative of the receiving aquifer (i.e. nitrates = 0 mg/L).

POTABLE SUPPLY WELL GEOCHEMISTRY - OFFSITE WELLS - NITRATE SPECIES					
PARAMETER	UNITS	ODWS	OFFSITE WELL LOCATION		
		LIMIT	128 Apple	139 Apple	140 Wilson
			24-Jun-16	24-Jun-16	24-Jun-16
<b>General Chemistry Parameters</b>					
DOC	mg/L	5 <sup>AO</sup>	1.7	2	1.9
Nitrite	mg/L	1.0 <sup>MAC</sup>	<0.025	<0.025	<0.025
Nitrate	mg/L	10 <sup>MAC</sup>	<0.10	<0.10	<0.10
Nitrite + Nitrate (as N)	mg/L	10 <sup>MAC</sup>	0.2	<0.10	2.52
<b>Nutrients</b>					
Ammonia	mg/L	-	0.2	<0.10	2.52
Organic Nitrogen	mg/L	0.15 <sup>OG</sup>	0.23	0.12	0.23
TKN	mg/L	-	0.23	0.12	0.23
MAC=Maximum Allowable Concentration		AO = Aesthetic Objective			
Shaded cell indicates an exceedance of the ODWS limit		OG = Operational Guideline			

Table 11 - Potable Supply Well Geochemistry - Offsite Wells - Nitrate Species

## 6.5 Wastewater Treatment and Disposal Options

Onsite sewage disposal needs can be accommodated with a combination of conventional absorption style and conventional filter media style Class 4 sewage systems. Standard class 4 systems consist of a septic tank and in-ground, partially or fully raised leaching beds, as per Part 8 of the Ontario Building Code. Class 4 systems with tertiary treatment are available for use, and often provide a reduced footprint, however, were not used in support of this study.

In order to minimize the impact of sewage systems on the environment the following design principals should be adhered to:

- Surface grades should promote drainage away from sewage systems such that surface water accumulation is prevented.
- Water supply wells should be properly constructed.
- Sewage systems should be properly constructed.
- The layout of each lot should maximize the separation between wells and sewage systems to ensure a minimum separation of 15 m for fully-raised sewage systems.

The proposed Lot Development Plan (Drawing No. PH4398-1 Lot Development Plan) in Appendix 5 shows details of the proposed layout at each lot. The purpose of this drawing is

to show that a typical home and private services will fit onto the proposed lot, and can meet all pertinent regulations without causing environmental constraints. The houses shown on Drawing No. PH4398-1 cover a plan area of 300 m<sup>2</sup> (four bedroom single family home). Each home is serviced by a sewage system with the capacity of 3,000 L/day.

In all instances, site specific analysis of the soil morphology in the area of each proposed leaching bed is required during the design stages of the leaching bed in order to determine if sufficient soil exists to facilitate the use of native soil for subgrade preparation. Detailed soil morphology should only be determined by a qualified geotechnical specialist.

It is not the intent of the Lot Development Plan (Drawing No. PH4398-1) to restrict placement of a dwelling on each lot. While the actual configuration and position of the home may change, the relative position of the home, sewage system and well should be maintained. In all cases, the separation criteria for the immediate and neighbouring lots should be followed. Sewage systems must be designed according to Part 8 of the Ontario Building Code (OBC). The OBC sets out minimum design and construction standards for all approved classes of sewage systems.

OBC requirements state that there must be a minimum of 900 mm of suitable soil or leaching bed fill present between the base of the absorption trenches and the high groundwater table, bedrock or soil with a percolation rate greater than 50 min/cm. Although it is not expected that groundwater conditions will affect the design of the systems, there is a potential for shallow bedrock conditions to govern the siting of leaching beds on individual lots.

## **6.6 Phosphorous Impact Assessment**

Individual onsite wastewater treatment systems are not usually a significant source of phosphorus impacts to surface water because the phosphorus rapidly binds to soil particles immediately below the leaching bed. The only concern is at locations where surface water is in close proximity to onsite wastewater treatment systems, and where soils are thin, sandy, and calcareous.

The science regarding phosphorus soil retention is complex and varies with different soil types. As effluent is dispersed to the unsaturated soil beneath the leaching bed, phosphorus is retained due to processes of precipitation and adsorption.

Precipitation occurs when negatively charged phosphate anions react with positively charged cations (e.g. iron, aluminum, and calcium). The amount of precipitation depends on pH, redox potential, and the availability of cations. Calcareous soils tend to be alkaline. Iron and aluminum cations are generally more available in acidic non-calcareous soils. Although

phosphate reacts with calcium in calcareous soils, it is more effectively immobilized by iron and aluminum in non-calcareous soils.

Adsorption occurs when phosphate anions are attracted to and bind to positively charged mineral particle surfaces. Binding by adsorption is not as strong as binding by precipitation and is reversible. Adsorption is also limited by the number of adsorption sites available.

All onsite wastewater treatment systems will be located more than 30 m away from the Mississippi River.

Soils conditions at the site are characterized by variable combinations of silt/sand/gravel. Existing soils are thin with the maximum thickness of approximately 4.6 m based on the available borehole and test pit logs.

The Mississippi River is 200 km long and drains an area of 4,450 km<sup>2</sup>. Canadian Hydro Developers Inc. operates an electrical power generation plant in Appleton, and routinely reports information about water depth and flow to the Mississippi Valley Conservation Authority (MVCA). The average flow measured at Appleton Hydro Dam is approximately 9 m<sup>3</sup>/second. This is equivalent to approximately 778 million L/day.

Ontario Ministry of the Environment, Conservation and Parks (MECP) Procedure D-5-4 indicates that the concentration of phosphate used in assessing the potential impact of sewage effluent should be 15 mg/L, at an effluent flow rate of 1,000 L/day per lot.

The MECP Ontario Provincial Water Quality Objectives (PWQO) indicate that phosphorus in lakes should not exceed 20 ug/L, and that “excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L”. The United States Environmental Protection Authority (USEPA) limit is 50 ug/L if streams discharge into lakes or reservoirs. The ‘Canadian Water Quality Guidelines for the Protection of Aquatic Life’ (CCME, 2004), indicates that most uncontaminated freshwaters contain between 10 and 50 ug/L of total phosphorus.

Although the soils at the site are relatively coarse grained and calcareous (due to the underlying limestone bedrock), there will still be a lot of precipitation and adsorption of phosphorus immediately below each wastewater treatment system bed. Depending on the soil thickness and the relative elevation of the overburden water table, each location will have a variable amount of soil material available for binding of phosphorus beneath the wastewater treatment system, and between the wastewater treatment system and the Mississippi River. Breakout to the river will not occur for many years but can be expected to occur eventually as all of the available soil becomes saturated with phosphorus. Preferential

pathways for groundwater flow (sandy lenses, soil fractures) could also result in the transportation of some phosphorus impacted shallow groundwater to the river.

The following calculation assumes a worst case scenario where ALL of the phosphorus from 14 lots reaches the river on any given day:

- ❑ 14 lots x 1000 litres effluent /day x 15 mg/L phosphorus = 210 g phosphorus/day
- ❑ Flow rate in the Mississippi River = 778 million litres/day
- ❑ 210 grams phosphorus dissolved into 778 million litres water = 0.0000027 grams/L

The resultant phosphorus concentration is equal to 0.27 micrograms/litre (ug/L). This value is two orders of magnitude less than the interim PWQO limit of 30 ug/L. If all of the phosphorus from the proposed subdivision flowed straight into the Mississippi River, there would be no significant impact. Most of the phosphorus will be retained onsite however due to precipitation and adsorption of phosphorus within the overburden soil unit, so there will be no adverse effects to the river. There are no significant concerns regarding potential phosphorus impacts to the Mississippi River that could be associated with the proposed subdivision.

## 7.0 CONCLUSIONS

The following statements and conclusions are based on the investigation and analysis contained within this report:

- ❑ The test wells in the proposed subdivision have demonstrated that the underlying aquifer is capable of providing water that is safe and suitable for human consumption.
- ❑ The test wells in the proposed subdivision have demonstrated that the underlying aquifer is capable of providing a sufficient quantity of water for normal domestic purposes.
- ❑ Adverse effects on well water in the proposed subdivision from potential onsite and offsite sources are considered to be minimal/insignificant. Previous contamination issues at the site have been addressed and are fully remediated (Paterson, 2010). No potential offsite sources of contamination were identified.
- ❑ In Paterson's professional opinion the probable well yields determined on the basis of this investigation are representative of the yields which residents of the proposed subdivision are likely to obtain from their wells in the long term.
- ❑ Groundwater withdrawals in the proposed subdivision and at neighbouring properties should not exceed the long term safe yield of the aquifer, or significantly decrease base flow to sensitive water courses. Long term safe yield calculations indicate that the groundwater use in the area will be well below the long term safe yield of the aquifer.
- ❑ Potential well interference with neighboring offsite wells is considered to be minimal and based on the aquifer parameters determined by this study, the anticipated water demand from this subdivision should have minimal impact on the safe yield of the main water supply aquifer in the area.
- ❑ The subject property is suitable for development as a residential subdivision at the proposed density. Impacts to the neighbouring low density residential development area is expected to be negligible.



## 8.0 RECOMMENDATIONS

### 8.1 Water Supply

- ❑ All new wells should be constructed such that the casing hole extends into sound bedrock at least 0.3 m as per O.Reg. 903, with a minimum casing length of 6.7 meters below grade and extend to a minimum depth of at least 10 m below grade.
- ❑ Existing wells at the site which are not to be utilized for water supply wells, should be decommissioned according to the requirements of O.Reg. 903.
- ❑ Due to the hydrogeologically sensitive nature of the site, a separation distance of 30 m between any proposed well location and the septic bed components, possible stormwater management ponds, and any other sources of contamination is recommended.
- ❑ New wells should be accessible for future repair and replacement and as such have been located in front and side yards.
- ❑ The creation of the casing hole, installation of the casing, and grouting of the annular space, should be inspected by a qualified Professional Engineer or Professional Geoscientist. All well construction must be carried out by a licensed and experienced well technician.
- ❑ Wells should be developed to a sand free state in order to ensure that the residual turbidity created by the well drilling activities is completely purged from the well. Additional well development, prior to placing the well into use, is strongly recommended in order to provide adequate development of the formation and remove extraneous rock debris from the aquifer pathways. It is likely that future wells at this site will require additional well development. The additional well development should take place during well construction, or alternatively, take place during the mandatory pumping test set forth by O.Reg. 903.
- ❑ All future water wells be completed such that the top of well casing is a minimum of 400 mm above the finished grade within a 3 m radius of the wellhead. The grade should slope away from the wellhead in all directions for a distance of at least 3 m.
- ❑ Any remaining monitoring wells at the site should be abandoned in accordance with O.Reg. 903 requirements.
- ❑ Individual future well owners should carry out semi-annual verification of potability of the raw water supply, specifically bacteriological analyses (E.coli, and total

coliforms). The well owner should ensure that the wellhead and surrounding area are maintained in accordance with the requirements of O.Reg. 903. Future well owners should refer to the MOECC Water Supply Wells Requirements and Best Management Practices, (Revised April 2015) website at:

<https://dr6j45jk9xcmk.cloudfront.net/documents/4410/a-wwbmp-title-master-table-of-contents-chapter-1.pdf>

- ❑ A warning clause addressed to people on low sodium diets should be registered on title regarding the elevated concentration of sodium (> 20 mg/L) identified at TW1 and potentially at other future wells at the site. The warning should also address the potential use of water softeners to reduce hardness, which was elevated at all of the test wells.
- ❑ The raw water found in the water supply aquifer system is considered to be hard. Residential grade water softeners are recommended where water hardness is deemed unsuitable to the future homeowner.
- ❑ Additional treatment to address TDS and color may be required at each location depending on the specific findings of analytical testing. Additional treatments methods may include reverse osmosis, coagulation/flocculation processes, biological filtration, and/or granulated activated charcoal filtration.

## 8.2 Wastewater Treatment

- In the proposed areas for septic systems, the water table and bedrock surface may be less than 0.9 m below the ground surface and therefore imported material may be required.
- A site specific investigation should be carried out for the detailed sewage system design at each lot, as part of the building permit application process.
- The septic systems should be constructed with all appropriate setbacks as per Ontario Building Code requirements.
- Some native material is relatively permeable for septic systems; the native soils should be assessed at the proposed septic location and imported fill be used, if necessary.
- Proposed well, septic, and building locations are noted on Drawing No. PH4398-1 Lot Development Plan (Appendix 5).

- Future owners of individual onsite wastewater treatment systems should familiarize themselves with basic safety and maintenance information which is available at: [http://www.omafra.gov.on.ca/english/environment/facts/sep\\_smart.htm](http://www.omafra.gov.on.ca/english/environment/facts/sep_smart.htm)

In summary, it is Paterson`s professional opinion that this site is suitable for development as a residential subdivision at the proposed lot density. The hydrogeological recommendations contained within this report, if followed, should ensure that the development takes place in an effective manner, with a minimal impact on the natural environment.

We trust that this information satisfies your immediate requirements.

Best Regards,

**Paterson Group Inc.**



Erik Ardley, BSc. Geology.



Michael S. Killam, P.Eng.



## 9.0 STATEMENT OF LIMITATIONS

This Hydrogeology and Terrain Analysis report has been prepared in general accordance with the agreed scope-of-work and the requirements of MECP Guideline D-5: Planning for Sewage and Water Services (August 1996), Procedure D-5-4: Technical Guideline for Individual Onsite Sewage Systems: Water Quality Impact Risk Assessment (August 1996), and Procedure D-5-5: Technical Guideline for Private Wells: Water Supply Assessment (August 1996).

The conclusions presented herein are based on information gathered from a limited historical review along with limited field inspection and testing programs. The findings of this investigation are based on a review of readily available geological, historical, and regulatory information and a cursory review made at the time of the field assessment. The historical research relies on information supplied by provincial agencies and was limited within the scope-of-work, time, and budget of the project herein.

The client should be aware that any information pertaining to soils and all test hole logs are furnished as a matter of general information only and test hole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those described by the test holes themselves.

This report was prepared for the sole use of Southwell Homes LTD. Permission from the above noted party and our firm will be required to release this report to any other party.

## 10.0 REFERENCES

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## Appendix 1

- **Soil Profile and Test Data Sheets**
- **Symbols and Terms**
- **Grain Size Distribution Curves**

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

**DATUM** Ground surface elevations provided by G. A. Smith Surveying Ltd.

**FILE NO.**  
**PE1114**

**REMARKS**

**HOLE NO.**  
**TP 1**

**BORINGS BY** Backhoe

**DATE** August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	124.90	20	40	60	80	
25mm Topsoil over brown <b>SILTY SAND</b> with some clay and gravel												
----- 0.48		G	1									
End of Test Pit												
TP terminated on bedrock surface @ 0.48m depth												
								100	200	300	400	500
								RKI Eagle Rdg. (ppm)				
								▲ Full Gas Resp. Δ Methane Elim.				



## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.

REMARKS

BORINGS BY Backhoe

DATE August 26, 2008

FILE NO. **PE1114**

HOLE NO. **TP 2**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	127.28	20	40	60	80	
TOPSOIL	0.10											
FILL: Brown silty sand with cinder blocks	0.53	G	1									
Brown SILTY SAND	0.81	G	2									
End of Test Pit												
TP terminated on bedrock surface @ 0.81m depth												

100 200 300 400 500  
RKI Eagle Rdg. (ppm)  
▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.



FILE NO. **PE1114**

REMARKS

HOLE NO. **TP 3**

BORINGS BY Backhoe

DATE August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %				
GROUND SURFACE						0	127.94	20	40	60	80		
<b>FILL:</b> Dark brown silty clay with gravel and brick pieces  1.62		G	1			1	126.94						▽
Grey-brown <b>SILTY CLAY</b> with sand  2.34		G	2			2	125.94						
End of Test Pit  TP terminated on bedrock surface @ 2.34m depth  (GWL @ 1.6m depth)													

100 200 300 400 500  
**RKI Eagle Rdg. (ppm)**  
 ▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.


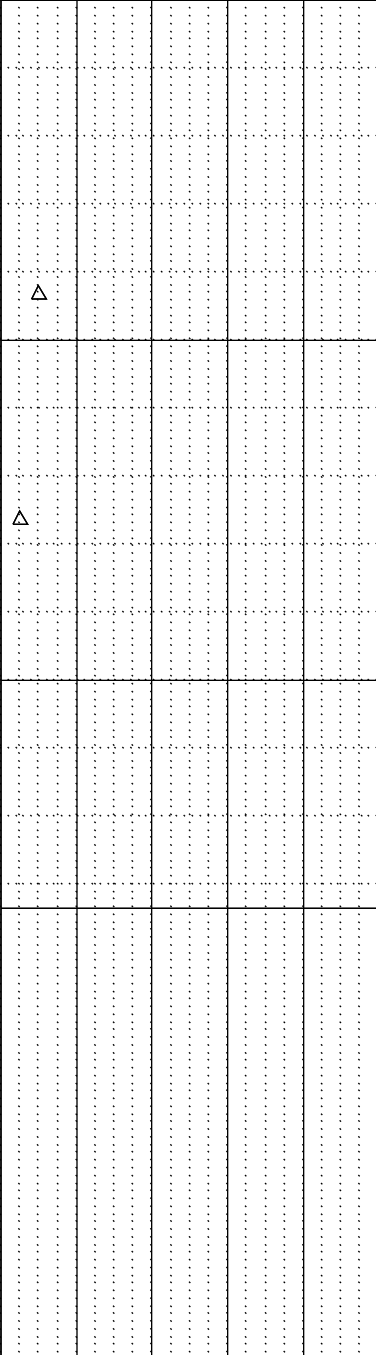
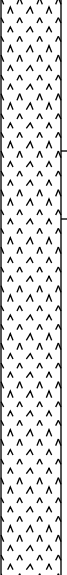
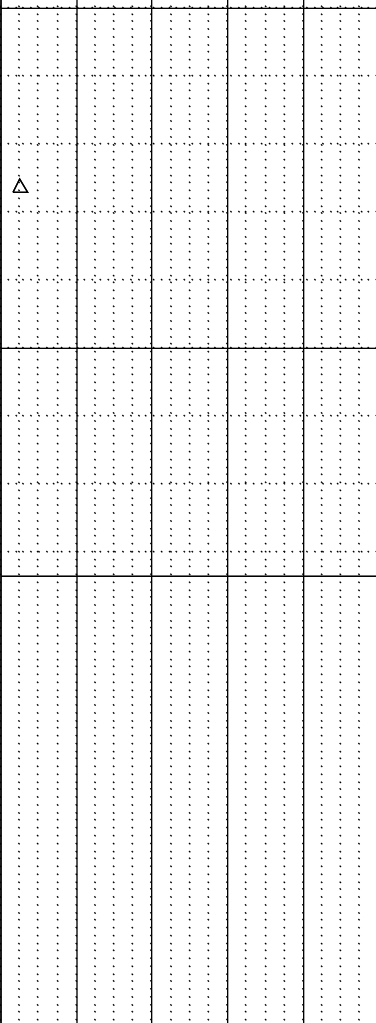
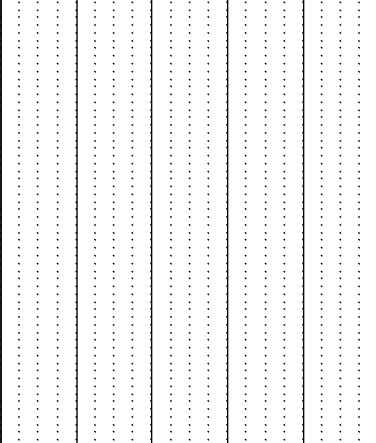
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REMARKS

HOLE NO. **TP 4**

BORINGS BY Backhoe

DATE August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	128.92	20	40	60	80	
<b>FILL:</b> Brown sand and gravel with rubble  0.97		G	1			1	127.92					
<b>GLACIAL TILL:</b> Brown silty sand with clay, gravel and cobbles  2.67		G	2			2	126.92					
End of Test Pit  TP terminated on bedrock surface @ 2.67m depth												

100 200 300 400 500  
**RKI Eagle Rdg. (ppm)**  
 ▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.

FILE NO. **PE1114**

REMARKS

HOLE NO. **TP 5**

BORINGS BY Backhoe

DATE August 26, 2005

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	128.72	20	40	60	80	
FILL: Brown silty sand with gravel and clay	[Cross-hatched pattern]	G	1									
						1	127.72					
GLACIAL TILL: Brown silty clay with sand and gravel	[Triangular pattern]	G	2									
						1.30						
End of Test Pit												
TP terminated on bedrock surface @ 1.83m depth												

100 200 300 400 500  
RKI Eagle Rdg. (ppm)  
▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.




REMARKS

BORINGS BY Backhoe

DATE August 26, 2008

FILE NO. **PE1114**

HOLE NO. **TP 6**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	127.70	20	40	60	80	
FILL: Dark brown silty sand with topsoil		G	1									
0.53												
Brown SILTY SAND, some clay		G	2									
0.99												
GLACIAL TILL: Grey-brown silty clay with sand, gravel and cobbles		G	3			1	126.70					
1.20												
End of Test Pit												
TP terminated on bedrock surface @ 1.20m depth												
								100	200	300	400	500
								RKI Eagle Rdg. (ppm)				
								▲ Full Gas Resp. △ Methane Elim.				

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.

FILE NO. **PE1114**

REMARKS

HOLE NO. **TP 7**

BORINGS BY Backhoe

DATE August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	128.63	20	40	60	80	
FILL: Brown silty sand with gravel		G	1									
0.48												
FILL: Dark brown silty sand with clay and concrete pieces		G	2									
0.84												
FILL: Brown silty sand with gravel		G	3			1	127.63					
1.22												
GLACIAL TILL: Light brown silty sand with clay, gravel and cobbles		G	4									
2.34						2	126.63					
End of Test Pit												
TP terminated on bedrock surface @ 2.34m depth												

100 200 300 400 500  
RKI Eagle Rdg. (ppm)  
▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.


FILE NO. **PE1114**

REMARKS

HOLE NO. **TP 8**

BORINGS BY Backhoe

DATE August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	128.92	20	40	60	80	
FILL: Brown silty sand with clay, cobbles, steel and topsoil		G	1			1	127.92					
		G	2									
End of Test Pit	1.78											
TP terminated on bedrock surface @ 1.78m depth												

100 200 300 400 500  
RKI Eagle Rdg. (ppm)  
▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.

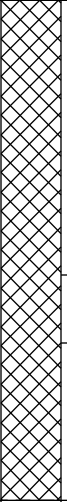
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REMARKS

HOLE NO. **TP 9**

BORINGS BY Backhoe

DATE August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	128.84	20	40	60	80	
<b>FILL:</b> Sand and gravel with concrete and steel pieces  End of Test Pit  TP terminated on bedrock surface @ 1.47m depth		G	1			1	127.84					
								100	200	300	400	500

**RKI Eagle Rdg. (ppm)**  
 ▲ Full Gas Resp.    △ Methane Elim.



## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.

FILE NO. **PE1114**

REMARKS

HOLE NO. **TP10**

BORINGS BY Backhoe

DATE August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	127.73	20	40	60	80	
TOPSOIL		G	1									
Brown <b>SILTY SAND</b> , trace clay		G	2									
<b>GLACIAL TILL:</b> Grey-brown silty clay with sand, gravel and cobbles		G	3									
End of Test Pit												
TP terminated on bedrock surface @ 0.99m depth												

100 200 300 400 500  
RKI Eagle Rdg. (ppm)  
▲ Full Gas Resp. △ Methane Elim.

**DATUM** Ground surface elevations provided by G. A. Smith Surveying Ltd.



**FILE NO.** PE1114

**REMARKS**

**HOLE NO.** TP11

**BORINGS BY** Backhoe

**DATE** August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	128.34	20	40	60	80	
<b>FILL:</b> Silty sand with gravel, concrete, metal and slag pieces 0.60		G	1									
		G	2									
Brown <b>SILTY CLAY</b> with sand 1.83						1	127.34					
End of Test Pit												

100 200 300 400 500  
**RKI Eagle Rdg. (ppm)**  
 ▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.

FILE NO. **PE1114**

REMARKS

HOLE NO. **TP12**

BORINGS BY Backhoe

DATE August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
								20	40	60	80	
<b>GROUND SURFACE</b>						0	128.16					
<b>FILL:</b> Brown sand with gravel	0.15											
<b>TOPSOIL</b>												
Brown <b>SILTY CLAY</b> with sand	0.33	G	2					△				
	0.53	G	1					△				
		G	3					△				
<b>GLACIAL TILL:</b> Light brown silty sand with clay, gravel and cobbles		G	4			1	127.16	△				
End of Test Pit	1.37											
TP terminated on bedrock surface @ 1.37m depth												
								100	200	300	400	500
								<b>RKI Eagle Rdg. (ppm)</b>				
								▲ Full Gas Resp. △ Methane Elim.				

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.

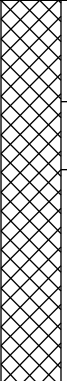
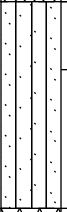

REMARKS

BORINGS BY Backhoe

DATE August 26, 2008

FILE NO. **PE1114**

HOLE NO. **TP13**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	128.85	20	40	60	80	
FILL: Sand and gravel with topsoil		G	1									
	1.12					1	127.85					
Brown SILTY SAND, some clay		G	2									
	1.73					2	126.85					
GLACIAL TILL: Light brown silty sand with clay, gravel and cobbles		G	3									
	3.05					3	125.85					
End of Test Pit												
TP terminated on bedrock surface @ 3.05m depth												

100 200 300 400 500  
RKI Eagle Rdg. (ppm)  
▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

**DATUM** Ground surface elevations provided by G. A. Smith Surveying Ltd.

**FILE NO.** PE1114

**REMARKS**

**HOLE NO.** TP14

**BORINGS BY** Backhoe

**DATE** August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	128.82	20	40	60	80	
<b>FILL:</b> Brown silty sand with clay, concrete and steel  1.30 <b>GLACIAL TILL:</b> Light brown silty sand with clay, gravel and cobbles 1.42 End of Test Pit  TP terminated on bedrock surface @ 1.42m depth		G	1			1	127.82					
		G	2									

100 200 300 400 500  
**RKI Eagle Rdg. (ppm)**  
 ▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

**DATUM** Ground surface elevations provided by G. A. Smith Surveying Ltd.

**REMARKS**

**BORINGS BY** Backhoe

**DATE** August 26, 2008

**FILE NO.** PE1114

**HOLE NO.** TP15

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	128.04	20	40	60	80	
<p><b>FILL:</b> Mixture of topsoil, sand, silty clay, gravel and wood</p> <p>End of Test Pit</p> <p>TP terminated on bedrock surface @ 0.51m depth</p>	0.51	G	1					▲				
								100	200	300	400	500

**RKI Eagle Rdg. (ppm)**  
▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

**DATUM** Ground surface elevations provided by G. A. Smith Surveying Ltd.


**REMARKS**

**BORINGS BY** Backhoe

**DATE** August 26, 2008

**FILE NO.**  
**PE1114**

**HOLE NO.**  
**TP16**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	127.95	20	40	60	80	
<b>FILL:</b> Sand and gravel with clay, wood and slag  End of Test Pit  TP terminated on bedrock surface @ 0.91m depth		G	1					▲				
		G	2						▲			
								100	200	300	400	500

**RKI Eagle Rdg. (ppm)**  
▲ Full Gas Resp.    △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.


FILE NO. **PE1114**

REMARKS

HOLE NO. **TP17**

BORINGS BY Backhoe

DATE August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0	127.85	20	40	60	80	
FILL: Sand, gravel, wood and slag  End of Test Pit TP terminated on bedrock surface @ 0.66m depth	 0.66	G	1					▲				
								100	200	300	400	500

**RKI Eagle Rdg. (ppm)**  
 ▲ Full Gas Resp.    △ Methane Elim.



154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

**DATUM** Ground surface elevations provided by G. A. Smith Surveying Ltd.

**FILE NO.** PE1114

**REMARKS**

**HOLE NO.** TP18

**BORINGS BY** Backhoe

**DATE** August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %				
GROUND SURFACE						0	125.97	20	40	60	80		
<p><b>FILL:</b> Silty sand with clay, topsoil, wood and slag</p> <p>0.63</p> <p>End of Test Pit</p> <p>TP terminated on bedrock surface @ 0.63m depth</p>	X	G	1									△	
								100	200	300	400	500	

**RKI Eagle Rdg. (ppm)**  
 ▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

**DATUM** Ground surface elevations provided by G. A. Smith Surveying Ltd.

**FILE NO.**  
**PE1114**

**REMARKS**

**HOLE NO.**  
**TP19**

**BORINGS BY** Backhoe

**DATE** August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)					
○ Lower Explosive Limit %						20	40	60	80				
<b>GROUND SURFACE</b>													
<b>TOPSOIL</b>						0							
End of Test Pit	0.03												
TP terminated on bedrock surface @ 0.03m depth													

100 200 300 400 500  
**RKI Eagle Rdg. (ppm)**  
▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

**DATUM** Ground surface elevations provided by G. A. Smith Surveying Ltd.

**REMARKS**

**BORINGS BY** Backhoe

**DATE** August 26, 2008

**FILE NO.**

**PE1114**

**HOLE NO.**

**TP20**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction		
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %	20	40		60	80
<b>GROUND SURFACE</b>						0								
<p><b>FILL:</b> Brown silty sand with clay, rubber, steel, plastic and fabric</p> <p>----- 0.25 -----</p> <p>End of Test Pit</p> <p>TP terminated on bedrock surface @ 0.25m depth</p>	XXXXXX	G	1				▲							

100 200 300 400 500  
**RKI Eagle Rdg. (ppm)**  
▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.


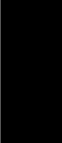

FILE NO. **PE1114**

REMARKS

HOLE NO. **TP21**

BORINGS BY Backhoe

DATE August 26, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %				
<b>GROUND SURFACE</b>						0	128.19	20	40	60	80		
<b>FILL:</b> Brown silty sand with clay and gravel ----- 0.20		G	1					▲					
<b>TOPSOIL</b> ----- 0.63		G	2					▲					
<b>GLACIAL TILL:</b> Brown silty clay with sand, gravel and cobbles ----- 1.12		G	3			1	127.19	▲					
End of Test Pit  TP terminated on bedrock surface @ 1.12m depth													
								100	200	300	400	500	
								<b>RKI Eagle Rdg. (ppm)</b>					
								▲ Full Gas Resp.    ▲ Methane Elim.					

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.


FILE NO. **PE1114**

REMARKS

HOLE NO. **MW 1-08**

BORINGS BY CME 55 Power Auger

DATE 26 Aug 08

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Lower Explosive Limit %				
GROUND SURFACE								20	40	60	80	
FILL: Silty sand with gravel		AU	1			0	127.46					
	0.86	RC	1	91	0	1	126.46					
		RC	2	90	60	2	125.46					
		RC	3	88	82	3	124.46					
		RC	4	100	44	4	123.46					
BEDROCK: Limestone		RC	5	90	73	5	122.46					
		RC	6	95	92	6	121.46					
		RC	7	100	78	7	120.46					
		RC	8	97	80	8	119.46					
		RC	9	100	100	9	118.46					
		RC	10			10	117.46					
		RC	11			11	116.46					
		RC	12			12	115.46					
End of Monitoring Well (GWL @ 9.86m-Sept. 2/08)	12.19											

100 200 300 400 500  
Gastech 1314 Rdg. (ppm)  
▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Phase II-Environmental Site Assessment  
Former Appletex Mill  
Appleton, Ontario

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.


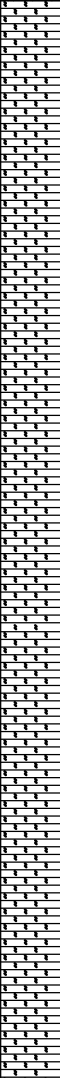
REMARKS

BORINGS BY CME 55 Power Auger

DATE 26 Aug 08

FILE NO. **PE1114**

HOLE NO. **MW 2-08**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Lower Explosive Limit %				
GROUND SURFACE						0	128.08	20	40	60	80	
FILL: Silty sand with gravel and concrete pieces						1	127.08					
		1.90				2	126.08					
BEDROCK: Limestone		RC	1	85	73	3	125.08					
		RC	2	93	60	4	124.08					
		RC	3	100	100	5	123.08					
		RC	4	97	87	6	122.08					
		RC	5	92	82	7	121.08					
		RC	6	100	93	8	120.08					
		RC	7	93	88	9	119.08					
		RC	8	100	100	10	118.08					
		RC	7	93	88	11	117.08					
		RC	8	100	100	12	116.08					
End of Monitoring Well (GWL @ 7.30m-Sept. 2/08)	12.19											

100 200 300 400 500  
Gastech 1314 Rdg. (ppm)  
▲ Full Gas Resp. △ Methane Elim.

DATUM Ground surface elevations provided by G. A. Smith Surveying Ltd.

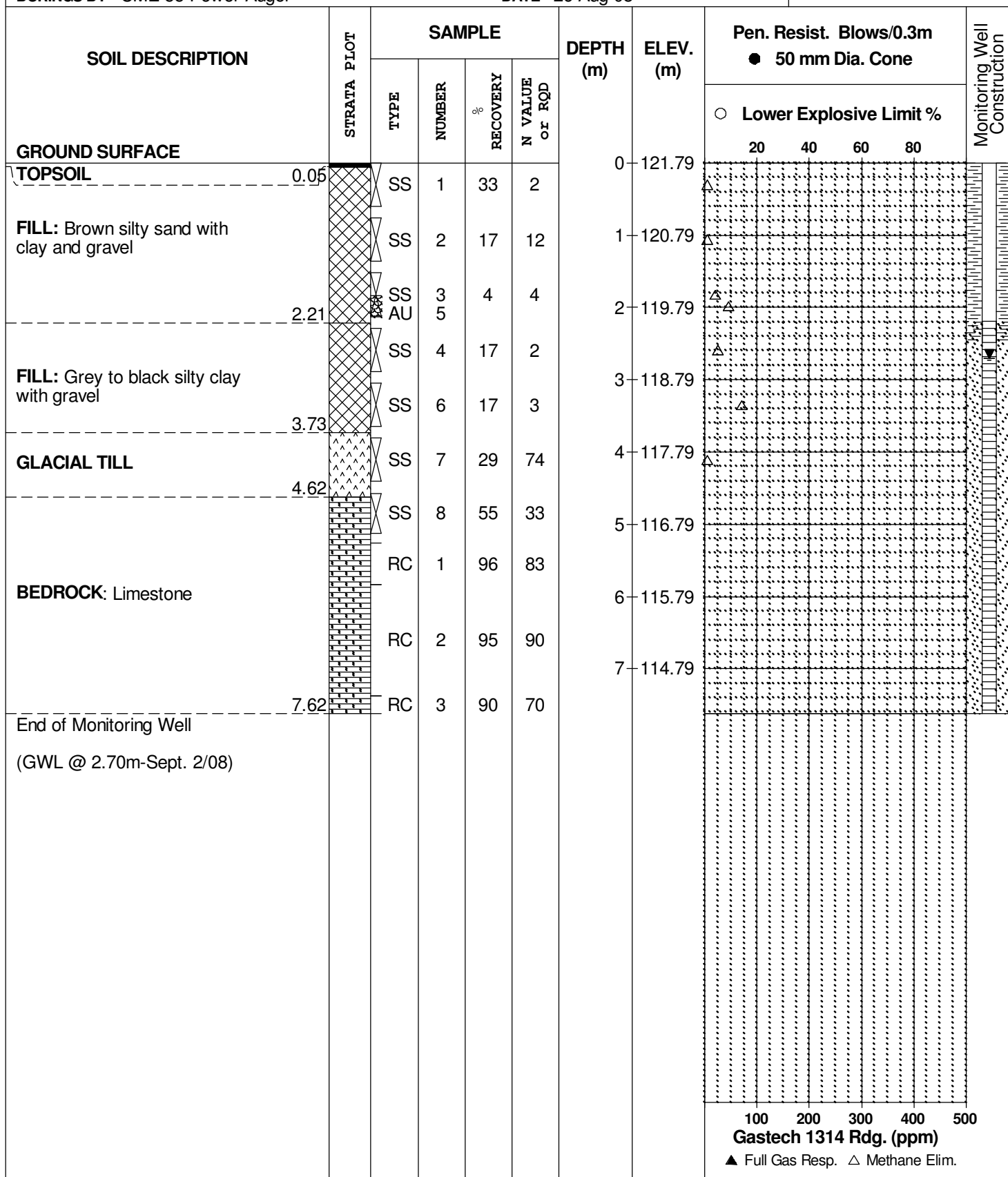
REMARKS

BORINGS BY CME 55 Power Auger

DATE 26 Aug 08

FILE NO. **PE1114**

HOLE NO. **MW 3-08**



100 200 300 400 500  
Gastech 1314 Rdg. (ppm)  
▲ Full Gas Resp. △ Methane Elim.

## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
Appleton, Ontario

**DATUM** Ground surface elevations interpolated from topo plan prepared by G.A. Smith  
Surveying Limited and, as such, are approximate only.

**REMARKS**

**FILE NO.**  
**PH2723**

**HOLE NO.**  
**TH 1**

**BORINGS BY** Hand Auger

**DATE** August 28, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	126.0						
FILL: Dark brown silty sand with gravel		G	1			1	125.0						
End of Test Hole							1.55						

20 40 60 80 100  
**Shear Strength (kPa)**  
▲ Undisturbed    △ Remoulded



## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
Appleton, Ontario

**DATUM** Ground surface elevations interpolated from topo plan prepared by G.A. Smith  
Surveying Limited and, as such, are approximate only.


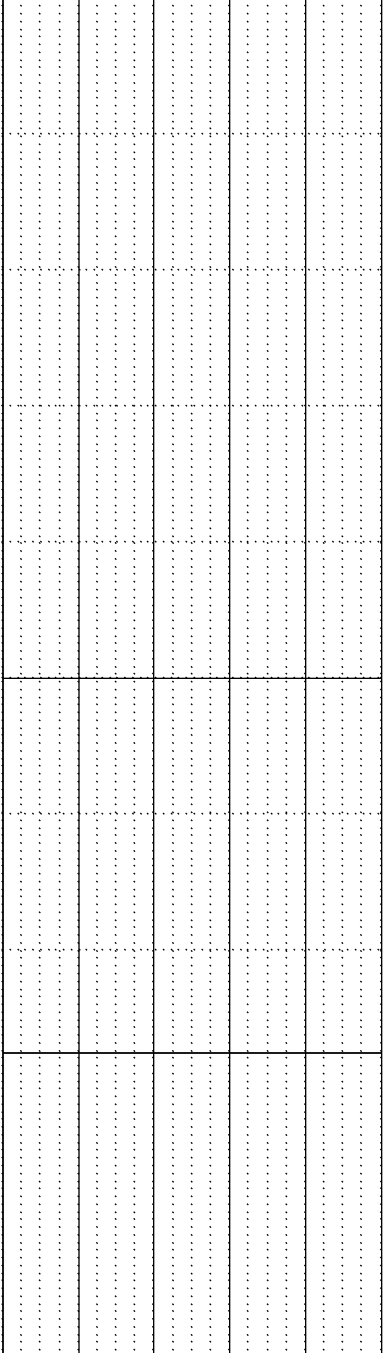
**REMARKS**

**FILE NO.**  
**PH2723**

**HOLE NO.**  
**TH 2**

**BORINGS BY** Hand Auger

**DATE** August 28, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %				
GROUND SURFACE						0	128.3	20	40	60	80	
<b>FILL:</b> Dark brown silty sand with gravel          End of Test Hole		G	1			1	127.3					Piezometer Construction
								<b>Shear Strength (kPa)</b> ▲ Undisturbed    △ Remoulded				

1.55

End of Test Hole

20 40 60 80 100  
**Shear Strength (kPa)**  
▲ Undisturbed    △ Remoulded

## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
Appleton, Ontario

**DATUM** Ground surface elevations interpolated from topo plan prepared by G.A. Smith  
Surveying Limited and, as such, are approximate only.


**REMARKS**

**FILE NO.**  
**PH2723**

**HOLE NO.**  
**TH 3**

**BORINGS BY** Hand Auger

**DATE** August 28, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction						
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %										
GROUND SURFACE						0	126.0	20	40	60	80							
<b>FILL:</b> Dark brown silty sand with gravel          End of Test Hole		G	1			0	126.0											
						1	125.0											

1.55

20 40 60 80 100  
**Shear Strength (kPa)**  
▲ Undisturbed    △ Remoulded

## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
Appleton, Ontario

**DATUM** Ground surface elevations interpolated from topo plan prepared by G.A. Smith Surveying Limited and, as such, are approximate only.

**REMARKS**

**FILE NO.**  
PH2723

**HOLE NO.**  
TH 4

**BORINGS BY** Hand Auger

**DATE** August 28, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
<b>GROUND SURFACE</b>					0	127.9						
<b>TOPSOIL</b>	0.05											
<b>FILL:</b> Dark brown silty sand with some gravel and cobbles to sand-gravel, trace silt and clay		G	1									
	1.13				1	126.9						
End of Test Pit												
Practical refusal to augering on inferred bedrock surface at 1.13m depth												
								20	40	60	80	100
								<b>Shear Strength (kPa)</b>				
								▲ Undisturbed    △ Remoulded				

## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
Appleton, Ontario

**DATUM** Ground surface elevations interpolated from topo plan prepared by G.A. Smith Surveying Limited and, as such, are approximate only.


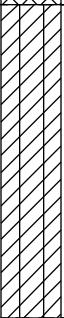
**REMARKS**

**FILE NO.**  
**PH2723**

**HOLE NO.**  
**TH 5**

**BORINGS BY** Hand Auger

**DATE** August 28, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
FILL: Light brown silty sand		G	1			0	127.9					
Very stiff, brown <b>SILTY CLAY</b> , trace gravel		G	2			1	126.9					
End of Test Hole												
Practical refusal to augering on inferred bedrock surface at 1.05m depth												

20 40 60 80 100  
**Shear Strength (kPa)**  
▲ Undisturbed    △ Remoulded

## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
Appleton, Ontario

**DATUM** Ground surface elevations interpolated from topo plan prepared by G.A. Smith Surveying Limited and, as such, are approximate only.

**REMARKS**

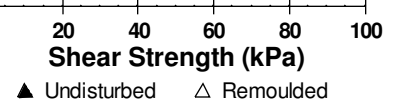
**FILE NO.**  
PH2723

**HOLE NO.**  
TH 6

**BORINGS BY** Hand Auger

**DATE** August 28, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %					
GROUND SURFACE								20	40	60	80		
TOPSOIL	0.06				0	128.6							
FILL: Brown silty sand with clay	0.35												
End of Test Hole Practical refusal to augering on inferred bedrock surface at 0.35m depth													



## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
Appleton, Ontario

**DATUM** Ground surface elevations interpolated from topo plan prepared by G.A. Smith Surveying Limited and, as such, are approximate only.

**REMARKS**

**BORINGS BY** Hand Auger

**DATE** August 28, 2015

**FILE NO.**  
PH2723

**HOLE NO.**  
TH 7

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %					
GROUND SURFACE								20	40	60	80		
TOPSOIL	0.04				0	123.9							
FILL: Brown silty sand with clay													
End of Test Hole	0.65												
Practical refusal to augering on inferred bedrock surface at 0.65m depth													
								20	40	60	80	100	
								<b>Shear Strength (kPa)</b>					
								▲ Undisturbed    △ Remoulded					

## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
Appleton, Ontario

**DATUM** Ground surface elevations interpolated from topo plan prepared by G.A. Smith Surveying Limited and, as such, are approximate only.

**REMARKS**

**FILE NO.**  
PH2723

**HOLE NO.**  
TH 8

**BORINGS BY** Hand Auger

**DATE** August 28, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	124.7						
TOPSOIL	0.04												
FILL: Brown silty sand with clay													
End of Test Hole	0.91												
Practical refusal to augering on inferred bedrock surface at 0.91m depth													

20 40 60 80 100  
**Shear Strength (kPa)**  
▲ Undisturbed    △ Remoulded

## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
Appleton, Ontario

**DATUM** Ground surface elevations interpolated from topo plan prepared by G.A. Smith Surveying Limited and, as such, are approximate only.

**REMARKS**

**FILE NO.**  
PH2723

**HOLE NO.**  
TH 9

**BORINGS BY** Hand Auger

**DATE** September 9, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	124.5						
TOPSOIL	0.03												
SILTY SAND with clay	0.34	G	1										
End of Test Hole Practical refusal to augering on inferred bedrock surface at 0.34m depth													

20 40 60 80 100  
**Shear Strength (kPa)**  
▲ Undisturbed    △ Remoulded



## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
Appleton, Ontario

**DATUM** Ground surface elevations interpolated from topo plan prepared by G.A. Smith Surveying Limited and, as such, are approximate only.

**REMARKS**

**FILE NO.**  
**PH2723**

**HOLE NO.**  
**TH10**

**BORINGS BY** Hand Auger

**DATE** September 9, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
SILTY SAND		G	1		0	123.7						
End of Test Hole  Practical refusal to augering on inferred bedrock surface at 0.22m depth	0.22											
								20	40	60	80	100
								<b>Shear Strength (kPa)</b>				
								▲ Undisturbed    △ Remoulded				

## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
Appleton, Ontario

**DATUM** Ground surface elevations interpolated from topo plan prepared by G.A. Smith  
Surveying Limited and, as such, are approximate only.

**REMARKS**

**FILE NO.**  
**PH2723**

**HOLE NO.**  
**TH11**

**BORINGS BY** Hand Auger

**DATE** September 9, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %					
GROUND SURFACE								20	40	60	80		
TOPSOIL	0.02				0	124.6							
SILTY SAND, some clay	0.18												
End of Test Hole													
Practical refusal to augering on inferred bedrock surface at 0.18m depth													

20 40 60 80 100  
**Shear Strength (kPa)**  
▲ Undisturbed    △ Remoulded

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. PH2723

HOLE NO. TP1

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
<b>FILL:</b> Brown sand, silt, clay, rock and burnt wood debris. Slightly moist. 0.70	X	G	1			0	126.25					
<b>FILL:</b> Brown sand, silt and broken stone. Dry. 1.10	X	G	2			1	125.25					
<b>FILL:</b> Gravel, old wires, black plastic pieces. Drainage tile (pea stone) at 1.3m depth. 1.30	X											
<b>FILL:</b> Brown sand, silt and fabric debris 1.60	X	G	3									
End of Test Pit  Refusal on bedrock at 1.60 m depth												

20 40 60 80 100  
**Shear Strength (kPa)**  
 ▲ Undisturbed    △ Remoulded

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP2**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
<b>FILL:</b> Brown silt, sand and clay with gravel. Slightly moist.	0.20	G	4			0	128.17					
<b>FILL:</b> Light brown silt, sand, some gravel. Slightly moist.	0.40	G	5									
<b>FILL:</b> Black sand and silt, trace clay and charcoal. Slightly moist.	0.70	G	6									
<b>FILL:</b> Light brown coarse sand, silt, gravel. Moist.	1.70	G	8			1	127.17					
		G	7									
End of Test Pit												
Refusal on bedrock at 1.70 m depth												

20 40 60 80 100  
Shear Strength (kPa)  
▲ Undisturbed    △ Remoulded

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP3**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			20	40	60	80		
<b>GROUND SURFACE</b>						0	128.60						
<b>FILL:</b> Dark brown sand, silt, clay topsoil. Moist	0.10												
<b>FILL:</b> Light brown sand, silt, clay and gravel. Slightly moist.		G	8			1	127.60						
End of Test Pit	1.83												
Refusal on bedrock at 1.83 m depth													

20 40 60 80 100  
**Shear Strength (kPa)**  
▲ Undisturbed    △ Remoulded

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP4**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			20	40	60	80		
<b>GROUND SURFACE</b>						0	127.95						
<b>FILL:</b> Brown sandy silt, trace clay topsoil. Slightly moist.	0.09												
<b>FILL:</b> Light brown sand, silt, clay, gravel with debris (wood and plastic). Slightly moist.		G	9			1	126.95						
End of Test Pit Refusal on bedrock at 1.92 m depth	1.92												

○ Water Content %

20 40 60 80 100  
**Shear Strength (kPa)**  
▲ Undisturbed    △ Remoulded

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP5**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			20	40	60	80		
<b>GROUND SURFACE</b>						0	128.78						
<b>FILL:</b> Brown sandy silt with roots topsoil. Moist.	0.11												
<b>FILL:</b> Light brown fine sand, silt, some clay and gravel. Slight moist.		G	10										
	1.17					1	127.78						
End of Test Pit Refusal on bedrock at 1.17 m depth													

○ Water Content %

20 40 60 80 100  
Shear Strength (kPa)

▲ Undisturbed    △ Remoulded





DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP7**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %					
GROUND SURFACE								20	40	60	80		
FILL: Brown sandy silt topsoil. Dry.						0	128.42						
0.38													
FILL: Light brown sandy silt, trace clay, debris. Dry.		G	12			1	127.42						
1.17													
End of Test Pit Refusal on bedrock at 1.17 m depth													

20 40 60 80 100  
Shear Strength (kPa)  
▲ Undisturbed    △ Remoulded

## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
Appleton, Ontario

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP8**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0							
FILL: Brown to light brown sandy silt. Dry.		G	13			1							
						1.76							
End of Test Pit													

20 40 60 80 100  
Shear Strength (kPa)  
▲ Undisturbed    △ Remoulded

## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
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DATUM Geodetic

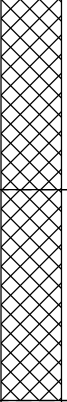
REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP9**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
<b>FILL:</b> Brown sandy silt topsoil. Slightly moist. ----- 0.56		G	14		0	128.31						
<b>FILL:</b> Light brown to grey sandy silt, gravel and wood debris. Slightly moist. ----- 1.18 End of Test Pit Refusal on bedrock at 1.18 m depth												

20 40 60 80 100  
**Shear Strength (kPa)**  
 ▲ Undisturbed    △ Remoulded

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. PH2723

HOLE NO. TP10

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
<p><b>FILL:</b> Brown topsoil. Slightly moist.</p> <p>0.31</p>	X				0	127.85						
<p><b>FILL:</b> Brown sandy silt, some clay. Slightly moist.</p> <p>0.55</p>	X	G	15									
<p>End of Test Pit</p> <p>Refusal on bedrock at 0.55 m depth</p>												

20 40 60 80 100  
**Shear Strength (kPa)**  
 ▲ Undisturbed    △ Remoulded

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP11**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	127.55						
FILL: Dark brown sandy topsoil. Dry.													
FILL: Brown sandy silt, clay and gravel. Dry.		G	16										
End of Test Pit													
Refusal on bedrock at 0.49 m depth													

20 40 60 80 100  
Shear Strength (kPa)  
▲ Undisturbed    △ Remoulded

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP12**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	127.85						
FILL: Dark brown sandy silt topsoil. Slightly moist.													
FILL: Light brown fine sand, silt, trace clay. Dry.		G	17										
End of Test Pit Refusal on bedrock at 0.88 m depth													

○ Water Content %

20 40 60 80 100  
Shear Strength (kPa)  
▲ Undisturbed    △ Remoulded

DATUM Geodetic


REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP13**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
<b>FILL:</b> Brown mixture of sand, silt, clay and gravel. Dry.  End of Test Pit Refusal on bedrock at 1.27 m depth		G	18		0	128.03						
					1	127.03						
								20	40	60	80	
								20	40	60	80	100

**Shear Strength (kPa)**  
 ▲ Undisturbed    △ Remoulded

## SOIL PROFILE AND TEST DATA

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REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. PH2723

HOLE NO. TP14

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			20	40	60	80		
<b>GROUND SURFACE</b>						0	126.89						
<b>FILL:</b> Brown sandy silt, gravel. Slightly moist.	0.28	G	19										
End of Test Pit													
Refusal on bedrock at 0.28 m depth													

20 40 60 80 100  
**Shear Strength (kPa)**  
▲ Undisturbed    △ Remoulded



DATUM Geodetic



REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP15**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
<b>FILL:</b> Brown sandy silt, clay, boulders, concrete, asphalt, plastic and steel debris. Slightly moist.		G	20			0	121.62					
						1	120.62					
<b>FILL:</b> Grey/black clay, sand, gravel and organics. Very moist.		G	21			2	119.62					
						3	118.62					
End of Test Pit Test pit terminated due to maximum reach of backhoe.												

20 40 60 80 100  
**Shear Strength (kPa)**  
 ▲ Undisturbed    △ Remoulded

DATUM Geodetic




REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP16**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
<b>FILL:</b> Brown sandy silt, clay and cobbles/boulders. Moist.		G	24			0	121.06					
						1	120.06					
<b>FILL:</b> Grey clay, sand		G	22			2	119.06					
Black organics, cat tails. Very wet.		G	23			3	118.06					
End of Test Pit Test pit terminated due to maximum reach of backhoe. (GWL @ 1.57 m depth)												

20 40 60 80 100  
**Shear Strength (kPa)**  
 ▲ Undisturbed    △ Remoulded

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP17**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
<b>FILL:</b> Brown sandy silt topsoil. Slightly moist. 0.13	X					0	120.63					
<b>FILL:</b> Brown to dark brown sandy silt, clay, gravel, brick, plastic and concrete debris. Moist. 1.92	X	G	27			1	119.63					
<b>FILL:</b> Grey clay, sand. Very wet. 2.34	X	G	26			2	118.63					
End of Test Pit  Test pit terminated due to inflow of groundwater. (GWL @ 1.78 m depth)												

20 40 60 80 100  
**Shear Strength (kPa)**  
 ▲ Undisturbed    △ Remoulded

DATUM Geodetic



REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP18**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
<b>FILL:</b> Brown silty sand, some clay, gravel. Dry		G	29			0	121.74					
						1	120.74					
<b>FILL:</b> Black to grey clay, sand, fabric, garbage bag. Slightly wet.		G	28			2	119.74					
						3	118.74					
End of Test Pit Test pit terminated due to maximum reach of backhoe.												

20 40 60 80 100  
**Shear Strength (kPa)**  
 ▲ Undisturbed    △ Remoulded

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP19**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
GROUND SURFACE								20	40	60	80		
<b>FILL:</b> Brown sandy silt topsoil. Slightly moist.	0.13					0	120.63						
<b>FILL:</b> Brown to dark brown sandy silt, clay, gravel, brick, plastic and concrete debris. Moist.						1	119.63						
<b>FILL:</b> Grey clay, sand. Very wet.	1.92					2	118.63						
End of Test Pit  Test pit terminated due to inflow of groundwater. (GWL @ 1.78 m depth)	2.34												

20 40 60 80 100  
**Shear Strength (kPa)**  
 ▲ Undisturbed    △ Remoulded

## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
 Old Mill Lane  
 Appleton, Ontario

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. PH2723

HOLE NO. TP20

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
<b>GROUND SURFACE</b>						0	127.07					
<b>FILL:</b> Dark brown sandy silt. Slightly moist.												
0.44												
<b>FILL:</b> Light brown sand, silt, clay, gravel, wood debris. Slightly moist.		G	30									
0.68												
End of Test Pit												
Refusal on bedrock at 0.68 m depth												

20 40 60 80 100  
**Shear Strength (kPa)**  
 ▲ Undisturbed    △ Remoulded

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP21**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			20	40	60	80	
GROUND SURFACE						0						
<b>FILL:</b> Brown sand, silt, clay, stone, wood and fabric debris		G	31			1						
						1.88						
End of Test Pit												

20 40 60 80 100  
**Shear Strength (kPa)**  
 ▲ Undisturbed    △ Remoulded





## SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision  
Old Mill Lane  
Appleton, Ontario

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP23**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
GROUND SURFACE								20	40	60	80		
					0	123.42							
<b>FILL:</b> Dark brown sandy silt. Dry.													
	0.53												
<b>FILL:</b> Light brown sandy silt, some clay, gravel. Dry.		G	35		1	122.42							
	1.74												
<b>FILL:</b> Brown clay, some sand, silt and gravel		G	36		2	121.42							
	2.17												
End of Test Pit													
Refusal on bedrock at 2.17 m depth													
								20	40	60	80	100	
								<b>Shear Strength (kPa)</b>					
								▲ Undisturbed    △ Remoulded					

DATUM Geodetic

REMARKS

BORINGS BY Backhoe

DATE August 18, 2016

FILE NO. **PH2723**

HOLE NO. **TP24**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
<b>FILL:</b> Dark brown sandy silt, some clay. Slightly moist.	0.25	G	39			0	123.16					
<b>FILL:</b> Light brown sandy silt, some clay and gravel. Dry.	1.67	G	38			1	122.16					
<b>FILL:</b> Dark grey clay with sand and boulders. Wet.	2.23	G	37			2	121.16					
End of Test Pit Refusal on large boulders at 2.23 m depth.												

20 40 60 80 100  
**Shear Strength (kPa)**  
▲ Undisturbed    △ Remoulded

DATUM

REMARKS

BORINGS BY CME 55 Power Auger

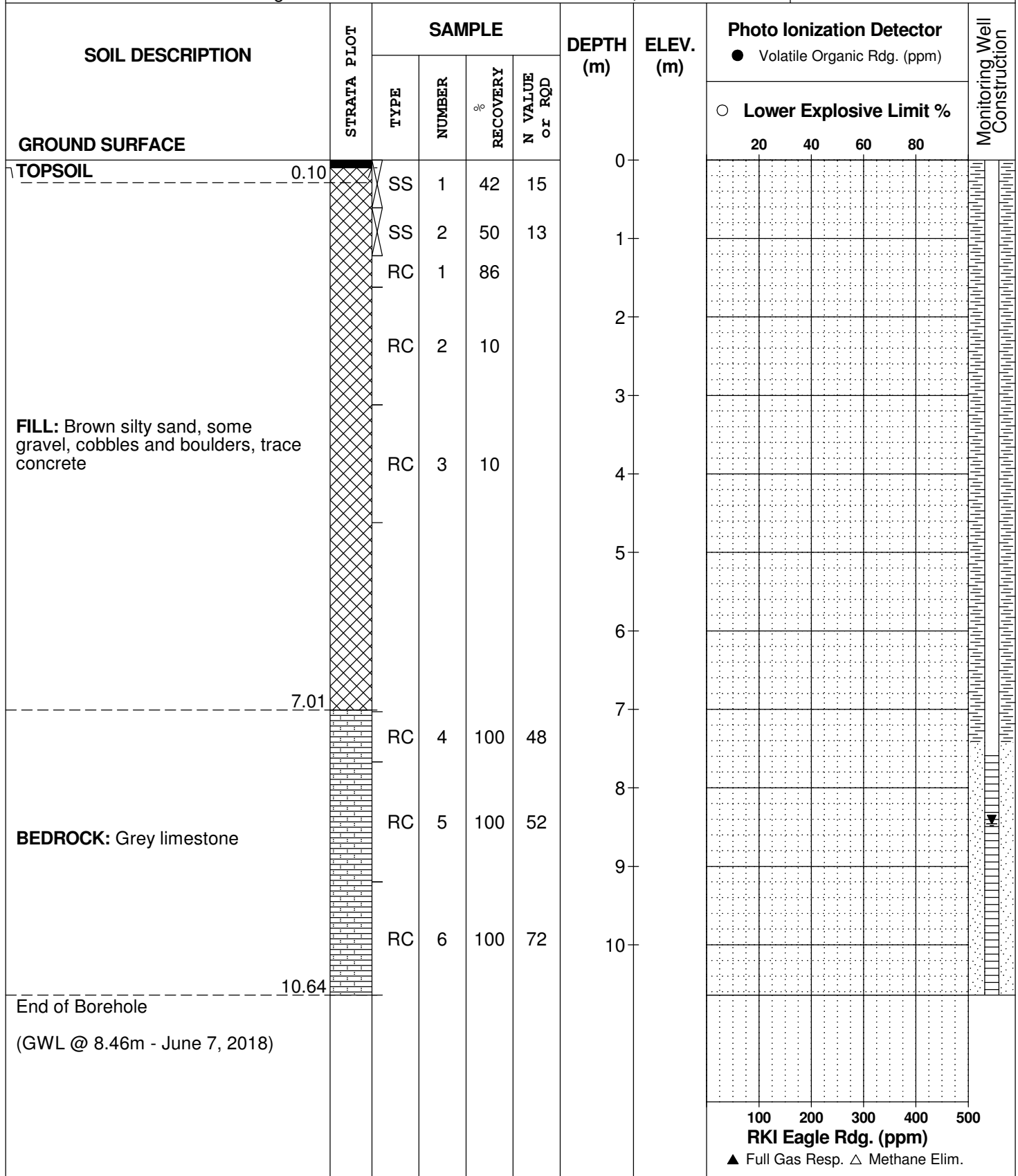
DATE March 16, 2018

FILE NO.

**PE1114**

HOLE NO.

**BH 1-18**



DATUM



REMARKS

BORINGS BY CME 55 Power Auger

DATE March 16, 2018

FILE NO. **PE1114**

HOLE NO. **BH 2-18**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE						0		20	40	60	80	
FILL: Topsoil with organics, trace gravel, cobbles and boulders		RC	1	100	52	1						
		RC	2	100	94	2						
BEDROCK: Grey limestone		RC	3	100	68	3						
		RC	4	100	93	5						
		RC	5	100	92	6						
End of Borehole (GWL @ 3.35m - June 7, 2018)						7						

100 200 300 400 500  
RKI Eagle Rdg. (ppm)  
▲ Full Gas Resp. △ Methane Elim.

# SYMBOLS AND TERMS

## SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

Relative Density	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

## SYMBOLS AND TERMS (continued)

### SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their "sensitivity". The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

### ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called "mechanical breaks") are easily distinguishable from the normal in situ fractures.

<b>RQD %</b>	<b>ROCK QUALITY</b>
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

### SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

## SYMBOLS AND TERMS (continued)

### GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic limit, % (water content above which soil behaves plastically)
PI	-	Plasticity index, % (difference between LL and PL)
Dxx	-	Grain size which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D_{30})^2 / (D_{10} \times D_{60})$
Cu	-	Uniformity coefficient = $D_{60} / D_{10}$

Cc and Cu are used to assess the grading of sands and gravels:

Well-graded gravels have:  $1 < Cc < 3$  and  $Cu > 4$

Well-graded sands have:  $1 < Cc < 3$  and  $Cu > 6$

Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.

Cc and Cu are not applicable for the description of soils with more than 10% silt and clay (more than 10% finer than 0.075 mm or the #200 sieve)

### CONSOLIDATION TEST

$p'_o$	-	Present effective overburden pressure at sample depth
$p'_c$	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below $p'_c$ )
Cc	-	Compression index (in effect at pressures above $p'_c$ )
OC Ratio		Overconsolidation ratio = $p'_c / p'_o$
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

### PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.
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## SYMBOLS AND TERMS (continued)

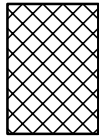
### STRATA PLOT



Topsoil



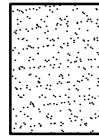
Asphalt



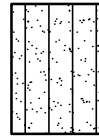
Fill



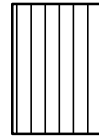
Peat



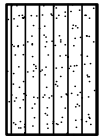
Sand



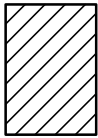
Silty Sand



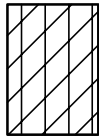
Silt



Sandy Silt



Clay



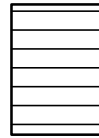
Silty Clay



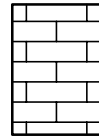
Clayey Silty Sand



Glacial Till



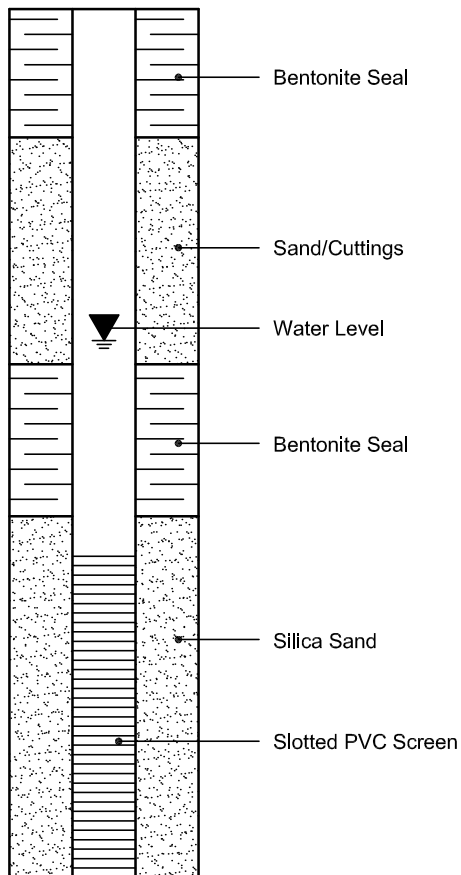
Shale



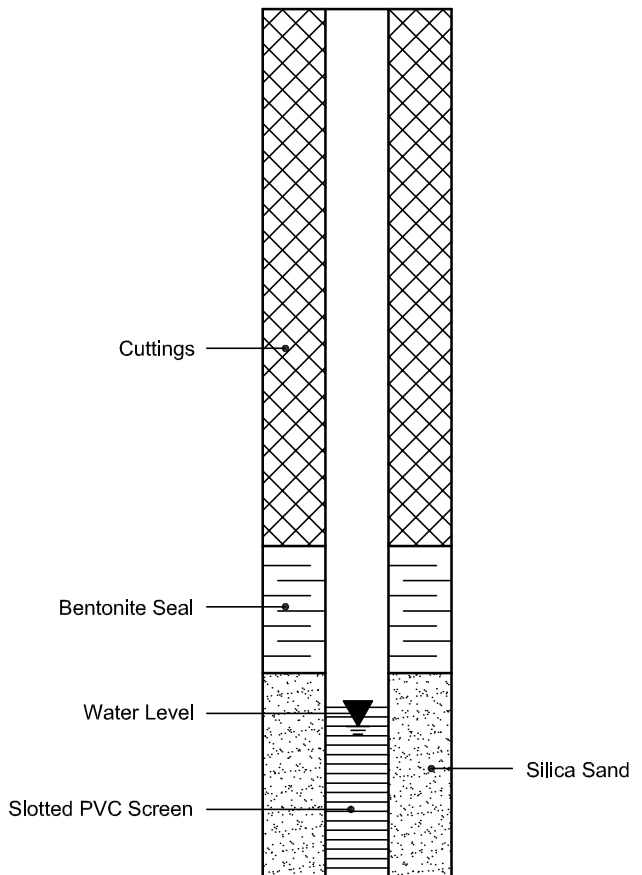
Bedrock

### MONITORING WELL AND PIEZOMETER CONSTRUCTION

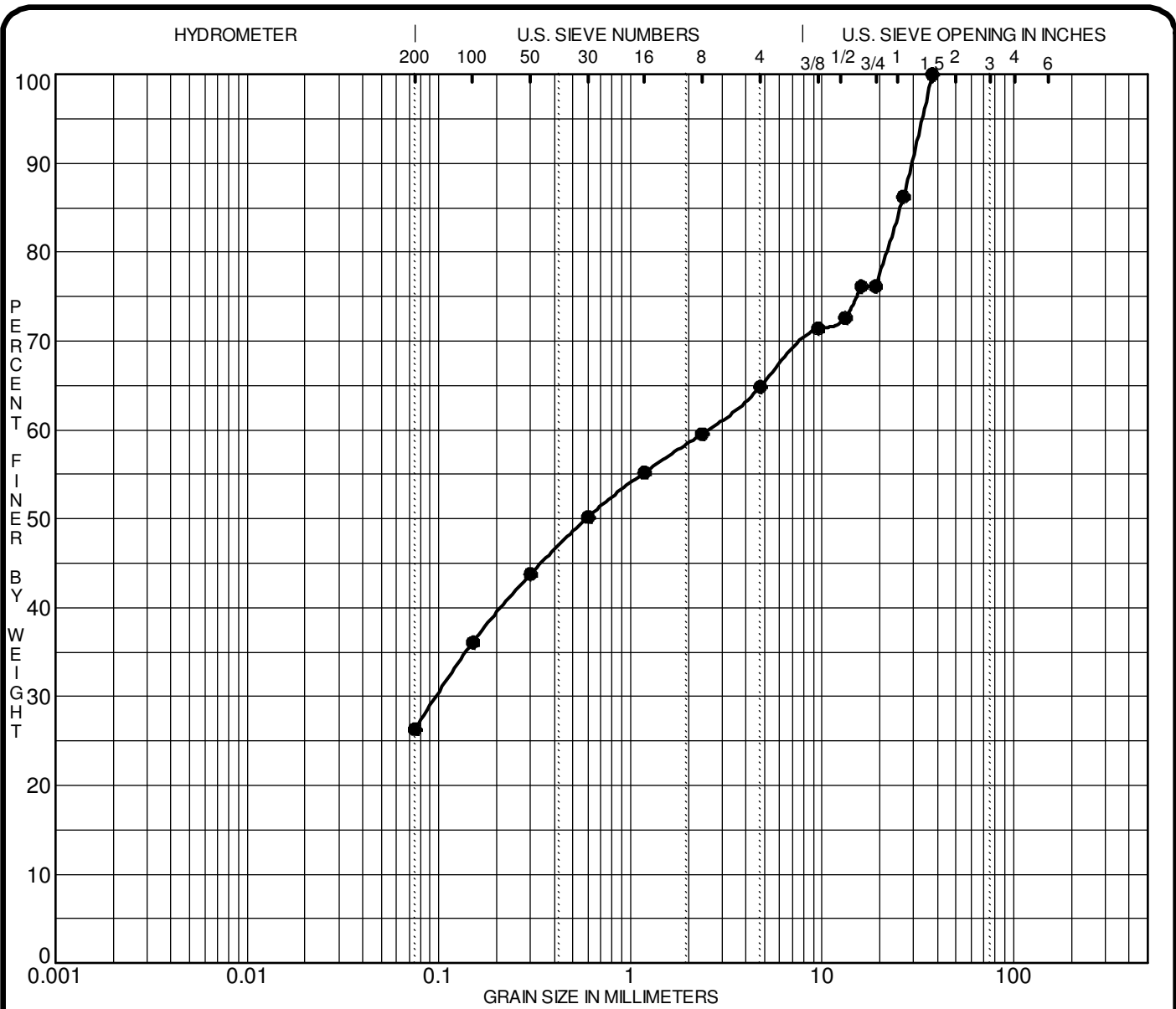
#### MONITORING WELL CONSTRUCTION



#### PIEZOMETER CONSTRUCTION







SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● TH 1 G 1	<b>FILL: Silty sand with gravel</b>						

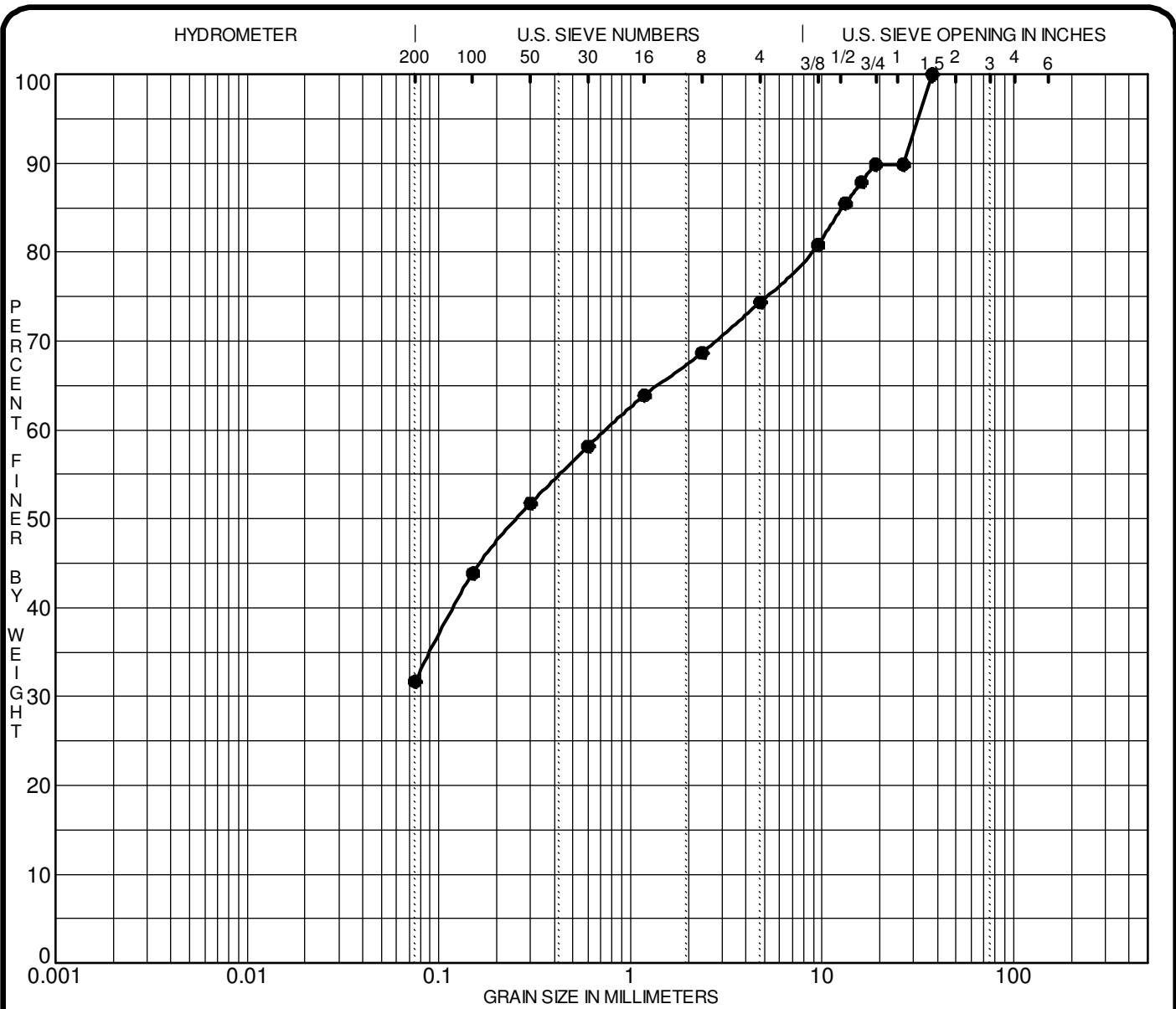
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TH 1 G 1	37.50	2.51	0.097		35.2	38.5	26.3	

CLIENT Carlgate Development Inc.  
 PROJECT Proposed Residential Subdivision - Old Mill Lane,  
Appleton, Ontario

FILE NO. PH2723  
 DATE 28 Aug 15

**patersongroup** Consulting Engineers  
 154 Colonnade Road South, Ottawa, Ontario K2E 7J5

**GRAIN SIZE DISTRIBUTION**



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● TH3 G 1	<b>FILL: Silty sand with gravel</b>						

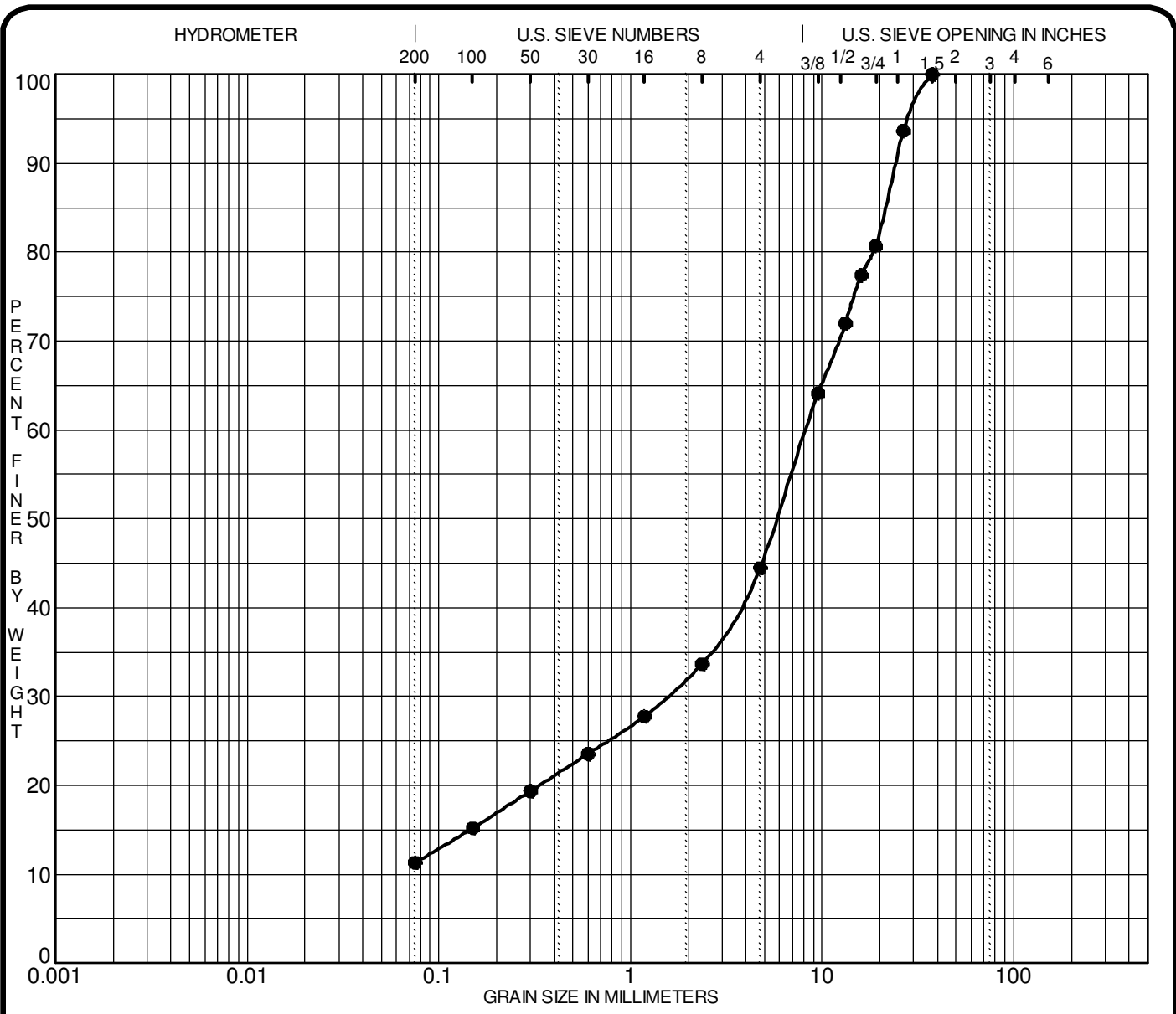
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TH3 G 1	37.50	0.75			25.6	42.7	31.7	

CLIENT Carlgate Development Inc.  
 PROJECT Proposed Residential Subdivision - Old Mill Lane,  
Appleton, Ontario

FILE NO. PH2723  
 DATE 28 Aug 15

**patersongroup** Consulting Engineers  
 154 Colonnade Road South, Ottawa, Ontario K2E 7J5

**GRAIN SIZE DISTRIBUTION**



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● TH 4 G 1	FILL: Sand-gravel, trace silt and clay					4.83	138.0

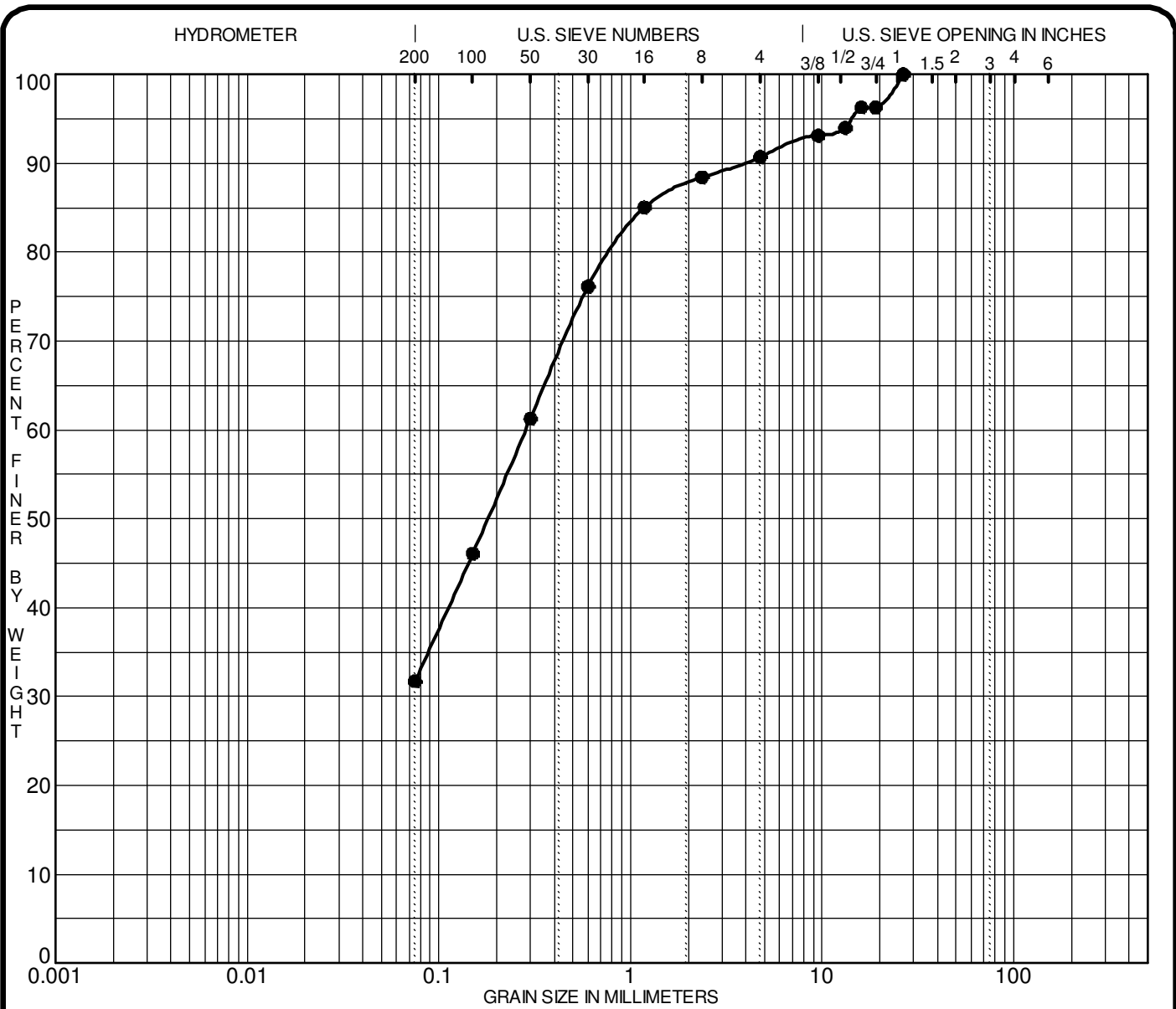
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TH 4 G 1	37.50	8.22	1.537		55.5	33.2	11.3	

CLIENT Carlgate Development Inc.  
 PROJECT Proposed Residential Subdivision - Old Mill Lane,  
Appleton, Ontario

FILE NO. PH2723  
 DATE 28 Aug 15

**patersongroup** Consulting Engineers  
 154 Colonnade Road South, Ottawa, Ontario K2E 7J5

**GRAIN SIZE DISTRIBUTION**



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● TH5 G 1	FILL: Silty sand						

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TH5 G 1	26.50	0.28			9.3	59.0	31.7	

CLIENT Carlgate Development Inc.  
 PROJECT Proposed Residential Subdivision - Old Mill Lane,  
Appleton, Ontario

FILE NO. PH2723  
 DATE 28 Aug 15

**patersongroup** Consulting Engineers  
 154 Colonnade Road South, Ottawa, Ontario K2E 7J5

**GRAIN SIZE DISTRIBUTION**

## Appendix 2

- **MECP Water Well Records for Test Wells TW 1 to TW 3**
- **MECP Water Well Records for Existing Neighbouring Wells**

TW 1



Ministry of the Environment

Tag#: A187038 Below A187038

Well Record

Regulation 903 Ontario Water Resources Act

Page of

Measurements recorded in: Metric Imperial

Well Owner's Information: First Name, Last Name / Organization (Carigate Development Inc.), E-mail Address, Well Constructed by Well Owner

Mailing Address (Street Number/Name): Box 44, Carleton Place, ON, Postal Code K7C 3P3, Telephone No. (inc. area code)

Well Location: Address of Well Location (Street Number/Name): #116 #122 Old Mill Lane, Township: Ramsay/Mississippi Mills, Lot: P/L 4, Concession: 10

County/District/Municipality: Lanark, City/Town/Village: Appleton, Province: Ontario, Postal Code

UTM Coordinates: Zone: Easting: Northing: Municipal Plan and Sublot Number: Plan 288, Other: Lot 7

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

Table with columns: General Colour, Most Common Material, Other Materials, General Description, Depth From, Depth To. Includes handwritten entries for Sand, Limestone, and Limestone.

