Phase Two Environmental Site Assessment

Millcroft Golf Club (Block C)

Burlington, Ontario

Prepared For:

Millcroft Greens Corporation

4900 Palladium Way, Suite 105,

Burlington, Ontario

L7M 0W7

DS Project No: 19-199-101

Date: 2020-07-02

Revised: 2022-03-02

DS CONSULTANTS LTD.
6221 Highway 7, Unit 16
Vaughan, Ontario, L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Executive Summary

DS Consultants Ltd. (DS) was retained by Millcroft Greens Corporation (the "Client") to complete a Phase Two Environmental Site Assessment (ESA) of a portion of the Millcroft Golf Club designated "Block C", located at 2155 Country Club Drive, in the City of Burlington, Ontario, herein referred to as the "Phase Two Property" or "Site". The Phase Two Property is a 1.4-hectare (3.46 acres) parcel of land situated within a residential neighbourhood in the City of Burlington, Ontario. The Phase Two Property is located approximately 50 m east of the intersection of Berwick Drive and Country Club Drive and was occupied by Millcroft Golf Club at the time of this investigation.

It is DS' understanding that this Phase Two ESA has been requested for due diligence purposes in association with the proposed redevelopment of the Property. DS understands that this Phase Two ESA may be used to support the filing of a Record of Site Condition (RSC) as part of the proposed redevelopment of the Phase Two Property which will consist of fourteen (14) residential Lots.

The Phase Two ESA was completed to satisfy the intent of the requirements, methodology and practices for a Phase Two ESA as described in Ontario Regulation 153/04 (as amended). The objective of this Phase Two ESA is to confirm whether contaminants are present, and at what concentration are they present on the Phase Two Property, as related to the Areas of Potential Environmental Concern (APEC) identified in the Phase One ESA.

The Phase One ESA completed in January 2020 indicated that the Phase Two Property was first developed for agricultural purposes from the late 1800s, and it was used as such until 1987, year when the Site was developed as one of the holes of the Millcroft Golf Club.

A total of three (3) Potentially Contaminating Activities (PCAs) were identified in the Phase One ESA, which were considered to be contributing to three (3) APECs on the Phase Two Property. A summary of the APECs, associated PCAs, and contaminants of potential concern (COPCs) identified is presented in the table below:

Table E-1: Summary of APECs Identified on Phase One Property

Area of Potential Environmental Concern	Location of APECs on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC-1	Entire Property	PCA-2 (#30): Importation of Fill Material of Unknown Quality	On Site	PHCs, VOCs, BTEX, Metals, As, Sb, Se, B-HWS, CN-, EC, Cr (VI), Hg, low or high pH, SAR, PAHs	Soil
APEC-2	Southwest portion of the Property	PCA-4 (#55): Transformer Manufacturing, Processing and Use	On Site	PCBs	Soil
APEC-3	Entire Property	PCA-5 (#40): Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Application	On Site	OCPs	Soil

Based on the findings of the Phase One ESA it was concluded that a Phase Two ESA is warranted in order to assess the soil conditions on the Phase Two Property.

The Phase Two ESA involved the advancement of three (3) boreholes, which was completed between November 2019, and one (1) grab sample in April 2020. The boreholes were advanced to a maximum depth of 6.2 metres below ground surface (mbgs), and the grab sample was collected from a maximum depth of 0.3 mbgs under the supervision of DS personnel. Groundwater monitoring wells were installed in three (3) of the boreholes to facilitate assessment of groundwater flow direction and for the purposes of the Geotechnical Assessment for the Site. The borehole locations were determined based on the findings of the Phase One ESA. All APECs were investigated with boreholes and/or monitoring wells in accordance with the requirements of O.Reg. 153/04 (as amended). Soil and groundwater samples were collected and submitted for analysis of all COPCs, including: PHCs, VOCs, BTEX, Metals, As, Sb, Se, B-HWS, CN-, EC, Cr (VI), Hg, low or high pH, SAR, PAHs, OCPs and PCBs.

The soil analytical results were compared to the "*Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Residential/Parkland/Institutional Use with coarse textured soils"* provided in the MECP document entitled, "*Soil, Ground Water and*

Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" dated April 15, 2011 (Table 1 Site Condition Standards) for medium and fine-textured soils.

Based on the findings of the Phase Two ESA, DS presents the following findings:

- A layer of surficial topsoil of 150 to 180 mm thickness was encounter in all of the boreholes advanced. Fill material consisting of clayey silt to silty clay, trace rootlets was found below the topsoil to depths ranging from 1.0 to 2.6 mbgs. The fill was underlain by clayey silt till extending to depths ranging from 2.3 to 3.4 mbgs. A Sandy silt till deposit was encountered in BH19-2 below the clayey silt till layer, extending to a depth of 6.1 mbgs. Shale bedrock of Queenston Formation was encountered at depths ranging from 3.3 to 6.1 mbgs;
- The depth to groundwater was measured in the three (3) monitoring wells installed during the course of this investigation. The monitoring wells were screened at the shale bedrock. The groundwater levels were found to range between 1.4 to 4.5 mbgs, with corresponding elevations of 140.44 to 144.36 metres above sea level (masl). Based on the groundwater elevations recorded, the groundwater flow direction appears to be northeasterly towards Appleby Creek. It is possible that the groundwater levels may vary seasonally. The groundwater levels may also be impacted by other factors such as historical infilling activities, subsurface utility trenches, and similar subsurface anomalies. The groundwater flow direction can only be confirmed through long term monitoring.
- Soil samples were collected from the boreholes advanced on the Phase Two Property and submitted for analysis of Metals and Inorganics, PHC, VOCs, PAHs, OCPs and PCBs. The results of the chemical analyses conducted indicated that all samples analyzed met the applicable Site Condition Standards.

Based on a review of the findings of this Phase Two ESA, DS presents the following conclusions and recommendations:

- The results of the chemical analyses conducted on soil samples indicate that the applicable Site Condition Standards have been met;
- Based on the findings of this Phase Two ESA, a Record of Site Condition may be filed for the Phase Two Property;
- All monitoring wells should be decommissioned in accordance with O.Reg. 903 when no longer required.

