FISHER ENVIRONMENTAL LTD.

ENGINEERING

Professional Engineers Ontario

LABORATORY

CALA
Canadian Association for Laboratory Accreditation Inc.

PHASE II
ENVIRONMENTAL SITE ASSESSMENT

PART OF LOT 18, CONCESSION 2 WHS
CHINGUACOUSY, CALEDON, ONTARIO

Prepared for:

Cedar City Developments

400 Esna Park Drive, Unit 15
Markham, ON
L3R 3K2

Tel: (905) 475-7755
Fax: (905) 475-7718
www.fisherenvironmental.com

Project No. FE-P 17-8080

May 3, 2017

TABLE OF CONTENTS

GLOSSARY OF ACRONYMS

APEC:	Area of Potential Environmental Concern
asl:	Above Sea Level
AST:	Aboveground Storage Tank
BOD:	Biological Oxygen Demand
bgs:	Below Ground Surface
BTEX:	Benzene, Toluene, Ethylbenzene and Xylenes
COD:	Chemical Oxygen Demand
CPC:	Contaminants of Potential Concern
CSA:	Canadian Standards Association
EC:	Electrical Conductivity
ESA:	Environmental Site Assessment
FIP:	Fire Insurance Plan
MECP:	Ministry of the Environment, Conservation and Parks
MOE:	Ministry of the Environment
OHSA:	Occupational Health and Safety Act
PAH:	Polycyclic Aromatic (Polyaromatic) Hydrocarbons
PCA:	Potentially Contaminating Activity
PCB:	Polychlorinated Biphenyls
pH:	potential of Hydrogen
PHC (F1-F4):	Petroleum Hydrocarbons (Fractions 1 to 4)
ppb:	Parts per Billion
ppm:	Parts per Million
RSC:	Record of Site Condition
SAR:	Sodium Adsorption Ratio
UST:	Underground Storage Tank
BTEX:	Volatile Organic Compounds

1. EXECUTIVE SUMMARY

Fisher Environmental Ltd. (Fisher) was commissioned by Cedar City Developments to carry out a Phase II Environmental Site Assessment (ESA) of the property described as Part of Lot 18, Concession 2 WHS (West of Hurontario Street) Chinguacousy, Caledon, Ontario, hereinafter referred to as the "Site". The subsurface soil and groundwater investigation was carried out between March 1 and 20, 2017.

The Site is located at the south portion of the Town of Caledon, at the north side of Mayfield Road. The Site consists of two unattached areas (referred herein as "east portion" and "west portion") with agricultural use, separated by approximately 170 m of agricultural land. The east portion includes an unaddressed property and two addressed properties: 2412 Mayfield Road and 12046 McLaughlin Road. The west portion includes a property addressed 2068 Mayfield Road. The Site has an area of 715,700 m^2.

The Site is legally described as Part of Lot 18, Concession 2 WHS (West of Hurontario Street) Chinguacousy; described as Part 1, 43R30852, Parts 1 & 2, 43R35226, RO700907, and RO53707030; Town of Caledon, Ontario. The Site constitutes all of four (4) PINs: 14252-0941, 14252-0961, 14252-0962 and 14252-0076

Fisher Environmental Ltd. conducted a Phase One ESA at the Site, the report dated April 3, 2017. Based on the records review, documentation of interviews, the following five (5) areas of potential environmental concern (APECs) were identified.

The subsurface soil and groundwater investigation (Phase II ESA) was carried out between March 1 and 20, 2017. Ten (10) boreholes were advanced in the investigated property to depths of up to 7.5 m bgs, and seven (7) of the boreholes were completed as monitoring wells: MW1, MW2, MW3, MW4, MW5, MW8 and MW9, to facilitate groundwater level monitoring and sampling.

The geodetic elevations of static groundwater levels encountered in seven (7) installed monitoring wells and one peizometer ranged from 258.57 m asl in BH10 to 256.935 m asl in MW3. Based on the field measurements, the groundwater flow direction was determined to be southeast.

Soil that was encountered on-Site during borehole drilling program generally consisted of fill materials, , consisting primarily of brown silt and sand soils, with occasional coarse sands, brick

and concrete debris. Native soil was primarily silty sand till, changing to red silt. Red shale bedrock was encountered at six drilling locations.

Eighteen (18) soil samples were submitted to the laboratory for Metals, PHC (F1-F4), BTEX, PAH, pH and/or grain size analysis. Eight (8) groundwater samples were collected from the seven (7) installed groundwater wells, and were submitted to the laboratory for Metals, PHC (F1-F4), PAH and BTEX analysis.

Based on the current subsurface investigation, it is concluded that no evidence of soil and groundwater contamination has occurred at the selected sampling locations. No further investigation is recommended at this time.

2. INTRODUCTION

Fisher Environmental Ltd. (Fisher) conducted a Phase II Environmental Site Assessment (Phase II ESA) of the property described as Part of Lot 18, Concession 2 WHS (West of Hurontario Street) Chinguacousy, Caledon, Ontario, herein referred to as the Site or Phase One ESA Property.

Fisher received authorization to carry out the Phase II ESA from Mr. Steven Sliverberg of Cedar City Developments, whose address is 150 Connie Cres., Unit 4, Concord, Ontario (L4K1L9), and can be contacted at (416) 306-9900.

The current Owners of the Site are Mayfield Station Developments Inc. (PIN 14252-0941), Mayfield McLaughlin Developments Inc. (PINs 14252-0961 & 14252-0076), and Caledon West 25 Inc. (PIN 14252-0962). The subsurface soil and groundwater investigation was carried out between March 1 and 20, 2017.

3. PROPERTY DESCRIPTION

The Site is located at the south portion of the Town of Caledon, at the north side of Mayfield Road. The Site consists of two unattached areas (referred herein as “east portion” and “west portion”) with agricultural use, separated by approximately 170 m of agricultural land. The east portion includes an unaddressed property and two addressed properties: 2412 Mayfield Road and 12046 McLaughlin Road. The west portion includes a property addressed 2068 Mayfield Road. The Site has an area of 715,700 m2.

The Site in situated in a primarily agricultural area, with a few neighbouring residential properties. The east portion is bounded by McLaughlin Road to the east, and primarily agricultural areas to the north, with a portion near the northwest corner bounded by forested areas. The west portion is bounded by primarily agricultural areas to the north and Chinguacousy Road to the west, with a portion near the northwest corner bounded by residential lots. Please refer to Appendix A for Site Location Map.

The Site is legally described as Part of Lot 18, Concession 2 WHS (West of Hurontario Street) Chinguacousy; described as Part 1, 43R30852, Parts 1 & 2, 43R35226, RO700907, and RO53707030; Town of Caledon, Ontario. The Site constitutes all of four (4) PINs: 14252-0941, 14252-0961, 14252-0962 and 14252-0076.

4. EXISTING REPORTS REVIEW

The following previous report was reviewed and used as a source of background information:

TABLE 1: PREVIOUS REPORTS

Report Title	Prepared By/For	Date	Scope and Conclusions
Phase I Environmental Assessment, Part of West Half of Lot 18, Concession 2, Caledon, Ontario	TRY Environmental services Inc. for Laurier Group	May 19, 2010	The report was conducted for the west on-Site portion of the property. The subject property was agricultural land located on the northeast corner of the Chinguacousy Road and Mayfield Road intersection, and encompassing the west half of Lot 18 with the exclusion of three residential dwellings on Chinguacousy Road (not part of current Site). Based on the information gathered and observations made during this investigation, the report revealed no evidence of potential environmental contamination associated with on-site activities.
Phase I Environmental Assessment, 2412 Mayfield Road, Caledon, Ontario	TRY Environmental services Inc. for Laurier Group	June 17, 2010	The report was conducted for the on-Site portion of the property formerly addressed 2412 Mayfield Road. The subject property was occupied by a residential house and farm at the time of the investigation. Based on the information gathered and observations made during this investigation, the report revealed evidence of potential environmental contamination associated with on-site activities. Identification of potential environmental contamination was based on the presence of an underground storage tank (UST) located at the exterior area of the residential dwelling and formerly utilized for fuel storage, approximately 10 years from the time of the report, and an aboveground storage tank (AST) which stored heating oil, and was also located near the residential dwelling. Additionally, an AST containing diesel and three (3) empty ASTs were observed at the exterior of the barn at the east side of the subject property. It was recommended the UST be decommissioned.

Report Title	Prepared By/For	Date	Scope and Conclusions
Phase I Environmental Assessment, Vacant Land Described As: Part of Lot 18, Concession 2, WHS, Caledon, Ontario	TRY Environmental services Inc. for Laurier Group	July 22, 2011	The report was conducted for the east-centre on-Site portion of the property. The subject property was agricultural land located on the north side of Mayfield Road, and comprised of agricultural land. Based on the information gathered and observations made during this investigation, the report revealed no evidence of potential environmental contamination associated with on-site activities.
Phase I Environmental Assessment, 12046 McLaughlin Road, Caledon, Ontario	TRY Environmental services Inc. for Laurier Group	January 15, 2016	The report was conducted for the on-Site portion of the property formerly addressed 12046 McLaughlin Road. The subject property was occupied by a residential house at the time of the investigation. Based on the information gathered and observations made during this investigation, the report revealed evidence of potential environmental contamination associated with on-site activities. Identification of potential environmental contamination was based on the presence of a former aboveground storage tank (AST) which used to store furnace oil, located in the basement of the residential dwelling. A Phase II ESA was not recommended.
Phase One Environmental Site Assessment, Part of Lot 18, Concession 2 (W.H.S.), Caledon, ON	Fisher Environmental Ltd.	April 3, 2017	The scope of work included records review, interviews, site reconnaissance, review and evaluation of information collected, preparation of tables with Current and Past Uses of the Site and Areas of Potential Environmental Concern (APECs), a Conceptual Site Model (CSM), preparation of a written report with conclusions and recommendations. Based on the records review, documentation of interviews, the following five (5) APECs were identified: APEC A – The APEC constitutes an area that historically contained, based on two (2) existing Phase I ESA reports, four (4) ASTs and one UST, and a nearby season water channel (transport pathway). Limited information regarding their

Report Title	Prepared By/For	Date	Scope and Conclusions
			operation dates, construction, frequency of usage and precise location was available within the reports. No other reviewed record revealed information associated with the tanks' existence and operation. No tank decommissioning reports and, potentially, remediation reports, were available for review. APEC B – The APEC constitutes an area that historically contained multiple buildings and sheds (a total of five structures), based on aerial photographs. All buildings were decommissioned in 2012 based on an interview with the Owners' representative. No records associated with the structures' decommissioning were available for review. It is anticipated, based on the current understanding of surficial geology and hydrogeology at the location of the APEC, that groundwater will not be impacted by contaminants within fill materials unless the fill comes in direct contact with groundwater to facilitate leaching of contaminants, which is not expected to be the case. APEC C – The APEC constitutes an area that historically contained, based on an existing Phase I ESA report, one AST. Limited information regarding the operation dates, construction, frequency of usage and precise location for the tank was available within the report. No other reviewed record revealed information associated with the tank's existence and operation. No tank decommissioning report and, potentially, remediation reports, were available for review. APEC D – The APEC constitutes an area that historically contained a building based on aerial photographs. The building was decommissioning in 2016 based on an interview with the Owners' representative, and the building footprint based on the infill area was evident during the Site visit for this investigation. No records associated with the building's decommissioning were available for review. It is anticipated, based on the current understanding of surficial geology and hydrogeology at the location of the APEC, that

Report Title	Prepared By/For	Date	Scope and Conclusions
			groundwater will not be impacted by contaminants within fill materials unless the fill comes in direct contact with groundwater to facilitate leaching of contaminants, which is not expected to be the case. APEC E – The APEC constitutes an area that historically contained a building based on aerial photographs. The building was decommissioning between 1965 and 2009. No records associated with the building's decommissioning were available for review. It is anticipated, based on the current understanding of surficial geology and hydrogeology at the location of the APEC, that groundwater will not be impacted by contaminants within fill materials unless the fill comes in direct contact with groundwater to facilitate leaching of contaminants, which is not expected to be the case.

5. SCOPE OF WORK

The current Phase II ESA was conducted in partial accordance with O.Reg. 153/04 maintained by the MECP, and in accordance with the CAN/CSA-Z769-00 standards, as published in March 2000 and reaffirmed in 2013, by the CSA Group.

A Phase II ESA involves sampling and testing of materials considered, usually by the outcome of a Phase I ESA or other investigation, to be possible instances of environmental contamination. The project, as carried out, fulfills the scope of a "Reconnaissance" type investigation in which conditions are previously unknown, and the aim is to establish whether any environmental contamination is present. Normal environmental assessment protocol reserves a detailed investigation for a subsequent phase if the reconnaissance survey indicates a requirement for further contaminant delineation.

The scope of this work generally consisted of the following:

- **Field Program -** Clearance of underground utilities and advancement of ten (10) boreholes to depths of up to 7.5 m or resistance, and installation of seven (7) groundwater monitoring wells.

- **Laboratory Testing Program -** Recovery and analysis of selected soil and groundwater samples for Metals, PHC (F1-F4), BTEX, PAH, pH and/or Grain Size distribution.

- **Data Evaluation -** Comparison of results of chemical analyses with the applicable MOE (currently MECP) Standards.

- **Reporting -** Provision of final engineering report detailing findings of performed works, and any further recommendations.

As conducted, the present investigation may lack information or analytical work that are specific requirements for filing a Record of Site Condition (RSC) under Part XV.1 of the EPA and Amended O. Reg. 153/04, therefore, if a RSC is necessary, the property owner or its agent should undertake complementary investigations required under the RSC filing process.

6. FIELD PROGRAM

The subsurface soil and groundwater investigation (Phase II ESA) was carried out between March 1 and 20, 2017. The field work was conducted by Arij Alam of Fisher Environmental Ltd. who directed drilling and sampling operations, and assured proper chain of custody procedures for the recovered soil and groundwater samples.

Ten (10) boreholes were advanced in the investigated property to depths of up to 7.5 m bgs, and seven (7) of the boreholes were completed as monitoring wells: MW1, MW2, MW3, MW4, MW5, MW8 and MW9, to facilitate groundwater level monitoring and sampling.

6.1. Site Preparation

Site preparation included the location of public and private underground services by referring to the respective utilities: hydro, gas, water, sewer and light cables to avoid potential disruptions to the utilities during the drilling. Soil drilling was conducted following receipt of clearance from all utilities for the given borehole locations.

6.2. Boreholes, Soil and Groundwater Sampling

The borehole locations were selected by an initial rationale as being the most likely locations of contamination. Refer to the attached Site Plans with borehole and monitoring well locations, attached as Appendix A.

Exterior borehole drilling was carried out using a Diedrich D-50 or CME-55 drilling rig. The boreholes were extended to depths of up to 7.5 m, at which point native material had been reached.

Fisher retains Fisher Drilling as our drilling contractor. Fisher Drilling maintains licensure for drilling (Water Well Drillers, Environmental Protection Act, Well Contractor License No. 6946) as required by the MOE, and conducted drilling and soil sampling works in accordance with CSA Standard Z769-00 (reaffirmed in 2013) and the Ontario Ministry of Environment and Energy (MOEE, currently MECP) “Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario”, December 1996, and in compliance with Occupational Health and Safety regulations.

The intrusive subsurface investigation was conducted by means of solid stem auger boreholes advancement through the subsoil, and a 50 mm diameter spoon sampler driven 600 mm into subsoil by a 65 kg hammer, falling 760 mm, collecting soil samples at a maximum of 0.76 m interval and at stratigraphic boundaries.

Soil and groundwater samples were collected and handled in accordance with generally accepted sampling and handling procedures used by the environmental consulting industry. For guidance, these practices rely on the 1996 MOEE publication “Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario”. To minimize the potential for cross contamination between soil samples, the split spoon sampler used to collect soil samples from the boreholes was brushed clean of soil and then washed in municipal water containing phosphate free detergent, rinsed in municipal water and then rinsed with distilled water. As well, new disposable nitrile gloves and stainless-steel spatula were used during each sampling event to remove the soil cores from the sampler and to transfer the samples into plastic bags and/or glass jars.

Through each soil sample, the lithology and esthetic evidence of impacts (debris, staining and odours) were recorded as part of field quality control (QC) procedures. Additionally each sample was screened in the field for headspace vapour concentration (combustible soil vapour and total organic vapour) using the 10.6 eV lamp MiniRae 2000 PID calibrated to 100 ppm Isobutylene. The samples were kept out of direct sunlight during field storage and the headspace measurements were made after at least two hours had elapsed since the sample *was bagged and the sample had* reached a minimum temperature of 15ºC. The headspace monitoring was performed on the samples as a preliminary screening for analysis.

Selection of samples to be submitted for laboratory analysis are based on the headspace vapour concentration, physical evidence of odours/ staining, apparent water table and/or proximity to potential contaminant sources. If no odours/staining are noted in the soil samples, the samples with the highest field screening measurement (i.e. highest headspace vapour concentration) are selected for laboratory analysis. Soil samples from the boreholes selected for potential chemical analysis of organic parameters were placed directly into laboratory supplied glass jars at the time of sampling, labeled and packed with minimal headspace. Samples were kept in coolers provided with cold packs during field storage and transportation to Fisher Environmental Laboratories for analysis.

Two (2) field duplicate soil sample had been submitted to the lab for analysis for quality assurance/ quality control (QA/QC) purposes.

Following sampling, monitoring wells were installed in seven (7) boreholes, in accordance to O. Reg. 903.

6.3. Monitoring Wells Program

Seven (7) monitoring wells were installed on the subject property. A peizometer was also placed at BH10. The wells were constructed of 52 mm ID diameter PVC pipes, which were pre-cleaned at the factory and delivered to the Site in sealed plastic bags. Further construction details of the monitoring wells are provided on the “Log of Boreholes” attached in Appendix B.

Groundwater sampling in the installed monitoring wells was conducted using the Low Flow sampling procedure (USEPA EQASOP-GW 001). The Flow-Through Cell is connected through a 5/8 in ID HDPE tubing to a stainless steel Mini-Monsoon submersible pump. Sampling progressed at the Site from the well that was expected to be least contaminated to the well that was expected to be most contaminated to minimize the potential for cross-contamination.

Laboratory supplied sample containers were used to collect groundwater samples which were labeled, stored in coolers provided with cold packs during field storage and transportation to Fisher Environmental Laboratories for analysis.

One (1) travel blank and one (1) field duplicate groundwater sample have been submitted to the lab for analysis for QA/QC purposes.

Groundwater static level measurement was conducted prior to sampling. The groundwater static level measurements are summarized in Table 2 below.

TABLE 2: GROUNDWATER STATIC LEVEL MEASUREMENTS

Location	Well Depth, m bgs	Groundwater Static Level, m bgs (March 17-20, 2017)	Ground Geodetic Elevation, m asl	Groundwater Relative Elevation, m asl
MW1	5.21	2.03	259.170	257.140
MW2	5.98	1.54	258.775	257.235
MW3	5.95	1.97	258.905	256.935
MW4	6.75	1.33	258.380	257.050
MW5	5.57	1.19	258.130	256.940
MW8	5.22	2.28	259.390	257.110
MW9	4.57	1.98	259.070	257.090
BH10	NA	0.77	259.340	258.570

The ground geodetic elevations were established using the benchmark “Catch Basin along Mayfield Road”, as having an elevation of 259.00 m asl, as determined by Google Earth.

Groundwater generally flows from areas of high hydraulic head towards areas of low hydraulic head. To assess the direction of groundwater movement, the hydraulic head is measured at each well location. This is accomplished by taking water level measurements and referencing them to a known benchmark to determine their elevation. Water level measurements having higher elevations suggest greater hydraulic head. Conversely, lower elevations of the water table are indicative of a lesser hydraulic head.

The geodetic elevations of static groundwater levels encountered in seven (7) installed monitoring wells and one peizometer ranged from 258.57 m asl in BH10 to 256.935 m asl in MW3. The groundwater level in the overburden is subject to seasonal variations. Based on the field measurements, the groundwater flow direction was determined to be southeast.

Refer to Figure 3 for a groundwater flow plan.

The localized shallow groundwater flow direction may be influenced by the presence of underground utilities, building foundation, variations in vertical and horizontal stratigraphy, depth of wells' screened intervals and/or well trauma.

6.4. Site Topography and Geology

The surficial geology encountered at the Phase Two property during boreholes drilling was found to correspond to the general geology in the area characterized as Till: Clay to silt-textured till (derived from glaciolacustrine deposits or shale). Soils stratigraphy descriptions obtained from a review of MOECC Well Records available for the Site indicated that the overburden consisted of brown/red, changing to grey, clay, with occasional sand and silty sand seams.

Bedrock geology in the area was characterized as Queenston Formation: Shale, limestone, dolostone, siltstone. Bedrock descriptions obtained from a review of MOECC Well Records available for the phase one study area, and assessed for accuracy by comparison with regional bedrock information, indicated that blue shale was encountered from 19.2 m below grade.

The site stratigraphy noted during boreholes drilling generally consisted of the following:

Unit 1

Fill materials, consisting primarily of brown silt and sand soils, with occasional coarse sands, brick and concrete debris. Maximum observable depth of fill materials from surface was encountered between depths of approximately 0.6 m and 2.1 m below ground surface (bgs).

Unit 2

Native soil underlying the fill materials consisted primarily of silty sand till, with occasional coarse sand, clay and gravel, encountered to depths between 4.2 m and 5.3 m bgs.

Unit 3

The grey silty sand till was underlain by red silt, hard, dry, encountered in five (5) of the eight (8) deeper boreholes, to depths between 5.9 and 7.5 m bgs, transitioning to the red shale bedrock.

The red shale bedrock was encountered in six (6) of the eight (8) deeper boreholes at the Site, to depths between 6.1 and 6.4 m bgs.

Geologic cross-sections based on Site boreholes are presented in Figures 5 and 6 (Phase Two CSM Figures).

The geodetic elevations of static groundwater levels encountered in seven (7) installed monitoring wells and one peizometer ranged from 258.57 m asl in BH10 to 256.935 m asl in MW3. The groundwater level in the overburden is subject to seasonal variations. Based on the field measurements, the groundwater flow direction was determined to be southeast.

The regional and Site hydrogeological conditions indicate a typical range of hydraulic conductivity for the encountered overburden soils of 10-4 – 10-6 cm/sec.

A description of the subsurface conditions encountered at the boreholes locations is presented in Appendix B - Log of Boreholes.

6.5. Head Space Combustible Vapours

A 10.6 eV lamp MiniRae 2000 PID calibrated to 100 ppm Isobutylene was used to measure combustible vapours in the soil samples. Vapour concentrations were read during the soil sampling and all soil samples had concentrations of 10 ppm or less.

6.6. Visual Olfactory Soil / Groundwater Quality

During the borehole-drilling program, the following visual/olfactory observations were made:

- No odours were noted in any collected soil or groundwater samples.
- No free product, film or sheen was observed on the surface of groundwater collected from any of the installed monitoring wells.

6.7. Selection of Analytical Samples and Parameters

Selection of samples for environmental analysis was based on appearance, headspace vapour concentrations, odour, expectations of Site conditions, and proximity of potential contaminant sources.

Eighteen (18) soil samples were submitted to the laboratory for Metals, PHC (F1-F4), BTEX, PAH, pH and/or grain size analysis. Eight (8) groundwater samples were collected from the seven (7) installed groundwater wells, and were submitted to the laboratory for Metals, PHC (F1-F4), PAH and BTEX analysis. Two travel blanks for water were also submitted for BTEX.

TABLE 3: RATIONALE FOR ANALYTICAL PARAMETER

Parameter	Description
Metals	Various metallic elements can cause adverse environmental effects at relatively low concentrations. Such metals are associated with industrial activities and/or the use of fill materials of unknown quality, both historic and current, and it is common practice to include Metals analysis in subsurface soil investigations.
PHC(F1-F4)	PHC are components of gasoline, diesel and other petroleum products for which soil quality guidelines have been developed. These compounds are widely utilized and often included in the evaluation of a Site's overall subsurface condition. PHCs include BTEX analysis.
PAH	PAH are associated with coal and furnace ash, and/or the use of fill materials of unknown quality.
pH	Soil pH is referred to as the "acidity" of the soil. When the soil pH is too "acid" (low pH) or too "alkaline" (high pH), nutrients present in the soil become locked-up or unavailable.

7. LABORATORY PROGRAM

7.1. General

Recovered soil and groundwater samples were submitted to Fisher Environmental Laboratories for analysis. As a Canadian Association for Laboratory Accreditation (CALA) registered analytical facility, QA/QC procedures were maintained consistent with CALA requirements and standard laboratory practices. The laboratories ensured that analytical sub-samples were, by appearance, representative of the whole sample as collected in the field.

7.2. Data Evaluation

7.2.1. Soil and Groundwater Standards

In view of the fact that the Site and other properties located within 250 m of the boundaries of the Site potentially utilize groundwater wells, potable Site Condition Standards (Table 2 SCS) are applied to the Site.

Fisher submitted three (3) representative soil samples for grain size analysis to the laboratory, all of which revealed a medium to fine textured soil condition. In accordance with Section 41 of the regulation, the Site is not an environmentally sensitive area. The Site is not a shallow soil property as defined in Section 43.1 of the regulation; nor does it include all or part of a water body or is adjacent to a water body or includes land that is within 30 metres of a water body.