\*RP27R 9884 Parts 1 to 4 / RP26R 5678 Parts 4, 9, 17, 18 + 28\*

TEST WELL #1 OF 3

Table for Annular Space: Depth Set at (m/D), Type of Sealant Used (Neat cement), Volume Placed (m³/D)

Results of Well Yield Testing: After test of well yield, water was: Clear and sand free, Not tested. Draw Down table with Time, Water Level, Recovery columns.

Method of Construction and Well Use: Cable Tool, Rotary, Diamond, etc. Public, Commercial, Domestic, etc.

Construction Record - Casing: Inside Diameter, Open Hole OR Material, Wall Thickness, Depth (m/ft). Status of Well: Water Supply, Replacement Well, etc.

Construction Record - Screen: Outside Diameter, Material, Slot No., Depth (m/ft). Status of Well: Abandoned, Insufficient Supply, etc.

Water Details: Water found at Depth, Kind of Water (Fresh, Untested, Gas, etc.). Hole Diameter: Depth (m/ft), Diameter (cm/in).

Well Contractor and Well Technician Information: Business Name of Well Contractor (Air Rock Drilling Co. Ltd.), Well Contractor's Licence No. (1119)

Business Address (Street Number/Name): 6550 Franktown Road, Richmond, ON, Postal Code: N0A 2Z0, Business E-mail Address: air-rock@sympatico.ca

Bus Telephone No. (inc. area code): 518882170, Name of Well Technician (Last Name, First Name): Hanna, Jeremy, Well Technician's Licence No.: T13632, Signature of Technician and/or Contractor, Date: 2015 06 30

Map of Well Location: Please provide a map below following instructions on the back. Includes handwritten map showing TW#1, TW#2, TW#3, Apple Street, and Old Mill Lane.

Comments: 1/2 HP. - 10 GPM SET @ 60 FT. TEST WELL #1 OF 3. Well owner's information package delivered: 2015 06 22, Date Work Completed: 2015 06 22, Ministry Use Only: Audit No. 2191501

# CERTIFICATE OF WELL COMPLIANCE

AIR ROCK DRILLING CO. LTD. DO HEREBY CERTIFY that I am  
licensed to drill wells in the Province of Ontario, and that I have supervised the drilling of  
a well on the property of (Name of Landowner)

CARLGATE DEVELOPMENT INC.

#116 - #122 OLD MILL LANE, APPLETON  
(Legal Description, Lot, Conc, Plan No.) in the Geographical Township of MISSISSIPPI MILLS  
in the County of LANARK (RAMSAY)

PIL #4 CON 10 PLAN 288 LOT 7  
CERTIFY FURTHER that, I am aware of the well drilling requirements, the guidelines,  
recommendations and regulations of the Ministry of the Environment governing well  
installations in the Province of Ontario, and the standards specified in any subdivision  
agreement and hydrogeological report applicable to this site and City Standards.

\*RP2TR988 4 Parts 1-04 / RP26R2678 Parts 4, 9, 17, 18 & 28 \*  
AND DO HEREBY CERTIFY THAT the said well has been drilled, cased, grouted  
(cement or bentonite) as applicable and constructed in strict conformity with the  
standards required.

Signed this 22<sup>ND</sup> day of JUNE, 2015

Kenny Desaulniers  
(Well Driller/Company) Air Rock Drilling Co. Ltd.  
Kenny Desaulniers

The Engineer on behalf of the landowner set out above Certifies that he/she has inspected  
the well and it was constructed in accordance with the specifications in O.Reg 903, this  
report and the Hydrogeological Report with regards to casing length and grouting  
requirements.

Signed this \_\_\_\_\_ day of \_\_\_\_\_,

\_\_\_\_\_  
(Engineer)

Please fax - 613-838-3277

TEST WELL # 1 OF 3  
TAG # A187038  
2015232



Ministry of the Environment

Tag#: A187039  
A187039

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in:  Metric  Imperial

Page \_\_\_ of \_\_\_

Well Owner's Information

First Name: \_\_\_\_\_ Last Name / Organization: **Cargate Development Inc.** E-mail Address: \_\_\_\_\_  Well Constructed by Well Owner

Mailing Address (Street Number/Name): **Box 44** Municipality: **Carleton Place** Province: **ON** Postal Code: **K7C 3P3** Telephone No. (inc. area code): \_\_\_\_\_

Well Location

Address of Well Location (Street Number/Name): **#116-122 Old Mill Lane** Township: **Ramsay/Mississippi Mills** Lot: **P/L 4** Concession: **10**

County/District/Municipality: **Lanark** City/Town/Village: **Appleton** Province: **Ontario** Postal Code: \_\_\_\_\_

UTM Coordinates: Zone: **18** Easting: **411380** Northing: **5009798** Municipal Plan and Sublot Number: **Plan 288** Other: **Lot 7**

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
	Sand	Stones		0' to 3'
Grey & Brown	Limestone			3' to 80'
Grey & Brown	Limestone			80' to 64'
Grey & Brown	Limestone			64' to 70'

**\*RP27R9884 parts 1 to 4 / RP26 R2678 parts 4, 9, 17, 18 + 28 \***  
**TEST WELL #2 OF 3**

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m <sup>3</sup> /ft <sup>3</sup> )
From 20' To 0'	Neat cement	10.0

Results of Well Yield Testing

Time (min)	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
1	29.0	29.0	30.5	30.5
2	30	29.0	30	29.0
3	30	30	30	29.0
4	30	30	30	29.0
5	30	30	30	29.0
10	30	30	30	29.0
15	30	30	30	29.0
20	30	30	30	29.0
25	30	30	30	29.0
30	30	30	30	29.0
40	30	30	30	29.0
50	30	30	30	29.0
60	30	30	30	29.0

After test of well yield, water was:  Clear and sand free **Not tested**  
 Other, specify \_\_\_\_\_

If pumping discontinued, give reason: **X**

Pump intake set at (m/ft): **60**

Pumping rate (l/min / GPM): **20**

Duration of pumping: **1** hrs **0** min

Final water level end of pumping (m/ft): **30.5**

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

Recommended pump depth (m/ft): **60**

Recommended pump rate (l/min / GPM): **20**

Well production (l/min / GPM): **20**

Disinfected?  Yes  No

Method of Construction

<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input checked="" type="checkbox"/> Domestic	<input type="checkbox"/> Municipal	<input type="checkbox"/> Dewatering
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input type="checkbox"/> Test Hole	<input type="checkbox"/> Monitoring
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning	
<input checked="" type="checkbox"/> Air percussion		<input type="checkbox"/> Industrial		
<input type="checkbox"/> Other, specify _____		<input type="checkbox"/> Other, specify _____		

Construction Record - Casing

Inside Diameter (cm/ft)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/ft)	Depth (m/ft)	
			From	To
64	Steel	1.88	2	20
6	Open Hole		20	70

Status of Well:

<input checked="" type="checkbox"/> Water Supply	<input type="checkbox"/> Replacement Well
<input type="checkbox"/> Test Hole	<input type="checkbox"/> Recharge Well
<input type="checkbox"/> Dewatering Well	<input type="checkbox"/> Observation and/or Monitoring Hole
<input type="checkbox"/> Alteration (Construction)	<input type="checkbox"/> Abandoned, Insufficient Supply
<input type="checkbox"/> Abandoned, Poor Water Quality	<input type="checkbox"/> Abandoned, other, specify _____
<input type="checkbox"/> Other, specify _____	

Construction Record - Screen

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

Water Details

Water found at Depth (m/ft)	Kind of Water:
80 (m/ft)	<input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____
64 (m/ft)	<input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____
	<input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____

Hole Diameter:

Depth (m/ft)	Diameter (cm/ft)
0' to 20'	9 3/4"
20' to 70'	6"

Well Contractor and Well Technician Information

Business Name of Well Contractor: **Air Rock Drilling Co. Ltd.** Well Contractor's Licence No.: **1719**

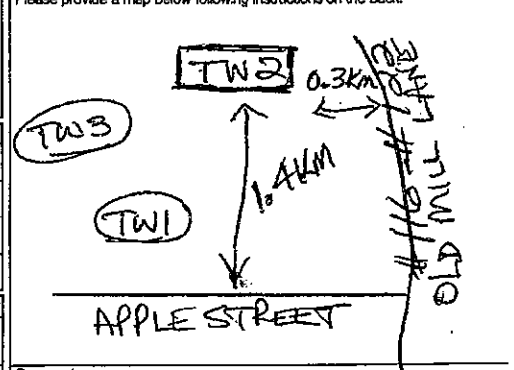
Business Address: **6050 Brantford Road, Brantford, ON** Municipality: **Brantford**

Province: **ON** Postal Code: **N0C 2Z0** Business E-mail Address: **air-rock@sympatico.ca**

Bus. Telephone No. (inc. area code): **8138882170** Name of Well Technician (Last Name, First Name): **Hshua, Jeremy**

Well Technician's Licence No.: **13632** Signature of Technician and/or Contractor: *[Signature]* Date: **2015/06/30**

Map of Well Location



Comments: **1/2 HP - 10 GPM SET @ 60 FT. TEST WELL # 2 OF 3**

Well owner's Information Package delivered	Date Package Delivered	Ministry Use Only
<input checked="" type="checkbox"/> Yes	2015 6 24	Audit No: <b>2191503</b>
<input type="checkbox"/> No	2015 6 23	Date Work Completed

Received



# CERTIFICATE OF WELL COMPLIANCE

AIR ROCK DRILLING CO. LTD. DO HEREBY CERTIFY that I am licensed to drill wells in the Province of Ontario, and that I have supervised the drilling of a well on the property of (Name of Landowner) \_\_\_\_\_

CARLGATE DEVELOPMENT INC.

#116 - #122 OLD MILL LANE, APPLETON  
(Legal Description, Lot, Conc. Plan No.) in the Geographical Township of MISSISSIPPI MILLS  
in the County of LANARK (RAMSAY)

PIL #4 CON 10 PLAN 288 LOT 7

CERTIFY FURTHER that, I am aware of the well drilling requirements, the guidelines, recommendations and regulations of the Ministry of the Environment governing well installations in the Province of Ontario, and the standards specified in any subdivision agreement and hydrogeological report applicable to this site and City Standards.

\*RP27R988 4 Parts 1 to 4 / RP26R2678 Parts 4, 9, 17, 18 & 28\*  
AND DO HEREBY CERTIFY THAT the said well has been drilled, cased, grouted (cement or bentonite) as applicable and constructed in strict conformity with the standards required.

Signed this 23<sup>RD</sup> day of JUNE, 2015

[Signature] Air Rock Drilling Co. Ltd.  
(Well Driller/Company) Kenny Desaulniers

The Engineer on behalf of the landowner set out above Certifies that he/she has inspected the well and it was constructed in accordance with the specifications in O.Reg 903, this report and the Hydrogeological Report with regards to casing length and grouting requirements.

Signed this \_\_\_\_\_ day of \_\_\_\_\_

\_\_\_\_\_  
(Engineer)

Please fax -- 613-838-3277

TEST WELL # 2 OF 3  
TAG # A 187039  
2015233



Ministry of the Environment

Tag#: A187040 (Below) A187040

Well Record Regulation 903 Ontario Water Resources Act

Measurements recorded in: Metric Imperial

Page of

Well Owner's Information

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

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

Well Location

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

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

UTM Coordinates Zone Easting Northing Municipal Plan and Sublot Number Other

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

Table with columns: General Colour, Most Common Material, Other Materials, General Description, Depth (m) From, To

\* R1278 9884 Ports 1 to 4 / R126 R2678 Ports 4, 9, 17, 18, 28 \* TEST WELL # 3 OF 3

Results of Well Yield Testing

Table with columns: Depth Set at (m) From, To, Annular Space, Type of Sealant Used, Volume Placed, After test of well yield, water was, Draw-Down, Recovery

Table with columns: Method of Construction, Well Use

Table with columns: Construction Record - Casing, Status of Well

Table with columns: Construction Record - Screen, Map of Well Location

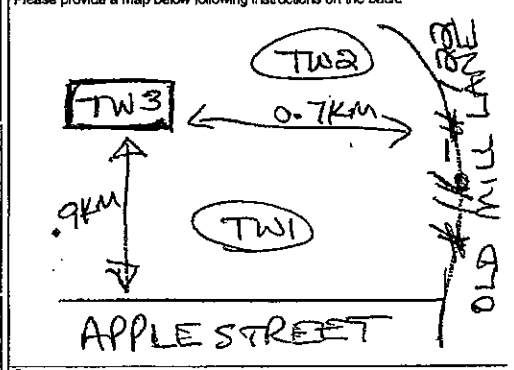


Table with columns: Water Details, Hole Diameter

Well Contractor and Well Technician Information

Province Postal Code Business E-mail Address

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

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

# CERTIFICATE OF WELL COMPLIANCE

AIR ROCK DRILLING CO. LTD. DO HEREBY CERTIFY that I am  
licensed to drill wells in the Province of Ontario, and that I have supervised the drilling of  
a well on the property of (Name of Landowner)

CARLGATE DEVELOPMENT INC.

#116 - #122 OLD MILL LANE, APPLETON  
(Legal Description, Lot, Conc. Plan No.) in the Geographical Township of MISSISSIPPI MILLS  
in the County of LANARK CRAMSAID

PIL # 4 CON 10 PLAN 288 LOT 7  
CERTIFY FURTHER that, I am aware of the well drilling requirements, the guidelines,  
recommendations and regulations of the Ministry of the Environment governing well  
installations in the Province of Ontario, and the standards specified in any subdivision  
agreement and hydrogeological report applicable to this site and City Standards.

\*RP27R9884 Parts 1-104 / RP26R2678 Parts 4, 9, 17, 18 & 28\*  
AND DO HEREBY CERTIFY THAT the said well has been drilled, cased, grouted  
(cement or bentonite) as applicable and constructed in strict conformity with the  
standards required.

Signed this 23RD day of JUNE, 2015

[Signature] Air Rock Drilling Co. Ltd.  
(Well Driller/Company) Kenny Desaulniers

The Engineer on behalf of the landowner set out above Certifies that he/she has inspected  
the well and it was constructed in accordance with the specifications in O.Reg 903, this  
report and the Hydrogeological Report with regards to casing length and grouting  
requirements.

Signed this \_\_\_\_\_ day of \_\_\_\_\_

\_\_\_\_\_  
(Engineer)

Please fax -- 613-838-3277

TEST WELL # 3 OF 3  
TAG # A187040  
2015234

# 317/1 ut

UTM 18 4 1 1 6 6 1 0  
5 R 5 0 0 2 9 7 5 N  
Elev. 5 R 0 4 2 5  
Basin 2 5



RECEIVED 35 No. 2099  
MAR - 8 53  
GEOLOGICAL BRANCH  
DEPARTMENT OF MINES

The Well Drillers Act  
Department of Mines, Province of Ontario

# Water Well Record

(Appleton)  
RAMSAY  
Village, Town or City  
Appleton Ont

Date Completed 9 April 53 Cost of Well (excluding pump)

## Pipe and Casing Record

## Pumping Test

Casing diameter(s) 6 1/4  
Length(s) of casing(s) 14 ft  
Type of screen  
Length of screen  
Distance from top of screen to ground level  
Is well a gravel-wall type?

Date April 9  
Static level over flowing  
Pumping level 1 1/2 feet about ground level  
Pumping rate 1200 gal per hr (20 gpm)  
Duration of test 30 min  
Distance from cylinder or bowls to ground level

## Water Record

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

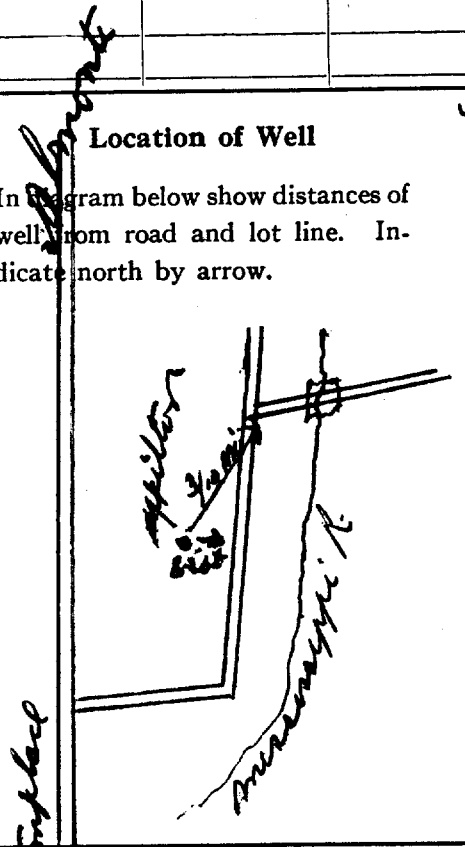
Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
43 ft		

## Well Log

Overburden and Bedrock Record	From	To
Soft brown limestone shale	0 ft.	10 ft.
hard brown limestone	10	43
very soft stibey limestone	43	44
hard sandstone	44	47

## Location of Well

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



Situation: Is well on upland, in valley or on hillside? upland  
Drilling Firm: W. K. Nugent  
Address: New hole road  
Name of Driller: James Washie  
Address: Lennox  
Date: April 9th  
Licence Number: 478  
Signature of Licensee: James Washie

317 1/2 east

UTM 18 4 1 1 6 5 0 E  
9 R 5 0 0 3 2 0 0 N  
Elev. 9 R 0 3 9 0  
Casing 2 5



35 No 2100

RECEIVED  
AUG 11 1952  
GEOLOGICAL BRANCH  
DEPARTMENT OF MINES

The Well Drillers Act  
Department of Mines, Province of Ontario

# Water Well Record

Country or Territorial District Lanark Township, Village, Town or City Ramsay  
Town or City Appleton  
Date Completed May 6 (day) 1952 (month) 52 (year) Cost of well (excluding pump) 301.50

### Pipe and Casing Record

### Pumping Test

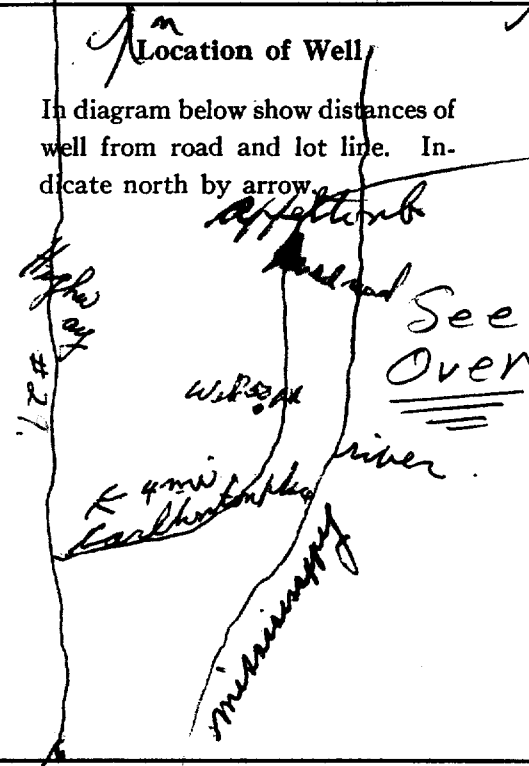
Casing diameter(s) 6 1/4 Date May 6  
Length(s) of casing(s) 6 ft. Static level 15 ft.  
Type of screen Pumping level 25 ft.  
Length of screen Pumping rate 900 gal per hr.  
Distance from top of screen to ground level Duration of test 30 min.  
Is well a gravel-wall type? Distance from cylinder or bowls to ground level

### Water Record

Kind (fresh or mineral)	Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
<u>Fresh</u>	<u>61 ft.</u>		<u>46 ft.</u>
Quality (hard, soft, contains iron, sulphur, etc.) <u>Not too hard</u>			
Appearance (clear, cloudy, coloured) <u>clear</u>			
For what purpose(s) is the water to be used? <u>house</u>			
How far is well from possible source of contamination?			
What is the source of contamination?			
Enclose a copy of any mineral analysis that has been made of water.			

### Well Log

Overburden and Bedrock Record	From	To
<u>Sandy loam</u>	<u>0 ft.</u>	<u>2 ft.</u>
<u>shale</u>	<u>2</u>	<u>5</u>
<u>brown sandstone</u>	<u>5</u>	<u>67</u>



Situation: Is well on upland, in valley, or on hillside? upland  
Drilling Firm W. V. Mudgett  
Address New town Ont  
Name of Driller James Crochie Address Lanark  
Date \_\_\_\_\_ Licence Number 473  
Carlton Place Signature of Licensee James Crochie

UTM 18 4 1 1 5 2 5 <sup>E</sup>  
 C 9 1 5 0 0 3 3 0 0 <sup>N</sup>  
 Elev 9 3 9 5  
 Basin 2 5



GROUND WATER BRANCH  
 35 14 1958 21  
 ONTARIO WATER RESOURCES COMMISSION

The Water-well Drillers Act, 1954  
 Department of Mines

# Water-Well Record

County or Territorial District Lanark Township, Village, Town or City Ramsay  
 in Village, Town or City  
 Address Appleton  
 (day) (month) (year)

## Pipe and Casing Record

## Pumping Test

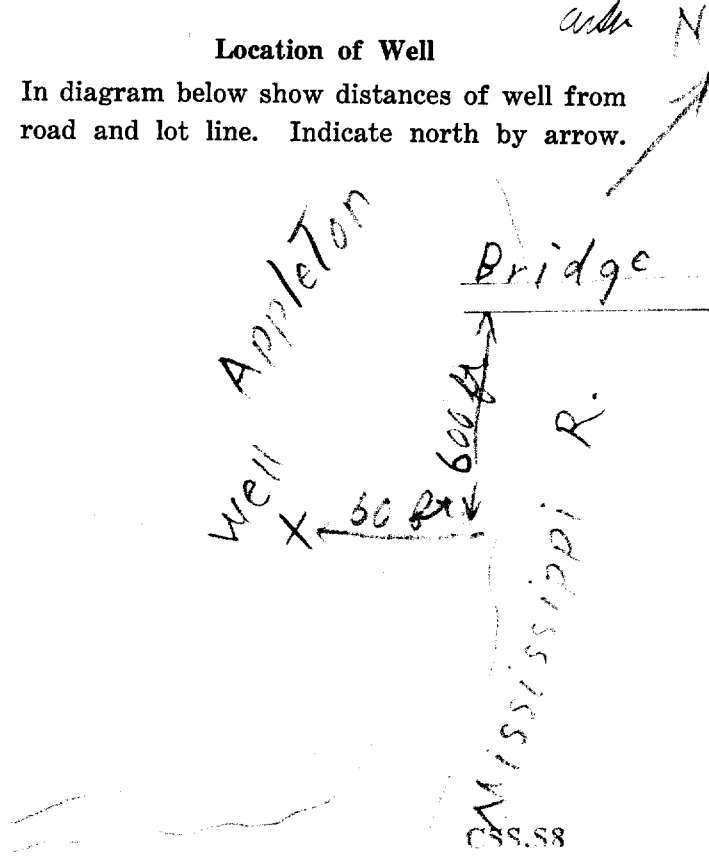
Casing diameter(s) 5" Static level 9  
 Length(s) 23' Pumping rate 750 galls per hr  
 Type of screen None Pumping level dry  
 Length of screen None Duration of test 1 hr

## Well Log

## Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth (s) at which water (s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
<u>sand loam</u>	<u>0</u>	<u>4'</u>	<u>46'</u>	<u>37'</u>	<u>fresh</u>
<u>shaly limestone</u>	<u>4'</u>	<u>20'</u>			
<u>hard limestone</u>	<u>10'</u>	<u>50'</u>			

For what purpose(s) is the water to be used?  
house  
 Is water clear or cloudy? Clear  
 Is well on upland, in valley, or on hillside?  
upland  
 Drilling firm W. J. Nugent  
 Address Lanark  
 Name of Driller Cecil Munro  
 Address Lanark  
 Licence Number 1677  
 I certify that the foregoing statements of fact are true.  
 Date 26 May Cecil Munro  
 Signature of Licensee



3171 cut

UTM 18 411500 E

9 R 5003400 N

Elev. 9 R 0407

Basin 25



ONTARIO

The Well Drillers Act

Department of Mines, Province of Ontario

35 No 2129  
**RECEIVED**  
DEC 21 1949  
GEOLOGICAL BRANCH  
DEPARTMENT OF MINES

# Water Well Record

Con. <sup>10</sup> Lot ..... Pt. Lot <sup>3</sup> .....  
Acres .....  
..... (not including pump) .....

## Pipe and Casing Record

## Pumping Test

Casing diameter(s) <u>4</u>	Date .....
Length(s) of casing(s) .....	Developed Capacity .....
Length of screen .....	Duration of Test .....
Type of screen .....	Pumping Rate .....
Type of pump .....	Drawdown .....
Capacity of pump .....	Static level of completed well .....
Depth of pump setting .....	Is well a gravel-wall type? .....

## Water Record

Kind (fresh or mineral) .....	Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
<u>fresh</u>			
Quality (hard, soft, contains iron, sulphur etc.) .....			
Appearance (clear, cloudy, coloured) <u>clear</u>	<u>12</u>		<u>37</u>
For what purpose(s) is the water to be used? <u>household</u>			
How far is well from possible source of contamination? .....			
What is source of contamination? .....			
Enclose a copy of any mineral analysis that has been made of water .....			

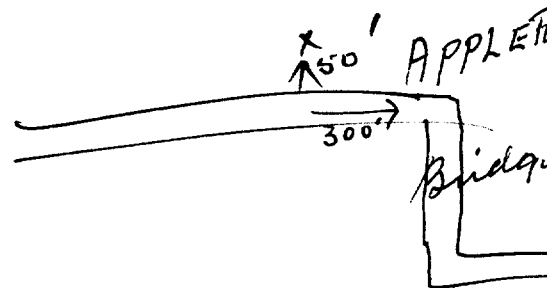
## Well Log

### Drift and Bedrock Record

From	To
0 ft.	.....ft.
<u>loam</u>	<u>6'</u>
<u>bristles</u>	<u>53'</u>

## Location of Well

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



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

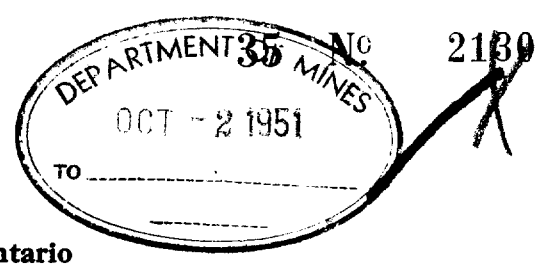
Drilling Firm C. Broadbent

Address Uxona

Recorded by C. L. Address .....

Date Oct. 11/49 Licence Number .....

UTM E 18 4 1 1 4 0 0 | E  
 9 R 5 0 0 3 4 1 5 | N  
 Elev. 9 R 0 4 0 5 |  
 Basin 2 5 |



The Well Drillers Act  
 Department of Mines, Province of Ontario

# Water Well Record

Country or Territorial District Levack Township, Village, Town or City Ramsay  
 Town or City Appleton  
 s. Appleton  
 Date Completed (day) (month) (year) Cost of well (excluding pump)

## Pipe and Casing Record

## Pumping Test

Casing diameter(s) <u>5 7/8</u>	Date <u>Sept 3, 1951</u>
Length(s) of casing(s) <u>10 1/2</u>	Static level <u>291</u>
Type of screen	Pumping level
Length of screen	Pumping rate <u>1.0 gal per min</u>
Distance from top of screen to ground level	Duration of test <u>1/2 hour</u>
Is well a gravel-wall type? <u>no</u>	Distance from cylinder or bowls to ground level

## Water Record

Kind (fresh or mineral) fresh  
 Quality (hard, soft, contains iron, sulphur, etc.) hard  
 Appearance (clear, cloudy, coloured) clear  
 For what purpose(s) is the water to be used? house  
 How far is well from possible source of contamination? 50'  
 What is the source of contamination? sewer  
 Enclose a copy of any mineral analysis that has been made of water

Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
<u>62'</u>	<u>fresh</u>	<u>4</u>

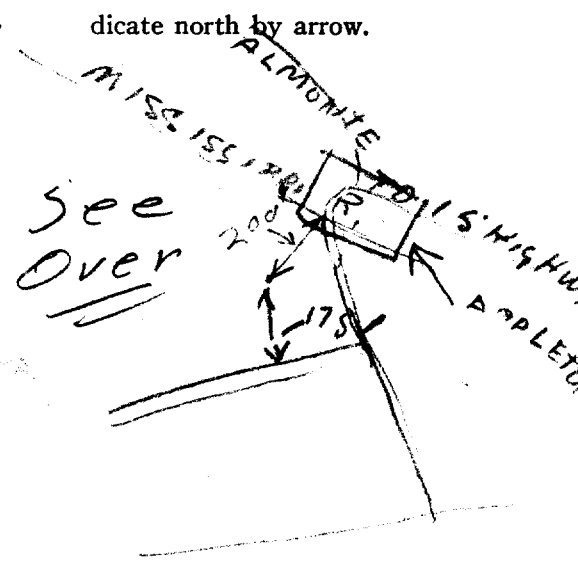
## Well Log

### Overburden and Bedrock Record

Overburden and Bedrock Record	From	To
	0 ft.	...ft.
<u>Clay</u>	<u>0</u>	<u>8</u>
<u>limestone</u>	<u>8</u>	<u>64'</u>

## Location of Well

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



Situation: Is well on upland, in valley, or on hillside? Upland  
 Drilling Firm G. Goodberry  
 Address Wesley  
 Name of Driller B. Ruttan Address Wesley  
 Date Sept 3, 1951 Licence Number 8  
 Signature of Licensee B. Ruttan



3171 east

JTM 18 4 11 6 0 0 E  
5 R 5 0 0 3 2 0 5 N  
Elev. 497 3  
5 R 9 4 1 5  
Basin 25



GROUND WATER BRANCH  
35 No. 2135  
MAR 9 1959  
ONTARIO WATER RESOURCES COMMISSION

The Ontario Water Resources Commission Act, 1957

# WATER WELL RECORD

Ramsay

County or District: Lanark w. 1/2 of Township, Village, Town or City: Ramsay Township  
Date completed: 4 MAR 59 (day month year)  
Address: Appleton

### Casing and Screen Record

### Pumping Test

Inside diameter of casing: 5"  
Total length of casing: 10'  
Type of screen: nil  
Length of screen:  
Depth to top of screen:  
Diameter of finished hole: 5 1/2"

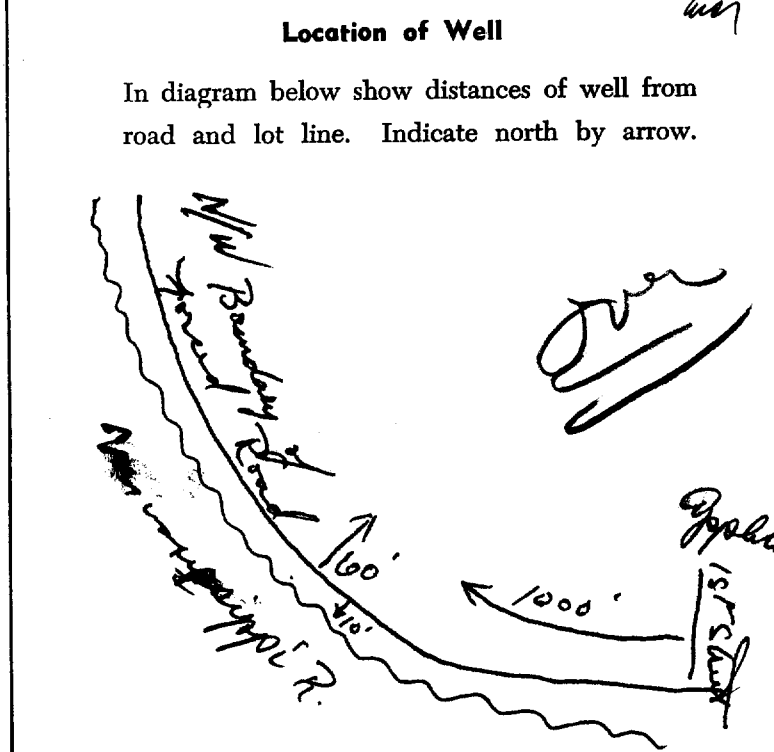
Static level: 12'  
Test-pumping rate: 10 G.P.M.  
Pumping level: 12'  
Duration of test pumping: 10 Minutes  
Water clear or cloudy at end of test: cloudy  
installed hand pump  
Recommended pumping rate: 3 G.P.M.  
with pumping level of: 12'

### Well Log

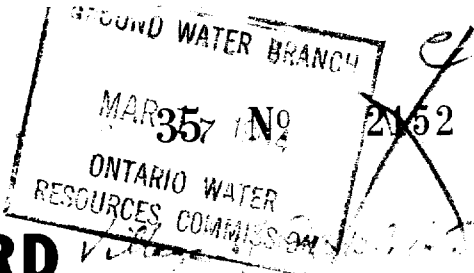
### Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, sulphur)
Overburden	0'	6"			
Limestone	6"	64'	50'	38'	fresh

For what purpose(s) is the water to be used?  
domestic  
Is well on upland, in valley, or on hillside?  
upland  
Drilling Firm: BLAIR PHILLIPS DRILLING CO. LTD.,  
Address: 1119 Palaise Road, Ottawa 5, Ont.  
Licence Number: 190  
Name of Driller: M. Sztepa  
Address: 90 Grove Ave., Ottawa  
Date: 4 March 1959  
*(Signature of Licensed Drilling Contractor)*



3171 east



UTM 18 411500 E

5R 5003400 N

The Ontario Water Resources Commission Act

Elev. 5R 0405

# WATER WELL RECORD

Basin or District LANARK

Township, Village, Town or City RAMSEY

Con. X Lot #3

Date completed 25 Apr 1963

Address Appleton Ont

### Casing and Screen Record

Inside diameter of casing 7"

Total length of casing 12'

Type of screen nil

Length of screen nil

Depth to top of screen nil

Diameter of finished hole 7

### Pumping Test

Static level 22'

Test-pumping rate 10 G.P.M.

Pumping level 22'

Duration of test pumping 1 hr.

Water clear or cloudy at end of test cloudy

Recommended pumping rate 10 G.P.M.

with pump setting of 25' feet below ground surface

### Well Log

### Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Clay	0'	5'		
Limestone	5'	70'	70'	fresh

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

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

Drilling or Boring Firm Blair Kelly Drilling

Address 111 Main

Licence Number 1018

Name of Driller or Borer J. Kelly

Address 20 Green Street

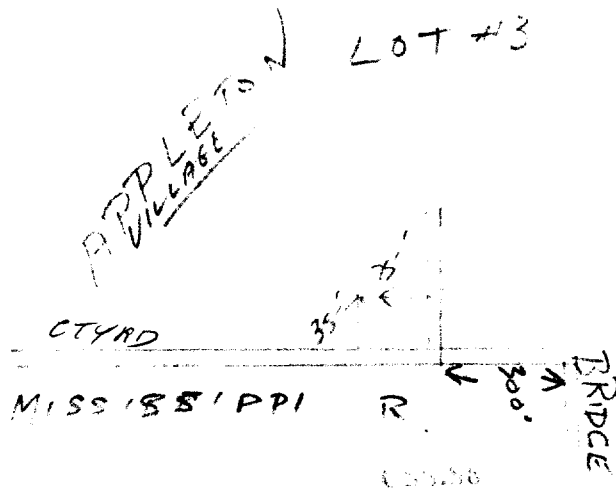
Date 24 Apr 1963

(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

### Location of Well

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





ONTARIO

MINISTRY OF THE ENVIRONMENT  
The Ontario Water Resources Act

# WATER WELL RECORD

31E1E

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

11

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MUNICIP.

35012

CON.

GAN

10

COUNTY OR DISTRICT: Jasper TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Appleton Ont. CON., BLOCK, TRACT, SURVEY, ETC: 10 LOT: 10

DATE COMPLETED: DAY 27 MO. 09 YR. 72

RC: 013550 ELEVATION: 0400 BASIN CODE: 25

### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	Fill			0	2
brown	Limestone			2	12
gray	"			12	103

31 0002 01 0012615 0103215

32

#### 41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13	<input checked="" type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
15-18	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
20-23	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
25-28	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
30-33	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL

#### 51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
06-11	<input checked="" type="checkbox"/> STEEL	188	0	25
17-18	<input type="checkbox"/> STEEL			20-23
24-25	<input checked="" type="checkbox"/> OPEN HOLE			0103

#### SCREEN

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

#### 61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	CEMENT GROUT, LEAD PACKER, ETC.
10-13	15	Cuttings
18-21	27	Cement

#### 71 PUMPING TEST

PUMPING TEST METHOD:  PUMP  BAILER

PUMPING RATE: 0015 GPM

DURATION OF PUMPING: 00 HOURS 30 MINS

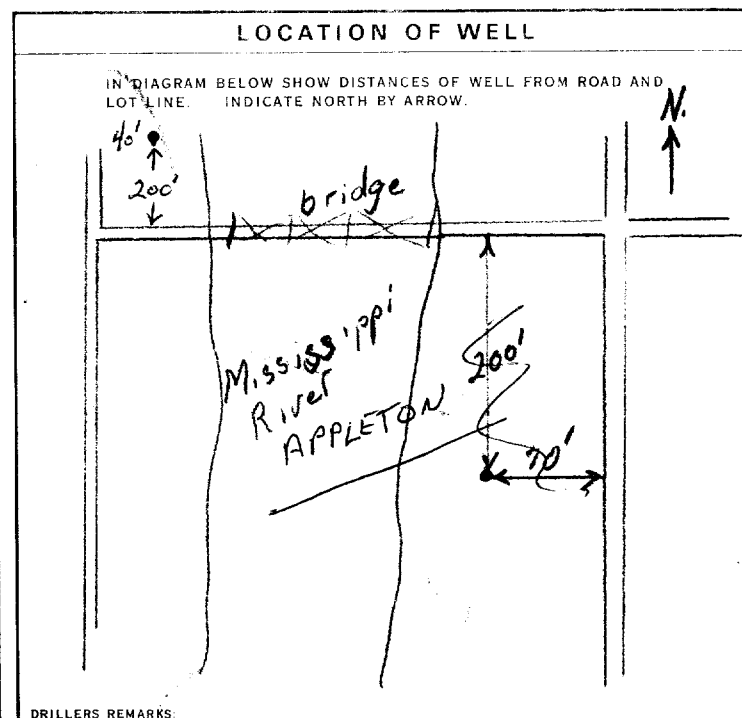
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING PUMPING			
015 FEET	035 FEET	15 MINUTES: 035 FEET	30 MINUTES: 035 FEET	45 MINUTES: FEET	60 MINUTES: FEET

RECOMMENDED PUMP TYPE:  SHALLOW  DEEP

RECOMMENDED PUMP SETTING: 050 FEET

RECOMMENDED PUMPING RATE: 0015 GPM

90-93: 000.8 GPM / FT. SPECIFIC CAPACITY



#### FINAL STATUS OF WELL

WATER SUPPLY

#### WATER USE

01 DOMESTIC

#### METHOD OF DRILLING

ROTARY (AIR)

CONTRACTOR: Air-Rock Drilling Co. LICENCE NUMBER: \_\_\_\_\_

ADDRESS: R.R. #2 Jasper Ont.

NAME OF DRILLER OR BORER: Wallace Desautels LICENCE NUMBER: 1739

SIGNATURE OF CONTRACTOR: Wallace Desautels SUBMISSION DATE: DAY 9 MO. 2 YR. 73

DATA SOURCE: 1 CONTRACTOR: 1119 DATE RECEIVED: 010373

DATE OF INSPECTION: \_\_\_\_\_ INSPECTOR: K.

REMARKS: \_\_\_\_\_

OFFICE USE ONLY: P K. WI



# WATER WELL RECORD

31 Fic

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

11

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MUNICIPALITY 1350.12

CON. C/W

LOT 25-27 X 003

COUNTY OR DISTRICT: Lanark  
 TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Ramsey  
 CON., BLOCK, TRACT, SURVEY, ETC.: 10  
 DATE COMPLETED: DAY 08, MO. 05, YR. 73  
 ADDRESS: 28 Grandeur Ave., Ottawa, Ontario.  
 BASIN CODE: 25T

### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
grey	sand	gravel	packed	0	1
grey	limestone		hard	1	65

31 100.0/122.8 100.65/21.5

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
00 27	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
00 64	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
6.1	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE	1.88	0	66.25
6.6	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE		25	65

SCREEN

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

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL TYPE	TO GROUT (LEAD PAPER, ETC.)
10-13		
18-21		
26-29		

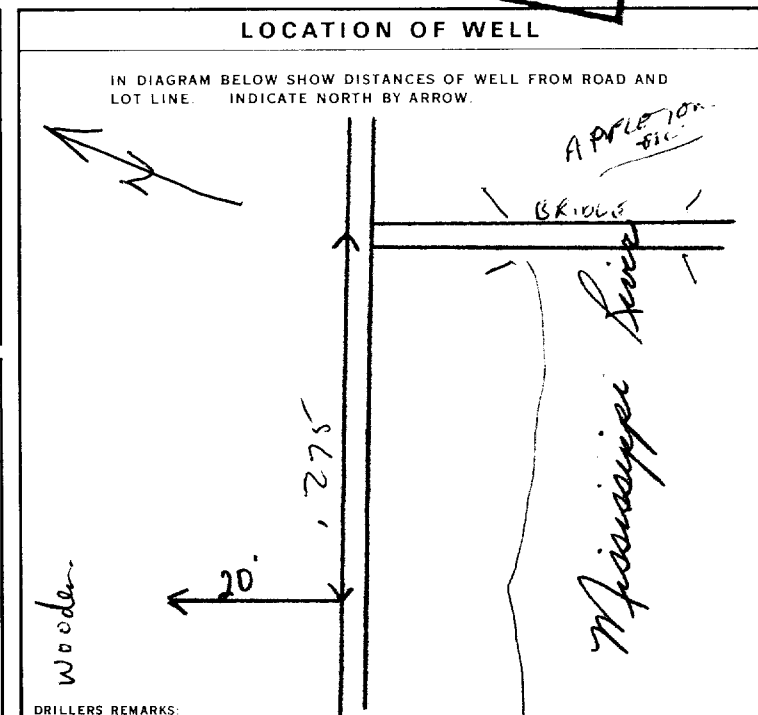
OWRC  
P.8

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	00 12 GPM	0 15-16 HOURS 00 17-18 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING PUMPING					
0 25 FEET	0 45 FEET	15 MINUTES: 0 45 FEET	30 MINUTES: 0 45 FEET	45 MINUTES: 0 45 FEET	60 MINUTES: 0 45 FEET	75 MINUTES: 0 45 FEET	90 MINUTES: 0 45 FEET

RECOMMENDED PUMP TYPE:  SHALLOW  DEEP  
 RECOMMENDED PUMP SETTING: 50 FEET  
 RECOMMENDED PUMPING RATE: 000 5 GPM



54 FINAL STATUS OF WELL

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

55-56 WATER USE

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

57 METHOD OF DRILLING

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

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd.  
 LICENCE NUMBER: 1558  
 ADDRESS: Box 490, Stittsville, Ontario.  
 NAME OF DRILLER OR BORER: Lenny Dryman  
 SIGNATURE OF CONTRACTOR: [Signature]  
 SUBMISSION DATE: DAY 10, NO. 5, YR. 73

OFFICE USE ONLY

DATA SOURCE: 1558  
 CONTRACTOR: 1558  
 DATE RECEIVED: 140673  
 DATE OF INSPECTION: [Blank]  
 INSPECTOR: [Signature]  
 REMARKS: [Blank]



# WATER WELL RECORD

31 F / 1 E

ONTARIO

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

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MUNICIP. 35012

CON. C6N

10

COUNTY OR DISTRICT

Kenark

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE

Ramsey

CON., BLOCK, TRACT, SURVEY, ETC.

3

LOT 25-27

003

DATE COMPLETED

02 05 73

THING 003467

RC 4

ELEVATION 0395

RC 5

Basin Code 25

## LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	Fill			0	2
Gray	Limestone			2	64

31	0002 011	0064215
----	----------	---------

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 <input checked="" type="checkbox"/> STEEL	1/8	0	22
17-18	1 <input type="checkbox"/> STEEL			20-23
24-25	1 <input type="checkbox"/> STEEL			27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
	34-38	39-40

61 PLUGGING & SEALING RECORD

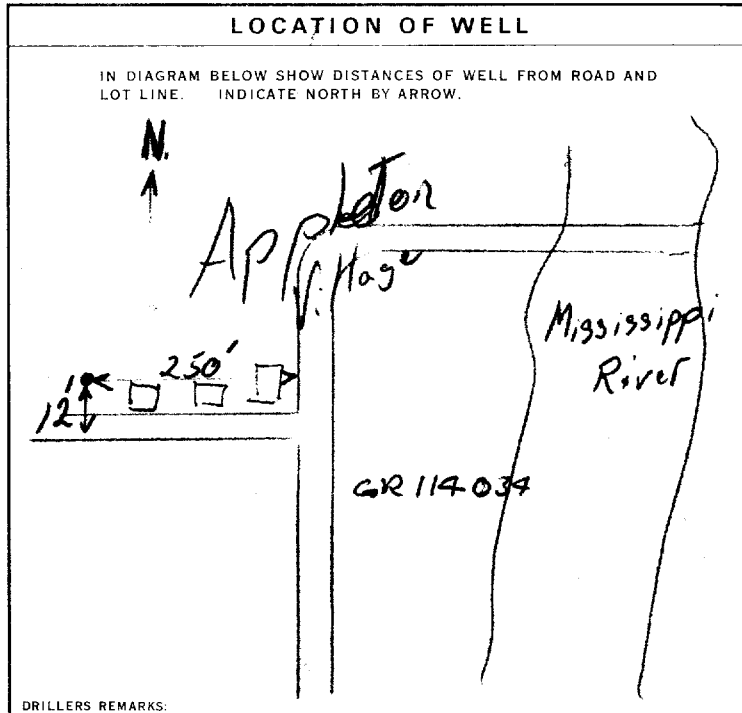
DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
FROM	TO	
10-13	14-17	
18-21	22-25	
26-29	30-33	

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE GPM.	DURATION OF PUMPING HOURS
1 <input checked="" type="checkbox"/> PUMP	0020	00 30

STATIC LEVEL FEET	WATER LEVEL END OF PUMPING FEET	WATER LEVELS DURING PUMPING			
020	030	15 MINUTES 030	30 MINUTES 030	45 MINUTES 030	60 MINUTES 030

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING FEET	RECOMMENDED PUMPING RATE GPM.
1 <input type="checkbox"/> SHALLOW	045	0020



54 FINAL STATUS OF WELL

1 <input checked="" type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
2 <input type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED, POOR QUALITY
3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
4 <input type="checkbox"/> RECHARGE WELL	

55-56 WATER USE

1 <input checked="" type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
9 <input type="checkbox"/> OTHER	9 <input type="checkbox"/> NOT USED

57 METHOD OF DRILLING

1 <input type="checkbox"/> CABLE TOOL	6 <input type="checkbox"/> BORING
2 <input checked="" type="checkbox"/> ROTARY (CONVENTIONAL)	7 <input type="checkbox"/> DIAMOND
3 <input type="checkbox"/> ROTARY (REVERSE)	8 <input type="checkbox"/> JETTING
4 <input type="checkbox"/> ROTARY (AIR)	9 <input type="checkbox"/> DRIVING
5 <input type="checkbox"/> AIR PERCUSSION	

CONTRACTOR

NAME OF WELL CONTRACTOR	LICENCE NUMBER
Air-Rock Drilling Co	1119
ADDRESS	
R.R. #2 Jasper Ont	
NAME OF DRILLER OR BORER	LICENCE NUMBER
Wallace Desautniers	1119
SIGNATURE OF CONTRACTOR	SUBMISSION DATE
Wallace Desautniers	9 23

OFFICE USE ONLY

DATA SOURCE	CONTRACTOR	DATE RECEIVED
1	1119	150873
DATE OF INSPECTION	INSPECTOR	
13 Nov 74	P/R.W. Doyle	
REMARKS:		



Ontario

# WATER WELL RECORD

31 F/1 E

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

11

3503546

MUNICIP. 35012

CON. CON.

110

COUNTY OR DISTRICT: Jasper TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Ramsay CON. BLOCK, TRACT, SURVEY, ETC.: 11 LOT: 003

DATE COMPLETED: DAY 21 MO. 09 YR. 73

Address: Post Box 1239 Carleton Place

RC: 33.67 4 039.5 5 2.5

### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<u>gray</u>	<u>clay</u>			<u>0</u>	<u>3</u>
	<u>limestone</u>			<u>3</u>	<u>64</u>

31 0003 BS 0064215

32

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER			
10-13	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL

**51 CASING & OPEN HOLE RECORD**

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
<u>09 10-11</u>	<u>STEEL</u>	<u>185</u>	<u>0</u>	<u>0025</u>
<u>17-18</u>	<u>STEEL</u>			<u>20-23</u>
<u>24-25</u>	<u>STEEL</u>			<u>27-30</u>

**61 PLUGGING & SEALING RECORD**

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

**71 PUMPING TEST**

PUMPING TEST METHOD: 1  PUMP 2  BAILER

PUMPING RATE: 0030 GPM

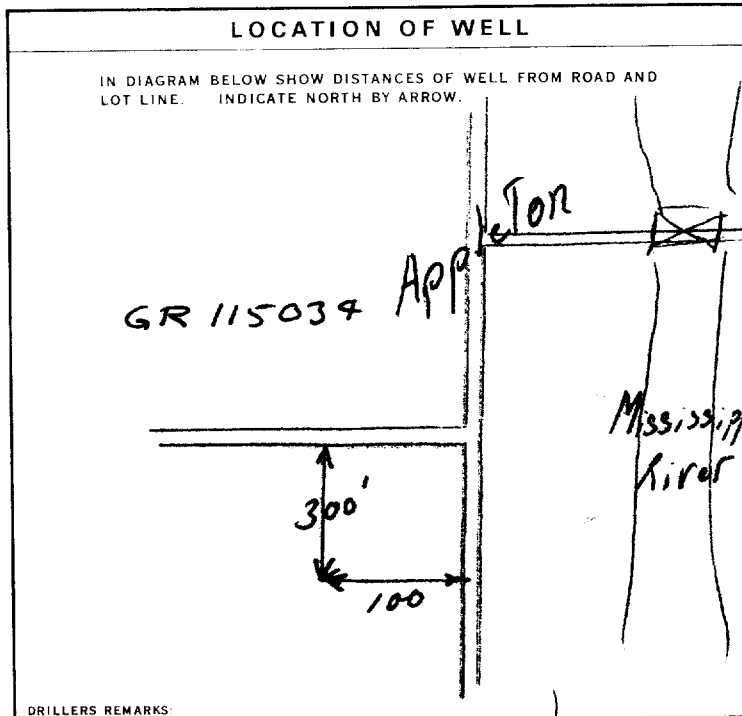
DURATION OF PUMPING: 00 HOURS 30 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING PUMPING				
<u>018</u> FEET	<u>035</u> FEET	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES	
		<u>035</u> FEET	<u>035</u> FEET			

RECOMMENDED PUMP TYPE:  SHALLOW  DEEP

RECOMMENDED PUMP SETTING: 040 FEET

RECOMMENDED PUMPING RATE: 0030 GPM



**FINAL STATUS OF WELL**

1  WATER SUPPLY 5  ABANDONED, INSUFFICIENT SUPPLY

2  OBSERVATION WELL 6  ABANDONED, POOR QUALITY

3  TEST HOLE 7  UNFINISHED

4  RECHARGE WELL

**WATER USE** 01

1  DOMESTIC 5  COMMERCIAL

2  STOCK 6  MUNICIPAL

3  IRRIGATION 7  PUBLIC SUPPLY

4  INDUSTRIAL 8  COOLING OR AIR CONDITIONING

9  OTHER 9  NOT USED

**METHOD OF DRILLING**

1  CABLE TOOL 6  BORING

2  ROTARY (CONVENTIONAL) 7  DIAMOND

3  ROTARY (REVERSE) 8  JETTING

4  ROTARY (AIR) 9  DRIVING

5  AIR PERCUSSION

**CONTRACTOR**

NAME OF WELL CONTRACTOR: Air-Rock Drilling Co. LTD. LICENCE NUMBER: 1119

ADDRESS: R.R. #2 Jasper Ont.

NAME OF DRILLER OR BORER: C. Morrison LICENCE NUMBER: 1119

SIGNATURE OF CONTRACTOR: Wallace Drumblair

SUBMISSION DATE: DAY 10 MO. 12 YR. 73

**OFFICE USE ONLY**

DATA SOURCE: 1-1119 CONTRACTOR: 1119 DATE RECEIVED: 13 12 73

DATE OF INSPECTION: 28 OCT 74 INSPECTOR: R.W. Doyle

REMARKS:



Ministry of the Environment

The Ontario Water Resources Act

# WATER WELL RECORD

31/1

Ontario

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

11

3504685

MUNICIPALITY

35012

CON

09

COUNTY OR DISTRICT <i>Lorain</i>	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE <i>Ramsay</i>	CON. BLOCK, TRACT, SURVEY, ETC. <i>9</i>	LOT <i>303</i>
OWNER (SURNAME FIRST) <i>D &amp; V Construction</i>	ADDRESS <i>Campano</i>	DATE COMPLETED DAY <i>12</i> MO <i>07</i> YR <i>77</i>	

TO 18 7/16/80 FROM 50.03000 S ELEVATION 0400 S IN CODE 26

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<i>Brown</i>	<i>Loam</i>			<i>0</i>	<i>3</i>
<i>Brown</i>	<i>Limestone</i>			<i>5</i>	<i>75</i>

31 0003602 0075615

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
0-13	<input checked="" type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
15-18	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
20-23	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
25-28	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
30-33	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
65	<input checked="" type="checkbox"/> STEEL	<i>188</i>	<i>0</i>	<i>22</i>
76	<input type="checkbox"/> GALVANIZED			<i>2022</i>
17-18	<input type="checkbox"/> STEEL			20-23
24-25	<input type="checkbox"/> STEEL			27-30

SCREEN

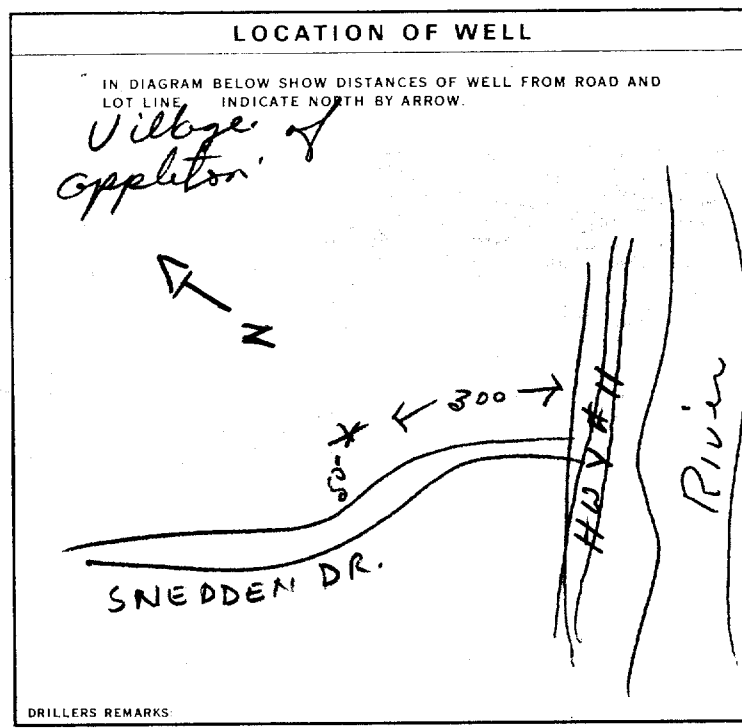
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD <input type="checkbox"/> PUMP <input type="checkbox"/> BAILER	PUMPING RATE GPM	DURATION OF PUMPING HOURS
STATIC LEVEL 012	WATER LEVEL END OF PUMPING 065	WATER LEVELS DURING
15-21	19-21	15 MINUTES 040
		30 MINUTES 063
		45 MINUTES 065
		60 MINUTES 065
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
		<input checked="" type="checkbox"/> CLEAR <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING 065	RECOMMENDED PUMPING RATE 0006



FINAL STATUS OF WELL

1  WATER SUPPLY

2  OBSERVATION WELL

3  TEST HOLE

4  RECHARGE WELL

5  ABANDONED, INSUFFICIENT SUPPLY

6  ABANDONED POOR QUALITY

7  UNFINISHED

WATER USE

1  DOMESTIC

2  STOCK

3  IRRIGATION

4  INDUSTRIAL

5  COMMERCIAL

6  MUNICIPAL

7  PUBLIC SUPPLY

8  COOLING OR AIR CONDITIONING

9  NOT USED

METHOD OF DRILLING

1  CABLE TOOL

2  ROTARY (CONVENTIONAL)

3  ROTARY (REVERSE)

4  ROTARY (AIR)

5  AIR PERCUSSION

6  BORING

7  DIAMOND

8  JETTING

9  DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR  
*Saunders Well Drilling*

LICENCE NUMBER  
*4767*

ADDRESS  
*RR# 21 Campano*

NAME OF DRILLER OR BORER  
*J. Bouter*

LICENCE NUMBER

SIGNATURE OF CONTRACTOR  
*R. Saunders*

SUBMISSION DATE  
DAY *14* MO *7* YR *77*

OFFICE USE ONLY

DATA SOURCE  
*1*

CONTRACTOR  
*4767*

DATE RECEIVED  
*220777*

DATE OF INSPECTION  
*JUNE 13/78*

INSPECTOR  
*DN*

REMARKS  
*NOTED*



Ministry of the Environment

# The Ontario Water Resources Act WATER WELL RECORD

31/1

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

11

3504686

MUNICIPALITY 35012

CONTRACT NO. 09

COUNTY OR DISTRICT: Lorain TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Rensselaer CON. BLOCK, TRACT, SURVEY, ETC.: 9 LOT: 303

OWNER (SURNAME FIRST): D & V Construction ADDRESS: Amherst DATE COMPLETED: DAY 12 MO 07 YR. 77

GRID: U 18 T 4 M 11490 EASTING V 5003020 S 0390 NORTHING ELEVATION S 26 CODE

### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<u>Brown</u>	<u>Loam</u>			<u>0</u>	<u>4</u>
<u>Brown</u>	<u>Limestone</u>			<u>4</u>	<u>75</u>

31 0004602 0075615

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
<u>5 1/2</u>	<u>STEEL</u>	<u>1/8</u>	<u>0</u>	<u>22</u>
<u>6</u>	<u>STEEL</u>			<u>20-23</u>
<u>6</u>	<u>STEEL</u>			<u>27-30</u>

SCREEN

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

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE
10-13	14-17
18-21	22-25
26-29	30-33

71 PUMPING TEST

PUMPING TEST METHOD: 1  PUMP 2  BAILER

PUMPING RATE: 0006 GPM

DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING			
<u>011</u>	<u>065</u>	15 MINUTES: <u>040</u>	30 MINUTES: <u>065</u>	45 MINUTES: <u>065</u>	60 MINUTES: <u>065</u>

IF FLOWING, GIVE RATE: — GPM

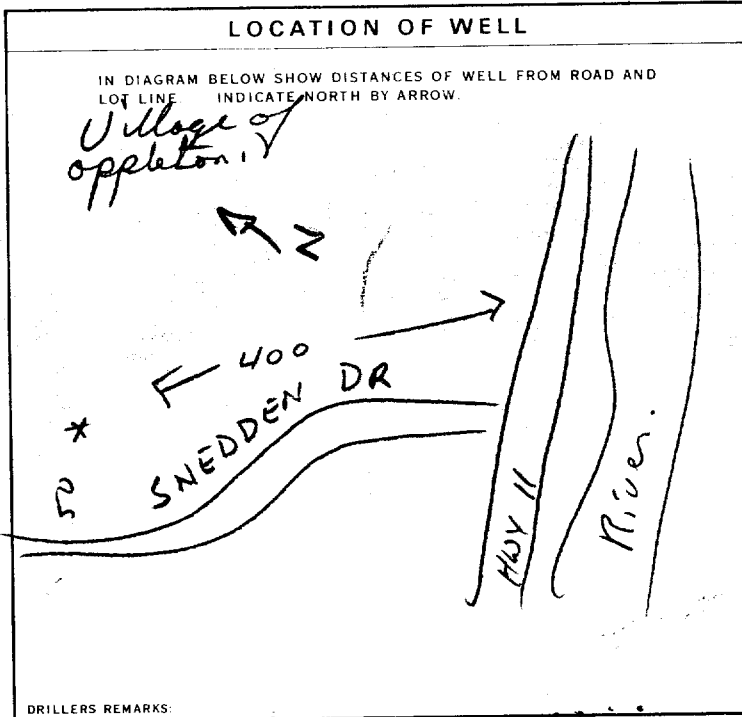
PUMP INTAKE SET AT: — FEET

WATER AT END OF TEST: — FEET

RECOMMENDED PUMP TYPE:  SHALLOW  DEEP

RECOMMENDED PUMP SETTING: 065 FEET

RECOMMENDED PUMPING RATE: 0006 GPM



54 FINAL STATUS OF WELL: 1  WATER SUPPLY

55-56 WATER USE: 1  DOMESTIC

57 METHOD OF DRILLING: 4  ROTARY (REVERSE)

CONTRACTOR: SQUANDERS WELL DRILLING LICENCE NUMBER: 4767

ADDRESS: RR# 2 GRAPPIOR.

NAME OF DRILLER OR BORER: S. Boutin

SIGNATURE OF CONTRACTOR: Robert Saunders SUBMISSION DATE: DAY 14 MO 7 YR. 77

OFFICE USE ONLY

DATA SOURCE: 1 CONTRACTOR: 4767 DATE RECEIVED: 2 207 77

DATE OF INSPECTION: JUNE 13/78 INSPECTOR: Ken DN

REMARKS: Plots





Ministry of the Environment

The Ontario Water Resources Act

# WATER WELL RECORD

311

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

(11) 3504687-1      MUNICIPAL 35012      CON 80N      09  
 COUNTY OR DISTRICT: Lanark      TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Rensselaer      CON., BLOCK, TRACT, SURVEY, ETC.: to 9      LOT: 003  
 OWNER (SURNAME FIRST): Do V. Constructors      ADDRESS: Amperior      DATE COMPLETED: DAY 12 MO 07 YR 77  
 U.T.M. 18      41/1510      50.02990      5      ELEVATION 0395      5      26

## LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	Loam			0	4
Brown	Limestone			4	100

31 0004602      0100615  
 32

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER			
0092	<input checked="" type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL

**51 CASING & OPEN HOLE RECORD**

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	<input checked="" type="checkbox"/> STEEL	188	0	22
17-18	<input type="checkbox"/> GALVANIZED			0022
24-25	<input type="checkbox"/> STEEL			20-23
	<input type="checkbox"/> GALVANIZED			
	<input type="checkbox"/> CONCRETE			
	<input type="checkbox"/> OPEN HOLE			

**SCREEN**

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

**61 PLUGGING & SEALING RECORD**

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

**71 PUMPING TEST**

PUMPING TEST METHOD: 1  PUMP 2  BAILER

PUMPING RATE: 0006 GPM

DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING			
012	065	15 MINUTES: 040	30 MINUTES: 065	45 MINUTES: 065	60 MINUTES: 065

IF FLOWING, GIVE RATE: \_\_\_\_\_ GPM

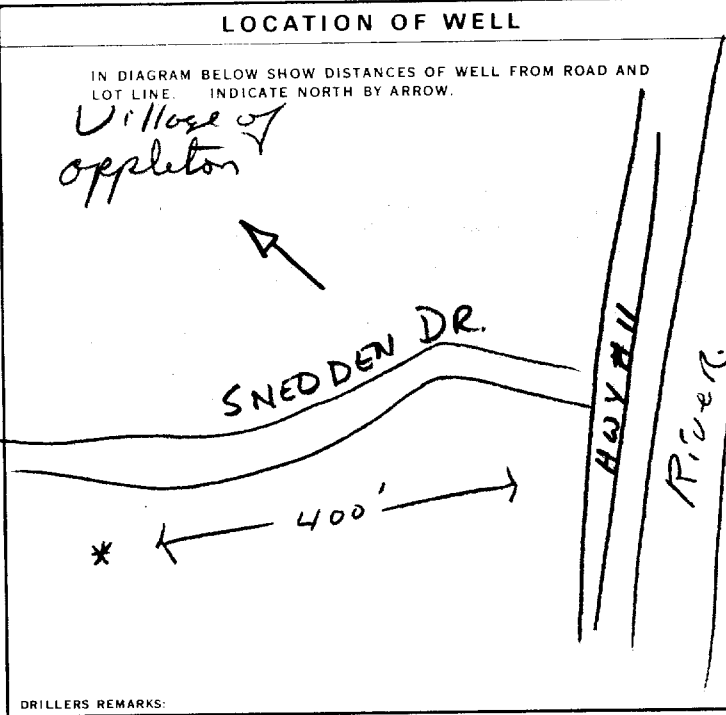
PUMP INTAKE SET AT: \_\_\_\_\_ FEET

WATER AT END OF TEST: 1  CLEAR 2  CLOUDY

RECOMMENDED PUMP TYPE:  SHALLOW  DEEP

RECOMMENDED PUMP SETTING: 065 FEET

RECOMMENDED PUMPING RATE: 0006 GPM



**FINAL STATUS OF WELL**

1  WATER SUPPLY      5  ABANDONED, INSUFFICIENT SUPPLY

2  OBSERVATION WELL      6  ABANDONED, POOR QUALITY

3  TEST HOLE      7  UNFINISHED

4  RECHARGE WELL

**WATER USE**

1  DOMESTIC      5  COMMERCIAL

2  STOCK      6  MUNICIPAL

3  IRRIGATION      7  PUBLIC SUPPLY

4  INDUSTRIAL      8  COOLING OR AIR CONDITIONING

OTHER      9  NOT USED

**METHOD OF DRILLING**

1  CABLE TOOL      6  BORING

2  ROTARY (CONVENTIONAL)      7  DIAMOND

3  ROTARY (REVERSE)      8  JETTING

4  ROTARY (AIR)      9  DRIVING

5  AIR PERCUSSION

**CONTRACTOR**

NAME OF WELL CONTRACTOR: SAUNDERS WELL DRILLING      LICENCE NUMBER: 4767

ADDRESS: RR#2 Amperior

NAME OF DRILLER OR BORER: B. Bantier      LICENCE NUMBER: \_\_\_\_\_

SIGNATURE OF CONTRACTOR: Robert Saunders      SUBMISSION DATE: DAY 14 MO 7 YR 77

**OFFICE USE ONLY**

DATA SOURCE: 1      CONTRACTOR: 4767      DATE RECEIVED: 220777

DATE OF INSPECTION: JUNE 13/75      INSPECTOR: KM. DN

REMARKS:

CSS:SS

PLOTTED



# WATER WELL RECORD

31/1

Ontario **P.P.N.**

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

11

3504689-

MUNICIPALITY 35.012<sup>+</sup> LOCALITY CON I

109

COUNTY OR DISTRICT <i>Lennox</i>	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE <i>Romney</i>	CON. BLOCK, TRACT, SURVEY, ETC. <i>9</i>	LOT <i>3003</i>
OWNER (SURNAME FIRST) <i>D V Construction</i>	ADDRESS <i>Compuir</i>	DATE COMPLETED DAY <i>14</i> MO. <i>07</i> YR. <i>77</i>	

UTM <i>21</i>	EASTING <i>18 411600</i>	NORTHING <i>5002930</i>	ELEVATION <i>5 0400</i>	ZONE <i>5 26</i>
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### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<i>Brown</i>	<i>Loam</i>			<i>0</i>	<i>2</i>
<i>Brown</i>	<i>Limestone</i>			<i>2</i>	<i>71</i>

<i>31</i>	<i>0002602</i>	<i>0075615</i>
<i>32</i>		

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER			
<i>0068</i>	<input checked="" type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
<i>15-18</i>	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
<i>20-23</i>	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
<i>25-28</i>	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
<i>30-33</i>	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL

**51 CASING & OPEN HOLE RECORD**

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
<i>6 1/4</i>	<input checked="" type="checkbox"/> STEEL	<i>188</i>	<i>0</i>	<i>2216</i>
<i>6 1/4</i>	<input type="checkbox"/> GALVANIZED			<i>0022</i>
<i>17-18</i>	<input type="checkbox"/> STEEL			<i>20-23</i>
<i>24-25</i>	<input type="checkbox"/> STEEL			<i>27-30</i>

**SCREEN**

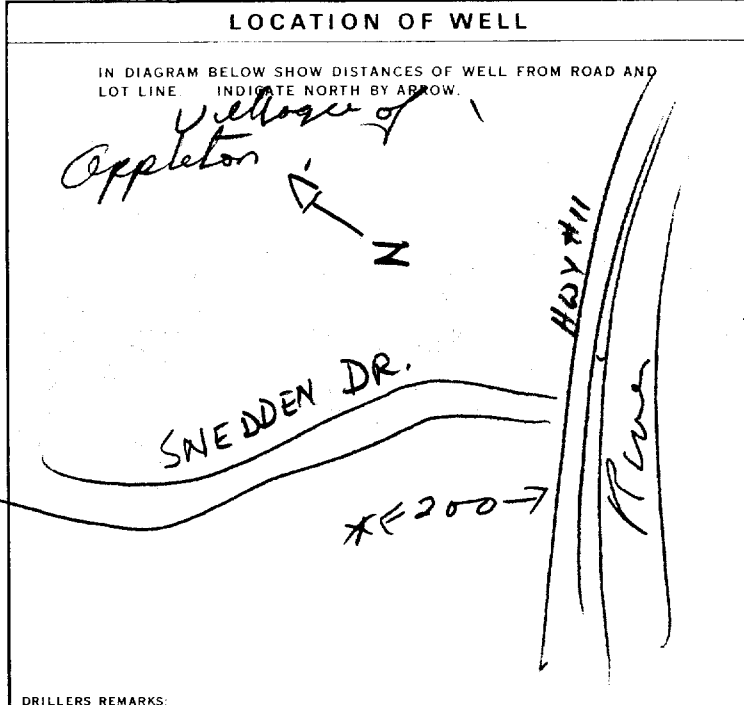
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN FEET

**61 PLUGGING & SEALING RECORD**

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

**71 PUMPING TEST**

PUMPING TEST METHOD <input type="checkbox"/> PUMP <input checked="" type="checkbox"/> BAILER	PUMPING RATE <i>0006</i> GPM	DURATION OF PUMPING 15-16 HOURS <i>00</i> MINS
STATIC LEVEL <i>009</i> FEET	WATER LEVEL - END OF PUMPING <i>065</i> FEET	WATER LEVELS DURING 15 MINUTES <i>040</i> FEET 30 MINUTES <i>065</i> FEET 45 MINUTES <i>065</i> FEET 60 MINUTES <i>065</i> FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT FEET	WATER AT END OF TEST <input checked="" type="checkbox"/> CLEAR <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING <i>065</i> FEET	RECOMMENDED PUMPING RATE <i>0006</i> GPM



**FINAL STATUS OF WELL** *1*

**WATER USE** *01*

**METHOD OF DRILLING** *4*

**CONTRACTOR**

NAME OF WELL CONTRACTOR  
*Saunders Well Drilling*

ADDRESS  
*RR#2 Compuir*

NAME OF DRILLER OR BORE  
*D. Burton*

SIGNATURE OF CONTRACTOR  
*R. Saunders*

LICENCE NUMBER  
*4767*

SUBMISSION DATE  
DAY *14* MO. *7* YR. *77*

**OFFICE USE ONLY**

DATA SOURCE  
*1*

CONTRACTOR  
*4767*

DATE RECEIVED  
*20777*

DATE OF INSPECTION  
*JUNE 13/78*

INSPECTOR  
*KM DN*

REMARKS  
*Plotted*

CSS.58



Ministry of the Environment

# The Ontario Water Resources Act WATER WELL RECORD

31/1

1. PRINT ONLY IN SPACES PROVIDED

2. CHECK  CORRECT BOX WHERE APPLICABLE

11

3504691

MUNICIPALITY 35012

CON. 60N

LOT 44 09

COUNTY OR DISTRICT: Lorain TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Rensselaer CON., BLOCK, TRACT, SURVEY, ETC.: 9 LOT: 003

OWNER (SURNAME FIRST): D & V Construction ADDRESS: Empire DATE COMPLETED: DAY 11 MO. 07 YR. 77

UTM GRID: 18 411540 5002940 5 0400 5 26

### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<u>Brown</u>	<u>Loam</u>			<u>0</u>	<u>3</u>
<u>Brown</u>	<u>Limestone</u>			<u>3</u>	<u>75</u>

31 0003602 0075615

32

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER			
<u>0069</u> <u>69</u>	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		

**51 CASING & OPEN HOLE RECORD**

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
<u>6 1/4</u> <u>06</u>	1 <input checked="" type="checkbox"/> STEEL	<u>188</u>	<u>0</u>	<u>22</u>
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			

**SCREEN**

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

**61 PLUGGING & SEALING RECORD**

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

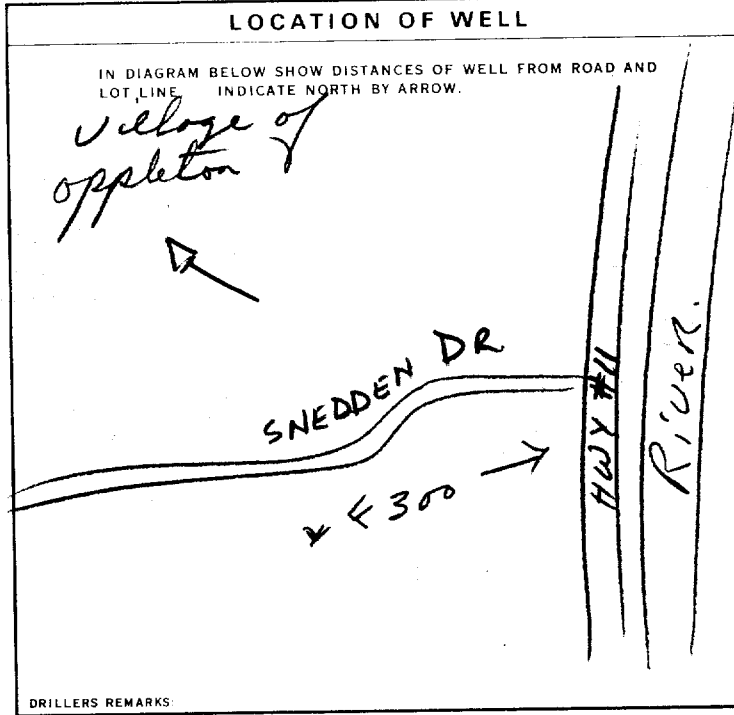
**71 PUMPING TEST**

PUMPING TEST METHOD:  PUMP  BAILER

PUMPING RATE: 0007 GPM

DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING			
<u>009</u>	<u>065</u>	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
		<u>040</u>	<u>065</u>	<u>065</u>	<u>065</u>



**FINAL STATUS OF WELL** 1

**WATER USE** 01

**METHOD OF DRILLING** 4

**CONTRACTOR**

NAME OF WELL CONTRACTOR: Saunders Well Drilling LICENCE NUMBER: 4767

ADDRESS: RR#2 Empire

NAME OF DRILLER OR BORE: J. Boutin LICENCE NUMBER: \_\_\_\_\_

SIGNATURE OF CONTRACTOR: R. Saunders SUBMISSION DATE: DAY 14 MO. 7 YR. 77

**OFFICE USE ONLY**

DATA SOURCE: 1 CONTRACTOR: 4767 DATE RECEIVED: 220777

DATE OF INSPECTION: JUNE 13/78 INSPECTOR: K. DN

REMARKS: \_\_\_\_\_



Ministry of the Environment

The Ontario Water Resources Act

# WATER WELL RECORD

31/1

Ontario

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

11 3504813 35012 CON 09

COUNTY OR DISTRICT: [redacted] TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Rensselaer CON., BLOCK, TRACT, SURVEY, ETC.: 9 LOT: 003

DATE COMPLETED: DAY 08 MO 11 YR 22

ING: 03430 S ELEVATION: 0390 S CODE: 26

### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	<u>Soil</u>			<u>0</u>	<u>2</u>
<u>grey</u>	<u>Limestone</u>			<u>2</u>	<u>124</u>

31 0002 PR 0124215

32

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER
<u>0117</u>	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL

**51 CASING & OPEN HOLE RECORD**

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
<u>06</u>	<input checked="" type="checkbox"/> STEEL		<u>0022</u>
<u>188</u>	<input type="checkbox"/> GALVANIZED		<u>22</u>

**SCREEN**

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

MATERIAL AND TYPE: [ ] DEPTH TO TOP OF SCREEN: [ ] FEET

**61 PLUGGING & SEALING RECORD**

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

**71 PUMPING TEST**

PUMPING TEST METHOD:  PUMP  BAILER

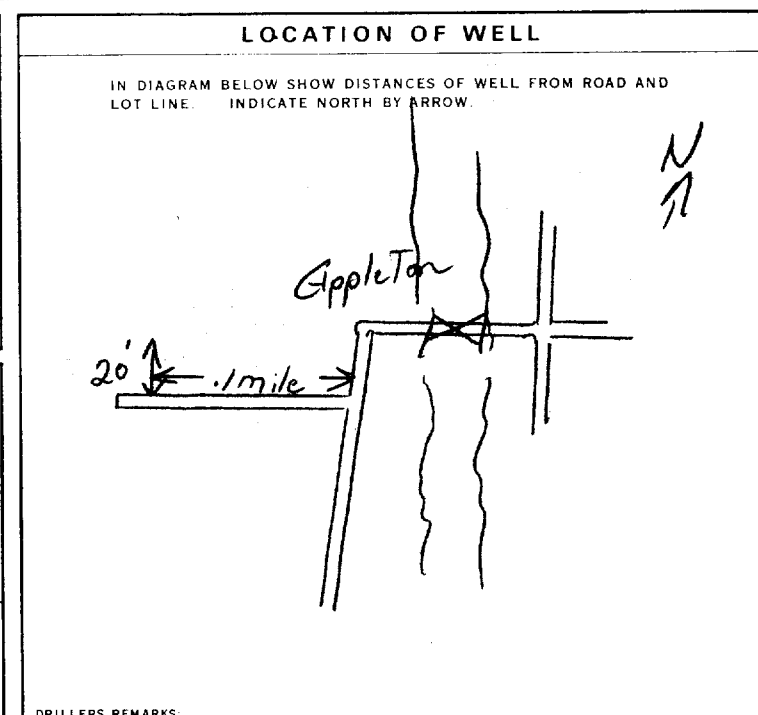
PUMPING RATE: 0009 GPM DURATION OF PUMPING: 00 HOURS 30 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
<u>025</u> FEET	<u>070</u> FEET	15 MINUTES: <u>070</u> FEET 30 MINUTES: <u>070</u> FEET 45 MINUTES: [ ] FEET 60 MINUTES: [ ] FEET

RECOMMENDED PUMP TYPE:  SHALLOW  DEEP

RECOMMENDED PUMP SETTING: 080 FEET

RECOMMENDED PUMP RATE: 0009 GPM



**FINAL STATUS OF WELL** 1

**WATER USE** 01

**METHOD OF DRILLING** 2

**CONTRACTOR**

NAME OF WELL CONTRACTOR: Air-Rock Drilling Co. LTD. LICENCE NUMBER: 1119

ADDRESS: RR # 2 Jasper Ont.