Table of Contents

1. Introduction 1
1.1 Site Description 2
1.2 Property Ownership 2
1.3 Current and Proposed Future Use 3
1.4 Applicable Site Condition Standards 3
2.0 Background Information 3
2.1 Physical Setting 3
2.1.1 Water Bodies and Areas of Natural Significance 3
2.1.2 Topography and Surface Water Draining Features 4
2.2 Past Investigations 4
2.2.1 Previous Report Summary 4
2.2.1 Use of Previous Analytical Results 5
3.0 Scope of the Investigation 5
3.1 Overview of Site Investigation 5
3.2 Media Investigated 6
3.2.1 Rationale for Inclusion or Exclusion of Media 6
3.2.2 Overview of Field Investigation of Media 6
3.3 Phase One Conceptual Site Model 6
3.3.1 Potentially Contaminating Activity Affecting the Phase One Property 7
3.3.2 Contaminants of Potential Concern 7
3.3.3 Underground Utilities and Contaminant Distribution and Transport 7
3.3.4 Geological and Hydrogeological Information 7
3.3.5 Uncertainty and Absence of Information 8
3.4 Deviations from Sampling and Analysis Plan 8
3.5 Impediments 8
4.0 Investigation Method 9
4.1 General 9
4.2 Drilling and Excavating 9
4.3 Soil Sampling 10
4.4 Field Screening Measurements 10
4.5 Groundwater Monitoring Well Installation 11
4.6 Groundwater Field Measurement of Water Quality Parameters 12
4.7 Groundwater Sampling 12
4.8 Sediment Sampling 12
4.9 Analytical Testing 12
4.10 Residue Management Procedures 12
4.10.1 Soil Cuttings From Drilling and Excavations 12
4.10.2 Water from Well Development 12
4.10.3 Fluids from Equipment Cleaning 13
4.11 Elevation Surveying 13
4.12 Quality Assurance and Quality Control Measures 13
4.12.1 Sample containers, preservation, labelling, handling and custody for samples submitted for laboratory analysis, including any deviations from the SAP 13
4.12.2 Description of equipment cleaning procedures followed during all sampling 13
4.12.3 Description of how the field quality control measures referred to in subsection 3 (3) were carried out 14

4.12.4Description of, and rational for, any deviations from the procedures set out in the quality assurance and quality control program set out in the SAP 14
5.0 Review and Evaluation 14
5.1 Geology 14
5.2 Ground Water Elevations and Flow Direction 15
5.2.1Rationale for Monitoring Well Location and Well Screen Intervals 15
5.2.2Results of Interface Probe Measurements 15
5.2.3Product Thickness and Free Flowing Product 15
5.2.4Groundwater Elevation 15
5.2.5Groundwater Flow Direction 16
5.2.6Assessment of Potential for Temporal Variability in Groundwater Flow Direction 16
5.2.7Evaluation of Potential Interaction Between Buried Utilities and the Water Table 16
5.3 Ground Water Hydraulic Gradients 16
5.3.1Horizontal Hydraulic Gradient 16
5.3.2Vertical Hydraulic Gradient 17
5.4 Fine-Medium Soil Texture 17
5.4.1Rational for use of Fine-Medium Soil Texture Category 17
5.4.2Rational for the Number of Samples Collected and Analyzed 17
5.5 Soil Field Screening 17
5.6 Soil Quality 18
5.6.1Metals and inorganics 18
5.6.2Petroleum Hydrocarbons 18
5.6.3Volatile Organic Compounds 18
5.6.4Polycyclic Aromatic Hydrocarbons 18
5.6.1Organochlorine Pesticides 18
5.6.2Polychlorinated Biphenyls 19
5.6.3Commentary on Soil Quality 19
5.7 Ground Water Quality 19
5.8 Sediment Quality 19
5.9 Quality Assurance and Quality Control Results 19
5.10 Phase Two Conceptual Site Model 20
6.0 Conclusions 20
6.1 Qualifications of the Assessors 22
6.2 Signatures 23
6.3 Limitations 24
7.0 References 25

Tables

Table 1-1:Phase Two Property Information 2
Table 1-2: Phase Two Property Ownership 3
Table 3-1: Rationale of Sampling Media 6
Table 3-2: Field Investigation of Media 6
Table 3-3: Summary of PCAs Contributing to APECs 7
Table 4-1: Summary of Drilling Activities 9
Table 4-2: Field Screening Equipment 11
Table 4-3: Summary of Sample Bottle Preservatives 13

Table 5-1: Summary of Geologic Units Investigated 15
Table 5-2: Summary of Horizontal Hydraulic Gradient Calculations 17
Table 5-3: Summary of Grain Size Analyses 17
Table 5-4: Summary of QA/QC Results..... 20

Enclosures

FIGURES

Figure 1 – Site Location Plan
Figure 2 – Phase Two Property Site Plan
Figure 3 – Phase Two Property Study Area
Figure 4 – PCA within Phase Two Property Study Area
Figure 5 – Borehole Location Plan with APECs
Figure 6 – Groundwater Elevation Contours and Flow Direction (Overburden)
Figure 7A – Soil Characterization – Metals and Inorganics
Figure 7B – Soil Characterization –PHCs,
Figure 7C – Soil Characterization – VOCs
Figure 7D – Soil Characterization –PAHs
Figure 7E – Soil Characterization –OCPs
Figure 7F – Soil Characterization – PCBs
Figure 8 - Exposure Pathways and Receptors

SUMMARY TABLES

Table 1: Summary of Monitoring Well Installation and Groundwater Data
Table 2: Summary of Soil Samples Submitted for Chemical Analysis
Table 3: Summary of APECs Investigated
Table 4: Summary of Metals and Inorganics in Soil
Table 5: Summary of PHCs in Soil
Table 6: Summary of VOCs in Soil
Table 7: Summary of PAHs in Soil
Table 8: Summary of OCPs in Soil
Table 9: Summary of PCBs in Soil
Table 10: Summary of Maximum Concentrations in Soil

APPENDICES

Appendix A – Plan of Survey
Appendix B – Sampling and Analysis Plan
Appendix C – Borehole Logs
Appendix D – Laboratory Certificates of Analysis
Appendix E – Phase Two Conceptual Site Model
Appendix F – Environmental Site Screening Questionnaire

1. Introduction

DS Consultants Ltd. (DS) was retained by Millcroft Greens Corporation (the "Client") to complete a Phase Two Environmental Site Assessment (ESA) of a portion of the Millcroft Golf Club designated "Block C", located at 2155 Country Club Drive, in the City of Burlington, Ontario, herein referred to as the "Phase Two Property" or "Site". It is DS' understanding that this Phase Two ESA has been requested for due diligence purposes in association with the proposed redevelopment of the Property. DS understands that this Phase Two ESA may be used to support the filing of a Record of Site Condition (RSC) as part of the proposed redevelopment of the Phase Two Property which consist of fourteen (14) residential Lots .