Soil pH samples collected from the Site were also within the acceptable range of surficial and/or subsurface soil for the application of MOECC SCS.

Currently, the on-Site property use is agricultural; however the Site is proposed to be utilized residentially in the future. No plans for the envisioned development have been provided to Fisher.

For the purpose of this Phase Two ESA CSM, the applicable SCS were identified as the MOECC Table 2 Full Depth Generic Site Condition Standards in a Potable Groundwater Condition, Residential/ Parkland/Institutional Property Use for soil samples, and All Types of Property Use for groundwater samples, in medium to fine textured soil.

7.2.2. Soil and Groundwater Quality

Eighteen (18) soil and eight (8) groundwater samples were submitted to the laboratory for Metals, PHC (F1-F4), BTEX, PAH, pH and/or grain size analysis. A copy of the Laboratory Certificates of Analysis is provided in Appendix C.

All submitted soil and groundwater samples were within applicable Table 2 Full Depth Generic Site Condition Standards in a Potable Groundwater Condition, Residential/ Parkland/Institutional Property Use for soil samples, and All Types of Property Use for groundwater samples, in medium to fine textured soil.

Site plans with results of analysis are provided in Appendix A, as Figures 4-A and 4-B.

Results of the chemical analyses are summarized in Section 9, Soil Analysis Summary Tables.

7.3. Quality Assurance/Quality Control

A chain of custody form was filled out for all samples prior to submitting to the laboratory. The chain of custody documented movement from selection of the sample to receipt at the laboratory and provided sample identification, requested analysis, and condition of samples upon arrival at the laboratory.

The laboratory checks randomly selected samples for Quality Assurance. Generally, one sample for every twenty samples submitted is selected for Quality Assurance checks. For each parameter, there is an acceptable upper and lower limit for the measured concentration of the parameter. Measured concentrations of analyzed samples must fall within the upper and lower

acceptable limits in order for the sample to be valid. If the result exceeds the upper or lower acceptable limits, the sample must be re-analyzed.

Based on Quality Assurance Reports provided by Fisher Environmental Laboratories, measured concentrations in soil samples were within the acceptable limits for quality control. Copies of the QA/QC Reports for Metals, PHC (F1-F4), PAH, BTEX and pH in soil and groundwater are included with the Certificates of Analysis in Appendix C.

8. SUMMARY AND CONCLUSIONS

Based on the current subsurface investigation, it is concluded that no evidence of soil and groundwater contamination has occurred at the selected sampling locations. No further investigation is recommended at this time.

9. SUMMARY TABLES

The following Tables summarize the findings of the Phase II ESA.

Table 1 – Monitoring Wells Construction & Groundwater Levels

Monitoring Well ID	Ground Elevation (m asl)	Well Depth (m bgs)	Well Construction below ground surface (bgs)	Groundwater Static Level – December 21, 2012 (m bgs)	LNAPL or DNAPL Thickness (m)	Ground Water Static Level Elevation, (m asl)
MW1	259.170	5.21	Screen: 2.21 –5.21 m, 20 slot, 2" ID PVC Riser: 0.10 – 2.21 m, 2" ID PVC Sandpack: 1.61 – 5.21 m, #3 sand silica Bentonite: 0.30 – 1.61 m, ¾" pellets Concrete: 0.20 – 0.30 m	2.03	ND	257.140
MW2	258.775	5.98	Screen: 2.98 – 5.98 m, 20 slot, 2" ID PVC Riser: 0.10 – 2.98 m, 2" ID PVC Sandpack: 2.38 – 5.98 m, #3 sand silica Bentonite: 0.30 – 2.38 m, ¾" pellets Concrete: 0.20 – 0.30 m	1.54	ND	257.235
MW3	258.905	5.95	Screen: 2.95 – 5.95 m, 20 slot, 2" ID PVC Riser: 0.10 – 2.95 m, 2" ID PVC Sandpack: 2.35 – 5.95 m, #3 sand silica Bentonite: 0.30 – 2.35 m, ¾" pellets Concrete: 0.20 – 0.30 m	1.97	ND	256.935
MW4	258.380	6.75	Screen: 3.75 – 6.75 m, 20 slot, 2" ID PVC Riser: 0.10 – 3.75 m, 2" ID PVC Sandpack: 3.15 – 6.75 m, #3 sand silica Bentonite: 0.30 – 3.15 m, ¾" pellets Concrete: 0.20 – 0.30 m	1.33	ND	257.050
MW5	258.130	5.57	Screen: 2.57 – 5.57 m, 20 slot, 2" ID PVC Riser: 0.10 – 2.57 m, 2" ID PVC Sandpack: 1.97 – 5.57 m, #3 sand silica Bentonite: 0.30 – 1.97 m, ¾" pellets Concrete: 0.20 – 0.30 m	1.19	ND	256.940

Notes:

The ground geodetic elevations were established using the benchmark 'catch basin along Mayfield Road" as datum having a geodetic elevation of 259.0 m asl.

LNAPL and DNAPL – light or dense non-aqueous phase liquid measurements at or under the phase two property.

ND – not detected.

Table 1 – Monitoring Wells Construction & Groundwater Levels

Monitoring Well ID	Ground Elevation (m asl)	Well Depth (m bgs)	Well Construction below ground surface (bgs)	Groundwater Static Level – December 21, 2012 (m bgs)	LNAPL or DNAPL Thickness (m)	Ground Water Static Level Elevation, (m asl)
MW8	259.390	5.22	Screen: 2.22 –5.22 m, 20 slot, 2" ID PVC Riser: 0.10 – 2.21 m, 2" ID PVC Sandpack: 1.61 – 5.21 m, #3 sand silica Bentonite: 0.30 – 1.61 m, ¾" pellets Concrete: 0.20 – 0.30 m	2.28	ND	257.110
MW9	259.070	4.57	Screen: 1.57 – 4.57 m, 20 slot, 2" ID PVC Riser: 0.10 – 1.57 m, 2" ID PVC Sandpack: 0.97 – 4.57 m, #3 sand silica Bentonite: 0.30 – 0.97 m, ¾" pellets Concrete: 0.20 – 0.30 m	1.98	ND	257.090

Notes:

The ground geodetic elevations were established using the benchmark 'catch basin along Mayfield Road" as datum having a geodetic elevation of 259.0 m asl.

LNAPL and DNAPL – light or dense non-aqueous phase liquid measurements at or under the phase two property.

ND – not detected.

Table 2 – Summary of Soil Samples Submitted for Chemical Analysis

Sample I.D.	Sample Depth (m bgs)	Parameter Analyzed
MW1 17-5863-1/2	0.75-1.35	Metals, PHC(F1-F4), PAH, BTEX
MW1 17-5863-3/4	3.00-3.60	Metals, PHC(F1-F4), PAH, BTEX, pH
MW2 17-5863-5	0.00-0.60	Metals, PHC(F1-F4), PAH, BTEX
MW2 17-5863-6	4.55-5.15	Metals, PHC(F1-F4), PAH, BTEX
MW3 17-5863-7	4.55-5.15	PHC(F1-F4), BTEX
MW4 17-5863-8	4.55-5.15	PHC(F1-F4), BTEX, pH
MW5 17-5863-9	4.55-5.15	PHC(F1-F4), BTEX
BH6 17-5863-10	1.50-2.10	Metals, PHC(F1-F4), PAH, BTEX
BH7 17-5863-11	0.75-1.35	Metals, PHC(F1-F4), PAH, BTEX
MW8 17-5863-12	1.50-2.10	Metals, PHC(F1-F4), PAH, VOC BTEX
MW8 17-5863-13	4.55-5.15	Metals, PHC(F1-F4), PAH, BTEX, pH
MW9 17-5863-14	0.00-0.60	Metals, PHC (F1-F4), PAH
MW9 17-5863-15	4.55-5.15	Metals, PHC(F1-F4), PAH, BTEX
BH10 17-5863-16	0.75-1.35	Metals, PHC (F1-F4), PAH
BH11 17-5863-17	0.00-0.60	Metals, PHC (F1-F4), PAH, pH
BH12 17-5863-18	0.00-0.60	Metals, PHC (F1-F4), PAH

Table 3: Soil Quality Data – Metals Analysis

Sample Location			MW1	MW1 Duplicate	MW1	MW1 Duplicate	MW2
Laboratory ID			17-5863-1	17-5863-2	17-5863-3	17-5863-4	17-5863-5
Sample Depth (m)			0.75-1.35m	0.75-1.35m	3.00-3.60m	3.00-3.60m	0,00-0.60m
Sampling Date			1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017
Parameters	**2011 Table 2 SCS**	**RDL**					
Barium	390	5	29	30	53	44	55
Beryllium	(5) 4	2	<2	<2	<2	<2	<2
Boron	120	5	<5	<5	<5	5.1	<5
Cadmium	1.2	1	<1	<1	<1	<1	<1
Chromium	160	5	10	10	13	12	14
Cobalt	22	2	6.9	6.3	7.6	7	8.9
Copper	(180) 140	5	21	17	21	21	14
Lead	120	10	<10	<10	<10	<10	11
Molybdenum	6.9	2	<2	<2	<2	<2	<2
Nickel	(130) 100	5	15	14	14	14	14
Silver	(25) 20	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium	1	1	<1	<1	<1	<1	<1
Uranium	23	1	<1	<1	<1	<1	<1
Vanadium	86	10	16	16	18	18	26
Zinc	340	30	33	<30	37	39	44

Notes:

Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/g (ppm) dry weight basis, unless otherwise noted.
ppm - means parts per million.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

FISHER ENVIRONMENTAL LTD.

Sample Location			MW2	BH6	BH7	MW8	MW8
Laboratory ID			17-5863-6	17-5863-10	17-5863-11	17-5863-12	17-5863-13
Sample Depth (m)			4.55-5.15	1.50-2.10	0.75-1.35	1.50-2.10	4.55-5.15
Sampling Date			1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017
Parameters	**2011 Table 3 SCS**	**RDL**					
Barium	390	5	72	66	71	61	161
Beryllium	(5) 4	2	<2	<2	<2	<2	<2
Boron	120	5	12	5.5	<5	7.2	18
Cadmium	1.2	1	<1	<1	<1	<1	<1
Chromium	160	5	13	12	16	13	14
Cobalt	22	2	9.6	8.8	11	8	8.1
Copper	(180) 140	5	8.6	34	24	20	6.9
Lead	120	10	11	11	13	<10	12
Molybdenum	6.9	2	<2	<2	<2	<2	<2
Nickel	(130) 100	5	20	17	16	18	19
Silver	(25) 20	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium	1	1	<1	<1	<1	<1	<1
Uranium	23	1	<1	<1	<1	<1	<1
Vanadium	86	10	20	19	26	22	22
Zinc	340	30	45	48	51	43	44

Notes:

Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/g (ppm) dry weight basis, unless otherwise noted.
ppm - means parts per million.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

FISHER ENVIRONMENTAL LTD.

Sample Location			MW9	MW9	BH10	BH11	BH12
Laboratory ID			17-5863-14	17-5863-15	17-5863-16	17-5863-17	17-5863-18
Sample Depth (m)			0.00-0.60m	4.55-5.15m	0.75-1.35m	0.00-0.60m	0.00-0.60m
Sampling Date			1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017
Parameters	**2011 Table 2 SCS**	**RDL**					
Barium	390	5	67	78	65	57	59
Beryllium	(5) 4	2	<2	<2	<2	<2	<2
Boron	120	5	<5	12	<5	<5	<5
Cadmium	1.2	1	<1	<1	<1	<1	<1
Chromium	160	5	14	17	16	14	12
Cobalt	22	2	7.4	10	9.9	8.9	6.5
Copper	(180) 140	5	24	18	28	14	22
Lead	120	10	16	11	<10	12	<10
Molybdenum	6.9	2	<2	<2	<2	<2	<2
Nickel	(130) 100	5	14	21	19	13	16
Silver	(25) 20	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium	1	1	<1	<1	<1	<1	<1
Uranium	23	1	<1	<1	<1	<1	<1
Vanadium	86	10	23	24	25	24	20
Zinc	340	30	68	107	55	34	34

Notes:

Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/g (ppm) dry weight basis, unless otherwise noted.
ppm - means parts per million.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

FISHER ENVIRONMENTAL LTD.

Table 4: Soil Quality Data – Hydride-Forming Metals Analysis

Sample Location			MW1	MW1 Duplicate	MW1	MW1 Duplicate	MW2
Laboratory ID			17-5863-1	17-5863-2	17-5863-3	17-5863-4	17-5863-5
Sample Depth (m)			0.75-1.35m	0.75-1.35m	3.00-3.60m	3.00-3.60m	0,00-0.60m
Sampling Date			1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017
Parameters	2011 Table 2 SCS	RDL					
Antimony	7.5	1	<1	<1	<1	<1	<1
Arsenic	18	1	4.4	4.2	4.1	3.9	5.1
Selenium	2.4	1	<1	<1	<1	<1	<1

Notes:

Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/g (ppm) dry weight basis, unless otherwise noted.
ppm - means parts per million.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

Sample Location			MW2	BH6	BH7	MW8	MW8
Laboratory ID			17-5863-6	17-5863-10	17-5863-11	17-5863-12	17-5863-13
Sample Depth (m)			4.55-5.15	1.50-2.10	0.75-1.35	1.50-2.10	4.55-5.15
Sampling Date			1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017
Parameters	2011 Table 2 SCS	RDL					
Antimony	7.5	1	<1	<1	<1	<1	<1
Arsenic	18	1	2.8	4.1	3.6	4.9	4.1
Selenium	2.4	1	<1	<1	<1	<1	<1

Notes:

Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/g (ppm) dry weight basis, unless otherwise noted.
ppm - means parts per million.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

Sample Location			MW9	MW9	BH10	BH11	BH12
Laboratory ID			17-5863-14	17-5863-15	17-5863-16	17-5863-17	17-5863-18
Sample Depth (m)			0.00-0.60m	4.55-5.15m	0.75-1.35m	0.00-0.60m	0.00-0.60m
Sampling Date			1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017
Parameters	2011 Table 2 SCS	RDL					
Antimony	7.5	1	<1	<1	<1	<1	<1
Arsenic	18	1	6	4.3	6.3	4.1	4.9
Selenium	2.4	1	<1	<1	<1	<1	<1

Notes:

Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/g (ppm) dry weight basis, unless otherwise noted.
ppm - means parts per million.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

Table 5: Soil Quality Data – PHC (F1-F4) Analysis

Sample Location			MW1	MW1 Duplicate	MW1	MW1 Duplicate	MW2
Laboratory ID			17-5863-1	17-5863-2	17-5863-3	17-5863-4	17-5863-5
Sample Depth (m)			0.75-1.35m	0.75-1.35m	3.00-3.60m	3.00-3.60m	0,00-0.60m
Sampling Date			1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017
Parameters	**2011 Table 2 SCS**	**RDL**					
BTEX in Soil							
Benzene	(0.17) 0.21	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	(6) 2.3	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	(1.6) 1.1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenes	(25) 3.1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PHCs (F1-F4) in Soil							
$F1_{-BTEX}$ (C_6 - C_{10})	(65) 55	10	<10	<10	<10	<10	<10
F2 (C_{10} - C_{16})	(150) 98	10	<10	<10	<10	<10	<10
F3 (C_{16} - C_{34})	(1300) 300	50	<50	<50	70	<50	<50
F4 (C_{34}-C_{50})	(5600) 2800	50	<50	<50	<50	<50	<50

Notes:

Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/g (ppm) dry weight basis, unless otherwise noted.
ppm - means parts per million.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

Sample Location			MW2	MW3	MW4	MW5	BH6
Laboratory ID			17-5863-6	17-5863-7	17-5863-8	17-5863-9	17-5863-10
Sample Depth (m)			4.55-5.15	4.55-5.15m	4.55-5.15m	4.55-5.15m	1.50-2.10
Sampling Date			1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017
Parameters	**2011 Table 2 SCS**	**RDL**					
BTEX in Soil							
Benzene	(0.17) 0.21	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	(6) 2.3	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	(1.6) 1.1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenes	(25) 3.1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PHCs (F1-F4) in Soil							
$F1_{-BTEX}$ (C_6 - C_{10})	(65) 55	10	<10	<10	<10	<10	<10
F2 (C_{10} - C_{16})	(150) 98	10	<10	<10	<10	<10	<10
F3 (C_{16} - C_{34})	(1300) 300	50	<50	<50	<50	<50	<50
F4 (C_{34}-C_{50})	(5600) 2800	50	<50	<50	<50	<50	<50

Notes:

Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/g (ppm) dry weight basis, unless otherwise noted.
ppm - means parts per million.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

Sample Location			BH7	MW8	MW8	MW9	MW9
Laboratory ID			17-5863-11	17-5863-12	17-5863-13	17-5863-14	17-5863-15
Sample Depth (m)			0.75-1.35	1.50-2.10	4.55-5.15	0.00-0.60m	4.55-5.15m
Sampling Date			1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017
Parameters	**2011 Table 2 SCS**	**RDL**					
BTEX in Soil							
Benzene	(0.17) 0.21	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	(6) 2.3	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	(1.6) 1.1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenes	(25) 3.1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PHCs (F1-F4) in Soil							
$F1_{-BTEX}$ (C_6 - C_{10})	(65) 55	10	<10	<10	<10	<10	<10
F2 (C_{10} - C_{16})	(150) 98	10	<10	<10	<10	<10	<10
F3 (C_{16} - C_{34})	(1300) 300	50	<50	<50	<50	<50	<50
F4 (C_{34}-C_{50})	(5600) 2800	50	<50	<50	<50	<50	<50

Notes:

Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/g (ppm) dry weight basis, unless otherwise noted.
ppm - means parts per million.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

FISHER ENVIRONMENTAL LTD.

Sample Location			BH10	BH11	BH12		
Laboratory ID			17-5863-16	17-5863-17	17-5863-18		
Sample Depth (m)			0.75-1.35m	0.00-0.60m	0.00-0.60m		
Sampling Date			1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017		
Parameters	**2011 Table 2 SCS**	**RDL**					
BTEX in Soil							
Benzene	(0.17) 0.21	0.02	<0.02	<0.02	<0.02		
Toluene	(6) 2.3	0.2	<0.2	<0.2	<0.2		
Ethylbenzene	(1.6) 1.1	0.05	<0.05	<0.05	<0.05		
Xylenes	(25) 3.1	0.05	<0.05	<0.05	<0.05		
PHCs (F1-F4) in Soil							
$F1_{-BTEX}$ (C_6 - C_{10})	(65) 55	10	<10	<10	<10		
F2 (C_{10} - C_{16})	(150) 98	10	<10	<10	<10		
F3 (C_{16} - C_{34})	(1300) 300	50	<50	<50	<50		
F4 (C_{34}-C_{50})	(5600) 2800	50	<50	<50	<50		

Notes:

Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/g (ppm) dry weight basis, unless otherwise noted.
ppm - means parts per million.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

FISHER ENVIRONMENTAL LTD.

Table 6: Soil Quality Data – PAH Analysis

Sample Location			MW1	MW1 Duplicate	MW1	MW1 Duplicate	MW2
Laboratory ID			17-5863-1	17-5863-2	17-5863-3	17-5863-4	17-5863-5
Sample Depth (m)			0.75-1.35m	0.75-1.35m	3.00-3.60m	3.00-3.60m	0,00-0.60m
Sampling Date			1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017
Parameters	2011 Table 2 SCS	RDL					
Naphthalene	(0.75) 0.6	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	(3.4) 0.99	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1-Methylnaphthalene		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	(0.17) 0.15	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	(29) 7.9	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	(69) 62	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	(7.8) 6.2	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	(0.74) 0.67	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.69	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	78	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo [a] anthracene	(0.63) 0.5	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	(7.8) 7	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo [b] fluoranthene	0.78	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo [k] fluoranthene	0.78	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo [a] pyrene	0.3	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno [1,2,3-cd] pyrene	(0.48) 0.38	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo [a,h] anthracene	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo [g,h,i] perylene	(7.8) 6.6	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Notes:

*Parameter is the sum of 1- and 2- methylnaphthalene

Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/g (ppm) dry weight basis, unless otherwise noted.
ppm - means parts per million.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

FISHER ENVIRONMENTAL LTD.

Sample Location			MW2	BH6	BH7	MW8	MW8
Laboratory ID			17-5863-6	17-5863-10	17-5863-11	17-5863-12	17-5863-13
Sample Depth (m)			4.55-5.15	1.50-2.10	0.75-1.35	1.50-2.10	4.55-5.15
Sampling Date			1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017
Parameters	2011 Table 2 SCS	RDL					
Naphthalene	(0.75) 0.6	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	(3.4) 0.99	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1-Methylnaphthalene		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	(0.17) 0.15	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	(29) 7.9	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	(69) 62	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	(7.8) 6.2	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	(0.74) 0.67	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.69	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	78	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo [a] anthracene	(0.63) 0.5	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	(7.8) 7	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo [b] fluoranthene	0.78	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo [k] fluoranthene	0.78	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo [a] pyrene	0.3	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno [1,2,3-cd] pyrene	(0.48) 0.38	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo [a,h] anthracene	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo [g,h,i] perylene	(7.8) 6.6	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Notes:

*Parameter is the sum of 1- and 2- methylnaphthalene

Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/g (ppm) dry weight basis, unless otherwise noted.
ppm - means parts per million.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

Sample Location			MW9	MW9	BH10	BH11	BH12
Laboratory ID			17-5863-14	17-5863-15	17-5863-16	17-5863-17	17-5863-18
Sample Depth (m)			0.00-0.60m	4.55-5.15m	0.75-1.35m	0.00-0.60m	0.00-0.60m
Sampling Date			1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017	1,2 Mar 2017
Parameters	**2011 Table 2 SCS**	**RDL**					
Naphthalene	(0.75) 0.6	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	(3.4) 0.99	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1-Methylnaphthalene		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	(0.17) 0.15	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	(29) 7.9	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	(69) 62	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	(7.8) 6.2	0.05	0.4	<0.05	<0.05	<0.05	0.15
Anthracene	(0.74) 0.67	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.69	0.05	0.36	<0.05	<0.05	<0.05	0.25
Pyrene	78	0.05	0.26	<0.05	<0.05	<0.05	0.2
Benzo [a] anthracene	(0.63) 0.5	0.05	0.13	<0.05	<0.05	<0.05	0.11
Chrysene	(7.8) 7	0.05	0.17	<0.05	<0.05	<0.05	0.11
Benzo [b] fluoranthene	0.78	0.05	0.16	<0.05	<0.05	<0.05	0.11
Benzo [k] fluoranthene	0.78	0.05	0.16	<0.05	<0.05	<0.05	0.11
Benzo [a] pyrene	0.3	0.05	0.17	<0.05	<0.05	<0.05	0.11
Indeno [1,2,3-cd] pyrene	(0.48) 0.38	0.1	0.13	<0.1	<0.1	<0.1	<0.1
Dibenzo [a,h] anthracene	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo [g,h,i] perylene	(7.8) 6.6	0.1	0.12	<0.1	<0.1	<0.1	<0.1

Notes:

*Parameter is the sum of 1- and 2- methylnaphthalene

Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/g (ppm) dry weight basis, unless otherwise noted.
ppm - means parts per million.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

Table 7 – Summary of Groundwater Samples Submitted for Chemical Analysis

Sample I.D.	Parameter Analyzed
MW1 17-5969-1	Metals, PHC(F1-F4), PAHs
MW2 17-5969-2	Metals, PHC(F1-F4), PAHs
MW3 17-5969-3/4	PHC(F1-F4)
MW4 17-5969-5	PHC(F1-F4)
MW5 17-5969-6	PHC(F1-F4)
MW8 17-5969-7	Metals, PHC(F1-F4), PAHs
MW9 17-5969-8	Metals, PHC(F1-F4)
Trip Blank 17-5969-9	VOC (II)
Trip Blank 17-5969-10	VOC (II)

Table 8: Groundwater Quality Data – Metals Analysis

Sample Location			MW1	MW2	MW8	MW9	
Laboratory ID			17-5969-1	17-5969-2	17-5969-7	17-5969-8	
Sampling Date			20-Mar-17	20-Mar-17	20-Mar-17	20-Mar-17	
Parameters	2011 Table 2 SCS	RDL					
Barium	1000	2	109	46	71	133	
Beryllium	4	0.5	<0.5	<0.5	<0.5	<0.5	
Boron	5000	10	145	753	203	949	
Cadmium	2.7	1	<0.5	<0.5	<0.5	<0.5	
Chromium	50	10	5.1	12	5.1	10	
Cobalt	3.8	1	<1	<1	<1	<1	
Copper	87	5	<5	<5	<5	<5	
Lead	10	2.5	<1	<1	<1	<1	
Molybdenum	70	0.5	38	6.8	68	11	
Nickel	100	1	3.3	3.1	3.3	2.8	
Silver	1.5	1	<0.3	<0.3	<0.3	<0.3	
Thallium	2	1	<0.5	<0.5	<0.5	<0.5	
Uranium	20	2	19	7.7	17	7.9	
Vanadium	6.2	0.5	1.5	2.9	1.9	2.3	
Zinc	1100	5	<5	<5	<5	<5	

Notes:

Bold – indicates exceedence of applicable MOE SCS
ppb - means parts per billion.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

FISHER ENVIRONMENTAL LTD.