NAME OF DRILLER OR BORER: Walter Desautels LICENCE NUMBER: 1119

SIGNATURE OF CONTRACTOR: [Signature] SUBMISSION DATE: 7 MO 12 YR 22

**OFFICE USE ONLY**

DATA SOURCE: 1 CONTRACTOR: 1119 DATE RECEIVED: 51277

DATE OF INSPECTION: JUNE 13/28 INSPECTOR: DN

REMARKS: OLD LOG HOUSE WITH NEW EXTENSION

PLOTTED



# WATER WELL RECORD

350 52 32

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

11

3505232

MUNICIPALITY: 350124 EDN 7 09  
LOT: 25-27 303

COUNTY OR DISTRICT <i>Lorain</i>	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE <i>Ramsay</i>	CON. BLOCK, TRACT, SURVEY, ETC. <i>9</i>	LOT <i>303</i>
OWNER (SURNAME FIRST) <i>D &amp; V. Construction</i>	ADDRESS <i>Empire</i>	DATE COMPLETED DAY <i>13</i> MO. <i>27</i> YR. <i>77</i>	
UTM ZONE <i>18</i>	EASTING <i>411610</i>	NORTHING <i>5002990</i>	ELEVATION <i>50400</i>

### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<i>Brown loam</i>				<i>0</i>	<i>4</i>
<i>Brown Limestone</i>				<i>4</i>	<i>75</i>

31 *0004602* *0075815*

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
<i>0068</i> 10-13	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
<i>6 1/4</i> 10-11	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	<i>188</i>	<i>0</i>	<i>22</i>
<i>6 1/4</i> 17-18	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			<i>0022</i>
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			27-30

SCREEN

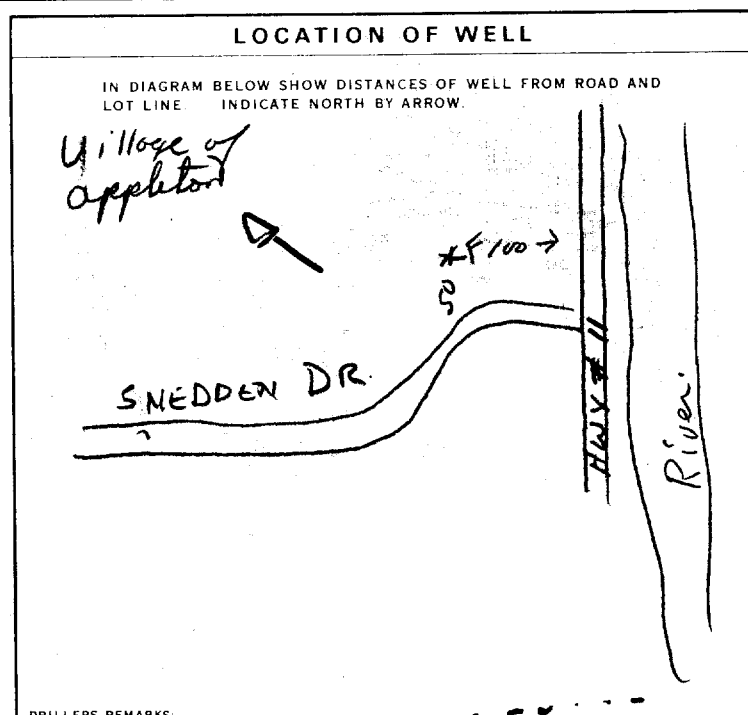
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD <input type="checkbox"/> PUMP <input checked="" type="checkbox"/> BAILEY	PUMPING RATE <i>0020</i> GPM	DURATION OF PUMPING 15-16 HOURS <i>00</i> 17-18 MINS
STATIC LEVEL <i>010</i> FEET	WATER LEVEL END OF PUMPING <i>065</i> FEET	WATER LEVELS DURING: 15 MINUTES <i>048</i> FEET 30 MINUTES <i>065</i> FEET 45 MINUTES <i>065</i> FEET 60 MINUTES <i>065</i> FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST 1 <input type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE



FINAL STATUS OF WELL

1  WATER SUPPLY  
2  OBSERVATION WELL  
3  TEST HOLE  
4  RECHARGE WELL

5  ABANDONED, INSUFFICIENT SUPPLY  
6  ABANDONED, POOR QUALITY  
7  UNFINISHED

WATER USE

1  DOMESTIC  
2  STOCK  
3  IRRIGATION  
4  INDUSTRIAL  
5  OTHER

6  COMMERCIAL  
7  MUNICIPAL  
8  PUBLIC SUPPLY  
9  COOLING OR AIR CONDITIONING  
10  NOT USED

METHOD OF DRILLING

1  CABLE TOOL  
2  ROTARY (CONVENTIONAL)  
3  ROTARY (REVERSE)  
4  ROTARY (AIR)  
5  AIR PERCUSSION

6  BORING  
7  DIAMOND  
8  JETTING  
9  DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR  
*Saunders Well Drilling*

LICENCE NUMBER  
*4767*

ADDRESS  
*RR# 2 Empire*

NAME OF DRILLER OR BOBER  
*R. Boutin*

LICENCE NUMBER

SIGNATURE OF CONTRACTOR  
*R. Saunders*

SUBMISSION DATE  
DAY *14* MO. *7* YR. *77*

OFFICE USE ONLY

DATA SOURCE  
*1*

CONTRACTOR  
*4767*

DATE RECEIVED  
*2-20-77*

DATE OF INSPECTION  
*JUNE 13/78*

INSPECTOR  
*M. DAI*

REMARKS  
*Was 350 4688*

CS.S.S.4

FORM NO. 0506-4-77

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

11

3505550

MUNICIPALITY 35012

CON 31 F/10

LOT 003

COUNTY OR DISTRICT: [REDACTED] TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: RAMSAT CON. BLOCK, TRACT, SURVEY, ETC.: 10 DATE COMPLETED: DAY 16 MO 08 YR 79

WELL NO.: 003200 RC: 5 ELEVATION: 0400 RC: 5 BASIN CODE: 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	Sand		Fine	0	2
Brown	Shail		Hard	2	68

31 0002608 006861773

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
0052 52-63	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
06 6 1/4	1 <input checked="" type="checkbox"/> STEEL		188	0 (002.3)
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			

SCREEN

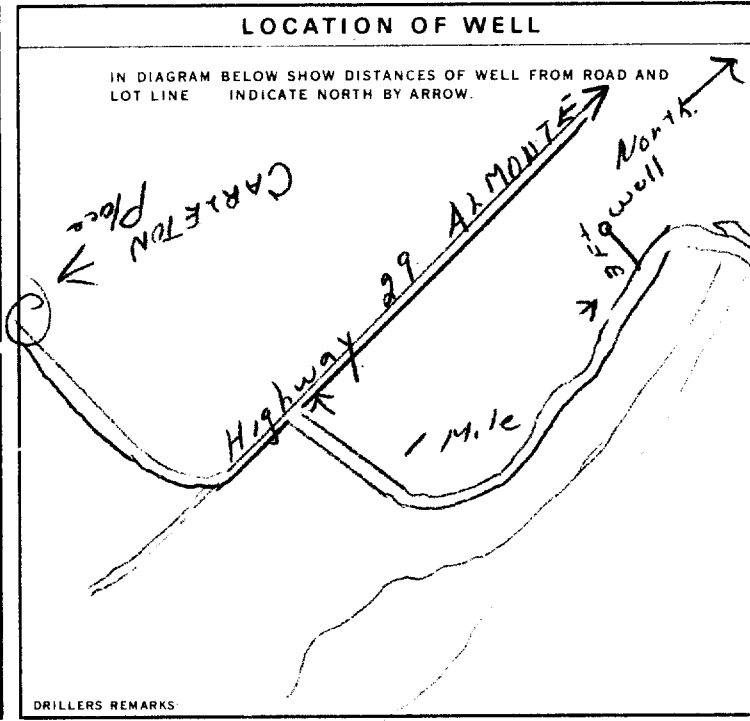
SIZE (S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
	INCHES	FEET
MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN
		41-44
		30

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD: 1 <input checked="" type="checkbox"/> PUMP 2 <input checked="" type="checkbox"/> BAILER	PUMPING RATE: 007.5 GPM	DURATION OF PUMPING: 02 HOURS 30 MINS
STATIC LEVEL: 072.2 FEET	WATER LEVEL END OF PUMPING: 079 FEET	WATER LEVELS DURING: 15 MINUTES: 072.2 FEET
RECOMMENDED PUMP TYPE: 4 DEEP	RECOMMENDED PUMP SETTING: 050 FEET	RECOMMENDED PUMPING RATE: 002.5 GPM



FINAL STATUS OF WELL: 1

WATER USE: 01

METHOD OF DRILLING: 1

CONTRACTOR: BOYD CAMERON LICENCE NUMBER: 1567

ADDRESS: R.R. 2 CLATTON

SIGNATURE OF CONTRACTOR: Boyd Cameron SUBMISSION DATE: DAY 18 MO 8 YR 79

OFFICE USE ONLY

DATA SOURCE: 1 1567 CONTRACTOR: 59-62 DATE RECEIVED: 011079

DATE OF INSPECTION: INSPECTOR:

REMARKS: 70

# WATER WELL RECORD

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

11 3507000 MUNICIPAL 35012 CON 09  
 COUNTY OR DISTRICT: Lanark TOWNSHIP, BOROUGH CITY, TOWN VILLAGE: Ramsay CON. BLOCK TRACT, SURVEY, ETC.: 9 IX LOT 25-27: 003  
 DATE COMPLETED: 28 MO 11 YR 84  
 ELEVATION: 03299 5 0425 5 216

## LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
grey	Soil 93 Feet Limestone			0	3
				3	65

MAY 28 1984

31 0003 0212 00652115  
 32

### 41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
0060	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	
	2 <input type="checkbox"/> SALTY			

### 51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
06	1 <input checked="" type="checkbox"/> STEEL	188	0	20
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			

### SCREEN

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

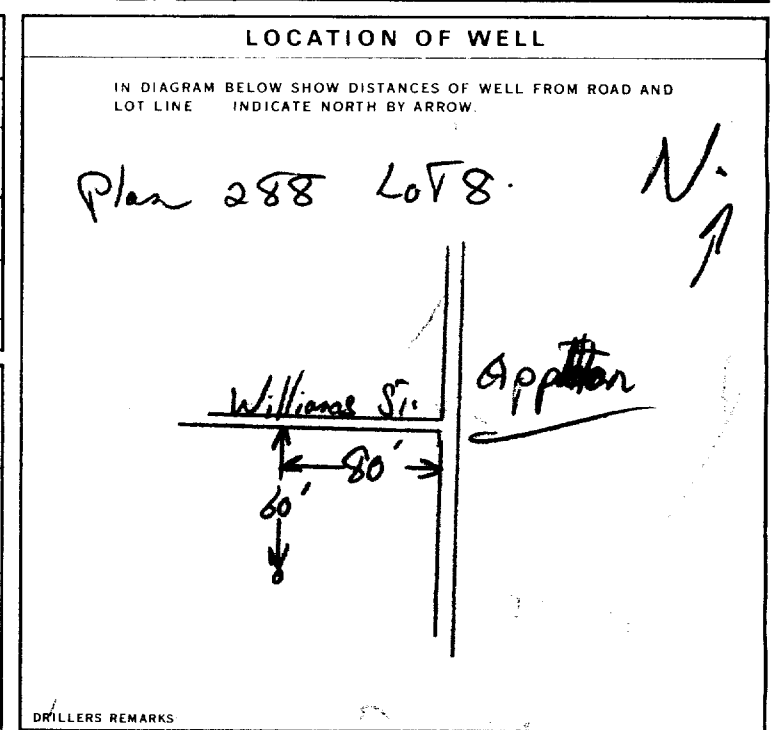
### 61 PLUGGING & SEALING RECORD

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

### 71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input checked="" type="checkbox"/> PUMP	0015 GPM	00 HOURS 30 MINS

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



### FINAL STATUS OF WELL

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

### WATER USE

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

### METHOD OF DRILLING

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

### CONTRACTOR

NAME OF WELL CONTRACTOR: Air-Rock Drilling Co Ltd LICENCE NUMBER: 1119  
 ADDRESS: RR# 2 Jasper Ont  
 NAME OF DRILLER OR BORER: Wallace Desautniers LICENCE NUMBER: 1119  
 SIGNATURE OF CONTRACTOR: Wallace Desautniers SUBMISSION DATE: 1984 MO 2 YR 84

### OFFICE USE ONLY

DATA SOURCE: 1 CONTRACTOR: 1119 DATE RECEIVED: 06 03 85  
 DATE OF INSPECTION: INSPECTOR: CSSES  
 REMARKS: CSSES

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

3507253

35012

CON

110

COUNTY OR DISTRICT <b>LANARK</b>	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE <b>RAMSAY</b>	CON., BLOCK, TRACT, SURVEY, ETC. <b>10</b>	LOT 25-27 <b>3</b>
OWNER (SURNAME FIRST) <b>HALLIDAY</b>	ADDRESS <b>HOMES P.O. BOX 340 CARLETON PLACE</b>	DATE COMPLETED DAY <b>4</b> MO. <b>12</b> YR. <b>85</b>	

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<b>BROWN</b>	<b>SAND</b>	<b>GRAVEL</b>	<b>STONE'S</b>	<b>0'</b>	<b>10'</b>
<b>GREY</b>	<b>LIMESTONE</b>			<b>10'</b>	<b>65'</b>

31  
32

WATER FOUND AT - FEET	KIND OF WATER
10-13 <b>63</b>	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11 <b>6 1/4"</b>	1 <input checked="" type="checkbox"/> STEEL 12 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE	<b>1.88</b>	<b>0'</b>	<b>20'</b>
17-18 <b>6"</b>	4 <input checked="" type="checkbox"/> OPEN HOLE 1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE		<b>20'</b>	<b>65'</b>
24-25	1 <input type="checkbox"/> STEEL 26 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			<b>27-30</b>

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

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

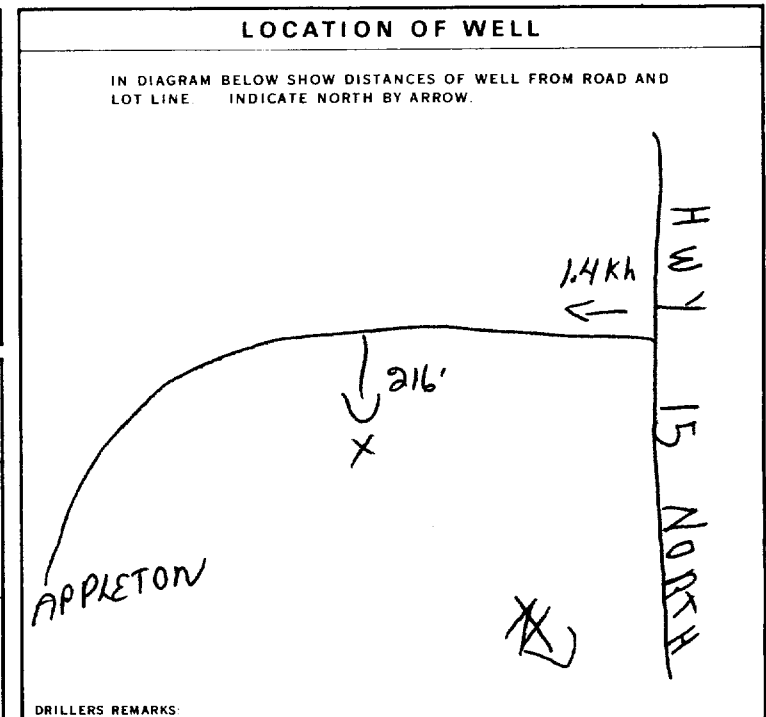
PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input type="checkbox"/> PUMP 2 <input checked="" type="checkbox"/> BAILER	<b>20</b> GPM	15-16 HOURS 17-18 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING			
19-21 <b>28</b> FEET	22-24 <b>40</b> FEET	15 MINUTES <b>40</b> FEET	30 MINUTES <b>40</b> FEET	45 MINUTES <b>40</b> FEET	60 MINUTES <b>40</b> FEET

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	<b>50</b> FEET	<b>7</b> GPM



FINAL STATUS OF WELL	WATER USE	METHOD OF DRILLING
1 <input checked="" type="checkbox"/> WATER SUPPLY 2 <input type="checkbox"/> OBSERVATION WELL 3 <input type="checkbox"/> TEST HOLE 4 <input type="checkbox"/> RECHARGE WELL	1 <input checked="" type="checkbox"/> DOMESTIC 2 <input type="checkbox"/> STOCK 3 <input type="checkbox"/> IRRIGATION 4 <input type="checkbox"/> INDUSTRIAL 5 <input type="checkbox"/> OTHER	1 <input checked="" type="checkbox"/> CABLE TOOL 2 <input type="checkbox"/> ROTARY (CONVENTIONAL) 3 <input type="checkbox"/> ROTARY (REVERSE) 4 <input type="checkbox"/> ROTARY (AIR) 5 <input type="checkbox"/> AIR PERCUSSION

NAME OF WELL CONTRACTOR <b>M. KAUNAGH &amp; SON WELL DRILLING</b>	LICENCE NUMBER <b>3142</b>
ADDRESS <b>RR 2 CARLETON PLACE</b>	
NAME OF DRILLER OR BORER <b>MIKE KAUNAGH</b>	LICENCE NUMBER <b>3142</b>
SIGNATURE OF CONTRACTOR <i>M. Kaunagh</i>	SUBMISSION DATE DAY <b>5</b> MO. <b>12</b> YR. <b>85</b>

DATA SOURCE	CONTRACTOR <b>3142</b>	DATE RECEIVED <b>31 12 85</b>
DATE OF INSPECTION	INSPECTOR	
REMARKS		



Measurements recorded in:  Metric  Imperial

NO TAG FOUND

5-16427 Page \_\_\_\_\_ of \_\_\_\_\_

Address of Well Location (Street Number/Name): **480 River Rd** Township: \_\_\_\_\_ Lot: \_\_\_\_\_ Concession: \_\_\_\_\_  
 County/District/Municipality: \_\_\_\_\_ City/Town/Village: **Appleton** Province: **Ontario** Postal Code: \_\_\_\_\_  
 UTM Coordinates: Zone **18** Easting **41116411** Northing **50103300** Municipal Plan and Sublot Number: \_\_\_\_\_ Other: \_\_\_\_\_

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

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

**Annular Space**

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	0.31	Topsoil	
0.31	1.22	Benseal	
1.22	3.45	Grout slurry	

**Results of Well Yield Testing**

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

**Method of Construction**

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

**Construction Record - Casing**

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
3.45	PVC	.356			<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input checked="" type="checkbox"/> Abandoned, other, specify <b>not needed</b> <input type="checkbox"/> Other, specify _____

**Construction Record - Screen**

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

**Water Details**

Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	0	1.5	4.21
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____			
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____			

**Well Contractor and Well Technician Information**

Business Name of Well Contractor: **Strata Drilling Group** Well Contractor's Licence No.: **72411**  
 Business Address (Street Number/Name): **165 shields crt** Municipality: **Markham**  
 Province: **ON** Postal Code: **L3R8V2** Business E-mail Address: **wrecords@stratasoil.com**  
 Bus. Telephone No. (inc. area code): **905/764/9304** Name of Well Technician (Last Name, First Name): **Beatty Brian**  
 Well Technician's Licence No.: **36116** Signature of Technician and/or Contractor: \_\_\_\_\_ Date Submitted: **2014/12/12**

**Map of Well Location**

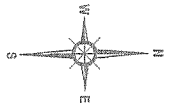
Please provide a map below following instructions on the back.

See map  
wrt #21  
BH-12

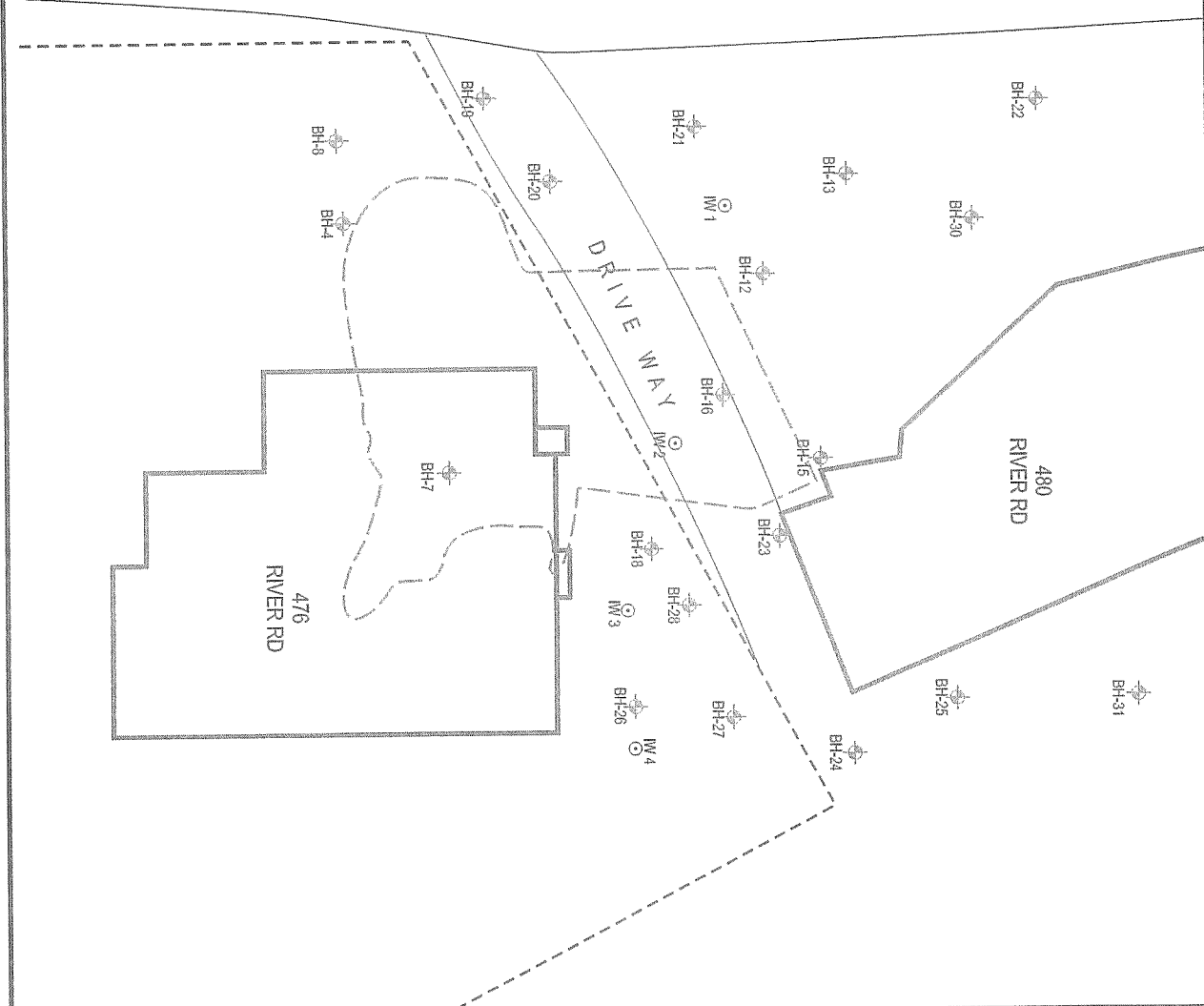
Comments: \_\_\_\_\_

Well owner's information package delivered <input type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered: _____ Date Work Completed: <b>2014/12/09</b>	<b>Ministry Use Only</b> Audit No. <b>Z 198167</b> Received _____
---	---	---

MISSISSIPPI RIVER



RIVER ROAD



5-16427

LEGEND:

- APPROXIMATE LOCATION OF MONITORING WELL.
- APPROXIMATE LOCATION OF INJECTION WELL.
- APPROXIMATE AREA OF REMEDIAL EXCAVATIONS
- BUILDING



**CONCENTRIC ASSOCIATES INTERNATIONAL**

**LONDON** Tel. 1-519-452-7700  
 Tel. Fax 1-888-919-4531

**OTTAWA** Tel. 1-513-324-8930  
 Tel. Fax 1-888-919-4530

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YOU CHALLENGE US... TOGETHER WE SUCCEED  
[www.concentriceng.com](http://www.concentriceng.com)

CLIENT NAME: AMWA CANADA

PROJECT ADDRESS: 476/480 RIVER ROAD  
APPLETON, ONTARIO

PROJECT NAME: 476 RIVER ROAD HEATING OIL SPILL

DRAWING TITLE: SITE PLAN

DESIGN: KS | SCALE: NTS

DRAWN: KS | DATE: MAR2014

APP/PD: CH | FILE No.: 06-1478-E

SHEET No.

FIG 2

5-16427 C-7211 2F8167

Measurements recorded in:  Metric  Imperial

**Well Owner's Information**

First Name: \_\_\_\_\_ Last Name / Organization: **Carigate Development Inc.** E-mail Address: \_\_\_\_\_  Well Constructed by Well Owner

Mailing Address (Street Number/Name): **Box 44** Municipality: **Carleton Place** Province: **ON** Postal Code: **K7C 3P3** Telephone No. (inc. area code): \_\_\_\_\_

**Well Location**

Address of Well Location (Street Number/Name): **#116-#122 Old Mill Lane** Township: **Ramsay/Mississippi Mills** Lot: **P/L 4** Concession: **10**

County/District/Municipality: **Lanark** City/Town/Village: **Appleton** Province: **Ontario** Postal Code: \_\_\_\_\_

UTM Coordinates Zone: **18** Easting: **411380** Northing: **5003662** Municipal Plan and Sublot Number: **Plan 288** Other: **Lot 7**

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
From	To			From To
	Sand			0' 4'
Grey & Brown	Limestone			4' 65'
Grey & Brown	Limestone			65' 71'

*\*RP27R9884 Parts 1 to 4 / RP26 R 26 78 Parts 4, 9, 17, 18 & 28\**

**TEST WELL #1 OF 3**

**Annular Space**

Depth Set at (m/ft): From **20'** To **0'** Type of Sealant Used (Material and Type): **Neat cement** Volume Placed (m<sup>3</sup>/ft<sup>3</sup>): **10.9**

**Method of Construction**

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

**Construction Record - Casing**

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	
			From	To
<b>6 1/4"</b>	<b>Steel</b>	<b>.188"</b>	<b>+2'</b>	<b>20'</b>
<b>6"</b>	<b>Open Hole</b>		<b>20'</b>	<b>71'</b>

**Status of Well**

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

**Construction Record - Screen**

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

**Water Details**

Water found at Depth **65'** (m/ft)  Gas  Fresh  Untested  Other, specify \_\_\_\_\_

Water found at Depth \_\_\_\_\_ (m/ft)  Gas  Fresh  Untested  Other, specify \_\_\_\_\_

Water found at Depth \_\_\_\_\_ (m/ft)  Gas  Fresh  Untested  Other, specify \_\_\_\_\_

**Well Contractor and Well Technician Information**

Business Name of Well Contractor: **Air Rock Drilling Co. Ltd.** Well Contractor's Licence No.: **1119**

Business Address (Street Number/Name): **6659 Franktown Road, RR#1** Municipality: **Richmond**

Province: **ON** Postal Code: **K0A 2Z0** Business E-mail Address: **air-rock@sympatico.ca**

Bus. Telephone No. (inc. area code): **613882170** Name of Well Technician (Last Name, First Name): **Hanna, Jeremy**

Well Technician's Licence No.: **T 3632** Signature of Technician and/or Contractor: \_\_\_\_\_ Date Submitted: **08 30 2015**

**Results of Well Yield Testing**

After test of well yield, water was:  Clear and sand free  Other, specify **Not tested**

If pumping discontinued, give reason: **X**

Pump intake set at (m/ft): **60**

Pumping rate (l/min / GPM): **20**

Duration of pumping: **1 hrs + 0 min**

Final water level end of pumping (m/ft): **37.5"**

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

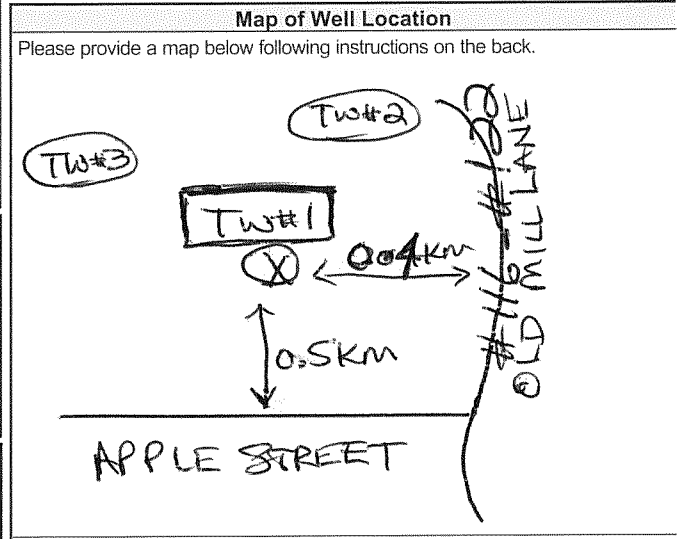
Recommended pump depth (m/ft): **60'**

Recommended pump rate (l/min / GPM): **20**

Well production (l/min / GPM): **20 +**

Disinfected?  Yes  No

Time (min)	Draw Down (m/ft)		Recovery (m/ft)	
	Water Level	Static Level	Time	Water Level
	<b>36.2"</b>	<b>37.5"</b>		
1	<b>36.5</b>		1	<b>36.8</b>
2	<b>36.7</b>		2	<b>36.5</b>
3	<b>36.9</b>		3	<b>36.2</b>
4	<b>37</b>		4	<b>36.2</b>
5	<b>37</b>		5	<b>36.2</b>
10	<b>37.2</b>		10	<b>36.2</b>
15	<b>37.5</b>		15	<b>36.2</b>
20	<b>37.5</b>		20	<b>36.2</b>
25	<b>37.5</b>		25	<b>36.2</b>
30	<b>37.5</b>		30	<b>36.2</b>
40	<b>37.5</b>		40	<b>36.2</b>
50	<b>37.5</b>		50	<b>36.2</b>
60	<b>37.5"</b>		60	<b>36.2"</b>



Comments: **1/2 HP - 10 GPM SET @ 60 FT TEST WELL #1 OF 3**

Well owner's information package delivered:  Yes  No

Date Package Delivered: **2015 06 24**

Date Work Completed: **2015 06 22**

**Ministry Use Only**

Audit No: **Z191501**

Rec: **JUL 21 2015**

Measurements recorded in:  Metric  Imperial

Well Owner's Information

First Name: \_\_\_\_\_ Last Name / Organization: **Carlgate Development Inc.** E-mail Address: \_\_\_\_\_  Well Constructed by Well Owner

Mailing Address (Street Number/Name): **Box 44** Municipality: **Carleton Place** Province: **ON** Postal Code: **K7C 3P3** Telephone No. (inc. area code): \_\_\_\_\_

Well Location

Address of Well Location (Street Number/Name): **#116-#122 Old Mill Lane** Township: **Ramsay/Mississippi Mills** Lot: **P/L 4** Concession: **10**

County/District/Municipality: **Lanark** City/Town/Village: **Appleton** Province: **Ontario** Postal Code: \_\_\_\_\_

UTM Coordinates Zone: **18** Easting: **411297** Northing: **5003615** Municipal Plan and Sublot Number: **Plan 288** Other: **Lot 7**

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m)	Depth (ft)
	Sand	Backfill		0'	12'
Grey & Brown	Limestone			12'	39'
Grey & Brown	Limestone			39'	60'
Grey & Brown	Limestone			60'	67'

\* R127R9884 Parts 1 to 4 / R126R2678 Parts 4, 9, 17, 18 & 28 \*

TEST WELL # 3 OF 3

Annular Space		
Depth Set at (m)	Type of Sealant Used (Material and Type)	Volume Placed (m <sup>3</sup> )
21' - 0'	Neat cement	10.9

Method of Construction	Well Use
<input type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary (Conventional) <input type="checkbox"/> Rotary (Reverse) <input type="checkbox"/> Boring <input checked="" type="checkbox"/> Air percussion <input type="checkbox"/> Other, specify _____	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input type="checkbox"/> Industrial <input type="checkbox"/> Other, specify _____

Construction Record - Casing				Status of Well	
Inside Diameter (cm)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm)	Depth (m)	<input checked="" type="checkbox"/> Water Supply	<input type="checkbox"/> Replacement Well
			From To		
6 1/4"	Steel	.188"	+2' 21'		<input type="checkbox"/> Test Hole
6"	Open Hole		21' 67'		<input type="checkbox"/> Recharge Well

Construction Record - Screen				Status of Well
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m)	
			From To	
				<input type="checkbox"/> Observation and/or Monitoring Hole

Water Details		Hole Diameter	
Water found at Depth: 39 (m)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Depth (m)	Diameter (cm/in)
Water found at Depth: 60 (m)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	0' 21'	9 3/4"
Water found at Depth: _____ (m)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	21' 67'	6"

Well Contractor and Well Technician Information

Business Name of Well Contractor: **Air Rock Drilling Co. Ltd.** Well Contractor's Licence No.: **1119**

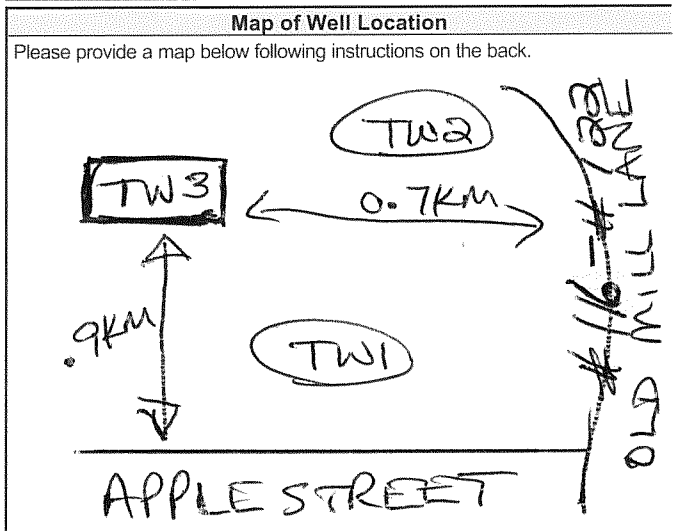
Business Address (Street Number/Name): **6059 Franktown Road, RR#1** Municipality: **Richmond**

Province: **ON** Postal Code: **K0A 2Z0** Business E-mail Address: **air-rock@sympatico.ca**

Bus. Telephone No. (inc. area code): **6138382170** Name of Well Technician (Last Name, First Name): **Hanna, Jeremy**

Well Technician's Licence No.: **T3632** Signature of Technician and/or Contractor: \_\_\_\_\_ Date Issued: **2015 06 30**

Results of Well Yield Testing				
After test of well yield, water was: <input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify <b>Not tested</b>	Draw Down		Recovery	
	Time (min)	Water Level (m)	Time (min)	Water Level (m)
If pumping discontinued, give reason:  <b>X</b> Pump intake set at (m) <b>50</b> Pumping rate (l/min / GPM) <b>20</b> Duration of pumping <b>1 hrs + 0 min</b> Final water level end of pumping (m) <b>22'</b> If flowing give rate (l/min / GPM) <b>X</b> Recommended pump depth (m) <b>50</b> Recommended pump rate (l/min / GPM) <b>20</b> Well production (l/min / GPM) <b>20+</b> Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Static Level	19' 4"	22'	
	1	21.2	1	20.1
	2	21.4	2	19.8
	3	21.4	3	19.5
	4	21.5	4	19.4
	5	21.6	5	19.4
10	21.8	10	19.4	
15	22	15	19.4	
20	22	20	19.4	
25	22	25	19.4	
30	22	30	19.4	
40	22	40	19.4	
50	22	50	19.4	
60	22'	60	19.4'	



Comments:  
**1/2 HP - 10 GPM SET @ 50 FT**  
**TEST WELL # 3 OF 3**

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
<input checked="" type="checkbox"/> Yes	<b>2015 06 24</b>	Audit No. <b>Z191490</b>
<input type="checkbox"/> No	Date Work Completed <b>2015 06 23</b>	<b>JUL 21 2015</b>

UTM 18 411600 E  
9 R 5003575 N  
 Elev. 9 R 0403  
 Basin 25



35 No. 2131  
 RECEIVED

The Water-well Drillers Act, 1954  
 Department of Mines

# Water-Well Record

County or Territorial District Lanark Township, Village, Town or City Ramsay  
 in Village, Town or City).....  
 Address Appleton  
 (day) (month) (year)

Pipe and Casing Record

Pumping Test

Casing diameter(s) 5"  
 Length(s) 22'  
 Type of screen .....  
 Length of screen .....

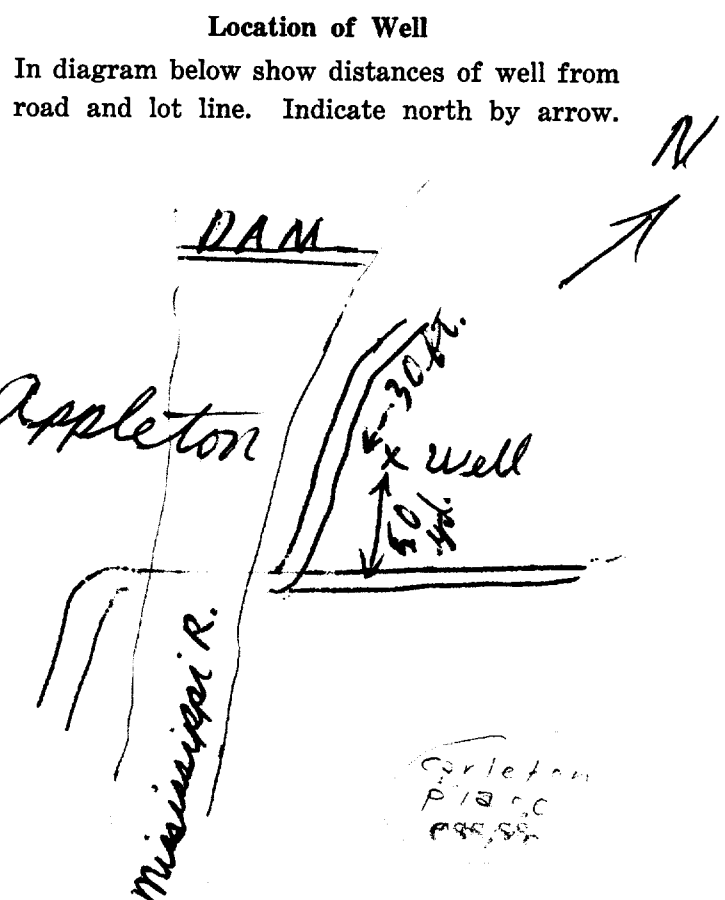
Static level 25'  
 Pumping rate 1000 gall per hr.  
 Pumping level 40'  
 Duration of test 1 hr.

Well Log

Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth (s) at which water (s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
<u>sandy loam</u>	<u>0</u>	<u>10'</u>	<u>60'</u>	<u>35'</u>	<u>fresh</u>
<u>hard limestone</u>	<u>10'</u>	<u>67'</u>			

For what purpose(s) is the water to be used?  
house  
 Is water clear or cloudy?..... Clear  
 Is well on upland, in valley, or on hillside?.....  
hillside  
 Drilling firm W. V. Nugent  
 Address Lanark  
 Name of Driller Cecil Munro  
 Address Lanark  
 Licence Number 1077  
 I certify that the foregoing statements of fact are true.  
 Date Sept 30 Cecil Munro  
 Signature of Licensee



317 1/2 East

GROUND WATER BRANCH  
3501 N<sup>o</sup> 19502130  
ONTARIO WATER  
RESOURCES COMMISSION



ONTARIO

The Water-well Drillers Act, 1954

Department of Mines

# Water-Well Record

UTM 18 4 1 1 6 0 0 E

9 R 5 0 0 3 7 2 5 N

Elev. 9 R 0 4 0 0

Basin 2 5

County or Territorial District Lambton Township, Village, Town or City Paris

in Village, Town or City

Address Appleton

(day) (month) (year)

## Pipe and Casing Record

## Pumping Test

Casing diameter (s) 6 1/2  
Length (s) 18  
Type of screen M  
Length of screen 14

Static level 2 1/2  
Pumping rate 800 gals/hr  
Pumping level 5 1/2  
Duration of test 1 hr

## Well Log

## Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth (s) at which water (s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
<u>sand loam</u>	<u>0</u>	<u>4'</u>	<u>65'</u>	<u>45'</u>	<u>fresh</u>
<u>shaly limestone</u>	<u>4</u>	<u>15'</u>			
<u>hard limestone</u>	<u>15'</u>	<u>71'</u>			

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

Is water clear or cloudy? clear

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

Drilling firm M. V. Hagan

Address Lambton

Name of Driller Carl Hagan

Address Lambton

Licence Number 1077

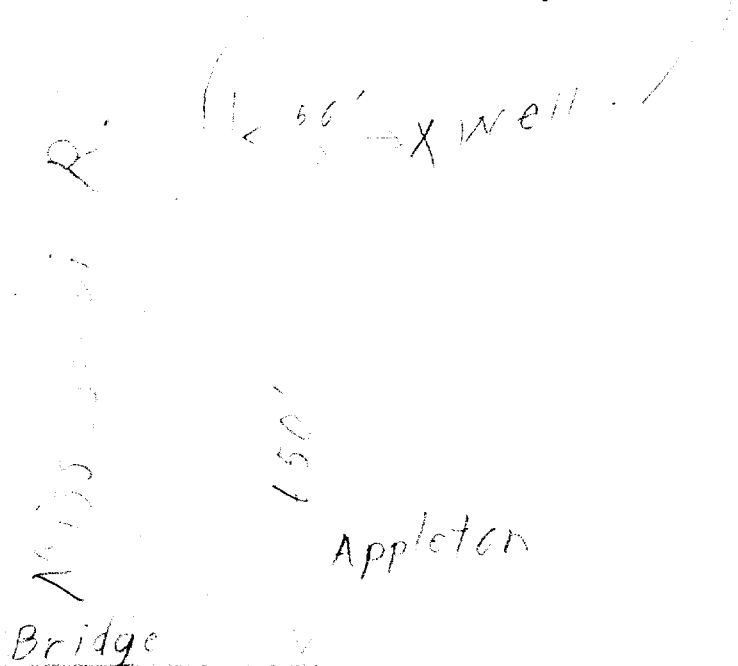
I certify that the foregoing statements of fact are true.

Date June 28 Carl Hagan

Signature of Licensee

## Location of Well

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





GROUND WATER BRANCH  
35 No. 2133  
JUL 14 1958  
ONTARIO WATER RESOURCES COMMISSION

UTM 18 4 1 1 6 6 0 E  
9 R 5 0 0 3 4 5 0 N  
Elev. 9 R 0 4 1 0  
Basin 2 5

The Water-well Drillers Act, 1954  
Department of Mines

# Water-Well Record

County or Territorial District Lanark Township, Village, Town or City Southey  
in Village, Town or City Southey  
Address Apportion  
(day) (month) (year)

## Pipe and Casing Record

## Pumping Test

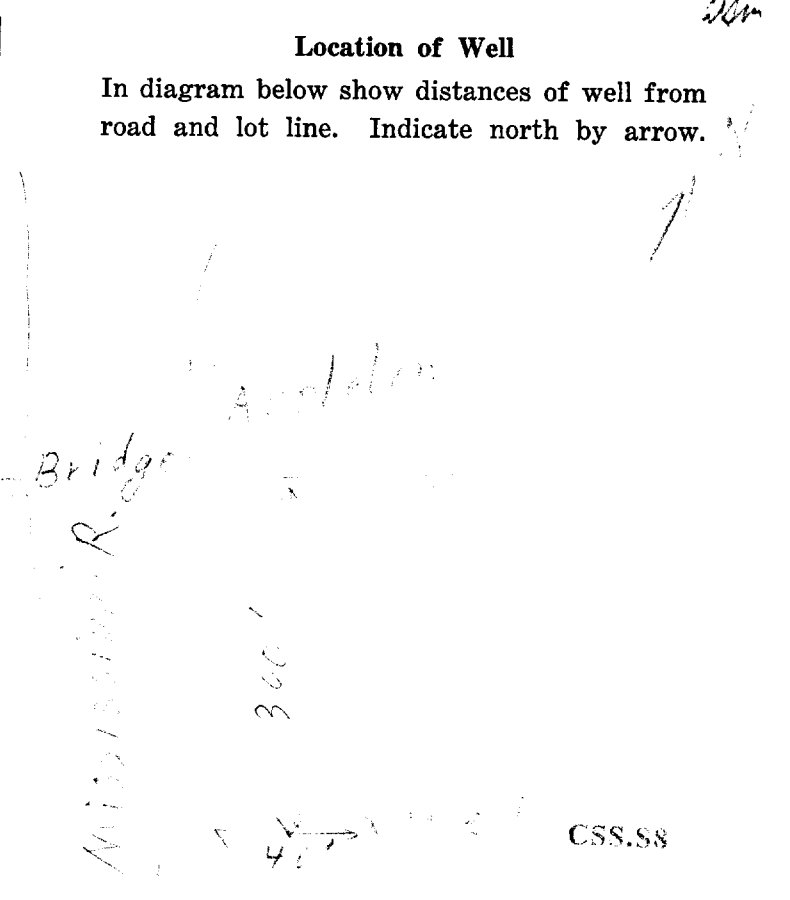
Casing diameter(s) 6 1/2 Static level 20'  
Length(s) 235 Pumping rate 500 gpm  
Type of screen 1/2 Pumping level 45'  
Length of screen 15 Duration of test 1 hr

## Well Log

## Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth (s) at which water (s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
<u>sand loam</u>	<u>0</u>	<u>5'</u>	<u>55'</u>	<u>35'</u>	<u>fresh</u>
<u>clay loam</u>	<u>5</u>	<u>15'</u>			
<u>20' sandstone</u>	<u>15</u>	<u>60'</u>			

For what purpose(s) is the water to be used? drinking  
Is water clear or cloudy? clear  
Is well on upland, in valley, or on hillside? upland  
Drilling firm M. J. Nugent  
Address Lanark  
Name of Driller Leslie Williams  
Address Lanark  
Licence Number 1727  
I certify that the foregoing statements of fact are true.  
Date July 14 1958  
Signature of Licensee Leslie Williams



UTM 18 4 11 6 5 0 E

9 R 5 0 0 3 5 1 5 N

Elev. 9 0 4 0 8

Basin 2 5 3



ONTARIO

The Water-well Drillers Act, 1954  
Department of Mines

GROUND WATER BRANCH  
35 No. 2134  
AUG 5 1958  
ONTARIO WATER RESOURCES COMMISSION

# Water-Well Record

County or Territorial District Lanark Township, Village, Town or City Ramsay  
in Village, Town or City  
Address Appelton  
(day) (month) (year)

## Pipe and Casing Record

## Pumping Test

Casing diameter(s) <u>6 1/2"</u>	Static level <u>30'</u>
Length(s) <u>16'</u>	Pumping rate <u>800 gal per hr</u>
Type of screen <u>N.S.</u>	Pumping level <u>40'</u>
Length of screen <u>16'</u>	Duration of test <u>1 hr</u>

## Well Log

## Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth (s) at which water (s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
<u>sand loam</u>	<u>0</u>	<u>2'</u>	<u>58'</u>	<u>28'</u>	<u>fresh</u>
<u>shaly blue limestone</u>	<u>2'</u>	<u>12'</u>			
<u>hard brown limestone</u>	<u>12'</u>	<u>64'</u>			

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

Is water clear or cloudy? Clear

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

Drilling firm M. V. Suggart

Address Lanark

Name of Driller Cecil Munro

Address Lanark

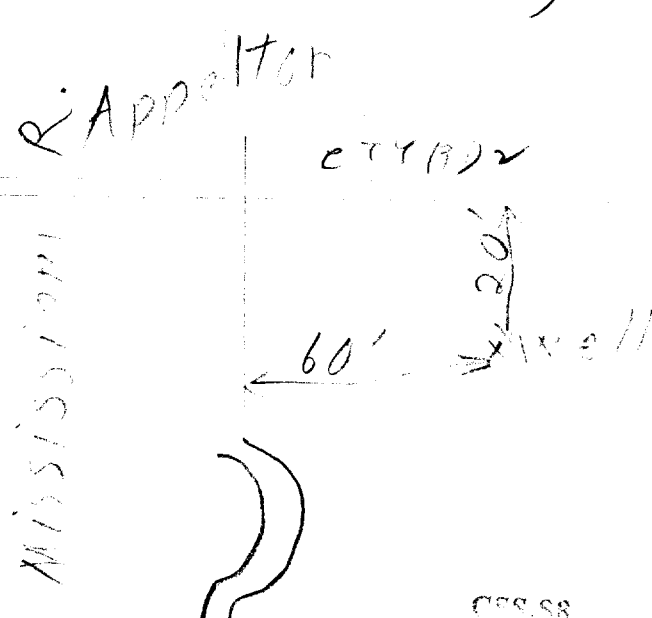
Licence Number 1077

I certify that the foregoing statements of fact are true.

Date July 16 Cecil Munro  
Signature of Licensee

## Location of Well

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





317/1 east

UTM 18 411640 E



35 No 2136  
GROUND WATER BRANCH  
D 1141373  
ONTARIO WATER RESOURCES COMMISSION

5 R 5003550 N

Elev 5 R 30406

The Ontario Water Resources Commission Act, 1957

Basin 25

# WATER WELL RECORD

County or District Sanack Township, Village, Town or City Ramsay  
Date completed 4 Nov 59  
(day month year)  
Address Appleton ont

### Casing and Screen Record

### Pumping Test

Inside diameter of casing 6.4  
Total length of casing 9  
Type of screen X  
Length of screen X  
Depth to top of screen X  
Diameter of finished hole 6

Static level 29  
Test-pumping rate 1 G.P.M.  
Pumping level 45  
Duration of test pumping 1 hr.  
Water clear or cloudy at end of test clear  
Recommended pumping rate 1 G.P.M.  
with pumping level of 45

### Well Log

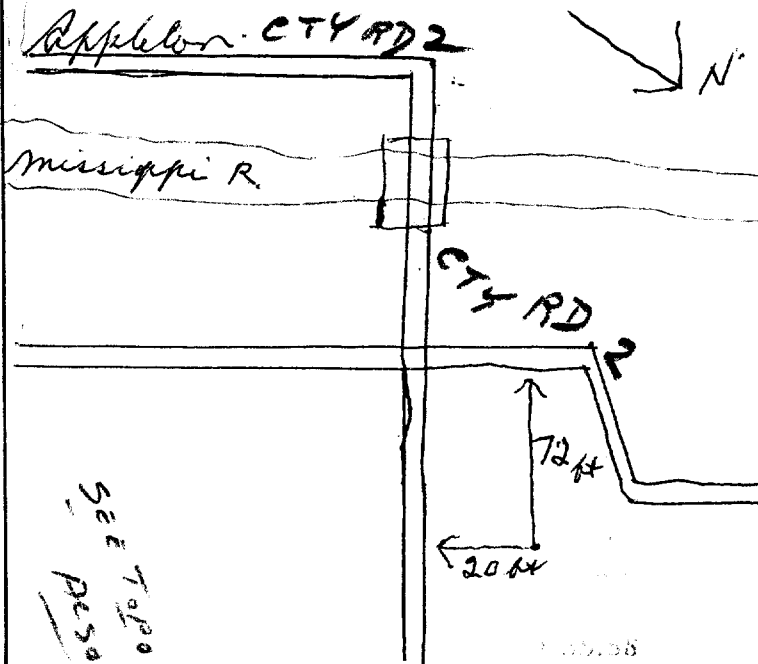
### Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, sulphur)
<u>Sand.</u>	<u>0</u>	<u>2</u>	<u>65</u>	<u>36</u>	<u>Fresh.</u>
<u>shale</u>	<u>2</u>	<u>7</u>			
<u>Sandstone</u>	<u>7</u>	<u>69</u>			

For what purpose(s) is the water to be used?  
House  
Is well on upland, in valley, or on hillside?  
Hillside  
Drilling Firm W.V. Nugent  
Address Sanack  
Licence Number 104  
Name of Driller Stewart Woods  
Address Sanack  
Date Nov 24  
W.V. Nugent  
(Signature of Licensed Drilling Contractor)

### Location of Well

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



3171 east



35 No 2140

UTM 18 4 11 6 0 0 E

5 5 0 0 3 7 5 0 N

The Ontario Water Resources Commission Act

Elev. 4 5 0 4 0 0

# WATER WELL RECORD

Basin 25 County or District LANARK

Township, Village, Town or City Ramsay

Con. 10 Lot 7

Date completed 26<sup>th</sup> October 1966

Address APPLETON DNT

### Casing and Screen Record

Inside diameter of casing 6 1/4"  
 Total length of casing 21'  
 Type of screen  
 Length of screen  
 Depth to top of screen  
 Diameter of finished hole 6"

### Pumping Test

Static level 25'  
 Test-pumping rate 25' G.P.M.  
 Pumping level 35'  
 Duration of test pumping 30 min  
 Water clear or cloudy at end of test clear  
 Recommended pumping rate 5' G.P.M.  
 with pump setting of 65' feet below ground surface

### Well Log

### Water Record

#### Overburden and Bedrock Record

From ft.

To ft.

Depth(s) at which water(s) found

Kind of water (fresh, salty, sulphur)

sand loams stones	0	2		
broken layer of sandstone	2	6		
sandstone rock	6	25'		
limestone rock	25'	85'	70.	fresh.

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

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

Drilling or Boring Firm Melville M. Laughlin

Address Appleton Ont.

Licence Number 1637

Name of Driller or Borer Melville M. Laughlin

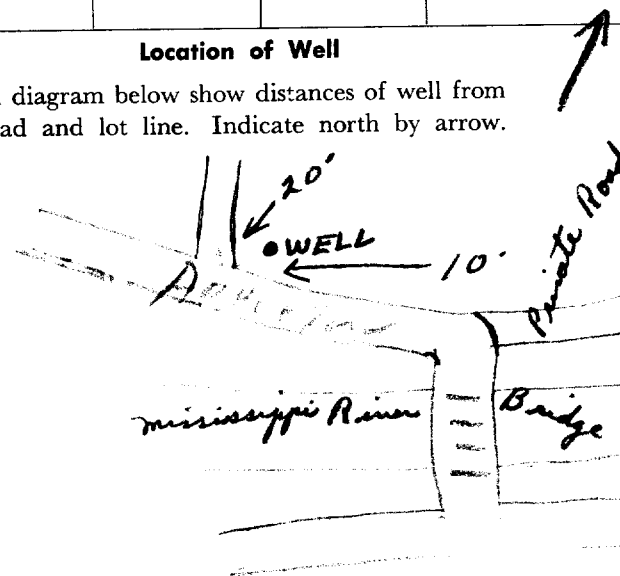
Address Appleton Ont.

Date October 27 1966

Melville M. Laughlin  
(Signature of Licensed Drilling or Boring Contractor)

### Location of Well

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





# WATER WELL RECORD

31F/1K

Water management in Ontario

PRINT ONLY IN SPACES PROVIDED

2. CHECK  CORRECT BOX WHERE APPLICABLE

11

3502471

MUNICIP.

35012

CON.

CdN

10

COUNTY OR DISTRICT

Lanark

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE

Ramsay Appleton

CON., BLOCK, TRACT, SURVEY, ETC.

10 X

LOT

8003

DATE COMPLETED

08 69

DAY 22 MO Aug. YR 1969

03460

0356

25

## LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
grey		occasional shellow layer of sand.	clay limestone	0	80

31 0003205 0080 15

32

### 41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
0065	<input checked="" type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL

### 51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
06	STEEL	1.98	0	30
06	STEEL		30	80

### SCREEN

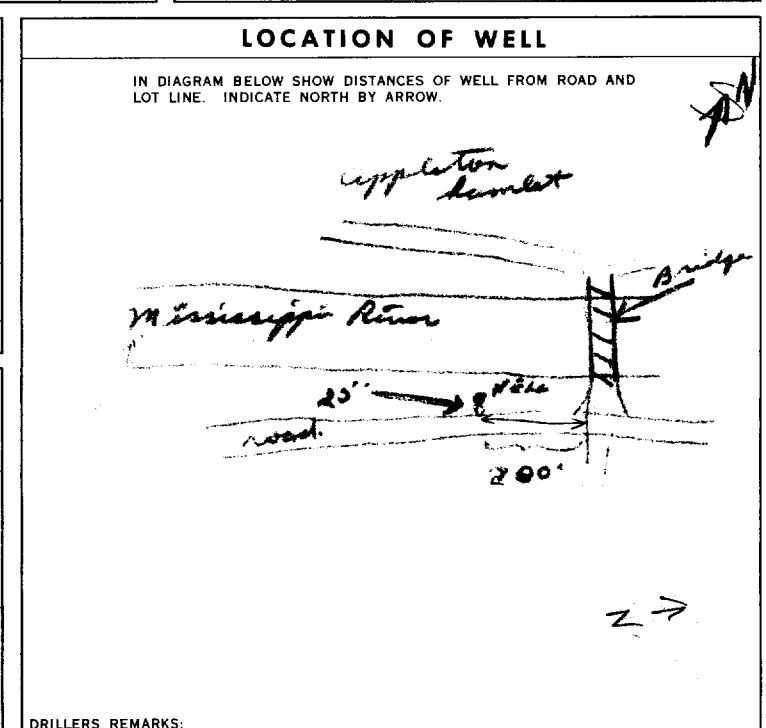
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

### 61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	
18-21	
26-29	

### 71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
<input checked="" type="checkbox"/> PUMP <input checked="" type="checkbox"/> BAILER	0015 GPM.	01 15-16 HOURS 30 MINS.
STATIC LEVEL	WATER LEVELS DURING PUMPING	
023 FEET	15 MINUTES 030 FEET	30 MINUTES 030 FEET
030 FEET	45 MINUTES 030 FEET	60 MINUTES 030 FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
		CLEAR
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
SHALLOW		
50-53 002.1 GPM./FT. SPECIFIC CAPACITY		



### FINAL STATUS OF WELL

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

### WATER USE

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

### METHOD OF DRILLING

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

### CONTRACTOR

NAME OF WELL CONTRACTOR: Mel M. Langhlin  
 LICENCE NUMBER: 3339  
 ADDRESS: Appleton Ont.  
 NAME OF DRILLER OR BORER: Melville M. Langhlin  
 LICENCE NUMBER: 3339  
 SIGNATURE OF CONTRACTOR: Melville M. Langhlin  
 SUBMISSION DATE: DAY 30 MO Aug. YR 69

### OFFICE USE ONLY

DATA SOURCE: 1  
 CONTRACTOR: 3503  
 DATE RECEIVED: 260969  
 DATE OF INSPECTION: 11/1/71  
 INSPECTOR: P/L  
 REMARKS: SA



# The Ontario Water Resources Commission Act WATER WELL RECORD

3:46

Water management in Ontario 1. PRINT ONLY IN SPACES PROVIDED

2. CHECK  CORRECT BOX WHERE APPLICABLE

11 3503278 35012 301 10

COUNTY OR DISTRICT: Lanark TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Ramsay

LOT: 103

DATE COMPLETED: DAY 23 MO 10 YR 72

ADDRESS: R#3 Almonte Ont.

GRID: 22 23 24 25 26 27 28 29 30 31

### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
fill gray	fill Limestone			0	3
				3	54

31 0003 01 0084 215

32

#### 41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	14
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	19
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	24
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	29
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	34-80

#### 51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
9.6	1 <input checked="" type="checkbox"/> STEEL	12	0	0025
6.7	2 <input type="checkbox"/> GALVANIZED	18.5	0	25
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			
	1 <input type="checkbox"/> STEEL	19		20-23
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input checked="" type="checkbox"/> OPEN HOLE			0084
	1 <input type="checkbox"/> STEEL	26		27-30
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			

#### SCREEN

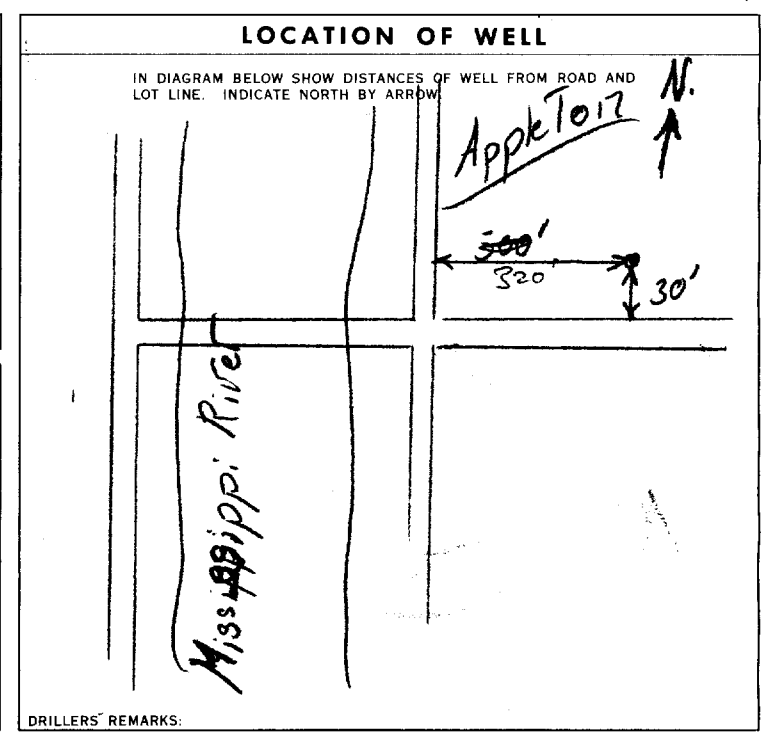
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
	31-33	39-40

#### 61 PLUGGING & SEALING RECORD

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

#### 71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	0012 GPM	00 15-16 30 17-18 HOURS MINS.
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
19-21 040 FEET	22-24 055 FEET	15 MINUTES 26-28 055 FEET
		30 MINUTES 29-31 055 FEET
		45 MINUTES 32-34 FEET
		60 MINUTES 35-37 FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
		42
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
1 <input type="checkbox"/> SHALLOW 2 <input checked="" type="checkbox"/> DEEP	070 FEET	0012 GPM
50-53 0.00.8 GPM./FT. SPECIFIC CAPACITY		



#### FINAL STATUS OF WELL

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

#### WATER USE

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

#### METHOD OF DRILLING

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

#### CONTRACTOR

NAME OF WELL CONTRACTOR: Air-Rock Drilling Co. LICENCE NUMBER: [blank]  
 ADDRESS: R.P.#2 Jasper Ont.  
 NAME OF DRILLER OR BORER: Wallace Desaulniers LICENCE NUMBER: 1739  
 SIGNATURE OF CONTRACTOR: Wallace Desaulniers SUBMISSION DATE: DAY 7 MO 2 YR 73

#### OFFICE USE ONLY

DATA SOURCE: 1 1119 CONTRACTOR: 58 010373 DATE RECEIVED: 59-62  
 DATE OF INSPECTION: [blank] INSPECTOR: [blank]  
 REMARKS: [blank]  
 P [blank]  
 WI [blank]



ONTARIO

MINISTRY OF THE ENVIRONMENT  
The Ontario Water Resources Act

# WATER WELL RECORD

31/F/E

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

11

3503311

MUNICIP. 35012

CON. C/M

10

COUNTY OR DISTRICT <b>Lanark</b>	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE <b>Ramsay</b>	CON., BLOCK, TRACT, SURVEY, ETC. <b>10</b>	LOT <b>003</b>
ADDRESS <b>10 Dorland Crescent, Ottawa 6, Ontario</b>			DATE COMPLETED DAY <b>27</b> MO. <b>02</b> YR. <b>73</b>
1 <b>003293</b>	2 <b>4</b>	3 <b>0420</b>	4 <b>5</b>
5 <b>25</b>	6 <b>25</b>	7 <b>25</b>	8 <b>25</b>

### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
brown	sand	clay	packed	0	2
brown&red	sand	boulders	loose	2	8
grey	limestone		soft	8	105
grey	sandstone			105	150

31 000262805 000362813 0105215 0150218

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
0092 10-13	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
0149 15-18	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

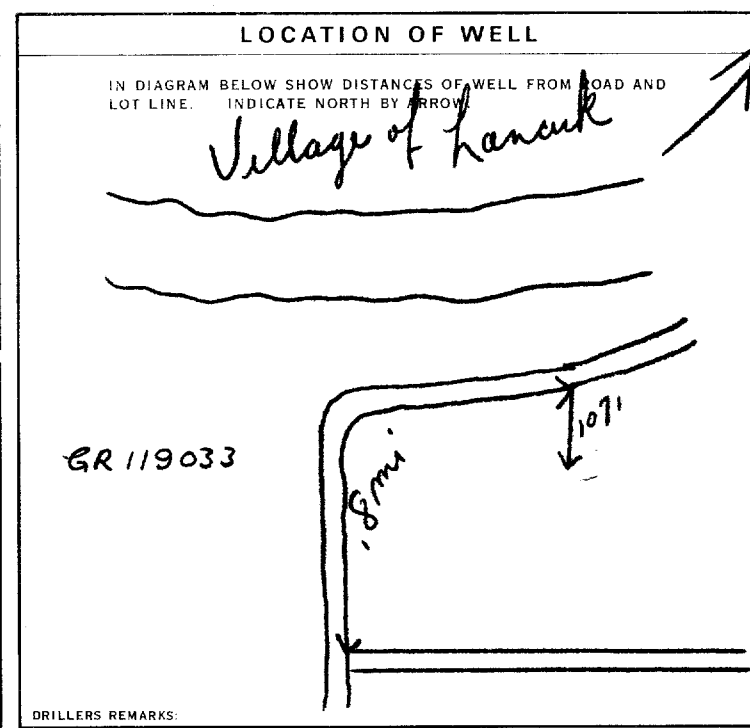
INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
6 1/2	1 <input checked="" type="checkbox"/> STEEL	188	0	25
6	2 <input type="checkbox"/> GALVANIZED			0025
5 7/8	3 <input type="checkbox"/> CONCRETE		25	150
	4 <input checked="" type="checkbox"/> OPEN HOLE			
6	1 <input type="checkbox"/> STEEL		25	0150

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

1 <input checked="" type="checkbox"/> PUMP	2 <input type="checkbox"/> BAILER	10 PUMPING RATE <b>0010</b> GPM	11-14 DURATION OF PUMPING 15-16 HOURS <b>00</b> 17-18 MINS
19-21 STATIC LEVEL <b>010</b> FEET	22-24 WATER LEVEL END OF PUMPING <b>040</b> FEET	25 WATER LEVELS DURING	
38-41 IF FLOWING GIVE RATE		42 WATER AT END OF TEST	
50-53 000.3 GPM / FT. SPECIFIC CAPACITY		RECOMMENDED PUMP RATE <b>0005</b> GPM	



54 FINAL STATUS OF WELL

55-56 WATER USE **01**

57 METHOD OF DRILLING

CONTRACTOR

NAME OF WELL CONTRACTOR  
**Capital Water Supply Ltd.**

ADDRESS  
**Box 490, Stittsville, Ontario.**

NAME OF DRILLER OR BOREP  
**Walter Kavanagh**

SUBMISSION DATE  
DAY **28** MO. **2** YR. **73**

OFFICE USE ONLY

DATE OF INSPECTION  
**28 Oct 74**

CONTRACTOR  
**1558**

DATE RECEIVED  
**240473**

INSPECTOR  
**R.W. Doyle**



Ontario

# WATER WELL RECORD

31/E

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

11 3503555

MUNICIP. 35012 CON. C/N 10 14 15 22 23 24

COUNTY OR DISTRICT <b>Lanark</b>	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE <b>Ramsay</b>	CON., BLOCK, TRACT, SURVEY, ETC. <b>300 2nd St 30</b>	LOT 25-27 <b>003</b>
DATE COMPLETED DAY <b>20</b> MO. <b>12</b> YR. <b>73</b>			
WELL NO. <b>003400</b>	RC <b>4</b>	ELEVATION <b>042.0</b>	RC <b>5</b>
BASIN CODE <b>25</b>			

### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
grey	clay	sand & stones	packed=	0	6
grey	limestone		medium	6	100
grey	sandstone		hard	100	134

31	00062052812	0100215	0134218
32			

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER
10-13 <b>0133</b>	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
15-18 <del>133</del>	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

**51 CASING & OPEN HOLE RECORD**

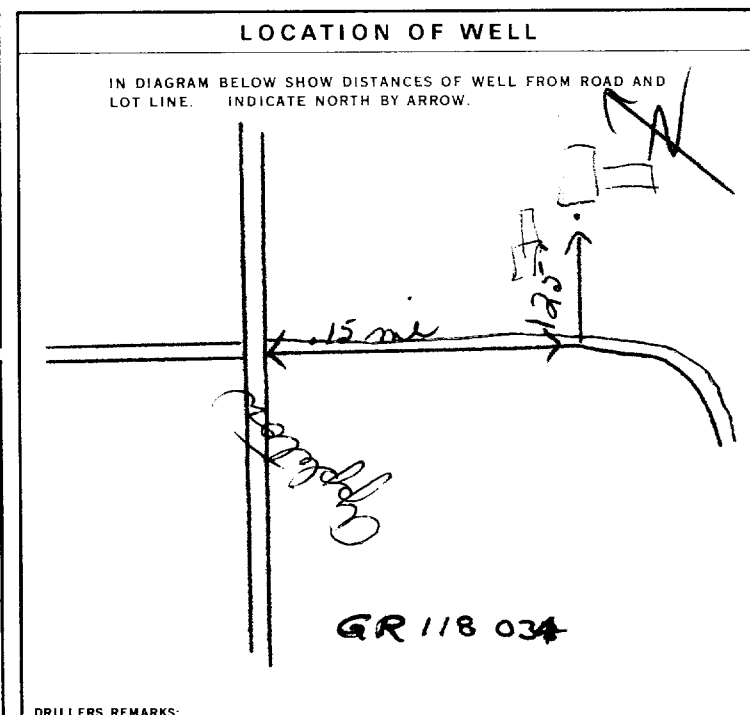
INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
10-11 <b>6+</b>	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE	<b>188</b>	FROM <b>0</b> TO <b>0025</b>
17-18 <b>06</b>	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE		FROM <b>25</b> TO <b>134</b>
24-25 <b>06</b>	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE		FROM <b>25</b> TO <b>0134</b>

**61 PLUGGING & SEALING RECORD**

DEPTH SET AT - FEET	MATERIAL AND TYPE	(CEMENT GROUT LEAD PACKER, ETC.)
10-13		
18-21		
26-29		

**71 PUMPING TEST**

PUMPING TEST METHOD 1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	PUMPING RATE <b>0015</b> GPM	DURATION OF PUMPING 15-16 HOURS <b>00</b> 17-18 MINS
STATIC LEVEL <b>006</b> FEET	WATER LEVEL END OF PUMPING <b>025</b> FEET	WATER LEVELS DURING 15 MINUTES <b>025</b> FEET 30 MINUTES <b>025</b> FEET 45 MINUTES <b>025</b> FEET 60 MINUTES <b>025</b> FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING <b>050</b> FEET	RECOMMENDED PUMPING RATE <b>0005</b> GPM
50-53 <b>000.8</b> GPM / FT. SPECIFIC CAPACITY		



**FINAL STATUS OF WELL**

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

**WATER USE** **02**

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

**METHOD OF DRILLING**

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

**CONTRACTOR**

NAME OF WELL CONTRACTOR  
**Capital Water Supply Ltd.**

LICENCE NUMBER  
**1558**

ADDRESS  
**Box 490 Stittsville, Ont.**

NAME OF DRILLER OR BORER  
**M. Hamilton**

LICENCE NUMBER

SIGNATURE OF CONTRACTOR  
*M. Hamilton*

SUBMISSION DATE  
DAY **8** MO. **12** YR. **74**

**OFFICE USE ONLY**

DATA SOURCE  
**1**

CONTRACTOR  
**1558**

DATE RECEIVED  
**14 01 74**

DATE OF INSPECTION  
**28 Oct 74**

INSPECTOR  
**R. W. DOYLE K.**

REMARKS

P  
WI

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

11

3505276

MUNICIPALITY 35012

CON. CON

LOT 25-27 003

COUNTY OR DISTRICT: *Simcoe* TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: *Ramsay* CON., BLOCK, TRACT, SURVEY, ETC.: *10* LOT: *003*

DATE COMPLETED: DAY *24* MO *11* YR *78*

WELL NO.: *303450* RC: *5* ELEVATION: *0445* RC: *5* BASIN CODE: *26*

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<i>Brown</i>	<i>Clay</i>			<i>0</i>	<i>1</i>
<i>Brown</i>	<i>Wood</i>			<i>1</i>	<i>4</i>
<i>Grey</i>	<i>Sandstone</i>		<i>layed</i>	<i>4</i>	<i>17</i>
<i>Grey</i>	<i>Sandstone</i>			<i>17</i>	<i>65</i>

31 *0001605* *0004635* *001721874* *0065218*

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
<i>0060</i>	<input checked="" type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
<i>6 7/8</i>	<input checked="" type="checkbox"/> STEEL	<i>188</i>	<i>0</i>	<i>22</i>
<i>06</i>	<input type="checkbox"/> GALVANIZED			<i>0022</i>
<i>06</i>	<input type="checkbox"/> CONCRETE			
<i>06</i>	<input type="checkbox"/> OPEN HOLE			
<i>5 7/8</i>	<input checked="" type="checkbox"/> STEEL		<i>22</i>	<i>65</i>
	<input type="checkbox"/> GALVANIZED			
	<input type="checkbox"/> CONCRETE			
	<input type="checkbox"/> OPEN HOLE			