It is the opinion of DS that the intended future property use (residential) constitutes a more sensitive property use, as defined under O.Reg. 153/04 (as amended) than the current commercial use. Given that the proposed change in property use is to a more sensitive property use, the filing of a Record of Site Condition (RSC) with the Ontario Ministry of Environment, Conservation and Parks (MECP) will be mandated under O.Reg. 153/04 (as amended).

The Phase Two ESA was completed to satisfy the intent of the requirements, methodology and practices for a Phase One ESA as described in Ontario Regulation 153/04 (as amended). The objective of this Phase Two ESA is to confirm whether contaminants are present, and at what concentration are they present on the Phase Two Property, as related to the Areas of Potential Environmental Concern (APEC) identified in the Phase One ESA.

1.1 Site Description

The Phase Two Property is a 1.4-hectare (3.46 acres) parcel of land situated within a residential neighbourhood in the City of Burlington, Ontario. The Phase One Property is located approximately 50 m east of the intersection of Berwick Drive and Country Club Drive and was occupied by Millcroft Golf Club at the time of this investigation. A Site Location Plan is provided in Figure 1.

For the purposes of this report, Berwick Drive is assumed to be aligned in a north-south orientation, and Country Club Drive in east-west orientation. A Plan of Survey for the Site has not been provided for DS to review; however, it will be required prior to the submission of an RSC.

The Phase Two Property is currently situated within the existing Millcroft Golf Club (1st hole) and includes a segment of golf cart path which is flanked by trees, six sand bunkers, and associated manicured grass characteristic of a golf course. A Site Plan depicting the location of the Phase Two Property is provided in Figure 2.

Additional details regarding the Phase Two Property are provided in the table below.

Table 1-1:Phase Two Property Information

Criteria	Information	Source
Legal Description	PT LTS 7 TO 9, CON 1 SDS, PTS 1 TO 10 20R13519 S&E LANDS LAID OUT BY PLANS 20M780, 20M811, 20M868, 20M922, PTS 1 & 2, 20R15846, PIN 07182-2263 & PT 1, 20R16891; BURLINGTON. (NEW REFERENCE PLAN TO BE DEPOSITED FOR DESCRIPTION) S/T EASE H302472. S/T EASE 570228 LYING WITHIN THE LIMITS OF PTS 5 & 6 20R13519. S/T EASE NU39399 OVER PTS 7 &8, 20R13519. S/T EASE NU39398 TRANSFERRED BY 95199. S/T EASE H521403 LYING WITHIN THE LIMITS OF PT 5, 20R13519 & PTS 7 & 9 20R13519. T/W EASE 1499 95 OVER PT 8 20R6131. T/W EASE 153572 OVER PTS 9 & 10, 20R6131. S/T EASE IN FAV OF LTS 1, 16, 117 & 119, PL 20M922 & PT LTS 8& 9, CON 1 SDS PT 2, 20R16282 AS IN HR447696, Burlington	Land Registry Office
Property Identification Number (PIN)	0718-2700	Land Registry Office
Current Site Occupants	Millcroft Golf Club	Phase One Site Reconnaissance
Site Area	1.4-hectare (3.46 acres)	Client

1.2 Property Ownership

The ownership details for the Phase Two Property are provided in the table below.

Table 1-2: Phase Two Property Ownership

Property Owner	Address	Contact
2079610 Ontario Limited	2155 Country Club Drive	Mr. Ed Liptay

1.3 Current and Proposed Future Use

The Phase Two Property is currently used as the 1st hole of the Millcroft Golf Club, which is considered to be commercial use under O.Reg. 153/04 (as amended). It is DS' understanding that the Client intends to redevelop the Site for residential purposes.

1.4 Applicable Site Condition Standards

The applicable Site Condition Standards (SCS) for the Phase Two Property are considered by the Qualified Person (QP) to be the Table 2 SCS: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Residential/Parkland/Institutional Use with coarse-textured soils as contained in the April 15, 2011 Ontario Ministry of Environment, Conservation and Parks (MECP) document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", herein referred to as the "Table 2 RPI SCS".

The selection of the Table 2 RPI SCS is considered appropriate based on the following rationale:

- The City of Burlington does still have areas that derive water from domestic wells;
- The Site is not considered to be environmentally sensitive, as defined under O.Reg. 153/04 (as amended);
- The proposed future use of the Phase Two Property will be residential;
- The Site is not located within 30 m of a water body;
- The pH of the soils analyzed during this Phase Two ESA are within the accepted range specified under O.Reg. 153/04 (as amended); and
- Bedrock was not encountered within 2 metres of the ground surface.

2.0 Background Information

2.1 Physical Setting

2.1.1 Water Bodies and Areas of Natural Significance

The nearest body of water to the Phase Two Property is Appleby Creek, located approximately 200m to the north-east of the Phase Two Property.

The Natural Heritage Areas database published by the Ministry of Natural Resources (MNR) was reviewed in order to identify the presence/absence of areas of natural significance including provincial parks, conservation reserves, areas of natural and scientific interest, wetlands, environmentally significant areas, habitats of threatened or endangered species, and wilderness areas. The regional and municipal Official Plans were also reviewed as part of this assessment.

No areas of natural or scientific interest were identified within the Phase Two Study Area.

2.1.2 Topography and Surface Water Draining Features

The Phase Two Property is located within a residual-urban setting, at an elevation of 150 metres above sea level (masl). The topography of the Phase Two Property is generally sloped to the east, towards Lake Ontario. The neighbouring property are generally at a similar elevation, and the topography in the vicinity of the Phase Two Property also generally slopes east towards Lake Ontario. There are no drainage features (e.g. ditches, swales, etc.) present on-Site. Surface water flow associated with precipitation events is anticipated to run towards Appleby Creek

2.2 Past Investigations

2.2.1 Previous Report Summary

The following environmental and geotechnical reports were provided for DS to review:

- *"Phase One Environmental Site Assessment, Millcroft Golf Club (Block C), Burlington, Ontario"* dated January 29, 2020, prepared for Argo (Millcroft) Limited, prepared by DS Consultants Ltd (DS).

A summary of the details pertinent to this investigation is provided below.

Phase One ESA, DS – January 2020

The Phase One ESA was conducted for due diligence purposes in association with the proposed redevelopment of the property. The result of the Phase One ESA identified that the Site appears to have been used for agricultural purposes from the late 1800s until 1987 when the golf course was developed. A total of three (3) APECs were identified within the Phase One Study Area, and it was concluded that soil sampling should be conducted to determine the possible impacts of contaminants of concern. Additional information regarding the Phase One ESA can be found in the Conceptual Site Model presented in Section 3.3.