Table 9: Groundwater Quality Data – Hydride-Forming Metals Analysis

Sample Location			MW1	MW2	MW8	MW9	
Laboratory ID			17-5969-1	17-5969-2	17-5969-7	17-5969-8	
Sampling Date			20-Mar-17	20-Mar-17	20-Mar-17	20-Mar-17	
Parameters	**2011 Table 3 SCS**	**RDL**					
Antimony	6	0.5	<0.5	<0.5	1	<0.5	
Arsenic	25	1	9.8	5	21	6.7	
Selenium	10	5	<5	<5	9.5	8.3	

Notes:

Bold – indicates exceedence of applicable MOE SCS
ppb - means parts per billion.
RDL - means report detection limit
2011 Table 2 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

FISHER ENVIRONMENTAL LTD.

Table 10: Groundwater Quality Data – PHC (F1-F4) & BTEX Analysis

Sample Location			MW1	MW2	MW3	MW3	MW4
Laboratory ID			17-5969-1	17-5969-2	17-5969-3	17-5969-4	17-5969-5
Sampling Date			20-Mar-17	20-Mar-17	20-Mar-17	20-Mar-17	20-Mar-17
Parameters	2011 Table 2 SCS	RDL					
BTEX in Water							
Benzene	5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	24	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	2	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylenes	300	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PHCs (F1-F4) in Water							
$F1_{-BTEX}$ (C_6 - C_{10})	750	25	<25	<25	<25	<25	<25
F2 (C_{10} - C_{16})	150	100	<100	<100	<100	<100	<100
F3 (C_{16} - C_{34})	500	100	110	<100	<100	120	**1490**
F4 (C_{34} - C_{50})	500	100	<100	<100	<100	<100	<100

Notes:
Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/L (ppb), unless otherwise noted.
ppb - means parts per billion.
RDL - means report detection limit
2011 Table 3 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

Sample Location			MW5	MW8	MW9	Trip Blank	Trip Blank
Laboratory ID			17-5969-6	17-5969-7	17-5969-8	17-5969-9	17-5969-10
Sampling Date			20-Mar-17	20-Mar-17	20-Mar-17	20-Mar-17	20-Mar-17
Parameters	2011 Table 2 SCS	RDL					
BTEX in Water							
Benzene	5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	24	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	2	0.5	<0.5	<0.5	0.7	<0.5	<0.5
Xylenes	300	0.5	<0.5	<0.5	1.7	<0.5	<0.5
PHCs (F1-F4) in Water							
$F1_{-BTEX}$ (C_6 - C_{10})	750	25	<25	<25	<25	<25	<25
F2 (C_{10} - C_{16})	150	100	<100	120	<100	<100	<100
F3 (C_{16} - C_{34})	500	100	<100	<100	<100	<100	<100
F4 (C_{34} - C_{50})	500	100	<100	<100	<100	<100	<100

Notes:
Bold – indicates exceedence of applicable MOE SCS
All values reported in µg/L (ppb), unless otherwise noted.
ppb - means parts per billion.
RDL - means report detection limit
2011 Table 3 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

Table 11: Groundwater Quality Data – PAH Analysis

Sample Location			MW1	MW2	MW8		
Laboratory ID			17-5969-1	17-5969-2	17-5969-7		
Sampling Date			20-Mar-17	20-Mar-17	20-Mar-17		
Parameters	**2011 Table 3 All Types**	**RDL**					
Naphthalene	11	2	<2	<2	<2		
2-Methylnaphthalene	3.2	2	<1	<1	<1		
1-Methylnaphthalene		2	<1	<1	<1		
Acenaphthylene	1	1	<1	<1	<1		
Acenaphthene	4.1	1	<1	<1	<1		
Fluorene	120	0.5	<0.5	<0.5	<0.5		
Phenanthrene	1	0.1	<0.1	<0.1	<0.1		
Anthracene	2.4	0.1	<0.1	<0.1	<0.1		
Fluoranthene	0.41	0.4	<0.4	<0.4	<0.4		
Pyrene	4.1	0.2	<0.2	<0.2	<0.2		
Benzo [a] anthracene	1	0.2	<0.2	<0.2	<0.2		
Chrysene	0.1	0.1	<0.1	<0.1	<0.1		
Benzo [b] fluoranthene	0.1	0.1	<0.1	<0.1	<0.1		
Benzo [k] fluoranthene	0.1	0.1	<0.1	<0.1	<0.1		
Benzo [a] pyrene	0.01	0.01	<0.01	<0.01	<0.01		
Indeno [1,2,3-cd] pyrene	0.2	0.2	<0.2	<0.2	<0.2		
Dibenzo [a,h] anthracene	0.2	0.2	<0.2	<0.2	<0.2		
Benzo [g,h,i] perylene	0.2	0.2	<0.2	<0.2	<0.2		

Notes:

*Parameter is the sum of 1- and 2- methylnaphthalene

Bold – indicates exceedence of applicable MOE SCS

All values reported in µg/L (ppb), unless otherwise noted.

ppb - means parts per billion.

RDL - means report detection limit

2011 Table 3 (SCS) - The Site Condition Standards (SCS) are defined in "Soil, Ground Water and Sediment Standards for Use under Part XV.21 of the Environmental protection Act ", MOE, April 15, 2011.

FISHER ENVIRONMENTAL LTD.

10. LIMITATIONS

This report was prepared for use by Cedar City Developments, and is based on the work as described in the Scope of Work. The conclusions presented in this report reflect existing Site conditions within the scope of this assignment.

No investigation method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. It can only reduce the possibility to an acceptable level. Professional judgment was exercised in gathering and analyzing the information obtained and the formulation of the conclusions and recommendations. Like all professional persons rendering advice, we do not act as absolute insurers of the conclusions reached, but commit ourselves to care and competence in reaching those conclusions. Where a Phase II ESA is conducted without the completion or review of a current Phase I ESA, it is noted that the selected test locations are based on information made readily available to Fisher and/or a cursory review of current site operations. In such instances, knowledge of historical and/or neighboring property use data may be significantly limited. No warranty, whether expressed or implied, is included or intended in this report.

The scope of services performed may not be appropriate for the purposes of other users. This report should not be used in contexts other than pertaining to the evaluation of the property at the current time. Written authorization must be obtained from Fisher Environmental Ltd. prior to use by any other parties, or any future use of this document or its findings, conclusions, or recommendations represented herein. Any use which a third party makes of this report, or any reliance on or decisions made on the basis of it, are the responsibility of the third parties. Fisher Environmental Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Fisher Environmental Ltd. notes that the work conducted at the Site may not fully satisfy the MOE (currently MECP) requirements for the purpose of filling a Record of Site Condition (RSC). Should a RSC be required, then additional investigations should be conducted at the Site.

11. QUALIFICATIONS OF ASSESSOR

As a Qualified Person who conducts and supervises Phase II ESAs, Mr. David Fisher, president of Fisher Environmental Ltd., is a senior Managerial and Environmental Engineering Specialist with over 30 years of progressive, innovative experience in the Petrochemical and Environmental Engineering Industry. Mr. Fisher is responsible for the development and management of a progressive environmental consulting engineering company specializing in environmental site assessments and remediation, geotechnical and hydrogeological investigations, tank removals, PCB waste treatment, land reclamation, recycling, hazardous waste disposal, and associated laboratory analytical practices.

Fisher Environmental Ltd. has been established as a team of engineers and consultants since 1989, and continues to develop a strong, wide client base. The company is staffed with personnel holding graduate or postgraduate qualifications at the Markham headquarters, as well as specialist associates offering a broad range of expertise and knowledge in environmental consulting. With a background in the petroleum industry, extensive experience has been gained in the prevention and cleanup of contamination in air, water and soil.

12. REFERENCES

The Phase II ESA was conducted in accordance with the applicable Regulations, Guidelines, Policies, Standards, Protocols and Objectives administrated by the Ontario Ministry of the Environment. Specific reference is made to the following:

- CAN/CSA Standard Z769-00 (reaffirmed in 2013), Phase II Environmental Site Assessment, A National Standard of Canada;
- "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario" Ministry of the Environment and Energy, December 1996;
- Environmental Protection Act, RSO 1990, Charter E. 19, as amended, September 2004;
- "Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", Ministry of the Environment, dated April 15, 2011;
- The Ontario Water Resources Act – R.R.O. 1990, Regulation 903 – Amended to O. Reg. 128.03, August 2003;
- Surficial Geology of Southern Ontario, Ontario Geological Survey (OGS);
- Bedrock Geology of Ontario, OGS;
- Google Earth;
- Make a Topographic Map, Ministry of Natural Resources and Forestry (MNRF).

APPENDIX A – SITE LOCATION MAP AND SITE PLAN

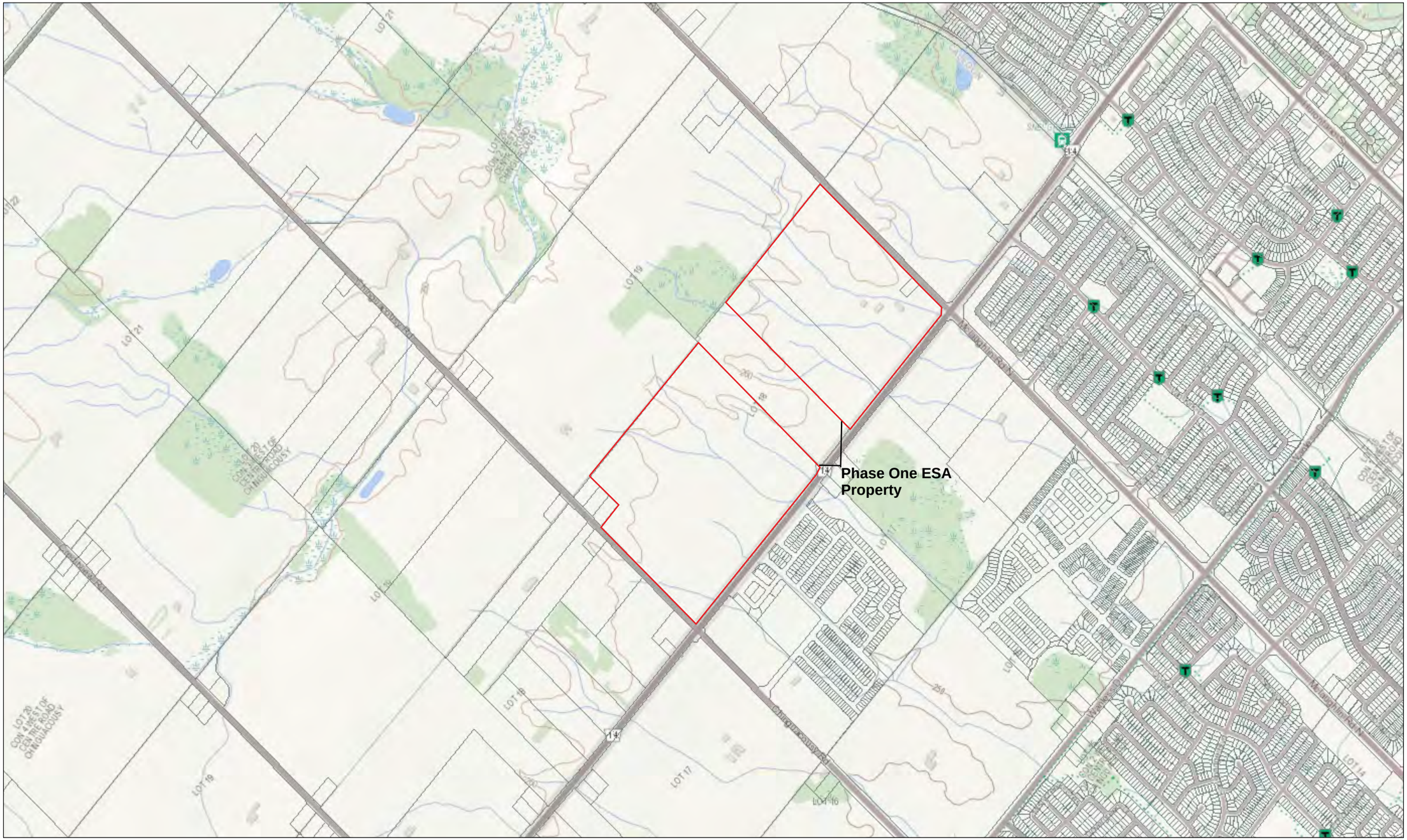
MINISTRY OF NATURAL RESOURCES AND FORESTRY

Ontario

Make a Topographic Map

Site Location Map

Notes: FE-P17-8080



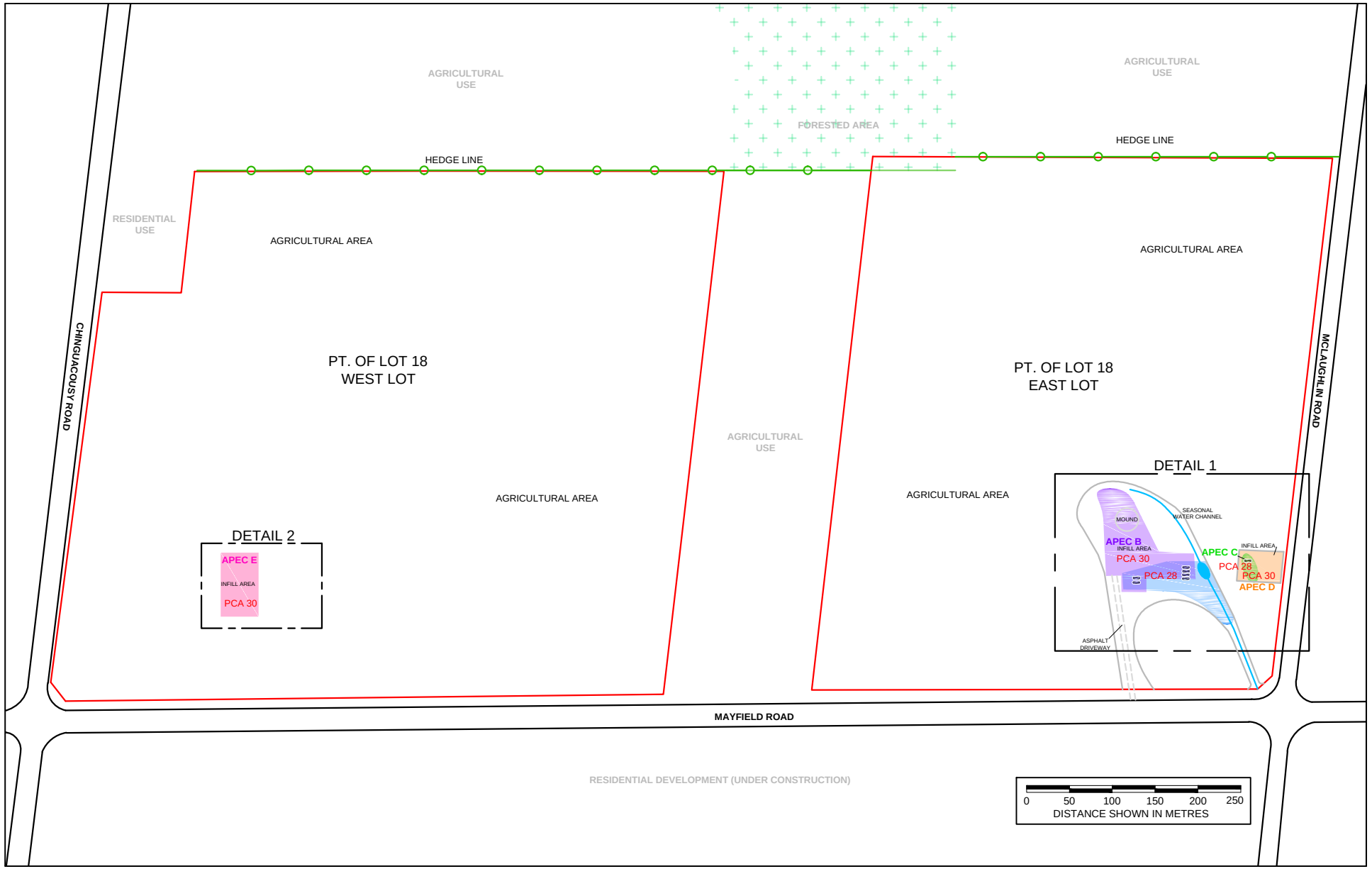
Legend

- Building as Symbol
- Building to Scale
- Airport
- Heliport \ Hospital Heliport
- Seaplane Base
- Ferry Route
- Trail Head \ Trail
- Railway \ Train Station
- Railway with Bridge
- Railway with Tunnel
- Road (Major → Minor)
- Winter Road
- Road with Bridge
- Road with Tunnel
- Primary, Kings or 400 Series Highway
- Secondary Highway
- Tertiary Highway
- District, County, Regional or Municipal Road
- Toll Highway
- One Way Road
- Road with Permanent Blocked Passage
- Road with Address Ranges
- Hydro Line, Communication Line or Unknown Transmission Line
- Natural Gas Pipeline, Water Pipeline or Unknown Pipeline
- Spot Height
- Index Contour
- Contour
- Wooded Area
- Wetland
- Waterbody
- Waterbody Elevation
- Watercourse
- Falls
- Rapids
- Rapids \ Falls
- Rapids
- Rocks
- Lock Gate
- Dam \ Hydro Wall
- Dam \ Hydro Wall
- Provincial \ State Boundary
- International Boundary
- Upper Tier \ District Municipal Boundary
- Lower Tier \ Single Tier Municipal Boundary
- Lot Line
- Indian Reserve
- Provincial Park
- National Park
- Conservation Reserve
- Military Lands

0 SCALE 0.7 km

Projection: Web Mercator

N



Fisher Environmental Ltd.

400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2

Tel: 905 475-7755
Fax: 905 475-7718

KEY PLAN

LEGEND

— — Off-Site Subsurface Utilities

APEC A Area of Potential Environmental Concern

PCA 28 Potentially Contaminating Activity

Fuel Storage Tank

PROJECT NAME AND ADDRESS

PHASE II ESA

Part of Lot 18, Concession 2
(WHS), Caledon, ON

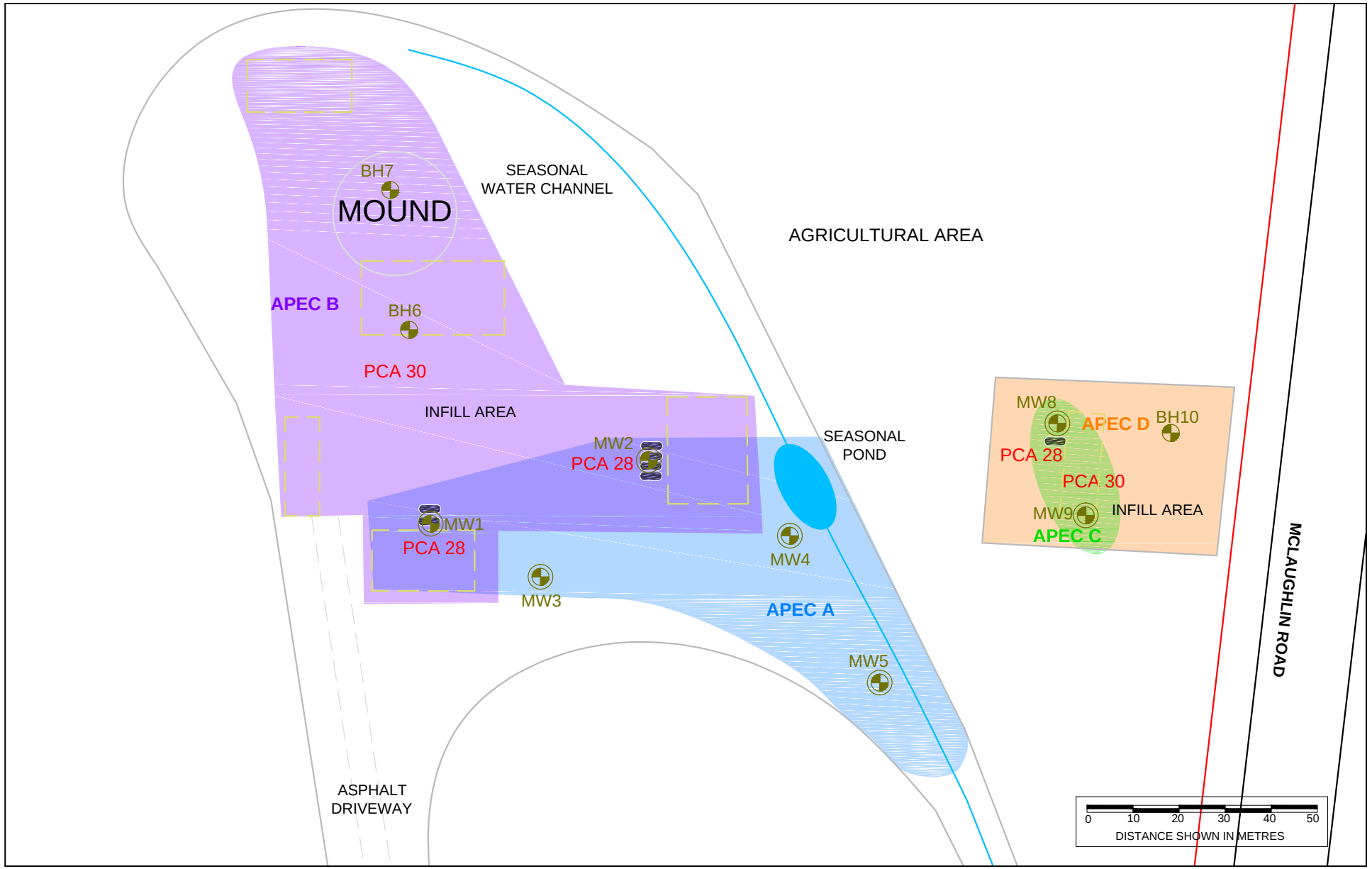
PROJECT NO.
FE-P 17-8080

DATE
MAY 2017

SCALE
As Shown

FIGURE 2-A:

Site Plan of Phase Two ESA Property, With Detail 1 & 2 Outlines, PCAs, APECs



Fisher Environmental Ltd.
400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2
Tel: 905 475-7755
Fax: 905 475-7718

KEY PLAN

LEGEND

APEC A Area of Potential Environmental Concern

Borehole & Monitoring Well Locations

PCA 28 Potentially Contaminating Activity

Former Building Foundations

Fuel Storage Tank

PROJECT NAME AND ADDRESS

PHASE II ESA

Part of Lot 18, Concession 2
(WHS), Caledon, ON

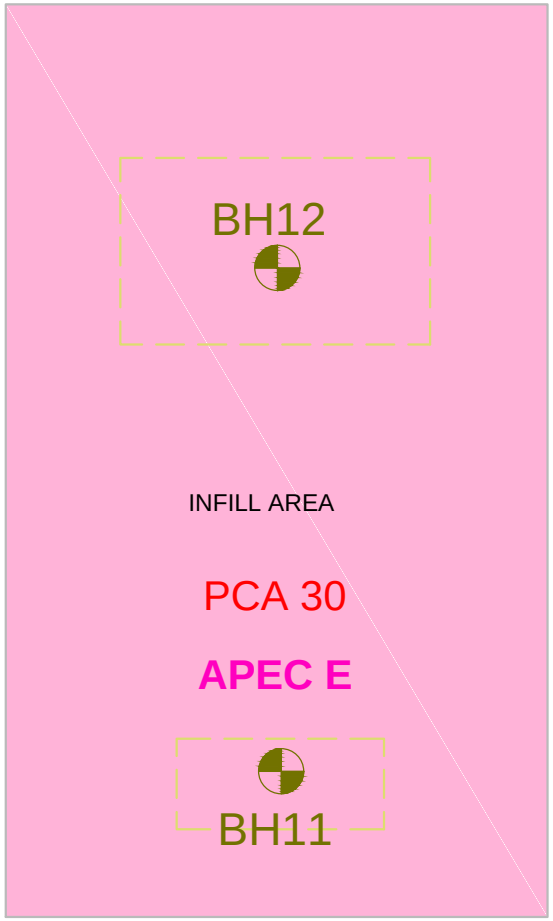
PROJECT NO. FE-P 17-8080

DATE MAY 2017

SCALE As Shown

FIGURE 2-B:

Site Plan of Detail 1 - With Borehole and Monitoring Well Locations



AGRICULTURAL AREA

0 10 20 30 40 50

DISTANCE SHOWN IN METRES

Fisher Environmental Ltd.
400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2
Tel: 905 475-7755
Fax: 905 475-7718