SCREEN

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

MATERIAL AND TYPE: \_\_\_\_\_ DEPTH TO TOP OF SCREEN: \_\_\_\_\_

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST METHOD

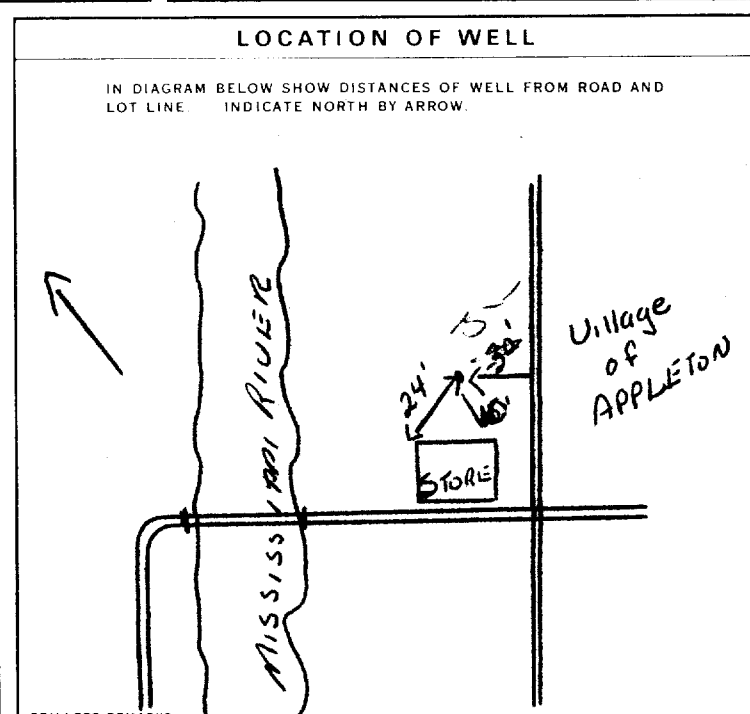
1  PUMP 2  BAILER

PUMPING RATE: *0025* GPM DURATION OF PUMPING: *01* HOURS *00* MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING			
<i>020</i> FEET	<i>030</i> FEET	15 MINUTES <i>030</i> FEET	30 MINUTES <i>030</i> FEET	45 MINUTES <i>030</i> FEET	60 MINUTES <i>030</i> FEET

RECOMMENDED PUMP TYPE:  SHALLOW  DEEP

RECOMMENDED PUMP SETTING: *025* FEET



FINAL STATUS OF WELL: 1  WATER SUPPLY

WATER USE: 1  DOMESTIC

METHOD OF DRILLING: 5  AIR PERCUSSION

CONTRACTOR: CAPITAL WATER SUPPLY LTD LICENCE NUMBER: *1558*

ADDRESS: *Box 490 STITTSVILLE ONT.*

NAME OF DRILLER OR BORER: *S. Miller* LICENCE NUMBER: \_\_\_\_\_

SIGNATURE OF CONTRACTOR: *J. Kavanagh* SUBMISSION DATE: DAY *27* MO *11* YR *78*

OFFICE USE ONLY

DATA SOURCE: *1* CONTRACTOR: *1558* DATE RECEIVED: *181278*

DATE OF INSPECTION: *25/05/74* INSPECTOR: *K H*

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

(11) 3505558 MUNICIPAL 35012 CON. CGN LOT 10

COUNTY OR DISTRICT: [redacted] TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Ramsay CON. BLOCK TRACT. SURVEY: 10 X LOT 25-27: 003  
DATE COMPLETED: DAY 15 MO 08 YR. 79  
ELEVATION: 0400 5 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
gray	broken rock Limestone			0	5
				5	64



31 0005 1271 0064215  
32

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER
0056	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

**51 CASING & OPEN HOLE RECORD**

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
06	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	188	0 0020

**SCREEN**

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

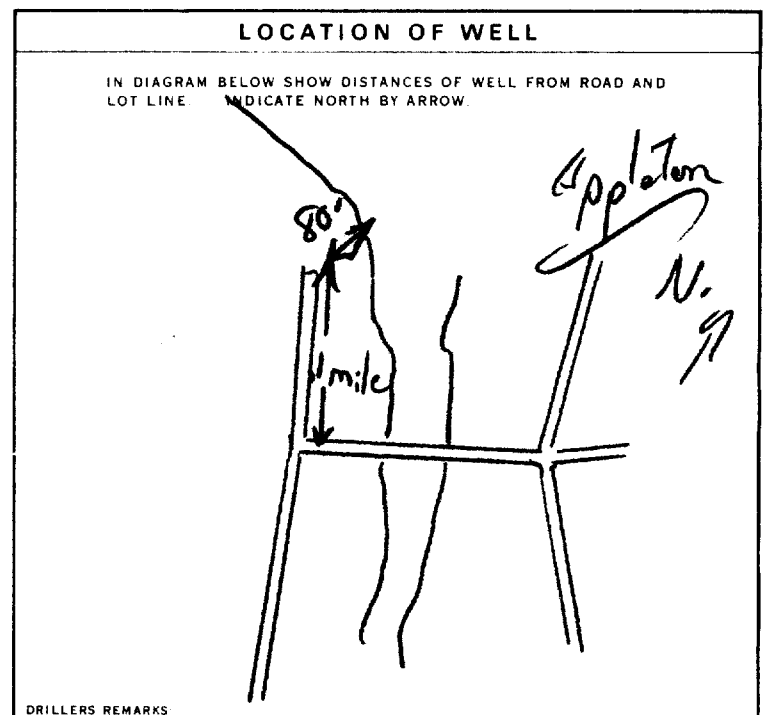
**61 PLUGGING & SEALING RECORD**

DEPTH SET AT - FEET	MATERIAL AND TYPE	CEMENT GROUT LEAD PACKER, ETC.
10-13		

**71 PUMPING TEST METHOD**

PUMPING RATE: 0015 GPM DURATION OF PUMPING: 00 HOURS 30 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
025 FEET	040 FEET	15 MINUTES: 040 FEET 30 MINUTES: 040 FEET 45 MINUTES: 040 FEET 60 MINUTES: 040 FEET



**FINAL STATUS OF WELL** 1  WATER SUPPLY

**WATER USE** 01 1  DOMESTIC

**METHOD OF DRILLING** 2  ROTARY (CONVENTIONAL)

**CONTRACTOR**

NAME OF WELL CONTRACTOR: Air Rock Drilling Co. LTD LICENCE NUMBER: 1119  
ADDRESS: R.R. #2 Jasper Ont.  
NAME OF OWNER OR BORER: Wallace Desautels LICENCE NUMBER: 1119  
SIGNATURE OF CONTRACTOR: Wallace Desautels SUBMISSION DATE: DAY 28 MO 9 YR 79

**OFFICE USE ONLY**

DATA SOURCE: 1 CONTRACTOR: 1119 DATE RECEIVED: 091079  
DATE OF INSPECTION: INSPECTOR:  
REMARKS:



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

11 3506135 MUNICIPAL 35012 CON COW 10

COUNTY OR DISTRICT: LANARK TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: APPLETON, KANSAY TWP CON. BLOCK, TRACT, SURVEY ETC: 10 LOT: 003  
 OWNER (SURNAME FIRST): [REDACTED] ADDRESS: RR#3 ALMONTE DATE COMPLETED: DAY 16 MO 10 YR 81  
 G 03289 RC 5 ELEVATION 0425 RC 5 BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	Shale			0	7
Brown	Limestone			7	63

31 0997617 0963615  
 32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-27	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-13	1 <input checked="" type="checkbox"/> GALVANIZED	188	0	63.2
17-18	1 <input type="checkbox"/> STEEL			20-23
24-25	1 <input type="checkbox"/> STEEL			27-30

SCREEN

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

61 PLUGGING & SEALING RECORD

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

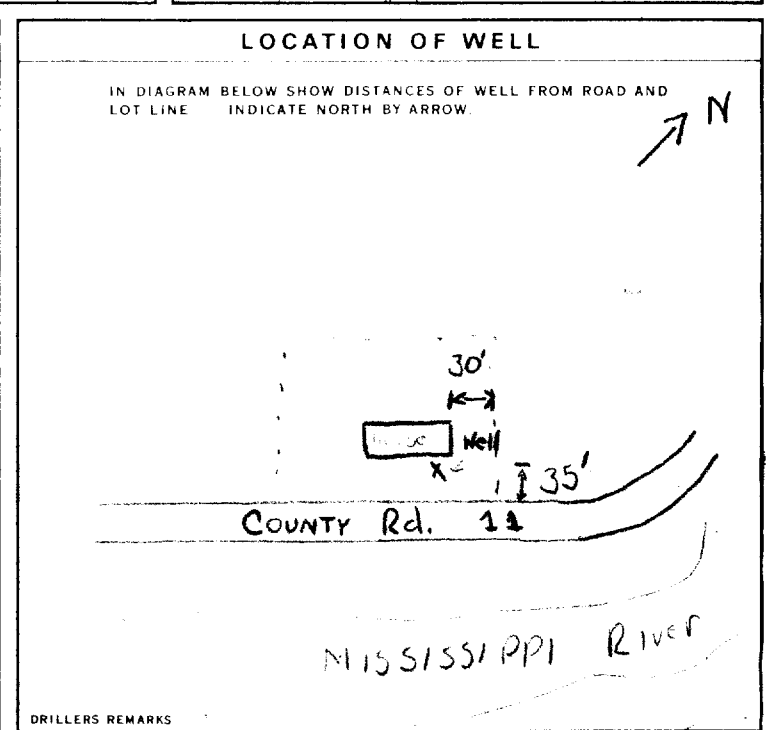
71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE GPM	DURATION OF PUMPING HOURS
1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	0009	01 15-16 00 17-18

STATIC LEVEL FEET	WATER LEVEL END OF PUMPING FEET	WATER LEVELS DURING			
020	050	15 MINUTES: 050	30 MINUTES: 050	45 MINUTES: 050	60 MINUTES: 050

IF FLOWING GIVE RATE: [REDACTED] GPM PUMP INTAKE SET AT: 60 FEET WATER AT END OF TEST: 1  CLEAR 2  CLOUDY

RECOMMENDED PUMP TYPE:  SHALLOW  DEEP RECOMMENDED PUMP SETTING: 050 FEET RECOMMENDED PUMPING RATE: 0009 GPM



FINAL STATUS OF WELL: 1  WATER SUPPLY 5  ABANDONED, INSUFFICIENT SUPPLY  
 2  OBSERVATION WELL 6  ABANDONED POOR QUALITY  
 3  TEST HOLE 7  UNFINISHED  
 4  RECHARGE WELL

WATER USE: 1  DOMESTIC 5  COMMERCIAL  
 2  STOCK 6  MUNICIPAL  
 3  IRRIGATION 7  PUBLIC SUPPLY  
 4  INDUSTRIAL 8  COOLING OR AIR CONDITIONING  
 9  NOT USED

METHOD OF DRILLING: 1  CABLE TOOL 6  BORING  
 2  ROTARY (CONVENTIONAL) 7  DIAMOND  
 3  ROTARY (REVERSE) 8  JETTING  
 4  ROTARY (AIR) 9  DRIVING  
 5  AIR PERCUSSION

CONTRACTOR: SAUNDERS WELL DRILLING LICENCE NUMBER: 4767  
 ADDRESS: RR#2 AMPHIVOR  
 NAME OF DRILLER OR BORER: T. SAUNDERS  
 SIGNATURE OF CONTRACTOR: R. SAUNDERS SUBMISSION DATE: 6 OCT 81

OFFICE USE ONLY: DATA SOURCE: 1 CONTRACTOR: 4767 DATE RECEIVED: 17 1181  
 DATE OF INSPECTION: INSPECTOR: op/ea  
 REMARKS: CSS.ES

3506487 MUNICIPAL 35012 CON 10

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

COUNTY OF DISTRICT **Perth** TOWNSHIP BOROUGH CITY TOWN VILLAGE **Ramsay** CON. BLOCK TRACT SURVEY ETC **Con 10** LOT 25-27 **004**  
 DATE COMPLETED DAY **16** MO **02** YR **83**  
 ELEVATION **03799** BASIN CODE **5 26**

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
grey	clay	gravel		0	3
grey red	shale rock			3	35
grey	limestone			35	104

31 000320511 003521712 010215

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER			
0/00	<input checked="" type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL

**51 CASING & OPEN HOLE RECORD**

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
6.67	STEEL	188	0	60.20
6.6	OPEN HOLE		20	104

**SCREEN**

SIZE (SI OF OPENING (SLOT NO.)	DIAMETER	LENGTH
	INCHES	FEET
	DEPTH TO TOP OF SCREEN	

**61 PLUGGING & SEALING RECORD**

DEPTH SET AT - FEET	MATERIAL AND TYPE	CEMENT GROUP / LEAD PACKER ETC.
0 - 20	concrete	grouted

**71 PUMPING TEST**

PUMPING TEST METHOD:  PUMP

PUMPING RATE: 00/5 GPM

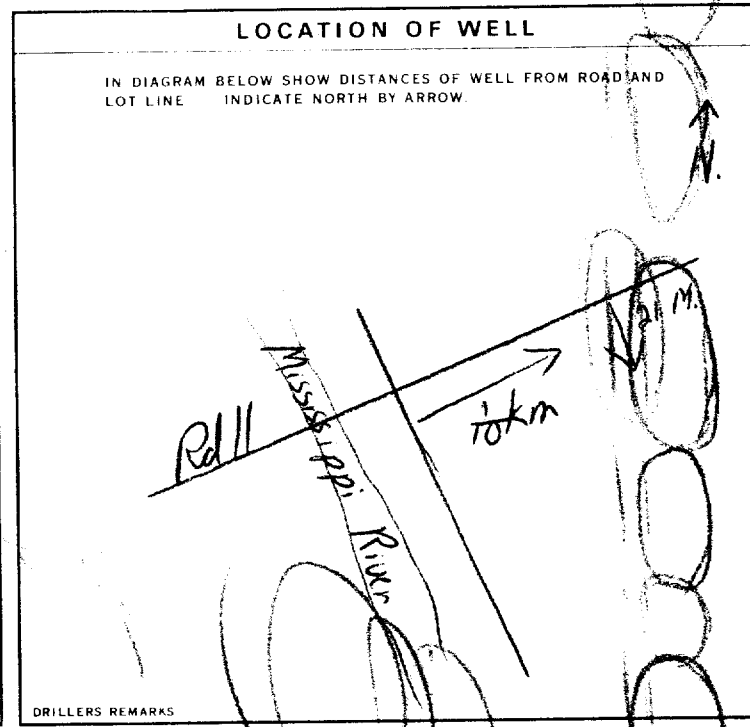
DURATION OF PUMPING: 01/00 HOURS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING			
030	080	15 MINUTES: 080	30 MINUTES: 080	45 MINUTES: 080	60 MINUTES: 080

RECOMMENDED PUMP TYPE:  DEEP

RECOMMENDED PUMP SETTING: 080 FEET

RECOMMENDED PUMPING RATE: 00/0 GPM



**FINAL STATUS OF WELL** 1

**WATER USE** 01

**METHOD OF DRILLING** 5

**CONTRACTOR**

NAME OF WELL CONTRACTOR: **Henry Mains Well Drilling** LICENCE NUMBER: **3644**

ADDRESS: **Box 326 Richmond Ont**

NAME OF DRILLER OR BORER: **Mains** LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: *[Signature]* SUBMISSION DATE: DAY \_\_\_\_\_ MO \_\_\_\_\_ YR \_\_\_\_\_

**OFFICE USE ONLY**

DATA SOURCE: **1** CONTRACTOR: **3644** DATE RECEIVED: **06 05 83**

DATE OF INSPECTION: \_\_\_\_\_ INSPECTOR: \_\_\_\_\_

REMARKS: **CSS.ES**



Ministry of the Environment

Same as 6487

The Ontario Water Resources Act

31 FIE

# WATER WELL RECORD

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

11

3506488

35012 CON

10

COUNTY OR DISTRICT: 6 TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Ramsay CON. BLOCK TRACT SURVEY ETC.: 10 LOT: 4

DATE COMPLETED: DAY 16 MO 2 YR 83

RC: Box 122 Munster KOA 3PO

## LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
grey	clay	gravel		0	3
grey red	shale rock			3	35
grey	limestone			35	104

31

32

### 41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13 <u>100</u>	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

### 51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11 <u>6 1/4</u>	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	<u>1/88</u>	0	20
17-18 <u>6</u>	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE		20	104
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			

### SCREEN

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

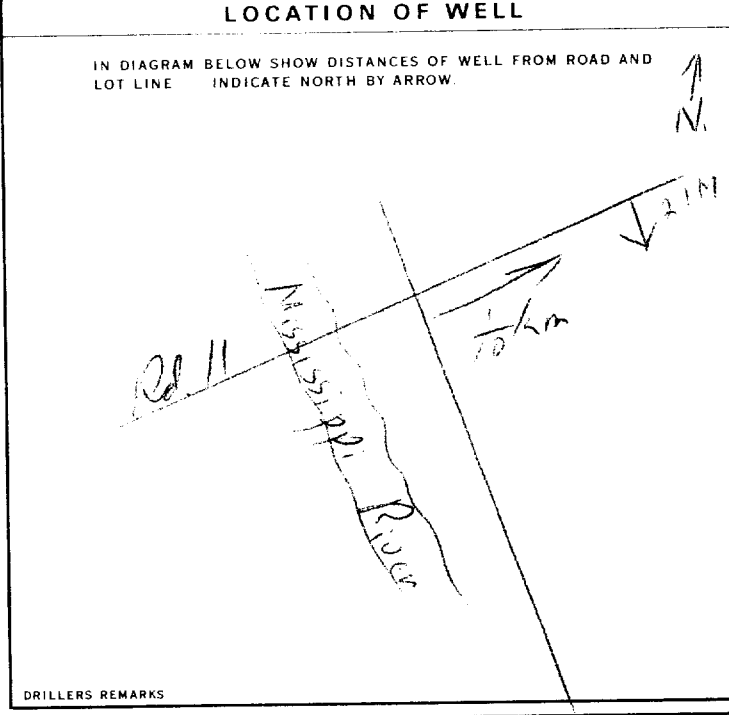
MATERIAL AND TYPE: \_\_\_\_\_ DEPTH TO TOP OF SCREEN: \_\_\_\_\_ FEET

### 61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
FROM TO	
0 10-13 <u>20</u> 14-17	<u>cement grouted</u>
18-21 22-25	
26-29 30-33 80	

### 71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	<u>15</u> GPM	1 15-16 0 17-18 HOURS MINS
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
19-21 <u>30</u> FEET	22-24 <u>80</u> FEET	15 MINUTES 25-28 <u>80</u> FEET
		30 MINUTES 29-31 <u>80</u> FEET
		45 MINUTES 32-34 <u>80</u> FEET
		60 MINUTES 35-37 <u>80</u> FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
	38-41 <u>80</u> GPM	1 <input type="checkbox"/> CLEAR 2 <input checked="" type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	<u>80</u> FEET	<u>10</u> GPM



### FINAL STATUS OF WELL

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

### WATER USE

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

### METHOD OF DRILLING

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

### CONTRACTOR

NAME OF WELL CONTRACTOR: Henry Mains Well Drilling LICENCE NUMBER: 3644

ADDRESS: Box 326 Richmond Ont

NAME OF DRILLER OR BORER: Mains LICENCE NUMBER: \_\_\_\_\_

SIGNATURE OF CONTRACTOR: \_\_\_\_\_ SUBMISSION DATE: DAY 16 MO 2 YR 83

### OFFICE USE ONLY

DATA SOURCE: 3644 CONTRACTOR: 3644 DATE RECEIVED: 06 05 83

DATE OF INSPECTION: \_\_\_\_\_ INSPECTOR: \_\_\_\_\_

REMARKS: \_\_\_\_\_

WDE CSS.FS

3506488

PRINT ONLY IN SPACES PROVIDED

DATE COMPLETED DAY 16 MO 5 YR 83

**LOG OF OVERBURDEN AND BEDROCK MATERIALS** (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH FEET	
				FROM	TO
grey	clay	gravel		0	3
grey	clay			5	35
grey	clay			35	104

**WATER RECORD**

WATER FOUND FEET: 30

KIND OF WATER:

FRESH  SALTY  SULPHUR  MINERAL

**CASING & OPEN HOLE RECORD**

INSIDE DIAM. INCHES	MATERIAL	DEPTH FEET
6.5	galvanized steel	0 - 20
6	galvanized steel	20 - 104

**SCREEN RECORD**

DEPTH OF OPENING: 20

DIAM. INCHES: 4.25

LENGTH FEET: 10

MATERIAL AND TYPE: galvanized steel

**PLUGGING & SEALING RECORD**

DEPTH SET AT FEET: 20

MATERIAL AND TYPE: cement grout

**PUMPING TEST METHOD**

PUMP  BAILEY

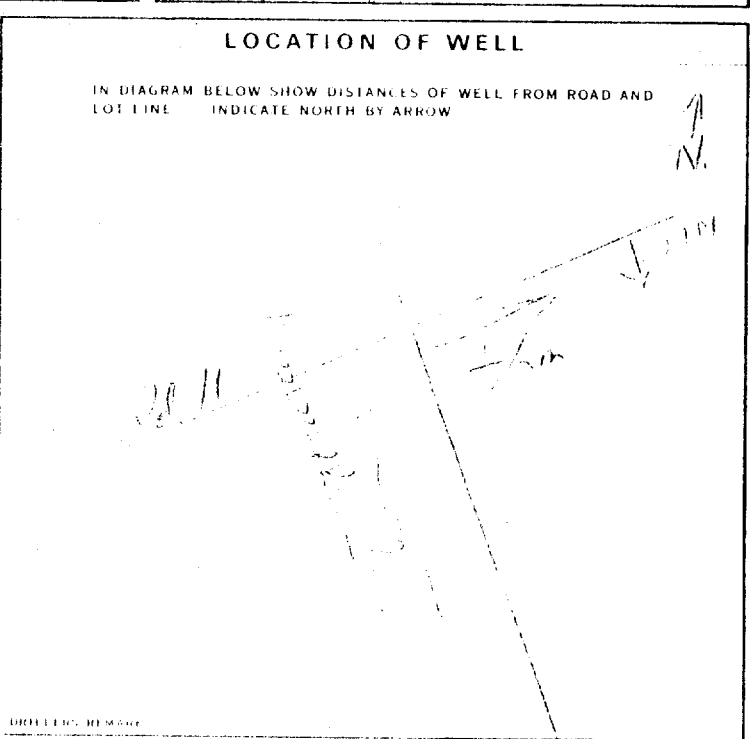
PUMPING RATE: 15 GPM

DURATION OF PUMPING: 1 - 0 HOURS

WATER LEVELS DURING PUMPING:

15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
10	10	10	10

RECOMMENDED PUMP SETTING: 10 GPM



**FINAL STATUS OF WELL**

WATER SUPPLY  OBSERVATION WELL  TEST HOLE  RECHARGE WELL

ABANDONED - INSUFFICIENT SUPPLY  ABANDONED - POOR QUALITY  UNFINISHED

**WATER USE**

DOMESTIC  STOCK  IRRIGATION  INDUSTRIAL  OTHER

**METHOD OF DRILLING**

CABLE TOOL  ROTARY (CONVENTIONAL)  ROTARY (REVERSE)  ROTARY (AIR)  AIR PERCUSSION

BORING  DIAMOND  JETTING  DRIVEN

NAME OF WELL CONTRACTOR: Henry Watson & Co. Ltd.

ADDRESS: 266 St. Nicholas St. Toronto

NAME OF DRILLER OR BORER: [Signature]

SIGNATURE OF CONTRACTOR: [Signature]

COMPLETION DATE: [Blank]

OFFICE USE ONLY

06 05 83

CSS.ES



Ministry of the Environment Ontario

# The Ontario Water Resources Act WATER WELL RECORD

31/1

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

11 3506887 35012 CON 10

COUNTY OR DISTRICT: LANARK TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: RAMSAY CON. BLOCK TRACT SURVEY ETC: 10 X LOT: 003 3  
DATE COMPLETED: DAY 06 MO 09 YR 1984  
R. # 3 Almonte, Ontario  
ELEVATION: 03599 5 CHRS 5 26

## LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
grey	Clay Gravel	Stone's	Packed	0°	4°
grey	Limestone		Hard	4°	105°
grey green	Limestone		Porous	105°	114°



31 0004205112 010521573 011441580  
32

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER
0112°	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input checked="" type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

**51 CASING & OPEN HOLE RECORD**

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
6"	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE	1.88	0° 0022°
06"	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE		22° 114°
06"	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE		0114

**SCREEN**

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

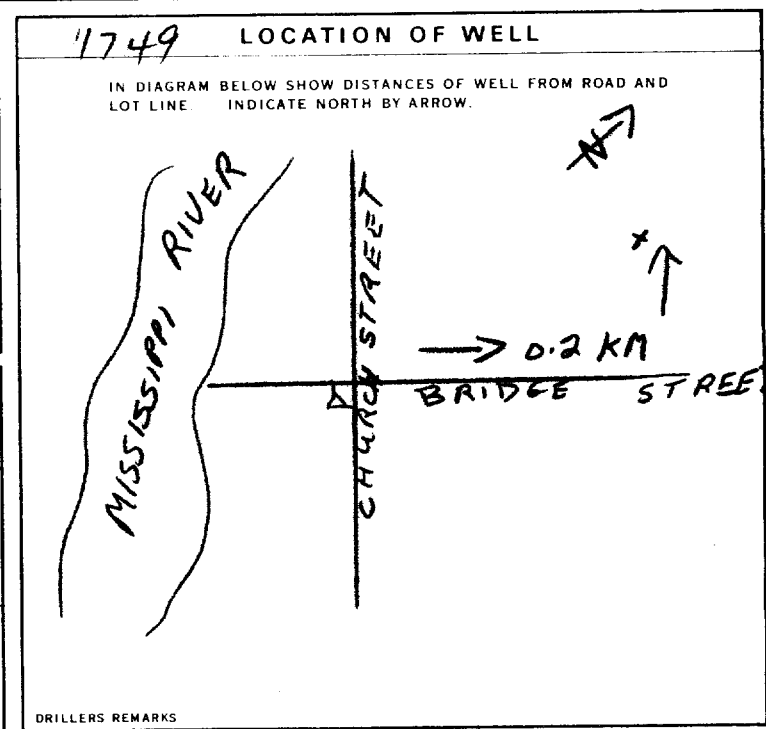
MATERIAL AND TYPE: \_\_\_\_\_ DEPTH TO TOP OF SCREEN: 41-44 FEET

**61 PLUGGING & SEALING RECORD**

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

**71 PUMPING TEST**

PUMPING TEST METHOD: 1 <input type="checkbox"/> PUMP 2 <input checked="" type="checkbox"/> BAILER	PUMPING RATE: 0030 GPM	DURATION OF PUMPING: 01 HOURS 00 MINS
STATIC LEVEL: 057 FEET	WATER LEVEL END OF PUMPING: 057 FEET	WATER LEVELS DURING:
		15 MINUTES: 057 FEET
		30 MINUTES: 057 FEET
		45 MINUTES: 057 FEET
		60 MINUTES: 057 FEET
IF FLOWING GIVE RATE: _____ GPM	PUMP INTAKE SET AT: _____ FEET	WATER AT END OF TEST: 1 <input type="checkbox"/> CLEAR 2 <input checked="" type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE: <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING: 080 FEET	RECOMMENDED PUMPING RATE: 0007 GPM



**FINAL STATUS OF WELL**

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

**WATER USE** 01

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

**METHOD OF DRILLING** 1

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

**CONTRACTOR**

NAME OF WELL CONTRACTOR: M. Kavanagh & Son Well Drilling LICENCE NUMBER: 3142  
ADDRESS: R. R. # 2 Carleton Place, Ont.  
NAME OF DRILLER OR BORER: Mike Kavanagh LICENCE NUMBER: 3142  
SIGNATURE OF CONTRACTOR: Michael Kavanagh SUBMISSION DATE: DAY 06 MO 09 YR 84

**OFFICE USE ONLY**

DATA SOURCE: 1 CONTRACTOR: 3142 DATE RECEIVED: 21 09 84  
DATE OF INSPECTION: \_\_\_\_\_ INSPECTOR: \_\_\_\_\_  
REMARKS: \_\_\_\_\_

CSS.ES

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

11

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MUNICIP

CON.

COUNTY OR DISTRICT: 1 TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Ramsay CON. BLOCK, TRACT, SURVEY ETC.: 10 LOT: 4

DATE COMPLETED: DAY 14 MO 8 YR 85

RC: Carleton Place Ont

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	clay			0	10
	sand			10	18
	clay			18	24
grey	Limestone			24	28

31

32

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER
10-13 <u>73</u>	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
15-18 <u>40</u>	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

**51 CASING & OPEN HOLE RECORD**

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			13-16
17-18 <u>6 1/4</u>	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	<u>1.88</u>	<u>0</u>	<u>29</u>
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			27-30

**SCREEN**

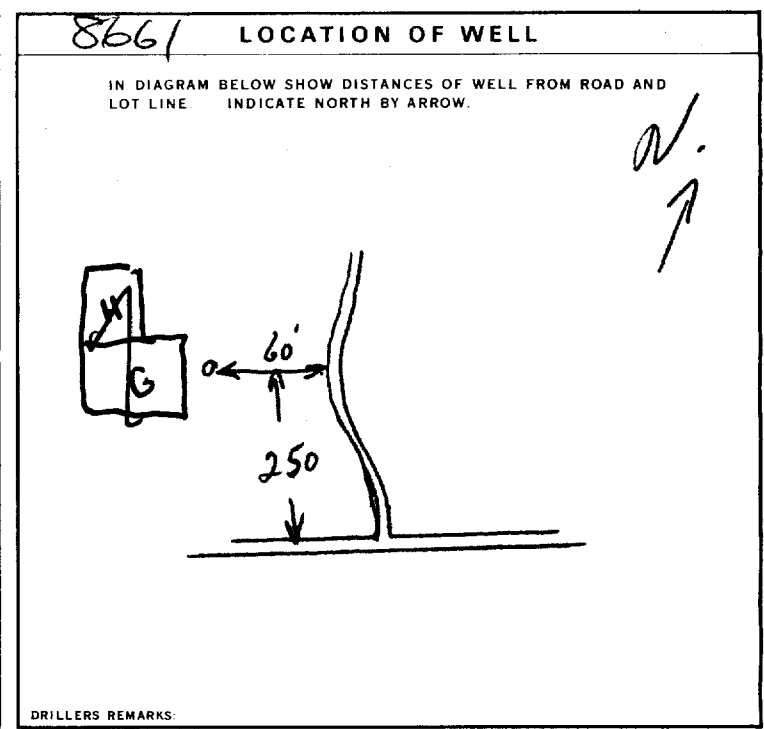
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
	34-38	39-40
MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN 41-44
		FEET 50

**61 PLUGGING & SEALING RECORD**

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13 <u>5</u>	18-17 <u>29</u> cement grout
18-21	22-25
26-29	30-33 80

**71 PUMPING TEST**

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	<u>12</u> GPM	15-16 HOURS <u>30</u> MINS
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
19-21 <u>24</u> FEET	22-24 <u>55</u> FEET	1 <input checked="" type="checkbox"/> PUMPING 2 <input type="checkbox"/> RECOVERY
		15 MINUTES 26-28 <u>55</u> FEET
		30 MINUTES 29-31 <u>55</u> FEET
		45 MINUTES 32-34
		60 MINUTES 35-37
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
	GPM	FEET
		1 <input checked="" type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	<u>65</u> FEET	<u>12</u> GPM



**FINAL STATUS OF WELL**

1 <input checked="" type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
2 <input type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED, POOR QUALITY
3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
4 <input type="checkbox"/> RECHARGE WELL	

**WATER USE**

1 <input type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
<input type="checkbox"/> OTHER	9 <input type="checkbox"/> NOT USED

**METHOD OF DRILLING**

1 <input type="checkbox"/> CABLE TOOL	6 <input type="checkbox"/> BORING
2 <input type="checkbox"/> ROTARY (CONVENTIONAL)	7 <input type="checkbox"/> DIAMOND
3 <input type="checkbox"/> ROTARY (REVERSE)	8 <input type="checkbox"/> JETTING
4 <input type="checkbox"/> ROTARY (AIR)	9 <input type="checkbox"/> DRIVING
5 <input type="checkbox"/> AIR PERCUSSION	

**CONTRACTOR**

NAME OF WELL CONTRACTOR: Pir Rock Drilling Co Ltd LICENCE NUMBER: 1119

ADDRESS: RR# 2 Jasper, Ont

NAME OF DRILLER OR BORER: Wallace Desautels LICENCE NUMBER: 1119

SIGNATURE OF CONTRACTOR: Wallace Desautels SUBMISSION DATE: DAY 10 MO 2 YR 86

**OFFICE USE ONLY**

DATA SOURCE: 58 CONTRACTOR: 59-62 DATE RECEIVED: 200286

DATE OF INSPECTION: \_\_\_\_\_ INSPECTOR: CSS.ES

REMARKS: \_\_\_\_\_

3507885

1. PRINT ONLY IN SPACES PROVIDED  
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COUNTY OR DISTRICT <i>LAMARCA</i>	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE <i>RAMSAY</i>	CON., BLOCK, TRACT, SURVEY, ETC. <i>10</i>	LOT <i>3</i>
DATE COMPLETED DAY <i>13</i> MO <i>5</i> YR <i>82</i>		MUNICIPALITY <i>R3 ALMONTE DNT KOA 1A0</i>	

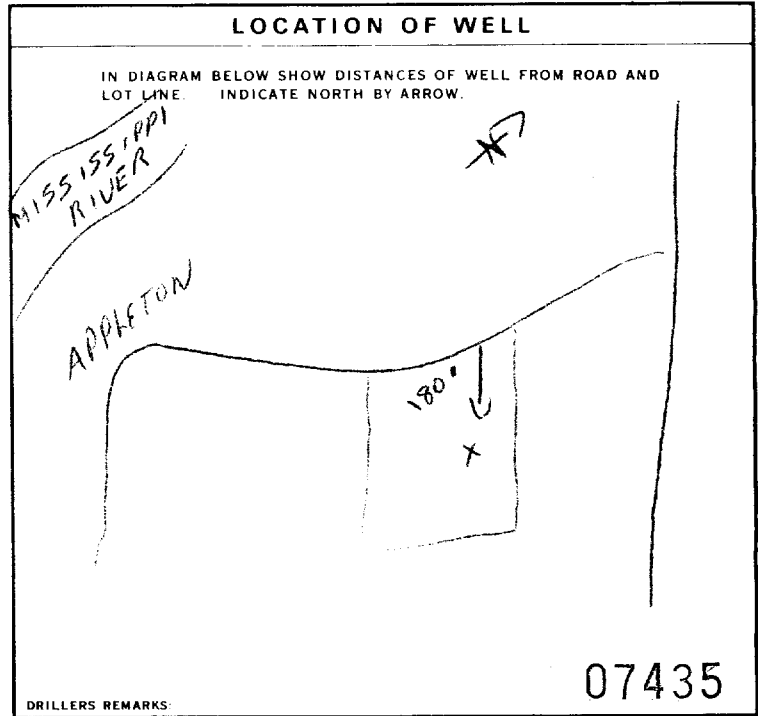
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
BROWN	CLAY	STONE'S		0'	8'
GREY	LIMESTONE			8'	78'
GREY BLACK GREY	LIMESTONE			78'	116'

31	32
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<b>4 WATER RECORD</b> WATER FOUND AT - FEET: <i>114</i> KIND OF WATER: <input type="checkbox"/> FRESH <input type="checkbox"/> SULPHUR <input type="checkbox"/> SALTY <input type="checkbox"/> MINERAL	<b>5 CASING &amp; OPEN HOLE RECORD</b> <table border="1"> <thead> <tr> <th rowspan="2">INSIDE DIAM INCHES</th> <th rowspan="2">MATERIAL</th> <th rowspan="2">WALL THICKNESS INCHES</th> <th colspan="2">DEPTH - FEET</th> </tr> <tr> <th>FROM</th> <th>TO</th> </tr> </thead> <tbody> <tr> <td><i>6 1/4"</i></td> <td><input checked="" type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE</td> <td><i>1.88</i></td> <td><i>0'</i></td> <td><i>20'</i></td> </tr> <tr> <td><i>6"</i></td> <td><input checked="" type="checkbox"/> OPEN HOLE <input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE</td> <td></td> <td><i>22'</i></td> <td><i>116'</i></td> </tr> </tbody> </table>	INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET		FROM	TO	<i>6 1/4"</i>	<input checked="" type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE	<i>1.88</i>	<i>0'</i>	<i>20'</i>	<i>6"</i>	<input checked="" type="checkbox"/> OPEN HOLE <input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE		<i>22'</i>	<i>116'</i>	<b>SCREEN</b> SIZE(S) OF OPENING (SLOT NO.): DIAMETER: _____ INCHES LENGTH: _____ FEET MATERIAL AND TYPE: DEPTH TO TOP OF SCREEN: _____ FEET
INSIDE DIAM INCHES	MATERIAL				WALL THICKNESS INCHES	DEPTH - FEET													
		FROM	TO																
<i>6 1/4"</i>	<input checked="" type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE	<i>1.88</i>	<i>0'</i>	<i>20'</i>															
<i>6"</i>	<input checked="" type="checkbox"/> OPEN HOLE <input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE		<i>22'</i>	<i>116'</i>															

DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
FROM	TO	
<i>10-12</i>	<i>14-12</i>	
<i>18-21</i>	<i>22-25</i>	
<i>26-29</i>	<i>30-33</i>	

<b>71 PUMPING TEST</b> PUMPING TEST METHOD: <input type="checkbox"/> PUMP <input checked="" type="checkbox"/> BAILER PUMPING RATE: <i>30</i> GPM DURATION OF PUMPING: <i>1</i> HOUR <i>17</i> MINS WATER LEVELS DURING: 15 MINUTES: <i>35</i> FEET 30 MINUTES: <i>35</i> FEET 45 MINUTES: <i>35</i> FEET 60 MINUTES: <i>35</i> FEET IF FLOWING, GIVE RATE: _____ GPM PUMP INTAKE SET AT: _____ FEET WATER AT END OF TEST: <input type="checkbox"/> CLEAR <input checked="" type="checkbox"/> CLOUDY RECOMMENDED PUMP TYPE: <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP RECOMMENDED PUMP SETTING: <i>60</i> FEET RECOMMENDED PUMPING RATE: <i>7</i> GPM
---



<b>FINAL STATUS OF WELL</b> <input checked="" type="checkbox"/> WATER SUPPLY <input type="checkbox"/> OBSERVATION WELL <input type="checkbox"/> TEST HOLE <input type="checkbox"/> RECHARGE WELL <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY <input type="checkbox"/> ABANDONED, POOR QUALITY <input type="checkbox"/> UNFINISHED	<b>WATER USE</b> <input checked="" type="checkbox"/> DOMESTIC <input type="checkbox"/> STOCK <input type="checkbox"/> IRRIGATION <input type="checkbox"/> INDUSTRIAL <input type="checkbox"/> OTHER	<b>METHOD OF DRILLING</b> <input checked="" type="checkbox"/> CABLE TOOL <input type="checkbox"/> ROTARY (CONVENTIONAL) <input type="checkbox"/> ROTARY (REVERSE) <input type="checkbox"/> ROTARY (AIR) <input type="checkbox"/> AIR PERCUSSION <input type="checkbox"/> BORING <input type="checkbox"/> DIAMOND <input type="checkbox"/> JETTING <input type="checkbox"/> DRIVING <i>3142</i>
--	--	--

<b>CONTRACTOR</b> NAME OF WELL CONTRACTOR: <i>M. KAVANAGH &amp; SON WELL DRILLING</i> LICENCE NUMBER: <i>3142</i> ADDRESS: <i>RR 2 CARLETON PLACE</i> NAME OF DRILLER OR BORER: <i>MIKE KAVANAGH</i> LICENCE NUMBER: <i>3142</i> SIGNATURE OF CONTRACTOR: <i>Michael Kavanagh</i> SUBMISSION DATE: DAY <i>14</i> MO <i>5</i> YR <i>82</i>
---

<b>OFFICE USE ONLY</b> CONTRACTOR: DATE RECEIVED: <i>030687</i> DATE OF INSPECTION: INSPECTOR: REMARKS: <i>CSS.ES</i>
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3508641

MUNICIPALITY 35012

CON. 15 22 23 24

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COUNTY OR DISTRICT: Lanark TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Ramsay CON. BLOCK TRACT SURVEY ETC: 10 LOT: 25-27: 3

DATE COMPLETED: 48-53 DAY: 28 MO: 11 YR: 88

2 Fenerty Court, Kanata, Ontario K2L 3B1

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Black	Shale		Soft	0	3
Gray	Limestone		Soft	3	18
Gray	Limestone		Medium Hard	18	99

31 32

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER
10-13	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS

**51 CASING & OPEN HOLE RECORD**

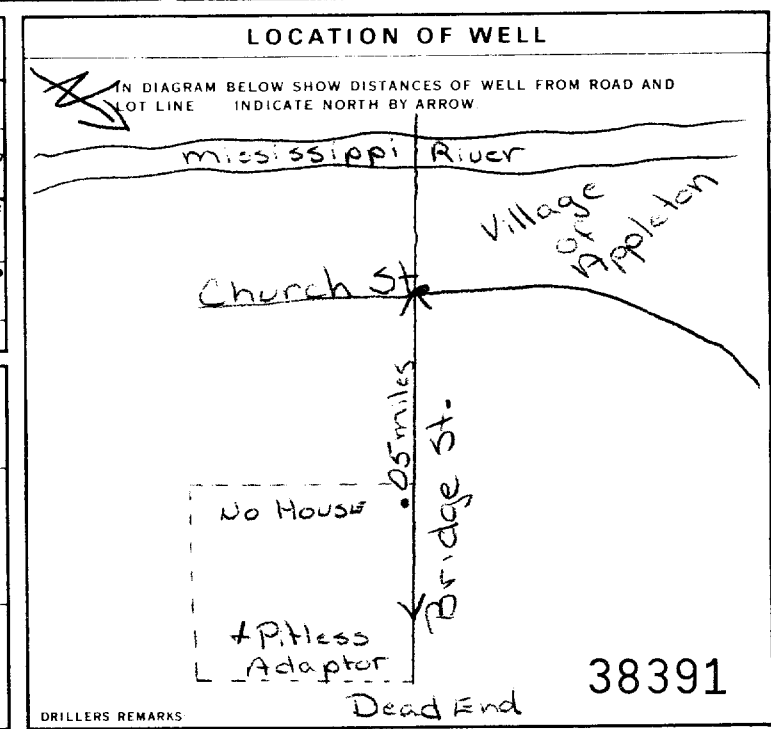
INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
6 1/4	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	.188	0	21
6	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC		21	99
	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			

**61 PLUGGING & SEALING RECORD**

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

**71 PUMPING TEST**

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	30 GPM	1 15-16 HOURS 17-18 MINS
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
50 FEET	65 FEET	15 MINUTES: 65 FEET 30 MINUTES: 65 FEET 45 MINUTES: 65 FEET 60 MINUTES: 65 FEET
IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
	65 FEET	1 <input checked="" type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	80 FEET	5 GPM



**FINAL STATUS OF WELL**

1  WATER SUPPLY 5  ABANDONED, INSUFFICIENT SUPPLY  
2  OBSERVATION WELL 6  ABANDONED POOR QUALITY  
3  TEST HOLE 7  UNFINISHED  
4  RECHARGE WELL 8  DEWATERING

**WATER USE**

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

**METHOD OF CONSTRUCTION**

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

**CONTRACTOR**

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd.  
WELL CONTRACTOR'S LICENCE NUMBER: 1558

ADDRESS: P.O. Box 490 Stittsville, Ontario KOA 3G0

NAME OF WELL TECHNICIAN: S. Miller  
WELL TECHNICIAN'S LICENCE NUMBER: T0097

SIGNATURE OF TECHNICIAN/CONTRACTOR: [Signature]  
SUBMISSION DATE: DAY 28 MO 11 YR 88

**OFFICE USE ONLY**

DATA SOURCE: 58 CONTRACTOR: 59-62 DATE RECEIVED: 63-66

1558 DEC 21 1988

DATE OF INSPECTION: INSPECTOR:

REMARKS: CSS, ES





1. PRINT ONLY IN SPACES PROVIDED  
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3510252

MUNICIP 35012

CON. CAN

110

COUNTY OR DISTRICT: [REDACTED] TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: RANSAY CON. BLOCK, TRACT, SURVEY, ETC: 10 Part of LOT: 3  
 DATE COMPLETED: DAY 17 MO 3 YR 92  
 BASIN CODE: 11 III IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	Sand		Fine	0	1
Brown	limestone		Layered	1	8
Brown	limestone		Hard	8	65

31  
32

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER					
10-13	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/> SALTY	14
50-60	2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/> SALTY	19
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/> SALTY	24
20-23	2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/> SALTY	29
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/> SALTY	34
30-33	2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/> SALTY	39

**51 CASING & OPEN HOLE RECORD**

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	188	0	21
17-18	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			20-23
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			27-30

**SCREEN**

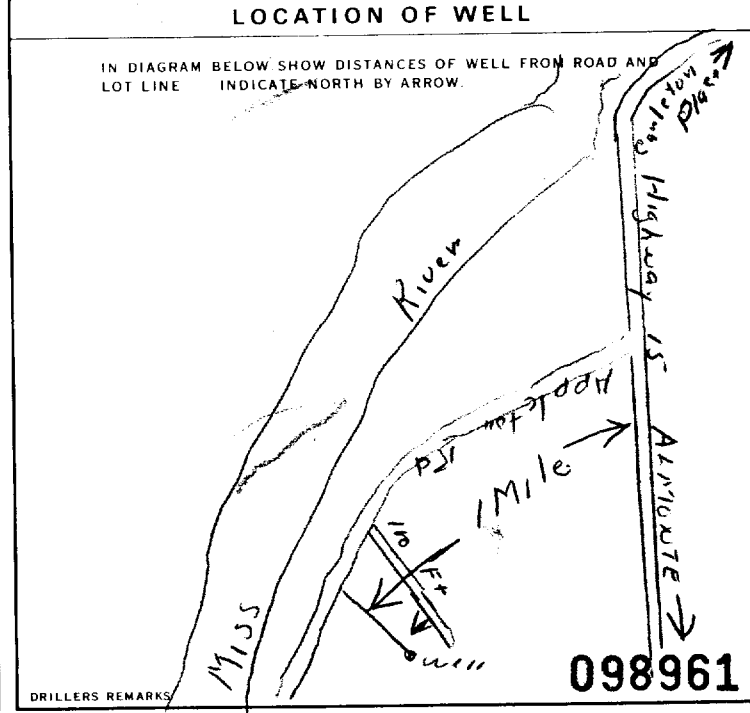
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

**61 PLUGGING & SEALING RECORD**

DEPTH SET AT - FEET	MATERIAL AND TYPE	CEMENT GROUT LEAD PACKER, ETC.
0 10-13	3 14-17	Rock Cuttings
3 18-21	21 22-25	TYPE D Cement

**71 PUMPING TEST**

1 <input type="checkbox"/> PUMP	2 <input checked="" type="checkbox"/> BAILER	25-30 PUMPING RATE: 25 GPM	31-35 DURATION OF PUMPING: 1 HOURS
36-40 STATIC LEVEL: 7 FEET	41-45 WATER LEVEL END OF PUMPING: 2.4 FEET	46-50 WATER LEVELS DURING:	51-55 PUMPING RECOVERY:
56-60 IF FLOWING, GIVE RATE:	61-65 PUMP INTAKE SET AT: 7 FEET	66-70 WATER AT END OF TEST:	71-75 PUMPING RATE: 20 GPM



**FINAL STATUS OF WELL**

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

**WATER USE**

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

**METHOD OF CONSTRUCTION**

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

**CONTRACTOR**

NAME OF WELL CONTRACTOR: BOYD CAMERON  
 ADDRESS: RR 2 CLAYTON ONT  
 NAME OF WELL TECHNICIAN: BOYD CAMERON  
 SIGNATURE OF TECHNICIAN/CONTRACTOR: Boyd Cameron  
 WELL CONTRACTOR'S LICENCE NUMBER: 1567  
 WELL TECHNICIAN'S LICENCE NUMBER: 70089  
 SUBMISSION DATE: DAY 20 MO 3 YR 92

**OFFICE USE ONLY**

DATA SOURCE: 1567  
 DATE RECEIVED: APR 22 1992  
 DATE OF INSPECTION:  
 INSPECTOR:  
 REMARKS: CSES

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11

3512629

Municipality 35012 Con. 10

County or District: Lanark Township/Borough/City/Town/Village: Mississippi Mills - Ramsay Con block tract survey, etc.: 10 Lot: 25-27: 3

Address: 135 William St. R.R. #3 Almonte, Ontario Date completed: 8 day 6 month 99 year

Northings: 10, 12, 17, 18, 24, 25, 26, 30, 31 Elevation: KOA 1A0

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
Brown	Sand	Boulders		0	6
Gray	Limestone			6	75

31

32

**41 WATER RECORD**

Water found at - feet	Kind of water
10-13	1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty 3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 5 <input type="checkbox"/> Gas 6 <input type="checkbox"/> Sulphur 7 <input type="checkbox"/> Minerals 8 <input type="checkbox"/> Gas
15-18	1 <input checked="" type="checkbox"/> NOT TESTED 2 <input type="checkbox"/> Fresh 3 <input type="checkbox"/> Salty 4 <input type="checkbox"/> Sulphur 5 <input type="checkbox"/> Minerals 6 <input type="checkbox"/> Gas
20-23	1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty 3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 5 <input type="checkbox"/> Gas
25-28	1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty 3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 5 <input type="checkbox"/> Gas
30-33	1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty 3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 5 <input type="checkbox"/> Gas

**51 CASING & OPEN HOLE RECORD**

Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
6 1/4	1 <input checked="" type="checkbox"/> Steel 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic	.188	0	22
6 1/8	1 <input type="checkbox"/> Steel 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic		22	75

**SCREEN**

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

**61 PLUGGING & SEALING RECORD**

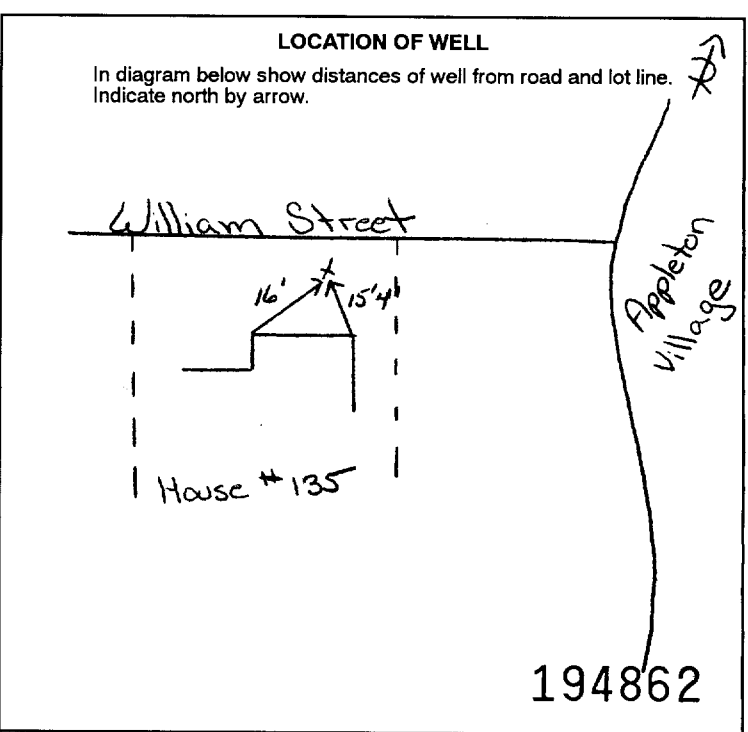
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)
From	To	
21	0	Grouted - Hole Plug (4)

**71 PUMPING TEST**

Pumping test method: 1  Pump 2  Bailor Pumping rate: 25 GPM Duration of pumping: 17-18 Hours

Static level	Water level end of pumping	Water levels during			
23'10"	50 feet	15 minutes: 32'6"	30 minutes: 24'5"	45 minutes: 24 feet	60 minutes: 23'10"

Recommended pump type: 1  Shallow 2  Deep Recommended pump setting: 55 feet Recommended pump rate: 5 GPM



**FINAL STATUS OF WELL**

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

**WATER USE**

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

**METHOD OF CONSTRUCTION**

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

Name of Well Contractor: Capital Water Supply Ltd. Well Contractor's Licence No.: 1558

Address: P.O. Box 490 Stittsville, Ontario K2S 1A6

Name of Well Technician: S. Miller Well Technician's Licence No.: T0097

Signature of Technician/Contractor: [Signature] Submission date: day 9 mo 6 yr 99

**MINISTRY USE ONLY**

Data source: 1558 Contractor: 1558 Date received: JUL 09 1999

Date of inspection: Inspector: Remarks: CSS.E80

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Mark correct box with a checkmark, where applicable.

11

3513014

Municipality  
35012

Con.  
CON 10

County or District <i>Lambton</i>	Township/Borough/City/Town/Village <i>Ramsey</i>	Con block tract survey, etc. <i>10</i>	Lot <i>3</i>
Address <i>Appleton Dr</i>		Date completed <i>13 06 00</i>	
Northing		Elevation	Basin Code

**LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)**

General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
<i>Grey</i>	<i>Limestone</i>			<i>0</i>	<i>42</i>
	<i>Sandstone</i>			<i>42</i>	<i>82</i>

31

32

**41 WATER RECORD**

Water found at - feet	Kind of water
<i>60</i>	<input checked="" type="checkbox"/> Fresh <input type="checkbox"/> Sulphur <input type="checkbox"/> Salty <input type="checkbox"/> Minerals <input type="checkbox"/> Gas
<i>76</i>	<input checked="" type="checkbox"/> Fresh <input type="checkbox"/> Sulphur <input type="checkbox"/> Salty <input type="checkbox"/> Minerals <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Sulphur <input type="checkbox"/> Salty <input type="checkbox"/> Minerals <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Sulphur <input type="checkbox"/> Salty <input type="checkbox"/> Minerals <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Sulphur <input type="checkbox"/> Salty <input type="checkbox"/> Minerals <input type="checkbox"/> Gas

**51 CASING & OPEN HOLE RECORD**

Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
<i>6 1/4</i>	<input checked="" type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input type="checkbox"/> Plastic	<i>100</i>	<i>0</i>	<i>22</i>
<i>8 3/4</i>	<input type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Open hole <input type="checkbox"/> Plastic		<i>0</i>	<i>20</i>
<i>6</i>	<input type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Open hole <input type="checkbox"/> Plastic		<i>20</i>	<i>82</i>

**SCREEN**

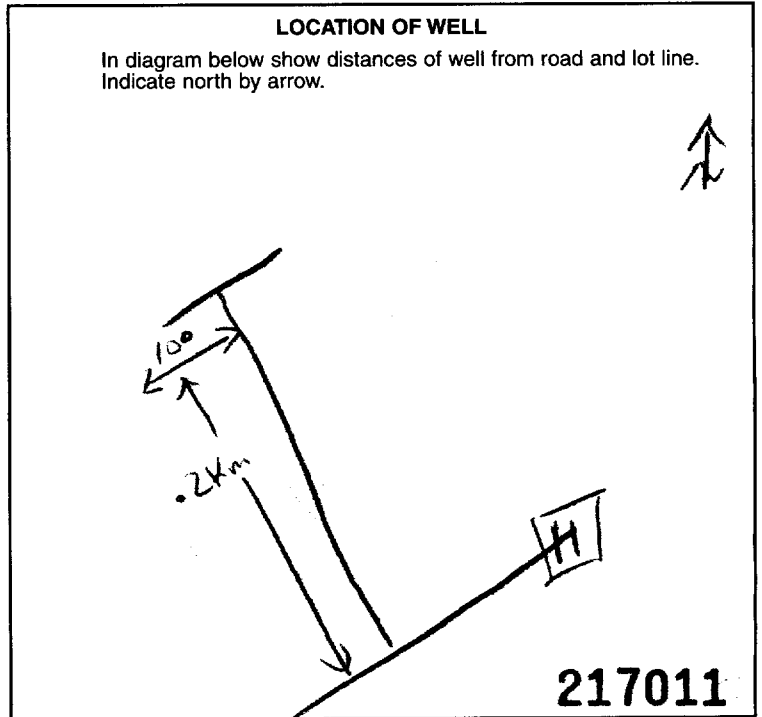
Sizes of opening (Slot No.)	Diameter inches	Length feet
Material and type		Depth at top of screen feet

**61 PLUGGING & SEALING RECORD**

<input checked="" type="checkbox"/> Annular space		<input type="checkbox"/> Abandonment
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)
From	To	
<i>2</i>	<i>22</i>	<i>Cement grout</i>

**71 PUMPING TEST**

Pumping test method <input checked="" type="checkbox"/> Pump <input type="checkbox"/> Bailor	Pumping rate <i>9</i> GPM	Duration of pumping <i>1</i> Hours <i>15</i> Mins
Static level <i>18</i> feet	Water level end of pumping <i>70</i> feet	Water levels during
		<input type="checkbox"/> Pumping <input checked="" type="checkbox"/> Recovery
		15 minutes <i>18</i> feet
		30 minutes <i>18</i> feet
		45 minutes <i>18</i> feet
		60 minutes <i>18</i> feet
If flowing give rate GPM	Pump intake set at feet	Water at end of test <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Cloudy
Recommended pump type <input type="checkbox"/> Shallow <input checked="" type="checkbox"/> Deep	Recommended pump setting <i>70</i> feet	Recommended pump rate <i>90</i> GPM



**FINAL STATUS OF WELL**

<input checked="" type="checkbox"/> Water supply	<input type="checkbox"/> Abandoned, insufficient supply	<input type="checkbox"/> Unfinished
<input type="checkbox"/> Observation well	<input type="checkbox"/> Abandoned, poor quality	<input type="checkbox"/> Replacement well
<input type="checkbox"/> Test hole	<input type="checkbox"/> Abandoned (Other)	
<input type="checkbox"/> Recharge well	<input type="checkbox"/> Dewatering	

**WATER USE**

<input checked="" type="checkbox"/> Domestic	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not use
<input type="checkbox"/> Stock	<input type="checkbox"/> Municipal	<input type="checkbox"/> Other
<input type="checkbox"/> Irrigation	<input type="checkbox"/> Public supply	
<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling & air conditioning	

**METHOD OF CONSTRUCTION**

<input type="checkbox"/> Cable tool	<input checked="" type="checkbox"/> Air percussion	<input type="checkbox"/> Driving
<input type="checkbox"/> Rotary (conventional)	<input type="checkbox"/> Boring	<input type="checkbox"/> Digging
<input type="checkbox"/> Rotary (reverse)	<input type="checkbox"/> Diamond	<input type="checkbox"/> Other
<input type="checkbox"/> Rotary (air)	<input type="checkbox"/> Jetting	

Name of Well Contractor <i>Air-Rock Drilling Ltd</i>	Well Contractor's Licence No. <i>1119</i>
Address <i>Rt 2 Jasper Ont</i>	
Name of Well Technician <i>Shannon Pruell</i>	Well Technician's Licence No. <i>72122</i>
Signature of Technician/Contractor <i>[Signature]</i>	
Submission date <i>13 06 00</i>	

**MINISTRY USE ONLY**

Data source	Contractor <i>1119</i>	Date received <i>JUL 21 2000</i>
Date of inspection	Inspector	
Remarks <i>CSS.ES0</i>		

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

11

3513234

Municipality  
35012

Con.  
CON 10

County or District <b>LAMARK</b>	Township/Borough/City/Town/Village <b>RAMSAY</b>	Con block tract survey, etc. <b>10 Plan 63</b>	Lot <b>3</b>
Address <b>R.R. 3 ALMONTIC</b>		Date completed <b>14 10 2000</b> day month year	

**LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)**

General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
Brown	Sand	Clay	Packed	0	6
Black	limestone		Layered Loose	6	19
Black	limestone		Hard	19	86

**41 WATER RECORD**

Water found at - feet	Kind of water					
10-13 <b>35-80</b>	<input checked="" type="checkbox"/> Fresh	<input type="checkbox"/> Salty	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas	
15-18	<input type="checkbox"/> Fresh	<input type="checkbox"/> Salty	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas	
20-23	<input type="checkbox"/> Fresh	<input type="checkbox"/> Salty	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas	
25-28	<input type="checkbox"/> Fresh	<input type="checkbox"/> Salty	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas	
30-33	<input type="checkbox"/> Fresh	<input type="checkbox"/> Salty	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas	

**51 CASING & OPEN HOLE RECORD**

Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
10-11	<input checked="" type="checkbox"/> Steel			13-16
17-18	<input checked="" type="checkbox"/> Steel	188	0	28
24-25	<input type="checkbox"/> Steel			27-30

**SCREEN**

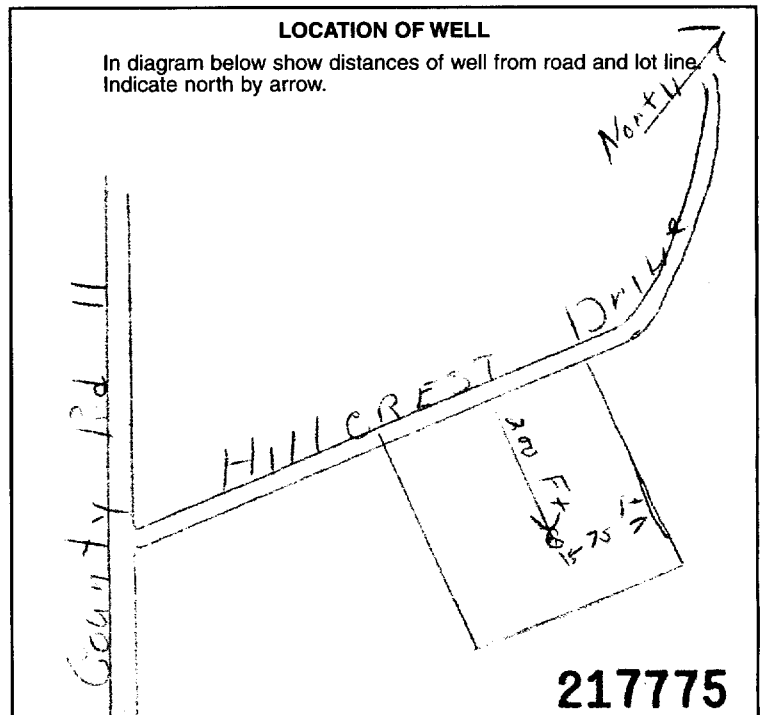
Sizes of opening (Slot No.)	Diameter inches	Length feet
Material and type		Depth at top of screen feet

**61 PLUGGING & SEALING RECORD**

<input type="checkbox"/> Annular space	<input type="checkbox"/> Abandonment
Depth set at - feet	Material and type (Cement grout, bentonite, etc.)
From To	
10-13 14-17	Type 10
18-21 22-25	Cement

**71 PUMPING TEST**

Pumping test method <input checked="" type="checkbox"/> Pump <input type="checkbox"/> Bailer	Pumping rate <b>11</b> GPM	Duration of pumping <b>2</b> Hours <b>17-38</b> Mins
Static level <b>19</b> feet	Water level end of pumping <b>50</b> feet	Water levels during
		15 minutes <b>35</b> feet
		30 minutes <b>30</b> feet
		45 minutes <b>29</b> feet
		60 minutes
Recommended pump type <input type="checkbox"/> Shallow <input checked="" type="checkbox"/> Deep	Recommended pump setting <b>75</b> feet	Recommended pump rate <b>11</b> GPM



**FINAL STATUS OF WELL**

Water supply  Abandoned, insufficient supply  Unfinished

Observation well  Abandoned, poor quality  Replacement well

Test hole  Abandoned (Other)

Recharge well  Dewatering

**WATER USE**

Domestic  Commercial  Not use

Stock  Municipal  Other

Irrigation  Public supply

Industrial  Cooling & air conditioning

**METHOD OF CONSTRUCTION**

Cable tool  Air percussion  Driving

Rotary (conventional)  Boring  Digging

Rotary (reverse)  Diamond  Other

Rotary (air)  Jetting

Name of Well Contractor <b>BOYD CAMERON</b>	Well Contractor's Licence No. <b>1567</b>
Address <b>R.R. CLAYTON ONT</b>	
Name of Well Technician <b>Boyd Cameron</b>	Well Technician's Licence No. <b>0059</b>
Signature of Technician/Contractor <i>Boyd Cameron</i>	Submission date <b>31 10 2000</b> day mo yr

**MINISTRY USE ONLY**

Data source <b>1567</b>	Contractor <b>1567</b>	Date received <b>MAR 16 2001</b>
Date of inspection	Inspector	
Remarks		

**CSS.ES1**

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

3513908

Municipality **35012** Con. **KON** 10

11

County or District <b>Lanark</b>	Township/Borough/City/Town/Village <b>Mississippi Mills - Ramsay</b>	Con block tract survey, etc. <b>10</b>	Lot <b>4</b>
Address <b>Box 578 Almonte, Ontario KOA 1A0</b>		Date completed <b>10</b> day <b>9</b> month <b>02</b> year	

Zone	Easting	Northing	RC	Elevation	RC	Basin Code	ii	iii	iv
21									

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
<b>brown</b>	<b>Clay</b>	<b>Stones</b>		<b>0</b>	<b>16</b>
<b>Green</b>	<b>Shale</b>			<b>16</b>	<b>70</b>
<b>Gray</b>	<b>Limestone</b>			<b>70</b>	<b>75</b>
Note: Casing was left 1.5 feet above ground level at time of drilling.					

31									
32									

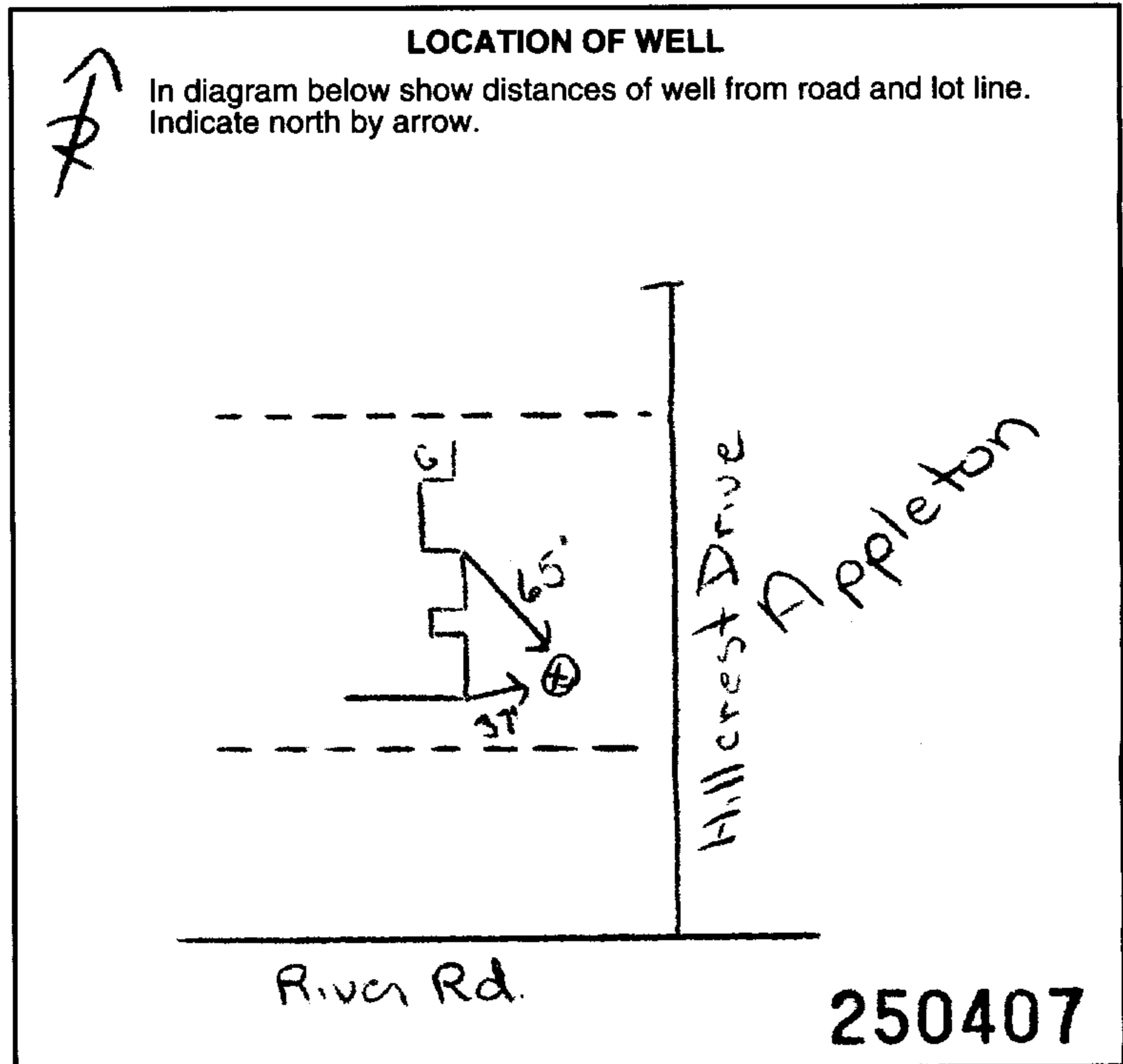
41 WATER RECORD			
Water found at - feet	Kind of water		
10-13 <b>69</b>	1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty	3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 5 <input type="checkbox"/> Gases	14
15-18	1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty	3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 5 <input type="checkbox"/> Gas	19
20-23	1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty	3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 5 <input type="checkbox"/> Gas	24
25-28	1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty	3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 5 <input type="checkbox"/> Gas	29
30-33	1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty	3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 5 <input type="checkbox"/> Gas	34

51 CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
<b>6 1/4</b>	1 <input checked="" type="checkbox"/> Steel 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic	<b>.188</b>	<b>0</b>	<b>22.5</b>
<b>5 7/8</b>	1 <input type="checkbox"/> Steel 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input checked="" type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic		<b>22.5</b>	<b>75</b>
	1 <input type="checkbox"/> Steel 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic			

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

61 PLUGGING & SEALING RECORD			
<input checked="" type="checkbox"/> Annular space <input type="checkbox"/> Abandonment			
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
From	To		
<b>21</b>	<b>0</b>	<b>Grouted - Cement (3)</b>	

71 PUMPING TEST					
Pumping test method	Pumping rate	Duration of pumping		Water levels during	
1 <input checked="" type="checkbox"/> Pump 2 <input type="checkbox"/> Bailer	<b>15</b> GPM	1 <input type="checkbox"/> Hours	17-18 <input type="checkbox"/> Mins	1 <input checked="" type="checkbox"/> Pumping	2 <input type="checkbox"/> Recovery
Static level	Water level end of pumping	15 minutes	30 minutes	45 minutes	60 minutes
<b>31.5</b> feet	<b>40</b> feet	<b>73</b> feet	<b>60</b> feet	<b>50</b> feet	<b>40</b> feet
If flowing give rate	Pump intake set at	Water at end of test			
	GPM	feet	<input type="checkbox"/> Clear <input checked="" type="checkbox"/> Cloudy		
Recommended pump type	Recommended pump setting	Recommended pump rate			
<input type="checkbox"/> Shallow <input checked="" type="checkbox"/> Deep	<b>50</b> feet	<b>5</b> GPM			



54 FINAL STATUS OF WELL		
1 <input checked="" type="checkbox"/> Water supply	5 <input type="checkbox"/> Abandoned, insufficient supply	9 <input type="checkbox"/> Unfinished
2 <input type="checkbox"/> Observation well	6 <input type="checkbox"/> Abandoned, poor quality	10 <input type="checkbox"/> Replacement well
3 <input type="checkbox"/> Test hole	7 <input type="checkbox"/> Abandoned (Other)	
4 <input type="checkbox"/> Recharge well	8 <input type="checkbox"/> Dewatering	

55-56 WATER USE		
1 <input checked="" type="checkbox"/> Domestic	5 <input type="checkbox"/> Commercial	9 <input type="checkbox"/> Not use
2 <input type="checkbox"/> Stock	6 <input type="checkbox"/> Municipal	10 <input type="checkbox"/> Other
3 <input type="checkbox"/> Irrigation	7 <input type="checkbox"/> Public supply	
4 <input type="checkbox"/> Industrial	8 <input type="checkbox"/> Cooling & air conditioning	

57 METHOD OF CONSTRUCTION		
1 <input type="checkbox"/> Cable tool	5 <input checked="" type="checkbox"/> Air percussion	9 <input type="checkbox"/> Driving
2 <input type="checkbox"/> Rotary (conventional)	6 <input type="checkbox"/> Boring	10 <input type="checkbox"/> Digging
3 <input type="checkbox"/> Rotary (reverse)	7 <input type="checkbox"/> Diamond	11 <input type="checkbox"/> Other
4 <input checked="" type="checkbox"/> Rotary (air)	8 <input type="checkbox"/> Jetting	

Name of Well Contractor <b>Capital Water Supply Ltd.</b>	Well Contractor's Licence No. <b>1558</b>
Address <b>P.O. Box 490 Stittsville, Ontario K2S 1A6</b>	
Name of Well Technician <b>S. Miller</b>	Well Technician's Licence No. <b>T0097</b>
Signature of Technician/Contractor <i>[Signature]</i>	Submission date day <b>10</b> mo <b>09</b> yr <b>02</b>

<b>MINISTRY USE ONLY</b>	Data source	Contractor <b>1558</b>	Date received <b>OCT 25 2002</b>
	Date of inspection	Inspector	
	Remarks		

Measurements recorded in:  Metric  Imperial

Address of Well Location (Street Number/Name): **480 River Rd.**  
 Township: **Ramsay**  
 Lot: \_\_\_\_\_ Concession: \_\_\_\_\_  
 County/District/Municipality: **Lanark**  
 City/Town/Village: **Appleton**  
 Province: **Ontario** Postal Code: \_\_\_\_\_  
 UTM Coordinates Zone Easting Northing: **8 3 184116465003794**  
 Municipal Plan and Sublot Number: \_\_\_\_\_ Other: \_\_\_\_\_

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
Brn	silt	sand	loose	0'	5'
Grey	limestone	shale	Bedrock	5'	72'

**Annular Space**

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0' 20'	cement grout	1 m³

**Method of Construction**

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

**Construction Record - Casing**

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
6"	steel	1/4"	0'	20'	<input checked="" type="checkbox"/> Water Supply <input checked="" type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____

**Construction Record - Screen**

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

**Water Details**

Water found at Depth (m/ft)	Kind of Water: <input checked="" type="checkbox"/> Fresh <input type="checkbox"/> Untested	Depth (m/ft)	Diameter (cm/in)
8'	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	0' 20'	10"
		20' 72'	6"

**Well Contractor and Well Technician Information**

Business Name of Well Contractor: **Aardvark Drilling Inc.** Well Contractor's Licence No.: **7 2 3**  
 Business Address (Street Number/Name): **25-C Lewis Road** Municipality: **Guelph**  
 Province: **ON** Postal Code: **N1H1E9** Business E-mail Address: **www.aardvarkdrillinginc.com**

us. Telephone No. (inc. area code): **5198269340** Name of Well Technician (Last Name, First Name): **Smith, Kyle**  
 Well Technician's Licence No.: **3591** Signature of Technician and/or Contractor: *[Signature]* Date Submitted: **20151105**

**Results of Well Yield Testing**

After test of well yield, water was:  
 Clear and sand free  
 Other, specify \_\_\_\_\_

If pumping discontinued, give reason: \_\_\_\_\_

Pump intake set at (m/ft): **60**

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

Duration of pumping: \_\_\_\_\_ hrs + \_\_\_\_\_ min

Final water level end of pumping (m/ft): **16.6 m**

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

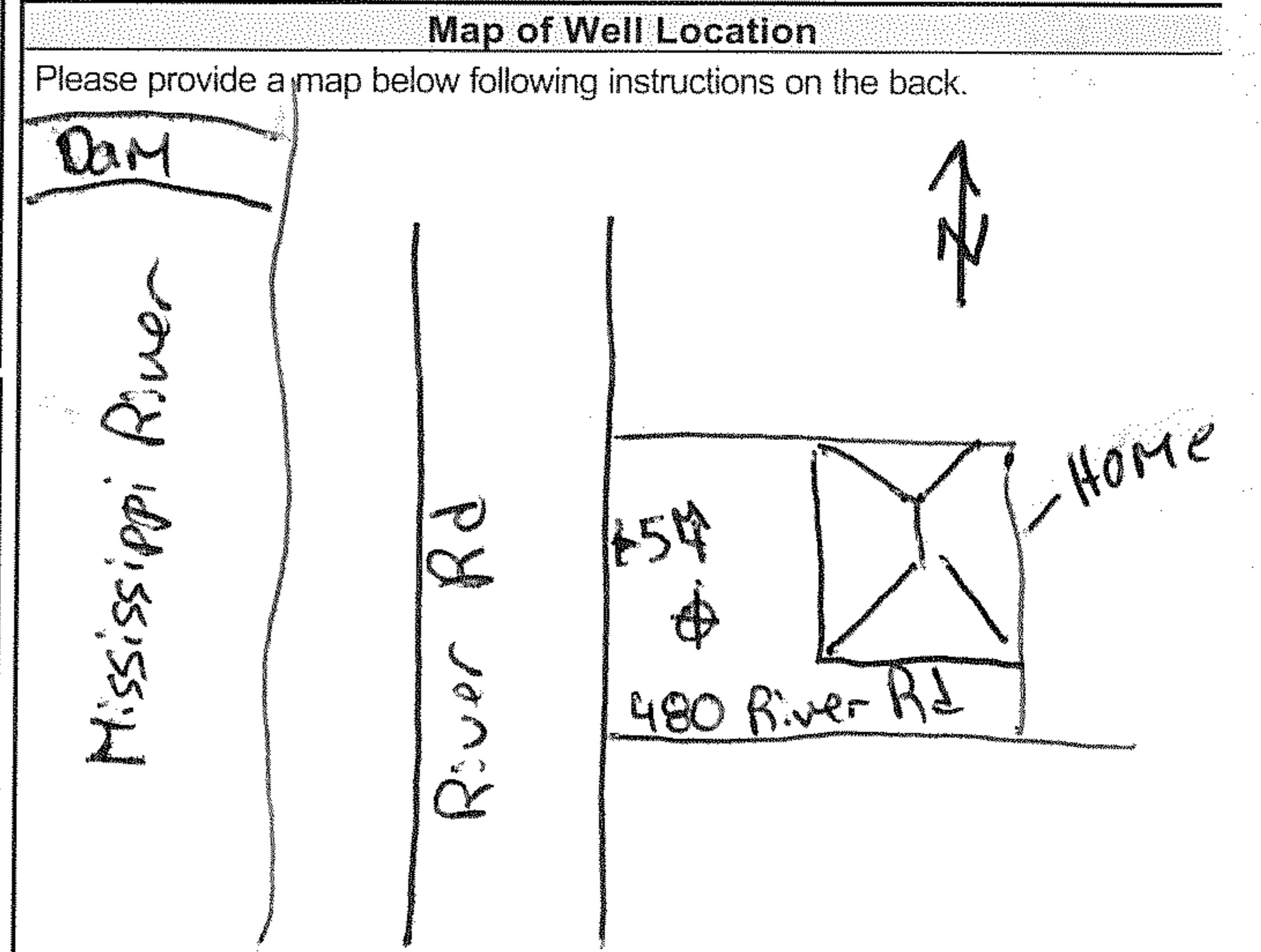
Recommended pump depth (m/ft): **60**

Recommended pump rate (l/min / GPM): **10**

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

Disinfected?  Yes  No

Time (min)	Draw Down		Recovery	
	Water Level (m/ft)	Time (min)	Water Level (m/ft)	Time (min)
Static Level	<b>8.09</b>			
1	<b>10.1</b>	1	<b>14.4</b>	
2	<b>11.4</b>	2	<b>12.5</b>	
3	<b>12.45</b>	3	<b>10.95</b>	
4	<b>13.35</b>	4	<b>9.79</b>	
5	<b>15.52</b>	5	<b>9.01</b>	
10	<b>15.96</b>	10	<b>8.23</b>	
15	<b>16.18</b>	15	<b>8.2</b>	
20	<b>16.19</b>	20	<b>8.17</b>	
25	<b>16.23</b>	25	<b>8.14</b>	
30	<b>16.29</b>	30	<b>8.13</b>	
40	<b>16.41</b>	40	<b>8.11</b>	
50	<b>16.53</b>	50	<b>8.09</b>	
60	<b>16.60</b>	60	<b>8.09</b>	



Comments: \_\_\_\_\_

Well owner's information package delivered:  Yes  No

Date Package Delivered: \_\_\_\_\_

Date Work Completed: **20151022**

**Ministry Use Only**

Audit No: **Z199779**

Received: **DEC 24 2015**

## Appendix 3

- **Certificates of Analysis for Water Samples (TW1 to TW3)**
- **Certificates of Analysis for Water Samples (Offsite Wells)**



Client: Paterson Group  
154 Colonnade Rd South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Jamie Blakely  
PO#: 15962  
Invoice to: Paterson Group

Report Number: 1513000  
Date Submitted: 2015-07-09  
Date Reported: 2015-07-17  
Project: PH2723  
COC #: 52218

---

**Dear Jamie Blakely:**

**Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).**

Report Comments:

APPROVAL: \_\_\_\_\_  
Shyla Monette  
Team Leader, Inorganics

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at <http://www.cala.ca/scopes/2602.pdf>.