2.2.1 Use of Previous Analytical Results

Not applicable, no previous analytical results were available for DS to review.

3.0 Scope of the Investigation

The scope of the Phase Two ESA was designed to investigate the portions of the Site determined in the Phase One ESA to be Areas of Potential Environmental Concern. This Phase Two ESA was conducted in general accordance with O.Reg. 153/04 (as amended). The scope of the investigation including the subsurface investigation, sampling, and laboratory analysis was based on the findings of the Phase One ESA and was limited to the portions of the site which were accessible.

3.1 Overview of Site Investigation

The following tasks were completed as part of the Phase Two ESA:

- Preparation of a Health and Safety Plan to ensure that all work was executed safely;
- Clearance of public private underground utility services prior to commencement of subsurface investigative operations;
- Preparation of a Sampling and Analysis Plan (SAP);
- Retained a MECP licensed driller to advance a total of three (3) boreholes on the Phase Two Property, to a depth of 6.2 mbgs. The three (3) boreholes were instrumented with groundwater monitoring wells upon completion. The soil lithology was logged during drilling, and representative soil samples were collected at regular intervals. The soil samples were screened for organic vapours using a RKI Eagle 2 MultiGas Detector, MiniRae, and examined for visual and olfactory indications of soil impacts;
- One (1) grab sample was collected from a maximum depth of 0.3 mbgs using a hand tool;
- Submitted “worst case” soil samples collected from the boreholes for laboratory analysis of relevant contaminants of potential concern (COPCs) as identified in the Phase One ESA;
- Conducted groundwater level measurements in the monitoring wells in order to determine the groundwater elevation, and to establish the local groundwater flow direction;
- Surveyed all monitoring wells to a geodetic benchmark;
- Developed and purged all monitoring wells prior to sampling. Groundwater samples were collected for all COPCs identified in the Phase One ESA;

- Compared all soil analytical data to the applicable MECP SCS; and
- Prepared a Phase Two ESA Report in general accordance with O.Reg. 153/04 (as amended).

3.2 Media Investigated

3.2.1 Rationale for Inclusion or Exclusion of Media

Table 3-1: Rationale of Sampling Media

Media	Included or Excluded	Rationale
Soil	Included	Soil was identified as a media of potential impact in the Phase One ESA, based on the historical operations conducted on-Site.
Groundwater	Excluded	Groundwater was not identified as a media of potential impact in the Phase One ESA, based on the historical operations conducted on-Site.
Sediment	Excluded	Sediment is not present on the Phase Two Property.
Surface Water	Excluded	Surface water is not present on the Phase Two Property.

3.2.2 Overview of Field Investigation of Media

Table 3-2: Field Investigation of Media

Media	Methodology of Investigation
Soil	A total of three (3) boreholes were advanced, to a maximum depth of 6.2 mbgs, and one (1) grab sample was collected from a maximum depth of 0.3 mbgs on the Phase Two Property. Soil samples were collected and submitted for analysis of all relevant COPCs.

3.3 Phase One Conceptual Site Model

A Conceptual Site Model was developed for the Phase One Property, "Block C" located on the Millcroft Gulf Club in Burlington, Ontario. The Phase One Conceptual Site Model is presented in Figures 3, 4, and 5 and visually depict the following:

- Any existing buildings and structures
- Water bodies located in whole, or in part, on the Phase One Study Area
- Areas of natural significance located in whole, or in part, on the Phase One Study Area
- Water wells at the Phase One Property or within the Phase One Study Area
- Roads, including names, within the Phase One Study Area
- Uses of properties adjacent to the Phase One Property
- Areas where any PCAs have occurred, including location of any tanks
- Areas of Potential Environmental Concern

3.3.1 Potentially Contaminating Activity Affecting the Phase One Property

All PCAs identified within the Phase One Study Area are presented on Figure 4. The PCAs which are considered to contribute to APECs on, in or under the Phase One Property are summarized in the table below:

Table 3-3: Summary of PCAs Contributing to APECs

PCA Item.	PCA Description (Per. Table 2, Schedule D of O.Reg. 153/04)	Description	Rationale
PCA-2	#30: Importation of Fill Material of Unknown Quality	Fill material is inferred to have been imported for grading purposes in the past. The Phase One Property started development around 1987 for what is now Millcroft Golf Club - Hole 1.	PCA is located in the Phase One Property
PCA-4	#55: Transformer Manufacturing, Processing and Use	One transformer was observed on the southwest corner of the Property.	PCA is located in the Phase One Property
PCA-5	#40: Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Pesticides are used on the grass that cover the Phase One Property.	PCA is located in the Phase One Property

N/S - not specified in Table 2, Schedule D, of O.Reg. 153/04

3.3.2 Contaminants of Potential Concern

The following contaminants of potential concern were identified for the Phase One Property: PHCs, VOCs, BTEX, Metals, As, Sb, Se, B-HWS, CN-, EC, Cr (VI), Hg, low or high pH, SAR, PAHs, OCPs and PCBs.

3.3.3 Underground Utilities and Contaminant Distribution and Transport

Underground utilities can affect contaminant distribution and transport. Trenches excavated to install utility services, and the associated granular backfill may provide preferential pathways for horizontal contaminant migration in the shallow subsurface.

Underground utilities were identified at the Phase One Property, a gas main was identified at 6.2 mbgs, across the Property. Water, electrical, and sewer services were not present.

The depth to groundwater at the Phase One Property is approximately 3 mbgs; therefore, it is possible that the utility corridors may act as preferential pathways for contaminant distribution and transport in the event that shallow subsurface contaminants exist at the Property.

3.3.4 Geological and Hydrogeological Information

The topography of the Phase One Property is generally flat, with a surface elevation of 150 masl. The topography within the Phase One Study Area generally slopes to the east, towards Lake Ontario, located approximately 6.5 km south-east of the Phase One Property. The nearest water body is

Appleby Creek, located to the north-east, approximately 200 m from the Phase One Property. The shallow groundwater flow direction within the Phase One Study Area is inferred to be north-east towards Appleby Creek.

The Site is situated within a south slope physiographic region. The surficial geology within the Phase One Study area is described as "till plains (drumlinized)", and the bedrock is described as "shale, limestone, dolostone, and siltstone of the Queenston Formation". Based on a review of borehole logs and MECP Well Records on the vicinity of the Property, the bedrock in the Phase One Study Area is anticipated to be encountered at an approximate depth range of 3.3 to 6.2 mbgs.