KEY PLAN

LEGEND

APEC A Area of Potential Environmental Concern

Borehole & Monitoring Well Locations

PCA 28 Potentially Contaminating Activity

Fuel Storage Tank

Former Building Foundations

PROJECT NAME AND ADDRESS

PHASE II ESA

Part of Lot 18, Concession 2
(WHS), Caledon, ON

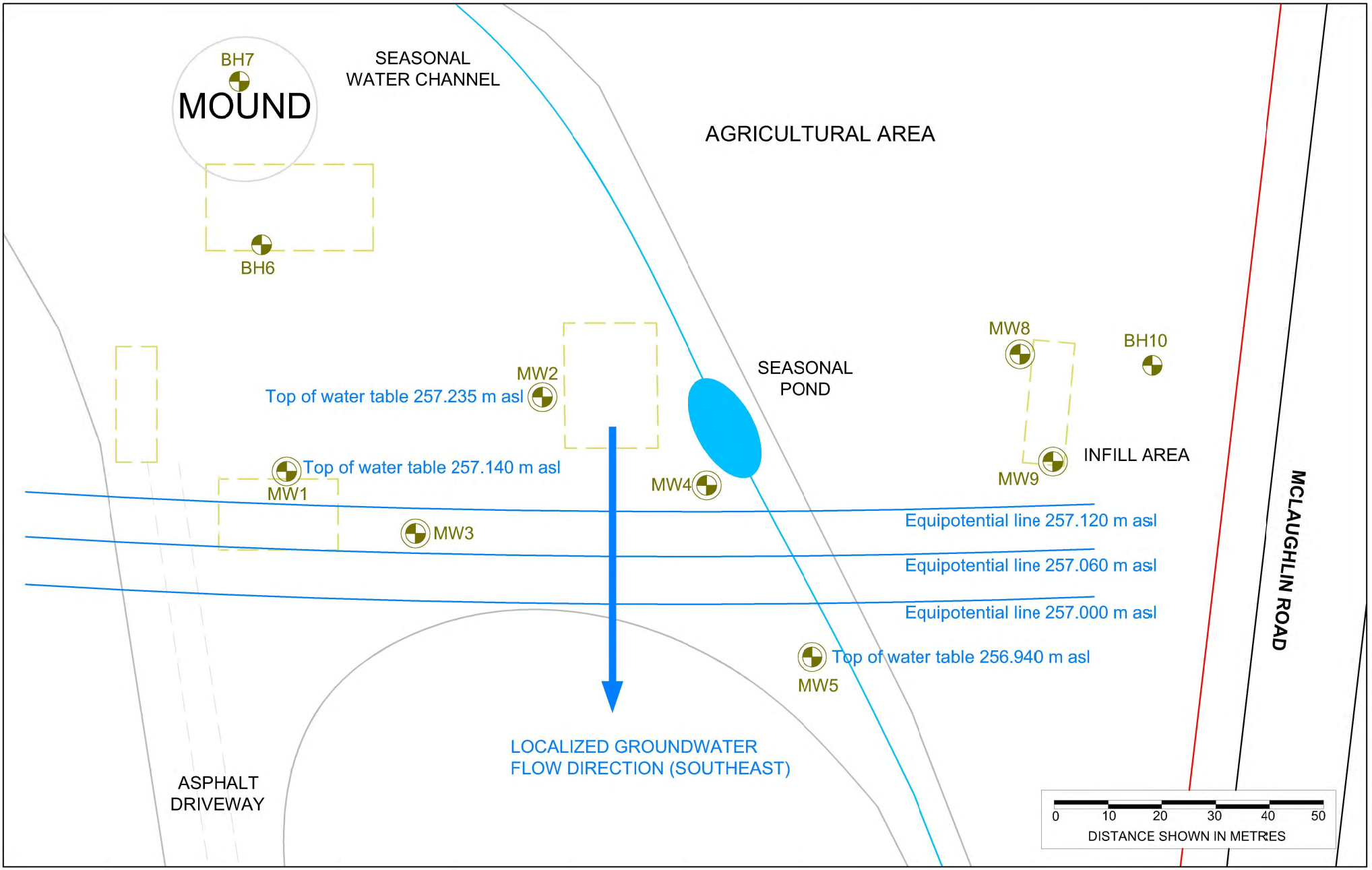
PROJECT NO. FE-P 17-8080

DATE MAY 2017

SCALE As Shown

FIGURE 2-C:

Site Plan of Detail 2 - With PCAs, APEC E, and Borehole Locations



Fisher Environmental Ltd.
400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2
Tel: 905 475-7755
Fax: 905 475-7718

KEY PLAN

LEGEND

Borehole & Monitoring Well Locations

Former Building Foundations

PROJECT NAME AND ADDRESS

PHASE II ESA

Part of Lot 18, Concession 2
(WHS), Caledon, ON

PROJECT NO. FE-P 17-8080

DATE MAY 2017

SCALE As Shown

FIGURE 3:

Site Plan with Groundwater Static Level Elevations and Flow Direction

MINISTRY OF NATURAL RESOURCES AND FORESTRY

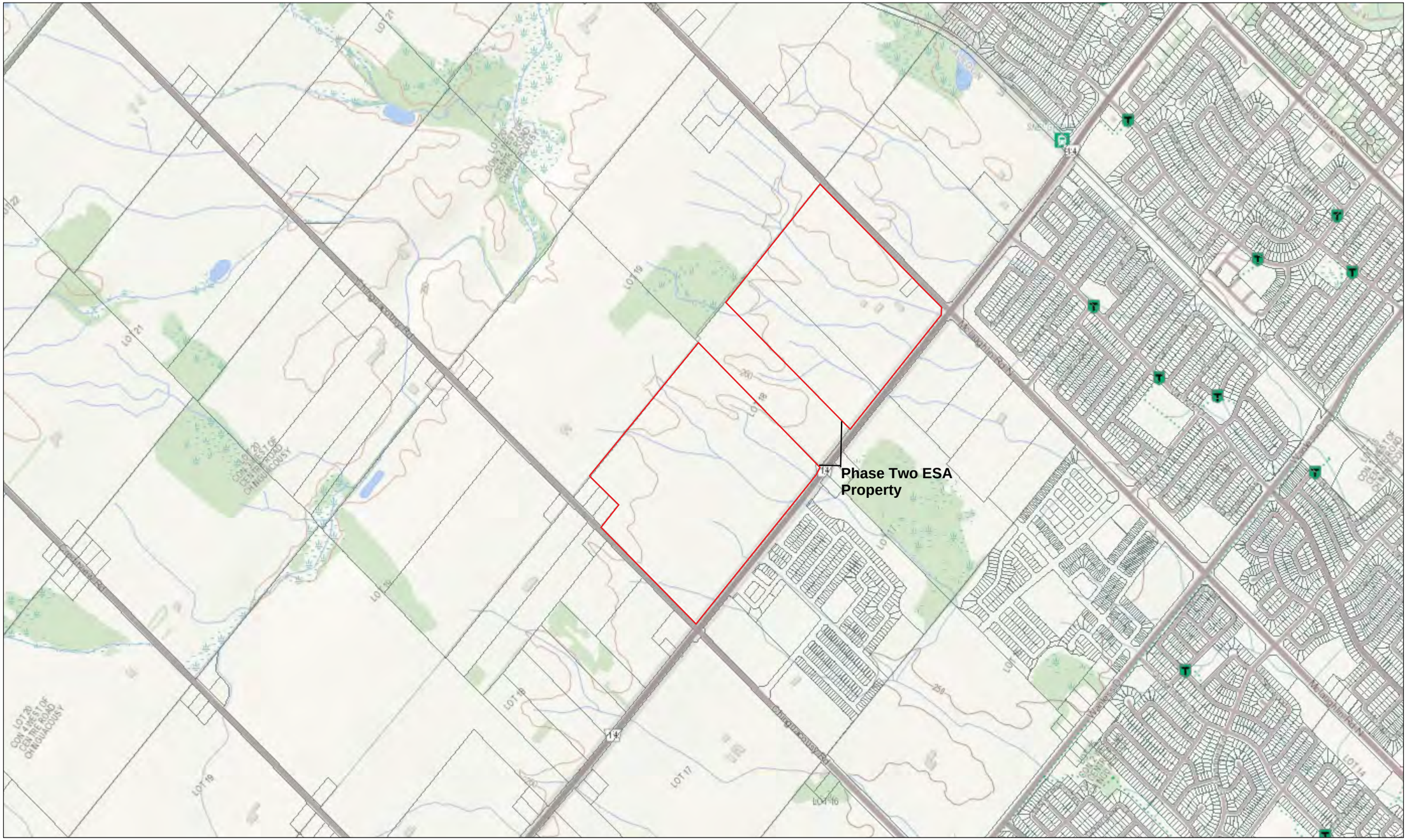
Ontario

Make a Topographic Map

Site Location Map

Notes: FE-P 17-8080

FISHER ENVIRONMENTAL LTD.



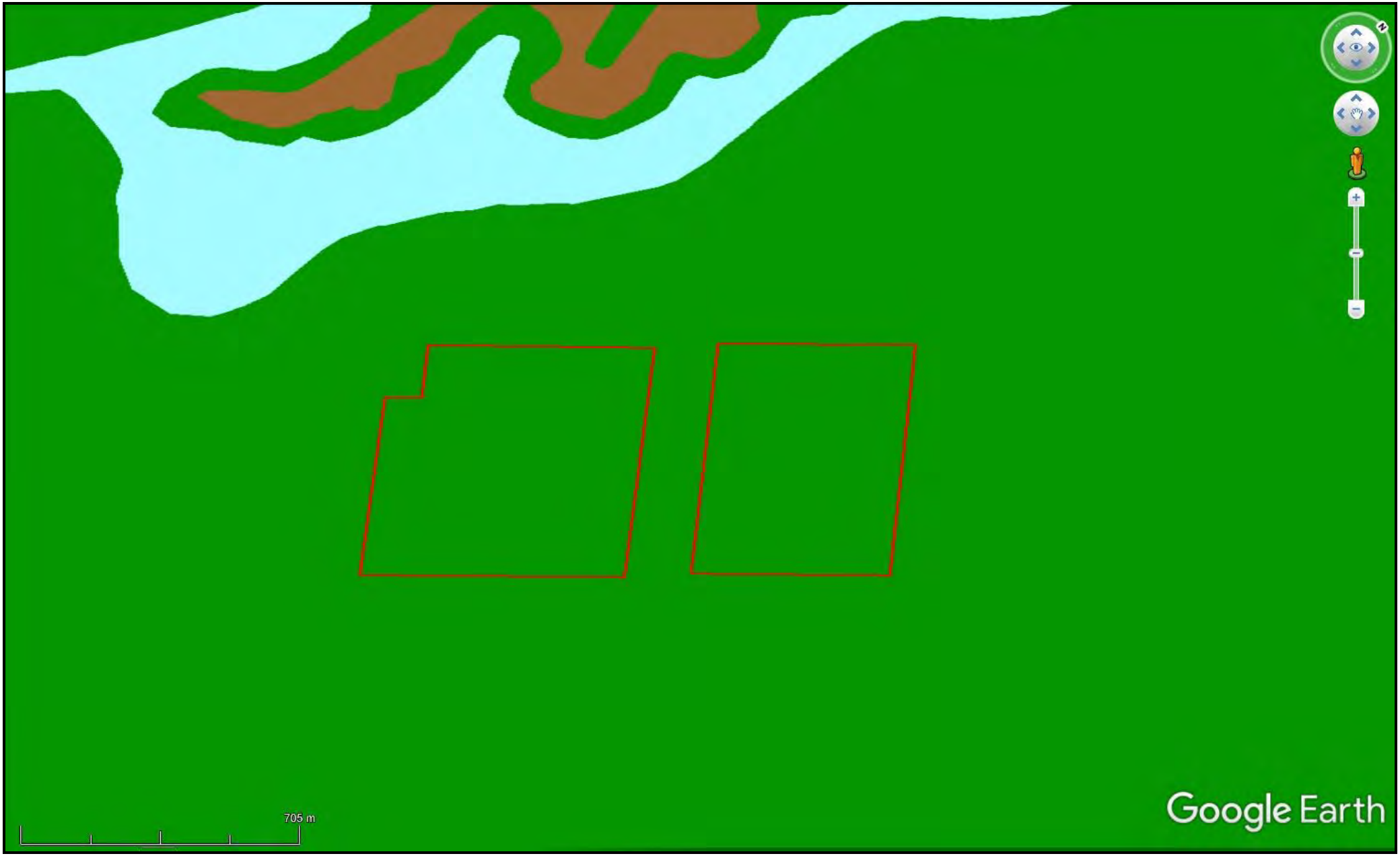
Legend

- Building as Symbol
- Building to Scale
- Airport
- Heliport \ Hospital Heliport
- Seaplane Base
- Ferry Route
- Trail Head \ Trail
- Railway \ Train Station
- Railway with Bridge
- Railway with Tunnel
- Road (Major → Minor)
- Winter Road
- Road with Bridge
- Road with Tunnel
- Primary, Kings or 400 Series Highway
- Secondary Highway
- Tertiary Highway
- District, County, Regional or Municipal Road
- Toll Highway
- One Way Road
- Road with Permanent Blocked Passage
- Road with Address Ranges
- Hydro Line, Communication Line or Unknown Transmission Line
- Natural Gas Pipeline, Water Pipeline or Unknown Pipeline
- Spot Height
- Index Contour
- Contour
- Wooded Area
- Wetland
- Waterbody
- Waterbody Elevation
- Watercourse
- Falls
- Rapids
- Rapids \ Falls
- Rapids
- Rocks
- Lock Gate
- Dam \ Hydro Wall
- Dam \ Hydro Wall
- Provincial \ State Boundary
- International Boundary
- Upper Tier \ District Municipal Boundary
- Lower Tier \ Single Tier Municipal Boundary
- Lot Line
- Indian Reserve
- Provincial Park
- National Park
- Conservation Reserve
- Military Lands

0 SCALE 0.7 km

Projection: Web Mercator

N



Surficial Geology Map

Pt of Lt 18, Con 2 WHS, Caledon, ON
FE-P 17-8080

Map legend attached following this figure

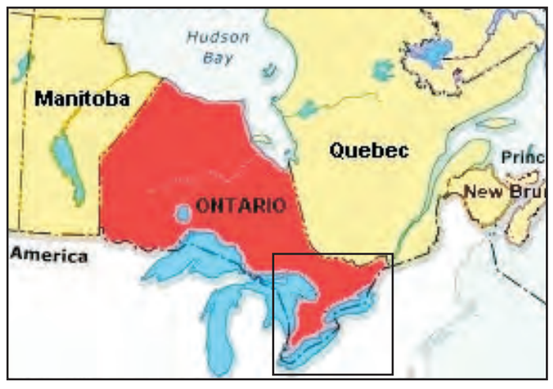
Ontario

Ontario Geological Survey

SURFICIAL GEOLOGY OF

SOUTHERN ONTARIO

This map is published with the permission of the Senior Manager, Sedimentary Geoscience Section, Ontario Geological Survey.



Location Map

SOURCES OF INFORMATION

Base map: Natural Resources and Values Information System (NRVIS)

Projection: NAD 83

CREDITS

Author: The Ontario Geological Survey

Acknowledgements: John Dodge (OGS), Andy Bajc (OGS), George Gao (OGS), Steve van Haaften (OGS), Shannon Evers (OGS), Steve Leney (MNR), John Ernsting (MNR), Scott Christilaw (MNR), Andrew Moore (GSC)

Issued 2003.

LEGEND

- **Fill**
- **Organic Deposits:** peat, muck and marl
- **Silt**
- **Clay**
- **Sand**
- **Gravel**
- **Till (Diamicton)**
- **Sedimentary (Paleozoic) bedrock**
- **Precambrian bedrock**

Correlation Matrix:

Material	Current map units
Fill	21
Organic Materials	20
Silt & Clay	8, 10, 12, 13, 15, 18, 19
Sand & Gravel	6, 7, 9, 11, 12, 14, 16, 18, 19
Sand	6, 7, 9, 11, 12, 14, 16, 17, 18, 19
Till (Diamicton)	5, 5a, 5b, 5c, 5d, 5e
Sedimentary bedrock	3, 4
Precambrian bedrock	1, 2

LEGEND

PHANEROZOIC

CENOZOIC

QUATERNARY

RECENT

21 **Man-made deposits:** fill, sewage lagoon, landfill, urban development

20 **Organic Deposits:** peat, muck, marl

19 **Modern alluvial deposits:** clay, silt, sand, gravel, may contain organic remains

18 **Colluvial deposits:** boulders, scree, talus, undifferentiated landslide materials

17 **Eolian deposits:** fine to very fine sand and silt

16 **Coarse-textured marine deposits:** sand, gravel, minor silt and clay
16a Deltaic deposits
16b Littoral deposits
16c Foreshore and basinal deposits

15 **Fine-textured marine deposits:** silt and clay, minor sand and gravel

14 **Coarse-textured lacustrine deposits:** sand, gravel, minor silt and clay
14a Deltaic deposit
14b Littoral deposits
14c Foreshore and basinal deposits

13 **Fine-textured lacustrine deposits:** silt and clay, minor sand and gravel

PLEISTOCENE

12 **Older alluvial deposits:** clay, silt, sand, gravel, may contain organic remains

11 **Coarse-textured glaciomarine deposits:** sand, gravel, minor silt and clay
11a Deltaic deposits
11b Littoral deposits
11c Foreshore and basinal deposits

10 **Fine-textured glaciomarine deposits:** silt and clay, minor sand and gravel
10a Massive to well laminated
10b Interbedded silt and clay and gritty, pebbly flow till and rainout deposits

9 **Coarse-textured glaciolacustrine deposits:** sand, gravel, minor silt and clay
9a Deltaic deposits
9b Littoral deposits
9c Foreshore and basinal deposits

8 **Fine-textured glaciolacustrine deposits:** silt and clay, minor sand and gravel
8a Massive to well laminated
8b Interbedded silt and clay and gritty, pebbly flow till and rainout deposits

7 **Glaciofluvial deposits:** river deposits and delta topset facies
7a Sandy deposits
7b Gravelly deposits

6 **Ice-contact stratified deposits:** sand and gravel, minor silt, clay and till
6a In moraines, eskers, kames and crevasse fills
6b In subaquatic fans

5a **Till:** Silty sand to sand-textured till on Precambrian terrain
5a Silty sand to sand-textured till on Precambrian terrain

5b 5b Stone-poor, sandy silt to silty sand-textured till on Paleozoic terrain

5c 5c Stony, sandy silt to silty sand-textured till on Paleozoic terrain

5d 5d Clay to silt-textured till (derived from glaciolacustrine deposits or shale)

5e 5e Undifferentiated older tills, may include stratified deposits

PALEOZOIC

4 **Bedrock-drift complex in Paleozoic terrain:**
4a Primarily till cover
4b Primarily stratified drift cover

3 **Paleozoic bedrock**

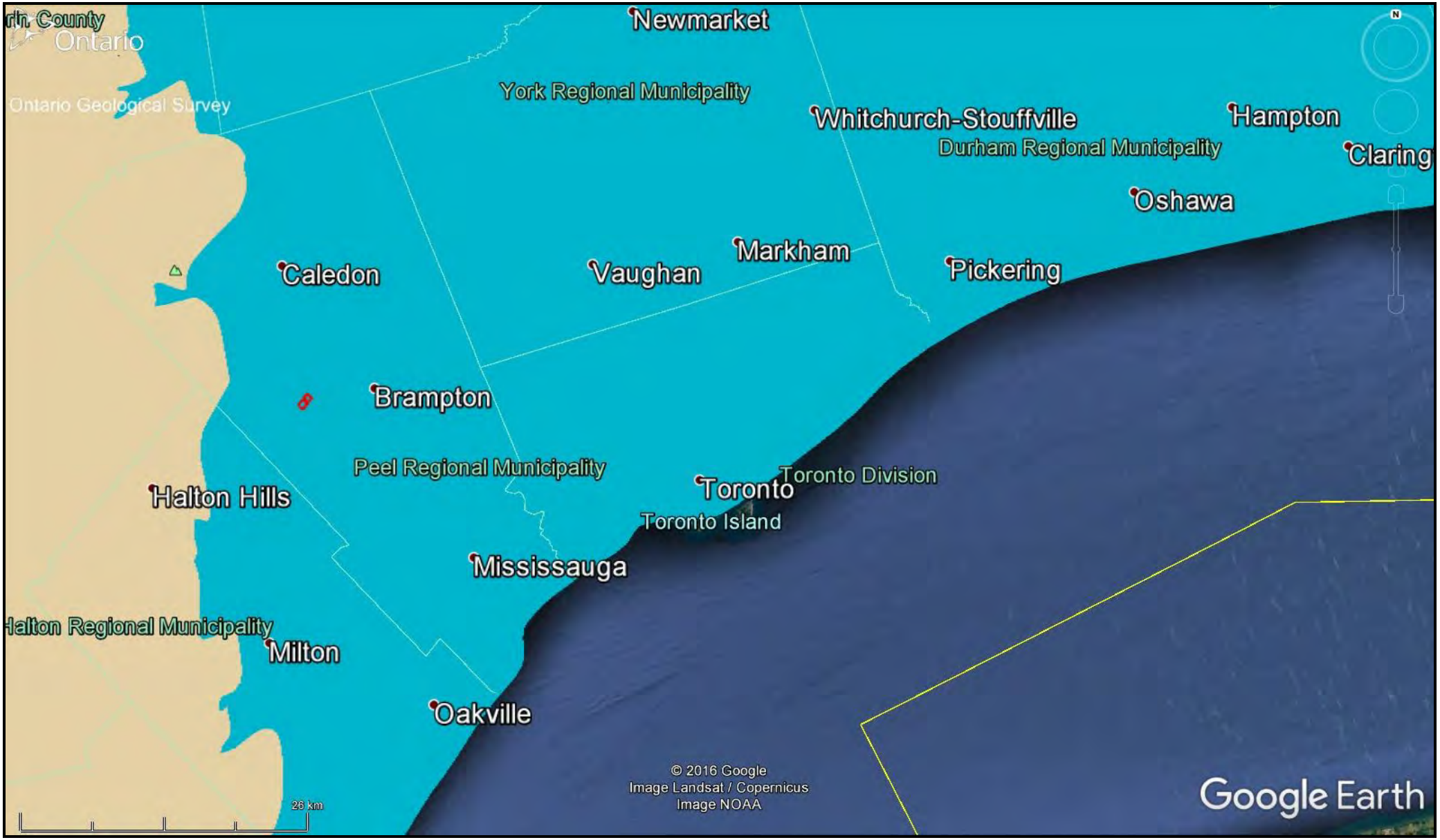
PRECAMBRIAN

2 **Bedrock-drift complex in Precambrian terrain:**
2a Primarily till cover
2b Primarily stratified drift cover

1 **Precambrian bedrock**

SYMBOLS

- Clay pit (active or inactive)
- Peat and muck pit
- Location of quarry
- Sand or gravel pit;
- Tailings
- Stoss and lee feature; crag and tail
- Delta, glaciolacustrine
- Drumlin or drumlinoid ridges
- Dune
- Glacial fluting
- Fossil locality
- Geotechnical or stratigraphic borehole not reaching bedrock
- Kame
- Solution weathering feature
- Kettle
- Outcrop
- Observed pebble orientation in till
- Reservoir
- Roches moutonee
- Sample site
- Small landslide scar
- Glacial striae; direction of ice movement known
- Glacial striae; direction of ice movement unknown
- Talus
- Area of sand dune
- Area of former lake bed
- Area of ribbed moraine or till ridges transverse to ice flow
- Area of scabland
- Beach ridges and near shore bars
- Shore bluff or scarp
- Crevasse filling
- Crests of large sand dune (eolian)
- Trend of moraine crest
- Bedrock scarp or escarpment
- Esker; direction of flow known
- Esker; direction of flow unknown
- Meltwater channel; inferred direction of flow
- Meltwater channel; direction of flow unknown
- Iceberg keel mark
- Ice-contact slope
- Clint and gryke topography
- Linear feature observed on aerial photograph
- Crest of megaripple
- Meltwater flow; inferred direction of flow
- Meltwater flow; direction of flow unknown
- Minor moraine
- Mapable edge of quarry or pit
- Bedrock pressure release ridge
- Ribbed or rogen moraine
- Edge of a mapable landslide scar
- Slump block, margin
- Abandoned meltwater channel or river channel; terrace escarpment
- Area of landslide scar
- Area of hummocky topography
- Area of moraine with no hummocky topography



Bedrock Geology Map

Pt of Lt 18, Con 2 WHS, Caledon, ON
FE-P 17-8080

Map legend attached following this figure

MRD 126 - Revision 1
1:250 000 Scale Bedrock Geology of Ontario

LEGEND[ax]

In general, older bedrock units are named after younger ones. For example, unit 59e is older than unit 59d.

PHANEROZOIC[b] (Present to 542.0 Ma)

MESOZOIC (65.5 Ma to 251.0 Ma)

CRETACEOUS AND JURASSIC (65.5 Ma to 199.6 Ma)

LOWER CRETACEOUS AND MIDDLE JURASSIC

63 **Kaolinitic clay, clay, sand, lignite**

- 63a Mattagami Fm.; Mistuskwia Beds
- 63b Evans Strait Fm.

JURASSIC (145.5 Ma to 199.6 Ma)

● **Alkalic dikes and intrusions:** kimberlite and lamprophyre

PALEOZOIC (251.0 Ma to 542.0 Ma)

MISSISSIPPIAN TO DEVONIAN[c] (318.1 Ma to 416.0 Ma)

61 **Shale:** Port Lambton Gp.