Exova (Ottawa) is certified and accredited for specific parameters by OMAFRA, Ontario Ministry of Agriculture, Food and Rural Affairs (for farm soils). Licensed by Ontario MOE for specific tests in drinking water.

Exova (Mississauga) is accredited for specific parameters by SCC, Standards Council of Canada (to ISO 17025)

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Exova recommends consulting the official provincial or federal guideline as required.

Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#: 15962  
 Invoice to: Paterson Group

Report Number: 1513000  
 Date Submitted: 2015-07-09  
 Date Reported: 2015-07-17  
 Project: PH2723  
 COC #: 52218

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.		
					1187383	Water		2015-07-09	TW1 WS1	1187384	Water
Calculations	Hardness as CaCO3	1	mg/L	OG-100						383*	392*
	Ion Balance	0.01								1.02	1.02
	TDS (COND - CALC)	1	mg/L	AO-500						520*	530*
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500						329	343
	Cl	1	mg/L	AO-250						53	56
	Colour	2	TCU	AO-5						<2	<2
	Conductivity	5	uS/cm							800	815
	F	0.10	mg/L	MAC-1.5						0.39	0.32
	N-NO2	0.10	mg/L	MAC-1.0						<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0						0.72	0.73
	pH	1.00		6.5-8.5						7.94	7.98
	SO4	1	mg/L	AO-500						40	36
	Turbidity	0.1	NTU	AO-5.0						2.7	0.2
Metals	Ca	1	mg/L							94	96
	Fe	0.03	mg/L	AO-0.3						<0.03	<0.03
	K	1	mg/L							7	7
	Mg	1	mg/L							36	37
	Mn	0.01	mg/L	AO-0.05						<0.01	<0.01
	Na	2	mg/L	AO-200						31	32
Nutrients	Total Kjeldahl Nitrogen	0.1	mg/L							<0.1	<0.1
Phenols	Phenols	0.001	mg/L							<0.001	<0.001
Subcontract	DOC	0.5	mg/L	AO-5						75.4*	71.2*
	N-NH3	0.01	mg/L							0.02	0.02
	S2-	0.02	mg/L	AO-0.05						<0.02	<0.02
	Tannin & Lignin	0.1	mg/L							<0.1	<0.1

**Guideline = ODWSOG** \* = **Guideline Exceedence**  
 All analysis completed in Ottawa, Ontario (unless otherwise indicated by \*\* which indicates analysis was completed in Mississauga, Ontario).  
 Results relate only to the parameters tested on the samples submitted.  
 Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#: 15962  
 Invoice to: Paterson Group

Report Number: 1513000  
 Date Submitted: 2015-07-09  
 Date Reported: 2015-07-17  
 Project: PH2723  
 COC #: 52218

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Run No</b> 290173 <b>Analysis/Extraction Date</b> 2015-07-10 <b>Analyst</b> K_A			
<b>Method</b> EPA 200.8			
Iron	<0.03 mg/L	95	92-107
Manganese	<0.01 mg/L	100	94-106
<b>Run No</b> 290241 <b>Analysis/Extraction Date</b> 2015-07-11 <b>Analyst</b> C_F			
<b>Method</b> C SM2130B			
Turbidity	<0.1 NTU	99	73-127
<b>Run No</b> 290251 <b>Analysis/Extraction Date</b> 2015-07-11 <b>Analyst</b> SKH			
<b>Method</b> M SM3120B-3500C			
Calcium	<1 mg/L	102	90-110
Potassium	<1 mg/L	100	87-113
Magnesium	<1 mg/L	98	76-124
Sodium	<2 mg/L	109	82-118
<b>Run No</b> 290304 <b>Analysis/Extraction Date</b> 2015-07-13 <b>Analyst</b> NP			
<b>Method</b> C SM4500-NO3-F			
N-NO2	<0.10 mg/L	107	80-120
N-NO3	<0.10 mg/L	92	80-120
<b>Run No</b> 290342 <b>Analysis/Extraction Date</b> 2015-07-13 <b>Analyst</b> AET			

**Guideline = ODWSOG**

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#: 15962  
 Invoice to: Paterson Group

Report Number: 1513000  
 Date Submitted: 2015-07-09  
 Date Reported: 2015-07-17  
 Project: PH2723  
 COC #: 52218

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Method C SM4500-H+B</b>			
Alkalinity (CaCO3)	<5 mg/L	104	90-110
Conductivity	<5 uS/cm	100	90-110
F	<0.10 mg/L	101	90-110
pH	6.03	100	90-110
<b>Run No 290540 Analysis/Extraction Date 2015-07-16 Analyst AET</b>			
<b>Method C SM2120C</b>			
Colour	<2 TCU	95	90-110
<b>Run No 290567 Analysis/Extraction Date 2015-07-15 Analyst NP</b>			
<b>Method SM 4110</b>			
Chloride	<1 mg/L	100	90-110
SO4	<1 mg/L	103	90-110
<b>Run No 290603 Analysis/Extraction Date 2015-07-14 Analyst AET</b>			
<b>Method SUBCONTRACT P-INORG</b>			
DOC	<0.5 mg/L	99	
N-NH3	<0.01 mg/L	100	
Phenols	<0.001 mg/L	92	69-132
S2-	<0.02 mg/L	104	
Tannin & Lignin	<0.1 mg/L	90	

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#: 15962  
 Invoice to: Paterson Group

Report Number: 1513000  
 Date Submitted: 2015-07-09  
 Date Reported: 2015-07-17  
 Project: PH2723  
 COC #: 52218

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Total Kjeldahl Nitrogen	<0.1 mg/L	101	81-126

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Client: Paterson Group  
154 Colonnade Rd South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Jamie Blakely  
PO#:  
Invoice to: Paterson Group

Report Number: 1513010  
Date Submitted: 2015-07-09  
Date Reported: 2015-07-11  
Project: PH2723  
COC #: 52218

Page 1 of 2

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**Dear Jamie Blakely:**

**Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).**

Report Comments:

APPROVAL: \_\_\_\_\_

Krista Quantrill  
Laboratory Supervisor, Microbiology

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#:   
 Invoice to: Paterson Group

Report Number: 1513010  
 Date Submitted: 2015-07-09  
 Date Reported: 2015-07-11  
 Project: PH2723  
 COC #: 52218

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
					1187401	Water		2015-07-09	TW1 WS1
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0	1187402	Water		2015-07-09	TW1 WS2
	Total Coliforms	0	ct/100mL	MAC-0					

**Guideline = ODWSOG**

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Client: Paterson Group  
154 Colonnade Rd South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Jamie Blakely  
PO#: 15963  
Invoice to: Paterson Group

Report Number: 1513209  
Date Submitted: 2015-07-13  
Date Reported: 2015-07-21  
Project: PH2723  
COC #: 52220

Page 1 of 5

---

**Dear Jamie Blakely:**

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Report Comments:

APPROVAL: \_\_\_\_\_

Shyla Monette  
Team Leader, Inorganics

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#: 15963  
 Invoice to: Paterson Group

Report Number: 1513209  
 Date Submitted: 2015-07-13  
 Date Reported: 2015-07-21  
 Project: PH2723  
 COC #: 52220

Group	Analyte	MRL	Units	Guideline	Lab I.D.	
					Sample Matrix	Sample Type
					1187964	1187965
					Water	Water
					2015-07-13	2015-07-13
					TW2 WS1	TW2 WS2
Calculations	Hardness as CaCO3	1	mg/L	OG-100	346*	348*
	Ion Balance	0.01			0.96	0.97
	TDS (COND - CALC)	1	mg/L	AO-500	449	460
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500	322	316
	Cl	1	mg/L	AO-250	30	34
	Colour	2	TCU	AO-5	11*	11*
	Conductivity	5	uS/cm		691	707
	F	0.10	mg/L	MAC-1.5	0.33	0.31
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0	0.16	0.23
	pH	1.00		6.5-8.5	7.98	7.91
	SO4	1	mg/L	AO-500	37	37
	Turbidity	0.1	NTU	AO-5.0	1.0	1.6
	Metals	Ca	1	mg/L		89
Fe		0.03	mg/L	AO-0.3	0.18	0.16
K		1	mg/L		3	3
Mg		1	mg/L		30	30
Mn		0.01	mg/L	AO-0.05	<0.01	<0.01
Na		2	mg/L	AO-200	18	19
Nutrients	Total Kjeldahl Nitrogen	0.1	mg/L		0.2	0.1
Phenols	Phenols	0.001	mg/L		<0.001	<0.001
Subcontract	DOC	0.5	mg/L	AO-5	70.3*	73.0*
	N-NH3	0.01	mg/L		0.02	0.03
	S2-	0.02	mg/L	AO-0.05	<0.02	<0.02
	Tannin & Lignin	0.1	mg/L		<0.1	<0.1

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#: 15963  
 Invoice to: Paterson Group

Report Number: 1513209  
 Date Submitted: 2015-07-13  
 Date Reported: 2015-07-21  
 Project: PH2723  
 COC #: 52220

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Run No</b> 290480 <b>Analysis/Extraction Date</b> 2015-07-15 <b>Analyst</b> K_A			
<b>Method</b> EPA 200.8			
Iron	<0.03 mg/L	99	92-107
Manganese	<0.01 mg/L	99	94-106
<b>Run No</b> 290496 <b>Analysis/Extraction Date</b> 2015-07-15 <b>Analyst</b> AET			
<b>Method</b> C SM2130B			
Turbidity	<0.1 NTU	93	73-127
<b>Run No</b> 290517 <b>Analysis/Extraction Date</b> 2015-07-15 <b>Analyst</b> AET			
<b>Method</b> C SM4500-H+B			
Alkalinity (CaCO3)	<5 mg/L	102	90-110
Conductivity	<5 uS/cm	101	90-110
F	<0.10 mg/L	101	90-110
pH	6.11	100	90-110
<b>Run No</b> 290540 <b>Analysis/Extraction Date</b> 2015-07-16 <b>Analyst</b> AET			
<b>Method</b> C SM2120C			
Colour	<2 TCU	95	90-110
<b>Run No</b> 290561 <b>Analysis/Extraction Date</b> 2015-07-16 <b>Analyst</b> SKH			
<b>Method</b> M SM3120B-3500C			

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 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#: 15963  
 Invoice to: Paterson Group

Report Number: 1513209  
 Date Submitted: 2015-07-13  
 Date Reported: 2015-07-21  
 Project: PH2723  
 COC #: 52220

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Calcium	<1 mg/L	102	90-110
Potassium	<1 mg/L	104	87-113
Magnesium	<1 mg/L	99	76-124
Sodium	<2 mg/L	103	82-118
<b>Run No 290572 Analysis/Extraction Date 2015-07-16 Analyst K_A</b>			
<b>Method EPA 200.8</b>			
Iron	<0.03 mg/L	94	92-107
Manganese	<0.01 mg/L	97	94-106
<b>Run No 290653 Analysis/Extraction Date 2015-07-17 Analyst NP</b>			
<b>Method C SM4500-NO3-F</b>			
N-NO2	<0.10 mg/L	93	80-120
N-NO3	<0.10 mg/L	93	80-120
<b>Run No 290719 Analysis/Extraction Date 2015-07-16 Analyst SCM</b>			
<b>Method SUBCONTRACT P-INORG</b>			
N-NH3	<0.01 mg/L	100	
<b>Run No 290720 Analysis/Extraction Date 2015-07-16 Analyst SCM</b>			
<b>Method SUBCONTRACT P-INORG</b>			
DOC	<0.5 mg/L	105	
<b>Run No 290721 Analysis/Extraction Date 2015-07-16 Analyst SCM</b>			

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Client: Paterson Group  
 154 Colonnade Rd South  
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 K2E 7T7  
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Report Number: 1513209  
 Date Submitted: 2015-07-13  
 Date Reported: 2015-07-21  
 Project: PH2723  
 COC #: 52220

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Method</b> SUBCONTRACT P-INORG			
Phenols	<0.001 mg/L	100	69-132
<b>Run No</b> 290723 <b>Analysis/Extraction Date</b> 2015-07-20 <b>Analyst</b> SCM			
<b>Method</b> SUBCONTRACT P-INORG			
Tannin & Lignin	<0.1 mg/L	100	
<b>Run No</b> 290724 <b>Analysis/Extraction Date</b> 2015-07-17 <b>Analyst</b> SCM			
<b>Method</b> SUBCONTRACT P-INORG			
Total Kjeldahl Nitrogen	<0.1 mg/L	105	81-126
<b>Run No</b> 290758 <b>Analysis/Extraction Date</b> 2015-07-15 <b>Analyst</b> AET			
<b>Method</b> SUBCONTRACT P-INORG			
S2-	<0.02 mg/L	104	
<b>Run No</b> 290781 <b>Analysis/Extraction Date</b> 2015-07-20 <b>Analyst</b> NP			
<b>Method</b> SM 4110			
Chloride	<1 mg/L	103	90-110
SO4	<1 mg/L	106	90-110

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Client: Paterson Group  
154 Colonnade Rd South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Jamie Blakely  
PO#: 15963  
Invoice to: Paterson Group

Report Number: 1513208  
Date Submitted: 2015-07-13  
Date Reported: 2015-07-14  
Project: PH2723  
COC #: 52220

Page 1 of 2

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**Dear Jamie Blakely:**

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Report Comments:

APPROVAL: \_\_\_\_\_

Krista Quantrill  
Laboratory Supervisor, Microbiology

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 154 Colonnade Rd South  
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 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#: 15963  
 Invoice to: Paterson Group

Report Number: 1513208  
 Date Submitted: 2015-07-13  
 Date Reported: 2015-07-14  
 Project: PH2723  
 COC #: 52220

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
					1187962	Water		2015-07-13	TW2 WS1
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0	1187963	Water		2015-07-13	TW2 WS2
	Total Coliforms	0	ct/100mL	MAC-0					

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Client: Paterson Group  
154 Colonnade Rd South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Jamie Blakely  
PO#: 15964  
Invoice to: Paterson Group

Report Number: 1513146  
Date Submitted: 2015-07-10  
Date Reported: 2015-07-20  
Project: PH2723  
COC #: 52219

Page 1 of 9

---

**Dear Jamie Blakely:**

**Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).**

Report Comments:

APPROVAL: \_\_\_\_\_

Shyla Monette  
Team Leader, Inorganics

APPROVAL: \_\_\_\_\_

Tanya Baillargeon  
Team Lead, Organics

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#: 15964  
 Invoice to: Paterson Group

Report Number: 1513146  
 Date Submitted: 2015-07-10  
 Date Reported: 2015-07-20  
 Project: PH2723  
 COC #: 52219

Group	Analyte	MRL	Units	Guideline	1187819 Water 2015-07-10 TW3 WS1	1187820 Water 2015-07-10 TW3 WS2	1187821 Water 2015-07-10 TW3 WS2 - Paterson Package
Calculations	Hardness as CaCO3	1	mg/L	OG-100	414*	419*	
	Ion Balance	0.01			1.04	1.02	
	TDS (COND - CALC)	1	mg/L	AO-500	565*	578*	
Cyanide	Cyanide (free)	0.005	mg/L	MAC-0.2			<0.005
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500	358	369	
	Cl	1	mg/L	AO-250	62	68	
	Colour	2	TCU	AO-5	<2	<2	
	Conductivity	5	uS/cm		869	889	
	DOC	0.5	mg/L	AO-5	2.3	2.1	
	F	0.10	mg/L	MAC-1.5	0.43	0.43	
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10	
	N-NO3	0.10	mg/L	MAC-10.0	0.93	1.16	
	pH	1.00		6.5-8.5	7.70	7.76	
	SO4	1	mg/L	AO-500	36	35	
	Tannin & Lignin	0.1	mg/L		<0.1	<0.1	
	Turbidity	0.1	NTU	AO-5.0	0.2	0.2	
Mercury	Hg	0.0001	mg/L	MAC-0.001			<0.0001
Metals	Ag	0.0001	mg/L				<0.0001
	As	0.001	mg/L	IMAC-0.025			<0.001
	B	0.01	mg/L	IMAC-5.0			0.14
	Ba	0.01	mg/L	MAC-1.0			0.21
	Be	0.0005	mg/L				<0.0005
	Ca	1	mg/L		100	102	
	Cd	0.0001	mg/L	MAC-0.005			<0.0001
	Co	0.0002	mg/L				<0.0002
	Cr	0.001	mg/L	MAC-0.05			<0.001

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Client: Paterson Group  
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 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#: 15964  
 Invoice to: Paterson Group

Report Number: 1513146  
 Date Submitted: 2015-07-10  
 Date Reported: 2015-07-20  
 Project: PH2723  
 COC #: 52219

Group	Analyte	MRL	Units	Guideline	1187819 Water 2015-07-10 TW3 WS1	1187820 Water 2015-07-10 TW3 WS2	1187821 Water 2015-07-10 TW3 WS2 - Paterson Package
Metals	Cu	0.001	mg/L	AO-1.0			<0.001
	Fe	0.03	mg/L	AO-0.3	<0.03	<0.03	
	K	1	mg/L		7	7	
	Mg	1	mg/L		40	40	
	Mn	0.01	mg/L	AO-0.05	0.01	0.01	
	Mo	0.005	mg/L				<0.005
	Na	2	mg/L	AO-200	39	42	
	Ni	0.005	mg/L				<0.005
	Pb	0.001	mg/L	MAC-0.010			<0.001
	Sb	0.0005	mg/L	IMAC-0.006			<0.0005
	Se	0.001	mg/L	MAC-0.01			<0.001
	Sr	0.001	mg/L				2.40
	Tl	0.0001	mg/L				<0.0001
	U	0.001	mg/L	MAC-0.02			0.002
V	0.001	mg/L				<0.001	
Zn	0.01	mg/L	AO-5.0			<0.01	
Nutrients	N-NH3	0.05	mg/L		<0.05	<0.05	
	Total Kjeldahl Nitrogen	0.07	mg/L		0.14	0.33	
Phenols-4AAP	Phenols	0.002	mg/L		<0.002	<0.002	
Sulphide	S2-	0.002	mg/L	AO-0.05	<0.002	<0.002	
VOCs	1,4-dichlorobenzene	0.4	ug/L	MAC-5			<0.4
	Benzene	0.5	ug/L	MAC-5			<0.5
	Dichloromethane	4.0	ug/L	MAC-50			<4.0
	Toluene	0.5	ug/L	AO-24			1.3
	Vinyl Chloride	0.2	ug/L	MAC-2			<0.2
VOCs Surrogates (%)	1,2-dichloroethane-d4	0	%				103

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#: 15964  
 Invoice to: Paterson Group

Report Number: 1513146  
 Date Submitted: 2015-07-10  
 Date Reported: 2015-07-20  
 Project: PH2723  
 COC #: 52219

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1187819 Water  2015-07-10 TW3 WS1	1187820 Water  2015-07-10 TW3 WS2	1187821 Water  2015-07-10 TW3 WS2 - Paterson Package
VOCs Surrogates (%REC)	4-bromofluorobenzene	0	%					106
	Toluene-d8	0	%					100

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 COC #: 52219

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Run No</b> 290245 <b>Analysis/Extraction Date</b> 2015-07-11 <b>Analyst</b> C_F			
<b>Method</b> C SM2130B			
Turbidity	<0.1 NTU	99	73-127
<b>Run No</b> 290251 <b>Analysis/Extraction Date</b> 2015-07-11 <b>Analyst</b> SKH			
<b>Method</b> M SM3120B-3500C			
Calcium	<1 mg/L	102	90-110
Potassium	<1 mg/L	100	87-113
Magnesium	<1 mg/L	98	76-124
Sodium	<2 mg/L	109	82-118
<b>Run No</b> 290315 <b>Analysis/Extraction Date</b> 2015-07-13 <b>Analyst</b> SCM			
<b>Method</b> M SM3112B-3500B			
Mercury	<0.0001 mg/L	100	76-123
<b>Run No</b> 290318 <b>Analysis/Extraction Date</b> 2015-07-13 <b>Analyst</b> K_A			
<b>Method</b> EPA 200.8			
Iron	<0.03 mg/L	94	92-107
Manganese	<0.01 mg/L	96	94-106
<b>Run No</b> 290480 <b>Analysis/Extraction Date</b> 2015-07-15 <b>Analyst</b> K_A			
<b>Method</b> EPA 200.8			

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 154 Colonnade Rd South  
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Report Number: 1513146  
 Date Submitted: 2015-07-10  
 Date Reported: 2015-07-20  
 Project: PH2723  
 COC #: 52219

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Silver	<0.0001 mg/L	95	94-106
Arsenic	<0.001 mg/L	96	93-106
Barium	<0.01 mg/L	100	91-109
Beryllium	<0.0005 mg/L	99	93-107
Cadmium	<0.0001 mg/L	101	93-107
Cobalt	<0.0002 mg/L	97	94-106
Chromium Total	<0.001 mg/L	97	94-106
Copper	<0.001 mg/L	96	93-106
Molybdenum	<0.005 mg/L	98	94-106
Nickel	<0.005 mg/L	97	94-106
Lead	<0.001 mg/L	101	70-130
Antimony	<0.0005 mg/L	96	80-120
Selenium	<0.001 mg/L	101	91-108
Strontium	<0.001 mg/L	101	89-110
Thallium	<0.0001 mg/L	98	95-105
Uranium	<0.001 mg/L	98	94-106
Vanadium	<0.001 mg/L	96	93-107
<b>Run No</b> 290503	<b>Analysis/Extraction Date</b> 2015-07-15	<b>Analyst</b> SCM	

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Report Number: 1513146  
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 COC #: 52219

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Method C SM4500-CNC</b>			
Cyanide (CN-)	<0.005 mg/L	103	75-125
<b>Run No 290517 Analysis/Extraction Date 2015-07-15 Analyst AET</b>			
<b>Method C SM4500-H+B</b>			
Alkalinity (CaCO3)	<5 mg/L	102	90-110
Conductivity	<5 uS/cm	101	90-110
F	<0.10 mg/L	101	90-110
pH	6.11	100	90-110
<b>Run No 290540 Analysis/Extraction Date 2015-07-16 Analyst AET</b>			
<b>Method C SM2120C</b>			
Colour	<2 TCU	95	90-110
<b>Run No 290563 Analysis/Extraction Date 2015-07-13 Analyst TJB</b>			
<b>Method V 8260B</b>			
Dichlorobenzene, 1,4-	<0.4 ug/L	113	60-130
Benzene	<0.5 ug/L	102	60-130
Methylene Chloride	<4.0 ug/L	89	60-130
Toluene	<0.5 ug/L	110	60-130
Vinyl Chloride	<0.2 ug/L	83	60-130
<b>Run No 290567 Analysis/Extraction Date 2015-07-16 Analyst NP</b>			

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**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Method</b> SM 4110			
Chloride	<1 mg/L	100	90-110
SO4	<1 mg/L	103	90-110
<b>Run No</b> 290572 <b>Analysis/Extraction Date</b> 2015-07-16 <b>Analyst</b> K A			
<b>Method</b> EPA 200.8			
Boron (total)	<0.01 mg/L	101	88-112
Zinc	<0.01 mg/L	98	94-106
<b>Run No</b> 290579 <b>Analysis/Extraction Date</b> 2015-07-15 <b>Analyst</b> AET			
<b>Method</b> Exova Edmonton-SM4500-NH3-G			
N-NH3	<0.05 mg/L	102	
<b>Run No</b> 290582 <b>Analysis/Extraction Date</b> 2015-07-15 <b>Analyst</b> AET			
<b>Method</b> Exova Edmonton-ISO/TR 11905-2			
Total Kjeldahl Nitrogen	<0.07 mg/L	102	
<b>Run No</b> 290583 <b>Analysis/Extraction Date</b> 2015-07-15 <b>Analyst</b> AET			
<b>Method</b> Exova Edmonton-SM5310B			
DOC	<0.5 mg/L	100	
<b>Run No</b> 290588 <b>Analysis/Extraction Date</b> 2015-07-15 <b>Analyst</b> AET			
<b>Method</b> Exova Edmonton-SM4500-S2 E			
S2-	<0.002 mg/L	99	

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Report Number: 1513146  
 Date Submitted: 2015-07-10  
 Date Reported: 2015-07-20  
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**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Run No</b> 290589 <b>Analysis/Extraction Date</b> 2015-07-15 <b>Analyst</b> AET			
<b>Method</b> Exova Surrey-SM5550B			
Tannin & Lignin	<0.1 mg/L	106	
<b>Run No</b> 290591 <b>Analysis/Extraction Date</b> 2015-07-15 <b>Analyst</b> AET			
<b>Method</b> Exova Edmonton-SM5530D			
Phenols	<0.002 mg/L	100	
<b>Run No</b> 290653 <b>Analysis/Extraction Date</b> 2015-07-17 <b>Analyst</b> NP			
<b>Method</b> C SM4500-NO3-F			
N-NO2	<0.10 mg/L	93	80-120
N-NO3	<0.10 mg/L	97	80-120

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154 Colonnade Rd South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Jamie Blakely  
PO#: 15964  
Invoice to: Paterson Group

Report Number: 1513145  
Date Submitted: 2015-07-10  
Date Reported: 2015-07-13  
Project: PH2723  
COC #: 52219

---

**Dear Jamie Blakely:**

**Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).**

Report Comments:

APPROVAL: \_\_\_\_\_

Krista Quantrill  
Laboratory Supervisor, Microbiology

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at <http://www.cala.ca/scopes/2602.pdf>.

Exova (Ottawa) is certified and accredited for specific parameters by OMAFRA, Ontario Ministry of Agriculture, Food and Rural Affairs (for farm soils). Licensed by Ontario MOE for specific tests in drinking water.

Exova (Mississauga) is accredited for specific parameters by SCC, Standards Council of Canada (to ISO 17025)

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Exova recommends consulting the official provincial or federal guideline as required.



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 K2E 7T7  
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Report Number: 1513145  
 Date Submitted: 2015-07-10  
 Date Reported: 2015-07-13  
 Project: PH2723  
 COC #: 52219

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
					1187817	Water	-	2015-07-10	TW3 WS1
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0	1187817	Water	-	2015-07-10	TW3 WS1
	Total Coliforms	0	ct/100mL	MAC-0	1187818	Water	-	2015-07-10	TW3 WS2

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154 Colonnade Rd South  
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K2E 7T7  
Attention: Mr. Jamie Blakely  
PO#: 18622  
Invoice to: Paterson Group

Report Number: 1517097  
Date Submitted: 2015-08-28  
Date Reported: 2015-09-08  
Project: PH2723  
COC #: 58211

Page 1 of 6

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**Dear Jamie Blakely:**

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Report Comments:

APPROVAL: \_\_\_\_\_

Shyla Monette  
Team Leader, Inorganics

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 Project: PH2723  
 COC #: 58211

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
					1198478	Water	1198479	Water	2015-08-28
					119 Old Mill Lane	110 Apple Street			
Calculations	Hardness as CaCO3	1	mg/L	OG-100	370*	430*			
	Ion Balance	0.01			1.04	0.98			
	TDS (COND - CALC)	1	mg/L	AO-500	506*	611*			
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500	319	352			
	Cl	1	mg/L	AO-250	50	84			
	Colour	2	TCU	AO-5	18*	16*			
	Conductivity	5	uS/cm		779	940			
	F	0.10	mg/L	MAC-1.5	0.32	0.43			
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10			
	N-NO3	0.10	mg/L	MAC-10.0	<0.10	1.23			
	pH	1.00		6.5-8.5	8.16	8.27			
	SO4	1	mg/L	AO-500	38	39			
	Turbidity	0.1	NTU	AO-5.0	0.6	0.1			
	Metals	Ca	1	mg/L		92	98		
Fe		0.03	mg/L	AO-0.3	<0.03	<0.03			
K		1	mg/L		4	9			
Mg		1	mg/L		34	45			
Mn		0.01	mg/L	AO-0.05	<0.01	<0.01			
Na		2	mg/L	AO-200	33	30			
Nutrients	Total Kjeldahl Nitrogen	0.1	mg/L		<0.1	<0.1			
Phenols	Phenols	0.001	mg/L		<0.001	<0.001			
Subcontract	DOC	0.5	mg/L	AO-5	63.9*	65.1*			
	N-NH3	0.01	mg/L		0.02	0.02			
	S2-	0.02	mg/L	AO-0.05	<0.02	<0.02			
	Tannin & Lignin	0.1	mg/L		0.2	<0.1			

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Report Number: 1517097  
 Date Submitted: 2015-08-28  
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 Project: PH2723  
 COC #: 58211

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Run No</b> 293561 <b>Analysis/Extraction Date</b> 2015-08-31 <b>Analyst</b> AET			
<b>Method</b> C SM2130B			
Turbidity	<0.1 NTU	93	73-127
<b>Run No</b> 293760 <b>Analysis/Extraction Date</b> 2015-09-01 <b>Analyst</b> K_A			
<b>Method</b> EPA 200.8			
Iron	<0.03 mg/L	97	92-107
Manganese	<0.01 mg/L	98	94-106
<b>Run No</b> 293762 <b>Analysis/Extraction Date</b> 2015-09-01 <b>Analyst</b> K_A			
<b>Method</b> M SM3120B-3500C			
Calcium	<1 mg/L	105	90-110
Potassium	<1 mg/L	100	87-113
Magnesium	<1 mg/L	100	76-124
Sodium	<2 mg/L	85	82-118
<b>Run No</b> 293798 <b>Analysis/Extraction Date</b> 2015-09-01 <b>Analyst</b> AET			
<b>Method</b> C SM4500-H+B			
Conductivity	<5 uS/cm	101	90-110
<b>Run No</b> 293840 <b>Analysis/Extraction Date</b> 2015-09-02 <b>Analyst</b> AET			
<b>Method</b> C SM2120C			

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**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Colour	<2 TCU	95	90-110
<b>Run No 293894 Analysis/Extraction Date 2015-09-02 Analyst NP</b>			
<b>Method C SM4500-NO3-F</b>			
N-NO2	<0.10 mg/L	110	80-120
N-NO3	<0.10 mg/L	83	80-120
<b>Run No 293919 Analysis/Extraction Date 2015-09-02 Analyst AET</b>			
<b>Method C SM4500-H+B</b>			
Alkalinity (CaCO3)	<5 mg/L	100	90-110
F	<0.10 mg/L	98	90-110
pH	5.89	100	90-110
<b>Run No 294103 Analysis/Extraction Date 2015-09-01 Analyst SCM</b>			
<b>Method SUBCONTRACT P-INORG</b>			
N-NH3	<0.01 mg/L	102	
<b>Run No 294105 Analysis/Extraction Date 2015-09-02 Analyst SCM</b>			
<b>Method SUBCONTRACT P-INORG</b>			
DOC	<0.5 mg/L	107	
<b>Run No 294108 Analysis/Extraction Date 2015-09-02 Analyst SCM</b>			
<b>Method SUBCONTRACT P-INORG</b>			
Total Kjeldahl Nitrogen	<0.1 mg/L	102	81-126

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**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Run No 294110 Analysis/Extraction Date 2015-09-01 Analyst SCM</b>			
<b>Method SUBCONTRACT P-INORG</b>			
Phenols	<0.001 mg/L	89	69-132
<b>Run No 294111 Analysis/Extraction Date 2015-09-02 Analyst SCM</b>			
<b>Method SUBCONTRACT P-INORG</b>			
Tannin & Lignin	<0.1 mg/L	94	
<b>Run No 294112 Analysis/Extraction Date 2015-09-01 Analyst SCM</b>			
<b>Method SUBCONTRACT P-INORG</b>			
S2-	<0.02 mg/L	105	
<b>Run No 294146 Analysis/Extraction Date 2015-09-03 Analyst NP</b>			
<b>Method SM 4110</b>			
Chloride	<1 mg/L	101	90-110
SO4	<1 mg/L	106	90-110
<b>Run No 294166 Analysis/Extraction Date 2015-09-08 Analyst SCM</b>			
<b>Method C SM2340B</b>			
Hardness as CaCO3			
<b>Run No 294167 Analysis/Extraction Date 2015-09-08 Analyst SCM</b>			
<b>Method C Ion Balance</b>			
Ion Balance			

**Guideline = ODWSOG**

**\* = Guideline Exceedence**

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#: 18622  
 Invoice to: Paterson Group

Report Number: 1517097  
 Date Submitted: 2015-08-28  
 Date Reported: 2015-09-08  
 Project: PH2723  
 COC #: 58211

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Method</b> C SM2540			
TDS (COND - CALC)			
<b>Run No</b> 294168 <b>Analysis/Extraction Date</b> 2015-09-08 <b>Analyst</b> SCM			
<b>Method</b> C SM2340B			
Hardness as CaCO3			
<b>Run No</b> 294169 <b>Analysis/Extraction Date</b> 2015-09-08 <b>Analyst</b> SCM			
<b>Method</b> C Ion Balance			
Ion Balance			
<b>Method</b> C SM2540			
TDS (COND - CALC)			

**Guideline = ODWSOG**

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Client: Paterson Group  
154 Colonnade Rd South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Jamie Blakely  
PO#:  
Invoice to: Paterson Group

Report Number: 1517089  
Date Submitted: 2015-08-28  
Date Reported: 2015-08-31  
Project: PH2723  
COC #: 58211

---

**Dear Jamie Blakely:**

**Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).**

Report Comments:

APPROVAL: \_\_\_\_\_

Krista Quantrill  
Laboratory Supervisor, Microbiology

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Exova (Mississauga) is accredited for specific parameters by SCC, Standards Council of Canada (to ISO 17025)

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Exova recommends consulting the official provincial or federal guideline as required.



Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#:   
 Invoice to: Paterson Group

Report Number: 1517089  
 Date Submitted: 2015-08-28  
 Date Reported: 2015-08-31  
 Project: PH2723  
 COC #: 58211

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
					1198465	Water		2015-08-28	RW WS1
					119 Old Mill Lane				110 Apple Street
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0	0				0
	Total Coliforms	0	ct/100mL	MAC-0	0				0

**Guideline = ODWSOG**

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Client: Paterson Group  
28 Concourse Gate, Unit 1  
Nepean, ON  
K2E 7T7

Attention: Ms. Stephanie Marriott

INVOICE: Paterson Group Inc.  
Chain of Custody Number: 108559

Report Number: 2930580  
Date: 2009-12-17  
Date Submitted: 2009-12-15

Project: PE1114

P.O. Number:  
Matrix: Water

			LAB ID:	767030	GUIDELINE					
			Sample Date:	2009-12-15	ODWSOG					
			Sample ID:	104 Old Mill Lane WS1						
PARAMETER	UNITS	MRL						TYPE	LIMIT	UNITS
Total Coliforms	CFU/100mL		0					MAC	0	CFU/100mL
Escherichia Coli	CFU/100mL		0					MAC	0	CFU/100mL
Heterotrophic Plate Count	CFU/1mL		0							
Faecal Coliforms	CFU/100mL		0							
Faecal Streptococcus	CFU/100mL		0							

MRL = Method Reporting Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:

APPROVAL: \_\_\_\_\_  
Dragana Dzeletovic  
Microbiology Analyst

Client: Paterson Group  
 28 Concourse Gate, Unit 1  
 Nepean, ON  
 K2E 7T7  
 Attention: Ms. Stephanie Marriott

Report Number: 2930624  
 Date: 2009-12-23  
 Date Submitted: 2009-12-15

Project: PE1114

INVOICE: Paterson Group Inc.  
 Chain of Custody Number: 108559

P.O. Number: 8478  
 Matrix: Water

				LAB ID:	767111	GUIDELINE				
				Sample Date:	2009-12-15					
				Sample ID:	104 Old Mill Lane-WS1	ODWSOG				
PARAMETER	UNITS	MRL						TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5	279					OG	500	mg/L
Chloride	mg/L	1	19					AO	250	mg/L
Colour	TCU	2	4					AO	5	TCU
Conductivity	uS/cm	5	641							
Dissolved Organic Carbon	mg/L	0.5	2.2					AO	5	mg/L
Fluoride	mg/L	0.1	0.26					MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01	<0.01					AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02	<0.02							
N-NO2 (Nitrite)	mg/L	0.1	<0.10					MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.1	0.60					MAC	10.0	mg/L
pH			7.86						6.5-8.5	
Phenols	mg/L	0.001	<0.001							
Sulphate	mg/L	1	39					AO	500	mg/L
Tannin & Lignin	mg/L	0.1	<0.1							
Total Dissolved Solids (COND - CALC)	mg/L	5	417					AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.1	<0.10							
Turbidity	NTU	0.1	0.2					MAC	1.0	NTU
Hardness as CaCO3	mg/L	1	322					OG	100	mg/L
Ion Balance		0.01	1.04							
Calcium	mg/L	1	86							
Magnesium	mg/L	1	26							
Potassium	mg/L	1	3							
Sodium	mg/L	2	17					AO	200	mg/L
Iron	mg/L	0.03	<0.03					AO	0.3	mg/L
Manganese	mg/L	0.01	<0.01					AO	0.05	mg/L

MRL = Method Reporting Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:

APPROVAL: \_\_\_\_\_  
 Ewan McRobbie  
 Inorganic Lab Supervisor

Client: Paterson Group  
 28 Concourse Gate, Unit 1  
 Nepean, ON  
 K2E 7T7  
 Attention: Ms. Stephanie Marriott

Report Number: 1001900  
 Date: 2010-02-03  
 Date Submitted: 2010-02-01

Project: PE1114

INVOICE: Paterson Group Inc.  
 Chain of Custody Number: 108560

P.O. Number: 8489  
 Matrix: Water

			LAB ID:	774157	GUIDELINE					
			Sample Date:	2010-01-30	ODWSOG					
			Sample ID:	116 Old Mill Lane WS 1						
PARAMETER	UNITS	MRL						TYPE	LIMIT	UNITS
Total Coliforms	CFU/100mL		0					MAC	0	CFU/100mL
Escherichia Coli	CFU/100mL		0					MAC	0	CFU/100mL
Heterotrophic Plate Count	CFU/1mL		0							
Faecal Coliforms	CFU/100mL		0							
Faecal Streptococcus	CFU/100mL		0							

MRL = Method Reporting Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration  
 Comment:

APPROVAL: \_\_\_\_\_  
 Krista Quantrill  
 Drinking Water Coordinator

Client: Paterson Group  
28 Concourse Gate, Unit 1  
Nepean, ON  
K2E 7T7

Attention: Ms. Stephanie Marriott

INVOICE: Paterson Group Inc.  
Chain of Custody Number: 108560

Report Number: 1001909  
Date: 2010-02-09  
Date Submitted: 2010-02-01

Project: PE1114

P.O. Number:  
Matrix: Water

				LAB ID:	774170	GUIDELINE				
				Sample Date:	2010-01-30					
				Sample ID:	116 Old Mill Lane WS 1	ODWSOG				
PARAMETER	UNITS	MRL						TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5	339					OG	500	mg/L
Chloride	mg/L	1	32					AO	250	mg/L
Colour	TCU	2	<2					AO	5	TCU
Conductivity	uS/cm	5	749							
Dissolved Organic Carbon	mg/L	0.5	1.8					AO	5	mg/L
Fluoride	mg/L	0.1	0.31					MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01	<0.01					AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02	<0.02							
N-NO2 (Nitrite)	mg/L	0.1	<0.10					MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.1	0.41					MAC	10.0	mg/L
pH			7.70						6.5-8.5	
Phenols	mg/L	0.001	<0.001							
Sulphate	mg/L	1	33					AO	500	mg/L
Tannin & Lignin	mg/L	0.1	<0.1							
Total Dissolved Solids (COND - CALC)	mg/L	5	487					AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.1	<0.10							
Turbidity	NTU	0.1	0.3					MAC	1.0	NTU
Hardness as CaCO3	mg/L	1	376					OG	100	mg/L
Ion Balance		0.01	1.01							
Calcium	mg/L	1	98							
Magnesium	mg/L	1	32							
Potassium	mg/L	1	5							
Sodium	mg/L	2	20					AO	200	mg/L
Iron	mg/L	0.03	<0.03					AO	0.3	mg/L
Manganese	mg/L	0.01	<0.01					AO	0.05	mg/L

MRL = Method Reporting Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:

APPROVAL: \_\_\_\_\_  
Ewan McRobbie  
Inorganic Lab Supervisor

Client: Paterson Group  
 28 Concourse Gate, Unit 1  
 Nepean, ON  
 K2E 7T7

Attention: Ms. Stephanie Marriott

INVOICE: Paterson Group Inc.  
 Chain of Custody Number: 108988

Report Number: 2931218  
 Date: 2009-12-30  
 Date Submitted: 2009-12-23

Project: PE1114

P.O. Number:  
 Matrix: Water

				LAB ID:	768646	GUIDELINE				
				Sample Date:	2009-12-23					
				Sample ID:	124 Wilson St W	ODWSOG				
PARAMETER	UNITS	MRL						TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5	339					OG	500	mg/L
Chloride	mg/L	1	177					AO	250	mg/L
Colour	TCU	2	3					AO	5	TCU
Conductivity	uS/cm	5	1280							
Fluoride	mg/L	0.1	0.32					MAC	1.5	mg/L
N-NO2 (Nitrite)	mg/L	0.1	<0.10					MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.1	5.30					MAC	10.0	mg/L
pH			7.67						6.5-8.5	
Sulphate	mg/L	1	40					AO	500	mg/L
Tannin & Lignin	mg/L	0.1	<0.1							
Total Dissolved Solids (COND - CALC)	mg/L	5	832					AO	500	mg/L
Turbidity	NTU	0.1	0.1					MAC	1.0	NTU

MRL = Method Reporting Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:

APPROVAL: \_\_\_\_\_  
 Ewan McRobbie  
 Inorganic Lab Supervisor

Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#:  
 Invoice to: Paterson Group

Report Number: 1517089  
 Date Submitted: 2015-08-28  
 Date Reported: 2015-08-31  
 Project: PH2723  
 COC #: 58211

Group	Analyte	MRL	Units	Guideline	1198465 Water 2015-08-28 RW WS1 119 OLD MILL LANE	1198466 Water 2015-08-28 RW WS2 110 APPLE ST.
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0	0	0
	Total Coliforms	0	ct/100mL	MAC-0	0	0

**Guideline = ODWSOG**

**\* = Guideline Exceedence**

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Jamie Blakely  
 PO#: 18622  
 Invoice to: Paterson Group

Report Number: 1517097  
 Date Submitted: 2015-08-28  
 Date Reported: 2015-09-08  
 Project: PH2723  
 COC #: 58211

Group	Analyte	MRL	Units	Guideline	1198478 Water 2015-08-28 RW WS1 119 OLD MILL LANE	1198479 Water 2015-08-28 RW WS2 110 APPLE ST.
Calculations	Hardness as CaCO3	1	mg/L	OG-100	370*	430*
	Ion Balance	0.01			1.04	0.98
	TDS (COND - CALC)	1	mg/L	AO-500	506*	611*
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500	319	352
	Cl	1	mg/L	AO-250	50	84
	Colour	2	TCU	AO-5	18*	16*
	Conductivity	5	uS/cm		779	940
	F	0.10	mg/L	MAC-1.5	0.32	0.43
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0	<0.10	1.23
	pH	1.00		6.5-8.5	8.16	8.27
	SO4	1	mg/L	AO-500	38	39
	Turbidity	0.1	NTU	AO-5.0	0.6	0.1
Metals	Ca	1	mg/L		92	98
	Fe	0.03	mg/L	AO-0.3	<0.03	<0.03
	K	1	mg/L		4	9
	Mg	1	mg/L		34	45
	Mn	0.01	mg/L	AO-0.05	<0.01	<0.01
	Na	2	mg/L	AO-200	33	30
Nutrients	Total Kjeldahl Nitrogen	0.1	mg/L		<0.1	<0.1
Phenols	Phenols	0.001	mg/L		<0.001	<0.001
Subcontract	DOC	0.5	mg/L	AO-5	63.9*	65.1*
	N-NH3	0.01	mg/L		0.02	0.02
	S2-	0.02	mg/L	AO-0.05	<0.02	<0.02
	Tannin & Lignin	0.1	mg/L		0.2	<0.1

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Client: Paterson Group  
154 Colonnade Rd South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Russell Chown  
PO#:  
Invoice to: Paterson Group

Report Number: 1610507  
Date Submitted: 2016-06-24  
Date Reported: 2016-07-04  
Project: PH2723  
COC #: 56555

---

**Dear Russell Chown:**

**Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).**

Report Comments:

APPROVAL: \_\_\_\_\_  
Nadine Pinsonneault  
Team Leader, Inorganics

APPROVAL: \_\_\_\_\_  
Charlie (Long) Qu  
Laboratory Supervisor, Organics

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Russell Chown  
 PO#:   
 Invoice to: Paterson Group

Report Number: 1610507  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH2723  
 COC #: 56555

Group	Analyte	MRL	Units	Guideline	1247167 Water 2016-06-23 TW1	1247168 Water 2016-06-23 TW3
Calculations	Hardness as CaCO3	1	mg/L	OG-100	394*	409*
	Ion Balance	0.01			0.98	1.01
	TDS (COND - CALC)	1	mg/L	AO-500	544*	621*
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500	358	439
	Cl	1	mg/L	AO-250	60	57
	Colour	2	TCU	AO-5	<2	2
	Conductivity	5	uS/cm		837	955
	DOC	0.5	mg/L	AO-5	1.6	3.5
	F	0.10	mg/L	MAC-1.5	0.41	0.40
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0	1.36	0.48
	pH	1.00		6.5-8.5	8.19	8.04
	SO4	1	mg/L	AO-500	40	34
	Turbidity	0.1	NTU	AO-5.0	0.1	0.3
Mercury	Hg	0.0001	mg/L	MAC-0.001	<0.0001	<0.0001
Metals	Ag	0.0001	mg/L		<0.0001	<0.0001
	Al	0.01	mg/L	OG-0.1	<0.01	<0.01
	As	0.001	mg/L	IMAC-0.025	<0.001	<0.001
	B	0.01	mg/L	IMAC-5.0	0.15	0.15
	Ba	0.01	mg/L	MAC-1.0	0.22	0.24
	Be	0.0005	mg/L		<0.0005	<0.0005
	Ca	1	mg/L		95	98
	Cd	0.0001	mg/L	MAC-0.005	<0.0001	<0.0001
	Cr	0.001	mg/L	MAC-0.05	<0.001	<0.001
	Cr(VI)	0.010	mg/L		<0.010	<0.010
	Cu	0.001	mg/L	AO-1.0	<0.001	<0.001

**Guideline = ODWSOG                      \* = Guideline Exceedence**  
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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Russell Chown  
 PO#:   
 Invoice to: Paterson Group

Report Number: 1610507  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH2723  
 COC #: 56555

Group	Analyte	MRL	Units	Guideline	Lab I.D.	1247167	1247168
					Sample Matrix	Water	Water
					Sample Type	2016-06-23	2016-06-23
					Sampling Date	TW1	TW3
					Sample I.D.		
Metals	Fe	0.03	mg/L	AO-0.3		<0.03	<0.03
	K	1	mg/L			7	7
	Mg	1	mg/L			38	40
	Mn	0.01	mg/L	AO-0.05		<0.01	0.02
	Mo	0.005	mg/L			<0.005	<0.005
	Na	2	mg/L	AO-200		36	66
	Ni	0.005	mg/L			<0.005	<0.005
	Pb	0.001	mg/L	MAC-0.010		<0.001	<0.001
	Sb	0.0005	mg/L	IMAC-0.006		<0.0005	<0.0005
	Se	0.001	mg/L	MAC-0.01		<0.001	<0.001
	Sr	0.001	mg/L			2.33	2.36
	Tl	0.0001	mg/L			<0.0001	<0.0001
	U	0.001	mg/L	MAC-0.02		0.003	0.003
Zn	0.01	mg/L	AO-5.0		<0.01	<0.01	
Nutrients	Total Kjeldahl Nitrogen	0.1	mg/L			0.2	0.3
Others	Alpha-androstrane	0	%			108	120
	F1 (C6-C10)	20	ug/L			<20	<20
	F2 (C10-C16)	20	ug/L			<20	<20
	F3 (C16-C34)	50	ug/L			<50	<50
	F4 (C34-C50)	50	ug/L			<50	<50
Phenols	Phenols	0.001	mg/L			<0.001	<0.001
Semi-Volatiles	1-methylnaphthalene	0.1	ug/L			<0.1	<0.1
	2-methylnaphthalene	0.1	ug/L			<0.1	<0.1
	Acenaphthene	0.1	ug/L			<0.1	<0.1
	Acenaphthylene	0.1	ug/L			<0.1	<0.1
	Anthracene	0.1	ug/L			<0.1	<0.1

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Russell Chown  
 PO#:   
 Invoice to: Paterson Group

Report Number: 1610507  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH2723  
 COC #: 56555

Group	Analyte	MRL	Units	Guideline	1247167 Water 2016-06-23 TW1	1247168 Water 2016-06-23 TW3
Semi-Volatiles	Benzo(a)anthracene	0.1	ug/L		<0.1	<0.1
	Benzo(a)pyrene	0.01	ug/L	MAC-0.01	<0.01	<0.01
	Benzo(b)fluoranthene	0.05	ug/L		<0.05	<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1	<0.1
	Benzo(k)fluoranthene	0.05	ug/L		<0.05	<0.05
	Chrysene	0.05	ug/L		<0.05	<0.05
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1	<0.1
	Fluoranthene	0.1	ug/L		<0.1	<0.1
	Fluorene	0.1	ug/L		<0.1	<0.1
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1	<0.1
	Naphthalene	0.1	ug/L		<0.1	<0.1
	Phenanthrene	0.1	ug/L		<0.1	<0.1
Pyrene	0.1	ug/L		<0.1	<0.1	
Subcontract	N-NH3	0.01	mg/L		0.01	0.10
	S2-	0.02	mg/L	AO-0.05	<0.02	<0.02
	Tannin & Lignin	0.1	mg/L		<0.1	0.2
VOCs	1,1,1,2-tetrachloroethane	0.5	ug/L		<0.5	<0.5
	1,1,1-trichloroethane	0.4	ug/L		<0.4	<0.4
	1,1,2,2-tetrachloroethane	0.5	ug/L		<0.5	<0.5
	1,1,2-trichloroethane	0.4	ug/L		<0.4	<0.4
	1,1-dichloroethane	0.4	ug/L		<0.4	<0.4
	1,1-dichloroethylene	0.5	ug/L	MAC-14	<0.5	<0.5
	1,2-dichlorobenzene	0.4	ug/L	MAC-200	<0.4	<0.4
	1,2-dichloroethane	0.2	ug/L	IMAC-5	<0.2	<0.2
	1,2-dichloropropane	0.5	ug/L		<0.5	<0.5
1,3-dichlorobenzene	0.4	ug/L		<0.4	<0.4	

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Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.	
					1247167	Water	1247168	Water	2016-06-23	2016-06-23
VOCs	1,3-Dichloropropylene (cis+trans)	0.2	ug/L						<0.2	<0.2
	1,4-dichlorobenzene	0.4	ug/L	MAC-5					<0.4	<0.4
	Acetone	30	ug/L						<30	<30
	Benzene	0.5	ug/L	MAC-5					<0.5	<0.5
	Bromodichloromethane	0.3	ug/L						<0.3	<0.3
	Bromoform	0.4	ug/L						<0.4	<0.4
	Bromomethane	0.5	ug/L						<0.5	<0.5
	c-1,2-Dichloroethylene	0.4	ug/L						<0.4	<0.4
	c-1,3-Dichloropropylene	0.2	ug/L						<0.2	<0.2
	Carbon Tetrachloride	0.2	ug/L	MAC-5					<0.2	<0.2
	Chloroform	0.5	ug/L						<0.5	<0.5
	Dibromochloromethane	0.3	ug/L						<0.3	<0.3
	Dichlorodifluoromethane	0.5	ug/L						<0.5	<0.5
	Dichloromethane	4.0	ug/L	MAC-50					<4.0	<4.0
	Ethylbenzene	0.5	ug/L	AO-2.4					<0.5	<0.5
	Ethylene Dibromide	0.2	ug/L						<0.2	<0.2
	Hexane	5	ug/L						<5	<5
	m/p-xylene	0.4	ug/L						<0.4	<0.4
	Methyl Ethyl Ketone (MEK)	10	ug/L						<10	<10
	Methyl Isobutyl Ketone (MIBK)	10	ug/L						<10	<10
Methyl Tert Butyl Ether (MTBE)	2	ug/L						<2	<2	
Monochlorobenzene	0.2	ug/L	MAC-80					<0.2	<0.2	
o-xylene	0.4	ug/L						<0.4	<0.4	
Styrene	0.5	ug/L						<0.5	<0.5	
t-1,2-Dichloroethylene	0.4	ug/L						<0.4	<0.4	
t-1,3-Dichloropropylene	0.2	ug/L						<0.2	<0.2	

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1247167 Water  2016-06-23 TW1	1247168 Water  2016-06-23 TW3
VOCs	Tetrachloroethylene	0.3	ug/L	MAC-30		<0.3	<0.3
	Toluene	0.5	ug/L	AO-24		<0.5	<0.5
	Trichloroethylene	0.3	ug/L	MAC-5		<0.3	<0.3
	Trichlorofluoromethane	0.5	ug/L			<0.5	<0.5
	Vinyl Chloride	0.2	ug/L	MAC-2		<0.2	<0.2
	Xylene; total	0.5	ug/L	AO-300		<0.5	<0.5
VOCs Surrogates (%REC)	1,2-dichloroethane-d4	0	%			102	102
	4-bromofluorobenzene	0	%			120	125
	Toluene-d8	0	%			95	95

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**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Run No</b> 290004 <b>Analysis/Extraction Date</b> 2016-06-30 <b>Analyst</b> TJB			
<b>Method</b> CCME O.Reg 153/04			
Petroleum Hydrocarbons F1	<20 ug/L	98	60-140
<b>Method</b> V 8260B			
Dichloropropene,1,3-			
Acetone	<30 ug/L	94	60-130
Methyl Ethyl Ketone	<10 ug/L	87	60-130
Methyl Isobutyl Ketone	<10 ug/L	83	60-130
Methyl tert-Butyl Ether (MTBE)	<2 ug/L	80	60-130
<b>Run No</b> 310325 <b>Analysis/Extraction Date</b> 2016-06-24 <b>Analyst</b> K A			
<b>Method</b> C SM2130B			
Turbidity	<0.1 NTU	101	70-130
<b>Run No</b> 310384 <b>Analysis/Extraction Date</b> 2016-06-27 <b>Analyst</b> C_N			
<b>Method</b> M SM3112B-3500B			
Mercury	<0.0001 mg/L	98	76-123
<b>Run No</b> 310385 <b>Analysis/Extraction Date</b> 2016-06-27 <b>Analyst</b> AET			
<b>Method</b> C SM4500-H+B			
Alkalinity (CaCO3)	<5 mg/L	99	90-110
Conductivity	<5 uS/cm	99	90-110

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**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
F	<0.10 mg/L	101	90-110
pH	5.86	99	90-110
<b>Run No 310387 Analysis/Extraction Date 2016-06-28 Analyst JLD</b>			
<b>Method CCME O.Reg 153/04</b>			
Petroleum Hydrocarbons F2	<20 ug/L	110	60-140
Petroleum Hydrocarbons F3	<50 ug/L	110	60-140
Petroleum Hydrocarbons F4	<50 ug/L	110	60-140
<b>Run No 310389 Analysis/Extraction Date 2016-06-27 Analyst NP</b>			
<b>Method C SM4500-NO3-F</b>			
N-NO2	<0.10 mg/L	103	80-120
N-NO3	<0.10 mg/L	95	80-120
<b>Run No 310391 Analysis/Extraction Date 2016-06-28 Analyst AET</b>			
<b>Method C SM2120C</b>			
Colour	<2 TCU	100	90-110
<b>Run No 310396 Analysis/Extraction Date 2016-06-27 Analyst NP</b>			
<b>Method SM 4110</b>			
Chloride	<1 mg/L	102	90-110
SO4	<1 mg/L	104	90-110
<b>Run No 310410 Analysis/Extraction Date 2016-06-28 Analyst SKH</b>			

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**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Method M SM3120B-3500C</b>			
Calcium	<1 mg/L	98	90-110
Potassium	<1 mg/L	102	87-113
Magnesium	<1 mg/L	98	76-124
Sodium	<2 mg/L	101	82-118
<b>Run No 310438 Analysis/Extraction Date 2016-06-28 Analyst JLD</b>			
<b>Method P 8270</b>			
Methlynaphthalene, 1-	<0.1 ug/L	60	50-140
Methlynaphthalene, 2-	<0.1 ug/L	54	50-140
Acenaphthene	<0.1 ug/L	68	50-140
Acenaphthylene	<0.1 ug/L	68	50-140
Anthracene	<0.1 ug/L	80	50-140
Benz[a]anthracene	<0.1 ug/L	80	50-140
Benzo[a]pyrene	<0.01 ug/L	90	50-140
Benzo[b]fluoranthene	<0.05 ug/L	80	50-140
Benzo[ghi]perylene	<0.1 ug/L	88	50-140
Benzo[k]fluoranthene	<0.05 ug/L	119	50-140
Chrysene	<0.05 ug/L	84	50-140

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**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Dibenz[a h]anthracene	<0.1 ug/L	88	50-140
Fluoranthene	<0.1 ug/L	84	50-140
Fluorene	<0.1 ug/L	76	50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L	82	50-140
Naphthalene	<0.1 ug/L	58	50-140
Phenanthrene	<0.1 ug/L	78	50-140
Pyrene	<0.1 ug/L	86	50-140
<b>Run No 310442 Analysis/Extraction Date 2016-06-28 Analyst K_A</b>			
<b>Method EPA 200.8</b>			
Silver	<0.0001 mg/L	105	94-106
Aluminum	<0.01 mg/L	104	89-111
Arsenic	<0.001 mg/L	103	93-106
Boron (total)	<0.01 mg/L	102	88-112
Barium	<0.01 mg/L	106	91-109
Beryllium	<0.0005 mg/L	100	93-107
Cadmium	<0.0001 mg/L	104	93-107
Chromium Total	<0.001 mg/L	100	94-106
Copper	<0.001 mg/L	99	93-106

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**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Iron	<0.03 mg/L	104	92-107
Manganese	<0.01 mg/L	100	94-106
Molybdenum	<0.005 mg/L	104	94-106
Nickel	<0.005 mg/L	99	94-106
Lead	<0.001 mg/L	103	70-130
Antimony	<0.0005 mg/L	100	80-120
Selenium	<0.001 mg/L	101	91-108
Strontium	<0.001 mg/L	101	89-110
Thallium	<0.0001 mg/L	101	95-105
Uranium	<0.001 mg/L	101	94-106
Zinc	<0.01 mg/L	105	94-106
<b>Run No 310601 Analysis/Extraction Date 2016-06-27 Analyst R_K</b>			
<b>Method SUBCONTRACT P</b>			
Chromium VI	<0.01 mg/L	104	
N-NH3	<0.01 mg/L	106	
Phenols	<0.001 mg/L	92	
S2-	<0.02 mg/L	104	
Tannin & Lignin	<0.1 mg/L	100	

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**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Total Kjeldahl Nitrogen	<0.1 mg/L	99	
<b>Run No</b> 310640 <b>Analysis/Extraction Date</b> 2016-07-04 <b>Analyst</b> NP			
<b>Method</b> C Ion Balance			
Ion Balance			
<b>Method</b> C SM2340B			
Hardness as CaCO3			
<b>Method</b> C SM2540			
TDS (COND - CALC)			
<b>Run No</b> 310645 <b>Analysis/Extraction Date</b> 2016-06-30 <b>Analyst</b> TJB			
<b>Method</b> V 8260B			
Tetrachloroethane, 1,1,1,2-	<0.5 ug/L	117	60-130
Trichloroethane, 1,1,1-	<0.4 ug/L	100	60-130
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	111	60-130
Trichloroethane, 1,1,2-	<0.4 ug/L	107	60-130
Dichloroethane, 1,1-	<0.4 ug/L	106	60-130
Dichloroethylene, 1,1-	<0.5 ug/L	92	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	110	60-130
Dichloroethane, 1,2-	<0.2 ug/L	100	60-130
Dichloropropane, 1,2-	<0.5 ug/L	104	60-130

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**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Dichlorobenzene, 1,3-	<0.4 ug/L	107	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	98	60-130
Benzene	<0.5 ug/L	98	60-130
Bromodichloromethane	<0.3 ug/L	101	60-130
Bromoform	<0.4 ug/L	111	60-130
Bromomethane	<0.5 ug/L	87	60-130
Dichloroethylene, 1,2-cis-	<0.4 ug/L	103	60-130
Dichloropropene,1,3-cis-	<0.2 ug/L	104	60-130
Carbon Tetrachloride	<0.2 ug/L	95	60-130
Chloroform	<0.5 ug/L	100	60-130
Dibromochloromethane	<0.3 ug/L	102	60-130
Dichlorodifluoromethane	<0.5 ug/L	103	60-130
Methylene Chloride	<4.0 ug/L	82	60-130
Ethylbenzene	<0.5 ug/L	98	60-130
Ethylene dibromide	<0.2 ug/L	107	60-130
Hexane (n)	<5 ug/L	80	60-130
m/p-xylene	<0.4 ug/L	97	60-130
Chlorobenzene	<0.2 ug/L	93	60-130

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**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
o-xylene	<0.4 ug/L	101	60-130
Styrene	<0.5 ug/L	98	60-130
Dichloroethylene, 1,2-trans-	<0.4 ug/L	95	60-130
Dichloropropene, 1,3-trans-	<0.2 ug/L	108	60-130
Tetrachloroethylene	<0.3 ug/L	98	60-130
Toluene	<0.5 ug/L	101	60-130
Trichloroethylene	<0.3 ug/L	95	60-130
Trichlorofluoromethane	<0.5 ug/L	99	60-130
Vinyl Chloride	<0.2 ug/L	93	60-130
<b>Run No 310647 Analysis/Extraction Date 2016-07-04 Analyst TJB</b>			
<b>Method V 8260B</b>			
Xylene Mixture			
<b>Run No 310666 Analysis/Extraction Date 2016-07-04 Analyst AET</b>			
<b>Method C SM5310C</b>			
DOC	<0.5 mg/L	104	84-116

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Client: Paterson Group  
154 Colonnade Rd South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Russell Chown  
PO#:  
Invoice to: Paterson Group

Report Number: 1611394  
Date Submitted: 2016-07-06  
Date Reported: 2016-07-13  
Project: PH 2723  
COC #: 183211

Page 1 of 3

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**Dear Russell Chown:**

**Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).**

Report Comments:

APPROVAL: \_\_\_\_\_

Tanya Baillargeon  
Team Lead, Organics

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at <http://www.cala.ca/scopes/2602.pdf>.

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 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Russell Chown  
 PO#:   
 Invoice to: Paterson Group

Report Number: 1611394  
 Date Submitted: 2016-07-06  
 Date Reported: 2016-07-13  
 Project: PH 2723  
 COC #: 183211

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1249217 Water 2016-06-23 TW1	1249218 Water 2016-06-23 TW3
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L			<0.1	<0.1

**Guideline = \* = Guideline Exceedence**

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Report Number: 1611394  
 Date Submitted: 2016-07-06  
 Date Reported: 2016-07-13  
 Project: PH 2723  
 COC #: 183211

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Run No</b> 208523 <b>Analysis/Extraction Date</b> 2016-07-08 <b>Analyst</b> C. M			
<b>Method</b> P 8081A			
Polychlorinated Biphenyls	<0.1 ug/L	103	60-140

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Report Number: 1610511  
Date Submitted: 2016-06-24  
Date Reported: 2016-07-04  
Project: PH 2723  
COC #: 56556

Page 1 of 14

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**Dear Russell Chown:**

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Report Comments:

APPROVAL: \_\_\_\_\_

Nadine Pinsonneault  
Team Leader, Inorganics

APPROVAL: \_\_\_\_\_

Charlie (Long) Qu  
Laboratory Supervisor, Organics

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Report Number: 1610511  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH 2723  
 COC #: 56556

Group	Analyte	MRL	Units	Guideline	Result
				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1247172 Water  2016-06-24 TW2
Calculations	Hardness as CaCO3	1	mg/L	OG-100	368*
	Ion Balance	0.01			0.99
	TDS (COND - CALC)	1	mg/L	AO-500	526*
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500	327
	Cl	1	mg/L	AO-250	60
	Colour	2	TCU	AO-5	4
	Conductivity	5	uS/cm		810
	DOC	0.5	mg/L	AO-5	2.4
	F	0.10	mg/L	MAC-1.5	0.33
	N-NO2	0.10	mg/L	MAC-1.0	<0.10
	N-NO3	0.10	mg/L	MAC-10.0	0.70
	pH	1.00		6.5-8.5	8.10
	SO4	1	mg/L	AO-500	41
	Turbidity	0.1	NTU	AO-5.0	0.5
Mercury	Hg	0.0001	mg/L	MAC-0.001	<0.0001
Metals	Ag	0.0001	mg/L		<0.0001
	Al	0.01	mg/L	OG-0.1	<0.01
	As	0.001	mg/L	IMAC-0.025	<0.001
	B	0.01	mg/L	IMAC-5.0	0.14
	Ba	0.01	mg/L	MAC-1.0	0.27
	Be	0.0005	mg/L		<0.0005
	Ca	1	mg/L		93
	Cd	0.0001	mg/L	MAC-0.005	<0.0001
	Cr	0.001	mg/L	MAC-0.05	<0.001
	Cr(VI)	0.010	mg/L		<0.010
	Cu	0.001	mg/L	AO-1.0	<0.001

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Report Number: 1610511  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH 2723  
 COC #: 56556

Group	Analyte	MRL	Units	Guideline	Result
				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1247172 Water  2016-06-24 TW2
Metals	Fe	0.03	mg/L	AO-0.3	0.10
	K	1	mg/L		3
	Mg	1	mg/L		33
	Mn	0.01	mg/L	AO-0.05	0.01
	Mo	0.005	mg/L		<0.005
	Na	2	mg/L	AO-200	38
	Ni	0.005	mg/L		<0.005
	Pb	0.001	mg/L	MAC-0.010	<0.001
	Sb	0.0005	mg/L	IMAC-0.006	<0.0005
	Se	0.001	mg/L	MAC-0.01	<0.001
	Sr	0.001	mg/L		2.33
	Tl	0.0001	mg/L		<0.0001
	U	0.001	mg/L	MAC-0.02	0.002
	Zn	0.01	mg/L	AO-5.0	<0.01
Nutrients	Total Kjeldahl Nitrogen	0.1	mg/L		0.2
Others	Alpha-androstrane	0	%		110
	F1 (C6-C10)	20	ug/L		<20
	F2 (C10-C16)	20	ug/L		<20
	F3 (C16-C34)	50	ug/L		<50
	F4 (C34-C50)	50	ug/L		<50
Phenols	Phenols	0.001	mg/L		<0.001
Semi-Volatiles	1-methylnaphthalene	0.1	ug/L		<0.1
	2-methylnaphthalene	0.1	ug/L		<0.1
	Acenaphthene	0.1	ug/L		<0.1
	Acenaphthylene	0.1	ug/L		<0.1
	Anthracene	0.1	ug/L		<0.1

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Report Number: 1610511  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH 2723  
 COC #: 56556

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Semi-Volatiles	Benzo(a)anthracene	0.1	ug/L		1247172 Water
	Benzo(a)pyrene	0.01	ug/L	MAC-0.01	2016-06-24 TW2
	Benzo(b)fluoranthene	0.05	ug/L		
	Benzo(g,h,i)perylene	0.1	ug/L		
	Benzo(k)fluoranthene	0.05	ug/L		
	Chrysene	0.05	ug/L		
	Dibenzo(a,h)anthracene	0.1	ug/L		
	Fluoranthene	0.1	ug/L		
	Fluorene	0.1	ug/L		
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		
	Naphthalene	0.1	ug/L		
	Phenanthrene	0.1	ug/L		
	Pyrene	0.1	ug/L		
Subcontract	N-NH3	0.01	mg/L		
	S2-	0.02	mg/L	AO-0.05	
	Tannin & Lignin	0.1	mg/L		
VOCs	1,1,1,2-tetrachloroethane	0.5	ug/L		
	1,1,1-trichloroethane	0.4	ug/L		
	1,1,2,2-tetrachloroethane	0.5	ug/L		
	1,1,2-trichloroethane	0.4	ug/L		
	1,1-dichloroethane	0.4	ug/L		
	1,1-dichloroethylene	0.5	ug/L	MAC-14	
	1,2-dichlorobenzene	0.4	ug/L	MAC-200	
	1,2-dichloroethane	0.2	ug/L	IMAC-5	
	1,2-dichloropropane	0.5	ug/L		
1,3-dichlorobenzene	0.4	ug/L			

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Report Number: 1610511  
 Date Submitted: 2016-06-24  
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 Project: PH 2723  
 COC #: 56556

Lab I.D. 1247172  
 Sample Matrix Water  
 Sample Type  
 Sampling Date 2016-06-24  
 Sample I.D. TW2

Group	Analyte	MRL	Units	Guideline	
VOCs	1,3-Dichloropropylene (cis+trans)	0.2	ug/L		<0.2
	1,4-dichlorobenzene	0.4	ug/L	MAC-5	<0.4
	Acetone	30	ug/L		<30
	Benzene	0.5	ug/L	MAC-5	<0.5
	Bromodichloromethane	0.3	ug/L		<0.3
	Bromoform	0.4	ug/L		<0.4
	Bromomethane	0.5	ug/L		<0.5
	c-1,2-Dichloroethylene	0.4	ug/L		<0.4
	c-1,3-Dichloropropylene	0.2	ug/L		<0.2
	Carbon Tetrachloride	0.2	ug/L	MAC-5	<0.2
	Chloroform	0.5	ug/L		<0.5
	Dibromochloromethane	0.3	ug/L		<0.3
	Dichlorodifluoromethane	0.5	ug/L		<0.5
	Dichloromethane	4.0	ug/L	MAC-50	<4.0
	Ethylbenzene	0.5	ug/L	AO-2.4	<0.5
	Ethylene Dibromide	0.2	ug/L		<0.2
	Hexane	5	ug/L		<5
	m/p-xylene	0.4	ug/L		<0.4
	Methyl Ethyl Ketone (MEK)	10	ug/L		<10
	Methyl Isobutyl Ketone (MIBK)	10	ug/L		<10
Methyl Tert Butyl Ether (MTBE)	2	ug/L		<2	
Monochlorobenzene	0.2	ug/L	MAC-80	<0.2	
o-xylene	0.4	ug/L		<0.4	
Styrene	0.5	ug/L		<0.5	
t-1,2-Dichloroethylene	0.4	ug/L		<0.4	
t-1,3-Dichloropropylene	0.2	ug/L		<0.2	

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 Attention: Mr. Russell Chown  
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Report Number: 1610511  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH 2723  
 COC #: 56556

Lab I.D.	1247172
Sample Matrix	Water
Sample Type	
Sampling Date	2016-06-24
Sample I.D.	TW2

Group	Analyte	MRL	Units	Guideline	
VOCs	Tetrachloroethylene	0.3	ug/L	MAC-30	<0.3
	Toluene	0.5	ug/L	AO-24	0.6
	Trichloroethylene	0.3	ug/L	MAC-5	<0.3
	Trichlorofluoromethane	0.5	ug/L		<0.5
	Vinyl Chloride	0.2	ug/L	MAC-2	<0.2
	Xylene; total	0.5	ug/L	AO-300	<0.5
VOCs Surrogates (%REC)	1,2-dichloroethane-d4	0	%		105
	4-bromofluorobenzene	0	%		120
	Toluene-d8	0	%		96

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 Date Reported: 2016-07-04  
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 COC #: 56556

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Run No</b> 290004 <b>Analysis/Extraction Date</b> 2016-07-04 <b>Analyst</b> TJB			
<b>Method</b> CCME O.Reg 153/04			
Petroleum Hydrocarbons F1	<20 ug/L	103	60-140
<b>Method</b> V 8260B			
Dichloropropene, 1,3-			
Acetone	<30 ug/L	94	60-130
Methyl Ethyl Ketone	<10 ug/L	87	60-130
Methyl Isobutyl Ketone	<10 ug/L	83	60-130
Methyl tert-Butyl Ether (MTBE)	<2 ug/L	80	60-130
<b>Run No</b> 310325 <b>Analysis/Extraction Date</b> 2016-06-24 <b>Analyst</b> K A			
<b>Method</b> C SM2130B			
Turbidity	<0.1 NTU	101	70-130
<b>Run No</b> 310354 <b>Analysis/Extraction Date</b> 2016-06-27 <b>Analyst</b> JLD			
<b>Method</b> P 8270			
Methylnaphthalene, 1-	<0.1 ug/L	64	50-140
Methylnaphthalene, 2-	<0.1 ug/L	62	50-140
Acenaphthene	<0.1 ug/L	64	50-140
Acenaphthylene	<0.1 ug/L	64	50-140

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Report Number: 1610511  
 Date Submitted: 2016-06-24  
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 Project: PH 2723  
 COC #: 56556

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Anthracene	<0.1 ug/L	68	50-140
Benz[a]anthracene	<0.1 ug/L	68	50-140
Benzo[a]pyrene	<0.01 ug/L	68	50-140
Benzo[b]fluoranthene	<0.05 ug/L	63	50-140
Benzo[ghi]perylene	<0.1 ug/L	72	50-140
Benzo[k]fluoranthene	<0.05 ug/L	77	50-140
Chrysene	<0.05 ug/L	74	50-140
Dibenz[a h]anthracene	<0.1 ug/L	68	50-140
Fluoranthene	<0.1 ug/L	68	50-140
Fluorene	<0.1 ug/L	64	50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L	68	50-140
Naphthalene	<0.1 ug/L	62	50-140
Phenanthrene	<0.1 ug/L	64	50-140
Pyrene	<0.1 ug/L	68	50-140
<b>Run No 310384 Analysis/Extraction Date 2016-06-27 Analyst C_N</b>			
<b>Method M SM3112B-3500B</b>			
Mercury	<0.0001 mg/L	98	76-123
<b>Run No 310385 Analysis/Extraction Date 2016-06-27 Analyst AET</b>			

**Guideline = ODWSOG**

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**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Method C SM4500-H+B</b>			
Alkalinity (CaCO3)	<5 mg/L	99	90-110
Conductivity	<5 uS/cm	99	90-110
F	<0.10 mg/L	101	90-110
pH	5.86	99	90-110
<b>Run No 310387 Analysis/Extraction Date 2016-06-28 Analyst JLD</b>			
<b>Method CCME O.Reg 153/04</b>			
Petroleum Hydrocarbons F2	<20 ug/L	110	60-140
Petroleum Hydrocarbons F3	<50 ug/L	110	60-140
Petroleum Hydrocarbons F4	<50 ug/L	110	60-140
<b>Run No 310389 Analysis/Extraction Date 2016-06-27 Analyst NP</b>			
<b>Method C SM4500-NO3-F</b>			
N-NO2	<0.10 mg/L	103	80-120
N-NO3	<0.10 mg/L	95	80-120
<b>Run No 310391 Analysis/Extraction Date 2016-06-28 Analyst AET</b>			
<b>Method C SM2120C</b>			
Colour	<2 TCU	100	90-110
<b>Run No 310396 Analysis/Extraction Date 2016-06-27 Analyst NP</b>			
<b>Method SM 4110</b>			

**Guideline = ODWSOG**

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Report Number: 1610511  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH 2723  
 COC #: 56556

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Chloride	<1 mg/L	102	90-110
SO4	<1 mg/L	104	90-110
<b>Run No 310410 Analysis/Extraction Date 2016-06-28 Analyst SKH</b>			
<b>Method M SM3120B-3500C</b>			
Calcium	<1 mg/L	98	90-110
Potassium	<1 mg/L	102	87-113
Magnesium	<1 mg/L	98	76-124
Sodium	<2 mg/L	101	82-118
<b>Run No 310442 Analysis/Extraction Date 2016-06-28 Analyst K A</b>			
<b>Method EPA 200.8</b>			
Silver	<0.0001 mg/L	105	94-106
Aluminum	<0.01 mg/L	104	89-111
Arsenic	<0.001 mg/L	103	93-106
Boron (total)	<0.01 mg/L	102	88-112
Barium	<0.01 mg/L	106	91-109
Beryllium	<0.0005 mg/L	100	93-107
Cadmium	<0.0001 mg/L	104	93-107
Chromium Total	<0.001 mg/L	100	94-106

**Guideline = ODWSOG**

**\* = Guideline Exceedence**

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Russell Chown  
 PO#:   
 Invoice to: Paterson Group

Report Number: 1610511  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH 2723  
 COC #: 56556

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Copper	<0.001 mg/L	99	93-106
Iron	<0.03 mg/L	104	92-107
Manganese	<0.01 mg/L	100	94-106
Molybdenum	<0.005 mg/L	104	94-106
Nickel	<0.005 mg/L	99	94-106
Lead	<0.001 mg/L	103	70-130
Antimony	<0.0005 mg/L	100	80-120
Selenium	<0.001 mg/L	101	91-108
Strontium	<0.001 mg/L	101	89-110
Thallium	<0.0001 mg/L	101	95-105
Uranium	<0.001 mg/L	101	94-106
Zinc	<0.01 mg/L	105	94-106
<b>Run No 310600 Analysis/Extraction Date 2016-06-27 Analyst R_K</b>			
<b>Method SUBCONTRACT P</b>			
Chromium VI	<0.01 mg/L	104	
N-NH3	<0.01 mg/L	106	
Phenols	<0.001 mg/L	96	
S2-	<0.02 mg/L	104	

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Russell Chown  
 PO#:   
 Invoice to: Paterson Group

Report Number: 1610511  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH 2723  
 COC #: 56556

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Tannin & Lignin	<0.1 mg/L	100	
Total Kjeldahl Nitrogen	<0.1 mg/L	99	
<b>Run No 310645 Analysis/Extraction Date 2016-06-30 Analyst TJB</b>			
<b>Method V 8260B</b>			
Tetrachloroethane, 1,1,1,2-	<0.5 ug/L	117	60-130
Trichloroethane, 1,1,1-	<0.4 ug/L	100	60-130
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	111	60-130
Trichloroethane, 1,1,2-	<0.4 ug/L	107	60-130
Dichloroethane, 1,1-	<0.4 ug/L	106	60-130
Dichloroethylene, 1,1-	<0.5 ug/L	92	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	110	60-130
Dichloroethane, 1,2-	<0.2 ug/L	100	60-130
Dichloropropane, 1,2-	<0.5 ug/L	104	60-130
Dichlorobenzene, 1,3-	<0.4 ug/L	107	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	98	60-130
Benzene	<0.5 ug/L	98	60-130
Bromodichloromethane	<0.3 ug/L	101	60-130
Bromoform	<0.4 ug/L	111	60-130

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Russell Chown  
 PO#:   
 Invoice to: Paterson Group

Report Number: 1610511  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH 2723  
 COC #: 56556

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Bromomethane	<0.5 ug/L	87	60-130
Dichloroethylene, 1,2-cis-	<0.4 ug/L	103	60-130
Dichloropropene, 1,3-cis-	<0.2 ug/L	104	60-130
Carbon Tetrachloride	<0.2 ug/L	95	60-130
Chloroform	<0.5 ug/L	100	60-130
Dibromochloromethane	<0.3 ug/L	102	60-130
Dichlorodifluoromethane	<0.5 ug/L	103	60-130
Methylene Chloride	<4.0 ug/L	82	60-130
Ethylbenzene	<0.5 ug/L	98	60-130
Ethylene dibromide	<0.2 ug/L	107	60-130
Hexane (n)	<5 ug/L	80	60-130
m/p-xylene	<0.4 ug/L	97	60-130
Chlorobenzene	<0.2 ug/L	93	60-130
o-xylene	<0.4 ug/L	101	60-130
Styrene	<0.5 ug/L	98	60-130
Dichloroethylene, 1,2-trans-	<0.4 ug/L	95	60-130
Dichloropropene, 1,3-trans-	<0.2 ug/L	108	60-130
Tetrachloroethylene	<0.3 ug/L	98	60-130

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Russell Chown  
 PO#:   
 Invoice to: Paterson Group

Report Number: 1610511  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH 2723  
 COC #: 56556

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Toluene	<0.5 ug/L	101	60-130
Trichloroethylene	<0.3 ug/L	95	60-130
Trichlorofluoromethane	<0.5 ug/L	99	60-130
Vinyl Chloride	<0.2 ug/L	93	60-130
<b>Run No 310647 Analysis/Extraction Date 2016-07-04 Analyst TJB</b>			
<b>Method V 8260B</b>			
Xylene Mixture			
<b>Run No 310657 Analysis/Extraction Date 2016-07-04 Analyst NP</b>			
<b>Method C Ion Balance</b>			
Ion Balance			
<b>Method C SM2340B</b>			
Hardness as CaCO3			
<b>Method C SM2540</b>			
TDS (COND - CALC)			
<b>Run No 310666 Analysis/Extraction Date 2016-07-04 Analyst AET</b>			
<b>Method C SM5310C</b>			
DOC	<0.5 mg/L	104	84-116

**Guideline = ODWSOG**

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Client: Paterson Group  
154 Colonnade Rd South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Russell Chown  
PO#:  
Invoice to: Paterson Group

Report Number: 1610522  
Date Submitted: 2016-06-24  
Date Reported: 2016-07-04  
Project: PH2723  
COC #: 56557

Page 1 of 3

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**Dear Russell Chown:**

**Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).**

Report Comments:

APPROVAL: \_\_\_\_\_

Nadine Pinsonneault  
Team Leader, Inorganics

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at <http://www.cala.ca/scopes/2602.pdf>.