3.3.5 Uncertainty and Absence of Information

DS has relied upon information obtained from federal, provincial, municipal, and private databases, in addition to records and summaries provided by EcoLog ERIS. All information obtained was reviewed and assessed for consistency, however the conclusions drawn by DS are subject to the nature and accuracy of the records reviewed.

All reasonable inquiries were made to obtain reasonably accessible information, as mandated by O.Reg.153/04 (as amended). All responses to database requests were received prior to completion of this report. On December 17, 2019, the MECP FOI found records pertaining to the Site; however, DS has yet to receive a copy of the records from the MECP. It is not anticipated that these records will affect the conclusions of the Phase One ESA, however the client will be notified should there be cause to revise the conclusions of the report. This report reflects the best judgement of DS based on the information available at the time of the investigation.

Information used in this report was evaluated based on proximity to the Phase One Property, anticipated direction of local groundwater flow, and the potential environmental impact on the Phase One Property as a result of potentially contaminating activities.

The QP has determined that the uncertainty does not affect the validity of the Phase One ESA Conceptual Site Model or the conclusions of this report.

3.4 Deviations from Sampling and Analysis Plan

The scope of worked planed for this Phase Two ESA was completed in general accordance with the SAP.

3.5 Impediments

DS was granted complete access to the Phase Two Property throughout the course of the investigation. No impediments were encountered.

4.0 Investigation Method

4.1 General

The Phase Two ESA followed the methodology outlined in the following documents:

- Ontario Ministry of the Environment "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario" (December 1996);
- Ontario Ministry of the Environment "Guide for Completing Phase Two Environmental Site Assessments under Ontario regulation 153/04" (June 2011);
- Ontario Ministry of the Environment "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" (July 2011) (Analytical Protocol);

The methods used in the Phase Two ESA investigation did not differ from the associated standard operating procedures.

4.2 Drilling and Excavating

A site visit was conducted prior to drilling in order to identify the borehole locations based on the APECs identified in the Phase One ESA. The selected borehole locations are presented on Figure 5. The borehole locations were cleared of underground public and private utility services prior to commencement of drilling. A summary of the drilling activities is provided in the table below.

Table 4-1: Summary of Drilling Activities

Parameter	Details
Drilling Contractor	Terra Firma Environmental Services Ltd.
Drilling Dates	November 26 – 27, 2019
Drilling Equipment Used	Truck-mounted CME 55
Measures taken to minimize the potential for cross contamination	◆ Soil sampling was conducted using a 50 mm stainless steel split spoon sampler. The split spoon sampler was brushed clean of soil, washed in municipal water containing phosphate free detergent, rinsed in municipal water, and then rinsed with distilled water for each sampling interval in order to reduce the potential for cross contamination; ◆ Soil samples were extracted from the interior of the sampler rather than from areas in contact with the sampler sidewalls; ◆ Use of dedicated and disposable nitrile gloves for the handling of soil samples. A new set of gloves was used for each sample.

Parameter	Details
Sample collection frequency	Samples were collected at a frequency of every 0.6 m per 0.8 m from the ground surface to 3.1 mbgs, followed by one sample per 1.5 m to borehole termination depth.

One (1) additional grab sample was collected using a hand tool (shovel). The shovel was cleaned of soil and washed with water containing phosphate free detergents, and then rinsed with distilled water. The soil collected were extracted from the hand tool using dedicated and disposable nitrile gloves.

4.3 Soil Sampling

Soil samples were collected using a stainless-steel split spoon sampler and hand tool. Discrete soil samples were collected from the split-spoon samplers and the hand tool by DS personnel using dedicated nitrile gloves.

A portion of each sample was placed in a resealable plastic bag for field screening, and the remaining portion was placed into laboratory supplied glass sampling jars. Samples intended for VOC and the F1 fraction of petroleum hydrocarbons analysis were collected using a laboratory-supplied soil core sampler, placed into the vials containing methanol for preservation purposes and sealed using Teflon lined septa lids. All sample jars were stored in dedicated coolers with ice for storage, pending transport to the analytical laboratory. A formal chain of custody was maintained for all samples submitted to the laboratory.

The subsurface soil conditions were logged by DS personnel at the time of drilling, and recorded on field borehole logs. The borehole logs are presented under Appendix C. Additional detail regarding the lithology encountered in the boreholes is presented under Section 5.1.

4.4 Field Screening Measurements

All retrieved soil samples were screened in the field for visual and olfactory observations. No obvious visual or olfactory evidence of potential contamination were noted. No aesthetic impacts (e.g. cinders, slag, hydrocarbon odours) were encountered during this investigation. The soil sample headspace vapour concentrations for all soil samples recovered during the investigation were screened using portable organic vapour testing equipment (RKI Eagle 2) in accordance with the procedure outlined in the MECP's '*Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario'.*

The soil samples were inspected and examined to assess soil type, ground water conditions, and possible chemical contamination by visual and olfactory observations or by organic

vapour screening. Samples submitted for chemical analysis were collected from locations judged by the assessor to be most likely to exhibit the highest concentrations of contaminants based on several factors including (i) visual or olfactory observations, (ii) sample location, depth, and soil type (iii) ground water conditions and headspace reading. A summary of the equipment used for field screening is provided below:

Table 4-2: Field Screening Equipment

Parameter	Details
Make and Model of Field Screening Instrument	RKI Eagle 2, Model 5101-P2 Serial Number: E2G721
Chemicals the equipment can detect and associated detection limits	VOCs with dynamic range of 0 parts per million (ppm) to 2,000 ppm PHCs with range of 0 to 50, 000 ppm
Precision of the measurements	3 significant figures
Accuracy of the measurements	VOCs: ± 10% display reading + one digit Hydrocarbons: ± 5% display reading + one digit
Calibration reference standards	PID: Isobutylene CGD: Hexane
Procedures for checking calibration of equipment	In-field re-calibration of the CGI was conducted (using the gas standard in accordance with the operator's manual instructions) if the calibration check indicated that he calibration had drifted by more than +/- 10%.

A summary of the soil headspace measurements are provided in the borehole logs, provided under Appendix C.

4.5 Groundwater Monitoring Well Installation

Monitoring wells were installed upon completion of three (3) the boreholes advanced on the Phase Two Property to facilitate the collection of water levels and the assessment of groundwater flow direction. The monitoring wells were constructed of 51-millimetre (2-inch) inner diameter (ID) flush-threaded schedule 40 polyvinyl chloride (PVC) risers, equipped with a 1.5 m length of No. 10 slot PVC screen. The well screens were sealed at the bottom using a threaded cap and at the top with a lockable J-plug.