DEVONIAN (359.2 Ma to 416.0 Ma)

UPPER DEVONIAN

60 **Shale**

- 60a Kettle Point Fm.
- 60b Long Rapids Fm.

MIDDLE DEVONIAN

59 **Limestone, dolostone, shale**

- 59a Hamilton Gp.
- 59b Marcellus Fm.
- 59c Dundee Fm.
- 59d Detroit River Gp.; Onondaga Fm.
- 59e Williams Island Fm.
- 59f Murray Island Fm.
- 59g Moose River Fm.
- 59h Kwataboahegan Fm.

LOWER DEVONIAN

58 **Sandstone, dolostone, limestone**

- 58a Bois Blanc Fm.; Oriskany Fm.
- 58b Stooping River Fm.
- 58c Sextant Fm.

SILURIAN (416.0 Ma to 443.7 Ma)

UPPER SILURIAN

57 **Limestone, dolostone, shale, sandstone, gypsum, salt**

- 57a Bass Islands Fm.
- 57b Bertie Fm.
- 57c Salina Fm.
- 57d Kenogami River Fm. (Upper Silurian to Lower Devonian)

LOWER SILURIAN

56 **Sandstone, shale, dolostone, siltstone**

- 56a Guelph Fm. (also present in the Upper Silurian)
- 56b Lockport Fm.
- 56c Amabel Fm.

56d Clinton Gp.; Cataract Gp.
56e Thornloe Fm.; Earlton Fm.
56f Wabi Gp.
56g Attawapiskat Fm. (also present in the Upper Silurian)
56h Ekwan River Fm.
56i Severn River Fm.

ORDOVICIAN (443.7 Ma to 488.3 Ma)

UPPER ORDOVICIAN

55 **Shale, limestone, dolostone, siltstone**

55a Queenston Fm.
55b Georgian Bay Fm.; Blue Mountain Fm.; Billings Fm.; Collingwood Mb.; Eastview Mb.
55c Liskeard Gp.
55d Red Head Rapids Fm.
55e Churchill River Gp.
55f Bad Cache Rapids Gp.

MIDDLE ORDOVICIAN

54 **Limestone, dolostone, shale, arkose, sandstone**

54a Ottawa Gp.; Simcoe Gp.; Shadow Lake Fm. (now considered Upper Ordovician)
54b Chazy Gp.; Rockcliffe Fm.

LOWER ORDOVICIAN

53 **Dolostone, sandstone:** Beekmantown Gp.

CAMBRIAN (488.3 Ma to 542.0 Ma)

52 **Conglomerate, sandstone, shale, dolostone:** Potsdam Gp.; Nepean Fm.; Covey Hill Fm.

UNCONFORMITY

PRECAMBRIAN[d] (0.542 Ga to <3.85 Ga)

GRENVILLE PROVINCE[e]

PROTEROZOIC (0.542 Ga to 2.50 Ga)

NEO- TO MESOPROTEROZOIC (0.542 Ga to 1.6 Ga)

51 **Tectonite unit:** tectonites, straight gneisses, porphyroclastic gneisses, unsubdivided gneisses in major deformation zones, mylonites, protomylonites

CENTRAL METASEDIMENTARY BELT

50 **Late felsic plutonic rocks[f]:** granodiorite, granite, syenite, pegmatite, alkalic granite, migmatitic gneisses

50a Granitic and syenitic gneisses
50b Granitic gneisses with metasedimentary xenoliths, migmatites, injection gneisses, pegmatites

49 **Mafic to ultramafic plutonic rocks[f]:** diorite, gabbro, peridotite, pyroxenite, anorthosite, derived metamorphic rocks

49a Gabbro
49b Diorite
49c Anorthosite, gabbroic anorthosite

48 **Alkalic plutonic rocks:** nepheline syenite, alkalic syenite, fenite; associated mafic, ultramafic and carbonatitic rocks

48a Syenite
48b Nepheline syenite

47 **Early felsic plutonic rocks[f]:** granodiorite, tonalite, monzogranite, syenogranite; derived gneisses and migmatites

47a Monzo- and syenogranite
47b Granodiorite
47c Trondhjemite
47d Tonalite

GRENVILLE SUPERGROUP AND FLINTON GROUP[g]

46 **Carbonate metasedimentary rocks:** marble, calc-silicate rocks, skarn, tectonic breccias

45 **Clastic metasedimentary rocks[f]:** conglomerate, wacke, quartz arenite, arkose, limestone, siltstone, chert, minor iron formation, minor metavolcanic rocks

44 **Mafic to felsic metavolcanic rocks:** flows, tuffs, breccias, minor iron formation, minor metasedimentary rocks; includes reworked pyroclastic units, amphibolite

MESOPROTEROZOIC (1.0 Ga to 1.6 Ga)

CENTRAL GNEISS BELT

43 **Felsic igneous rocks:** tonalite, granodiorite, monzonite, granite, syenite; derived gneisses

42 **Anorthosite and alkalic igneous rocks:** anorthosite, anorthositic gabbro, gabbro and related gneisses, nepheline syenite, alkalic syenite

41 **Migmatitic rocks and gneisses of undetermined protolith:** commonly layered biotite gneisses and migmatites; locally includes quartzofeldspathic gneisses, orthogneisses, paragneisses

40 **Mafic rocks:** amphibolite, gabbro, diorite, mafic gneisses

39 **Gneisses of metasedimentary origin:** quartzofeldspathic gneisses, pelitic to semi-pelitic gneisses, calc-silicate gneisses, minor quartzite, minor marble and marble breccia

SOUTHERN and SUPERIOR[h] PROVINCES

EARLY PALEOZOIC TO NEOPROTEROZOIC (443.7 Ma to 1.0 Ga)

38 **Carbonate-alkalic intrusive suite (443.7 Ma to 600 Ma):** carbonatite, nepheline syenite, alkalic syenite, ijolite, fenite; associated mafic and ultramafic intrusions

38a Intrusions of uncertain age

37 **Mafic intrusive rocks[i]**

37a Grenville or Rideau mafic dike swarm (575-590 Ma)
37b Frontenac mafic dike swarm (circa 1160 Ma)
37c Gabbro, diorite, ultramafic rocks, and granophyre

MESOPROTEROZOIC (1.0 Ga to 1.6 Ga)

UPPER KEWEENAWAN SUPERGROUP (<1086 Ma)

36 **Sandstone, shale, conglomerate:** Jacobsville Gp.; Oronto Gp

INTRUSIVE CONTACT

35 **Alkalic intrusive suite and carbonatite (circa 1.1 to 1.2 Ga):** alkalic syenite, ijolite, nepheline syenite, fenite, associated mafic and ultramafic rocks, and minor carbonatite

35a Martison Carbonatite Complex

34 **Mafic dikes and related intrusive rocks (Keweenawan age)[i] (circa 1.1 to 1.2 Ga)**

34a Logan and Nipigon mafic sills (circa 1100-1115 Ma)
34b Mafic sills and dikes (circa 1130-1180 Ma), including the Mine Centre dike (circa 1137±20 Ma), the Empey Lake dike (circa 1178±31 Ma), and the Kipling (Abitibi) dike (circa 1140 Ma).
34c Ultramafic, gabbroic and granophyric intrusions (probably related to unit 35)
34d Felsic to intermediate intrusive rocks
34e Abitibi swarm (1141 Ma) mafic dikes

Mafic intrusive rocks[i] and mafic dikes

33a Mackenzie mafic dike swarm (1267 Ma)
33b Sudbury mafic dike swarm (circa 1235-1238 Ma)

MIDDLE AND LOWER KEWEENAWAN SUPERGROUP (1086 to 1107 Ma)

32 **Osler Gp., Mamainse Point Fm., Michipicoten Island Fm.**

32a Basalt and associated conglomerate and arkose
32b Rhyolite, quartz-feldspar porphyry; associated conglomerate and arkose

31 **Sibley Gp. (circa 1.34 Ga):** conglomerate, sandstone, shale

MESO- TO PALEOPROTEROZOIC (1.0 Ga to 2.5 Ga)

30 **Felsic intrusive rocks**

30a Granite, alkali granite, granodiorite, quartz-feldspar porphyry; minor related volcanic rocks[j] (1.5 to 1.6 Ga)
30b Killarney monzogranite and granitic rocks[k] (1.7 and 1.4 Ga)
30c Intermediate to felsic volcanic rocks[k] (1.8 to 1.9 Ga.)

INTRUSIVE CONTACT

PALEOPROTEROZOIC (1.6 Ga to 2.5 Ga)

29 **Sudbury Igneous Complex (1850 Ma):** norite, gabbro, granophyre

29a Granophyre
29b Norite-gabbro, quartz norite, sublayer and offset rocks

28 **Whitewater Gp.[l]:** fragmental rocks, mudstone, wacke

28a Chelmsford Formation: wacke, minor siltstone
28b Onwatin Formation: carbonaceous slate
28c Onaping Formation: lapilli tuff, breccia, felsic flows and intrusions, minor carbonate and chert

27 **Carbonatite-alkalic intrusive suite (circa 1.8 to 1.9 Ga):** carbonatite complexes, nepheline syenite, alkalic syenite, ijolite, fenite; associated mafic and ultramafic rocks

26 **Mafic intrusive rocks[i], mafic dikes and mafic sills**

26a Molson mafic dike swarm (circa 1889 to 1871 Ma) and mafic sills of the Sutton Inliers (circa 1871 Ma)
26b Pickle Crow mafic dike; normally magnetized northwest-trending subswarm (Molson swarm) (circa 1876 Ma)
26c Pickle Crow mafic dike; reversely magnetized northwest-trending subswarm (Molson swarm) (circa 1876 Ma)
26d Mafic dikes and mafic plutons of uncertain age; gabbro, diorite, quartz diorite
26e North Channel mafic dike swarm

INTRUSIVE CONTACT

25 **Trans-Hudson Orogen Supracrustal rocks / sedimentary rocks (Sutton Inliers):** dolostone, chert breccias, argillite, wacke, conglomerate, iron formation

25a Mafic and ultramafic metavolcanic rocks, metasedimentary rocks, differentiated mafic to ultramafic intrusions of the Fox River belt
25b Undifferentiated clastic and carbonate metasedimentary rocks
25c Sutton Inliers – Sutton Ridges Formation: unsubdivided clastic metasedimentary rocks (including wacke, siltstone, argillite, chert breccia and conglomerate), and chert-banded and clastic iron formation
25d Sutton Inliers – Nowashe Formation: carbonate metasedimentary rocks (dolomite, cherty dolomite, stromatolitic dolomite, argillaceous dolomite)
25e Undifferentiated clastic metasedimentary migmatite

24 **Sedimentary rocks (Animikie Group)[m]:** wacke, shale, iron formation, limestone, minor volcanic rocks, conglomerate, taconite, algal chert, carbonate rocks, argillite-tuff

24a Rove Formation: argillite, shale, wacke, minor volcanic rocks
24b Gunflint Formation: conglomerate, taconite, algal chert, chert, carbonate rocks, argillite-tuff

23 **Mafic and related intrusive rocks[i] and mafic dikes**

23a Marathon mafic dike; north-northwest to north-northeast-trending subswarm (circa 2101 to 2126 Ma)
23b Fort Frances mafic dike; northwest-trending subswarm (circa 2075 Ma)
23c Marathon, Kapuskasing or Biscotasing mafic dike; northeast-trending subswarm (circa 2101-2126 or circa 2167-2171 Ma)
23d Nipissing mafic sills (2219 Ma): mafic sills, mafic dikes and related granophyre
23e Biscotasing mafic dike; north-northeast-trending swarm (circa 2167-2171 Ma)
23f Mafic dikes of uncertain age
23g Mafic plutons of uncertain age

22 **Felsic intrusive rocks (Murray Granite 2388 Ma, Creighton Granite 2333 Ma):** granite

HURONIAN SUPERGROUP (2.2 Ga to 2450 Ma)

21 **Cobalt Gp.[n]:** siltstone, argillite, sandstone, conglomerate

21a Bar River Formation: quartz sandstone, hematitic sandstone, sandstone
21b Gordon Lake Formation: siltstone, argillite, sandstone
21c Lorrain Formation: quartz sandstone, minor conglomerate, siltstone
21d Gowganda Formation: conglomerate, sandstone, siltstone, argillite

20 **Quirke Lake Gp.:** sandstone, siltstone, conglomerate, limestone, dolostone

20a Serpent Formation: quartz-feldspar sandstone, sandstone with minor siltstone, calcareous siltstone and conglomerate
20b Espanola Formation: limestone, dolostone, siltstone, sandstone
20c Bruce Formation: conglomerate with minor sandstone and siltstone

19 **Hough Lake Gp.:** siltstone, wacke, argillite, quartz-feldspar sandstone, conglomerate, sandstone

19a Mississagi Formation: quartz-feldspar sandstone, argillite and conglomerate
19b Pecors Formation: siltstone, argillite, wacke, minor sandstone
19c Ramsay Lake Formation: conglomerate, minor sandstone, siltstone

18 **Elliot Lake Gp.:** siltstone, wacke, argillite, quartz-feldspar sandstone, conglomerate, mafic, intermediate and felsic metavolcanic rocks, intercalated metasedimentary rocks and epiclastic rocks

18a McKim Formation: siltstone, wacke, argillite
18b Matinenda Formation: quartz-feldspar sandstone, conglomerate, sandstone
18c Volcanic rocks: includes mafic, intermediate and felsic metavolcanic rocks, intercalated metasedimentary rocks and epiclastic rocks

INTRUSIVE CONTACT

17 **Mafic and ultramafic intrusive rocks and mafic dikes**

17a Matachewan mafic dike swarm (circa 2454 Ma)
17b Gabbro, anorthosite

SUPERIOR PROVINCE

ARCHEAN (2.5 Ga to <3.85 Ga)

NEOARCHEAN (2.5 Ga to 2.8 Ga)

INTRUSIVE CONTACT

16 **Hornblendite - nepheline syenite suite[go]:** pyroxenite, diorite, monzonite, syenite, nepheline syenite (saturated to undersaturated suite)

- 16a Hornblendite, pyroxenite
- 16b Gabbro, diorite, monzonite
- 16c Syenite, nepheline and/or foid-bearing syenite

NEO- TO MESOARCHEAN (2.5 Ga to 3.2 Ga)[egop]

INTRUSIVE CONTACT

15 **Massive granodiorite to granite:** massive to foliated granodiorite to granite

- 15a Potassium feldspar megacrystic units

14 **Diorite-monzodiorite-granodiorite suite:** diorite, quartz diorite, minor tonalite, monzonite, granodiorite, syenite and hypabyssal equivalents (saturated to oversaturated suite)

- 14a Diorite, monzonite, quartz monzonite
- 14b Granodiorite, granite
- 14c Syenite

13 **Muscovite-bearing granitic rocks:** muscovite-biotite and cordierite-biotite granite, granodiorite-tonalite

12 **Foliated tonalite suite:** tonalite to granodiorite - foliated to massive

- 12a Biotite tonalite to granodiorite
- 12b Hornblende tonalite to granodiorite

11 **Gneissic tonalite suite:** tonalite to granodiorite - foliated to gneissic - with minor supracrustal inclusions

10 **Mafic and ultramafic rocks[q]:** gabbro, anorthosite, ultramafic rocks

- 10a Gabbro
- 10b Anorthosite
- 10c Ultramafic rocks

INTRUSIVE CONTACT

NEOARCHEAN (2.5 Ga to 2.8 Ga)

SUPRACRUSTAL ROCKS

9 **Coarse clastic metasedimentary rocks[r]:** mainly coarse clastic metasedimentary rocks, with minor, mainly alkalic, mafic to felsic metavolcanic flows, tuffs and breccias

- 9a Metasedimentary rocks: conglomerate, arkose, arenite, wacke, sandstone, siltstone, argillite
- 9b Alkaline metavolcanic rocks: mafic to felsic metavolcanic flows, tuffs and breccias

NEO- TO MESOARCHEAN (2.5 Ga to 3.2 Ga)

SUPRACRUSTAL ROCKS

8 **Migmatized supracrustal rocks[eg]:** metavolcanic rocks, minor metasedimentary rocks, mafic gneisses of uncertain protolith, granitic gneisses

7 **Metasedimentary rocks[eg]:** wacke, siltstone, arkose, argillite, slate, mudstone, marble, chert, iron formation, minor metavolcanic rocks, conglomerate, arenite, paragneiss, migmatites

- 7a Wacke, siltstone, arkose
- 7b Argillite, slate, mudstone
- 7c Marble, chert, iron formation, minor metavolcanic rocks
- 7d Conglomerate and arenite
- 7e Paragneiss and migmatites[s]

6 **Felsic to intermediate metavolcanic rocks[gt]:** rhyolitic, rhyodacitic, dacitic and andesitic flows, tuffs and breccias, chert, iron formation, minor metasedimentary and intrusive rocks; related migmatites

- 6a Dacitic and andesitic flows, tuffs and breccias
- 6b Rhyolitic, rhyodacitic flows, tuffs and breccias

5 **Mafic to intermediate metavolcanic rocks[gt]:** basaltic and andesitic flows, tuffs and breccias, chert, iron formation, minor metasedimentary and intrusive rocks, related migmatites

- 5a Andesitic flows, tuffs and breccias with minor rhyolites[u]
- 5b Basaltic and andesitic flows, tuffs and breccias

4 **Mafic to ultramafic metavolcanic rocks[gt]:** mafic metavolcanic and basaltic rocks with minor komatiitic flows, metasedimentary and pyroclastic rocks

4a Ultramafic metavolcanic rocks
4b Mafic metavolcanic rocks, metasedimentary rocks and pyroclastic rocks

MESOARCHEAN (2.8 Ga to 3.2 Ga)[v]

SUPRACRUSTAL ROCKS

3 **Mafic metavolcanic and metasedimentary rocks[tw]:** mafic metavolcanic rocks, minor iron formation

2 **Felsic to intermediate metavolcanic rocks[t]:** rhyolitic, rhyodacitic, dacitic and andesitic flows, tuffs and breccias

1 **Metasedimentary rocks and mafic to ultramafic metavolcanic rocks[tw]:** coarse clastic metasedimentary rocks, marble, quartz arenite, iron formation, komatiite, mafic metavolcanic rocks, and minor felsic metavolcanic rocks

a - The letter "G" preceding a map unit number indicates lithologic information interpreted from geophysical data.

b - Phanerozoic stratigraphic nomenclature varies in the level of detail to match the variable level of detail displayed on the map face.

c - Unassigned.

d - Subdivisions of Precambrian geologic time and units characterized by a range of ages are cited in terms of Ga. The subdivisions of geologic time correspond to international standards. All ages of individual units cited in the legend are based on high precision U/Pb zircon ages, and are cited in terms of Ma.

e - Granulite grade units are shown by screened overprint.

f - The rocks of the Central Granulite Terrane in Quebec are coded in a lithologic sense only and represent units of ca. 1050 to 1150 Ma in age. Equivalents of these rocks are not known to be present in Ontario.

g - Rocks in these groups are subdivided lithologically. The order does not imply age relationship within or among groups.

h - This part of the legend describes Proterozoic units of the Southern Province, and those Proterozoic units within the Superior Province. Most diabase dike and alkalic intrusive rock map units listed for the Grenville Province cut Grenville and Southern provinces; therefore, they are listed in the Southern Province part of the legend.

i - A generalized distribution of diabase dikes is shown. Some individual swarms occur in more than one geological province.

j - This unit has a geographic distribution from the west shore of Lake Nipigon to the north shore of Lake Huron, including the Cutler, Chief Lake, Croker Island, English Bay and Manitoulin granites.

k - This unit includes the Killarney and related granitoids and equivalent metavolcanic units, as well as the Killarney area granitoids.

l - This unit includes the Chelmsford, Onwatin and Onaping formations.

m - This unit includes the Gunflint and Rove formations.

n - This unit includes the Gowganda, Lorrain, Gordon Lake and Bar River formations.

o - This unit was formerly classified as Algoman and/or Laurentian. Units 13, 14 and 15 are mainly Neoarchean except in areas of the Sachigo Subprovince, where some examples of Mesoarchean age occur.

p - The intrusive rocks of Archean age range from approximately 2.65 Ga to 3.2 Ga.

q - This unit was formerly classified as Haileyburian.

r - This unit was formerly classified as Timiskaming. This unit comprises fluvial to marine metasedimentary rocks with minor, commonly alkalic, metavolcanic rocks that locally unconformably overlie units 1 to 6. They have generally only undergone the late deformation common in greenstone belts.

s - These units are shown only in the English River and Quetico subprovinces.

t - This unit was formerly classified as Keewatin. Most of these sequences range in age from 2.7 Ga to 2.8 Ga, based on U/Pb zircon ages.

u - These units are large enough to show at the map scale only within the Abitibi Subprovince, forming the Blake River Group and units south of Lake Abitibi.

v - The units under this heading include those greenstone belts that are older than 2.9 Ga, based on U/Pb zircon chronology. All other Archean greenstone sequences have been placed in the Neo- to Mesoarchean subdivision of the legend.

w - This unit comprises those greenstone sequences in which shallow-water supermature sediments (quartz arenites, shallow-water carbonates) have been identified. This type of unit unconformably overlies older granitoid rocks in the Steeprock Lake area, and notably in older greenstone belts in the North Caribou Lake region.

x - Number codes subdivided into a, b, c, etc., are generally arranged—especially for Proterozoic units—from younger to older.

Additional Notes

This compilation represents the Ontario Geological Survey's current interpretation of the Precambrian bedrock geology. The primary goal in creating this theme was to create a seamless product providing blanket coverage of the province. The understanding of Ontario's Precambrian geology will grow with the knowledge acquired through core business-unit-related geoscience studies.

This digital theme was prepared for the sole purpose of portraying the bedrock geology of Ontario at 1:250 000 scale. It can not be used for any other purpose. Use of this theme is governed by the following principles:

1. The theme is scale dependent. Use of the information on this theme at any scale larger than 1:250 000 is unwarranted and will result in erroneous conclusions.

2. To enable the rapid dissemination of information, this digital theme has not received a thorough technical edit. Discrepancies may occur for which the Ministry of Northern Development, Mines and Forestry does not assume liability. The digital theme does not fully portray the complex geology of Ontario and users should verify critical information.

3. The OGS is continually collecting, synthesizing and compiling new data throughout the province. Users should be aware that the digital theme was current at time of posting, but new information may substantially change the interpretation in any area. Users should verify the currency of data in any area before proceeding.

4. The digital theme was prepared from the 1:250 000 manuscript *Geology of Ontario* maps created between 1986 and 1990. These maps were updated within the confines of the available time with information collected post–1990. No attempt was made to check source material published prior to the creation of the manuscript maps.

5. The geology was subdivided to aid identification of economically important rock units.

Numerical subdivisions of the Geological time scale are from the International Commision on Stratigraphy, International Stratigraphic Chart (http://www.stratigraphy.org/upload/ISChart2009.pdf) , August 2009.

Users of OGS products are encouraged to contact those Aboriginal communities whose traditional territories may be located in the mineral exploration area to discuss their project.

How can we help y

Search

contact us Français
Popular +

Trending Now

- Ontario Public Service careers
- OSAP: Ontario Student Assistance Program
- Government services
- Outdoors Cards, Licences and Draws
- Renew a licence plate sticker
- Change the address on identification cards
- Driving and Roads

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the Open Data catalogue.

You may search by Well ID, Well Tag # or see help for advanced options.