Exova (Ottawa) is certified and accredited for specific parameters by OMAFRA, Ontario Ministry of Agriculture, Food and Rural Affairs (for farm soils). Licensed by Ontario MOE for specific tests in drinking water.

Exova (Mississauga) is accredited for specific parameters by SCC, Standards Council of Canada (to ISO 17025)

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Russell Chown  
 PO#:   
 Invoice to: Paterson Group

Report Number: 1610522  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH2723  
 COC #: 56557

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
					1247195	1247196	1247197		
					Water	Water	Water		
					2016-06-24	2016-06-24	2016-06-24	128 Apple	139 Apple
					1.7	2.0	1.9		
General Chemistry	DOC	0.5	mg/L	AO-5					
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10	<0.10		
	N-NO3	0.10	mg/L	MAC-10.0	0.20	<0.10	2.52		
	NO2 + NO3 as N	0.10	mg/L	MAC-10.0	0.20	<0.10	2.52		
Nutrients	N-NH3	0.025	mg/L		<0.025	<0.025	<0.025		
	Organic Nitrogen	0.08	mg/L	OG-0.15	0.23*	0.12	0.23*		
	Total Kjeldahl Nitrogen	0.07	mg/L		0.23	0.12	0.23		

**Guideline = ODWSOG**

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Client: Paterson Group  
 154 Colonnade Rd South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Russell Chown  
 PO#:   
 Invoice to: Paterson Group

Report Number: 1610522  
 Date Submitted: 2016-06-24  
 Date Reported: 2016-07-04  
 Project: PH2723  
 COC #: 56557

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Run No 310389 Analysis/Extraction Date 2016-06-27 Analyst NP</b>			
<b>Method C SM4500-NO3-F</b>			
N-NO2	<0.10 mg/L	103	80-120
N-NO3	<0.10 mg/L	97	80-120
NO2 + NO3 as N	<0.10 mg/L	98	80-120
<b>Run No 310632 Analysis/Extraction Date 2016-06-29 Analyst AET</b>			
<b>Method Exova Edmonton-SM4500-NH3-G</b>			
N-NH3	<0.025 mg/L	99	80-120
<b>Run No 310634 Analysis/Extraction Date 2016-06-28 Analyst AET</b>			
<b>Method Exova Edmonton-ISO/TR 11905-2</b>			
Total Kjeldahl Nitrogen	<0.07 mg/L	93	
<b>Run No 310640 Analysis/Extraction Date 2016-07-04 Analyst NP</b>			
<b>Method C SM4500-Norg-C</b>			
Organic Nitrogen			
<b>Run No 310666 Analysis/Extraction Date 2016-07-04 Analyst AET</b>			
<b>Method C SM5310C</b>			
DOC	<0.5 mg/L	104	84-116

**Guideline = ODWSOG**

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Client: Paterson Group  
154 Colonnade Rd. South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Kirby Magee-Dittburner  
PO#:  
Invoice to: Paterson Group

Report Number: 1968225  
Date Submitted: 2021-12-07  
Date Reported: 2021-12-21  
Project: PH4398  
COC #: 883921

Page 1 of 8

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**Dear Kirby Magee-Dittburner:**

**Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).**

Report Comments:

APPROVAL: \_\_\_\_\_

Long Qu, Organics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <http://www.cala.ca/scopes/2602.pdf>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

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**Certificate of Analysis**

Client: Paterson Group  
 154 Colonnade Rd. South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Kirby Magee-Dittburner  
 PO#:  
 Invoice to: Paterson Group

Report Number: 1968225  
 Date Submitted: 2021-12-07  
 Date Reported: 2021-12-21  
 Project: PH4398  
 COC #: 883921

Lab I.D.  
 Sample Matrix  
 Sample Type  
 Sampling Date  
 Sample I.D.

1600428  
 GW  
 2021-12-07  
 TW1

Group	Analyte	MRL	Units	Guideline	
Metals	Ag	0.0001	mg/L		<0.0001
	As	0.001	mg/L		<0.001
	B	0.01	mg/L		0.15
	Ba	0.01	mg/L		0.21
	Be	0.0005	mg/L		<0.0005
	Cd	0.0001	mg/L		<0.0001
	Co	0.0002	mg/L		0.0002
	Cr	0.001	mg/L		<0.001
	Cr(VI)	0.01	mg/L		<0.01
	Cu	0.001	mg/L		0.002
	Hg	0.0001	mg/L		<0.0001
	Mo	0.005	mg/L		<0.005
	Na	2	mg/L		27
	Ni	0.005	mg/L		<0.005
	Pb	0.001	mg/L		<0.001
	Sb	0.0005	mg/L		<0.0005
	Se	0.001	mg/L		<0.001
	Tl	0.0001	mg/L		<0.0001
	U	0.001	mg/L		0.002
V	0.001	mg/L		<0.001	
Zn	0.01	mg/L		<0.01	
PAH	1+2-methylnaphthalene	0.1	ug/L		<0.1
	1-methylnaphthalene	0.1	ug/L		<0.1
	2-methylnaphthalene	0.1	ug/L		<0.1
	Acenaphthene	0.1	ug/L		<0.1

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 Project: PH4398  
 COC #: 883921

Lab I.D.  
 Sample Matrix  
 Sample Type  
 Sampling Date  
 Sample I.D.

1600428  
 GW  
 2021-12-07  
 TW1

Group	Analyte	MRL	Units	Guideline	
PAH	Acenaphthylene	0.1	ug/L		<0.1
	Anthracene	0.1	ug/L		<0.1
	Benzo(a)anthracene	0.1	ug/L		<0.1
	Benzo(a)pyrene	0.01	ug/L		<0.01
	Benzo(b)fluoranthene	0.05	ug/L		<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1
	Benzo(k)fluoranthene	0.05	ug/L		<0.05
	Chrysene	0.05	ug/L		<0.05
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1
	Fluoranthene	0.1	ug/L		<0.1
	Fluorene	0.1	ug/L		<0.1
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1
	Naphthalene	0.1	ug/L		<0.1
	Phenanthrene	0.1	ug/L		<0.1
Pyrene	0.1	ug/L		<0.1	
PCB Surrogate	Decachlorobiphenyl	0	%		90
PCBs	Aroclor 1016	0.1	ug/L		<0.1
	Aroclor 1242	0.1	ug/L		<0.1
	Aroclor 1248	0.1	ug/L		<0.1
	Aroclor 1254	0.1	ug/L		<0.1
	Aroclor 1260	0.1	ug/L		<0.1
	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		<0.1
VOCs Surrogates	Toluene-d8	0	%		100
Volatiles	Benzene	0.5	ug/L		<0.5
	Ethylbenzene	0.5	ug/L		<0.5

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Client: Paterson Group  
 154 Colonnade Rd. South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Kirby Magee-Dittburner  
 PO#:  
 Invoice to: Paterson Group

Report Number: 1968225  
 Date Submitted: 2021-12-07  
 Date Reported: 2021-12-21  
 Project: PH4398  
 COC #: 883921

Lab I.D. 1600428  
 Sample Matrix GW  
 Sample Type  
 Sampling Date 2021-12-07  
 Sample I.D. TW1

Group	Analyte	MRL	Units	Guideline	
Volatiles	m/p-xylene	0.4	ug/L		<0.4
	o-xylene	0.4	ug/L		<0.4
	Toluene	0.5	ug/L		<0.5
	Xylene; total	0.5	ug/L		<0.5

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Client: Paterson Group  
 154 Colonnade Rd. South  
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Report Number: 1968225  
 Date Submitted: 2021-12-07  
 Date Reported: 2021-12-21  
 Project: PH4398  
 COC #: 883921

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Run No</b> 413207 <b>Analysis/Extraction Date</b> 2021-12-10 <b>Analyst</b> C M <b>Method</b> P 8270			
Methlynaphthalene, 1-	<0.1 ug/L	100	50-140
Methlynaphthalene, 2-	<0.1 ug/L	100	50-140
Acenaphthene	<0.1 ug/L	102	50-140
Acenaphthylene	<0.1 ug/L	100	50-140
Anthracene	<0.1 ug/L	100	50-140
Benz[a]anthracene	<0.1 ug/L	84	50-140
Benzo[a]pyrene	<0.01 ug/L	95	50-140
Benzo[b]fluoranthene	<0.05 ug/L	99	50-140
Benzo[ghi]perylene	<0.1 ug/L	100	50-140
Benzo[k]fluoranthene	<0.05 ug/L	104	50-140
Chrysene	<0.05 ug/L	111	50-140
Dibenz[a h]anthracene	<0.1 ug/L	82	50-140
Fluoranthene	<0.1 ug/L	94	50-140
Fluorene	<0.1 ug/L	96	50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L	92	50-140
Naphthalene	<0.1 ug/L	104	50-140

**Guideline =**

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Client: Paterson Group  
 154 Colonnade Rd. South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Kirby Magee-Dittburner  
 PO#:   
 Invoice to: Paterson Group

Report Number: 1968225  
 Date Submitted: 2021-12-07  
 Date Reported: 2021-12-21  
 Project: PH4398  
 COC #: 883921

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Phenanthrene	<0.1 ug/L	102	50-140
Pyrene	<0.1 ug/L	94	50-140
<b>Run No</b> 413771	<b>Analysis/Extraction Date</b> 2021-12-09	<b>Analyst</b> SD	
<b>Method</b> EPA 200.8			
Silver	<0.0001 mg/L	114	80-120
Arsenic	<0.001 mg/L	102	80-120
Boron (total)	<0.01 mg/L	113	80-120
Barium	<0.01 mg/L	101	80-120
Beryllium	<0.0005 mg/L	116	80-120
Cadmium	<0.0001 mg/L	107	80-120
Cobalt	<0.0002 mg/L	106	80-120
Chromium Total	<0.001 mg/L	106	80-120
Copper	<0.001 mg/L	111	80-120
Mercury	<0.0001 mg/L	90	80-120
Molybdenum	<0.005 mg/L	100	80-120
Nickel	<0.005 mg/L	110	80-120
Lead	<0.001 mg/L	103	80-120
Antimony	<0.0005 mg/L	79	80-120

**Guideline =**

**\* = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.  
 Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



**Certificate of Analysis**

Client: Paterson Group  
 154 Colonnade Rd. South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Kirby Magee-Dittburner  
 PO#:  
 Invoice to: Paterson Group

Report Number: 1968225  
 Date Submitted: 2021-12-07  
 Date Reported: 2021-12-21  
 Project: PH4398  
 COC #: 883921

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
Selenium	<0.001 mg/L	108	80-120
Thallium	<0.0001 mg/L	102	80-120
Uranium	<0.001 mg/L	98	80-120
Vanadium	<0.001 mg/L	104	80-120
Zinc	<0.01 mg/L	114	80-120
<b>Run No 413825 Analysis/Extraction Date 2021-12-10 Analyst YH</b>			
<b>Method EPA 8260</b>			
Benzene	<0.5 ug/L	88	60-130
Ethylbenzene	<0.5 ug/L	82	60-130
m/p-xylene	<0.4 ug/L	84	60-130
o-xylene	<0.4 ug/L	91	60-130
Toluene	<0.5 ug/L	88	60-130
<b>Run No 413834 Analysis/Extraction Date 2021-12-10 Analyst YH</b>			
<b>Method EPA 8260</b>			
Xylene Mixture			
<b>Run No 413856 Analysis/Extraction Date 2021-12-10 Analyst Z S</b>			
<b>Method M SM3120B-3500C</b>			
Sodium	<2 mg/L	103	82-118

**Guideline =** \* = **Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.  
 Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Paterson Group  
 154 Colonnade Rd. South  
 Nepean, ON  
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 PO#:   
 Invoice to: Paterson Group

Report Number: 1968225  
 Date Submitted: 2021-12-07  
 Date Reported: 2021-12-21  
 Project: PH4398  
 COC #: 883921

**QC Summary**

Analyte	Blank	QC % Rec	QC Limits
<b>Run No</b> 413883 <b>Analysis/Extraction Date</b> 2021-12-10 <b>Analyst</b> SKH <b>Method</b> SM 3500-Cr B			
Chromium VI	<0.01 mg/L	94	80-120
<b>Run No</b> 413950 <b>Analysis/Extraction Date</b> 2021-12-10 <b>Analyst</b> R G <b>Method</b> EPA 8081B			
Aroclor 1016	<0.1 ug/L	120	
Aroclor 1242	<0.1 ug/L	120	60-140
Aroclor 1248	<0.1 ug/L	120	60-140
Aroclor 1254	<0.1 ug/L	120	60-140
Aroclor 1260	<0.1 ug/L	120	60-140
Polychlorinated Biphenyls	<0.1 ug/L	120	60-140
<b>Run No</b> 413968 <b>Analysis/Extraction Date</b> 2021-12-13 <b>Analyst</b> C M <b>Method</b> P 8270			
1+2-methylnaphthalene			

**Guideline =**                      \* = **Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.  
 Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

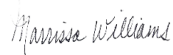
## ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC  
2425 New Holland Pike  
Lancaster, PA 17601  
Tel: (717)656-2300

Laboratory Job ID: 410-66404-1  
Client Project/Site: 1968225-PH4398

For:  
Eurofins Environment Testing Canada  
146 Colonnade Road, No. 8  
Ottawa, Ontario K2E 7Y1

Attn: Rebecca Koshy



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Authorized for release by:  
12/15/2021 5:59:21 PM

Marrison Williams, Project Manager  
(717)556-7246  
[Marrison.Williams@eurofinset.com](mailto:Marrison.Williams@eurofinset.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:

[www.eurofinsus.com/Env](http://www.eurofinsus.com/Env)

*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
  - Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
  - Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
- Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

A handwritten signature in cursive script that reads "Marrison Williams".

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Marrison Williams  
Project Manager  
12/15/2021 5:59:21 PM

# Case Narrative

Client: Eurofins Environment Testing Canada  
Project/Site: 1968225-PH4398

Job ID: 410-66404-1

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**Job ID: 410-66404-1**

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**Laboratory: Eurofins Lancaster Laboratories Env, LLC**

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**Narrative**

**Job Narrative  
410-66404-1**

**Receipt**

The sample was received on 12/10/2021 9:56 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 11.6°C

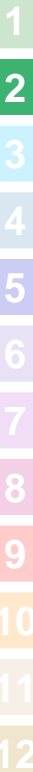
**Receipt Exceptions**

The following sample was received at the laboratory outside the required temperature criteria: 1600428-TW1 (410-66404-1). The client was contacted regarding this issue, and the laboratory was instructed to proceed with analysis.

**Dioxin**

Method 1613B: Any peak area that is the result of interferences from poly-chlorinated diphenyl ethers observed in the sample has been removed from the calculated results prior to reporting the data for totals. 1600428-TW1 (410-66404-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.



# Sample Summary

Client: Eurofins Environment Testing Canada  
Project/Site: 1968225-PH4398

Job ID: 410-66404-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-66404-1	1600428-TW1	Water	12/07/21 00:00	12/10/21 09:56

1

2

3

4

5

6

7

8

9

10

11

12

# Client Sample Results

Client: Eurofins Environment Testing Canada  
Project/Site: 1968225-PH4398

Job ID: 410-66404-1

**Client Sample ID: 1600428-TW1**

**Lab Sample ID: 410-66404-1**

Date Collected: 12/07/21 00:00

Matrix: Water

Date Received: 12/10/21 09:56

**Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)**

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	ND	cn	27	3.3	pg/L		12/13/21 16:35	12/14/21 13:50	1
1,2,3,4,6,7,8-HpCDF	ND	cn	27	0.068	pg/L		12/13/21 16:35	12/14/21 13:50	1
1,2,3,4,7,8-HxCDD	ND	cn	27	0.12	pg/L		12/13/21 16:35	12/14/21 13:50	1
1,2,3,4,7,8-HxCDF	ND	cn	27	0.69	pg/L		12/13/21 16:35	12/14/21 13:50	1
<b>1,2,3,4,7,8,9-HpCDF</b>	<b>0.31</b>	<b>J I cn</b>	27	0.096	pg/L		12/13/21 16:35	12/14/21 13:50	1
1,2,3,6,7,8-HxCDD	ND	cn	27	0.12	pg/L		12/13/21 16:35	12/14/21 13:50	1
1,2,3,6,7,8-HxCDF	ND	cn	27	0.70	pg/L		12/13/21 16:35	12/14/21 13:50	1
1,2,3,7,8-PeCDD	ND	cn	27	0.19	pg/L		12/13/21 16:35	12/14/21 13:50	1
1,2,3,7,8-PeCDF	ND	cn	27	0.14	pg/L		12/13/21 16:35	12/14/21 13:50	1
1,2,3,7,8,9-HxCDD	ND	cn	27	0.12	pg/L		12/13/21 16:35	12/14/21 13:50	1
1,2,3,7,8,9-HxCDF	ND	cn	27	0.85	pg/L		12/13/21 16:35	12/14/21 13:50	1
2,3,4,6,7,8-HxCDF	ND	cn	27	0.69	pg/L		12/13/21 16:35	12/14/21 13:50	1
2,3,4,7,8-PeCDF	ND	cn	27	0.11	pg/L		12/13/21 16:35	12/14/21 13:50	1
2,3,7,8-TCDD	ND	cn	4.3	0.20	pg/L		12/13/21 16:35	12/14/21 13:50	1
2,3,7,8-TCDF	ND	cn	5.4	0.14	pg/L		12/13/21 16:35	12/14/21 13:50	1
<b>OCDD</b>	<b>0.75</b>	<b>J I cn</b>	120	0.17	pg/L		12/13/21 16:35	12/14/21 13:50	1
OCDF	ND	cn	54	0.15	pg/L		12/13/21 16:35	12/14/21 13:50	1
Total HpCDD	ND	cn	27	3.3	pg/L		12/13/21 16:35	12/14/21 13:50	1
<b>Total HpCDF</b>	<b>0.31</b>	<b>J I B cn</b>	27	0.082	pg/L		12/13/21 16:35	12/14/21 13:50	1
<b>Total HxCDD</b>	<b>0.61</b>	<b>J I B cn</b>	27	0.12	pg/L		12/13/21 16:35	12/14/21 13:50	1
Total HxCDF	ND	cn	27	0.85	pg/L		12/13/21 16:35	12/14/21 13:50	1
Total PeCDD	ND	cn	27	0.19	pg/L		12/13/21 16:35	12/14/21 13:50	1
<b>Total PeCDF</b>	<b>0.89</b>	<b>J I B cn</b>	27	0.12	pg/L		12/13/21 16:35	12/14/21 13:50	1
Total TCDD	ND	cn	5.4	0.20	pg/L		12/13/21 16:35	12/14/21 13:50	1
<b>Total TCDF</b>	<b>0.60</b>	<b>J I cn</b>	5.4	0.14	pg/L		12/13/21 16:35	12/14/21 13:50	1
<b>Total PCDD</b>	<b>1.4</b>	<b>J I B cn</b>	5.4	0.79	pg/L		12/13/21 16:35	12/14/21 13:50	1
<b>Total PCDF</b>	<b>1.8</b>	<b>J I B cn</b>	5.4	0.27	pg/L		12/13/21 16:35	12/14/21 13:50	1
<b>Total PCDD/PCDF</b>	<b>3.2</b>	<b>J I B cn</b>	5.4	0.53	pg/L		12/13/21 16:35	12/14/21 13:50	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C-1,2,3,4,6,7,8-HpCDD	81	cn	23 - 140				12/13/21 16:35	12/14/21 13:50	1
13C-1,2,3,4,6,7,8-HpCDF	94	cn	28 - 143				12/13/21 16:35	12/14/21 13:50	1
13C-1,2,3,4,7,8-HxCDD	84	cn	32 - 141				12/13/21 16:35	12/14/21 13:50	1
13C-1,2,3,4,7,8-HxCDF	92	cn	26 - 152				12/13/21 16:35	12/14/21 13:50	1
13C-1,2,3,4,7,8,9-HpCDF	92	cn	26 - 138				12/13/21 16:35	12/14/21 13:50	1
13C-1,2,3,6,7,8-HxCDD	86	cn	28 - 130				12/13/21 16:35	12/14/21 13:50	1
13C-1,2,3,6,7,8-HxCDF	93	cn	26 - 123				12/13/21 16:35	12/14/21 13:50	1
13C-1,2,3,7,8-PeCDD	61	cn	25 - 181				12/13/21 16:35	12/14/21 13:50	1
13C-1,2,3,7,8-PeCDF	65	cn	24 - 185				12/13/21 16:35	12/14/21 13:50	1
13C-1,2,3,7,8,9-HxCDD	82	cn	28 - 130				12/13/21 16:35	12/14/21 13:50	1
13C-1,2,3,7,8,9-HxCDF	85	cn	29 - 147				12/13/21 16:35	12/14/21 13:50	1
13C-2,3,4,6,7,8-HxCDF	85	cn	28 - 136				12/13/21 16:35	12/14/21 13:50	1
13C-2,3,4,7,8-PeCDF	66	cn	21 - 178				12/13/21 16:35	12/14/21 13:50	1
13C-2,3,7,8-TCDD	70	cn	25 - 164				12/13/21 16:35	12/14/21 13:50	1
13C-2,3,7,8-TCDF	70	cn	24 - 169				12/13/21 16:35	12/14/21 13:50	1
13C-OCDD	87	cn	17 - 157				12/13/21 16:35	12/14/21 13:50	1
13C-OCDF	89	cn	17 - 157				12/13/21 16:35	12/14/21 13:50	1

# Toxicity Summary

Client: Eurofins Environment Testing Canada  
 Project/Site: 1968225-PH4398

Job ID: 410-66404-1

Client Sample ID: 1600428-TW1

Lab Sample ID: 410-66404-1

Analyte	Result	Qualifier	RL	EDL	Unit	WHO 2005		Method
						TEF	TEQ	
						ND = 0		
1,2,3,4,6,7,8-HpCDD	ND	cn	27	3.3	pg/L	0.01	0.00	1613B
1,2,3,4,6,7,8-HpCDF	ND	cn	27	0.068	pg/L	0.01	0.00	1613B
1,2,3,4,7,8-HxCDD	ND	cn	27	0.12	pg/L	0.1	0.00	1613B
1,2,3,4,7,8-HxCDF	ND	cn	27	0.69	pg/L	0.1	0.00	1613B
<b>1,2,3,4,7,8,9-HpCDF</b>	<b>0.31</b>	<b>J I cn</b>	27	0.096	pg/L	0.01	<b>0.0031</b>	1613B
1,2,3,6,7,8-HxCDD	ND	cn	27	0.12	pg/L	0.1	0.00	1613B
1,2,3,6,7,8-HxCDF	ND	cn	27	0.70	pg/L	0.1	0.00	1613B
1,2,3,7,8-PeCDD	ND	cn	27	0.19	pg/L	1	0.00	1613B
1,2,3,7,8-PeCDF	ND	cn	27	0.14	pg/L	0.03	0.00	1613B
1,2,3,7,8,9-HxCDD	ND	cn	27	0.12	pg/L	0.1	0.00	1613B
1,2,3,7,8,9-HxCDF	ND	cn	27	0.85	pg/L	0.1	0.00	1613B
2,3,4,6,7,8-HxCDF	ND	cn	27	0.69	pg/L	0.1	0.00	1613B
2,3,4,7,8-PeCDF	ND	cn	27	0.11	pg/L	0.3	0.00	1613B
2,3,7,8-TCDD	ND	cn	4.3	0.20	pg/L	1	0.00	1613B
2,3,7,8-TCDF	ND	cn	5.4	0.14	pg/L	0.1	0.00	1613B
<b>OCDD</b>	<b>0.75</b>	<b>J I cn</b>	120	0.17	pg/L	0.0003	<b>0.00023</b>	1613B
OCDF	ND	cn	54	0.15	pg/L	0.0003	0.00	1613B

Analyte	Result	Qualifier	NONE	NONE	Unit	WHO 2005		Method
						TEF	TEQ	
						ND = 0		
Total Toxic Dioxins and Furans					pg/L		0.0033	TEQ

**TEF Reference:**

WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners



# QC Sample Results

Client: Eurofins Environment Testing Canada  
 Project/Site: 1968225-PH4398

Job ID: 410-66404-1

## Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)

**Lab Sample ID: MB 410-204823/1-A**  
**Matrix: Water**  
**Analysis Batch: 205076**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 204823**

Analyte	MB	MB	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,2,3,4,6,7,8-HpCDD	ND		25	0.80	pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,4,6,7,8-HpCDF	0.563	J I	25	0.079	pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,4,7,8-HxCDD	ND		25	0.14	pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,4,7,8-HxCDF	ND		25	0.47	pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,4,7,8,9-HpCDF	ND		25	0.11	pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,6,7,8-HxCDD	ND		25	0.14	pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,6,7,8-HxCDF	2.57	J I	25	0.43	pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,7,8-PeCDD	0.623	J I	25	0.21	pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,7,8-PeCDF	ND		25	0.15	pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,7,8,9-HxCDD	ND		25	0.15	pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,7,8,9-HxCDF	ND		25	0.58	pg/L		12/13/21 16:35	12/14/21 13:01	1
2,3,4,6,7,8-HxCDF	ND		25	0.47	pg/L		12/13/21 16:35	12/14/21 13:01	1
2,3,4,7,8-PeCDF	ND		25	0.13	pg/L		12/13/21 16:35	12/14/21 13:01	1
2,3,7,8-TCDD	ND		4.0	0.22	pg/L		12/13/21 16:35	12/14/21 13:01	1
2,3,7,8-TCDF	ND		5.0	0.18	pg/L		12/13/21 16:35	12/14/21 13:01	1
OCDD	ND		110	0.19	pg/L		12/13/21 16:35	12/14/21 13:01	1
OCDF	ND		50	0.16	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total HpCDD	ND		25	0.80	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total HpCDF	0.563	J I	25	0.094	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total HxCDD	1.28	J I	25	0.14	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total HxCDF	2.57	J I	25	0.49	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total PeCDD	0.623	J I	25	0.21	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total PeCDF	1.19	J I	25	0.14	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total TCDD	ND		5.0	0.22	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total TCDF	ND		5.0	0.18	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total PCDD	1.90	J I	5.0	0.31	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total PCDF	4.32	J I	5.0	0.21	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total PCDD/PCDF	6.22	I	5.0	0.26	pg/L		12/13/21 16:35	12/14/21 13:01	1
Isotope Dilution	MB	MB	Limits	Prepared	Analyzed	Dil Fac			
	%Recovery	Qualifier							
13C-1,2,3,4,6,7,8-HpCDD	73		23 - 140	12/13/21 16:35	12/14/21 13:01	1			
13C-1,2,3,4,6,7,8-HpCDF	86		28 - 143	12/13/21 16:35	12/14/21 13:01	1			
13C-1,2,3,4,7,8-HxCDD	72		32 - 141	12/13/21 16:35	12/14/21 13:01	1			
13C-1,2,3,4,7,8-HxCDF	79		26 - 152	12/13/21 16:35	12/14/21 13:01	1			
13C-1,2,3,4,7,8,9-HpCDF	81		26 - 138	12/13/21 16:35	12/14/21 13:01	1			
13C-1,2,3,6,7,8-HxCDD	77		28 - 130	12/13/21 16:35	12/14/21 13:01	1			
13C-1,2,3,6,7,8-HxCDF	87		26 - 123	12/13/21 16:35	12/14/21 13:01	1			
13C-1,2,3,7,8-PeCDD	54		25 - 181	12/13/21 16:35	12/14/21 13:01	1			
13C-1,2,3,7,8-PeCDF	60		24 - 185	12/13/21 16:35	12/14/21 13:01	1			
13C-1,2,3,7,8,9-HxCDD	70		28 - 130	12/13/21 16:35	12/14/21 13:01	1			
13C-1,2,3,7,8,9-HxCDF	74		29 - 147	12/13/21 16:35	12/14/21 13:01	1			
13C-2,3,4,6,7,8-HxCDF	73		28 - 136	12/13/21 16:35	12/14/21 13:01	1			
13C-2,3,4,7,8-PeCDF	57		21 - 178	12/13/21 16:35	12/14/21 13:01	1			
13C-2,3,7,8-TCDD	65		25 - 164	12/13/21 16:35	12/14/21 13:01	1			
13C-2,3,7,8-TCDF	59		24 - 169	12/13/21 16:35	12/14/21 13:01	1			
13C-OCDD	79		17 - 157	12/13/21 16:35	12/14/21 13:01	1			
13C-OCDF	83		17 - 157	12/13/21 16:35	12/14/21 13:01	1			

# QC Sample Results

Client: Eurofins Environment Testing Canada  
 Project/Site: 1968225-PH4398

Job ID: 410-66404-1

## Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters) (Continued)

**Lab Sample ID: LCS 410-204823/2-A**  
**Matrix: Water**  
**Analysis Batch: 205076**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 204823**  
**%Rec.**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
1,2,3,4,6,7,8-HpCDD	1000	970		pg/L		97	70 - 140
1,2,3,4,6,7,8-HpCDF	1000	991		pg/L		99	82 - 122
1,2,3,4,7,8-HxCDD	1000	1040		pg/L		104	70 - 164
1,2,3,4,7,8-HxCDF	1000	1040		pg/L		104	72 - 134
1,2,3,4,7,8,9-HpCDF	1000	967		pg/L		97	78 - 138
1,2,3,6,7,8-HxCDD	1000	1020		pg/L		102	76 - 134
1,2,3,6,7,8-HxCDF	1000	1000		pg/L		100	84 - 130
1,2,3,7,8-PeCDD	1000	1060		pg/L		106	70 - 142
1,2,3,7,8-PeCDF	1000	1040		pg/L		104	80 - 134
1,2,3,7,8,9-HxCDD	1000	1070		pg/L		107	64 - 162
1,2,3,7,8,9-HxCDF	1000	1010		pg/L		101	78 - 130
2,3,4,6,7,8-HxCDF	1000	996		pg/L		100	70 - 156
2,3,4,7,8-PeCDF	1000	1040		pg/L		104	68 - 160
2,3,7,8-TCDD	200	199		pg/L		100	67 - 158
2,3,7,8-TCDF	200	208		pg/L		104	75 - 158
OCDD	2000	1950		pg/L		97	78 - 144
OCDF	2000	2060		pg/L		103	63 - 170

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	67		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	77		21 - 158
13C-1,2,3,4,7,8-HxCDD	69		21 - 193
13C-1,2,3,4,7,8-HxCDF	75		19 - 202
13C-1,2,3,4,7,8,9-HpCDF	75		20 - 186
13C-1,2,3,6,7,8-HxCDD	74		25 - 163
13C-1,2,3,6,7,8-HxCDF	79		21 - 159
13C-1,2,3,7,8-PeCDD	53		21 - 227
13C-1,2,3,7,8-PeCDF	58		21 - 192
13C-1,2,3,7,8,9-HxCDD	66		25 - 163
13C-1,2,3,7,8,9-HxCDF	71		17 - 205
13C-2,3,4,6,7,8-HxCDF	71		22 - 176
13C-2,3,4,7,8-PeCDF	60		13 - 328
13C-2,3,7,8-TCDD	64		20 - 175
13C-2,3,7,8-TCDF	62		22 - 152
13C-OCDD	74		13 - 199
13C-OCDF	75		13 - 199

# QC Association Summary

Client: Eurofins Environment Testing Canada  
Project/Site: 1968225-PH4398

Job ID: 410-66404-1

## Specialty Organics

### Prep Batch: 204823

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-66404-1	1600428-TW1	Total/NA	Water	1613B	
MB 410-204823/1-A	Method Blank	Total/NA	Water	1613B	
LCS 410-204823/2-A	Lab Control Sample	Total/NA	Water	1613B	

### Analysis Batch: 205076

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-66404-1	1600428-TW1	Total/NA	Water	1613B	204823
MB 410-204823/1-A	Method Blank	Total/NA	Water	1613B	204823
LCS 410-204823/2-A	Lab Control Sample	Total/NA	Water	1613B	204823



# Lab Chronicle

Client: Eurofins Environment Testing Canada  
Project/Site: 1968225-PH4398

Job ID: 410-66404-1

**Client Sample ID: 1600428-TW1**

**Lab Sample ID: 410-66404-1**

**Date Collected: 12/07/21 00:00**

**Matrix: Water**

**Date Received: 12/10/21 09:56**

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Prepared or Analyzed</u>	<u>Analyst</u>	<u>Lab</u>
Total/NA	Prep	1613B			204823	12/13/21 16:35	X5YV	ELLE
Total/NA	Analysis	1613B		1	205076	12/14/21 13:50	RGA5	ELLE

**Laboratory References:**

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

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# Isotope Dilution Summary

Client: Eurofins Environment Testing Canada  
Project/Site: 1968225-PH4398

Job ID: 410-66404-1

## Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)

Matrix: Water

Prep Type: Total/NA

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HpCDD (23-140)	HpCDF (28-143)	HxCDD (32-141)	HxCDF (26-152)	HpCDF2 (26-138)	HxDD (28-130)	HxDF (26-123)	PeCDD (25-181)
410-66404-1	1600428-TW1	81 cn	94 cn	84 cn	92 cn	92 cn	86 cn	93 cn	61 cn
MB 410-204823/1-A	Method Blank	73	86	72	79	81	77	87	54

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PeCDF (24-185)	<sup>13</sup> CHxCD (28-130)	HxCF (29-147)	<sup>13</sup> CHxCF (28-136)	PeCF (21-178)	TCDD (25-164)	TCDF (24-169)	OCDD (17-157)
410-66404-1	1600428-TW1	65 cn	82 cn	85 cn	85 cn	66 cn	70 cn	70 cn	87 cn
MB 410-204823/1-A	Method Blank	60	70	74	73	57	65	59	79

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	OCDF (17-157)
410-66404-1	1600428-TW1	89 cn
MB 410-204823/1-A	Method Blank	83

#### Surrogate Legend

HpCDD = 13C-1,2,3,4,6,7,8-HpCDD  
 HpCDF = 13C-1,2,3,4,6,7,8-HpCDF  
 HxCDD = 13C-1,2,3,4,7,8-HxCDD  
 HxCDF = 13C-1,2,3,4,7,8-HxCDF  
 HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF  
 HxDD = 13C-1,2,3,6,7,8-HxCDD  
 HxDF = 13C-1,2,3,6,7,8-HxCDF  
 PeCDD = 13C-1,2,3,7,8-PeCDD  
 PeCDF = 13C-1,2,3,7,8-PeCDF  
<sup>13</sup>CHxCD = 13C-1,2,3,7,8,9-HxCDD  
 HxCF = 13C-1,2,3,7,8,9-HxCDF  
<sup>13</sup>CHxCF = 13C-2,3,4,6,7,8-HxCDF  
 PeCF = 13C-2,3,4,7,8-PeCDF  
 TCDD = 13C-2,3,7,8-TCDD  
 TCDF = 13C-2,3,7,8-TCDF  
 OCDD = 13C-OCDD  
 OCDF = 13C-OCDF

## Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)

Matrix: Water

Prep Type: Total/NA

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HpCDD (26-166)	HpCDF (21-158)	HxCDD (21-193)	HxCDF (19-202)	HpCDF2 (20-186)	HxDD (25-163)	HxDF (21-159)	PeCDD (21-227)
LCS 410-204823/2-A	Lab Control Sample	67	77	69	75	75	74	79	53

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PeCDF (21-192)	<sup>13</sup> CHxCD (25-163)	HxCF (17-205)	<sup>13</sup> CHxCF (22-176)	PeCF (13-328)	TCDD (20-175)	TCDF (22-152)	OCDD (13-199)
LCS 410-204823/2-A	Lab Control Sample	58	66	71	71	60	64	62	74

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	OCDF (13-199)
LCS 410-204823/2-A	Lab Control Sample	75

#### Surrogate Legend

HpCDD = 13C-1,2,3,4,6,7,8-HpCDD

# Isotope Dilution Summary

Client: Eurofins Environment Testing Canada

Job ID: 410-66404-1

Project/Site: 1968225-PH4398

HpCDF = 13C-1,2,3,4,6,7,8-HpCDF

HxCDD = 13C-1,2,3,4,7,8-HxCDD

HxCDF = 13C-1,2,3,4,7,8-HxCDF

HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF

HxDD = 13C-1,2,3,6,7,8-HxCDD

HxDF = 13C-1,2,3,6,7,8-HxCDF

PeCDD = 13C-1,2,3,7,8-PeCDD

PeCDF = 13C-1,2,3,7,8-PeCDF

13CHxCD = 13C-1,2,3,7,8,9-HxCDD

HxCF = 13C-1,2,3,7,8,9-HxCDF

13CHxCF = 13C-2,3,4,6,7,8-HxCDF

PeCF = 13C-2,3,4,7,8-PeCDF

TCDD = 13C-2,3,7,8-TCDD

TCDF = 13C-2,3,7,8-TCDF

OCDD = 13C-OCDD

OCDF = 13C-OCDF

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# Accreditation/Certification Summary

Client: Eurofins Environment Testing Canada  
 Project/Site: 1968225-PH4398

Job ID: 410-66404-1

## Laboratory: Eurofins Lancaster Laboratories Env, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	1.01	11-30-22
A2LA	ISO/IEC 17025	0001.01	11-30-22
Alaska	State	PA00009	06-30-22
Alaska (UST)	State	17-027	02-28-22
Arizona	State	AZ0780	03-12-22
Arkansas DEQ	State	88-0660	08-10-22
California	State	2792	02-02-22
Colorado	State	PA00009	06-30-22
Connecticut	State	PH-0746	06-30-23
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-22
Delaware (DW)	State	N/A	02-01-22
Florida	NELAP	E87997	06-30-22
Georgia (DW)	State	C048	01-31-22
Hawaii	State	N/A	01-31-22
Illinois	NELAP	200027	01-31-23
Iowa	State	361	03-02-22
Kansas	NELAP	E-10151	10-31-22
Kentucky (DW)	State	KY90088	01-01-22
Kentucky (UST)	State	1.01	11-30-22
Kentucky (WW)	State	KY90088	12-31-21
Louisiana	NELAP	02055	06-30-22
Maine	State	2019012	03-12-22
Maryland	State	100	06-30-22
Massachusetts	State	M-PA009	06-30-22
Michigan	State	9930	01-31-22
Minnesota	NELAP	042-999-487	12-31-22
Missouri	State	450	01-31-25
Montana (DW)	State	0098	01-01-22
Nebraska	State	NE-OS-32-17	01-31-22
New Hampshire	NELAP	2730	01-10-22
New Jersey	NELAP	PA011	06-30-22
New York	NELAP	10670	04-01-22
North Carolina (DW)	State	42705	07-31-22
North Carolina (WW/SW)	State	521	12-31-21
North Dakota	State	R-205	01-31-22
Oklahoma	NELAP	R-205	08-31-22
Oregon	NELAP	PA200001	09-11-22
PALA	Canada	1978	09-16-24
Pennsylvania	NELAP	36-00037	01-31-22
Rhode Island	State	LAO00338	01-31-22
South Carolina	State	89002002	01-31-22
Tennessee	State	02838	01-31-22
Texas	NELAP	T104704194-21-40	08-31-22
Utah	NELAP	PA000092019-16	03-01-22
Vermont	State	VT - 36037	10-28-22
Virginia	NELAP	460182	06-14-22
Washington	State	C457	04-12-22
West Virginia (DW)	State	9906 C	12-31-21
West Virginia DEP	State	055	12-31-21
Wyoming	State	8TMS-L	01-31-22

# Accreditation/Certification Summary

Client: Eurofins Environment Testing Canada  
Project/Site: 1968225-PH4398

Job ID: 410-66404-1

## Laboratory: Eurofins Lancaster Laboratories Env, LLC (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wyoming (UST)	A2LA	1.01	11-30-22

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410-66404 Chain of Custody

YES  NO

CLIENT INFORMATION		INVOICE INFORM	
Company: Eurofins Ottawa	Contact: Rebecca Koshy	Company:	Contact:
Address:	Telephone:	Address:	Telephone:
Cell:	Email: #1:	Email: #2:	PO #:

TURN-AROUND TIME (Business Days)		REGULATION/GUIDELINE REQUIRED	
<input type="checkbox"/> 1 Day* (100%)	<input type="checkbox"/> 2 Day** (50%)	<input type="checkbox"/> Sanitary Sewer, City: _____	<input type="checkbox"/> O. Reg 153
<input type="checkbox"/> 3-5 Days (25%)	<input type="checkbox"/> 5-7 Days (Standard)	<input type="checkbox"/> Storm Sewer, City: _____	The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04. Analysis of full parameter list only. Yes <input type="checkbox"/> No <input type="checkbox"/>
Please contact Lab in advance to determine rush availability. *For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%. **For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.		<input type="checkbox"/> ODWSOG (Use DW CoC if analyzing drinking water)	Table # _____, Coarse / Fine, Surface / subsurface Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment
		<input type="checkbox"/> PWQO	<input type="checkbox"/> O. Reg 406 Excess Soils
		<input type="checkbox"/> O.Reg 347	Table # _____ Full depth/Strat/Ceiling/mSPL Leachate Type: Com-Ind / Res-Park / Agri / All Other Category: Surface / Subsurface
		<input type="checkbox"/> Other: _____	

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. **Note that this COC is not to be used for drinking water samples.** The COC must be complete upon submission of the samples, there will be a \$25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details		O.Reg.153 parameters								RN# (Lab Use Only)
Sample Matrix	# of Containers	PHCE1 - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganic	Metals only		
1600428 - TW1	7/12/2021 W2									Dioxins #Hwans

PRINT	SIGN	DATE/TIME	TEMP (°C)	COMMENTS:
Sampled By: Rebecca	[Signature]	8/12/21	8°	
Relinquished By: Leah Foreman	[Signature]	12/10/21		
Received By:				CUSTODY SEAL: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Ice packs submit: YES <input type="checkbox"/> No <input checked="" type="checkbox"/>

TAB Coder Temp & 11/10



## Login Sample Receipt Checklist

Client: Eurofins Environment Testing Canada

Job Number: 410-66404-1

**Login Number: 66404**

**List Source: Eurofins Lancaster Laboratories Env, LLC**

**List Number: 1**

**Creator: Bryan, Debra A**

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	No ice present, no attempt to chill
Cooler Temperature is acceptable (<math>\leq 6^{\circ}\text{C}</math>, not frozen).	False	Refer to Job Narrative for details.
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (<math>\leq 6^{\circ}\text{C}</math>, not frozen).	True	
WV: Container Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	

# Definitions/Glossary

Client: Eurofins Environment Testing Canada  
Project/Site: 1968225-PH4398

Job ID: 410-66404-1

## Qualifiers

### Dioxin

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
cn	Refer to Case Narrative for further detail
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client: Paterson Group  
154 Colonnade Rd. South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Kirby Magee-Dittburner  
Invoice to: Paterson Group  
PO#: 33461

Report Number: 1968398  
Date Submitted: 2021-12-09  
Date Reported: 2021-12-21  
Project: PH4398  
COC #: 884073  
Temperature (C): 19  
Custody Seal:

Page 1 of 11

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**Dear Kirby Magee-Dittburner:**

**Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).**

Report Comments:

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Long Qu, Organics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated

Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at <http://www.cala.ca/scopes/2602.pdf>

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Client: Paterson Group  
154 Colonnade Rd. South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Kirby Magee-Dittburner  
PO#: 33461  
Invoice to: Paterson Group

Report Number: 1968398  
Date Submitted: 2021-12-09  
Date Reported: 2021-12-21  
Project: PH4398  
COC #: 884073

***Exceedence Summary***

Sample I.D.	Analyte	Result	Units	Criteria

Results relate only to the parameters tested on the samples submitted.  
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Paterson Group  
 154 Colonnade Rd. South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Kirby Magee-Dittburner  
 PO#: 33461  
 Invoice to: Paterson Group

Report Number: 1968398  
 Date Submitted: 2021-12-09  
 Date Reported: 2021-12-21  
 Project: PH4398  
 COC #: 884073

**Guideline = O.Reg 153-T1-Groundwater**

**Metals**

Lab I.D.  
 Sample Matrix  
 Sample Type  
 Sample Date  
 Sampling Time  
 Sample I.D.

1600846 GW153	1600847 GW153	1600848 GW153	1600849 GW153
2021-12-08	2021-12-08	2021-12-08	2021-12-08
TW2	TW3	BH1	BH2

Analyte	Batch No	MRL	Units	Guideline	1600846 GW153	1600847 GW153	1600848 GW153	1600849 GW153
Antimony	413977	0.5	ug/L	STD 1.5	<0.5	<0.5	<0.5	<0.5
Arsenic	413977	1	ug/L	STD 13	<1	<1	<1	<1
Barium	413977	10	ug/L	STD 610	240	230	250	220
Beryllium	413977	0.5	ug/L	STD 0.5	<0.5	<0.5	<0.5	<0.5
Boron (total)	413977	10	ug/L	STD 1700	130	130	70	50
Cadmium	413977	0.1	ug/L	STD 0.5	<0.1	<0.1	<0.1	<0.1
Chromium Total	413977	1	ug/L	STD 11	<1	<1	<1	<1
Chromium VI	413883	10	ug/L	STD 25	<10	<10	<10	<10
Cobalt	413977	0.2	ug/L	STD 3.8	<0.2	<0.2	0.2	<0.2
Copper	413977	1	ug/L	STD 5	2	2	<1	<1
Lead	413977	1	ug/L	STD 1.9	<1	<1	<1	<1
Mercury	414089	0.1	ug/L	STD 0.1	<0.1	<0.1	<0.1	
	414172	0.1	ug/L	STD 0.1				<0.1
Molybdenum	413977	5	ug/L	STD 23	<5	<5	<5	<5
Nickel	413977	5	ug/L	STD 14	<5	<5	<5	<5
Selenium	413977	1	ug/L	STD 5	<1	<1	<1	<1
Silver	413977	0.1	ug/L	STD 0.3	<0.1	<0.1	<0.1	<0.1
Sodium	413967	2000	ug/L	STD 490000	22000	28000	12000	8000
Thallium	413977	0.1	ug/L	STD 0.5	<0.1	<0.1	<0.1	<0.1
Uranium	413977	1	ug/L	STD 8.9	2	3	2	2
Vanadium	413977	1	ug/L	STD 3.9	<1	<1	2	<1
Zinc	413977	10	ug/L	STD 160	<10	<10	<10	<10

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MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Paterson Group  
 154 Colonnade Rd. South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Kirby Magee-Dittburner  
 PO#: 33461  
 Invoice to: Paterson Group

Report Number: 1968398  
 Date Submitted: 2021-12-09  
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 COC #: 884073

**Guideline = O.Reg 153-T1-Groundwater**

**PAH**

Lab I.D.  
 Sample Matrix  
 Sample Type  
 Sample Date  
 Sampling Time  
 Sample I.D.

1600846 GW153	1600847 GW153	1600848 GW153	1600849 GW153
2021-12-08	2021-12-08	2021-12-08	2021-12-08
TW2	TW3	BH1	BH2

Analyte	Batch No	MRL	Units	Guideline	1600846 GW153	1600847 GW153	1600848 GW153	1600849 GW153
1+2-methylnaphthalene	414118	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
Acenaphthene	413207	0.1	ug/L	STD 4.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	413207	0.1	ug/L	STD 1	<0.1	<0.1	<0.1	<0.1
Anthracene	413207	0.1	ug/L	STD 0.1	<0.1	<0.1	<0.1	<0.1
Benz[a]anthracene	413207	0.1	ug/L	STD 0.2	<0.1	<0.1	<0.1	<0.1
Benzo[a]pyrene	413207	0.01	ug/L	STD 0.01	<0.01	<0.01	<0.01	<0.01
Benzo[b]fluoranthene	413207	0.05	ug/L	STD 0.1	<0.05	<0.05	<0.05	<0.05
Benzo[ghi]perylene	413207	0.1	ug/L	STD 0.2	<0.1	<0.1	<0.1	<0.1
Benzo[k]fluoranthene	413207	0.05	ug/L	STD 0.1	<0.05	<0.05	<0.05	<0.05
Chrysene	413207	0.05	ug/L	STD 0.1	<0.05	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	413207	0.1	ug/L	STD 0.2	<0.1	<0.1	<0.1	<0.1
Fluoranthene	413207	0.1	ug/L	STD 0.4	<0.1	<0.1	<0.1	<0.1
Fluorene	413207	0.1	ug/L	STD 120	<0.1	<0.1	<0.1	<0.1
Indeno[1 2 3-cd]pyrene	413207	0.1	ug/L	STD 0.2	<0.1	<0.1	<0.1	<0.1
Methylnaphthalene, 1-	413207	0.1	ug/L	STD 2	<0.1	<0.1	<0.1	<0.1
Methylnaphthalene, 2-	413207	0.1	ug/L	STD 2	<0.1	<0.1	<0.1	<0.1
Naphthalene	413207	0.1	ug/L	STD 7	<0.1	<0.1	<0.1	<0.1
Phenanthrene	413207	0.1	ug/L	STD 0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	413207	0.1	ug/L	STD 0.2	<0.1	<0.1	<0.1	<0.1

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**Guideline = O.Reg 153-T1-Groundwater**

**Volatiles**

Lab I.D.  
 Sample Matrix  
 Sample Type  
 Sample Date  
 Sampling Time  
 Sample I.D.

1600846 GW153	1600847 GW153	1600848 GW153	1600849 GW153
2021-12-08	2021-12-08	2021-12-08	2021-12-08
TW2	TW3	BH1	BH2

Analyte	Batch No	MRL	Units	Guideline	1600846 GW153	1600847 GW153	1600848 GW153	1600849 GW153
Benzene	413921	0.5	ug/L	STD 0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	413921	0.5	ug/L	STD 0.5	<0.5	<0.5	<0.5	<0.5
Toluene	413921	0.5	ug/L	STD 0.8	<0.5	<0.5	<0.5	<0.5
Xylene Mixture	413921	0.5	ug/L	STD 72	<0.5	<0.5	<0.5	<0.5
Xylene, m/p-	413921	0.4	ug/L		<0.4	<0.4	<0.4	<0.4
Xylene, o-	413921	0.4	ug/L		<0.4	<0.4	<0.4	<0.4

**PCBs**

Lab I.D.  
 Sample Matrix  
 Sample Type  
 Sample Date  
 Sampling Time  
 Sample I.D.

1600846 GW153	1600847 GW153	1600848 GW153	1600849 GW153
2021-12-08	2021-12-08	2021-12-08	2021-12-08
TW2	TW3	BH1	BH2

Analyte	Batch No	MRL	Units	Guideline	1600846 GW153	1600847 GW153	1600848 GW153	1600849 GW153
Aroclor 1016	414140	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
Aroclor 1242	414140	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
Aroclor 1248	414140	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
Aroclor 1254	414140	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
Aroclor 1260	414140	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
Polychlorinated Biphenyls	414140	0.1	ug/L	STD 0.2	<0.1	<0.1	<0.1	<0.1

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**Environment Testing**

Client: Paterson Group  
 154 Colonnade Rd. South  
 Nepean, ON  
 K2E 7T7  
 Attention: Mr. Kirby Magee-Dittburner  
 PO#: 33461  
 Invoice to: Paterson Group

Report Number: 1968398  
 Date Submitted: 2021-12-09  
 Date Reported: 2021-12-21  
 Project: PH4398  
 COC #: 884073

**Guideline = O.Reg 153-T1-Groundwater**

**PCB Surrogate**

Lab I.D.	1600846	1600847	1600848	1600849
Sample Matrix	GW153	GW153	GW153	GW153
Sample Type				
Sample Date	2021-12-08	2021-12-08	2021-12-08	2021-12-08
Sampling Time				
Sample I.D.	TW2	TW3	BH1	BH2

Analyte	Batch No	MRL	Units	Guideline
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Decachlorobiphenyl	414143	0	%		69	117	69	62
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**VOCs Surrogates**

Lab I.D.	1600846	1600847	1600848	1600849
Sample Matrix	GW153	GW153	GW153	GW153
Sample Type				
Sample Date	2021-12-08	2021-12-08	2021-12-08	2021-12-08
Sampling Time				
Sample I.D.	TW2	TW3	BH1	BH2

Analyte	Batch No	MRL	Units	Guideline
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Toluene-d8	413921	0	%		98	97	100	99
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**Quality Assurance Summary**

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
413207	Methylnaphthalene, 1-	<0.1 ug/L	100	50-140		50-140		0-30
413207	Methylnaphthalene, 2-	<0.1 ug/L	100	50-140		50-140		0-30
413207	Acenaphthene	<0.1 ug/L	102	50-140		50-140		0-30
413207	Acenaphthylene	<0.1 ug/L	100	50-140		50-140		0-30
413207	Anthracene	<0.1 ug/L	100	50-140		50-140		0-30
413207	Benz[a]anthracene	<0.1 ug/L	84	50-140		50-140		0-30
413207	Benzo[a]pyrene	<0.01 ug/L	95	50-140		50-140		0-30
413207	Benzo[b]fluoranthene	<0.05 ug/L	99	50-140		50-140		0-30
413207	Benzo[ghi]perylene	<0.1 ug/L	100	50-140		50-140		0-30
413207	Benzo[k]fluoranthene	<0.05 ug/L	104	50-140		50-140		0-30
413207	Chrysene	<0.05 ug/L	111	50-140		50-140		0-30
413207	Dibenz[a h]anthracene	<0.1 ug/L	82	50-140		50-140		0-30
413207	Fluoranthene	<0.1 ug/L	94	50-140		50-140		0-30
413207	Fluorene	<0.1 ug/L	96	50-140		50-140		0-30
413207	Indeno[1 2 3-cd]pyrene	<0.1 ug/L	92	50-140		50-140		0-30
413207	Naphthalene	<0.1 ug/L	104	50-140		50-140		0-30
413207	Phenanthrene	<0.1 ug/L	102	50-140		50-140		0-30
413207	Pyrene	<0.1 ug/L	94	50-140		50-140		0-30
413883	Chromium VI	<10 ug/L	94	80-120	88	70-130	0	0-35
413921	Benzene	<0.5 ug/L	88	60-130	101	50-140	0	0-30
413921	Ethylbenzene	<0.5 ug/L	82	60-130	90	50-140	0	0-30
413921	Xylene, m/p-	<0.4 ug/L	84	60-130	97	50-140	0	0-30
413921	Xylene, o-	<0.4 ug/L	91	60-130	97	50-140	0	0-30
413921	Toluene	<0.5 ug/L	88	60-130	102	50-140	0	0-30
413921	Xylene Mixture	<0.5 ug/L						
413967	Sodium	<2000 ug/L	108	82-118	80	80-120	0	0-20
413977	Silver	<0.1 ug/L	111	80-120	124	70-130	17	0-20
413977	Arsenic	<1 ug/L	101	80-120	116	70-130	0	0-20
413977	Boron (total)	<10 ug/L	110	80-120		80-120	0	0-20
413977	Barium	<10 ug/L	90	80-120	13	70-130	0	0-20
413977	Beryllium	<0.5 ug/L	116	80-120	120	70-130	0	0-20
413977	Cadmium	<0.1 ug/L	105	80-120	122	70-130	0	0-20
413977	Cobalt	<0.2 ug/L	97	80-120	97	70-130	0	0-20

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**Quality Assurance Summary**

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
413977	Chromium Total	<1 ug/L	96	80-120	103	70-130	0	0-20
413977	Copper	<1 ug/L	102	80-120	92	70-130	2	0-20
413977	Molybdenum	<5 ug/L	94	80-120	103	70-130	0	0-20
413977	Nickel	<5 ug/L	106	80-120	100	70-130	0	0-20
413977	Lead	<1 ug/L	89	80-120	93	70-130	0	0-20
413977	Antimony	<0.5 ug/L	107	80-120	111	70-130	0	0-20
413977	Selenium	<1 ug/L	114	80-120	142	70-130	0	0-20
413977	Thallium	<0.1 ug/L	91	80-120	96	70-130	0	0-20
413977	Uranium	<1 ug/L	92	80-120	107	70-130	0	0-20
413977	Vanadium	<1 ug/L	98	80-120	107	70-130	0	0-20
413977	Zinc	<10 ug/L	113	80-120	137	70-130	0	0-20
414089	Mercury	<0.1 ug/L	98	76-123	96	70-130	0	0-20
414118	1+2-methylnaphthalene							
414140	Aroclor 1016	<0.1 ug/L	120		N/A		N/A	
414140	Aroclor 1242	<0.1 ug/L	120	60-140	N/A	60-140	N/A	0-30
414140	Aroclor 1248	<0.1 ug/L	120	60-140	N/A	60-140	N/A	0-30
414140	Aroclor 1254	<0.1 ug/L	120	60-140	N/A	60-140	N/A	0-30
414140	Aroclor 1260	<0.1 ug/L	120	60-140	N/A	60-140	N/A	0-30
414140	Polychlorinated Biphenyls	<0.1 ug/L	120	60-140		60-140		0-30
414172	Mercury	<0.1 ug/L	118	76-123	91	70-130	0	0-20

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 COC #: 884073

**Test Summary**

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
413207	Methylnaphthalene, 1-	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Methylnaphthalene, 2-	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Acenaphthene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Acenaphthylene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Anthracene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Benz[a]anthracene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Benzo[a]pyrene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Benzo[b]fluoranthene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Benzo[ghi]perylene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Benzo[k]fluoranthene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Chrysene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Dibenz[a h]anthracene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Fluoranthene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Fluorene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Indeno[1 2 3-cd]pyrene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Naphthalene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Phenanthrene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Pyrene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413883	Chromium VI		2021-12-10	2021-12-10	SKH	SM 3500-Cr B
413921	Benzene	GC-MS	2021-12-03	2021-12-11	YH	EPA 8260
413921	Ethylbenzene	GC-MS	2021-12-03	2021-12-11	YH	EPA 8260
413921	Xylene, m/p-	GC-MS	2021-12-03	2021-12-11	YH	EPA 8260
413921	Xylene, o-	GC-MS	2021-12-03	2021-12-11	YH	EPA 8260
413921	Toluene	GC-MS	2021-12-03	2021-12-11	YH	EPA 8260
413921	Xylene Mixture	GC-MS	2021-12-13	2021-12-13	YH	EPA 8260
413967	Sodium	ICP-OES	2021-12-13	2021-12-13	Z_S	M SM3120B-3500C
413977	Silver	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Arsenic	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Boron (total)	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Barium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Beryllium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Cadmium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Cobalt	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8

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 COC #: 884073

**Test Summary**

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
413977	Chromium Total	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Copper	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Molybdenum	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Nickel	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Lead	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Antimony	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Selenium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Thallium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Uranium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Vanadium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Zinc	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
414089	Mercury	CV AA	2021-12-14	2021-12-14	AaN	M SM3112B-3500B
414118	1+2-methylnaphthalene	GC-MS	2021-12-15	2021-12-15	C_M	P 8270
414140	Aroclor 1016	GC/ECD	2021-12-14	2021-12-15	ZoB	EPA 8081B
414140	Aroclor 1242	GC/ECD	2021-12-14	2021-12-15	ZoB	EPA 8081B
414140	Aroclor 1248	GC/ECD	2021-12-14	2021-12-15	ZoB	EPA 8081B
414140	Aroclor 1254	GC/ECD	2021-12-14	2021-12-15	ZoB	EPA 8081B
414140	Aroclor 1260	GC/ECD	2021-12-14	2021-12-15	ZoB	EPA 8081B
414140	Polychlorinated Biphenyls	GC/ECD	2021-12-14	2021-12-15	ZoB	EPA 8081B
414172	Mercury	CV AA	2021-12-15	2021-12-15	AaN	M SM3112B-3500B

Results relate only to the parameters tested on the samples submitted.  
 Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Paterson Group  
154 Colonnade Rd. South  
Nepean, ON  
K2E 7T7  
Attention: Mr. Kirby Magee-Dittburner  
PO#: 33461  
Invoice to: Paterson Group

Report Number: 1968398  
Date Submitted: 2021-12-09  
Date Reported: 2021-12-21  
Project: PH4398  
COC #: 884073

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**CWS for Petroleum Hydrocarbons in Soil - Tier 1****Notes:**

1. The laboratory method complies with CCME Tier 1 reference method for PHC in soil. It is validated for laboratory use.
2. Where the F1 fraction (C6 to C10) and BTEX are both measured, F1-BTEX is reported.
3. Where the F2 fraction (C10 to C16) and naphthalene are both measured, F2-naphthalene is reported.
4. Where the F3 fraction (C16 to C34) and PAHs\* are both measured, F3-PAH is reported.
5. F4G is analyzed if the chromatogram does not descend to baseline before C50. Where F4 (C34 to C50) and F4G are both reported, the higher result is compared to the standard.
6. Unless otherwise stated in the sample comments, the following criteria have been met where applicable:
  - nC6 and nC10 response factors within 30% of response factor for toluene;
  - nC10, nC16, and nC34 response factors within 10% of each other;
  - C50 response factors within 70% of nC10 + nC16 + nC34 average; and,
  - Linearity is within 15%.
7. Unless otherwise stated in the sample comments, sampling requirements and analytical holding times have been met.
8. Gravimetric heavy hydrocarbons (F4G) cannot be added to the C6 and C50 hydrocarbons.
9. \*PAHs = phenanthrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene and pyrene.

CLIENT INFORMATION		INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	
Company:	Paterson Group	Company:	
Contact:	Kirby Magee-Dittburner	Contact:	
Address:	154 Colonnade Road South	Address:	
Telephone:	613-218-3444	Telephone:	
Cell:		PO #:	33461
Email:	#1: eardley@patersongroup.ca, mlaflamme@patersongroup.ca		
Email:	#2: kmageedittburner@patersongroup.ca		
Project:	PH4398		
Quote #:			

**TURN-AROUND TIME (Business Days)**

1 Day\* (100%)   
  2 Day\*\* (50%)   
  3-5 Days (25%)   
  5-7 Days (Standard)

Please contact Lab in advance to determine rush availability.

\*For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.

\*\*For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

**REGULATION/GUIDELINE REQUIRED**

Sanitary Sewer, City: Ottawa  
 Storm Sewer, City: Ottawa  
 ODWSOG  
 PWQO  
 O. Reg 347/558  
 Other: \_\_\_\_\_  
 None

O. Reg 153  
 Table # \_\_\_\_, Course / Fine, Surface / subsurface.  
 Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment  
 Excess Soil, Table: \_\_\_\_\_ Type: \_\_\_\_\_

The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04

Yes  No

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. **Note that this COC is not to be used for drinking water samples.** The COC must be complete upon submission of the samples, there will be a \$25 surcharge if required information is missing (required fields are shaded in grey).

Sample ID	Date/Time Collected	Sample Details		Sample Analysis Required														RN# (Lab Use Only)		
		Sample Matrix	# of Containers	O.Reg.153 parameters																
				PHC F1 - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganics	Metals only	See attached paper	Subdivision Supply Bact 2 (EcTC only)	TSS	pH	Total Metals	Hg	Chromium 6		Dioxins & Furans	
TW2	December 8, 2021	GW	1		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		1600846
TW3	December 8, 2021	GW	1		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		47
BH1	December 8, 2021	GW	1		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		48
BH2	December 8, 2021	GW	1		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		49

PRINT		SIGN		DATE/TIME		TEMP (°C)	COMMENTS:
Sampled By:	Kirby Magee-Dittburner			December 8, 2021			
Relinquished By:	Kirby Magee-Dittburner			December 9, 2021		19.3	
Received By:				12/09/21 15:13			

## ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC  
2425 New Holland Pike  
Lancaster, PA 17601  
Tel: (717)656-2300

Laboratory Job ID: 410-67026-1  
Client Project/Site: P968398-PH9398

For:  
Eurofins Environment Testing Canada  
146 Colonnade Road, No. 8  
Ottawa, Ontario K2E 7Y1

Attn: Rebecca Koshy



---

Authorized for release by:  
12/21/2021 8:12:57 AM

Marrison Williams, Project Manager  
(717)556-7246  
[Marrison.Williams@eurofinset.com](mailto:Marrison.Williams@eurofinset.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:

[www.eurofinsus.com/Env](http://www.eurofinsus.com/Env)

*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*





Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
  - Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
  - Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
- Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

---

Marrison Williams  
Project Manager  
12/21/2021 8:12:57 AM

# Case Narrative

Client: Eurofins Environment Testing Canada  
Project/Site: P968398-PH9398

Job ID: 410-67026-1

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**Job ID: 410-67026-1**

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**Laboratory: Eurofins Lancaster Laboratories Env, LLC**

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**Narrative**

**Job Narrative  
410-67026-1**

**Receipt**

The samples were received on 12/15/2021 9:37 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 13.8°C

**Receipt Exceptions**

The following samples were received at the laboratory outside the required temperature criteria: P968398-PH9398 1600846-tw2 (410-67026-1), P968398-PH9398 1600847-tw3 (410-67026-2), P968398-PH9398 1600848-BH1 (410-67026-3) and P968398-PH9398 1600848-BH2 (410-67026-4). The laboratory was instructed to proceed with analysis.

Any peak area that is the result of interferences from poly-chlorinated diphenyl ethers observed in the sample has been removed from the calculated results prior to reporting the data for totals.

**Dioxin**

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.