Silica sand was placed around and up to 0.6m above the well screen to act as a filter pack. Bentonite was placed from the ground surface to the top of the sand pack. The wells were completed with protective flush mount casings. Details regarding the monitoring well construction can be found in Table 2, and on the borehole logs provided in Appendix C.

Disposable nitrile gloves were used to minimize the potential for cross-contamination during well installation. Dedicated equipment was used for well development and sampling for further minimize the risk of cross contamination.

The monitoring wells were developed on December 2019 in accordance with DS SOPs for monitoring well development. The wells were developed by removing a minimum of three standing water column volumes using dedicated inertial pumps comprised of Waterra polyethylene tubing and dedicated foot valves.

4.6 Groundwater Field Measurement of Water Quality Parameters

Not applicable – groundwater was not identified as a media of potential concern.

4.7 Groundwater Sampling

Not applicable – groundwater was not identified as a media of potential concern.

4.8 Sediment Sampling

No sediment as defined under O.Reg. 153/04 (as amended) was present on the Phase Two Property at the time of this investigation. Sediment sampling was not conducted as a result.

4.9 Analytical Testing

The soil samples collected were submitted to SGS Canada Inc. (SGS) under chain of custody protocols. SGS an independent laboratory accredited by the Canadian Association for Laboratory Accreditation. SGS conducted the analyses in accordance with the MECP document "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" dated March 9, 2004 (revised on July 1, 2011).

4.10 Residue Management Procedures

4.10.1 Soil Cuttings From Drilling and Excavations

The soil cuttings generated by the borehole drilling program were stored in 205 L drums, and left on-site for disposal by a MECP approved waste-hauler for disposal at a MECP-approved waste management facility.

4.10.2 Water from Well Development

Excess water derived from well development activities were collected in buckets and disposed of overland at the locations of the monitoring wells.

4.10.3 Fluids from Equipment Cleaning

Excess equipment cleaning fluids were stored in 20-L sealed plastic pails and temporarily stored on site for disposal by a MECP approved waste-hauler for disposal at a MECP-approved waste management facility.

4.11 Elevation Surveying

The ground surface elevations of the boreholes/monitoring wells were surveyed using a Sokkia GCX-2 GNSS RTK receiver, based on global positioning system satellites. The benchmark reference used to survey the Site was a benchmark station No. 00819818102, located at the southeast corner of Appleby Line and Highway 5. The monument has a vertical elevation of 152.339, which is consistent with the measured elevations of the subject Site.

The ground surface elevations can be found on the borehole logs presented in Appendix C.

4.12 Quality Assurance and Quality Control Measures

4.12.1 Sample containers, preservation, labelling, handling and custody for samples submitted for laboratory analysis, including any deviations from the SAP

All soil samples were stored in laboratory-supplied sample containers in accordance with the MECP Analytical Protocol. A summary of the preservatives supplied by the laboratory is provided in the table below.

Table 4-3: Summary of Sample Bottle Preservatives

Media	Parameter	Sample Container
Soil	PHCs F1 VOCs	40 mL methanol preserved glass vial with septum lid.
	PHCs F2-F4 metals and ORPs PAHs	120 mL or 250 mL unpreserved glass jar with Teflon™-lined lid.

Each sample container was labelled with a unique sample identification, the project number, and the sampling date. All samples were placed in an ice-filled cooler upon completion of sampling, and kept under refrigerated conditions until the time of delivery to the analytical laboratory. A formal chain of custody was maintained for all samples submitted to the laboratory.

4.12.2 Description of equipment cleaning procedures followed during all sampling

Dedicated, disposable nitrile gloves were used for each sampling event to reduce the potential for cross-contamination.

The split spoon sampler was brushed clean of soil, washed in municipal water containing phosphate free detergent, rinsed in municipal water, and then rinsed with distilled water for each sampling interval in order to reduce the potential for cross contamination. Dedicated equipment was used for well development to further minimize the risk of cross contamination. Non-dedicated equipment (i.e. interface probe) was cleaned before initial use and between all measurement points with a solution of Alconox™ and distilled water. The Alconox™ solution was rinsed off using distilled water.

4.12.3 Description of how the field quality control measures referred to in subsection 3 (3) were carried out

Field duplicate samples were collected at the time of sampling. In accordance with O.Reg. 153/04, one duplicate sample was analyzed per ten samples submitted for analysis.

All field screening devices (RKI Eagle 2) were calibrated prior to use by the supplier. Calibration checks were completed, and re-calibrations were conducted as required.

4.12.4 Description of, and rational for, any deviations from the procedures set out in the quality assurance and quality control program set out in the SAP

There were no deviations from the QA/QC program described in the SAP.

5.0 Review and Evaluation

5.1 Geology

A summary of the subsurface conditions is presented below. Additional details may be found in the borehole logs appended in Appendix C.

A layer of surficial topsoil of 150 to 180 mm thickness was encounter in all of the boreholes advanced. Fill material consisting of clayey silt to silty clay, trace rootlets was found below the topsoil to depths ranging from 0.8 to 2.6 mbgs. The fill was underlain by clayey silt till extending to depths ranging from 2.3 to 3.4 mbgs. A Sandy silt till deposit was encountered in BH19-2 below the clayey silt till layer, extending to a depth of 6.1 mbgs. Shale bedrock of Queenston Formation was encountered at depths ranging from 3.3 to 6.1 mbgs;

Table 5-1: Summary of Geologic Units Investigated

Geologic Unit	Inferred Thickness (m)	Top Elevation (masl)	Bottom Elevation (masl)	Properties
Fill material: Clayey Silt	1.0 - 2.6	145.8	142.8	Moist, very stiff, 20% - 25 % moisture content (MC)
Clayey Silt Till	2.3 - 3.5	143.9	139.3	Trace gravel, moist, very stiff to hard, shale fragments, 10%-15% MC, contains groundwater table
Shale Bedrock	>3.0	141.7-	Unknown	Weathered, red to brown, contains groundwater table

The clayey silt till layer and the weathered shale were identified as a water bearing formation and it is considered an unconfined aquifer.

5.2 Ground Water Elevations and Flow Direction

5.2.1 Rationale for Monitoring Well Location and Well Screen Intervals

A total of three (3) monitoring wells were installed on the Phase Two Property in order to enable groundwater monitoring and to assess groundwater flow direction. The monitoring wells were screened at depths ranging from 4.6 to 6.1 mbgs within the clayey silt till and shale bedrock encountered. This unit is inferred to be an unconfined aquifer.