Search Clear

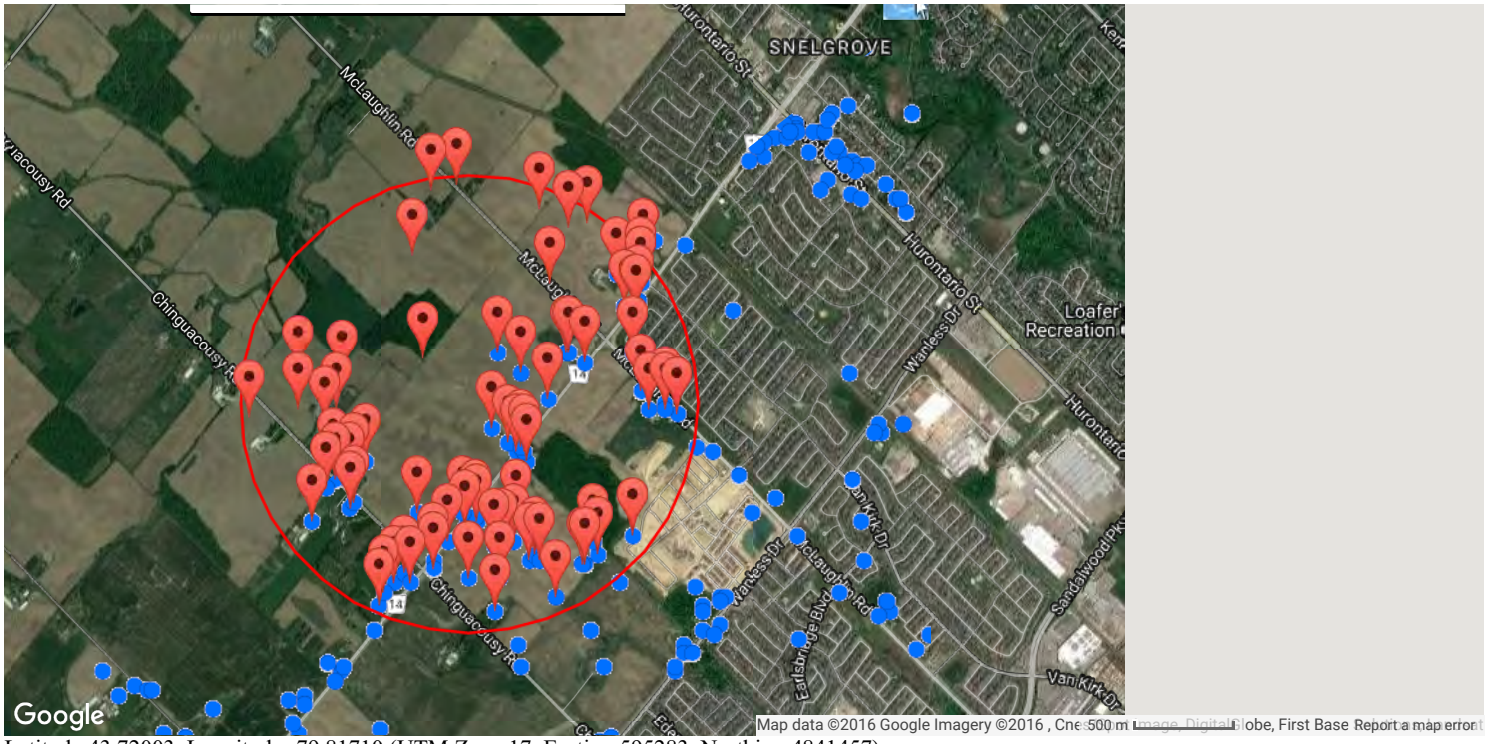
Search current map display only

Your search returns 85 well records, which are displayed as red pins over blue dots.

Recommended for you

How to use a Ministry of the Environment map

Technical documentation: Metadata record



Latitude:43.72003, Longitude:-79.81710 (UTM Zone:17, Easting:595283, Northing:4841457)

Show 100 entries Search:

Well ID	Well Record Information	Well Tag # (since 2003)	Audit #	Contractor Lic#	Well Depth (m)	Date of Completion (MM/DD/YYYY)
4901603	PDF|HTML	N/A	N/A	1307	10.4	08/14/1962
4901615	PDF|HTML	N/A	N/A	1612	30.8	10/13/1962
4901619	PDF|HTML	N/A	N/A	1612	30.5	11/26/1963
4901715	PDF|HTML	N/A	N/A	1307	7.3	06/21/1961
4901717	PDF|HTML	N/A	N/A	2801	48.8	01/22/1964
4901718	PDF|HTML	N/A	N/A	4838	24.1	07/06/1959
4901719	PDF|HTML	N/A	N/A	1325	19.2	07/26/1962
4901833	PDF|HTML	N/A	N/A	1325	17.7	12/02/1963
4901834	PDF|HTML	N/A	N/A	1325	18.3	11/18/1959
4904557	PDF|HTML	N/A	N/A	3513	25.3	06/17/1974
4904660	PDF|HTML	N/A	N/A	2918	24.4	05/19/1975
4905060	PDF|HTML	N/A	N/A	3637	11.6	12/15/1976
4905251	PDF|HTML	N/A	N/A	3637	11.6	06/09/1977
4905535	PDF|HTML	N/A	N/A	3349	26.2	11/13/1978
4905550	PDF|HTML	N/A	N/A	3637	24.1	07/25/1978
4905551	PDF|HTML	N/A	N/A	3637	20.4	07/20/1978
4905741	PDF|HTML	N/A	N/A	4919	18.3	07/12/1980
4906851	PDF|HTML	N/A	NA	4919	18.3	03/04/1988
4907003	PDF|HTML	N/A	43011	1660	19.8	10/19/1988
4907073	PDF|HTML	N/A	37250	4005	17.4	03/17/1987
4907105	PDF|HTML	N/A	47117	4919	30.5	03/10/1989
4907178	PDF|HTML	N/A	62476	4919	18.3	07/20/1989
4907220	PDF|HTML	N/A	43828	1660	36.6	11/03/1989
4907655	PDF|HTML	N/A	110914	4919	30.5	02/10/1992
4907821	PDF|HTML	N/A	125615	4919	6.7	09/10/1993
4908022	PDF|HTML	N/A	161302	6782	30.2	06/15/1993
4908031	PDF|HTML	N/A	159776	3132	41.5	05/31/1995
4908320	PDF|HTML	N/A	184385	6782	30.8	01/08/1998
4908331	PDF|HTML	N/A	187552	1660	16.2	12/12/1997
4908346	PDF|HTML	N/A	177754	2552	7.9	11/04/1997
4908803	PDF|HTML	N/A	219347	6300	26.2	05/18/2001
4910186	PDF|HTML	_NO_TAG	Z38414	6865	24.0	03/08/2006
4910258	PDF|HTML	A038077	Z42507	7143	37.2	06/27/2006
4910312	PDF|HTML	A038082	Z42473	7143	N/A	07/05/2006
7041323	PDF|HTML	A040592	Z45182	3349	18.3	12/30/2006
7041758	PDF|HTML	N/A	Z30639	3108	4.9	02/01/2007
7044484	PDF|HTML	N/A	Z65718	7147	N/A	05/23/2007
7044485	PDF|HTML	N/A	Z65716	7147	N/A	05/23/2007

Well ID	Well Record Information	Well Tag # (since 2003)	Audit #	Contractor Lic#	Well Depth (m)	Date of Completion (MM/DD/YYYY)
7044486	PDF|HTML	N/A	Z65717	7147	N/A	05/23/2007
7052303	PDF|HTML	A062223	Z69282	6809	6.1	10/24/2007
7127670	HTML	A081319	M04311	6607	N/A	02/09/2009
7131414	PDF|HTML	N/A	Z103953	4011	N/A	10/01/2009
7172582	PDF|HTML	A084005	Z121224	6032	7.6	09/14/2011
7179242	HTML	A116949	C16470	7360	N/A	10/25/2011
7181652	PDF|HTML	N/A	Z143659	4645	N/A	04/24/2012
7181653	PDF|HTML	N/A	Z143660	4645	N/A	04/24/2012
7184153	PDF|HTML	A133011	Z149180	7360	15.2	06/15/2012
7224621	HTML	A142408	Z163836	7215	N/A	02/01/2014
7224622	HTML	A142409	Z163842	7215	N/A	02/04/2014
7224623	HTML	A142413	Z163846	7215	N/A	02/04/2014
7224625	HTML	A128843	Z163845	7215	N/A	02/04/2013
7238722	PDF|HTML	N/A	Z190760	7523	N/A	11/09/2014
7243039	HTML	A175716	C29610	7437	N/A	04/13/2015
7244481	HTML	A138167	Z194236	6032	6.1	04/29/2015
7254939	HTML	N/A	Z218834	7523	N/A	09/10/2015
7254940	HTML	N/A	Z218833	7523	N/A	09/10/2015
7254941	HTML	N/A	Z218832	7523	N/A	09/10/2015
7254942	HTML	N/A	Z218831	7523	N/A	09/10/2015
7258384	HTML	A192563	Z227523	7472	6.1	10/29/2015
7258385	HTML	A192564	Z227525	7472	6.1	10/30/2015
7258386	HTML	A192565	Z227527	7472	12.2	10/30/2015
7258387	HTML	A192566	Z227529	7472	7.6	11/01/2015
7258388	HTML	A192567	Z227531	7472	7.6	11/03/2015
7258632	HTML	A192563	Z227524	7147	N/A	11/03/2015
7258633	HTML	A192564	Z227526	7472	N/A	N/A
7258634	HTML	A192565	Z227528	7472	N/A	N/A
7258635	HTML	A192566	Z227530	7472	N/A	N/A
7258636	HTML	A192567	Z227532	7472	N/A	N/A
7262569	HTML	A201516	Z230588	7472	7.6	01/28/2016
7262570	HTML	A201517	Z230587	7472	16.8	01/28/2016
7262571	HTML	A202625	Z230586	7472	13.7	01/28/2016
7262572	HTML	A202626	Z230585	7472	7.6	01/28/2016
7262573	HTML	A202642	Z230591	7472	9.1	01/28/2016
7262574	HTML	A202643	Z230592	7472	7.6	01/28/2016
7262575	HTML	A202644	Z230593	7472	6.1	01/28/2016
7262576	HTML	A202645	Z230594	7472	6.1	01/28/2016
7264363	HTML	N/A	Z228028	7147	N/A	05/13/2016
7265094	HTML	N/A	Z235691	7523	N/A	06/13/2016
7265663	HTML	A206202	Z235418	7472	N/A	02/26/2016
7265664	HTML	A206201	Z235423	7472	N/A	02/26/2016
7265665	HTML	A206200	Z235424	7472	N/A	02/26/2016
7265667	HTML	A206197	Z235420	7472	10.7	02/26/2016
7265668	HTML	A206196	Z235421	7472	12.2	02/26/2016
7265670	HTML	A206193	Z235428	7472	N/A	02/26/2016
7265672	HTML	A206192	Z235425	7472	N/A	02/26/2016

Showing 1 to 85 of 85 entries First Previous 1 Next Last

Updated: February 8, 2016
Rate Rate
Share facebook twitter Print
Tags

- Environment and energy,
- Drinking water,
- Environment maps,
- Well water

Glen Murray

Minister of the Environment and Climate Change

Ministry of the Environment and Climate Change

Contact Us

Contact us by phone

Follow Us

Find us on Facebook

Follow us on Twitter

Follow us on YouTube

Follow us on Flickr

Follow us on Tumblr

Topics

- Arts and culture
- Business and economy
- Driving and roads
- Education and training
- Environment and energy
- Government
- Health and wellness
- Home and community
- Jobs and employment
- Law and safety
- Laws
- Rural and north
- Taxes and benefits
- Travel and recreation

ABOUT ONTARIO

APPENDIX B – LOG OF BOREHOLES

FISHER ENVIRONMENTAL LTD.

Log of Borehole: MW1

Lot 18, Concession 2 (W.H.S)
Caledon, Ontario

Sheet: 1 of 12

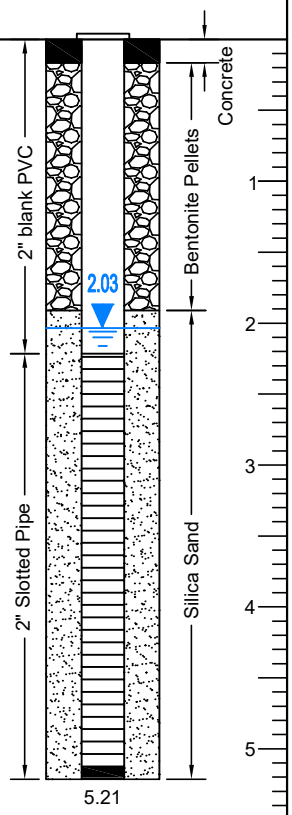
Project #: 17-8080

G.S.Elevation: 259.170 m asl

Location:

Drill Method:	Marooka Drilling Rig	Drilling Date:	1 March 2017
Sample Method:	Solid-stem	Dates: Water Level	17 March 2017
Borehole Diameter:	6"	Water Level: 2.03 m	Logged By: HU / Checked By: AA

DEPTH (meters)	Sample No.	Blow Counts	H.C.Vapour (ppm)	(feet) DEPTH (meters)	Materials Description	Monitoring Well Construction & Water Level (m)
0				0	Grass/Topsoil	
1				2	FILL: Dark brown SILTY SAND with CLAY and stones, moist	
				4	FILL: Brown SILTY SAND, with CLAY, trace fine GRAVEL, moist	
2				6		
				8	Brown SILTY SAND, with CLAY, trace fine GRAVEL, moist	
3				10		
				12	Grey SILTY SAND till, with coarse SAND seams, moist to wet	
4				14		
				16		
5				18	Red SILT till, hard, dry	
6				20	End of borehole at 5.95m	
				22		
7				24		
				26		
8				28		
9				30		
				32		
10				10		



FISHER ENVIRONMENTAL LTD.

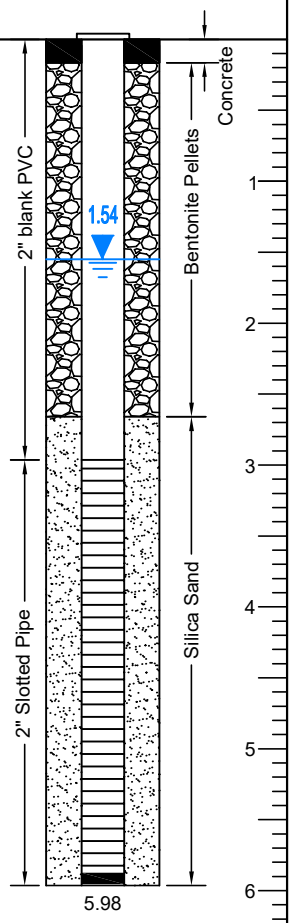
Log of Borehole: MW2
Lot 18, Concession 2 (W.H.S)
Caledon, Ontario

Sheet: 2 of 12
Project #: 17-8080
G.S.Elevation: 258.775 m asl

Location:

Drill Method:	Marooka Drilling Rig	Drilling Date:	1 March 2017
Sample Method:	Solid-stem	Dates: Water Level	17 March 2017
Borehole Diameter:	6"	Water Level: 1.54 m	Logged By: HU / Checked By: AA

DEPTH (meters)	Sample No.	Blow Counts	H.C.Vapour (ppm)	(feet) DEPTH (meters)	Materials Description	Monitoring Well Construction & Water Level (m)
0					Grass/Topsoil	
0					FILL: Brown SILTY SAND, with CLAY and stones, moist	
1				2	FILL: Brown SILTY SAND, with CLAY, trace fine gravel, moist	
1				4		
2				6	Brown to grey SILTY SAND till, trace clay, dry	
2				8		
3				10		
3				12		
4				14	Red SILT till, trace clay, fine gravel seams, moist to wet	
4				16		
5				18		
5				20		
6				20	Red SHALE, wet to dry	
6					End of borehole at 5.95m	
7				22		
7				24		
8				26		
8				28		
9				30		
9				32		
10				10		



FISHER ENVIRONMENTAL LTD.

Log of Borehole: MW3
Lot 18, Concession 2 (W.H.S)
Caledon, Ontario

Sheet: 3 of 12
Project #: 17-8080
G.S.Elevation: 258.905 m asl

Location:

Drill Method:	Marooka Drilling Rig	Drilling Date:	1 March 2017
Sample Method:	Solid-stem	Dates: Water Level	17 March 2017
Borehole Diameter:	6"	Water Level: 1.97 m	Logged By: HU / Checked By: AA

DEPTH (meters)	Sample No.	Blow Counts	H.C.Vapour (ppm)	(feet) DEPTH (meters)	Materials Description	Monitoring Well Construction & Water Level (m)
0					Grass/Topsoil	
					FILL: Dark brown SILTY SAND with CLAY and stones, moist	
				2	FILL: Brown SILTY SAND, with CLAY, trace fine gravel, moist	Concrete
1				4		
				6	Brown SILTY SAND, trace clay, sand seams, dry	2" blank PVC / Bentonite Pellets
2				8		1.97
				10		
3				12	Grey SILTY SAND till, with coarse SAND seams, moist to wet	Silica Sand
4				14		
				16	Red SILT till, with CLAY, fine GRAVEL seams, wet	2" Slotted Pipe
5				18		
6				20	Red SHALE, wet to dry	5.95
					End of borehole at 6.10 m	
7				22		
				24		
8				26		
				28		
9				30		
				32		
10				10		

FISHER ENVIRONMENTAL LTD.

Log of Borehole: MW4

Lot 18, Concession 2 (W.H.S)
Caledon, Ontario

Sheet: 4 of 12

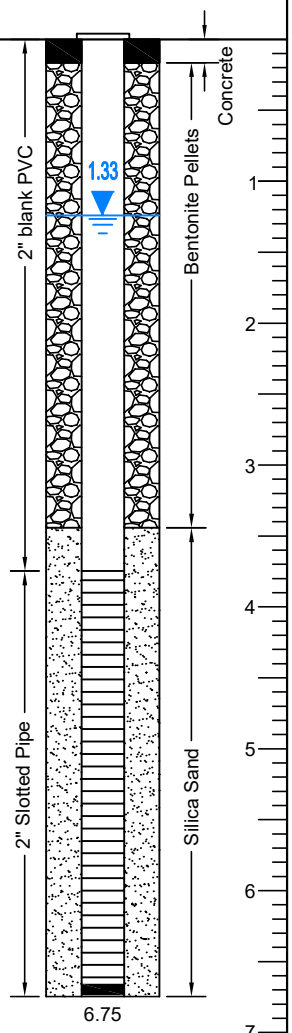
Project #: 17-8080

G.S.Elevation: 258.380 m asl

Location:

Drill Method:	Marooka Drilling Rig	Drilling Date:	1 March 2017
Sample Method:	Solid-stem	Dates: Water Level	17 March 2017
Borehole Diameter:	6"	Water Level: 1.33 m	Logged By: HU / Checked By: AA

DEPTH (meters)	Sample No.	Blow Counts	H.C.Vapour (ppm)	(feet) DEPTH (meters)	Materials Description	Monitoring Well Construction & Water Level (m)
0					Grass/Topsoil	
					FILL: Dark brown SILTY SAND with CLAY and stones, moist	
				2	FILL: Brown SILTY SAND, with CLAY, trace fine gravel, moist	
1				4	Brown SILTY SAND, trace clay, sand seams, dry	
2				6		
				8		
3				10	Grey SILTY SAND till, dry	
				12		
4				14		
				16	Red SILT till, with CLAY, trace fine gravel, slightly moist	
5				18		
				20	Red SILT till, hard, trace fine gravel seams, moist	
6				22		
				24	Red SILT till, hard, dry, occassional shale pieces	
7				26	End of borehole at 7.50 m	
				28		
8				30		
9				32		
10						



FISHER ENVIRONMENTAL LTD.

Log of Borehole: MW5
Lot 18, Concession 2 (W.H.S)
Caledon, Ontario

Sheet: 5 of 12
Project #: 17-8080
G.S.Elevation: 258.130 m asl

Location:

Drill Method:	Marooka Drilling Rig	Drilling Date:	1 March 2017
Sample Method:	Solid-stem	Dates: Water Level	17 March 2017
Borehole Diameter:	6"	Water Level: 1.19 m	Logged By: HU / Checked By: AA

DEPTH (meters)	Sample No.	Blow Counts	H.C.Vapour (ppm)	(feet) DEPTH (meters)	Materials Description	Monitoring Well Construction & Water Level (m)
0					Grass/Topsoil	
0 to 1				0 to 4	FILL: Dark brown SILTY SAND with CLAY and stones, moist	Concrete
1 to 2				4 to 6	Brown SAND, with SILT and CLAY, trace fine GRAVEL, moist	2" blank PVC; Bentonite Pellets; 1.19
2 to 4				6 to 14	Brown to grey SILTY SAND till, trace clay, dry to slightly moist	2" blank PVC; Bentonite Pellets; Silica Sand
4 to 5				14 to 16	Red SILT till, with fine GRAVEL seams, occasional coarse gravel, wet	2" Slotted Pipe; Silica Sand
5 to 5.64				16 to 18	Red SHALE, wet to dry	2" Slotted Pipe; Silica Sand
5.64				18	End of borehole at 5.64 m	5.57
5 to 10				18 to 32		

FISHER ENVIRONMENTAL LTD.

Log of Borehole: BH6

Lot 18, Concession 2 (W.H.S)
Caledon, Ontario

Sheet: 6 of 12

Project #: 17-8080

G.S.Elevation: 258.890 m asl

Location:

Drill Method: Marooka Drilling Rig

Drilling Date: 2 March 2017

Sample Method: Solid-stem

Dates: Water Level

Borehole Diameter: 6"

Water Level: Dry

Logged By: HU

Checked By: AA

DEPTH (meters)	Sample No.	Blow Counts	H.C.Vapour (ppm)	(feet) DEPTH (meters)	Materials Description	Monitoring Well Construction & Water Level (m)
0				0	Grass/Topsoil	
					FILL: Brown SILTY SAND with CLAY, moist	
1				2 / 4 / 1	FILL: Dark brown SILTY SAND, with CLAY, trace fine gravel, pieces of brick, dry	
2				6 / 8 / 2	Brown SILTY SAND till, trace clay, dry	
3				10 / 3	End of borehole at 2.90m	
4				12 / 14 / 4		
5				16 / 18 / 5		
6				20 / 22 / 6		
7				24 / 7		
8				26 / 28 / 8		
9				30 / 9		
10				32 / 10		

FISHER ENVIRONMENTAL LTD.

Log of Borehole: BH7

Lot 18, Concession 2 (W.H.S)
Caledon, Ontario

Sheet: 7 of 12

Project #: 17-8080

G.S.Elevation: 259.435 m asl

Location:

Drill Method: Marooka Drilling Rig

Drilling Date: 2 March 2017

Sample Method: Solid-stem

Dates: Water Level

Borehole Diameter: 6"

Water Level:

Logged By: HU

Checked By: AA

DEPTH (meters)	Sample No.	Blow Counts	H.C.Vapour (ppm)	(feet) DEPTH (meters)		Materials Description	Monitoring Well Construction & Water Level (m)
						Grass/Topsoil	
						FILL: Brown SILTY SAND with CLAY, moist	
				2		FILL: Brown SILTY SAND, with CLAY, trace fine gravel, dry	
1				4	1		1
				6		Brown SILTY SAND till, trace clay, dry	
2				8	2	End of borehole at 2.30m	2
3				10	3		3
				12			
4				14	4		4
				16			
5				18	5		5
				20			
6				22	6		6
				24			
7				26	7		7
				28			
8				30	8		8
				32			
9					9		9
10					10		10

FISHER ENVIRONMENTAL LTD.

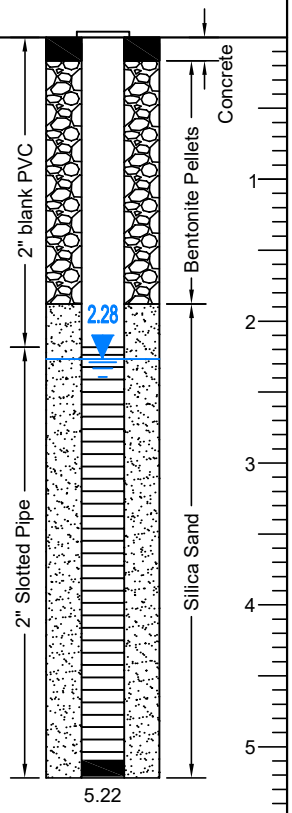
Log of Borehole: MW8
Lot 18, Concession 2 (W.H.S)
Caledon, Ontario

Sheet: 8 of 12
Project #: 17-8080
G.S.Elevation: 259.390 m asl

Location:

Drill Method:	Marooka Drilling Rig	Drilling Date:	2 March 2017
Sample Method:	Solid-stem	Dates: Water Level	20 March 2017
Borehole Diameter:	6"	Water Level: 2.28 m	Logged By: HU / Checked By: AA

DEPTH (meters)	Sample No.	Blow Counts	H.C.Vapour (ppm)	(feet) DEPTH (meters)	Materials Description	Monitoring Well Construction & Water Level (m)
					On Sand	
0–1.5				0–5	FILL: Brown SAND, trace SILT and CLAY, dry	
1.5–2.5				5–8	FILL: Dark brown SILTY SAND to SANDY SILT, with CLAY, trace fine gravel, moist	
2.5–4.8				8–16	Brown to grey SILTY SAND till, with CLAY, dry to slightly moist	
4.8–5.2				16–17	Red SILT till, with fine GRAVEL seams, occasional coarse gravel, wet	
5.2				17	Red SHALE, wet to dry	
5.35				18	End of borehole at 5.35m	



FISHER ENVIRONMENTAL LTD.

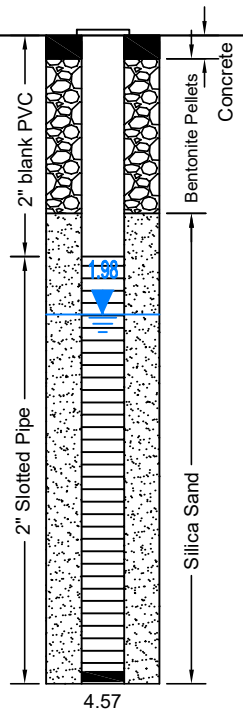
Log of Borehole: MW9
Lot 18, Concession 2 (W.H.S)
Caledon, Ontario

Sheet: 9 of 12
Project #: 17-8080
G.S.Elevation: 259.070 m asl

Location:

Drill Method:	Marooka Drilling Rig	Drilling Date:	2 March 2017
Sample Method:	Solid-stem	Dates: Water Level	20 March 2017
Borehole Diameter:	6"	Water Level:	Logged By: HU / Checked By: AA

DEPTH (meters)	Sample No.	Blow Counts	H.C.Vapour (ppm)	(feet) DEPTH (meters)	Materials Description	Monitoring Well Construction & Water Level (m)
					On Sand	
0–1				0–2	FILL: Brown SAND, trace SILT and CLAY, dry	
1–2				2–6	Brown SAND, with SILT and CLAY, trace fine gravel, moist	
2–4				6–14	Brown to grey SILTY SAND till, trace clay, dry to slightly moist	
4–5				14–16	Red SILT till, with fine GRAVEL seams, occasional coarse gravel, wet	
					Red SHALE, wet to dry	
5.35				18	End of borehole at 5.35m	



FISHER ENVIRONMENTAL LTD.