# Sample Summary

Client: Eurofins Environment Testing Canada  
Project/Site: P968398-PH9398

Job ID: 410-67026-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-67026-1	P968398-PH9398 1600846-tw2	Water	12/08/21 00:00	12/15/21 09:37
410-67026-2	P968398-PH9398 1600847-tw3	Water	12/08/21 00:00	12/15/21 09:37
410-67026-3	P968398-PH9398 1600848-BH1	Water	12/08/21 00:00	12/15/21 09:37
410-67026-4	P968398-PH9398 1600848-BH2	Water	12/08/21 00:00	12/15/21 09:37

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# Client Sample Results

Client: Eurofins Environment Testing Canada  
 Project/Site: P968398-PH9398

Job ID: 410-67026-1

**Client Sample ID: P968398-PH9398 1600846-tw2**

**Lab Sample ID: 410-67026-1**

Date Collected: 12/08/21 00:00

Matrix: Water

Date Received: 12/15/21 09:37

**Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)**

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	ND		31	0.31	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>1,2,3,4,6,7,8-HpCDF</b>	<b>0.37</b>	<b>J I</b>	31	0.029	pg/L		12/16/21 15:00	12/17/21 14:59	1
1,2,3,4,7,8-HxCDD	ND		31	0.048	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>1,2,3,4,7,8-HxCDF</b>	<b>0.48</b>	<b>J I B</b>	31	0.16	pg/L		12/16/21 15:00	12/17/21 14:59	1
1,2,3,4,7,8,9-HpCDF	ND		31	0.043	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>1,2,3,6,7,8-HxCDD</b>	<b>0.23</b>	<b>J I B</b>	31	0.046	pg/L		12/16/21 15:00	12/17/21 14:59	1
1,2,3,6,7,8-HxCDF	ND		31	0.15	pg/L		12/16/21 15:00	12/17/21 14:59	1
1,2,3,7,8-PeCDD	ND		31	0.075	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>1,2,3,7,8-PeCDF</b>	<b>0.56</b>	<b>J I B</b>	31	0.10	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>1,2,3,7,8,9-HxCDD</b>	<b>0.26</b>	<b>J I</b>	31	0.043	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>1,2,3,7,8,9-HxCDF</b>	<b>0.54</b>	<b>J I B</b>	31	0.18	pg/L		12/16/21 15:00	12/17/21 14:59	1
2,3,4,6,7,8-HxCDF	ND		31	0.14	pg/L		12/16/21 15:00	12/17/21 14:59	1
2,3,4,7,8-PeCDF	ND		31	0.083	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>2,3,7,8-TCDD</b>	<b>0.19</b>	<b>J I</b>	5.0	0.10	pg/L		12/16/21 15:00	12/17/21 14:59	1
2,3,7,8-TCDF	ND		6.2	0.051	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>OCDD</b>	<b>2.5</b>	<b>J I B</b>	140	0.075	pg/L		12/16/21 15:00	12/17/21 14:59	1
OCDF	ND		62	0.071	pg/L		12/16/21 15:00	12/17/21 14:59	1
Total HpCDD	ND		31	0.31	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>Total HpCDF</b>	<b>0.37</b>	<b>J I B</b>	31	0.036	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>Total HxCDD</b>	<b>1.2</b>	<b>J I B</b>	31	0.046	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>Total HxCDF</b>	<b>1.0</b>	<b>J I B</b>	31	0.16	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>Total PeCDD</b>	<b>0.64</b>	<b>J B</b>	31	0.075	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>Total PeCDF</b>	<b>0.91</b>	<b>J I B</b>	31	0.091	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>Total TCDD</b>	<b>0.19</b>	<b>J I B</b>	6.2	0.10	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>Total TCDF</b>	<b>0.59</b>	<b>J I B</b>	6.2	0.051	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>Total PCDD</b>	<b>4.5</b>	<b>J I B</b>	6.2	0.12	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>Total PCDF</b>	<b>2.9</b>	<b>J I B</b>	6.2	0.082	pg/L		12/16/21 15:00	12/17/21 14:59	1
<b>Total PCDD/PCDF</b>	<b>7.4</b>	<b>I</b>	6.2	0.10	pg/L		12/16/21 15:00	12/17/21 14:59	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	68		23 - 140	12/16/21 15:00	12/17/21 14:59	1
13C-1,2,3,4,6,7,8-HpCDF	64		28 - 143	12/16/21 15:00	12/17/21 14:59	1
13C-1,2,3,4,7,8-HxCDD	70		32 - 141	12/16/21 15:00	12/17/21 14:59	1
13C-1,2,3,4,7,8-HxCDF	71		26 - 152	12/16/21 15:00	12/17/21 14:59	1
13C-1,2,3,4,7,8,9-HpCDF	57		26 - 138	12/16/21 15:00	12/17/21 14:59	1
13C-1,2,3,6,7,8-HxCDD	71		28 - 130	12/16/21 15:00	12/17/21 14:59	1
13C-1,2,3,6,7,8-HxCDF	72		26 - 123	12/16/21 15:00	12/17/21 14:59	1
13C-1,2,3,7,8-PeCDD	59		25 - 181	12/16/21 15:00	12/17/21 14:59	1
13C-1,2,3,7,8-PeCDF	64		24 - 185	12/16/21 15:00	12/17/21 14:59	1
13C-1,2,3,7,8,9-HxCDD	71		28 - 130	12/16/21 15:00	12/17/21 14:59	1
13C-1,2,3,7,8,9-HxCDF	63		29 - 147	12/16/21 15:00	12/17/21 14:59	1
13C-2,3,4,6,7,8-HxCDF	68		28 - 136	12/16/21 15:00	12/17/21 14:59	1
13C-2,3,4,7,8-PeCDF	63		21 - 178	12/16/21 15:00	12/17/21 14:59	1
13C-2,3,7,8-TCDD	67		25 - 164	12/16/21 15:00	12/17/21 14:59	1
13C-2,3,7,8-TCDF	64		24 - 169	12/16/21 15:00	12/17/21 14:59	1
13C-OCDD	69		17 - 157	12/16/21 15:00	12/17/21 14:59	1
13C-OCDF	59		17 - 157	12/16/21 15:00	12/17/21 14:59	1

# Client Sample Results

Client: Eurofins Environment Testing Canada  
Project/Site: P968398-PH9398

Job ID: 410-67026-1

**Client Sample ID: P968398-PH9398 1600847-tw3**

**Lab Sample ID: 410-67026-2**

Date Collected: 12/08/21 00:00

Matrix: Water

Date Received: 12/15/21 09:37

**Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)**

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>1,2,3,4,6,7,8-HpCDD</b>	<b>1.3</b>	<b>J I B</b>	26	0.060	pg/L		12/16/21 15:00	12/17/21 15:51	1
1,2,3,4,6,7,8-HpCDF	ND		26	0.025	pg/L		12/16/21 15:00	12/17/21 15:51	1
1,2,3,4,7,8-HxCDD	ND		26	0.042	pg/L		12/16/21 15:00	12/17/21 15:51	1
1,2,3,4,7,8-HxCDF	ND		26	0.026	pg/L		12/16/21 15:00	12/17/21 15:51	1
1,2,3,4,7,8,9-HpCDF	ND		26	0.036	pg/L		12/16/21 15:00	12/17/21 15:51	1
1,2,3,6,7,8-HxCDD	ND		26	0.038	pg/L		12/16/21 15:00	12/17/21 15:51	1
1,2,3,6,7,8-HxCDF	ND		26	0.027	pg/L		12/16/21 15:00	12/17/21 15:51	1
1,2,3,7,8-PeCDD	ND		26	0.092	pg/L		12/16/21 15:00	12/17/21 15:51	1
<b>1,2,3,7,8-PeCDF</b>	<b>0.51</b>	<b>J I B</b>	26	0.049	pg/L		12/16/21 15:00	12/17/21 15:51	1
1,2,3,7,8,9-HxCDD	ND		26	0.037	pg/L		12/16/21 15:00	12/17/21 15:51	1
1,2,3,7,8,9-HxCDF	ND		26	0.033	pg/L		12/16/21 15:00	12/17/21 15:51	1
2,3,4,6,7,8-HxCDF	ND		26	0.026	pg/L		12/16/21 15:00	12/17/21 15:51	1
2,3,4,7,8-PeCDF	ND		26	0.037	pg/L		12/16/21 15:00	12/17/21 15:51	1
<b>2,3,7,8-TCDD</b>	<b>0.13</b>	<b>J I</b>	4.1	0.078	pg/L		12/16/21 15:00	12/17/21 15:51	1
2,3,7,8-TCDF	ND		5.2	0.054	pg/L		12/16/21 15:00	12/17/21 15:51	1
OCDD	ND		110	0.060	pg/L		12/16/21 15:00	12/17/21 15:51	1
<b>OCDF</b>	<b>0.087</b>	<b>J I B</b>	52	0.057	pg/L		12/16/21 15:00	12/17/21 15:51	1
<b>Total HpCDD</b>	<b>1.3</b>	<b>J I B</b>	26	0.060	pg/L		12/16/21 15:00	12/17/21 15:51	1
Total HpCDF	ND		26	0.036	pg/L		12/16/21 15:00	12/17/21 15:51	1
<b>Total HxCDD</b>	<b>1.8</b>	<b>J I B</b>	26	0.039	pg/L		12/16/21 15:00	12/17/21 15:51	1
Total HxCDF	ND		26	0.033	pg/L		12/16/21 15:00	12/17/21 15:51	1
<b>Total PeCDD</b>	<b>0.93</b>	<b>J I B</b>	26	0.092	pg/L		12/16/21 15:00	12/17/21 15:51	1
<b>Total PeCDF</b>	<b>0.51</b>	<b>J I B</b>	26	0.043	pg/L		12/16/21 15:00	12/17/21 15:51	1
<b>Total TCDD</b>	<b>1.3</b>	<b>J I B</b>	5.2	0.078	pg/L		12/16/21 15:00	12/17/21 15:51	1
<b>Total TCDF</b>	<b>0.17</b>	<b>J I B</b>	5.2	0.054	pg/L		12/16/21 15:00	12/17/21 15:51	1
<b>Total PCDD</b>	<b>5.3</b>	<b>I B</b>	5.2	0.066	pg/L		12/16/21 15:00	12/17/21 15:51	1
<b>Total PCDF</b>	<b>0.77</b>	<b>J I B</b>	5.2	0.044	pg/L		12/16/21 15:00	12/17/21 15:51	1
<b>Total PCDD/PCDF</b>	<b>6.1</b>	<b>I</b>	5.2	0.055	pg/L		12/16/21 15:00	12/17/21 15:51	1
<b>Isotope Dilution</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
13C-1,2,3,4,6,7,8-HpCDD	68		23 - 140				12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,4,6,7,8-HpCDF	67		28 - 143				12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,4,7,8-HxCDD	70		32 - 141				12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,4,7,8-HxCDF	68		26 - 152				12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,4,7,8,9-HpCDF	61		26 - 138				12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,6,7,8-HxCDD	74		28 - 130				12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,6,7,8-HxCDF	72		26 - 123				12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,7,8-PeCDD	60		25 - 181				12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,7,8-PeCDF	62		24 - 185				12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,7,8,9-HxCDD	70		28 - 130				12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,7,8,9-HxCDF	63		29 - 147				12/16/21 15:00	12/17/21 15:51	1
13C-2,3,4,6,7,8-HxCDF	68		28 - 136				12/16/21 15:00	12/17/21 15:51	1
13C-2,3,4,7,8-PeCDF	62		21 - 178				12/16/21 15:00	12/17/21 15:51	1
13C-2,3,7,8-TCDD	64		25 - 164				12/16/21 15:00	12/17/21 15:51	1
13C-2,3,7,8-TCDF	59		24 - 169				12/16/21 15:00	12/17/21 15:51	1
13C-OCDD	75		17 - 157				12/16/21 15:00	12/17/21 15:51	1
13C-OCDF	64		17 - 157				12/16/21 15:00	12/17/21 15:51	1

# Client Sample Results

Client: Eurofins Environment Testing Canada  
 Project/Site: P968398-PH9398

Job ID: 410-67026-1

**Client Sample ID: P968398-PH9398 1600848-BH1**

**Lab Sample ID: 410-67026-3**

Date Collected: 12/08/21 00:00

Matrix: Water

Date Received: 12/15/21 09:37

**Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)**

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	1.9	J I B	32	0.31	pg/L		12/16/21 15:00	12/17/21 16:40	1
1,2,3,4,6,7,8-HpCDF	0.25	J I	32	0.034	pg/L		12/16/21 15:00	12/17/21 16:40	1
1,2,3,4,7,8-HxCDD	0.66	J I	32	0.052	pg/L		12/16/21 15:00	12/17/21 16:40	1
1,2,3,4,7,8-HxCDF	ND		32	0.12	pg/L		12/16/21 15:00	12/17/21 16:40	1
1,2,3,4,7,8,9-HpCDF	ND		32	0.050	pg/L		12/16/21 15:00	12/17/21 16:40	1
1,2,3,6,7,8-HxCDD	ND		32	0.053	pg/L		12/16/21 15:00	12/17/21 16:40	1
1,2,3,6,7,8-HxCDF	0.41	J I B	32	0.12	pg/L		12/16/21 15:00	12/17/21 16:40	1
1,2,3,7,8-PeCDD	ND		32	0.087	pg/L		12/16/21 15:00	12/17/21 16:40	1
1,2,3,7,8-PeCDF	0.34	J I B	32	0.062	pg/L		12/16/21 15:00	12/17/21 16:40	1
1,2,3,7,8,9-HxCDD	ND		32	0.052	pg/L		12/16/21 15:00	12/17/21 16:40	1
1,2,3,7,8,9-HxCDF	0.42	J I B	32	0.13	pg/L		12/16/21 15:00	12/17/21 16:40	1
2,3,4,6,7,8-HxCDF	ND		32	0.12	pg/L		12/16/21 15:00	12/17/21 16:40	1
2,3,4,7,8-PeCDF	ND		32	0.050	pg/L		12/16/21 15:00	12/17/21 16:40	1
2,3,7,8-TCDD	ND		5.1	0.10	pg/L		12/16/21 15:00	12/17/21 16:40	1
2,3,7,8-TCDF	ND		6.4	0.070	pg/L		12/16/21 15:00	12/17/21 16:40	1
OCDD	14	J B	140	0.086	pg/L		12/16/21 15:00	12/17/21 16:40	1
OCDF	0.82	J I B	64	0.078	pg/L		12/16/21 15:00	12/17/21 16:40	1
Total HpCDD	1.9	J I B	32	0.31	pg/L		12/16/21 15:00	12/17/21 16:40	1
Total HpCDF	0.42	J I B	32	0.042	pg/L		12/16/21 15:00	12/17/21 16:40	1
Total HxCDD	3.8	J I B	32	0.052	pg/L		12/16/21 15:00	12/17/21 16:40	1
Total HxCDF	0.83	J I B	32	0.12	pg/L		12/16/21 15:00	12/17/21 16:40	1
Total PeCDD	0.38	J B	32	0.087	pg/L		12/16/21 15:00	12/17/21 16:40	1
Total PeCDF	0.34	J I B	32	0.056	pg/L		12/16/21 15:00	12/17/21 16:40	1
Total TCDD	0.13	J I B	6.4	0.10	pg/L		12/16/21 15:00	12/17/21 16:40	1
Total TCDF	ND		6.4	0.070	pg/L		12/16/21 15:00	12/17/21 16:40	1
Total PCDD	20	I B	6.4	0.13	pg/L		12/16/21 15:00	12/17/21 16:40	1
Total PCDF	2.4	J I B	6.4	0.074	pg/L		12/16/21 15:00	12/17/21 16:40	1
Total PCDD/PCDF	22	I	6.4	0.10	pg/L		12/16/21 15:00	12/17/21 16:40	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	58		23 - 140				12/16/21 15:00	12/17/21 16:40	1
13C-1,2,3,4,6,7,8-HpCDF	56		28 - 143				12/16/21 15:00	12/17/21 16:40	1
13C-1,2,3,4,7,8-HxCDD	60		32 - 141				12/16/21 15:00	12/17/21 16:40	1
13C-1,2,3,4,7,8-HxCDF	60		26 - 152				12/16/21 15:00	12/17/21 16:40	1
13C-1,2,3,4,7,8,9-HpCDF	51		26 - 138				12/16/21 15:00	12/17/21 16:40	1
13C-1,2,3,6,7,8-HxCDD	64		28 - 130				12/16/21 15:00	12/17/21 16:40	1
13C-1,2,3,6,7,8-HxCDF	61		26 - 123				12/16/21 15:00	12/17/21 16:40	1
13C-1,2,3,7,8-PeCDD	51		25 - 181				12/16/21 15:00	12/17/21 16:40	1
13C-1,2,3,7,8-PeCDF	53		24 - 185				12/16/21 15:00	12/17/21 16:40	1
13C-1,2,3,7,8,9-HxCDD	61		28 - 130				12/16/21 15:00	12/17/21 16:40	1
13C-1,2,3,7,8,9-HxCDF	55		29 - 147				12/16/21 15:00	12/17/21 16:40	1
13C-2,3,4,6,7,8-HxCDF	59		28 - 136				12/16/21 15:00	12/17/21 16:40	1
13C-2,3,4,7,8-PeCDF	54		21 - 178				12/16/21 15:00	12/17/21 16:40	1
13C-2,3,7,8-TCDD	54		25 - 164				12/16/21 15:00	12/17/21 16:40	1
13C-2,3,7,8-TCDF	52		24 - 169				12/16/21 15:00	12/17/21 16:40	1
13C-OCDD	59		17 - 157				12/16/21 15:00	12/17/21 16:40	1
13C-OCDF	52		17 - 157				12/16/21 15:00	12/17/21 16:40	1

# Client Sample Results

Client: Eurofins Environment Testing Canada  
Project/Site: P968398-PH9398

Job ID: 410-67026-1

**Client Sample ID: P968398-PH9398 1600848-BH2**

**Lab Sample ID: 410-67026-4**

Date Collected: 12/08/21 00:00

Matrix: Water

Date Received: 12/15/21 09:37

**Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)**

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>1,2,3,4,6,7,8-HpCDD</b>	<b>1.8</b>	<b>J I B</b>	26	0.21	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>1,2,3,4,6,7,8-HpCDF</b>	<b>0.24</b>	<b>J I</b>	26	0.028	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,4,7,8-HxCDD	ND		26	0.046	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,4,7,8-HxCDF	ND		26	0.12	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,4,7,8,9-HpCDF	ND		26	0.037	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,6,7,8-HxCDD	ND		26	0.041	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>1,2,3,6,7,8-HxCDF</b>	<b>0.27</b>	<b>J I B</b>	26	0.12	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,7,8-PeCDD	ND		26	0.11	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>1,2,3,7,8-PeCDF</b>	<b>0.40</b>	<b>J I B</b>	26	0.050	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>1,2,3,7,8,9-HxCDD</b>	<b>0.38</b>	<b>J I</b>	26	0.043	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>1,2,3,7,8,9-HxCDF</b>	<b>0.54</b>	<b>J I B</b>	26	0.14	pg/L		12/16/21 15:00	12/17/21 17:29	1
2,3,4,6,7,8-HxCDF	ND		26	0.11	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>2,3,4,7,8-PeCDF</b>	<b>0.37</b>	<b>J I B</b>	26	0.042	pg/L		12/16/21 15:00	12/17/21 17:29	1
2,3,7,8-TCDD	ND		4.2	0.086	pg/L		12/16/21 15:00	12/17/21 17:29	1
2,3,7,8-TCDF	ND		5.3	0.055	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>OCDD</b>	<b>1.4</b>	<b>J I B</b>	120	0.090	pg/L		12/16/21 15:00	12/17/21 17:29	1
OCDF	ND		53	0.082	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>Total HpCDD</b>	<b>1.8</b>	<b>J I B</b>	26	0.21	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>Total HpCDF</b>	<b>0.47</b>	<b>J I B</b>	26	0.033	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>Total HxCDD</b>	<b>0.88</b>	<b>J I B</b>	26	0.044	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>Total HxCDF</b>	<b>0.82</b>	<b>J I B</b>	26	0.12	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>Total PeCDD</b>	<b>0.65</b>	<b>J I B</b>	26	0.11	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>Total PeCDF</b>	<b>0.77</b>	<b>J I B</b>	26	0.046	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>Total TCDD</b>	<b>1.1</b>	<b>J I B</b>	5.3	0.086	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>Total TCDF</b>	<b>0.14</b>	<b>J I B</b>	5.3	0.055	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>Total PCDD</b>	<b>5.8</b>	<b>I B</b>	5.3	0.11	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>Total PCDF</b>	<b>2.2</b>	<b>J I B</b>	5.3	0.067	pg/L		12/16/21 15:00	12/17/21 17:29	1
<b>Total PCDD/PCDF</b>	<b>8.0</b>	<b>I</b>	5.3	0.087	pg/L		12/16/21 15:00	12/17/21 17:29	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C-1,2,3,4,6,7,8-HpCDD	52		23 - 140				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,4,6,7,8-HpCDF	50		28 - 143				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,4,7,8-HxCDD	54		32 - 141				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,4,7,8-HxCDF	54		26 - 152				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,4,7,8,9-HpCDF	48		26 - 138				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,6,7,8-HxCDD	57		28 - 130				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,6,7,8-HxCDF	54		26 - 123				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,7,8-PeCDD	45		25 - 181				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,7,8-PeCDF	52		24 - 185				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,7,8,9-HxCDD	53		28 - 130				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,7,8,9-HxCDF	49		29 - 147				12/16/21 15:00	12/17/21 17:29	1
13C-2,3,4,6,7,8-HxCDF	51		28 - 136				12/16/21 15:00	12/17/21 17:29	1
13C-2,3,4,7,8-PeCDF	49		21 - 178				12/16/21 15:00	12/17/21 17:29	1
13C-2,3,7,8-TCDD	50		25 - 164				12/16/21 15:00	12/17/21 17:29	1
13C-2,3,7,8-TCDF	51		24 - 169				12/16/21 15:00	12/17/21 17:29	1
13C-OCDD	60		17 - 157				12/16/21 15:00	12/17/21 17:29	1
13C-OCDF	52		17 - 157				12/16/21 15:00	12/17/21 17:29	1

# Toxicity Summary

Client: Eurofins Environment Testing Canada  
Project/Site: P968398-PH9398

Job ID: 410-67026-1

**Client Sample ID: P968398-PH9398 1600846-tw2**

**Lab Sample ID: 410-67026-1**

Analyte	Result	Qualifier	RL	EDL	Unit	WHO 2005		Method
						TEF	TEQ	
1,2,3,4,6,7,8-HpCDD	ND		31	0.31	pg/L	0.01	0.00	1613B
<b>1,2,3,4,6,7,8-HpCDF</b>	<b>0.37</b>	<b>J I</b>	31	0.029	pg/L	0.01	<b>0.0037</b>	1613B
1,2,3,4,7,8-HxCDD	ND		31	0.048	pg/L	0.1	0.00	1613B
<b>1,2,3,4,7,8-HxCDF</b>	<b>0.48</b>	<b>J I B</b>	31	0.16	pg/L	0.1	<b>0.048</b>	1613B
1,2,3,4,7,8,9-HpCDF	ND		31	0.043	pg/L	0.01	0.00	1613B
<b>1,2,3,6,7,8-HxCDD</b>	<b>0.23</b>	<b>J I B</b>	31	0.046	pg/L	0.1	<b>0.023</b>	1613B
1,2,3,6,7,8-HxCDF	ND		31	0.15	pg/L	0.1	0.00	1613B
1,2,3,7,8-PeCDD	ND		31	0.075	pg/L	1	0.00	1613B
<b>1,2,3,7,8-PeCDF</b>	<b>0.56</b>	<b>J I B</b>	31	0.10	pg/L	0.03	<b>0.017</b>	1613B
<b>1,2,3,7,8,9-HxCDD</b>	<b>0.26</b>	<b>J I</b>	31	0.043	pg/L	0.1	<b>0.026</b>	1613B
<b>1,2,3,7,8,9-HxCDF</b>	<b>0.54</b>	<b>J I B</b>	31	0.18	pg/L	0.1	<b>0.054</b>	1613B
2,3,4,6,7,8-HxCDF	ND		31	0.14	pg/L	0.1	0.00	1613B
2,3,4,7,8-PeCDF	ND		31	0.083	pg/L	0.3	0.00	1613B
<b>2,3,7,8-TCDD</b>	<b>0.19</b>	<b>J I</b>	5.0	0.10	pg/L	1	<b>0.19</b>	1613B
2,3,7,8-TCDF	ND		6.2	0.051	pg/L	0.1	0.00	1613B
<b>OCDD</b>	<b>2.5</b>	<b>J I B</b>	140	0.075	pg/L	0.0003	<b>0.00075</b>	1613B
OCDF	ND		62	0.071	pg/L	0.0003	0.00	1613B

Analyte	Result	Qualifier	NONE	NONE	Unit	WHO 2005		Method
						TEF	TEQ	
Total Toxic Dioxins and Furans					pg/L		0.36	TEQ

**Client Sample ID: P968398-PH9398 1600847-tw3**

**Lab Sample ID: 410-67026-2**

Analyte	Result	Qualifier	RL	EDL	Unit	WHO 2005		Method
						TEF	TEQ	
<b>1,2,3,4,6,7,8-HpCDD</b>	<b>1.3</b>	<b>J I B</b>	26	0.060	pg/L	0.01	<b>0.013</b>	1613B
1,2,3,4,6,7,8-HpCDF	ND		26	0.025	pg/L	0.01	0.00	1613B
1,2,3,4,7,8-HxCDD	ND		26	0.042	pg/L	0.1	0.00	1613B
1,2,3,4,7,8-HxCDF	ND		26	0.026	pg/L	0.1	0.00	1613B
1,2,3,4,7,8,9-HpCDF	ND		26	0.036	pg/L	0.01	0.00	1613B
1,2,3,6,7,8-HxCDD	ND		26	0.038	pg/L	0.1	0.00	1613B
1,2,3,6,7,8-HxCDF	ND		26	0.027	pg/L	0.1	0.00	1613B
1,2,3,7,8-PeCDD	ND		26	0.092	pg/L	1	0.00	1613B
<b>1,2,3,7,8-PeCDF</b>	<b>0.51</b>	<b>J I B</b>	26	0.049	pg/L	0.03	<b>0.015</b>	1613B
1,2,3,7,8,9-HxCDD	ND		26	0.037	pg/L	0.1	0.00	1613B
1,2,3,7,8,9-HxCDF	ND		26	0.033	pg/L	0.1	0.00	1613B
2,3,4,6,7,8-HxCDF	ND		26	0.026	pg/L	0.1	0.00	1613B
2,3,4,7,8-PeCDF	ND		26	0.037	pg/L	0.3	0.00	1613B
<b>2,3,7,8-TCDD</b>	<b>0.13</b>	<b>J I</b>	4.1	0.078	pg/L	1	<b>0.13</b>	1613B
2,3,7,8-TCDF	ND		5.2	0.054	pg/L	0.1	0.00	1613B
OCDD	ND		110	0.060	pg/L	0.0003	0.00	1613B
<b>OCDF</b>	<b>0.087</b>	<b>J I B</b>	52	0.057	pg/L	0.0003	<b>0.000026</b>	1613B

**TEF Reference:**

WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners



# Toxicity Summary

Client: Eurofins Environment Testing Canada  
Project/Site: P968398-PH9398

Job ID: 410-67026-1

## Client Sample ID: P968398-PH9398 1600847-tw3 (Continued)

Lab Sample ID: 410-67026-2

Analyte	Result	Qualifier	NONE	NONE	Unit	WHO 2005		Method
						ND = 0		
						TEF	TEQ	
Total Toxic Dioxins and Furans					pg/L		0.16	TEQ

## Client Sample ID: P968398-PH9398 1600848-BH1

Lab Sample ID: 410-67026-3

Analyte	Result	Qualifier	RL	EDL	Unit	WHO 2005		Method
						ND = 0		
						TEF	TEQ	
1,2,3,4,6,7,8-HpCDD	1.9	J I B	32	0.31	pg/L	0.01	0.019	1613B
1,2,3,4,6,7,8-HpCDF	0.25	J I	32	0.034	pg/L	0.01	0.0025	1613B
1,2,3,4,7,8-HxCDD	0.66	J I	32	0.052	pg/L	0.1	0.066	1613B
1,2,3,4,7,8-HxCDF	ND		32	0.12	pg/L	0.1	0.00	1613B
1,2,3,4,7,8,9-HpCDF	ND		32	0.050	pg/L	0.01	0.00	1613B
1,2,3,6,7,8-HxCDD	ND		32	0.053	pg/L	0.1	0.00	1613B
1,2,3,6,7,8-HxCDF	0.41	J I B	32	0.12	pg/L	0.1	0.041	1613B
1,2,3,7,8-PeCDD	ND		32	0.087	pg/L	1	0.00	1613B
1,2,3,7,8-PeCDF	0.34	J I B	32	0.062	pg/L	0.03	0.010	1613B
1,2,3,7,8,9-HxCDD	ND		32	0.052	pg/L	0.1	0.00	1613B
1,2,3,7,8,9-HxCDF	0.42	J I B	32	0.13	pg/L	0.1	0.042	1613B
2,3,4,6,7,8-HxCDF	ND		32	0.12	pg/L	0.1	0.00	1613B
2,3,4,7,8-PeCDF	ND		32	0.050	pg/L	0.3	0.00	1613B
2,3,7,8-TCDD	ND		5.1	0.10	pg/L	1	0.00	1613B
2,3,7,8-TCDF	ND		6.4	0.070	pg/L	0.1	0.00	1613B
OCDD	14	J B	140	0.086	pg/L	0.0003	0.0042	1613B
OCDF	0.82	J I B	64	0.078	pg/L	0.0003	0.00025	1613B

Analyte	Result	Qualifier	NONE	NONE	Unit	WHO 2005		Method
						ND = 0		
						TEF	TEQ	
Total Toxic Dioxins and Furans					pg/L		0.18	TEQ

## Client Sample ID: P968398-PH9398 1600848-BH2

Lab Sample ID: 410-67026-4

Analyte	Result	Qualifier	RL	EDL	Unit	WHO 2005		Method
						ND = 0		
						TEF	TEQ	
1,2,3,4,6,7,8-HpCDD	1.8	J I B	26	0.21	pg/L	0.01	0.018	1613B
1,2,3,4,6,7,8-HpCDF	0.24	J I	26	0.028	pg/L	0.01	0.0024	1613B
1,2,3,4,7,8-HxCDD	ND		26	0.046	pg/L	0.1	0.00	1613B
1,2,3,4,7,8-HxCDF	ND		26	0.12	pg/L	0.1	0.00	1613B
1,2,3,4,7,8,9-HpCDF	ND		26	0.037	pg/L	0.01	0.00	1613B
1,2,3,6,7,8-HxCDD	ND		26	0.041	pg/L	0.1	0.00	1613B
1,2,3,6,7,8-HxCDF	0.27	J I B	26	0.12	pg/L	0.1	0.027	1613B
1,2,3,7,8-PeCDD	ND		26	0.11	pg/L	1	0.00	1613B
1,2,3,7,8-PeCDF	0.40	J I B	26	0.050	pg/L	0.03	0.012	1613B
1,2,3,7,8,9-HxCDD	0.38	J I	26	0.043	pg/L	0.1	0.038	1613B
1,2,3,7,8,9-HxCDF	0.54	J I B	26	0.14	pg/L	0.1	0.054	1613B
2,3,4,6,7,8-HxCDF	ND		26	0.11	pg/L	0.1	0.00	1613B

**TEF Reference:**

WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners

# Toxicity Summary

Client: Eurofins Environment Testing Canada  
 Project/Site: P968398-PH9398

Job ID: 410-67026-1

**Client Sample ID: P968398-PH9398 1600848-BH2 (Continued)**

**Lab Sample ID: 410-67026-4**

Analyte	Result	Qualifier	RL	EDL	Unit	WHO 2005		Method
						TEF	TEQ	
<b>2,3,4,7,8-PeCDF</b>	<b>0.37</b>	<b>J I B</b>	26	0.042	pg/L	0.3	<b>0.11</b>	1613B
2,3,7,8-TCDD	ND		4.2	0.086	pg/L	1	0.00	1613B
2,3,7,8-TCDF	ND		5.3	0.055	pg/L	0.1	0.00	1613B
<b>OCDD</b>	<b>1.4</b>	<b>J I B</b>	120	0.090	pg/L	0.0003	<b>0.00042</b>	1613B
OCDF	ND		53	0.082	pg/L	0.0003	0.00	1613B

Analyte	Result	Qualifier	NONE	NONE	Unit	WHO 2005		Method
						TEF	TEQ	
Total Toxic Dioxins and Furans					pg/L		0.26	TEQ

**TEF Reference:**

WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners



# QC Sample Results

Client: Eurofins Environment Testing Canada  
 Project/Site: P968398-PH9398

Job ID: 410-67026-1

## Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)

**Lab Sample ID: MB 410-206460/1-A**  
**Matrix: Water**  
**Analysis Batch: 206661**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 206460**

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	2.21	J I	25	0.29	pg/L		12/16/21 15:00	12/17/21 14:11	1
1,2,3,4,6,7,8-HpCDF	ND		25	0.028	pg/L		12/16/21 15:00	12/17/21 14:11	1
1,2,3,4,7,8-HxCDD	ND		25	0.047	pg/L		12/16/21 15:00	12/17/21 14:11	1
1,2,3,4,7,8-HxCDF	0.713	J I	25	0.071	pg/L		12/16/21 15:00	12/17/21 14:11	1
1,2,3,4,7,8,9-HpCDF	0.526	J	25	0.040	pg/L		12/16/21 15:00	12/17/21 14:11	1
1,2,3,6,7,8-HxCDD	0.388	J I	25	0.044	pg/L		12/16/21 15:00	12/17/21 14:11	1
1,2,3,6,7,8-HxCDF	0.267	J I	25	0.073	pg/L		12/16/21 15:00	12/17/21 14:11	1
1,2,3,7,8-PeCDD	0.495	J I	25	0.076	pg/L		12/16/21 15:00	12/17/21 14:11	1
1,2,3,7,8-PeCDF	0.763	J I	25	0.071	pg/L		12/16/21 15:00	12/17/21 14:11	1
1,2,3,7,8,9-HxCDD	ND		25	0.049	pg/L		12/16/21 15:00	12/17/21 14:11	1
1,2,3,7,8,9-HxCDF	0.907	J	25	0.090	pg/L		12/16/21 15:00	12/17/21 14:11	1
2,3,4,6,7,8-HxCDF	0.647	J I	25	0.079	pg/L		12/16/21 15:00	12/17/21 14:11	1
2,3,4,7,8-PeCDF	0.426	J I	25	0.065	pg/L		12/16/21 15:00	12/17/21 14:11	1
2,3,7,8-TCDD	ND		4.0	0.13	pg/L		12/16/21 15:00	12/17/21 14:11	1
2,3,7,8-TCDF	0.138	J I	5.0	0.059	pg/L		12/16/21 15:00	12/17/21 14:11	1
OCDD	1.54	J I	110	0.076	pg/L		12/16/21 15:00	12/17/21 14:11	1
OCDF	0.984	J I	50	0.063	pg/L		12/16/21 15:00	12/17/21 14:11	1
Total HpCDD	2.21	J I	25	0.29	pg/L		12/16/21 15:00	12/17/21 14:11	1
Total HpCDF	0.526	J	25	0.034	pg/L		12/16/21 15:00	12/17/21 14:11	1
Total HxCDD	1.35	J I	25	0.047	pg/L		12/16/21 15:00	12/17/21 14:11	1
Total HxCDF	2.91	J I	25	0.078	pg/L		12/16/21 15:00	12/17/21 14:11	1
Total PeCDD	0.495	J I	25	0.076	pg/L		12/16/21 15:00	12/17/21 14:11	1
Total PeCDF	1.60	J I	25	0.068	pg/L		12/16/21 15:00	12/17/21 14:11	1
Total TCDD	0.923	J I	5.0	0.13	pg/L		12/16/21 15:00	12/17/21 14:11	1
Total TCDF	0.733	J I	5.0	0.059	pg/L		12/16/21 15:00	12/17/21 14:11	1
Total PCDD	6.52	I	5.0	0.12	pg/L		12/16/21 15:00	12/17/21 14:11	1
Total PCDF	6.75	I	5.0	0.060	pg/L		12/16/21 15:00	12/17/21 14:11	1
Total PCDD/PCDF	ND		5.0	0.092	pg/L		12/16/21 15:00	12/17/21 14:11	1

Isotope Dilution	%Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	62		23 - 140	12/16/21 15:00	12/17/21 14:11	1
13C-1,2,3,4,6,7,8-HpCDF	66		28 - 143	12/16/21 15:00	12/17/21 14:11	1
13C-1,2,3,4,7,8-HxCDD	65		32 - 141	12/16/21 15:00	12/17/21 14:11	1
13C-1,2,3,4,7,8-HxCDF	67		26 - 152	12/16/21 15:00	12/17/21 14:11	1
13C-1,2,3,4,7,8,9-HpCDF	59		26 - 138	12/16/21 15:00	12/17/21 14:11	1
13C-1,2,3,6,7,8-HxCDD	68		28 - 130	12/16/21 15:00	12/17/21 14:11	1
13C-1,2,3,6,7,8-HxCDF	70		26 - 123	12/16/21 15:00	12/17/21 14:11	1
13C-1,2,3,7,8-PeCDD	53		25 - 181	12/16/21 15:00	12/17/21 14:11	1
13C-1,2,3,7,8-PeCDF	62		24 - 185	12/16/21 15:00	12/17/21 14:11	1
13C-1,2,3,7,8,9-HxCDD	59		28 - 130	12/16/21 15:00	12/17/21 14:11	1
13C-1,2,3,7,8,9-HxCDF	57		29 - 147	12/16/21 15:00	12/17/21 14:11	1
13C-2,3,4,6,7,8-HxCDF	56		28 - 136	12/16/21 15:00	12/17/21 14:11	1
13C-2,3,4,7,8-PeCDF	54		21 - 178	12/16/21 15:00	12/17/21 14:11	1
13C-2,3,7,8-TCDD	56		25 - 164	12/16/21 15:00	12/17/21 14:11	1
13C-2,3,7,8-TCDF	55		24 - 169	12/16/21 15:00	12/17/21 14:11	1
13C-OCDD	67		17 - 157	12/16/21 15:00	12/17/21 14:11	1
13C-OCDF	60		17 - 157	12/16/21 15:00	12/17/21 14:11	1

# QC Sample Results

Client: Eurofins Environment Testing Canada  
 Project/Site: P968398-PH9398

Job ID: 410-67026-1

## Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters) (Continued)

Lab Sample ID: LCS 410-206460/2-A

Matrix: Water

Analysis Batch: 206661

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 206460

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	1000	987		pg/L		99	70 - 140
1,2,3,4,6,7,8-HpCDF	1000	951		pg/L		95	82 - 122
1,2,3,4,7,8-HxCDD	1000	1000		pg/L		100	70 - 164
1,2,3,4,7,8-HxCDF	1000	944		pg/L		94	72 - 134
1,2,3,4,7,8,9-HpCDF	1000	989		pg/L		99	78 - 138
1,2,3,6,7,8-HxCDD	1000	955		pg/L		96	76 - 134
1,2,3,6,7,8-HxCDF	1000	954		pg/L		95	84 - 130
1,2,3,7,8-PeCDD	1000	1080		pg/L		108	70 - 142
1,2,3,7,8-PeCDF	1000	1050		pg/L		105	80 - 134
1,2,3,7,8,9-HxCDD	1000	963		pg/L		96	64 - 162
1,2,3,7,8,9-HxCDF	1000	975		pg/L		97	78 - 130
2,3,4,6,7,8-HxCDF	1000	956		pg/L		96	70 - 156
2,3,4,7,8-PeCDF	1000	1030		pg/L		103	68 - 160
2,3,7,8-TCDD	200	176		pg/L		88	67 - 158
2,3,7,8-TCDF	200	203		pg/L		101	75 - 158
OCDD	2000	1950		pg/L		98	78 - 144
OCDF	2000	1990		pg/L		99	63 - 170

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
13C-1,2,3,4,6,7,8-HpCDD	70		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	69		21 - 158
13C-1,2,3,4,7,8-HxCDD	69		21 - 193
13C-1,2,3,4,7,8-HxCDF	78		19 - 202
13C-1,2,3,4,7,8,9-HpCDF	63		20 - 186
13C-1,2,3,6,7,8-HxCDD	73		25 - 163
13C-1,2,3,6,7,8-HxCDF	81		21 - 159
13C-1,2,3,7,8-PeCDD	64		21 - 227
13C-1,2,3,7,8-PeCDF	83		21 - 192
13C-1,2,3,7,8,9-HxCDD	73		25 - 163
13C-1,2,3,7,8,9-HxCDF	67		17 - 205
13C-2,3,4,6,7,8-HxCDF	74		22 - 176
13C-2,3,4,7,8-PeCDF	71		13 - 328
13C-2,3,7,8-TCDD	71		20 - 175
13C-2,3,7,8-TCDF	72		22 - 152
13C-OCDD	76		13 - 199
13C-OCDF	67		13 - 199

# QC Association Summary

Client: Eurofins Environment Testing Canada  
Project/Site: P968398-PH9398

Job ID: 410-67026-1

## Specialty Organics

### Prep Batch: 206460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67026-1	P968398-PH9398 1600846-tw2	Total/NA	Water	1613B	
410-67026-2	P968398-PH9398 1600847-tw3	Total/NA	Water	1613B	
410-67026-3	P968398-PH9398 1600848-BH1	Total/NA	Water	1613B	
410-67026-4	P968398-PH9398 1600848-BH2	Total/NA	Water	1613B	
MB 410-206460/1-A	Method Blank	Total/NA	Water	1613B	
LCS 410-206460/2-A	Lab Control Sample	Total/NA	Water	1613B	

### Analysis Batch: 206661

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67026-1	P968398-PH9398 1600846-tw2	Total/NA	Water	1613B	206460
410-67026-2	P968398-PH9398 1600847-tw3	Total/NA	Water	1613B	206460
410-67026-3	P968398-PH9398 1600848-BH1	Total/NA	Water	1613B	206460
410-67026-4	P968398-PH9398 1600848-BH2	Total/NA	Water	1613B	206460
MB 410-206460/1-A	Method Blank	Total/NA	Water	1613B	206460
LCS 410-206460/2-A	Lab Control Sample	Total/NA	Water	1613B	206460



# Lab Chronicle

Client: Eurofins Environment Testing Canada  
 Project/Site: P968398-PH9398

Job ID: 410-67026-1

**Client Sample ID: P968398-PH9398 1600846-tw2**

**Lab Sample ID: 410-67026-1**

Date Collected: 12/08/21 00:00

Matrix: Water

Date Received: 12/15/21 09:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			206460	12/16/21 15:00	CPV9	ELLE
Total/NA	Analysis	1613B		1	206661	12/17/21 14:59	UA2A	ELLE

**Client Sample ID: P968398-PH9398 1600847-tw3**

**Lab Sample ID: 410-67026-2**

Date Collected: 12/08/21 00:00

Matrix: Water

Date Received: 12/15/21 09:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			206460	12/16/21 15:00	CPV9	ELLE
Total/NA	Analysis	1613B		1	206661	12/17/21 15:51	UA2A	ELLE

**Client Sample ID: P968398-PH9398 1600848-BH1**

**Lab Sample ID: 410-67026-3**

Date Collected: 12/08/21 00:00

Matrix: Water

Date Received: 12/15/21 09:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			206460	12/16/21 15:00	CPV9	ELLE
Total/NA	Analysis	1613B		1	206661	12/17/21 16:40	UA2A	ELLE

**Client Sample ID: P968398-PH9398 1600848-BH2**

**Lab Sample ID: 410-67026-4**

Date Collected: 12/08/21 00:00

Matrix: Water

Date Received: 12/15/21 09:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			206460	12/16/21 15:00	CPV9	ELLE
Total/NA	Analysis	1613B		1	206661	12/17/21 17:29	UA2A	ELLE

**Laboratory References:**

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

# Isotope Dilution Summary

Client: Eurofins Environment Testing Canada  
Project/Site: P968398-PH9398

Job ID: 410-67026-1

## Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		HpCDD (23-140)	HpCDF (28-143)	HxCDD (32-141)	HxCDF (26-152)	HpCDF2 (26-138)	HxDD (28-130)	HxDF (26-123)	PeCDD (25-181)
410-67026-1	P968398-PH9398 1600846-tw2	68	64	70	71	57	71	72	59
410-67026-2	P968398-PH9398 1600847-tw3	68	67	70	68	61	74	72	60
410-67026-3	P968398-PH9398 1600848-BH1	58	56	60	60	51	64	61	51
410-67026-4	P968398-PH9398 1600848-BH2	52	50	54	54	48	57	54	45
MB 410-206460/1-A	Method Blank	62	66	65	67	59	68	70	53

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		PeCDF (24-185)	13CHxCD (28-130)	HxCF (29-147)	13CHxCF (28-136)	PeCF (21-178)	TCDD (25-164)	TCDF (24-169)	OCDD (17-157)
410-67026-1	P968398-PH9398 1600846-tw2	64	71	63	68	63	67	64	69
410-67026-2	P968398-PH9398 1600847-tw3	62	70	63	68	62	64	59	75
410-67026-3	P968398-PH9398 1600848-BH1	53	61	55	59	54	54	52	59
410-67026-4	P968398-PH9398 1600848-BH2	52	53	49	51	49	50	51	60
MB 410-206460/1-A	Method Blank	62	59	57	56	54	56	55	67

Lab Sample ID	Client Sample ID	OCDF (17-157)
		410-67026-1
410-67026-2	P968398-PH9398 1600847-tw3	64
410-67026-3	P968398-PH9398 1600848-BH1	52
410-67026-4	P968398-PH9398 1600848-BH2	52
MB 410-206460/1-A	Method Blank	60

### Surrogate Legend

- HpCDD = 13C-1,2,3,4,6,7,8-HpCDD
- HpCDF = 13C-1,2,3,4,6,7,8-HpCDF
- HxCDD = 13C-1,2,3,4,7,8-HxCDD
- HxCDF = 13C-1,2,3,4,7,8-HxCDF
- HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF
- HxDD = 13C-1,2,3,6,7,8-HxCDD
- HxDF = 13C-1,2,3,6,7,8-HxCDF
- PeCDD = 13C-1,2,3,7,8-PeCDD
- PeCDF = 13C-1,2,3,7,8-PeCDF
- 13CHxCD = 13C-1,2,3,7,8,9-HxCDD
- HxCF = 13C-1,2,3,7,8,9-HxCDF
- 13CHxCF = 13C-2,3,4,6,7,8-HxCDF
- PeCF = 13C-2,3,4,7,8-PeCDF
- TCDD = 13C-2,3,7,8-TCDD
- TCDF = 13C-2,3,7,8-TCDF
- OCDD = 13C-OCDD
- OCDF = 13C-OCDF

## Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		HpCDD (26-166)	HpCDF (21-158)	HxCDD (21-193)	HxCDF (19-202)	HpCDF2 (20-186)	HxDD (25-163)	HxDF (21-159)	PeCDD (21-227)
LCS 410-206460/2-A	Lab Control Sample	70	69	69	78	63	73	81	64

# Isotope Dilution Summary

Client: Eurofins Environment Testing Canada  
 Project/Site: P968398-PH9398

Job ID: 410-67026-1

## Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters) (Continued)

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PeCDF (21-192)	<sup>13</sup> CHxCD (25-163)	HxCF (17-205)	<sup>13</sup> CHxCF (22-176)	PeCF (13-328)	TCDD (20-175)	TCDF (22-152)	OCDD (13-199)
LCS 410-206460/2-A	Lab Control Sample	83	73	67	74	71	71	72	76

		OCDF (13-199)
LCS 410-206460/2-A	Lab Control Sample	67

### Surrogate Legend

- HpCDD = 13C-1,2,3,4,6,7,8-HpCDD
- HpCDF = 13C-1,2,3,4,6,7,8-HpCDF
- HxCDD = 13C-1,2,3,4,7,8-HxCDD
- HxCDF = 13C-1,2,3,4,7,8-HxCDF
- HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF
- HxDD = 13C-1,2,3,6,7,8-HxCDD
- HxDF = 13C-1,2,3,6,7,8-HxCDF
- PeCDD = 13C-1,2,3,7,8-PeCDD
- PeCDF = 13C-1,2,3,7,8-PeCDF
- <sup>13</sup>CHxCD = 13C-1,2,3,7,8,9-HxCDD
- HxCF = 13C-1,2,3,7,8,9-HxCDF
- <sup>13</sup>CHxCF = 13C-2,3,4,6,7,8-HxCDF
- PeCF = 13C-2,3,4,7,8-PeCDF
- TCDD = 13C-2,3,7,8-TCDD
- TCDF = 13C-2,3,7,8-TCDF
- OCDD = 13C-OCDD
- OCDF = 13C-OCDF



# Accreditation/Certification Summary

Client: Eurofins Environment Testing Canada  
 Project/Site: P968398-PH9398

Job ID: 410-67026-1

## Laboratory: Eurofins Lancaster Laboratories Env, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	1.01	11-30-22
A2LA	ISO/IEC 17025	0001.01	11-30-22
Alaska	State	PA00009	06-30-22
Alaska (UST)	State	17-027	02-28-22
Arizona	State	AZ0780	03-12-22
Arkansas DEQ	State	88-0660	08-10-22
California	State	2792	02-02-22
Colorado	State	PA00009	06-30-22
Connecticut	State	PH-0746	06-30-23
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-22
Delaware (DW)	State	N/A	02-01-22
Florida	NELAP	E87997	06-30-22
Georgia (DW)	State	C048	01-31-22
Hawaii	State	N/A	01-31-22
Illinois	NELAP	200027	01-31-23
Iowa	State	361	03-02-22
Kansas	NELAP	E-10151	10-31-22
Kentucky (DW)	State	KY90088	01-01-22
Kentucky (UST)	State	1.01	11-30-22
Kentucky (WW)	State	KY90088	12-31-21
Louisiana	NELAP	02055	06-30-22
Maine	State	2019012	03-12-22
Maryland	State	100	06-30-22
Massachusetts	State	M-PA009	06-30-22
Michigan	State	9930	01-31-22
Minnesota	NELAP	042-999-487	12-31-22
Missouri	State	450	01-31-25
Montana (DW)	State	0098	01-01-22
Nebraska	State	NE-OS-32-17	01-31-22
New Hampshire	NELAP	2730	01-10-22
New Jersey	NELAP	PA011	06-30-22
New York	NELAP	10670	04-01-22
North Carolina (DW)	State	42705	07-31-22
North Carolina (WW/SW)	State	521	12-31-21
North Dakota	State	R-205	01-31-22
Oklahoma	NELAP	R-205	08-31-22
Oregon	NELAP	PA200001	09-11-22
PALA	Canada	1978	09-16-24
Pennsylvania	NELAP	36-00037	01-31-22
Rhode Island	State	LAO00338	01-31-22
South Carolina	State	89002002	01-31-22
Tennessee	State	02838	01-31-22
Texas	NELAP	T104704194-21-40	08-31-22
Utah	NELAP	PA000092019-16	03-01-22
Vermont	State	VT - 36037	10-28-22
Virginia	NELAP	460182	06-14-22
Washington	State	C457	04-12-22
West Virginia (DW)	State	9906 C	12-31-21
West Virginia DEP	State	055	12-31-21
Wyoming	State	8TMS-L	01-31-22

# Accreditation/Certification Summary

Client: Eurofins Environment Testing Canada  
Project/Site: P968398-PH9398

Job ID: 410-67026-1

## Laboratory: Eurofins Lancaster Laboratories Env, LLC (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wyoming (UST)	A2LA	1.01	11-30-22

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12



410-67026 Chain of Custody

CLIENT INFORMATION				INVOICE INFORMATION (SAME AS CLIENT)							
Company: Eurofins Ottawa		Company:		Company:		Fax: 410-67026 Chain of Custody					
Contact:		Contact:		Contact:		Email: #1:					
Address:		Address:		Address:		Email: #2:					
Telephone:		Cell:		Telephone:		PO #:					
Email: #1:		Email: #2:		<b>REGULATION/GUIDELINE REQUIRED</b> <input type="checkbox"/> Sanitary Sewer, City: _____ <input type="checkbox"/> Storm Sewer, City: _____ <input type="checkbox"/> ODWSOG (Use DW CoC if analyzing drinking water) <input type="checkbox"/> PWQO <input type="checkbox"/> O.Reg 347 <input type="checkbox"/> Other: _____							
Project: 1968398 - PH4398		Quote #:									
TURN-AROUND TIME (Business Days)				<input type="checkbox"/> O. Reg 153 The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04. Analysis of full parameter list only Yes <input type="checkbox"/> No <input type="checkbox"/>							
<input type="checkbox"/> 1 Day* (100%) <input type="checkbox"/> 2 Day** (50%) <input type="checkbox"/> 3-5 Days (25%) <input type="checkbox"/> 5-7 Days (Standard)				<input type="checkbox"/> O. Reg 406 Excess Soils Table # _____ Full depth/Strat/Ceiling/mSPL Leachate Type: Com-Ind / Res-Park / Agri / All Other Category: Surface / Subsurface							
Please contact Lab in advance to determine rush availability. *For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%. **For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.											
The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. <b>Note that this COC is not to be used for drinking water samples.</b> The COC must be complete upon submission of the samples, there will be a \$25 surcharge if required information is missing (required fields are shaded in grey).				<b>Sample Details</b> Field Filtered →							
Sample ID	Date/Time Collected	Sample Matrix	# of Containers	O.Reg.153 parameters						RN# (Lab Use Only)	
				PHC FI - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganic	Metals only	
1600846 - TW2	08/12/2021	W	2								
1600847 - TW3											
1600848 - KH1											
1600849 - BH2											
PRINT				SIGN				DATE/TIME		TEMP (°C)	
Sampled By: Renato Secades		[Signature]		13/12/2021		10°		COMMENTS:  CUSTODY SEAL: <input type="checkbox"/> YES <input type="checkbox"/> NO Ice packs submit <input type="checkbox"/> Yes <input type="checkbox"/> No			
Relinquished By: Leah Foreman		[Signature]		12/15/21 0937							



## Login Sample Receipt Checklist

Client: Eurofins Environment Testing Canada

Job Number: 410-67026-1

**Login Number: 67026**

**List Source: Eurofins Lancaster Laboratories Env, LLC**

**List Number: 1**

**Creator: Dawodu, Habibah**

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	No ice present, no attempt to chill
Cooler Temperature is acceptable (<math>\leq 6^{\circ}\text{C}</math>, not frozen).	False	Refer to Job Narrative for details.
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (<math>\leq 6^{\circ}\text{C}</math>, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	False	No time on COC or sample containers.
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	

## Definitions/Glossary

Client: Eurofins Environment Testing Canada  
Project/Site: P968398-PH9398

Job ID: 410-67026-1

### Qualifiers

#### Dioxin

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

## Appendix 4

- **Pumping Test Field Data Sheets**
- **Aquifer Analysis Data For Test Wells**
- **Determination of Potential Well Interference**
- **Predictive Impact Assessment for Nitrates**
- **Langlier and Ryzner Index Calculations**

PUMP TEST AND DRAWDOWN / RECOVERY MEASUREMENT DATA										
Date:		July 9 <sup>th</sup>			Test Well No:		Tw 1			
Client:		Central Developments			Field Supervisor:		Ago			
Project No.:		P2723			Page:		1 of 2			
Water Level Data				Discharge Data			Logger Data			
Static Level:		11.17m		Pump Rate:		25g/min		Logger Serial No.:		33092
Stick-up:		0.49m		Depth of Pump:		70ft		Logger Depth:		15m
Drawdown Data			Field Measurements					Comments		
Clock Time	Time (Min.)	Drawdown (m)	Turbidity (NTU)	Temp (°C)	pH	Conductivity (us)	TDS (mg/L)			
8:05a	0	11.17								
	1	11.26								
	2	11.29								
	3	11.33								
	4	11.35								
	5	11.36								
	6	11.38								
	7	11.39								
	8	11.40								
	9	11.41								
8:15	10	11.42						• Tested for Chloride & no Chloride was present on the well		
8:20	15	11.49								
8:25	20	11.52								
8:30	25	11.53								
8:35	30	11.58								
8:45	40	11.58								
8:55	50	11.58								
9:05	60	11.58								
9:20	75	11.58								
9:35	90	11.58								
9:50	105	11.58								
10:05	120	11.58								
10:20	135	11.62								
10:35	150	11.62								
11:05	180	11.64	0.62	9.4°C	8.15	803	549			
11:35	210	11.64		8.6°C	8.08	817	542			
12:05	240	11.65	0.51	8.6°C	8.08	817	542			
12:35	270	11.65								
13:05	300	11.66	0.51	10.3°C	8.07	812	574			
13:35	330	11.68								
14:05	360	11.70	0.47	10.5°C	7.98	818	522			

8:35  
8:45  
8:55  
9:05  
9:20  
9:35  
9:50  
10:05  
10:20  
10:35  
11:05  
11:35  
12:05  
12:35  
13:05  
13:35  
14:05

TW 3 Static = 6.48m  
TW 2 Static = 9.60m

TW 3 Static = 6.48m  
TW 2 Static = 9.40m

*Recovery*

PUMP TEST AND DRAWDOWN / RECOVERY MEASUREMENT DATA								
Date:		July 9, 2015		Test Well No:		TW1		
Client:		PH1723		Field Supervisor:				
Project No.:		PH1723 Concrete dev.		Page:		2 of 2		
Water Level Data			Discharge Data			Logger Data		
Static Level:				Pump Rate:		Logger Serial No.:		
Stick-up:				Depth of Pump:		Logger Depth:		
Drawdown Data			Field Measurements					Comments
Clock Time	Time (Min.)	Drawdown (m)	Turbidity (NTU)	Temp (°C)	pH	Conductivity (us)	TDS (mg/L)	
	0	11:20						
	1	11:56						
	2							
	3							
	4							
	5	11:40						
	6							
	7							
	8	11:42						
	9	H						
	10	11:40						
	15	11:34						
	20	11:29						
	25							
	30							
	40							
	50							
	60							
	75							
	90							
	120							
	150							
	180							
	210							
	240							
	270							
	300							
	330							
	360							

0.53 DA  
0.41 Rec.



well tag A127029

PUMP TEST AND DRAWDOWN / RECOVERY MEASUREMENT DATA										
Date:		13 July, 2015			Test Well No:		TW2			
Client:		Caulgate Dev.			Field Supervisor:		Ago			
Project No.:		P14			Page:		1 of 2			
Water Level Data			Discharge Data			Logger Data				
Static Level:		9.23			Pump Rate:		25 gpm		Logger Serial No.:	SN 51744
Stick-up:		0.53			Depth of Pump:				Logger Depth:	
Drawdown Data			Field Measurements					Comments		
Clock Time	Time (Min.)	Drawdown (m)	Turbidity (NTU)	Temp (°C)	pH	Conductivity (us)	TDS (mg/L)			
7:57	0	9.23								
	1	9.28								
	2	9.34								
	3	9.35								
	4	9.38								
	5	9.40								
	6	9.45								
	7	9.46								
	8	9.47								
	9	9.48						Tested for Chloride, no Chloride was present in the well.		
8:07	10	9.49								
8:12	15	9.52								
8:17	20	9.55								
8:22	25	9.58								
8:27	30	9.58								
8:37	40	9.60								
8:47	50	9.62								
8:57	60	9.64								
9:12	75	9.64								
9:27	90	9.64								
9:57	120	9.64						TW <sub>1</sub> Static = 9.64		
10:27	150	9.64	0.54	8.2	8.15	677	429	TW <sub>3</sub> Static = 6.46		
10:57	180	9.64								
11:27	210	9.64	0.76	8.5°C	8.09	716	426			
11:57	240	9.66								
12:27	270	9.66	0.52	9.2°C	7.98	752	501	TW <sub>1</sub> Static = 11.63		
12:57	300	9.70						TW <sub>3</sub> Static = 6.46		
1:27	330	9.65	0.52	8.1°C	8.02	703	510			
1:57	360	9.67								

PUMP TEST AND DRAWDOWN / RECOVERY MEASUREMENT DATA									
Date:		July 13, 2015		Test Well No:		Tw 2			
Client:		Carl Date dev.		Field Supervisor:		Ago			
Project No.:		- P147723		Page:		2 of 2			
Water Level Data			Discharge Data			Logger Data			
Static Level:		9.23		Pump Rate:		25 GPM		Logger Serial No.:	
Stick-up:		0.53		Depth of Pump:				Logger Depth:	15m
Drawdown Data			Field Measurements					Comments	
Clock Time	Time (Min.)	Drawdown (m)	Turbidity (NTU)	Temp (°C)	pH	Conductivity (us)	TDS (mg/L)		
	0	9.67							
	1	9.63							
	2	9.58							
	3	9.54							
	4	9.51							
	5	9.49							
	6	9.46							
	7	9.43							
	8	9.42							
	9								
	10	9.40							
	15	9.36							
	20	9.30							
	25								
	30								
	40								
	50								
	60								
	75								
	90								
	120								
	150								
	180								
	210								
	240								
	270								
	300								
	330								
	360								

well log

A187040  
A187039

## PUMP TEST AND DRAWDOWN / RECOVERY MEASUREMENT DATA

Date:	10 July 2015	Test Well No:	TW3		
Client:	Colonnade Develop	Field Supervisor:	Ayo		
Project No.:	PH2723	Page:	1 of 2		
Water Level Data		Discharge Data		Logger Data	
Static Level:	6.07	Pump Rate:	250 LPM	Logger Serial No.:	15M S1040
Stick-up:	0.40	Depth of Pump:	67 ft 18.24m	Logger Depth:	15m

Drawdown Data			Field Measurements					Comments
Clock Time	Time (Min.)	Drawdown (m)	Turbidity (NTU)	Temp (°C)	pH	Conductivity (µs)	TDS (mg/L)	
8:55	0	6.07						
	1							
	2							
	3	6.40						
	4	6.44						
	5	6.46						
	6	6.47						
	7	6.50						
	8	6.51						
	9	6.52						
9:05	10	6.54						* Tested for Chloride, no Chloride was present in the well.
9:10	15	6.59						
9:15	20	6.54						
9:20	25	6.5458						
9:25	30	6.59						
9:35	40	6.72						
9:45	50	6.74						
9:55	60	6.76						
10:10	75	6.81						
10:25	90	6.81						
10:35	120	6.82						TW <sub>1</sub> Static = 11.69m
11:25	150	6.8322	0.90	8.5°C	8.05	905	618	TW <sub>2</sub> Static = 9.00m
11:55	180	6.82						
12:25	210	6.83	0.65	9.1°C	7.98	872	642	
12:55	240	6.83						
1:25	270	6.83	0.44	9.2°C	8.08	870	580	TW <sub>1</sub> Static = 11.64 TW <sub>2</sub> Static = 9.67
1:55	300	6.82						
2:25	330	6.84	0.51	8.8°C	7.90	897	610	
2:55	360	6.83						

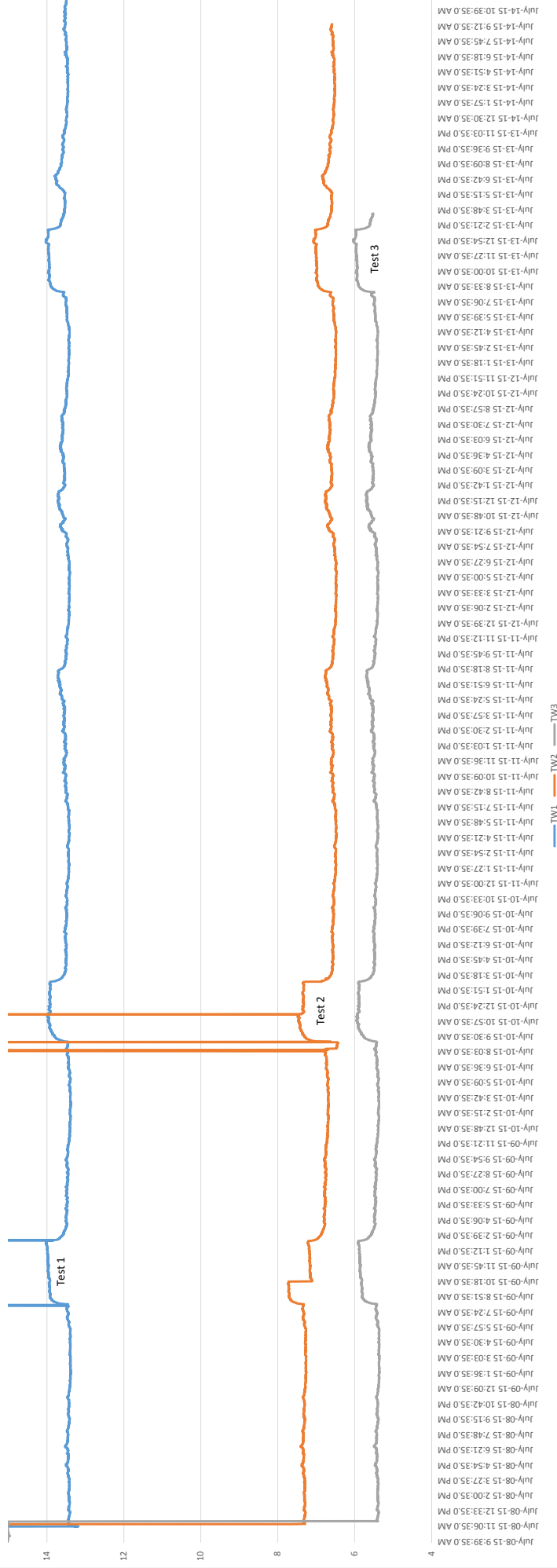
$$\frac{12.58}{152} = \frac{0}{20}$$

$$\frac{10.9}{1.5} = \frac{7.27}{1}$$

*Recovery*

PUMP TEST AND DRAWDOWN / RECOVERY MEASUREMENT DATA									
Date:		July 10, 2015		Test Well No:		TW3			
Client:		Carleton Place		Field Supervisor:		Asst. Dir.			
Project No.:		PH2723		Page:		2 of 2			
Water Level Data			Discharge Data			Logger Data			
Static Level:		0.2607		Pump Rate:		N/A		Logger Serial No.:	
Stick-up:		0.40		Depth of Pump:		18.24m		Logger Depth:	1.5m
Drawdown Data			Field Measurements					Comments	
Clock Time	Time (Min.)	Drawdown (m)	Turbidity (NTU)	Temp (°C)	pH	Conductivity (us)	TDS (mg/L)		
	0	6.84							
	1	6.40							
	2	6.35							
	3	6.35							
	4	6.35							
	5	6.34							
	6	6.33							
	7								
	8	6.29							
	9	6.28							
	10	6.27							
	15	6.22							
	20	6.18							
	25								
	30								
	40								
	50								
	60								
	75								
	90								
	120								
	150								
	180								
	210								
	240								
	270								
	300								
	330								
	360								

Carlgate Appleton Pumping Test Hydrographs  
9 to 13, July, 2015



**Paterson Group  
Consulting Engineers  
154 Colonnade Road South  
Ottawa - Ontario - K2E 7J5**

**Site Plan**

Project: CARLGATE

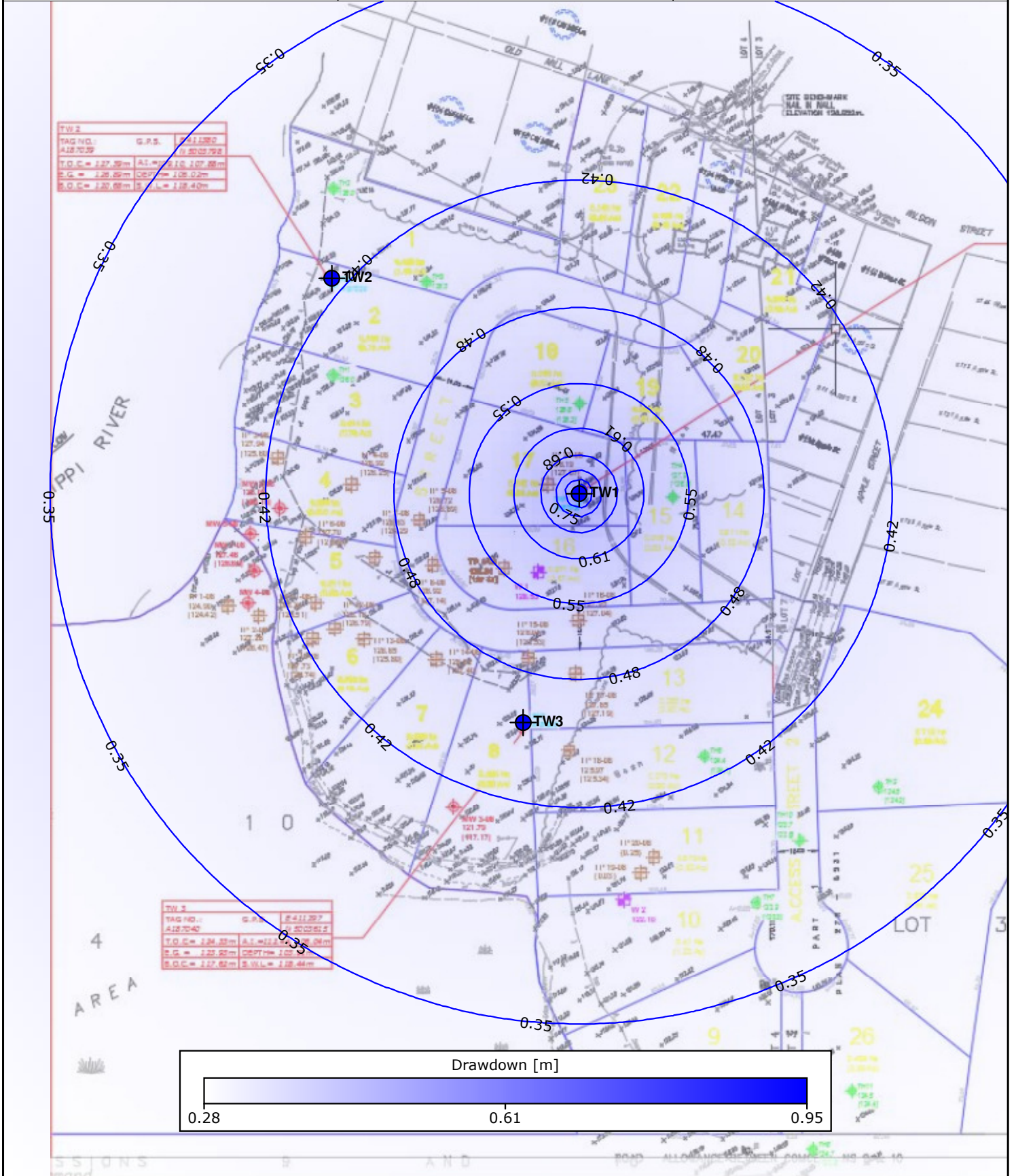
Number: PH2723

Client: John Southwell

Location: Appleton ON

Scale 1:2200

Map Origin [m] X: -20 Y: 0



Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 1

Pumping Well: TW1

Test Conducted by: AO

Test Date: 09/07/2015

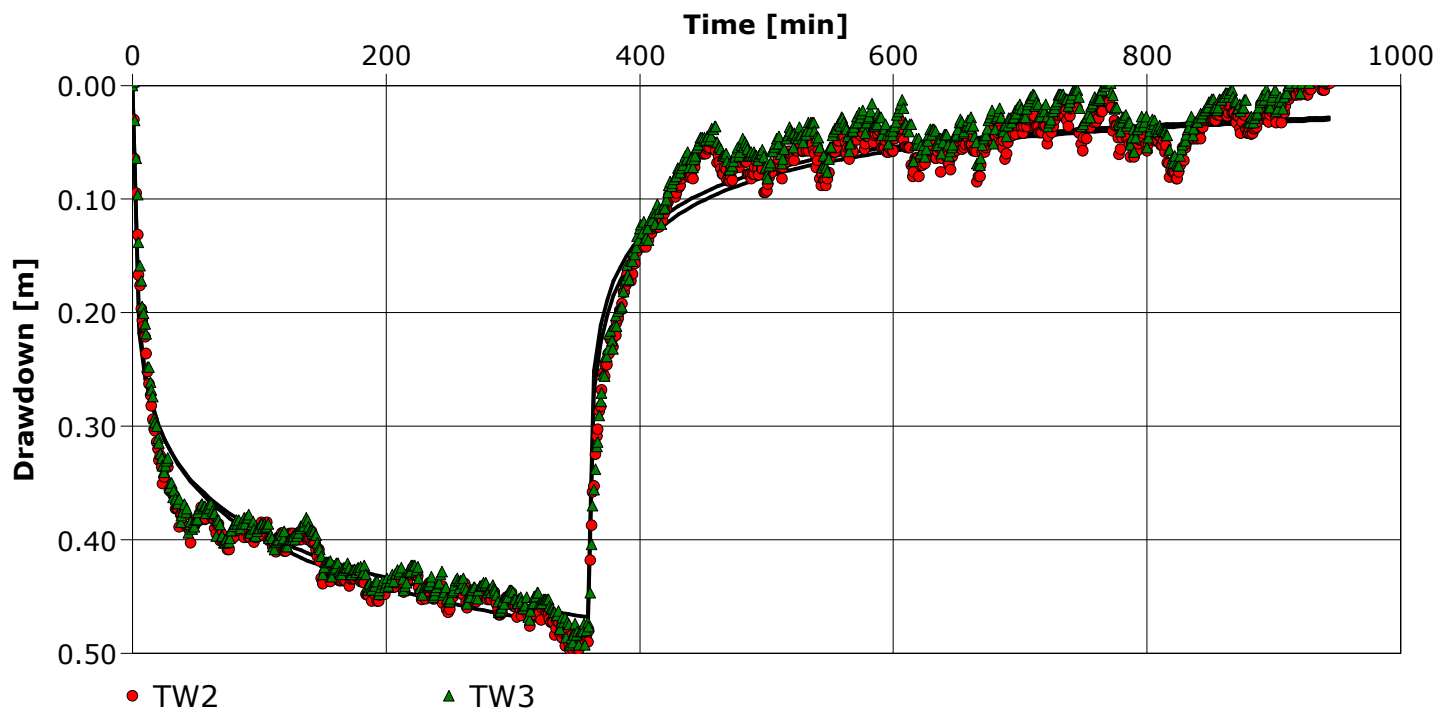
Analysis Performed by:

Theis

Analysis Date: 30/10/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]



Calculation using Theis

Observation Well	Transmissivity [m <sup>2</sup> /d]	Hydraulic Conductivity [m/d]	Storage coefficient	Radial Distance to PW [m]	
TW2	$2.05 \times 10^2$	$1.71 \times 10^1$	$3.05 \times 10^{-6}$	140.36	
TW3	$2.20 \times 10^2$	$1.83 \times 10^1$	$4.39 \times 10^{-6}$	100.9	
Average	$2.12 \times 10^2$	$1.77 \times 10^1$	$3.72 \times 10^{-6}$		

Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 1

Pumping Well: TW1

Test Conducted by: AO

Test Date: 09/07/2015

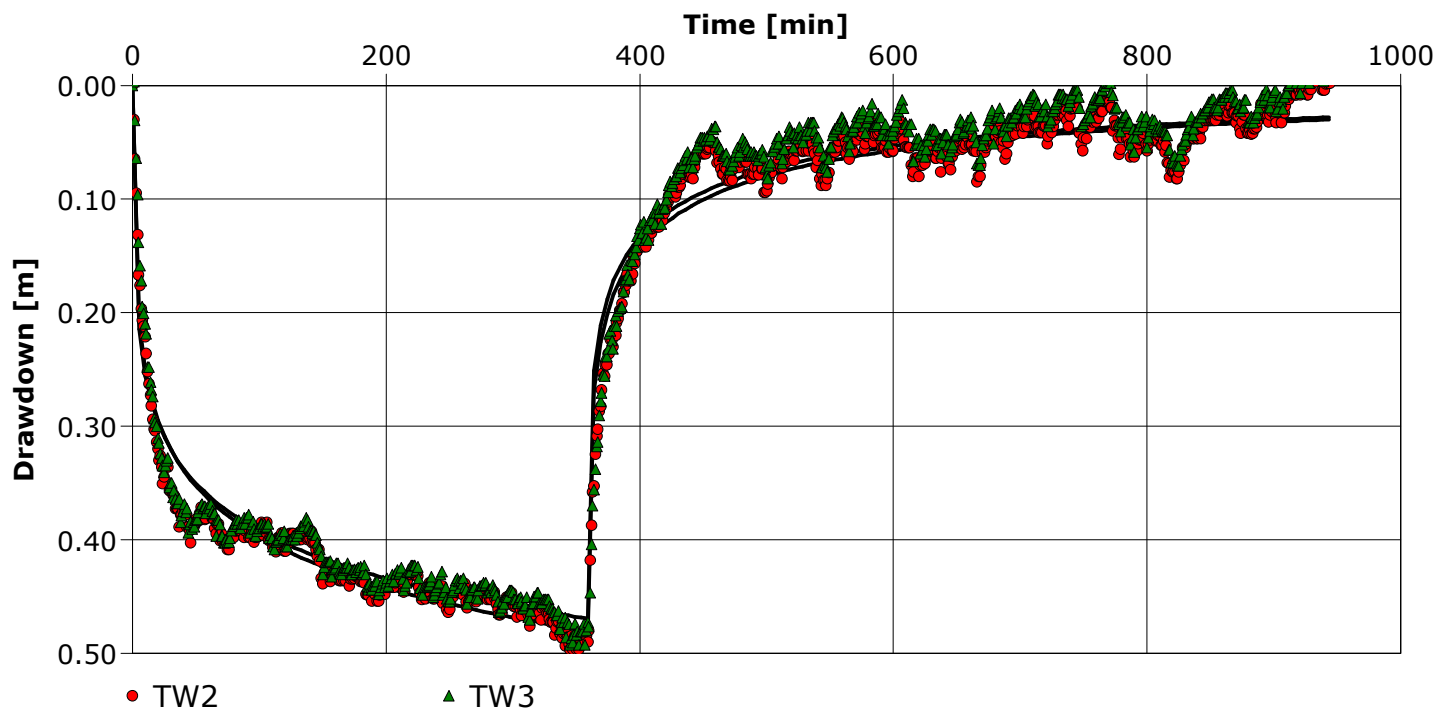
Analysis Performed by:

Theis Jacob

Analysis Date: 30/10/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]



Calculation using Theis with Jacob Correction

Observation Well	Transmissivity [m <sup>2</sup> /d]	Hydraulic Conductivity [m/d]	Storage coefficient	Radial Distance to PW [m]
TW2	$2.08 \times 10^2$	$1.73 \times 10^1$	$3.20 \times 10^{-6}$	140.36
TW3	$2.22 \times 10^2$	$1.85 \times 10^1$	$4.64 \times 10^{-6}$	100.9
Average	$2.15 \times 10^2$	$1.79 \times 10^1$	$3.92 \times 10^{-6}$	



Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 1

Pumping Well: TW1

Test Conducted by: AO

Test Date: 09/07/2015

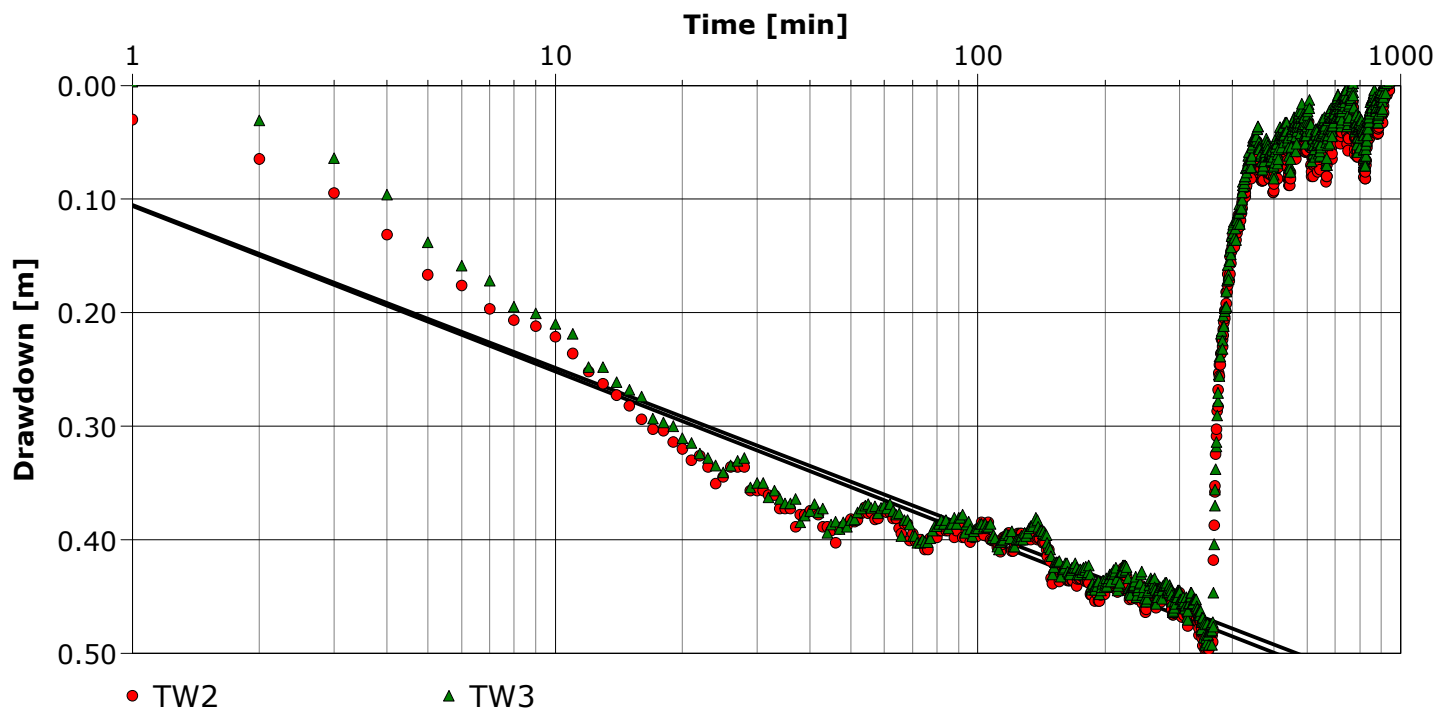
Analysis Performed by:

Cooper Jacob I

Analysis Date: 30/10/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]



Calculation using COOPER & JACOB

Observation Well	Transmissivity [m <sup>2</sup> /d]	Hydraulic Conductivity [m/d]	Storage coefficient	Radial Distance to PW [m]	
TW2	$2.05 \times 10^2$	$1.71 \times 10^1$	$3.05 \times 10^{-6}$	140.36	
TW3	$2.09 \times 10^2$	$1.74 \times 10^1$	$5.87 \times 10^{-6}$	100.9	
Average	$2.07 \times 10^2$	$1.72 \times 10^1$	$4.46 \times 10^{-6}$		



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**Pumping Test Analysis Report**

Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 1

Pumping Well: TW1

Test Conducted by: AO

Test Date: 09/07/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [m <sup>2</sup> /d]	K [m/d]	S
1	Theis		30/10/2015	Theis	TW2	$2.05 \times 10^2$	$1.71 \times 10^1$	$3.05 \times 10^{-6}$
2	Theis		30/10/2015	Theis	TW3	$2.20 \times 10^2$	$1.83 \times 10^1$	$4.39 \times 10^{-6}$
3	Theis Jacob		30/10/2015	Theis with Jacob Corre	TW2	$2.08 \times 10^2$	$1.73 \times 10^1$	$3.20 \times 10^{-6}$
4	Theis Jacob		30/10/2015	Theis with Jacob Corre	TW3	$2.22 \times 10^2$	$1.85 \times 10^1$	$4.64 \times 10^{-6}$
5	Cooper Jacob I		30/10/2015	Cooper & Jacob I	TW2	$2.05 \times 10^2$	$1.71 \times 10^1$	$3.05 \times 10^{-6}$
6	Cooper Jacob I		30/10/2015	Cooper & Jacob I	TW3	$2.09 \times 10^2$	$1.74 \times 10^1$	$5.87 \times 10^{-6}$
7	Theis Recovery		30/10/2015	Theis Recovery	TW2	$1.77 \times 10^2$	$1.48 \times 10^1$	NAN
8	Theis Recovery		30/10/2015	Theis Recovery	TW3	$1.70 \times 10^2$	$1.41 \times 10^1$	NAN
Average						$2.02 \times 10^2$	$1.68 \times 10^1$	NAN

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**Site Plan**

Project: CARLGATE

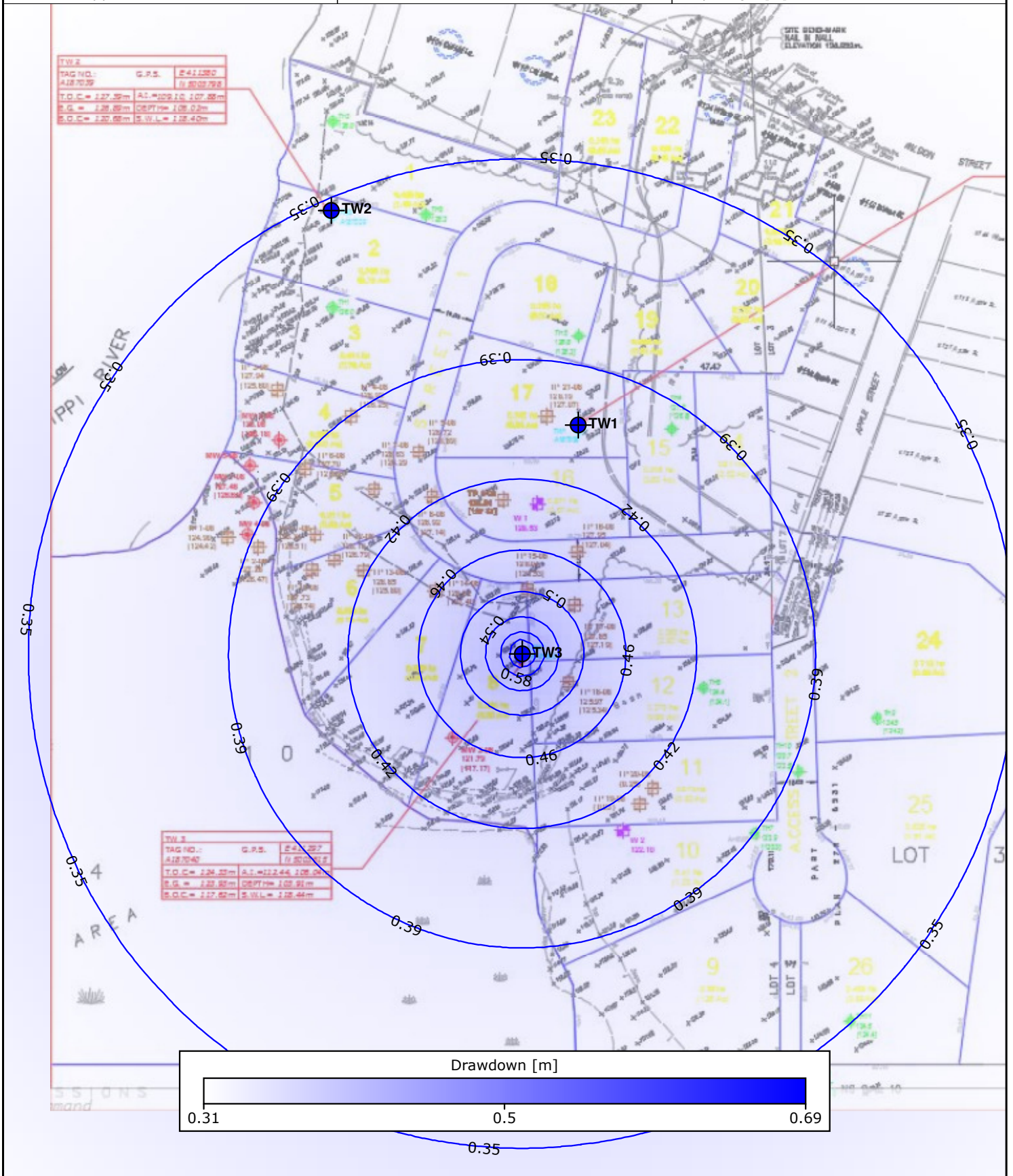
Number: PH2723

Client: John Southwell

Location: Appleton ON

Scale 1:2200

Map Origin [m] X: -20 Y: -30



Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 2

Pumping Well: TW3

Test Conducted by: AO

Test Date: 10/07/2015

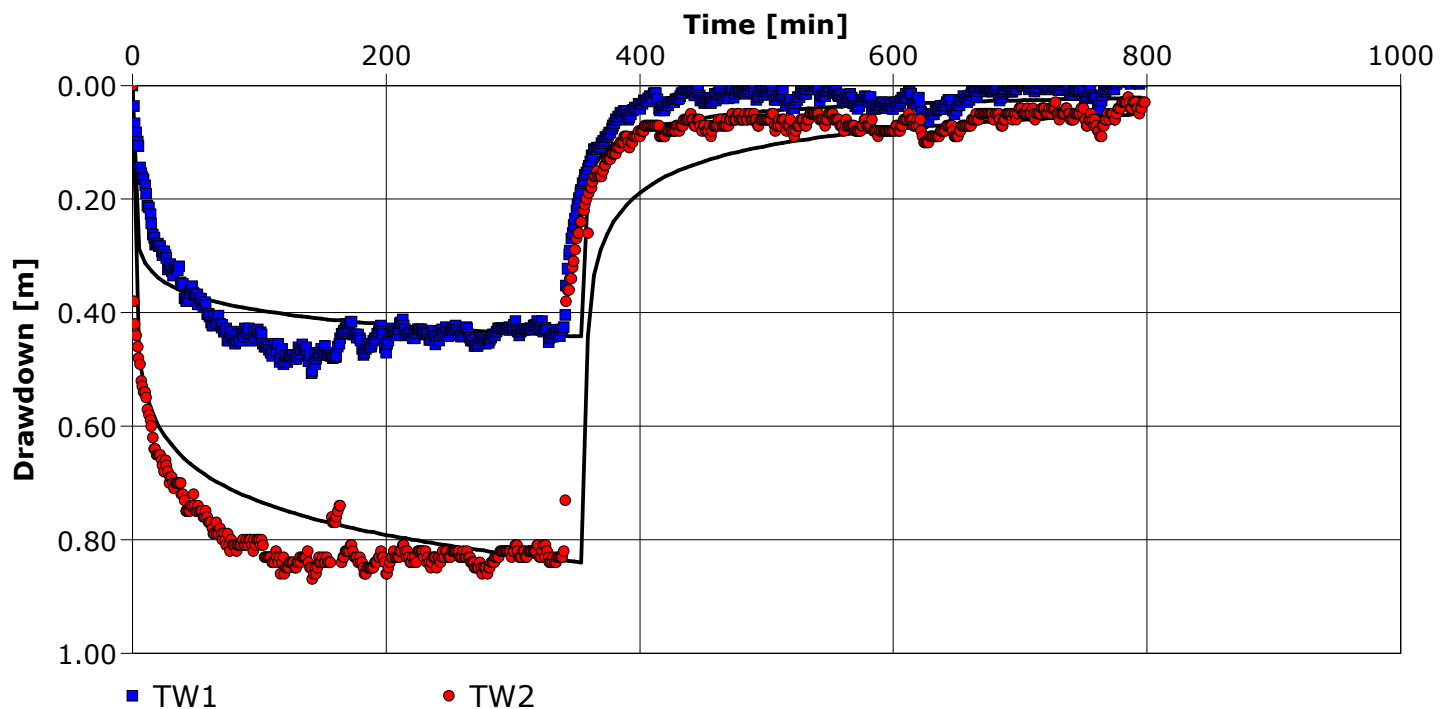
Analysis Performed by:

Theis

Analysis Date: 30/10/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]



Calculation using Theis

Observation Well	Transmissivity [m <sup>2</sup> /d]	Hydraulic Conductivity [m/d]	Storage coefficient	Radial Distance to PW [m]	
TW1	$3.58 \times 10^2$	$2.98 \times 10^1$	$1.00 \times 10^{-7}$	100.9	
TW2	$1.53 \times 10^2$	$1.27 \times 10^1$	$1.00 \times 10^{-7}$	206.94	
Average	$2.56 \times 10^2$	$2.13 \times 10^1$	$1.00 \times 10^{-7}$		

Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 2

Pumping Well: TW3

Test Conducted by: AO

Test Date: 10/07/2015

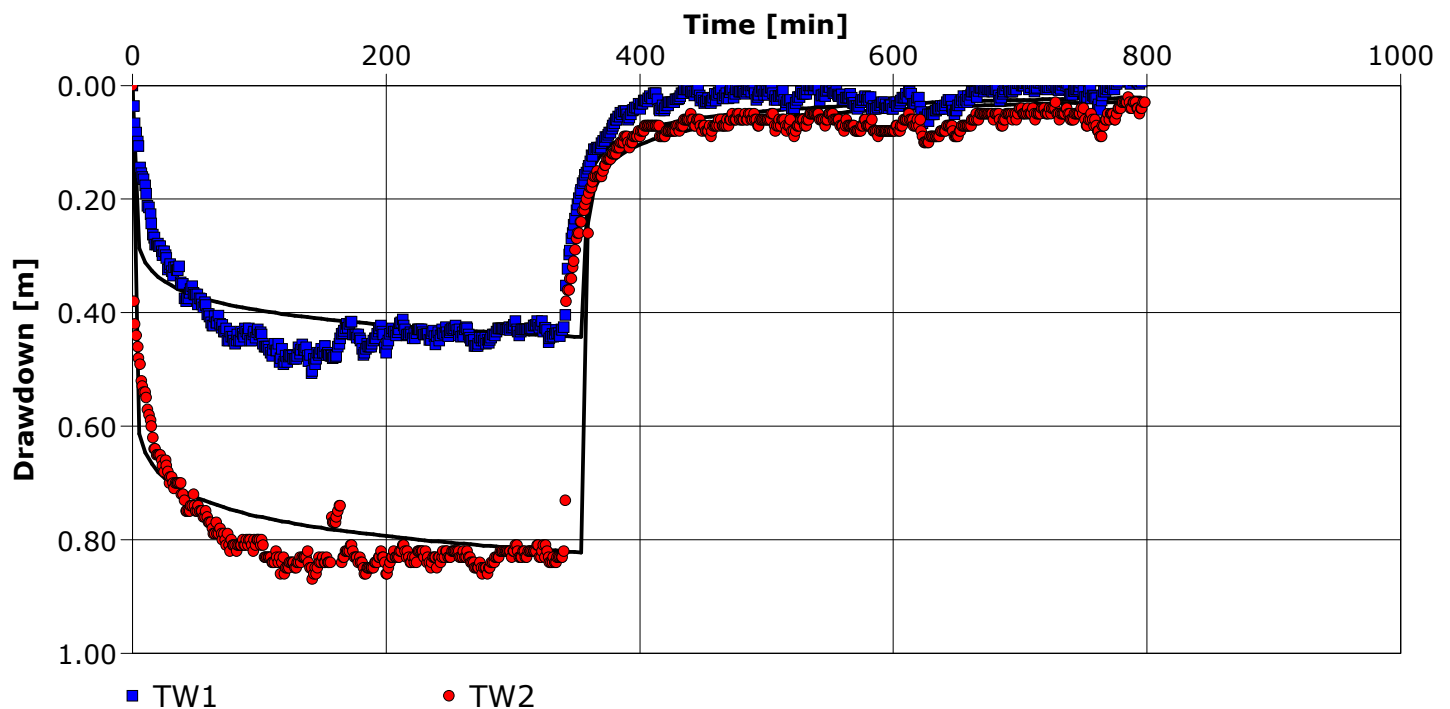
Analysis Performed by:

Theis Jacob

Analysis Date: 30/10/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]



Calculation using Theis with Jacob Correction

Observation Well	Transmissivity [m <sup>2</sup> /d]	Hydraulic Conductivity [m/d]	Storage coefficient	Radial Distance to PW [m]	
TW1	$3.65 \times 10^2$	$3.04 \times 10^1$	$1.00 \times 10^{-7}$	100.9	
TW2	$2.80 \times 10^2$	$2.33 \times 10^1$	$1.37 \times 10^{-10}$	206.94	
Average	$3.22 \times 10^2$	$2.68 \times 10^1$	$5.01 \times 10^{-8}$		

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**Pumping Test Analysis Report**

Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 2

Pumping Well: TW3

Test Conducted by: AO

Test Date: 10/07/2015

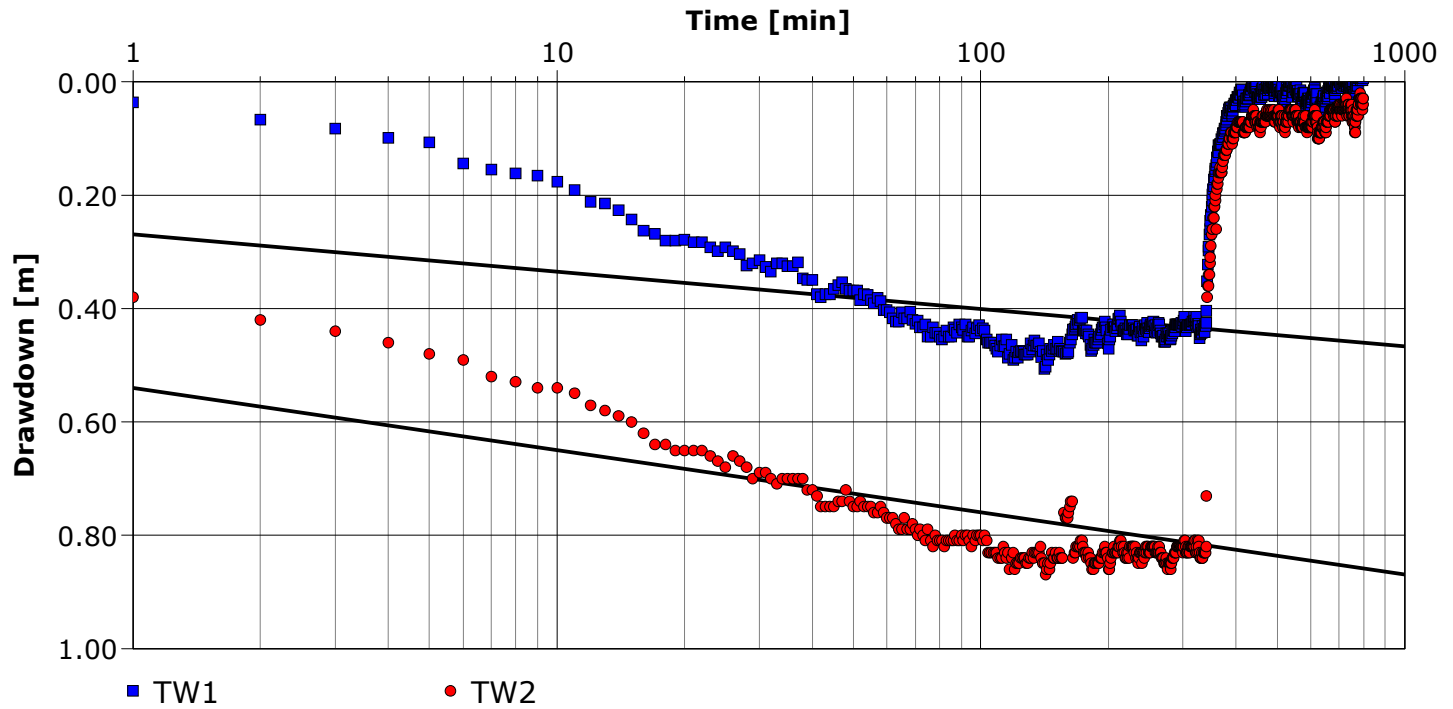
Analysis Performed by:

Cooper Jacob I

Analysis Date: 16/11/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]



Calculation using COOPER & JACOB

Observation Well	Transmissivity [m <sup>2</sup> /d]	Hydraulic Conductivity [m/d]	Storage coefficient	Radial Distance to PW [m]	
TW1	$4.56 \times 10^2$	$3.80 \times 10^1$	$5.39 \times 10^{-9}$	100.9	
TW2	$2.73 \times 10^2$	$2.27 \times 10^1$	$1.17 \times 10^{-10}$	206.94	
Average	$3.65 \times 10^2$	$3.04 \times 10^1$	$2.75 \times 10^{-9}$		

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**Pumping Test Analysis Report**

Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 2

Pumping Well: TW3

Test Conducted by: AO

Test Date: 10/07/2015

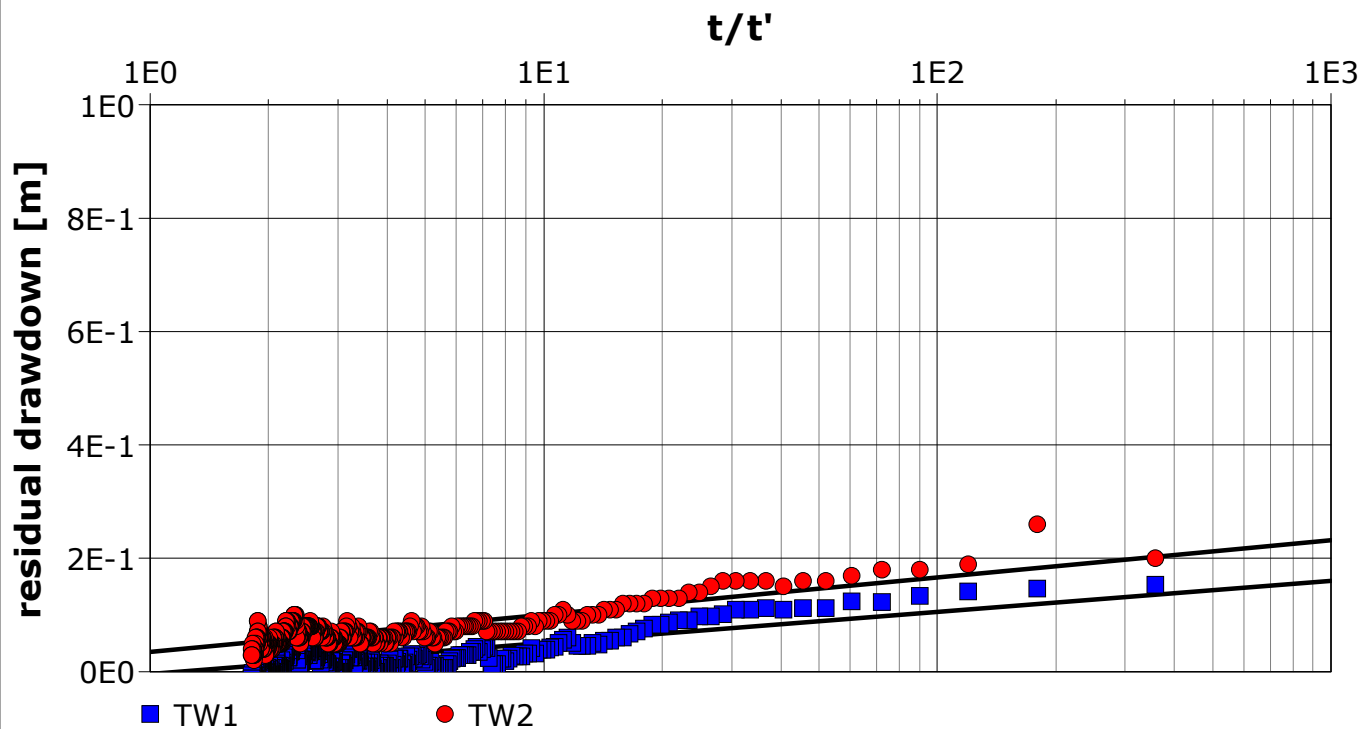
Analysis Performed by:

Theis RECOVERY

Analysis Date: 16/11/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]



Calculation using THEIS & JACOB

Observation Well	Transmissivity [m <sup>2</sup> /d]	Hydraulic Conductivity [m/d]	Radial Distance to PW [m]
TW1	$5.45 \times 10^2$	$4.54 \times 10^1$	100.9
TW2	$4.52 \times 10^2$	$3.77 \times 10^1$	206.94
Average	$4.98 \times 10^2$	$4.15 \times 10^1$	



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**Pumping Test Analysis Report**

Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 2

Pumping Well: TW3

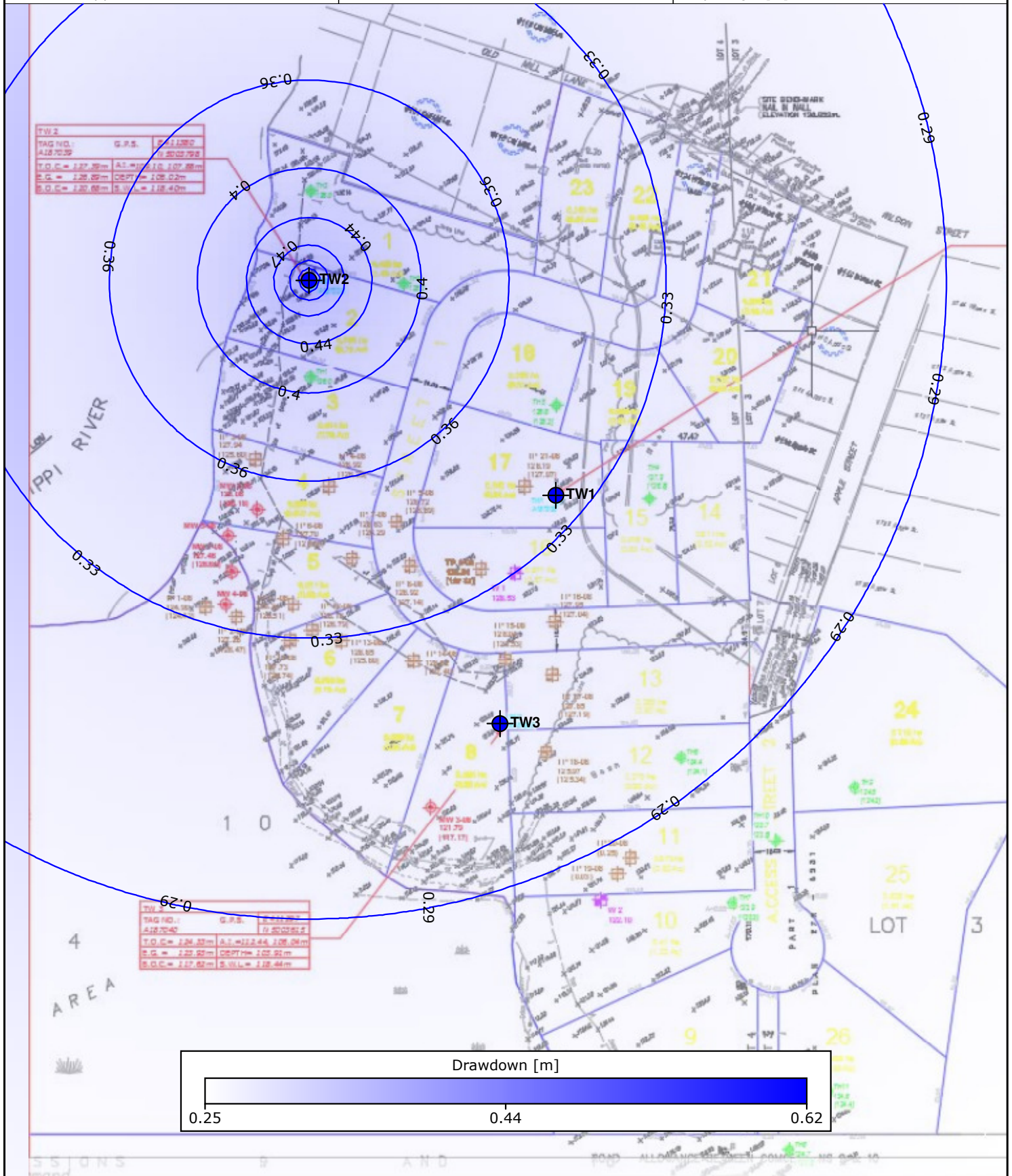
Test Conducted by: AO

Test Date: 10/07/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [m <sup>2</sup> /d]	K [m/d]	S
1	Theis		30/10/2015	Theis	TW1	$3.58 \times 10^2$	$2.98 \times 10^1$	$1.00 \times 10^{-7}$
2	Theis		30/10/2015	Theis	TW2	$1.53 \times 10^2$	$1.27 \times 10^1$	$1.00 \times 10^{-7}$
3	Theis Jacob		30/10/2015	Theis with Jacob Correction	TW1	$3.65 \times 10^2$	$3.04 \times 10^1$	$1.00 \times 10^{-7}$
4	Theis Jacob		30/10/2015	Theis with Jacob Correction	TW2	$2.80 \times 10^2$	$2.33 \times 10^1$	$1.37 \times 10^{-10}$
5	Cooper Jacob I		16/11/2015	Cooper & Jacob I	TW1	$4.56 \times 10^2$	$3.80 \times 10^1$	$5.39 \times 10^{-9}$
6	Cooper Jacob I		16/11/2015	Cooper & Jacob I	TW2	$2.73 \times 10^2$	$2.27 \times 10^1$	$1.17 \times 10^{-10}$
7	Theis RECOVERY		16/11/2015	Theis Recovery	TW1	$5.45 \times 10^2$	$4.54 \times 10^1$	NAN
8	Theis RECOVERY		16/11/2015	Theis Recovery	TW2	$4.52 \times 10^2$	$3.77 \times 10^1$	NAN
Average						$3.60 \times 10^2$	$3.00 \times 10^1$	NAN



Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 3

Pumping Well: TW2

Test Conducted by: AO

Test Date: 13/07/2015

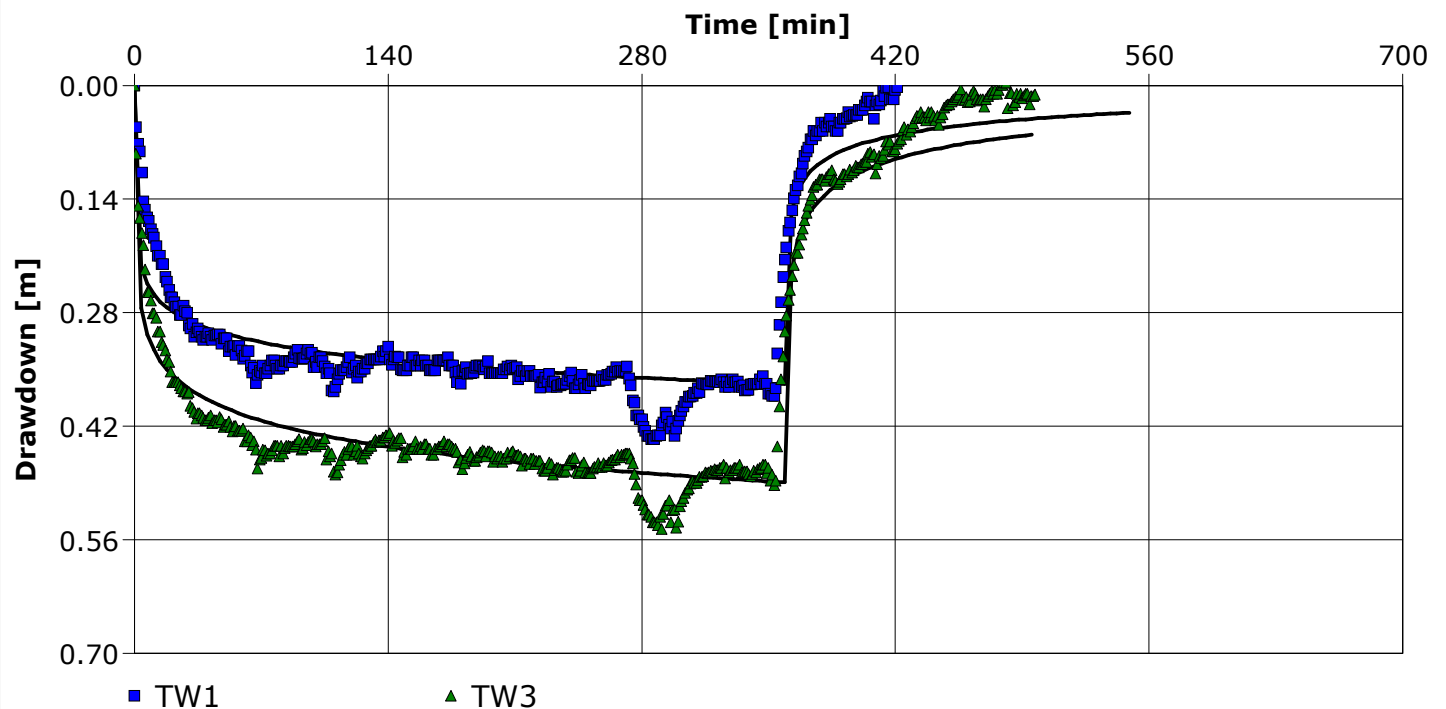
Analysis Performed by:

Theis

Analysis Date: 30/10/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]



Calculation using Theis

Observation Well	Transmissivity [m <sup>2</sup> /d]	Hydraulic Conductivity [m/d]	Storage coefficient	Radial Distance to PW [m]	
TW1	$4.12 \times 10^2$	$3.43 \times 10^1$	$1.00 \times 10^{-7}$	140.36	
TW3	$2.79 \times 10^2$	$2.33 \times 10^1$	$1.00 \times 10^{-7}$	206.94	
Average	$3.46 \times 10^2$	$2.88 \times 10^1$	$1.00 \times 10^{-7}$		

Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 3

Pumping Well: TW2

Test Conducted by: AO

Test Date: 13/07/2015

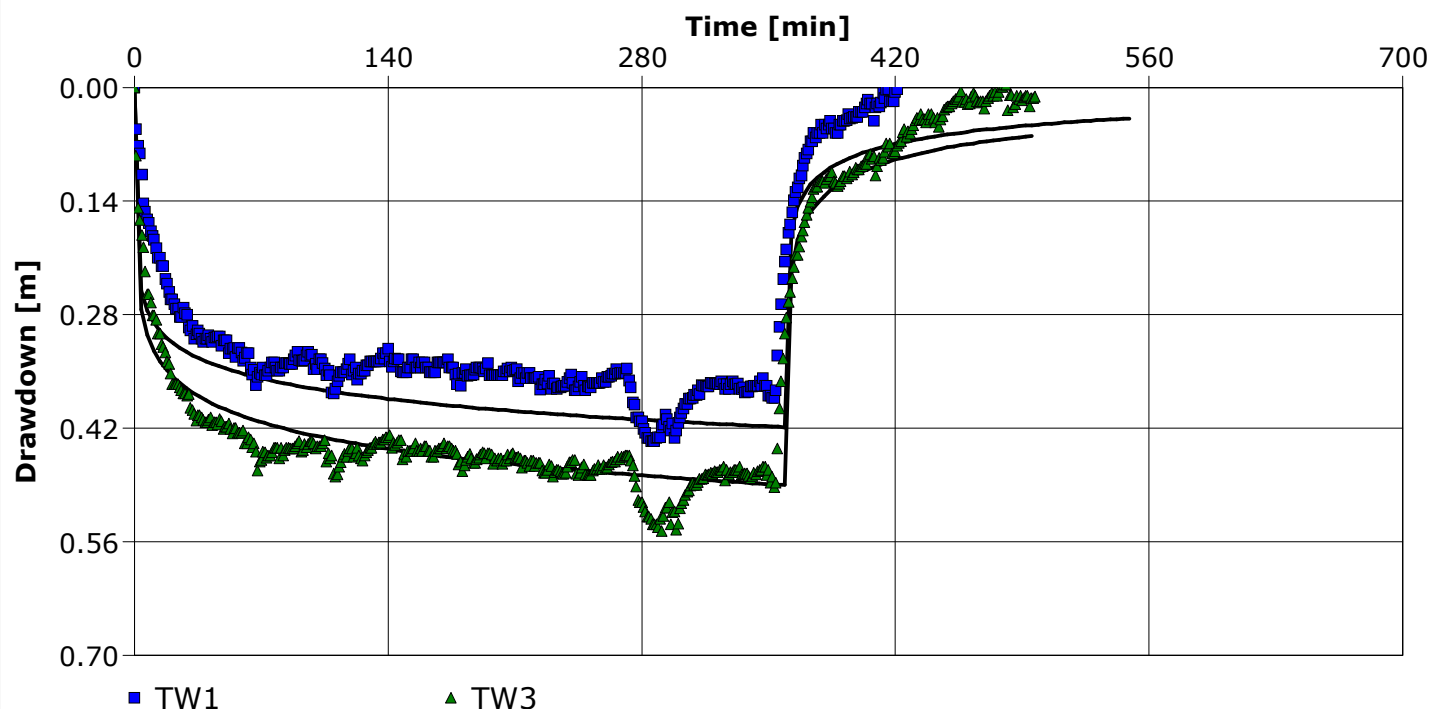
Analysis Performed by:

Theis Jacob

Analysis Date: 30/10/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]



Calculation using Theis with Jacob Correction

Observation Well	Transmissivity [m <sup>2</sup> /d]	Hydraulic Conductivity [m/d]	Storage coefficient	Radial Distance to PW [m]	
TW1	$3.65 \times 10^2$	$3.04 \times 10^1$	$1.00 \times 10^{-7}$	140.36	
TW3	$2.85 \times 10^2$	$2.37 \times 10^1$	$1.00 \times 10^{-7}$	206.94	
Average	$3.25 \times 10^2$	$2.71 \times 10^1$	$1.00 \times 10^{-7}$		

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**Pumping Test Analysis Report**

Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 3

Pumping Well: TW2

Test Conducted by: AO

Test Date: 13/07/2015

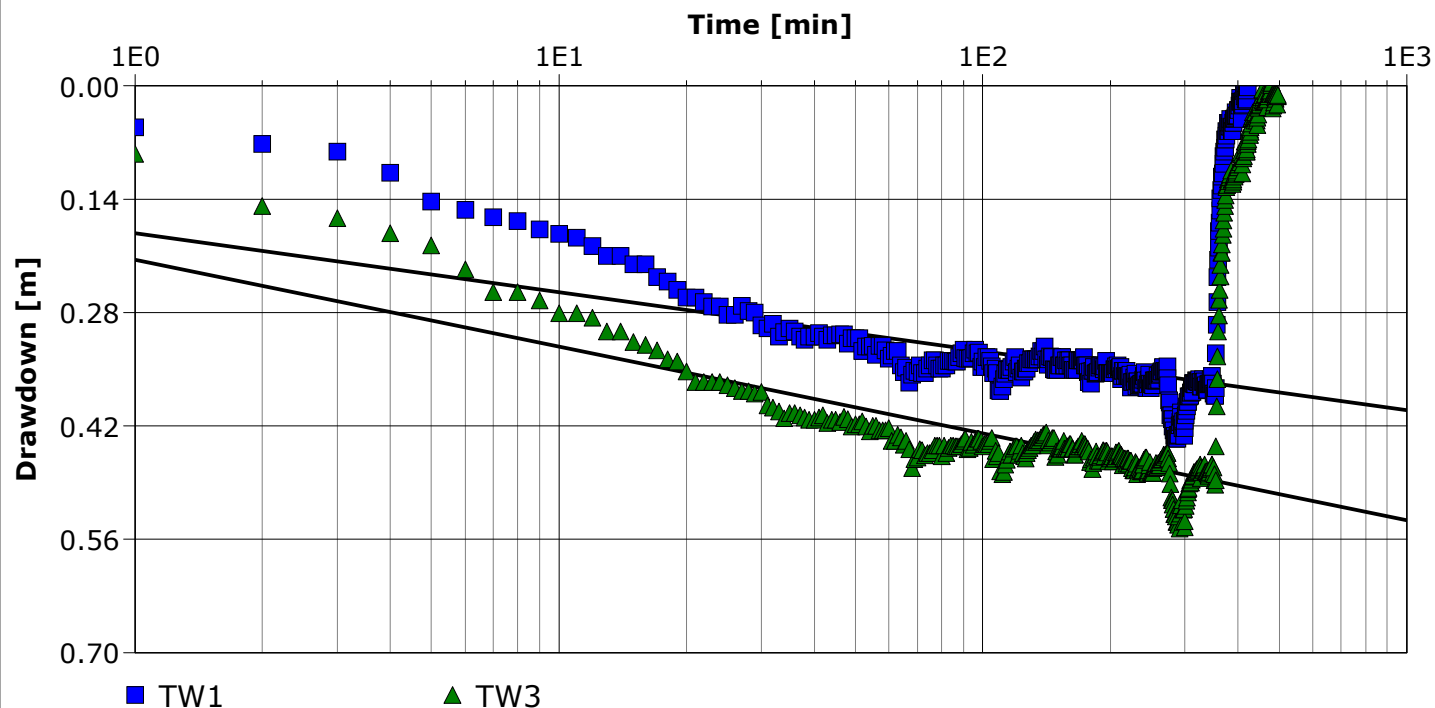
Analysis Performed by:

Cooper Jacob I

Analysis Date: 16/11/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]



Calculation using COOPER & JACOB

Observation Well	Transmissivity [m <sup>2</sup> /d]	Hydraulic Conductivity [m/d]	Storage coefficient	Radial Distance to PW [m]
TW1	$4.12 \times 10^2$	$3.43 \times 10^1$	$1.00 \times 10^{-7}$	140.36
TW3	$2.79 \times 10^2$	$2.33 \times 10^1$	$1.00 \times 10^{-7}$	206.94
Average	$3.46 \times 10^2$	$2.88 \times 10^1$	$1.00 \times 10^{-7}$	

Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 3

Pumping Well: TW2

Test Conducted by: AO

Test Date: 13/07/2015

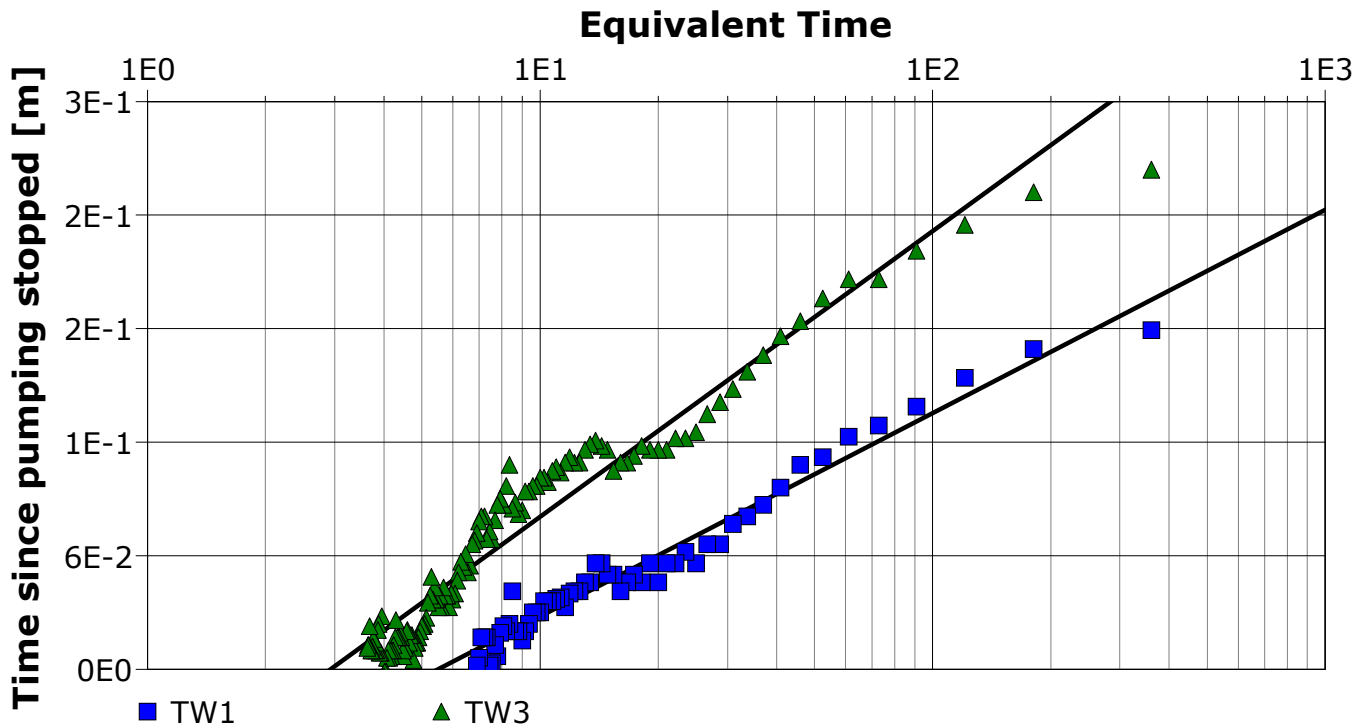
Analysis Performed by:

Theis Recovery

Analysis Date: 30/10/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]



Calculation using THEIS & JACOB

Observation Well	Transmissivity [m <sup>2</sup> /d]	Hydraulic Conductivity [m/d]	Radial Distance to PW [m]
TW1	$2.78 \times 10^2$	$2.32 \times 10^1$	140.36
TW3	$1.98 \times 10^2$	$1.65 \times 10^1$	206.94
Average	$2.38 \times 10^2$	$1.98 \times 10^1$	

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**Pumping Test Analysis Report**

Project: CARLGATE

Number: PH2723

Client: John Southwell

Location: Appleton ON

Pumping Test: Pumping Test 3

Pumping Well: TW2

Test Conducted by: AO

Test Date: 13/07/2015

Aquifer Thickness: 12.00 m

Discharge: variable, average rate 1.89 [l/s]

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [m <sup>2</sup> /d]	K [m/d]	S
1	Theis		30/10/2015	Theis	TW1	$4.12 \times 10^2$	$3.43 \times 10^1$	$1.00 \times 10^{-7}$
2	Theis		30/10/2015	Theis	TW3	$2.79 \times 10^2$	$2.33 \times 10^1$	$1.00 \times 10^{-7}$
3	Theis Jacob		30/10/2015	Theis with Jacob Correction	TW1	$3.65 \times 10^2$	$3.04 \times 10^1$	$1.00 \times 10^{-7}$
4	Theis Jacob		30/10/2015	Theis with Jacob Correction	TW3	$2.85 \times 10^2$	$2.37 \times 10^1$	$1.00 \times 10^{-7}$
5	Theis Recovery		30/10/2015	Theis Recovery	TW1	$2.78 \times 10^2$	$2.32 \times 10^1$	NAN
6	Theis Recovery		30/10/2015	Theis Recovery	TW3	$1.98 \times 10^2$	$1.65 \times 10^1$	NAN
7	Cooper Jacob I		16/11/2015	Cooper & Jacob I	TW1	$4.12 \times 10^2$	$3.43 \times 10^1$	$1.00 \times 10^{-7}$
8	Cooper Jacob I		16/11/2015	Cooper & Jacob I	TW3	$2.79 \times 10^2$	$2.33 \times 10^1$	$1.00 \times 10^{-7}$
Average						$3.13 \times 10^2$	$2.61 \times 10^1$	NAN

### Determination of Potential Well Interference

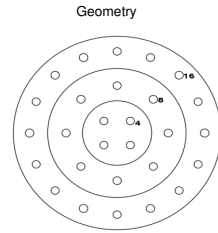
Based on Average Values of Transmissivity and Storativity

Pumping Rate (Q) m <sup>3</sup> /day	3
Transmissivity (T) m <sup>2</sup> /day	291.9166667
Average Well Spacing (m) r	30
Coefficient of Storage S	1.39E-06
Pi	3.14E+00

**Thies (1935) nonequilibrium equation**

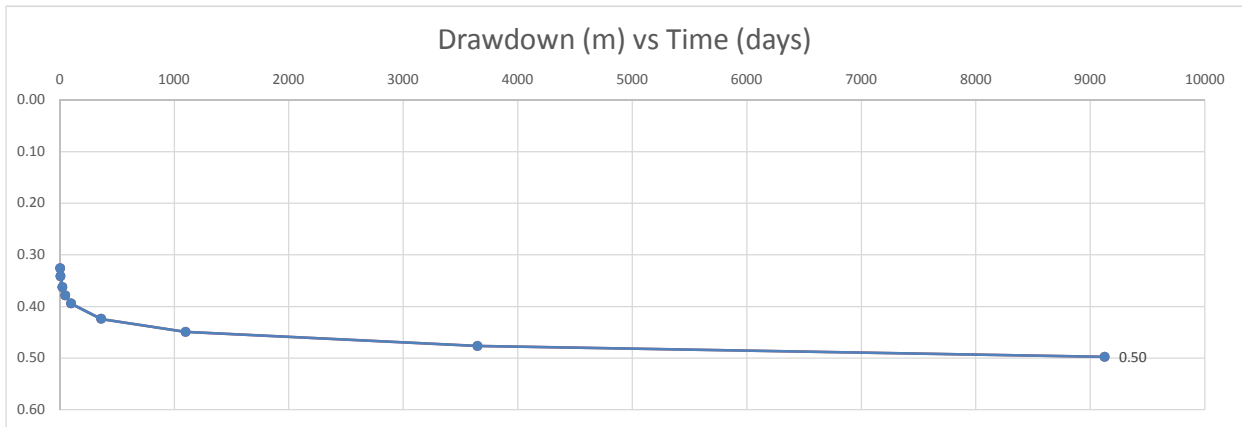
$$u = r^2 S / 4 T t$$

W(u) = exponential integral (of u)



Analysis Assumes Continuous Pumping of 28 Wells

Time (days)	1st Well Grouping 4		2nd Well Grouping 8		3rd Well Grouping 16		Drawdown
	u	W(u)	u	W(u)	u	W(u)	
5	1.1E-07	15.47	3.2E-07	14.37	5.4E-07	13.86	0.33
10	5.4E-08	16.16	1.6E-07	15.06	2.7E-07	14.55	0.34
25	2.2E-08	17.08	6.5E-08	15.98	1.1E-07	15.47	0.36
50	1.1E-08	17.77	3.2E-08	16.67	5.4E-08	16.16	0.38
100	5.4E-09	18.46	1.6E-08	17.37	2.7E-08	16.85	0.39
365	1.5E-09	19.76	4.4E-09	18.66	7.4E-09	18.15	0.42
1100	4.9E-10	20.86	1.5E-09	19.76	2.4E-09	19.25	0.45
3650	1.5E-10	22.06	4.4E-10	20.96	7.4E-10	20.45	0.48
9125	5.9E-11	22.98	1.8E-10	21.88	2.9E-10	21.37	0.50





### Determination of Potential Well Interference

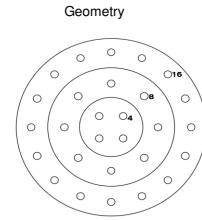
Based on Worst Case Values of Transmissivity and Storativity

Pumping Rate (Q) m <sup>3</sup> /day	3
Transmissivity (T) m <sup>2</sup> /day	1.53E+02
Average Well Spacing (m) r	30
Coefficient of Storage S	1.17E-10
Pi	3.14E+00

**Thies (1935) nonequilibrium equation**

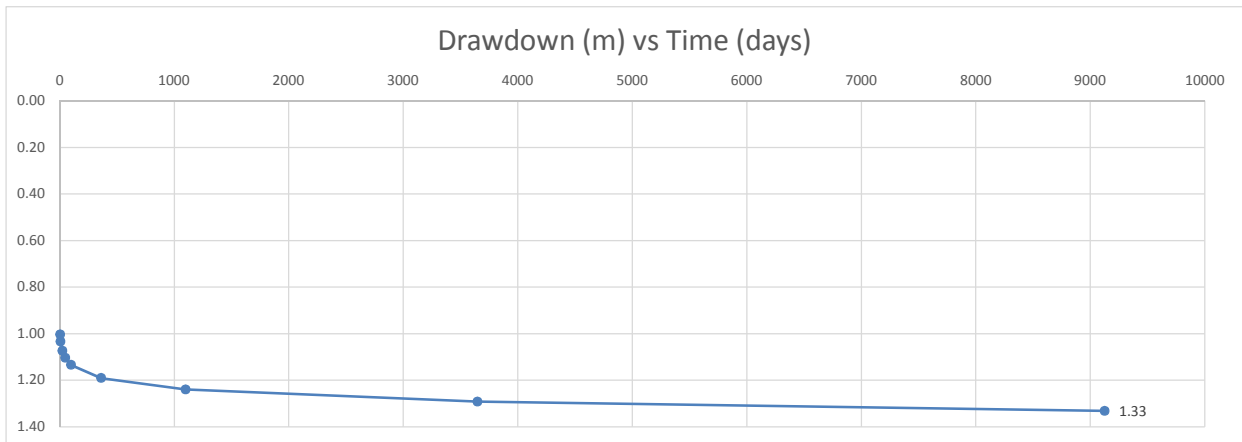
$$u = r^2 S / 4 T t$$

W(u) = exponential integral (of u)



Analysis Assumes Continuous Pumping of 28 Wells

Time (days)	1st Well Grouping 4		2nd Well Grouping 8		3rd Well Grouping 16		Drawdown
	u	W(u)	u	W(u)	u	W(u)	
5	1.7E-11	24.21	5.2E-11	23.11	8.6E-11	22.60	1.00
10	8.6E-12	24.90	2.6E-11	23.80	4.3E-11	23.29	1.03
25	3.4E-12	25.82	1.0E-11	24.72	1.7E-11	24.21	1.07
50	1.7E-12	26.51	5.2E-12	25.41	8.6E-12	24.90	1.10
100	8.6E-13	27.20	2.6E-12	26.11	4.3E-12	25.59	1.13
365	2.4E-13	28.50	7.1E-13	27.40	1.2E-12	26.89	1.19
1100	7.8E-14	29.60	2.3E-13	28.50	3.9E-13	27.99	1.24
3650	2.4E-14	30.80	7.1E-14	29.70	1.2E-13	29.19	1.29
9125	9.4E-15	31.72	2.8E-14	30.62	4.7E-14	30.11	1.33



## PREDICTIVE NITRATE IMPACT ASSESSEMENT

### Infiltration Factors

Topography	0.25
Soil	0.30
Cover	0.15
<b>Total</b>	<b>0.70</b>

### Site Characteristics

Area of Site :	196100	m <sup>2</sup>
Area of Subdivision:	69900	m <sup>2</sup>
Proposed subdivision as % of subject property:	36	%
Area of each roof:	300	m <sup>2</sup>
Total of roof areas:	4200	m <sup>2</sup>
Area of each paved driveway:	200	m <sup>2</sup>
Total area of paved driveway areas:	2800	m <sup>2</sup>
Roof + paved driveway areas + paved roadway	13300	m <sup>2</sup>
Length of paved roadways:	2100	m
Width of paved roadways:	3	m
Total area of paved roadways:	6300	m <sup>2</sup>
Impervious Area	13300	m <sup>2</sup>
Percent Impervious Area =	7	%
Infiltration Area =	182800	m <sup>2</sup>

### Septic Effluent

Concentration of Effluent (Cs) =	40	mg/L
Daily Sewage Flow (Qs)=	1	m <sup>3</sup>
See Notes below.		

### Infiltration Calculation

Nitrate concentration in precipitation (C <sub>i</sub> ) =	0	mg/L
Surplus Water (Environment Canada)	342	mm/yr
Factored Water Surplus =	239	mm/yr
Infiltration % due to stormwater management measures	-	
Infiltration rate from stormwater management measures =	0	mm/yr
Infiltration Flow Entering the System (Q <sub>i</sub> ) =	120	m <sup>3</sup> /day

### Mass Balance Model (MOEE, 1995)

$$C_T = (Q_b C_b + Q_e C_e + Q_i C_i) / (Q_b + Q_e + Q_i) = \text{Cumulative Nitrate Concentration}$$

Q <sub>b</sub> = flow entering the system across the upgradient area	0	m <sup>3</sup> /day
C <sub>b</sub> = background nitrate concentration	1.4	mg/L
Q <sub>e</sub> = flow entering the system from the septic drainfield	14	m <sup>3</sup> /day
C <sub>e</sub> = concentration of nitrates in the septic effluent	40	mg/L
Q <sub>i</sub> = flow entering the system from infiltration	120	m <sup>3</sup> /day
C <sub>i</sub> = Concentration of nitrates in the infiltrate	0	mg/L
<b>C<sub>T</sub> =</b>	<b>4.18</b>	<b>mg/L</b>
Estimate Number of Lots	<b>14</b>	<b>lots</b>

*Notes: Site characteristic values were measured as approximate values from the available site plan. Daily Sewage Flow volume provided by Novatech as a preliminary design flow.*

Appleton WATER BUDGET MEANS FOR THE PERIOD 1992-2021 DC20492

LAT.... 45.18 WATER HOLDING CAPACITY...100 MM HEAT INDEX... 37.24  
 LONG... 76.12 LOWER ZONE..... 60 MM A..... 1.088

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-9.5	62	16	22	1	1	0	35	55	99	285
28- 2	-8.1	50	14	23	1	1	0	35	68	99	334
31- 3	-2.3	58	27	72	7	7	0	91	26	100	391
30- 4	5.8	75	69	32	31	31	0	70	0	100	467
31- 5	13.2	71	71	0	81	81	0	12	0	78	537
30- 6	18.3	98	98	0	116	112	-4	8	0	56	636
31- 7	20.7	95	95	0	134	114	-20	4	0	32	730
31- 8	19.7	89	89	0	117	91	-26	1	0	28	816
30- 9	15.4	86	86	0	78	72	-7	1	0	41	903
31-10	8.6	84	82	1	38	38	0	14	0	73	85
30-11	1.7	72	57	11	11	11	0	35	5	94	157
31-12	-5.2	67	27	14	2	2	0	36	31	98	224
AVE	6.6 TTL	905	731	175	617	561	-57	342			

Appleton STANDARD DEVIATIONS FOR THE PERIOD 1992-2021 DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	3.1	27	19	22	1	1	0	38	35	6	51
28- 2	2.8	21	15	20	1	1	0	29	40	4	55
31- 3	2.6	25	19	33	6	6	0	36	48	0	62
30- 4	1.5	39	38	47	7	7	0	59	0	1	79
31- 5	1.6	36	36	0	11	11	0	22	0	25	95
30- 6	1.2	38	38	0	8	11	11	13	0	39	109
31- 7	1.4	53	53	0	10	31	35	24	0	35	135
31- 8	1.2	45	45	0	8	28	32	7	0	34	140
30- 9	1.5	36	36	0	8	13	15	3	0	37	131
31-10	1.6	34	35	4	7	7	1	24	2	30	34
30-11	2.0	24	24	9	5	5	0	34	12	14	46
31-12	2.7	25	19	15	2	2	0	28	30	7	51

## Appendix 5

- **Figure-1 - Site Location Plan**
- **Figure-2 – Overburden Geology**
- **Figure-3 – Bedrock Geology**
- **Figure-4 – MECP Water Well Location Plan**
- **Figure-5 - Generalized North - South Site Cross-Section**
- **Drawing PH4398-1- Lot Development Plan**
- **Drawing PH4398-2 - Test Hole Location Plan**



**LEGEND:**

---- Property Boundary  
 —— Site Boundary

-N-

**REFERENCE:**  
 Information reproduced from Google Earth 2015

DD/MM/YY	DESCRIPTION	REV.
20/10/2015	ISSUED WITH REPORT PH2723-REP-01	0

Consultant:  
**patersongroup**  
 consulting engineers

Client:  
**SOUTHWELL HOMES LTD.**

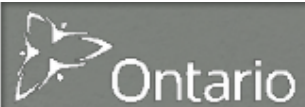
Project:  
**PROPOSED RESIDENTIAL SUBDIVISION**  
**OLD MILL LANE**  
**APPLETON, ONTARIO**

Drawing:  
**SITE LOCATION PLAN**

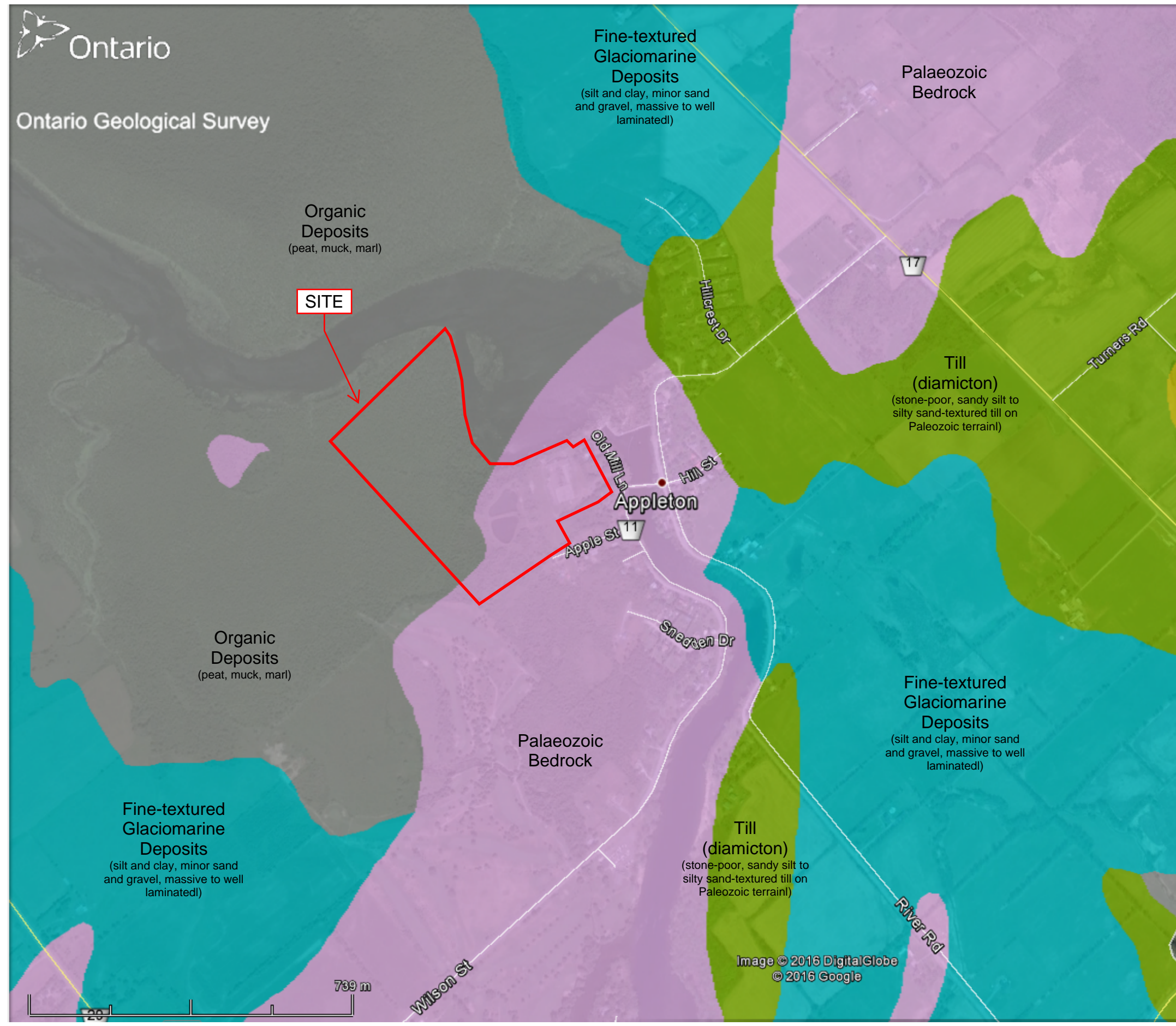
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File: PH2723	Checked by: RLC

Drawing No.:  
**FIGURE-1**

p:\autocad drawings\hydrogeology\ph2723\ph2723-appleton\ph2723-figures.dwg



Ontario Geological Survey



REF: The Ontario Geological Survey. 2003. Surficial Geology of Southern Ontario.

LEGEND

- Fill
- Organic Deposits: peat, muck and marl
- Silt
- Clay
- Sand
- Gravel
- Till (Diamiction)
- Sedimentary (Paleozoic) bedrock
- Precambrian bedrock

22-AUG-16	PH2723-REP.01R1	
DD/MMYY	DESCRIPTION	REV.

Consultant:  
**patersongroup**  
 consulting engineers

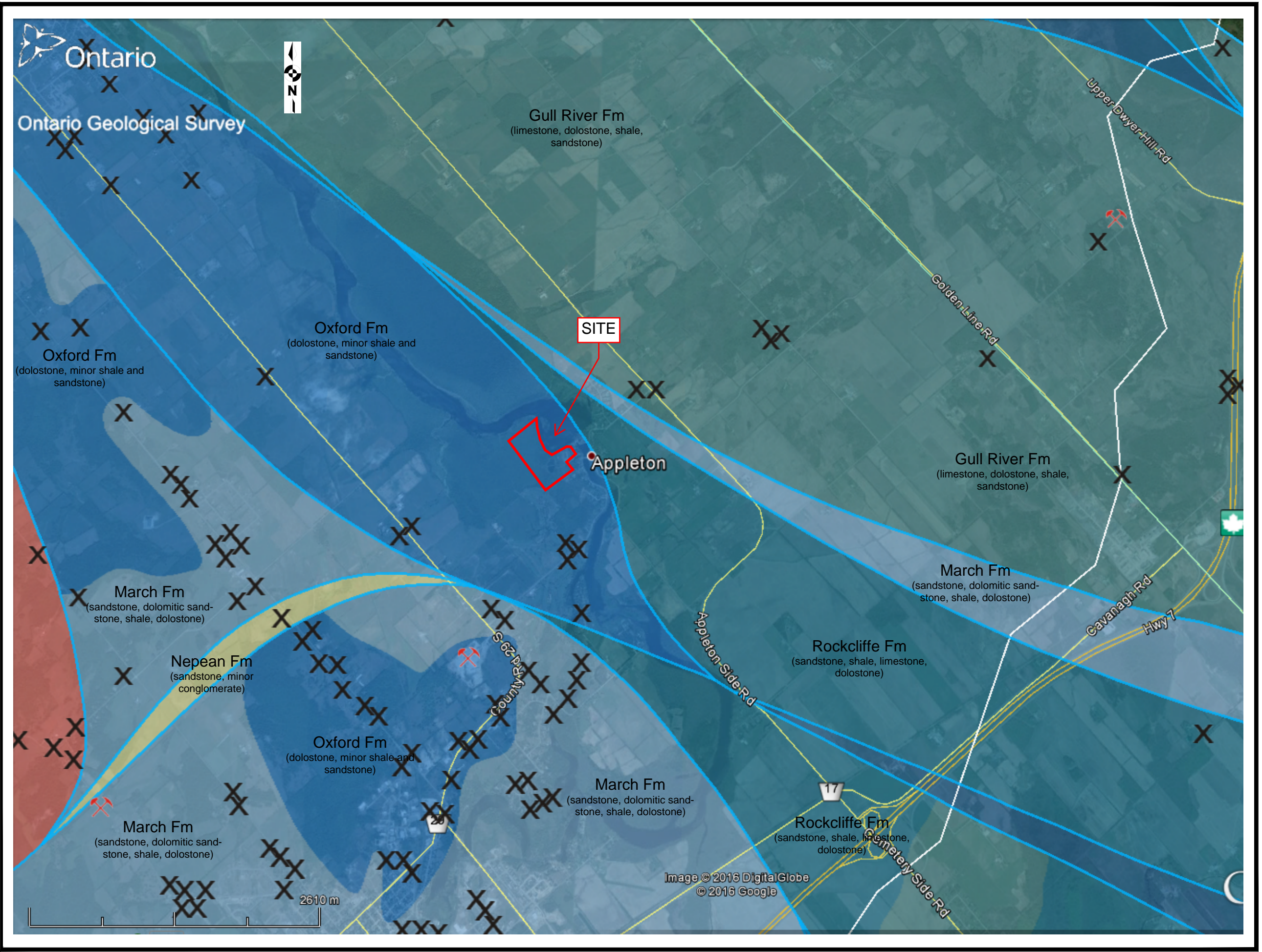
Client:  
**SOUTHWELL HOMES LTD.**

Project:  
**OLD MILL LANE  
 APPLETON, ONTARIO**

Drawing:  
**OVERBURDEN GEOLOGY**

Scale: see Figure	Drawn by: RLC
File: PH2723	Checked by: AVS

FIGURE 2



REF: Armstrong, D.K. and Dodge, J.E.P. Paleozoic Geology Map of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 219

- Middle Ordovician**
- Simcoe Group**
- 11 Lindsay Formation: limestone; nodular to black laminated (=Collingwood Member or Eastview Member in eastern Ontario)
  - 10 Verulam Formation: limestone and shale
  - 9 Bobcaygeon Formation: limestone, with minor shales in upper part
  - 8 Gull River Formation: limestone, with dolostone beds towards base
  - 7 Shadow Lake Formation: shale, argillaceous sandstone, silty dolostone
  - 6 Rockcliffe Formation: sandstone, shale, limestone, dolostone
- Lower Ordovician**
- Beekmantown Group**
- 5 Oxford Formation: dolostone, minor shale and sandstone
  - 4 March Formation: sandstone, dolomitic sandstone, dolostone
- Cambrian**
- Potsdam Group**
- 3 Nepean Formation: sandstone, minor conglomerate
  - 2 Covey Hill Formation: feldspathic conglomerate, impure sandstone

22-AUG-16	PH2723-REP.01R1	
DD/MM/YY	DESCRIPTION	REV.

Consultant:  
**patersongroup**  
 consulting engineers

Client:  
**SOUTHWELL HOMES LTD.**

Project:  
**OLD MILL LANE  
 APPLETON, ONTARIO**

Drawing:  
**BEDROCK GEOLOGY**

Scale: see Figure	Drawn by: RLC
File: PH2723	Checked by: AVS

**FIGURE 3**

Image © 2016 DigitalGlobe  
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22-AUG-16	PH2723-REP.01R1	
DD/MMYY	DESCRIPTION	REV.

Consultant:  
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Client:  
**SOUTHWELL HOMES LTD.**

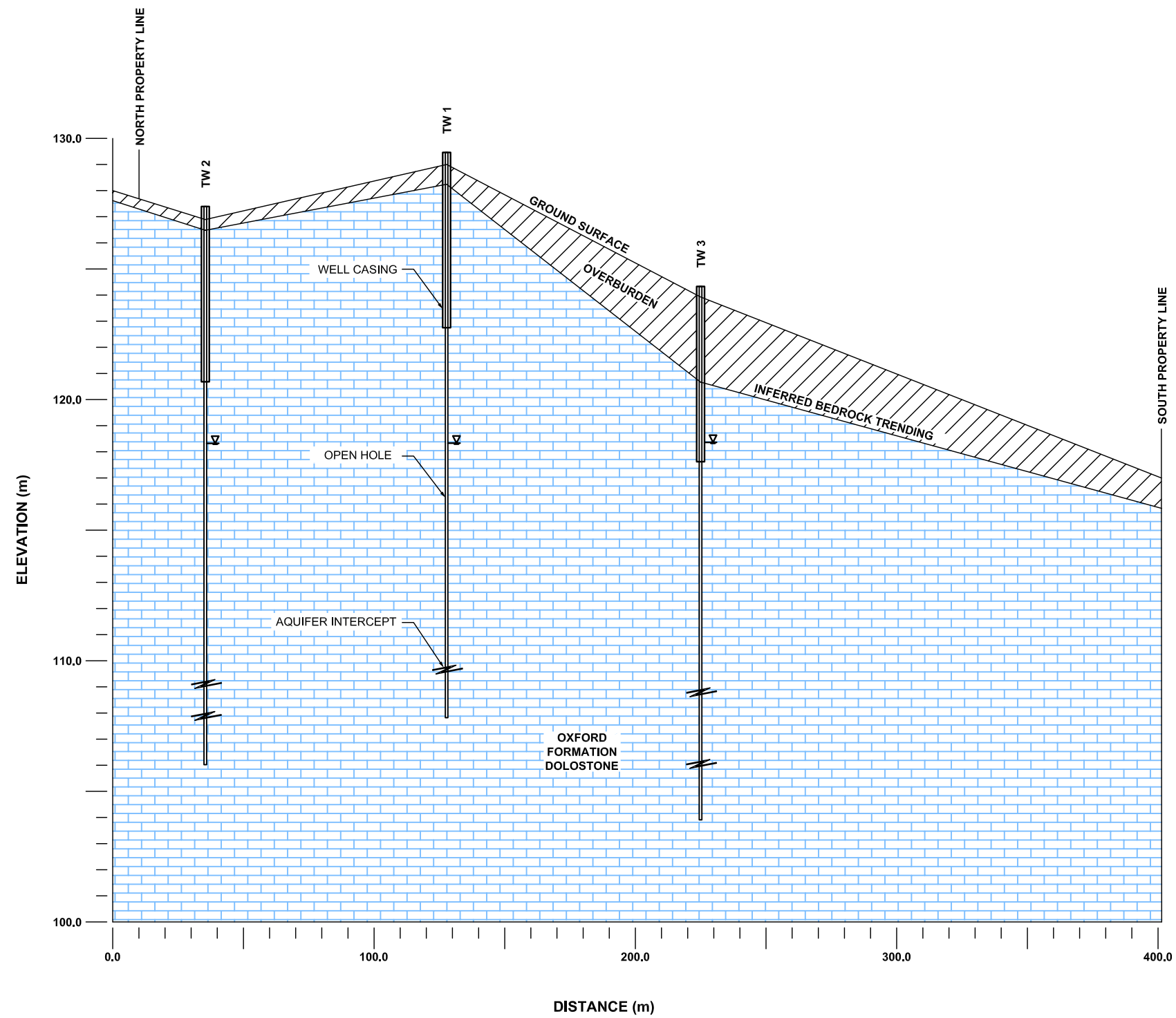
Project:  
**OLD MILL LANE  
 APPLETON, ONTARIO**

Drawing:  
**WATER WELL RECORDS**

Scale: see Figure	Drawn by: RLC
File: PH2723	Checked by: AVS

**FIGURE 4**





**LEGEND:**

	Overburden
	Oxford Bedrock Formation
	Static Water Level at Prior to Pumping Test (July 8, 2015)
	Depth Water Found

20/10/2015	ISSUED WITH REPORT PH2723-REP-01	0
DD/MM/YY	DESCRIPTION	REV.

Consultant:  
**patersongroup**  
 consulting engineers

Client:  
**SOUTHWELL HOMES LTD.**

Project:  
**PROPOSED RESIDENTIAL SUBDIVISION**  
**OLD MILL LANE**  
**APPLETON, ONTARIO**

Drawing:  
**GENERALIZED NORTH-SOUTH SITE CROSS-SECTION**

Scale: 1:2000 H  
 1:200 V  
 Drawn by: JB

File: PH2723  
 Checked by: RLC

Drawing No.: **FIGURE-5**

08/04/22	Revised as per Slope Stability Setback	1
02/02/22	Issued with Report No. PH4398-REP.01	0
DD/MM/YY	Description	Rev.

Client	<b>SOUTHWELL HOMES LTD.</b>
Project	<b>PROPOSED RESIDENTIAL SUBDIVISION OLD MILL LANE APPLETON, ONTARIO</b>

Scale:	1:2000	Drawn by:	JM
Date:	08/2022	Checked by:	EA
Drawing no.:	<b>PH4398-1(rev.2)</b>		

**LOT DEVELOPMENT PLAN**

**LEGEND:**

- BOREHOLE WITH MONITORING WELL LOCATION
- DESTROYED MONITORING WELL LOCATION
- TEST WELL LOCATION (2015)
- MONITORING WELL LOCATION (BY OTHERS)
- Proposed Well
- Offset

121.79 GROUND SURFACE ELEVATION (m)  
[117.17] BEDROCK SURFACE ELEVATION (m)

SCALE: 1:2000

**DETAIL OF SEWAGE SYSTEM LAYOUT FOR A FULLY-RAISED CONVENTIONAL FILTER MEDIA BED WITH IMPORTED MANTLE**  
N.T.S.

**SEWAGE SYSTEM SIZING CRITERIA**  
HOUSE: 4 BEDROOMS, 300m<sup>2</sup> FINISHED FLOOR AREA, SINGLE FAMILY DWELLING  
DESIGN DAILY SEWAGE FLOW = 3000 L

**FILTER BED SIZING:**  
FILTER MEDIA AREA REQUIRED =  $Q/75 = 3000/75 = 40\text{m}^2$   
EXPANDED BASE REQUIRED  $QT/850 = 3000(50)/850 = 176.5\text{m}^2$   
SAND AREA REQUIRED =  $Q/4 = 3000/4 = 750\text{m}^2$

USE 6 RUNS OF 6m EACH @ 1.0m o/c  
FILTER MEDIA AREA PROVIDED = 44.8m<sup>2</sup>  
EXPANDED BASE AREA PROVIDED = 187.44m<sup>2</sup>  
SAND AREA PROVIDED = 750m<sup>2</sup> min (VARIES)

**NOTE:** SIZING CRITERIA BASED ON AN ABSORPTION DISPERSAL BED USED IN CONJUNCTION WITH A CONJUNCTION WITH A SEPTIC TANK

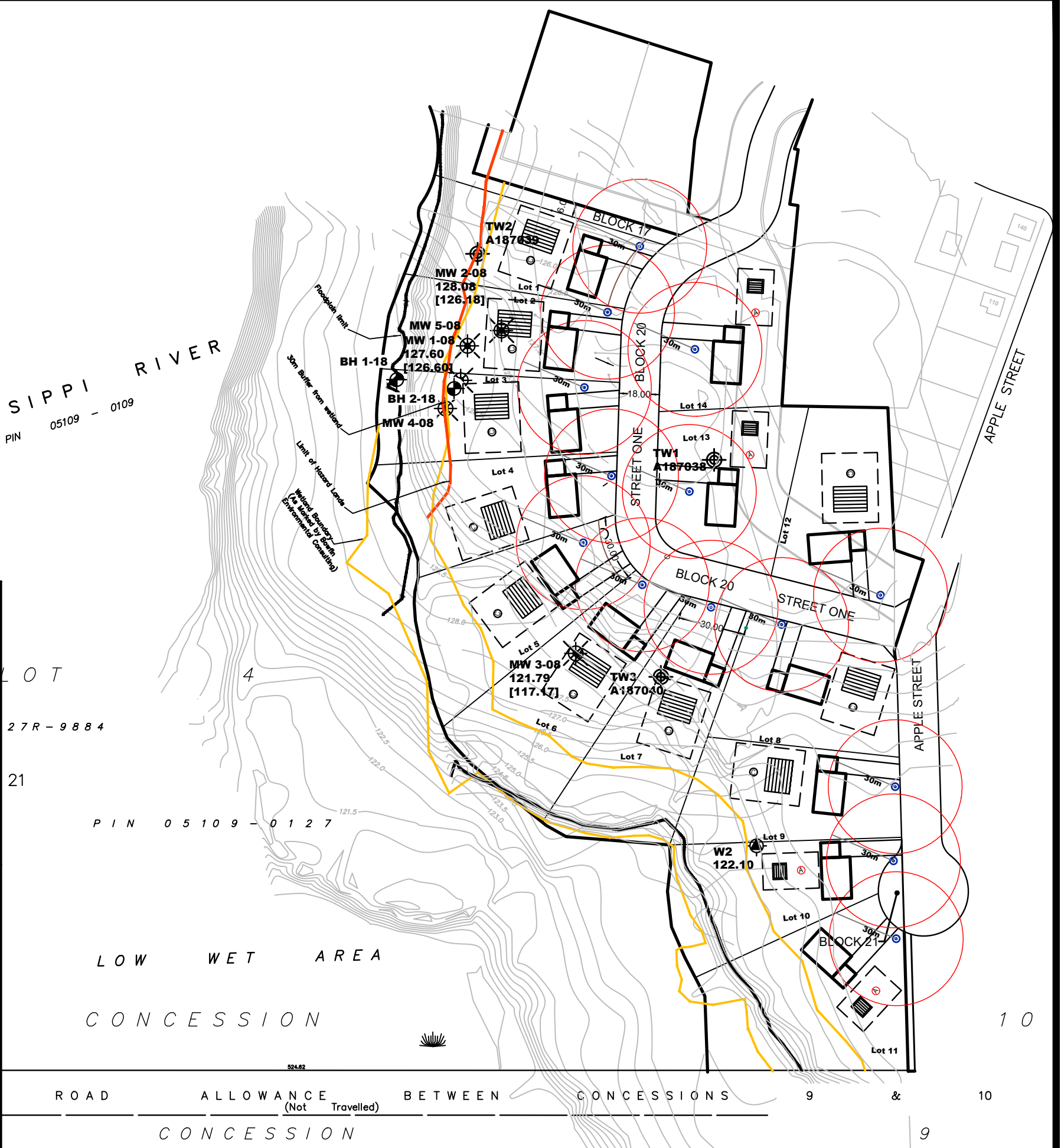
**DETAIL OF SEWAGE SYSTEM LAYOUT FOR A FULLY-RAISED CONVENTIONAL BED WITH IMPORTED MANTLE**  
N.T.S.

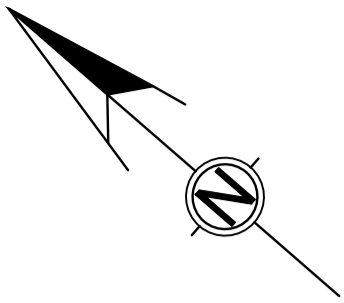
**SEWAGE SYSTEM SIZING CRITERIA**  
HOUSE: 4 BEDROOMS, 300m<sup>2</sup> FINISHED FLOOR AREA, SINGLE FAMILY DWELLING  
DESIGN DAILY SEWAGE FLOW = 3000 L

**CONVENTIONAL LEACHING BED SIZING:**  
LENGTH OF DISTRIBUTION PIPE REQUIRED =  $QT/200 = 3000(8)/200 = 120\text{m}^2$   
SAND AREA REQUIRED =  $Q/4 = 3000/4 = 750\text{m}^2$

USE 8 RUNS OF 15m EACH  
LENGTH OF DISTRIBUTION PIPE PROVIDED = 120m  
SAND AREA PROVIDED = 780m<sup>2</sup>

**NOTE:** SIZING CRITERIA BASED ON AN ABSORPTION TRENCH STYLE LEACHING BED USED IN CONJUNCTION WITH A SEPTIC TANK



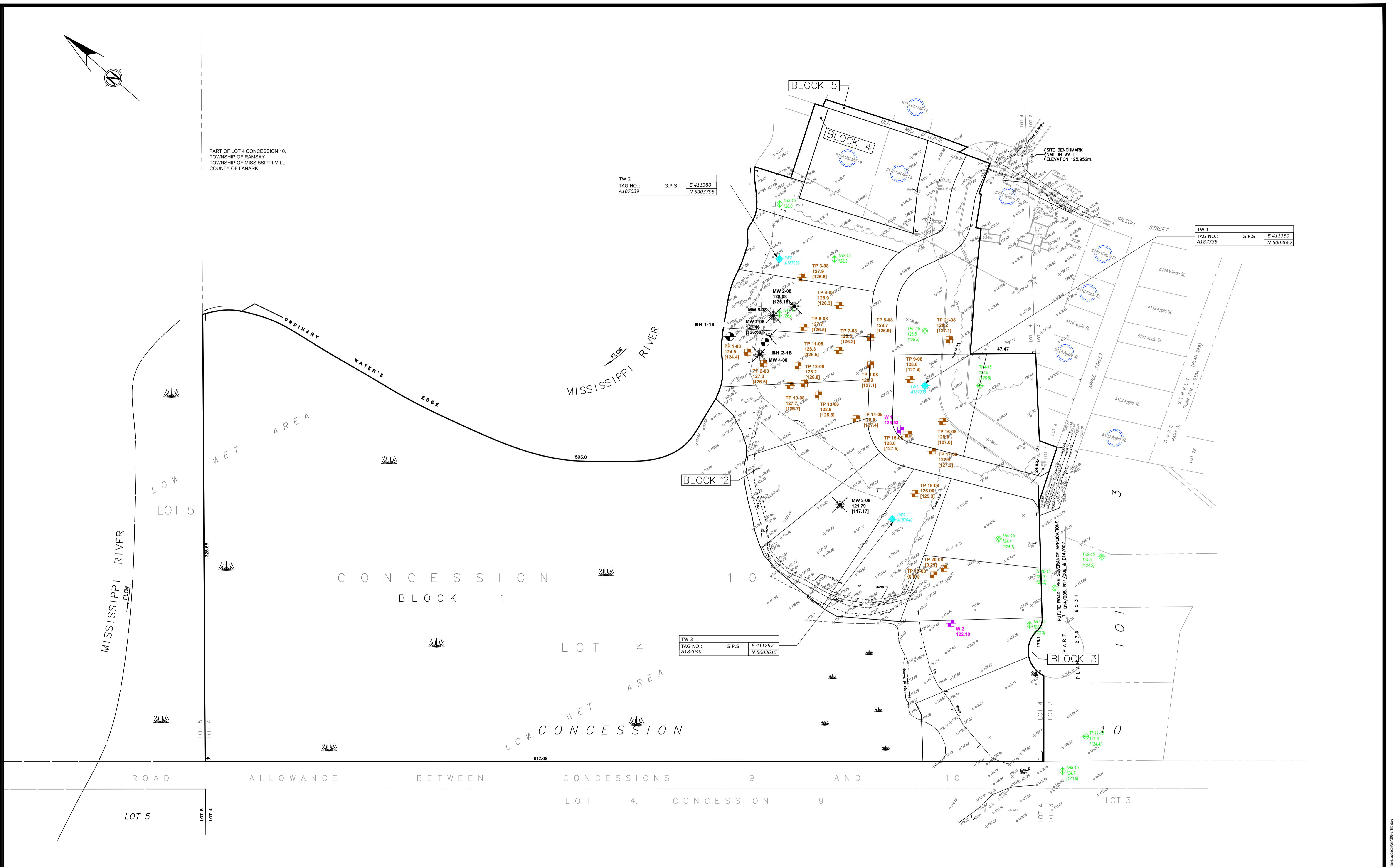


PART OF LOT 4 CONCESSION 10,  
TOWNSHIP OF RAMSAY  
TOWNSHIP OF MISSISSIPPI MILL  
COUNTY OF LANARK

TW 2  
TAG NO.: A187039 G.P.S. E 411380 N 5003798

TW 1  
TAG NO.: A187338 G.P.S. E 411380 N 5003662

TW 3  
TAG NO.: A187040 G.P.S. E 411297 N 5003615



BASE PLAN AND TOPOGRAPHIC INFORMATION PROVIDED BY G.A. SMITH  
SURVEY LTD., REFERENCE No. 14-4119TOPO

**patersongroup**  
consulting engineers

154 Colonnade Road South  
Ottawa, Ontario K2E 7J5  
Tel: (613) 226-7381 Fax: (613) 226-6344

LEGEND:	
	2008 TEST PIT LOCATION
	DESTROYED 2008 MONITORING WELL LOCATION
	MONITORING WELL LOCATION, BY OTHERS
	BOREHOLE WITH MONITORING WELL LOCATION
	2015 TEST WELL LOCATION
	GROUND SURFACE ELEVATION (m)
	[117.17] INFERRED BEDROCK BEDROCK ELEVATION (m)
	{0.25} DEPTH TO BEDROCK (m)
	2015 AUGER HOLE LOCATION
	OFFSITE WELL SAMPLING LOCATION

PROJECT:  
**PROPOSED RESIDENTIAL SUBDIVISION**  
OLD MILL LANE  
APPLETON, ONTARIO

CLIENT:  
**SOUTHWELL HOMES LTD.**

DRAWING:  
**TEST HOLE LOCATION PLAN**



DATE	DESCRIPTION	REV.
11/02/2022	ISSUED WITH REPORT PH4398-REP.01	0

Scale:	1:1250
Checked by:	EA
Approved by:	MK
Drawn by:	HV
Date:	02/2022

FILE No.:	PH4398
Drawing No.:	PH4398-2

Paterson Group Inc. 2022-02-28 10:00 AM