5.2.2 Results of Interface Probe Measurements

A summary of the groundwater level measurements is provided in Table 1. The groundwater level measurements were collected using a (Solinst) interface probe (model 122). The depth to groundwater was found to be 1.4 to 4.5 mbgs on December 4, 2019. There was no indication of DNAPL or LNAPL in the monitoring wells at this time.

5.2.3 Product Thickness and Free Flowing Product

No evidence of product was observed in the monitoring wells at the time of the investigation.

5.2.4 Groundwater Elevation

The groundwater elevation was calculated by subtracting the depth to groundwater from the surface elevation determined by the surface elevation survey conducted as part of this investigation.

Groundwater elevations were taken on December 4, 2019. A summary of the groundwater elevations calculated is presented in Table 1. The groundwater elevation was found to range between 140.44 to 144.36 masl in December 4, 2019.

5.2.5 Groundwater Flow Direction

The groundwater flow direction was interpreted using the groundwater elevations calculated for the monitoring wells installed on the Phase Two Property. Based on the groundwater elevations calculated, the groundwater flow direction is interpreted to be in an easterly direction towards Appleby Creek. The groundwater elevation contours and flow direction are presented on Figure 6.

5.2.6 Assessment of Potential for Temporal Variability in Groundwater Flow Direction

The aquifer investigated is inferred to be an unconfined aquifer, based on the soil stratigraphy observed in the boreholes advanced on the Phase Two Property. It is possible that temporal variations in groundwater elevations may occur on the Phase Two Property in response to seasonal weather patterns.

Temporal variability in groundwater level has the ability to influence the groundwater flow direction. The degree of variation in groundwater levels on the Phase Two Property can only be confirmed with long-term monitoring.

5.2.7 Evaluation of Potential Interaction Between Buried Utilities and the Water Table

The groundwater table was encountered at depths ranging from 1.4 to 4.5 mbgs on the Phase Two Property. Public and private locates were performed in the Property and a gas main was identified at 6.2 mbgs, across the Phase One Property. However, no groundwater impacts were identified, therefore the potential for preferential migration of contaminants is not of concern at this time.

5.3 Ground Water Hydraulic Gradients

5.3.1 Horizontal Hydraulic Gradient

The horizontal hydraulic gradient was calculated based on the groundwater levels recorded on December 4, 2019.

Table 5-2: Summary of Horizontal Hydraulic Gradient Calculations

Hydrogeological Unit	Calculated Horizontal Hydraulic Gradient
Shallow Aquifer	Min: 0.0356 Max: 0.0401 Average: 0.0378

5.3.2 Vertical Hydraulic Gradient

The vertical hydraulic gradient was not calculated, as no groundwater impacts were identified on the Phase Two Property.

5.4 Fine-Medium Soil Texture

5.4.1 Rational for use of Fine-Medium Soil Texture Category

A summary of the soil samples analyzed, and the corresponding grain size results is presented in the table below:

Table 5-3: Summary of Grain Size Analyses

Sample	% Gravel	% Sand	% Silt	% Clay	%Silt + Clay	Classification
BH19-1 SS3	6	17	59	18	77	Medium-fine textured
BH19-3 SS6	27	24	36	13	49	Coarse textured

The stratigraphy encountered consisted of clayey silt (fill) and clayey silt till, underlain by shale bedrock. Based on the soil textures observed and the results of the grain size analyses, more than 2/3 of the soil profile is interpreted to be medium-fine textured.

5.4.2 Rational for the Number of Samples Collected and Analyzed

The grain size analyses were conducted for the purposes of this Phase Two ESA, in addition to a geotechnical investigation which was conducted concurrently. At least one sample was analyzed per stratigraphic unit encountered in order to characterize the various strata encountered.

5.5 Soil Field Screening

Soil vapour headspace readings were collected at the time of sample collection, the results of which are presented on the borehole logs (Appendix C). The soil vapour headspace readings were collected using a PID and CGD in methane elimination mode. The PID readings ranged between 1 and 2 ppm. The CGD readings ranged between 0 and 15 ppm.

The soil samples were also screened for visual and olfactory indicators of impacts (e.g. staining, odours). No staining, orders, sheening, or evidences of LNAPL or DNAPL were present at the time of sampling.

5.6 Soil Quality

The results of the chemical analyses conducted are presented in Tables 4 through 9. A visual summary of the location of the sample locations is provided in Figures 7A through 7F. The laboratory certificates of analysis have been provided under Appendix D.

5.6.1 Metals and inorganics

A total of four (4) samples, including one (1) field duplicates for QA/QC purposes were submitted for analysis of metals and inorganics. The results of the analyses are tabulated in Table 4, and presented on Figure 7A. The results of the analyses indicated that there were no exceedances of Table 2 RPI SCS.

The pH of all samples analysed were within the accepted range of 5-9 for surface soils and 5-11 for subsurface soils,

5.6.2 Petroleum Hydrocarbons

Three (3) samples were submitted for analysis of PHCs (incl. BTEX). The results of the analyses are tabulated in Table 5, and presented on Figure 7B. The results of the analyses indicated that there were no exceedances of Table 2 RPI SCS.

5.6.3 Volatile Organic Compounds

Three (3) samples were submitted for analysis of VOCs. The results of the analyses are tabulated in Table 6, and presented on Figure 7C. The results of the analyses indicated that there were no exceedances of Table 2 RPI SCS.

5.6.4 Polycyclic Aromatic Hydrocarbons

Three (3) samples were submitted for analysis of PAHs. The results of the analyses are tabulated in Table 7, and presented on Figure 7D. The results of the analyses indicated that there were no exceedances of Table 2 RPI SCS.

5.6.1 Organochlorine Pesticides

Three (3) samples were submitted for analysis of OCPs. The results of the analyses are tabulated in Table 8, and presented on Figure 7E. The results of the analyses indicated that there were no exceedances of Table 2 RPI SCS.

5.6.2 Polychlorinated Biphenyls

One (1) sample was submitted for analysis of PCBs. The results of the analyses are tabulated in Table 9, and presented on Figure 7F. The results of the analyses indicated that there were no exceedances of Table 2 RPI SCS.

5.6.3 Commentary on Soil Quality

All samples analysed indicated that the soil on the Phase Two Property met the applicable Table 2 RPI SCS for all parameters analyzed.