Log of Borehole: BH10

Lot 18, Concession 2 (W.H.S)
Caledon, Ontario

Sheet: 10 of 12

Project #: 17-8080

G.S.Elevation: 259.340 m asl

Location:

Drill Method: Marooka Drilling Rig

Drilling Date: 2 March 2017

Sample Method: Solid-stem

Dates: Water Level 20 March 2017

Borehole Diameter: 6"

Water Level: 0.77 m

Logged By: HU

Checked By: AA

DEPTH (meters)	Sample No.	Blow Counts	H.C.Vapour (ppm)	(feet) DEPTH (meters)	Materials Description	Monitoring Well Construction & Water Level (m)
					On SAND	
0				0	FILL: Brown SAND, trace SILT and CLAY, slightly moist	
1				2 / 4 / 1	FILL: Dark brown SILTY SAND to SANDY SILT, trace fine GRAVEL, dry	
2				6 / 2	Brown SILTY SAND till, with CLAY, dry to slightly moist	
3				8 / 10 / 3	Brown to grey SILTY SAND till, trace clay, dry to slightly moist	
4				12 / 14 / 4		
5				16 / 5	Red SILT till, with fine GRAVEL seams, occasional coarse gravel, wet	
					Red SHALE, wet to dry	
					End of borehole at 5.35m	
6				18 / 20 / 6		
7				22 / 24 / 7		
8				26 / 8		
9				28 / 30 / 9		
10				32 / 10		

FISHER ENVIRONMENTAL LTD.

Log of Borehole: BH11

Lot 18, Concession 2 (W.H.S)
Caledon, Ontario

Sheet: 11 of 12

Project #: 17-8080

G.S.Elevation: 257.500 m asl

Location:

Drill Method: Marooka Drilling Rig

Drilling Date: 2 March 2017

Sample Method: Solid-stem

Dates: Water Level

Borehole Diameter: 6"

Water Level: Dry

Logged By: HU

Checked By: AA

DEPTH (meters)	Sample No.	Blow Counts	H.C.Vapour (ppm)	(feet) DEPTH (meters)	Materials Description	Monitoring Well Construction & Water Level (m)
					Topsoil	
				0 – 2	FILL: Dark brown SILTY SAND, with CLAY, moist, seams of coarse SAND, occasional brick and concrete	
				2 – 4	FILL: Brown SILTY SAND, with CLAY, trace fine gravel, dry	
				4 – 6	Brown SILTY SAND till, trace clay, dry	
				6 – 8	End of borehole at 2.30m	

FISHER ENVIRONMENTAL LTD.

Log of Borehole: BH12

Lot 18, Concession 2 (W.H.S)
Caledon, Ontario

Sheet: 12 of 12

Project #: 17-8080

G.S.Elevation: 257.500 m asl

Location:

Drill Method: Marooka Drilling Rig

Drilling Date: 2 March 2017

Sample Method: Solid-stem

Dates: Water Level

Borehole Diameter: 6"

Water Level: Dry

Logged By: HU

Checked By: AA

DEPTH (meters)	Sample No.	Blow Counts	H.C.Vapour (ppm)	(feet) DEPTH (meters)		Materials Description	Monitoring Well Construction & Water Level (m)
						Topsoil	
				2		FILL: Dark brown SILTY SAND, with CLAY, moist, trace seams of coarse sand, occasional brick and concrete	
1				4	1		1
				6	2	Brown SILTY SAND till, trace clay, dry	
2				8		End of borehole at 2.30m	2
3				10	3		3
				12	4		
4				14			4
				16	5		
5				18			5
				20	6		
6				22			6
				24	7		
7				26			7
				28	8		
8				30			8
				32	9		
9							9
10					10		10

APPENDIX C – CERTIFICATES OF ANALYSIS

FISHER ENVIRONMENTAL LABORATORIES

FULL RANGE ANALYTICAL SERVICES • SOIL/WATER/AIR TESTING • ENVIRONMENTAL COMPLIANCE PACKAGES • 24 HOUR EMERGENCY RESPONSE • CALA ACCREDITED

400 ESNA PARK DRIVE #15
MARKHAM, ONT. L3R 3K2
TEL: 905 475-7755
FAX: 905 475-7718
www.fisherenvironmental.com

Client: Mayfield McLaughlin Developments Inc.
Address: 150 Connie Cres., Unit 4,
Concord, Ontario L4K1L9

Tel.: (416) 306-9900
Fax:
Email:
Attn.: Steven Silverberg

F.E. Job #: 17-5863
Project Name: Phase II ESA
Project ID: FE-P 17-8080
Date Sampled: 1, 2-Mar-17
Date Received: 3-Mar-17
Date Reported: 16-Mar-17
Location: Pt of Lt 18, Con 2 (W.H.S.),
Caledon, ON

Certificate of Analysis

Analyses	Matrix	Quantity	Date Extracted	Date Analyzed	Lab SOP	Method Reference
Metals	Soil	15	6-Mar-17	7-Mar-17	Metals F-18	SM 3120-B
PHCs (F1 & BTEX)	Soil	18	6-Mar-17	7-Mar-17	PHCs F-7	CCME CWS
PHCs (F2 - F4)	Soil	18	6-Mar-17	10-Mar-17	PHCs F-7	CCME CWS
PAHs	Soil	15	7-Mar-17	8-Mar-17	PAHs F-4	SM 6410-B
pH	Soil	5	14-Mar-17	14-Mar-17	pH-EC-SAR F-16	SW-846, 9045D
Grain Size	Soil	3	13-Mar-17	13-Mar-17	Grain Size F-28	ASTM D6913-04
Moisture Content	Soil	18	N/A	8-Mar-17	Support Procedures F-99	Carter (1993)

Fisher Environmental Laboratories is accredited by CALA (the Canadian Association for Laboratory Accreditation Inc.) for specific parameters as required by Ontario Regulation 153/04. All analytical testing has been performed in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act published by Ontario Ministry of the Environment.

Authorized by:

Roger Lin, Ph. D., C. Chem.
Laboratory Manager

Results related only to the items tested

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs, pH, Grain Size
Sample Description:	18 Soil Samples

Parameter	***17-5863-1*** MW1 0.75-1.35m	***17-5863-2*** MW1 (Dupe) 0.75-1.35m	***17-5863-3*** MW1 3.00-3.60m	***17-5863-4*** MW1 (Dupe) 3.00-3.60m	***17-5863-5*** MW2 0.00-0.60m	**Soil Standards** [1]
	Concentration (µg/g)					
Metals in Soil						
Antimony	<1	<1	<1	<1	<1	7.5
Arsenic	4.4	4.2	4.1	3.9	5.1	18
Barium	29	30	53	44	55	390
Beryllium	<2	<2	<2	<2	<2	(5) 4
Boron	<5	<5	<5	5.1	<5	120
Cadmium	<1	<1	<1	<1	<1	1.2
Chromium	10	10	13	12	14	160
Cobalt	6.9	6.3	7.6	7.0	8.9	22
Copper	21	17	21	21	14	(180) 140
Lead	<10	<10	<10	<10	11	120
Molybdenum	<2	<2	<2	<2	<2	6.9
Nickel	15	14	14	14	14	(130) 100
Selenium	<1	<1	<1	<1	<1	2.4
Silver	<0.5	<0.5	<0.5	<0.5	<0.5	(25) 20
Thallium	<1	<1	<1	<1	<1	1
Uranium	<1	<1	<1	<1	<1	23
Vanadium	16	16	18	18	26	86
Zinc	33	<30	37	39	44	340

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Residential/Parkland/Institutional Property Use **(R/P/I)**; ( ) Standard value in brackets applies to medium and fine textured soils.

Certificate of Analysis

Analysis Requested:	Metals, VOCs, PHCs, PAHs
Sample Description:	11 Soil Samples

Parameter	***17-5863-6*** MW2 4.55-5.15m	***17-5863-10*** BH6 1.50-2.10m	***17-5863-11*** BH7 0.75-1.35m	***17-5863-12*** MW8 1.50-2.10m	***17-5863-13*** MW8 4.55-5.15m	**Soil Standards [1]**
	Concentration (µg/g)					
Metals in Soil						
Antimony	<1	<1	<1	<1	<1	7.5
Arsenic	2.8	4.1	3.6	4.9	4.1	18
Barium	72	66	71	61	161	390
Beryllium	<2	<2	<2	<2	<2	(5) 4
Boron	12	5.5	<5	7.2	18	120
Cadmium	<1	<1	<1	<1	<1	1.2
Chromium	13	12	16	13	14	160
Cobalt	9.6	8.8	11	8.0	8.1	22
Copper	8.6	34	24	20	6.9	(180) 140
Lead	11	11	13	<10	12	120
Molybdenum	<2	<2	<2	<2	<2	6.9
Nickel	20	17	16	18	19	(130) 100
Selenium	<1	<1	<1	<1	<1	2.4
Silver	<0.5	<0.5	<0.5	<0.5	<0.5	(25) 20
Thallium	<1	<1	<1	<1	<1	1
Uranium	<1	<1	<1	<1	<1	23
Vanadium	20	19	26	22	22	86
Zinc	45	48	51	43	44	340

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Residential/Parkland/Institutional Property Use **(R/P/I)**; ( ) Standard value in brackets applies to medium and fine textured soils.

Certificate of Analysis

Analysis Requested:	Metals, VOCs, PHCs, PAHs
Sample Description:	11 Soil Samples

Parameter	***17-5863-14*** MW9 0.00-0.60m	***17-5863-15*** MW9 4.55-5.15m	***17-5863-16*** BH10 0.75-1.35m	***17-5863-17*** BH11 0.00-0.60m	***17-5863-18*** BH12 0.00-0.60m	**Soil Standards [1]**
	Concentration (µg/g)					
Metals in Soil						
Antimony	<1	<1	<1	<1	<1	7.5
Arsenic	6.0	4.3	6.3	4.1	4.9	18
Barium	67	78	65	57	59	390
Beryllium	<2	<2	<2	<2	<2	(5) 4
Boron	<5	12	<5	<5	<5	120
Cadmium	<1	<1	<1	<1	<1	1.2
Chromium	14	17	16	14	12	160
Cobalt	7.4	10	9.9	8.9	6.5	22
Copper	24	18	28	14	22	(180) 140
Lead	16	11	<10	12	<10	120
Molybdenum	<2	<2	<2	<2	<2	6.9
Nickel	14	21	19	13	16	(130) 100
Selenium	<1	<1	<1	<1	<1	2.4
Silver	<0.5	<0.5	<0.5	<0.5	<0.5	(25) 20
Thallium	<1	<1	<1	<1	<1	1
Uranium	<1	<1	<1	<1	<1	23
Vanadium	23	24	25	24	20	86
Zinc	68	107	55	34	34	340

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Residential/Parkland/Institutional Property Use **(R/P/I)**; ( ) Standard value in brackets applies to medium and fine textured soils.

QA/QC Report

Parameter	Blank	RL	LCS	AR	MS	AR
	(µg/g)		Recovery (%)		Recovery (%)	
Metals in Soil						
Antimony	<1	1	102	80-120	109	70-130
Arsenic	<1	1	99	80-120	110	70-130
Barium	<5	5	104	80-120	109	70-130
Beryllium	<2	2	114	80-120	109	70-130
Boron	<5	5	117	80-120	108	70-130
Cadmium	<1	1	104	80-120	106	70-130
Chromium	<5	5	103	80-120	91	70-130
Cobalt	<2	2	103	80-120	98	70-130
Copper	<5	5	86	80-120	89	70-130
Lead	<10	10	101	80-120	112	70-130
Molybdenum	<2	2	104	80-120	112	70-130
Nickel	<5	5	103	80-120	99	70-130
Selenium	<1	1	93	80-120	105	70-130
Silver	<0.5	0.5	103	80-120	102	70-130
Thallium	<1	1	105	80-120	125	70-130
Uranium	<1	1	103	80-120	106	70-130
Vanadium	<10	10	100	80-120	95	70-130
Zinc	<30	30	93	80-120	103	70-130

LEGEND:
RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range

QA/QC Report

Parameter	Duplicate	AR				
	RPD (%)					
Metals in Soil						
Antimony	0.0	0-30				
Arsenic	8.7	0-30				
Barium	3.1	0-30				
Beryllium	0.0	0-30				
Boron	0.0	0-30				
Cadmium	0.0	0-30				
Chromium	4.0	0-30				
Cobalt	1.4	0-30				
Copper	2.8	0-30				
Lead	0.0	0-30				
Molybdenum	0.0	0-30				
Nickel	7.2	0-30				
Selenium	0.0	0-30				
Silver	0.0	0-30				
Thallium	0.0	0-30				
Uranium	0.0	0-30				
Vanadium	0.6	0-30				
Zinc	1.2	0-30				

LEGEND:
AR - Acceptable Range
RPD - Relative Percent Difference

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs, pH, Grain Size
Sample Description:	18 Soil Samples

Parameter	***17-5863-1*** MW1 0.75-1.35m	***17-5863-2*** MW1 (Dupe) 0.75-1.35m	***17-5863-3*** MW1 3.00-3.60m	***17-5863-4*** MW1 (Dupe) 3.00-3.60m	***17-5863-5*** MW2 0.00-0.60m	**Soil Standards [1]**
	Concentration (µg/g)					
BTEX in Soil						
Benzene	<0.02	<0.02	<0.02	<0.02	<0.02	(0.17) 0.21
Toluene	<0.2	<0.2	<0.2	<0.2	<0.2	(6) 2.3
Ethylbenzene	<0.05	<0.05	<0.05	<0.05	<0.05	(1.6) 1.1
Xylenes	<0.05	<0.05	<0.05	<0.05	<0.05	(25) 3.1
PHCs (F_1-F_4) in Soil						
F_1 (C_6 - C_{10})	<10	<10	<10	<10	<10	(65) 55
F_2 (C_{10} - C_{16})	<10	<10	<10	<10	<10	(150) 98
F_3 (C_{16} - C_{34})	<50	<50	<50	<50	<50	(1300) 300
F_4 (C_{34} - C_{50})	<50	<50	<50	<50	<50	(5600) 2800
Chromatogram descends to baseline by nC50 ? (Yes/No)	Yes	Yes	Yes	Yes	Yes	
Surrogate Recovery (%)						
1,2-Dichloroethane-d4	113	125	112	113	125	60-140
Toluene-d8	110	131	118	104	112	60-140
4-Bromofluorobenzene	111	117	117	84	98	60-140

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Residential/Parkland/Institutional Property Use **(R/P/I)**; ( ) Standard value in brackets applies to medium and fine textured soils.

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs, pH, Grain Size
Sample Description:	18 Soil Samples

Parameter	***17-5863-6*** MW2 4.55-5.15m	***17-5863-7*** MW3 4.55-5.15m	***17-5863-8*** MW4 4.55-5.15m	***17-5863-9*** MW5 4.55-5.15m	***17-5863-10*** BH6 1.50-2.10m	**Soil Standards [1]**
	Concentration (µg/g)					
BTEX in Soil						
Benzene	<0.02	<0.02	<0.02	<0.02	<0.02	(0.17) 0.21
Toluene	<0.2	<0.2	<0.2	<0.2	<0.2	(6) 2.3
Ethylbenzene	<0.05	<0.05	<0.05	<0.05	<0.05	(1.6) 1.1
Xylenes	<0.05	<0.05	<0.05	<0.05	<0.05	(25) 3.1
PHCs (F_1-F_4) in Soil						
F_1 (C_6 - C_{10})	<10	<10	<10	<10	<10	(65) 55
F_2 (C_{10} - C_{16})	<10	<10	<10	<10	<10	(150) 98
F_3 (C_{16} - C_{34})	<50	<50	<50	<50	<50	(1300) 300
F_4 (C_{34} - C_{50})	<50	<50	<50	<50	<50	(5600) 2800
Chromatogram descends to baseline by nC50 ? (Yes/No)	Yes	Yes	Yes	Yes	Yes	
Surrogate Recovery (%)						
1,2-Dichloroethane-d4	134	117	108	104	117	60-140
Toluene-d8	117	101	121	118	101	60-140
4-Bromofluorobenzene	111	93	108	108	86	60-140

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Residential/Parkland/Institutional Property Use **(R/P/I)**; ( ) Standard value in brackets applies to medium and fine textured soils.

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs, pH, Grain Size
Sample Description:	18 Soil Samples

Parameter	***17-5863-11*** BH7 0.75-1.35m	***17-5863-12*** MW8 1.50-2.10m	***17-5863-13*** MW8 4.55-5.15m	***17-5863-14*** MW9 0.00-0.60m	***17-5863-15*** MW9 4.55-5.15m	**Soil Standards [1]**
	Concentration (µg/g)					
BTEX in Soil						
Benzene	<0.02	<0.02	<0.02	<0.02	<0.02	(0.17) 0.21
Toluene	<0.2	<0.2	<0.2	<0.2	<0.2	(6) 2.3
Ethylbenzene	<0.05	<0.05	<0.05	<0.05	<0.05	(1.6) 1.1
Xylenes	<0.05	<0.05	<0.05	<0.05	<0.05	(25) 3.1
PHCs (F_1-F_4) in Soil						
F_1 (C_6 - C_{10})	<10	<10	<10	<10	<10	(65) 55
F_2 (C_{10} - C_{16})	<10	<10	<10	<10	<10	(150) 98
F_3 (C_{16} - C_{34})	<50	<50	<50	<50	<50	(1300) 300
F_4 (C_{34} - C_{50})	<50	<50	<50	<50	<50	(5600) 2800
Chromatogram descends to baseline by nC50 ? (Yes/No)	Yes	Yes	Yes	Yes	Yes	
Surrogate Recovery (%)						
1,2-Dichloroethane-d4	105	114	130	127	123	60-140
Toluene-d8	104	104	119	106	103	60-140
4-Bromofluorobenzene	120	96	98	110	96	60-140

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Residential/Parkland/Institutional Property Use **(R/P/I)**; ( ) Standard value in brackets applies to medium and fine textured soils.

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs, pH, Grain Size
Sample Description:	18 Soil Samples

Parameter	***17-5863-16*** BH10 0.75-1.35m	***17-5863-17*** BH11 0.00-0.60m	***17-5863-18*** BH12 0.00-0.60m			**Soil Standards** [1]
	Concentration (µg/g)					
BTEX in Soil						
Benzene	<0.02	<0.02	<0.02			(0.17) 0.21
Toluene	<0.2	<0.2	<0.2			(6) 2.3
Ethylbenzene	<0.05	<0.05	<0.05			(1.6) 1.1
Xylenes	<0.05	<0.05	<0.05			(25) 3.1
PHCs (F_1-F_4) in Soil						
F_1 (C_6 - C_{10})	<10	<10	<10			(65) 55
F_2 (C_{10} - C_{16})	<10	<10	<10			(150) 98
F_3 (C_{16} - C_{34})	<50	<50	<50			(1300) 300
F_4 (C_{34} - C_{50})	<50	<50	<50			(5600) 2800
Chromatogram descends to baseline by nC50 ? (Yes/No)	Yes	Yes	Yes			
Surrogate Recovery (%)						
1,2-Dichloroethane-d4	123	106	114			60-140
Toluene-d8	119	107	92			60-140
4-Bromofluorobenzene	103	113	112			60-140

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Residential/Parkland/Institutional Property Use **(R/P/I)**; ( ) Standard value in brackets applies to medium and fine textured soils.

QA/QC Report

Parameter	Blank	RL	LCS	AR	MS	AR
	(µg/g)		Recovery (%)		Recovery (%)	
BTEX in Soil						
Benzene	<0.02	0.02	111	60-130	107	50-140
Toluene	<0.2	0.2	95	60-130	118	50-140
Ethylbenzene	<0.05	0.05	102	60-130	103	50-140
Xylenes	<0.05	0.05	95	60-130	90	50-140
PHCs (F_1-F_4) in Soil						
$F1_{-BTEX}$ (C_6 - C_{10})	<10	10	95	80-120	118	60-140
F2 (C_{10} - C_{16})	<10	10	104	80-120	129	60-140
F3 (C_{16} - C_{34})	<50	50	94	80-120	82	60-140
F4 (C_{34}-C_{50})	<50	50	107	80-120	63	60-140
Surrogates						
Parameter	**Recovery (%)**	**AR**	**Recovery (%)**	**AR**	**Recovery (%)**	**AR**
1,2-Dichloroethane-d4	130	60-140	93	60-140	102	60-140
Toluene-d8	101	60-140	103	60-140	113	60-140
4-Bromofluorobenzene	108	60-140	126	60-140	108	60-140

LEGEND:

RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range

BTEX should be subtracted from F_1, Naphthalene from F_2 and selected PAHs from F_3 if BTEX/PAHs are analyzed, then report $F_{1\text{-BTEX}}$, $F_{2\text{-Naph.}}$ and $F_{3\text{-PAH}}$.
nC_{50} response factor was within 70% of nC_{10}+nC_{16}+nC_{34} average.

QA/QC Report

Parameter	Duplicate	AR				
	RPD (%)					
BTEX in Soil						
Benzene	0.0	0-50				
Toluene	6.7	0-50				
Ethylbenzene	8.3	0-50				
Xylenes	7.4	0-50				
PHCs (F_1-F_4) in Soil						
$F1_{-BTEX}$ (C_6 - C_{10})	5.4	0-30				
F2 (C_{10} - C_{16})	1.0	0-30				
F3 (C_{16} - C_{34})	14	0-30				
F4 (C_{34}-C_{50})	3.0	0-30				
Surrogates						
Parameter	**Recovery (%)**	**AR**				
1,2-Dichloroethane-d4	104	60-140				
Toluene-d8	99	60-140				
4-Bromofluorobenzene	89	60-140				

LEGEND:

AR - Acceptable Range

RPD - Relative Percent Difference

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs, pH, Grain Size
Sample Description:	18 Soil Samples

Parameter	***17-5863-1*** MW1 0.75-1.35m	***17-5863-2*** MW1 (Dupe) 0.75-1.35m	***17-5863-3*** MW1 3.00-3.60m	***17-5863-4*** MW1 (Dupe) 3.00-3.60m	***17-5863-5*** MW2 0.00-0.60m	**Soil Standards** [1]
	Concentration (µg/g)					
PAHs in Soil						
Naphthalene	<0.05	<0.05	<0.05	<0.05	<0.05	(0.75) 0.6
2-Methylnaphthalene	<0.05	<0.05	<0.05	<0.05	<0.05	(3.4) 0.99
1-Methylnaphthalene	<0.05	<0.05	<0.05	<0.05	<0.05	
Acenaphthylene	<0.05	<0.05	<0.05	<0.05	<0.05	(0.17) 0.15
Acenaphthene	<0.05	<0.05	<0.05	<0.05	<0.05	(29) 7.9
Fluorene	<0.05	<0.05	<0.05	<0.05	<0.05	(69) 62
Phenanthrene	<0.05	<0.05	<0.05	<0.05	<0.05	(7.8) 6.2
Anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	(0.74) 0.67
Fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	0.69
Pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	78
Benzo [a] anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	(0.63) 0.5
Chrysene	<0.05	<0.05	<0.05	<0.05	<0.05	(7.8) 7
Benzo [b] fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	0.78
Benzo [k] fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	0.78
Benzo [a] pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	0.3
Indeno [1,2,3-cd] pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	(0.48) 0.38
Dibenzo [a,h] anthracene	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Benzo [g,h,i] perylene	<0.1	<0.1	<0.1	<0.1	<0.1	(7.8) 6.6
Surrogate Recovery (%)						
Naphthalene-d8	91	124	98	91	104	50-140
Phenanthrene-d10	99	94	82	90	86	50-140
Chrysene-d12	72	83	88	76	69	50-140

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Residential/Parkland/Institutional Property Use **(R/P/I)**; ( ) Standard value in brackets applies to medium and fine textured soils.

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs, pH, Grain Size
Sample Description:	18 Soil Samples

Parameter	***17-5863-6*** MW2 4.55-5.15m	***17-5863-10*** BH6 1.50-2.10m	***17-5863-11*** BH7 0.75-1.35m	***17-5863-12*** MW8 1.50-2.10m	***17-5863-13*** MW8 4.55-5.15m	**Soil Standards** [1]
	Concentration (µg/g)					
PAHs in Soil						
Naphthalene	<0.05	<0.05	<0.05	<0.05	<0.05	(0.75) 0.6
2-Methylnaphthalene	<0.05	<0.05	<0.05	<0.05	<0.05	(3.4) 0.99
1-Methylnaphthalene	<0.05	<0.05	<0.05	<0.05	<0.05	
Acenaphthylene	<0.05	<0.05	<0.05	<0.05	<0.05	(0.17) 0.15
Acenaphthene	<0.05	<0.05	<0.05	<0.05	<0.05	(29) 7.9
Fluorene	<0.05	<0.05	<0.05	<0.05	<0.05	(69) 62
Phenanthrene	<0.05	<0.05	<0.05	<0.05	<0.05	(7.8) 6.2
Anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	(0.74) 0.67
Fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	0.69
Pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	78
Benzo [a] anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	(0.63) 0.5
Chrysene	<0.05	<0.05	<0.05	<0.05	<0.05	(7.8) 7
Benzo [b] fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	0.78
Benzo [k] fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	0.78
Benzo [a] pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	0.3
Indeno [1,2,3-cd] pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	(0.48) 0.38
Dibenzo [a,h] anthracene	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Benzo [g,h,i] perylene	<0.1	<0.1	<0.1	<0.1	<0.1	(7.8) 6.6
Surrogate Recovery (%)						
Naphthalene-d8	111	101	99	114	112	50-140
Phenanthrene-d10	93	106	82	88	110	50-140
Chrysene-d12	82	88	93	90	102	50-140

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Residential/Parkland/Institutional Property Use **(R/P/I)**; ( ) Standard value in brackets applies to medium and fine textured soils.

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs, pH, Grain Size
Sample Description:	18 Soil Samples

Parameter	***17-5863-14*** MW9 0.00-0.60m	***17-5863-15*** MW9 4.55-5.15m	***17-5863-16*** BH10 0.75-1.35m	***17-5863-17*** BH11 0.00-0.60m	***17-5863-18*** BH12 0.00-0.60m	**Soil Standards** [1]
	Concentration (µg/g)					
PAHs in Soil						
Naphthalene	<0.05	<0.05	<0.05	<0.05	<0.05	(0.75) 0.6
2-Methylnaphthalene	<0.05	<0.05	<0.05	<0.05	<0.05	(3.4) 0.99
1-Methylnaphthalene	<0.05	<0.05	<0.05	<0.05	<0.05	
Acenaphthylene	<0.05	<0.05	<0.05	<0.05	<0.05	(0.17) 0.15
Acenaphthene	<0.05	<0.05	<0.05	<0.05	<0.05	(29) 7.9
Fluorene	<0.05	<0.05	<0.05	<0.05	<0.05	(69) 62
Phenanthrene	0.40	<0.05	<0.05	<0.05	<0.05	(7.8) 6.2
Anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	(0.74) 0.67
Fluoranthene	0.36	<0.05	<0.05	<0.05	<0.05	0.69
Pyrene	0.26	<0.05	<0.05	<0.05	<0.05	78
Benzo [a] anthracene	0.13	<0.05	<0.05	<0.05	<0.05	(0.63) 0.5
Chrysene	0.17	<0.05	<0.05	<0.05	<0.05	(7.8) 7
Benzo [b] fluoranthene	0.16	<0.05	<0.05	<0.05	<0.05	0.78
Benzo [k] fluoranthene	0.16	<0.05	<0.05	<0.05	<0.05	0.78
Benzo [a] pyrene	0.17	<0.05	<0.05	<0.05	<0.05	0.3
Indeno [1,2,3-cd] pyrene	0.13	<0.1	<0.1	<0.1	<0.1	(0.48) 0.38
Dibenzo [a,h] anthracene	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Benzo [g,h,i] perylene	0.12	<0.1	<0.1	<0.1	<0.1	(7.8) 6.6
Surrogate Recovery (%)						
Naphthalene-d8	124	82	85	87	113	50-140
Phenanthrene-d10	91	76	85	83	86	50-140
Chrysene-d12	93	69	86	76	79	50-140

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Residential/Parkland/Institutional Property Use **(R/P/I)**; ( ) Standard value in brackets applies to medium and fine textured soils.

QA/QC Report

Parameter	Blank	RL	LCS	AR	MS	AR
	(µg/g)		Recovery (%)		Recovery (%)	
PAHs in Soil						
Naphthalene	<0.05	0.05	65	50-140	89	50-140
2-Methylnaphthalene	<0.05	0.05	85	50-140	83	50-140
1-Methylnaphthalene	<0.05	0.05	84	50-140	96	50-140
Acenaphthylene	<0.05	0.05	78	50-140	80	50-140
Acenaphthene	<0.05	0.05	90	50-140	98	50-140
Fluorene	<0.05	0.05	102	50-140	84	50-140
Phenanthrene	<0.05	0.05	113	50-140	112	50-140
Anthracene	<0.05	0.05	124	50-140	134	50-140
Fluoranthene	<0.05	0.05	105	50-140	102	50-140
Pyrene	<0.05	0.05	124	50-140	118	50-140
Benzo [a] anthracene	<0.05	0.05	114	50-140	127	50-140
Chrysene	<0.05	0.05	95	50-140	127	50-140
Benzo [b] fluoranthene	<0.05	0.05	113	50-140	100	50-140
Benzo [k] fluoranthene	<0.05	0.05	114	50-140	100	50-140
Benzo [a] pyrene	<0.05	0.05	98	50-140	103	50-140
Indeno [1,2,3-cd] pyrene	<0.1	0.1	108	50-140	98	50-140
Dibenzo [a,h] anthracene	<0.1	0.1	94	50-140	82	50-140
Benzo [g,h,i] perylene	<0.1	0.1	105	50-140	100	50-140
Surrogates						
Parameter	**Recovery (%)**	**AR**	**Recovery (%)**	**AR**	**Recovery (%)**	**AR**
Naphthalene-d8	77	50-140	74	50-140	99	50-140
Phenanthrene-d10	87	50-140	80	50-140	84	50-140
Chrysene-d12	111	50-140	91	50-140	75	50-140

LEGEND:

RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range

QA/QC Report

Parameter	Duplicate	AR				
	RPD (%)					
PAHs in Soil						
Naphthalene	0.0	0-40				
2-Methylnaphthalene	0.0	0-40				
1-Methylnaphthalene	0.0	0-40				
Acenaphthylene	0.0	0-40				
Acenaphthene	0.0	0-40				
Fluorene	0.0	0-40				
Phenanthrene	0.0	0-40				
Anthracene	0.0	0-40				
Fluoranthene	0.0	0-40				
Pyrene	0.0	0-40				
Benzo [a] anthracene	0.0	0-40				
Chrysene	0.0	0-40				
Benzo [b] fluoranthene	0.0	0-40				
Benzo [k] fluoranthene	0.0	0-40				
Benzo [a] pyrene	0.0	0-40				
Indeno [1,2,3-cd] pyrene	0.0	0-40				
Dibenzo [a,h] anthracene	0.0	0-40				
Benzo [g,h,i] perylene	0.0	0-40				
Surrogates						
Parameter	**Recovery (%)**	**AR**				
Naphthalene-d8	88	50-140				
Phenanthrene-d10	79	50-140				
Chrysene-d12	84	50-140				

LEGEND:

AR - Acceptable Range

RPD - Relative Percent Difference

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs, pH, Grain Size
Sample Description:	18 Soil Samples

Parameter	***17-5863-3*** MW1 3.00-3.60m	***17-5863-4*** MW1 (Dupe) 3.00-3.60m	***17-5863-8*** MW4 4.55-5.15m	***17-5863-13*** MW8 4.55-5.15m	***17-5863-17*** BH11 0.00-0.60m	**Soil Standards ***
pH *(pH unit)*	7.13	6.89	7.05	7.74	6.99	(5-11) 5-9

* Surface soil pH value from 5 - 9, Sub-surface soil pH value from 5-11. *Floor of excavation located 4.0 m below site's median grade elevation.

QA/QC Report

Parameter	**LCS**	**AR**	**Duplicate**	**AR**		
			Absolute Difference *(pH Unit)*			
pH *(pH unit)*	7.04	7.00-7.40	0.06	<0.3		

LEGEND:
LCS - Laboratory Control Sample
AR - Acceptable Range

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs, pH, Grain Size
Sample Description:	18 Soil Samples

Parameter	***17-5863-8*** MW4 4.55-5.15m	***17-5863-11*** BH7 0.75-1.35m	***17-5863-17*** BH11 0.00-0.60m			
Grain Size in Soil						
Total Sample, g	22.30	21.45	20.38			
Coarse Fraction >75µm, g	8.74	5.76	5.23			
Fine Fraction <75µm, g	13.56	15.69	15.14			
Coarse Fraction >75µm, %	39.2	26.9	25.7			
Fine Fraction <75µm, %	60.8	73.1	74.3			
Comments	Medium to fine textured	Medium to fine textured	Medium to fine textured			

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs, pH, Grain Size
Sample Description:	18 Soil Samples

Parameter	***17-5863-1*** MW1 0.75-1.35m	***17-5863-2*** MW1 (Dupe) 0.75-1.35m	***17-5863-3*** MW1 3.00-3.60m	***17-5863-4*** MW1 (Dupe) 3.00-3.60m	***17-5863-5*** MW2 0.00-0.60m	***17-5863-6*** MW2 4.55-5.15m
Moisture Content (%)	17	18	15	15	16	11

Parameter	***17-5863-7*** MW3 4.55-5.15m	***17-5863-8*** MW4 4.55-5.15m	***17-5863-9*** MW5 4.55-5.15m	***17-5863-10*** BH6 1.50-2.10m	***17-5863-11*** BH7 0.75-1.35m	***17-5863-12*** MW8 1.50-2.10m
Moisture Content (%)	18	11	18	14	14	13

Parameter	***17-5863-13*** MW8 4.55-5.15m	***17-5863-14*** MW9 0.00-0.60m	***17-5863-15*** MW9 4.55-5.15m	***17-5863-16*** BH10 0.75-1.35m	***17-5863-17*** BH11 0.00-0.60m	***17-5863-18*** BH12 0.00-0.60m
Moisture Content (%)	18	16	19	14	19	15

QA/QC Report

Parameter	**Blank**	**RL**	**LCS**	**AR**	**Duplicate**	**AR**
			Recovery (%)		**RPD (%)**	
Moisture Content (%)	<0.1	0.1	100	70-130	3.6	0-20

LEGEND:
RL - Reporting Limit
LCS - Laboratory Control Sample
AR - Acceptable Range
RPD - Relative Percent Difference

FISHER ENVIRONMENTAL LABORATORIES

FULL RANGE ANALYTICAL SERVICES • SOIL/WATER/AIR TESTING • ENVIRONMENTAL COMPLIANCE PACKAGES • 24 HOUR EMERGENCY RESPONSE • CALA ACCREDITED

400 ESNA PARK DRIVE #15
MARKHAM, ONT. L3R 3K2
TEL: 905 475-7755
FAX: 905 475-7718
www.fisherenvironmental.com

Client: Mayfield McLaughlin Developments Inc.
Address: 150 Connie Cres., Unit 4,
Concord, Ontario L4K1L9

Tel.: (416) 306-9900
Fax:
Email:
Attn.: Steven Silverberg

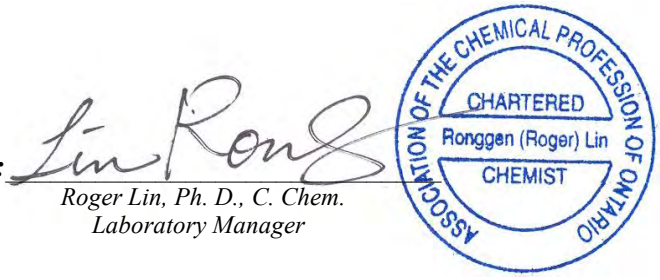
F.E. Job #: 17-5969
Project Name: Phase II ESA
Project ID: FE-P 17-8080
Date Sampled: 17, 20-Mar-17
Date Received: 20-Mar-17
Date Reported: 24-Mar-17
Location: Pt of Lt 18, Con 2 (W.H.S.),
Caledon, ON

Certificate of Analysis

Analyses	Matrix	Quantity	Date Extracted	Date Analyzed	Lab SOP	Method Reference
Metals	Water	4	N/A	22-Mar-17	Metals F-1	SM 3120-B
PHCs (F1 & BTEX)	Water	10	N/A	22-Mar-17	PHCs F-7	CCME CWS
PHCs (F2 - F4)	Water	8	20-Mar-17	23-Mar-17	PHCs F-7	CCME CWS
PAHs	Water	3	21-Mar-17	22-Mar-17	PAHs F-4	SM 6410B

Fisher Environmental Laboratories is accredited by CALA (the Canadian Association for Laboratory Accreditation Inc.) for specific parameters as required by Ontario Regulation 153/04. All analytical testing has been performed in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act published by Ontario Ministry of the Environment.

Authorized by:



Roger Lin, Ph. D., C. Chem.
Laboratory Manager

Results related only to the items tested

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs
Sample Description:	10 Water Samples

Parameter	***17-5969-1*** MW1	***17-5969-2*** MW2	***17-5969-7*** MW8	***17-5969-8*** MW9		**Ground Water Standards** [1]
	Concentration (µg/L)					
Metals in Water						
Antimony	<0.5	<0.5	1.0	<0.5		6
Arsenic	9.8	5.0	21	6.7		25
Barium	109	46	71	133		1,000
Beryllium	<0.5	<0.5	<0.5	<0.5		4
Boron	145	753	203	949		5,000
Cadmium	<0.5	<0.5	<0.5	<0.5		2.7
Chromium	5.1	12	5.1	10		50
Cobalt	<1	<1	<1	<1		3.8
Copper	<5	<5	<5	<5		87
Lead	<1	<1	<1	<1		10
Molybdenum	38	6.8	68	11		70
Nickel	3.3	3.1	3.3	2.8		100
Selenium	<5	<5	10	8.3		10
Silver	<0.3	<0.3	<0.3	<0.3		1.5
Thallium	<0.5	<0.5	<0.5	<0.5		2
Uranium	19	7.7	17	7.9		20
Vanadium	1.5	2.9	1.9	2.3		6.2
Zinc	<5	<5	<5	<5		1,100

< result obtained was below RL (Reporting Limit).

Bold: Result exceeds limit noted in Ground Water Standards.

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

All Types of Property Use.

QA/QC Report

Parameter	Blank	RL	LCS	AR	MS	AR
	(µg/L)		Recovery (%)		Recovery (%)	
Metals in Water						
Antimony	<0.5	0.5	101	80-120	99	70-130
Arsenic	<1	1	92	80-120	110	70-130
Barium	<2	2	80	80-120	80	70-130
Beryllium	<0.5	0.5	100	80-120	76	70-130
Boron	<10	10	94	80-120	84	70-130
Cadmium	<0.5	0.5	87	80-120	93	70-130
Chromium	<10	10	87	80-120	90	70-130
Cobalt	<1	1	93	80-120	89	70-130
Copper	<5	5	93	80-120	84	70-130
Lead	<1	1	89	80-120	99	70-130
Molybdenum	<0.5	0.5	91	80-120	95	70-130
Nickel	<1	1	96	80-120	86	70-130
Selenium	<5	5	81	80-120	117	70-130
Silver	<0.3	0.3	86	80-120	79	70-130
Thallium	<0.5	0.5	86	80-120	102	70-130
Uranium	<2	2	98	80-120	113	70-130
Vanadium	<0.5	0.5	89	80-120	88	70-130
Zinc	<5	5	102	80-120	95	70-130

LEGEND:
RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range

QA/QC Report

Parameter	Duplicate	AR				
	RPD (%)					
Metals in Water						
Antimony	0.0	0-20				
Arsenic	0.0	0-20				
Barium	3.3	0-20				
Beryllium	0.0	0-20				
Boron	6.8	0-20				
Cadmium	0.0	0-20				
Chromium	0.0	0-20				
Cobalt	9.1	0-20				
Copper	0.0	0-20				
Lead	0.0	0-20				
Molybdenum	5.4	0-20				
Nickel	6.2	0-20				
Selenium	0.0	0-20				
Silver	0.0	0-20				
Thallium	0.0	0-20				
Uranium	0.0	0-20				
Vanadium	4.3	0-20				
Zinc	0.0	0-20				

LEGEND:

AR - Acceptable Range

RPD - Relative Percent Difference

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs
Sample Description:	10 Water Samples

Parameter	***17-5969-1*** MW1	***17-5969-2*** MW2	***17-5969-3*** MW3	***17-5969-4*** MW3 Duplicate	***17-5969-5*** MW4	**Ground Water Standards [1]**
	Concentration (µg/L)					
BTEX in Water						
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	5
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	24
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	2.4
Xylenes	<0.5	<0.5	<0.5	<0.5	<0.5	300
PHCs (F1-F4) in Water						
$F1_{-BTEX}$ (C_6 - C_{10})	<25	<25	<25	<25	<25	750
F2 (C_{10} - C_{16})	<100	<100	<100	<100	<100	150
F3 (C_{16} - C_{34})	<100	<100	<100	<100	<100	500
F4 (>C_{34})	<100	<100	<100	<100	<100	500
Chromatogram descends to baseline by nC50 ? (Yes/No)	Yes	Yes	Yes	Yes	Yes	
Surrogate Recovery (%)						
Bromochloromethane	118	98	139	106	69	60-140
1,4-Difluorobenzene	119	99	135	106	71	60-140
1,4-Dichlorobutane	127	91	133	114	77	60-140

F_{4G} (gravimetric heavy hydrocarbons) cannot be added to the C_6 to C_{50} hydrocarbons.

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

All Types of Property Use.

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs
Sample Description:	10 Water Samples

Parameter	***17-5969-6*** MW5	***17-5969-7*** MW8	***17-5969-8*** MW9	***17-5969-9*** Trip Blank 17-Mar-17	***17-5969-10*** Trip Blank 20-Mar-17	**Ground Water Standards** [1]
	Concentration (µg/L)					
BTEX in Water						
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	5
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	24
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	2.4
Xylenes	<0.5	<0.5	<0.5	<0.5	<0.5	300
PHCs (F1-F4) in Water						
$F1_{-BTEX}$ (C_6 - C_{10})	<25	<25	<25	-	-	750
F2 (C_{10} - C_{16})	<100	120	<100	-	-	150
F3 (C_{16} - C_{34})	<100	<100	<100	-	-	500
F4 (>C_{34})	<100	<100	<100	-	-	500
Chromatogram descends to baseline by nC50 ? (Yes/No)	Yes	Yes	Yes			
Surrogate Recovery (%)						
Bromochloromethane	95	103	116	81	93	60-140
1,4-Difluorobenzene	97	104	11*9	78	87	60-140
1,4-Dichlorobutane	107	114	106	74	86	60-140

F_{4G} (gravimetric heavy hydrocarbons) cannot be added to the C_6 to C_{50} hydrocarbons.

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

All Types of Property Use.

QA/QC Report

Parameter	Blank	RL	LCS	AR	MS	AR
	(ug/L)		Recovery (%)		Recovery (%)	
BTEX in Water						
Benzene	<0.5	0.5	97	60-130	117	50-140
Toluene	<0.5	0.5	92	60-130	116	50-140
Ethylbenzene	<0.5	0.5	90	60-130	97	50-140
Xylenes	<0.5	0.5	81	60-130	105	50-140
PHC (F1-F4) in Water						
$F1_{-BTEX}$ (C_6 - C_{10})	<25	25	92	60-140	128	60-140
F2 (C_{10} - C_{16})	<100	100	106	60-140	76	60-140
F3 (C_{16} - C_{34})	<100	100	103	60-140	64	60-140
F4 (>C_{34})	<100	100	104	60-140	60	60-140
Surrogates						
Parameter	**Recovery (%)**	**AR**	**Recovery (%)**	**AR**	**Recovery (%)**	**AR**
Bromochloromethane	79	60-140	117	60-140	80	60-140
1,4-Difluorobenzene	83	60-140	103	60-140	77	60-140
1,4-Dichlorobutane	82	60-140	110	60-140	74	60-140

LEGEND:

RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range

QA/QC Report

Parameter	Duplicate	AR				
	RPD (%)					
BTEX in Water						
Benzene	4.0	0-30				
Toluene	1.0	0-30				
Ethylbenzene	1.0	0-30				
Xylenes	1.0	0-30				
PHC (F1-F4) in Water						
$F1_{-BTEX}$ (C_6 - C_{10})	3.0	0-30				
F2 (C_{10} - C_{16})	10	0-30				
F3 (C_{16} - C_{34})	3.0	0-30				
F4 (>C_{34})	14	0-30				
Surrogates						
Parameter	**Recovery (%)**	**AR**				
Bromochloromethane	89	60-140				
1,4-Difluorobenzene	90	60-140				
1,4-Dichlorobutane	98	60-140				

LEGEND:

AR - Acceptable Range

RPD - Relative Percent Difference

Certificate of Analysis

Analysis Requested:	Metals, PHCs, PAHs
Sample Description:	10 Water Samples

Parameter	***17-5969-1*** MW1	***17-5969-2*** MW2	***17-5969-7*** MW8			**Ground Water Standards** [1]
	Concentration (µg/L)					
PAHs in Water						
Naphthalene	<2	<2	<2			11
2-Methylnaphthalene	<1	<1	<1			3.2
1-Methylnaphthalene	<1	<1	<1			
Acenaphthylene	<1	<1	<1			1
Acenaphthene	<1	<1	<1			4.1
Fluorene	<0.5	<0.5	<0.5			120
Phenanthrene	<0.1	<0.1	<0.1			1
Anthracene	<0.1	<0.1	<0.1			2.4
Fluoranthene	<0.4	<0.4	<0.4			0.41
Pyrene	<0.2	<0.2	<0.2			4.1
Benzo [a] anthracene	<0.2	<0.2	<0.2			1
Chrysene	<0.1	<0.1	<0.1			0.1
Benzo [b] fluoranthene	<0.1	<0.1	<0.1			0.1
Benzo [k] fluoranthene	<0.1	<0.1	<0.1			0.1
Benzo [a] pyrene	<0.01	<0.01	<0.01			0.01
Indeno [1,2,3-cd] pyrene	<0.2	<0.2	<0.2			0.2
Dibenzo [a,h] anthracene	<0.2	<0.2	<0.2			0.2
Benzo [g,h,i] perylene	<0.2	<0.2	<0.2			0.2
Surrogate Recovery (%)						
Naphthalene-d8	60	52	51			50-140
Phenanthrene-d10	100	110	98			50-140
Chrysene-d12	55	84	111			50-140

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.
Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.
All Types of Property Use.

QA/QC Report

Parameter	Blank	RL	LCS	AR	MS	AR
	(µg/L)		Recovery (%)		Recovery (%)	
PAHs in Water						
Naphthalene	<2	2	71	50-140	66	50-140
2-Methylnaphthalene	<1	1	61	50-140	55	50-140
1-Methylnaphthalene	<1	1	73	50-140	65	50-140
Acenaphthylene	<1	1	86	50-140	71	50-140
Acenaphthene	<1	1	66	50-140	66	50-140
Fluorene	<0.5	0.5	72	50-140	86	50-140
Phenanthrene	<0.1	0.1	67	50-140	71	50-140
Anthracene	<0.1	0.1	61	50-140	60	50-140
Fluoranthene	<0.4	0.4	81	50-140	69	50-140
Pyrene	<0.2	0.2	102	50-140	64	50-140
Benzo [a] anthracene	<0.2	0.2	109	50-140	117	50-140
Chrysene	<0.1	0.1	99	50-140	90	50-140
Benzo [b] fluoranthene	<0.1	0.1	119	50-140	89	50-140
Benzo [k] fluoranthene	<0.1	0.1	127	50-140	124	50-140
Benzo [a] pyrene	<0.01	0.01	113	50-140	91	50-140
Indeno [1,2,3-cd] pyrene	<0.2	0.2	109	50-140	88	50-140
Dibenzo [a,h] anthracene	<0.2	0.2	103	50-140	72	50-140
Benzo [g,h,i] perylene	<0.2	0.2	90	50-140	79	50-140
Surrogates						
Parameter	**Recovery (%)**	**AR**	**Recovery (%)**	**AR**	**Recovery (%)**	**AR**
Naphthalene-d8	51	50-140	51	50-140	50	50-140
Phenanthrene-d10	67	50-140	70	50-140	63	50-140
Chrysene-d12	73	50-140	85	50-140	82	50-140

LEGEND:

RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range

QA/QC Report

Parameter	Duplicate	AR				
	RPD (%)					
PAHs in Water						
Naphthalene	2.6	0-30				
2-Methylnaphthalene	5.9	0-30				
1-Methylnaphthalene	1.5	0-30				
Acenaphthylene	8.2	0-30				
Acenaphthene	2.9	0-30				
Fluorene	12	0-30				
Phenanthrene	4.8	0-30				
Anthracene	4.2	0-30				
Fluoranthene	5.3	0-30				
Pyrene	9.7	0-30				
Benzo [a] anthracene	0.2	0-30				
Chrysene	12	0-30				
Benzo [b] fluoranthene	11	0-30				
Benzo [k] fluoranthene	2.7	0-30				
Benzo [a] pyrene	2.3	0-30				
Indeno [1,2,3-cd] pyrene	2.6	0-30				
Dibenzo [a,h] anthracene	14	0-30				
Benzo [g,h,i] perylene	4.4	0-30				
Surrogates						
Parameter	**Recovery (%)**	**AR**				
Naphthalene-d8	60	50-140				
Phenanthrene-d10	72	50-140				
Chrysene-d12	85	50-140				

LEGEND:

AR - Acceptable Range

RPD - Relative Percent Difference