5.7 Ground Water Quality

Groundwater was not collected for analysis for this investigation since it is not considered to media of potential concern.

5.8 Sediment Quality

No sediment was present on the Phase Two Property at the time of the investigation.

5.9 Quality Assurance and Quality Control Results

Collection of soil and groundwater samples was conducted in general accordance with the MECP *Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*. As described in Section 5.12, dedicated equipment was used where possible, and all non-dedicated equipment was decontaminated before and between sampling events. All soil and groundwater samples were transferred directly into laboratory-supplied containers. The laboratory containers were prepared by the laboratory with suitable preservative, as required. All samples were stored and transported under refrigerated conditions. Chain of custody protocols were maintained from the time of sampling to delivery to the analytical laboratory.

The field QA/QC program involved the collection of field duplicate soil samples. In addition to the controls listed above, the analytical laboratory employed method blanks, internal laboratory duplicates, surrogate spike samples, matrix spike samples, and standard reference materials.

A summary of the field duplicate samples analyzed and an interpretation of the efficacy of the QA/QC program is provided in the table below.

Table 5-4: Summary of QA/QC Results

Sample ID	QA/QC duplicate	Medium	Parameter Analyzed	QA/QC Result
BH19-2 S1	Dup-1	Soil	Metals and Inorganics	All results were within the analytical protocol criteria for RPD

Based on the interpretation of the laboratory results and the QA/QC program, it is the opinion of the QP that the laboratory analytical data can be relied upon.

All samples were handled in accordance with the MECP Analytical Protocol regarding sample holding time, preservation methods, storage requirements, and type of container.

SGS routinely conducts internal QA/QC analyses in order to satisfy regulatory QA/QC requirements. The results of the SGS QA/QC analyses for the submitted soil samples are summarized in the laboratory Certificates of Analyses provided in Appendix D.

With respect to subsection 47(3) of O.Reg 153/04 (as amended), all certificates of analysis or analytical reports pursuant to clause 47(2) (b) of the regulation comply with subsection 47(3). A certificate of analysis has been received for each sample submitted for analysis and have been provided (in full) in Appendix D.

A review of the QA/QC sample results indicated that no issues were identified with respect to both the field collection methodology and the laboratory reporting. It is the opinion of the QP that the analytical data obtained are representative of the soil and groundwater conditions at the Phase Two Property for the purpose of assessing whether the soil and groundwater at the Phase Property meets the applicable MECP SCS.

5.10 Phase Two Conceptual Site Model

The Phase Two Conceptual Site Model is presented under Appendix E.

6.0 Conclusions

This Phase Two ESA involved that advancement of three (3) boreholes and one (1) grab sample, and the collection of soil samples for analysis of the potential contaminants of concern, including: PHCs, VOCs, BTEX, Metals, As, Sb, Se, B-HWS, CN-, EC, Cr (VI), Hg, low or high pH, SAR, PAHs, OCPs and PCBs.

Based on the results of the information gathered through the course of the investigation, DS presents the following conclusions:

- The soil samples analyzed for this investigation, indicated that the soil quality on-Site meet the applicable Table 2 RPI SCS for all the parameter analyzed.

- Based on the findings of this Preliminary Phase Two ESA no further environmental investigations is required, and a Record of Site Condition may be filed for the Phase Two Property.
- All monitoring wells should be decommissioned in accordance with O.Reg. 903 when no longer required

It is the opinion of the QP_{ESA} that the applicable SCS for the soil at the Phase Two Property have been met as of the date of this report. No further sub-surface investigation is required regarding the environmental quality of the soil and groundwater at the Phase Two Property.

6.1 Qualifications of the Assessors

John Gaviria-Ballen, B. Eng., EIT

Mr. Gaviria-Ballen is an Environmental Technician with DS Consultants Ltd. John holds a bachelor's degree in Environmental Engineering from Carleton University and a Post Graduate Certificate in Environmental Engineering Technology from Conestoga College. John is a registered Engineer in Training (EIT) with Professional Engineers of Ontario (PEO) and has been conducting Phase One and Two Environmental Site Assessments since 2018.

Drew Doak, B.Sc.E., P.Eng., QP_{ESA}

Mr. Doak is an Environmental Project Manager with DS Consultants Limited. Drew holds a Bachelor of Science in Engineering from Queen's University, and is a practicing member of the Professional Engineers of Ontario (PEO). Drew has five years of environmental consulting experience and has conducted and/or managed a multitude of projects in his professional experience. Drew has extensive experience conducting Phase One and Phase Two Environmental Site Assessments in support of brownfields redevelopment in urban settings, and been involved in numerous remediation projects, and supported many risk assessments and Records of Site Conditions with the Ministry of Environment, Conservation and Parks. He has also conducted a variety of Hydrogeological investigations within the GTA. Drew is considered a Qualified Person to conduct Environmental Site Assessments as defined by Ontario Regulation 153/04 (as amended).

Mr. Patrick (Rick) Fioravanti, B.Sc., P.Geo., QP_{ESA}

Mr. Fioravanti is the Manager of Environmental Services with DS Consultants Limited. Patrick holds a Honours Bachelor of Science with distinction in Toxicology from the University of Guelph, and is a practicing member of the Association of Professional Geoscientists of Ontario (APGO). Patrick has over nine years of environmental consulting experience and has conducted and/or managed over 200 projects in his professional experience. Patrick has extensive experience conducting Phase One and Phase Two Environmental Site Assessments in support of brownfields redevelopment in urban settings, and been involved in numerous remediation projects, supported many risk assessments, and successfully filed Records of Site Condition with the Ministry of Environment and Climate Change. He has conducted work across southern and eastern Ontario, and Quebec in his professional experience. Patrick is considered a Qualified Person to conduct Environmental Site Assessments as defined by Ontario Regulation 153/04 (as amended).

6.2 Signatures

This Phase Two ESA was conducted under the supervision of Mr. Drew Doak B.Sc.E., P.Eng. in accordance with the requirements of O.Reg. 153/04 (as amended). The findings and conclusions presented have been determined based on the information obtained at the time of the investigation, and on an assessment of the conditions of the Site at this time.

We trust this report meets with your requirements. Should you have any questions regarding the information presented, please do not hesitate to contact our office.

Yours truly,

DS Consultants Ltd

Prepared by:



John Gaviria-Ballen, B. Eng., EIT
Environmental Technician

Reviewed by:



Drew Doak, B.Sc.E., P.Eng., QP$_{ESA}$
Environmental Project Manager



Patrick Fioravanti, B.Sc., P.Geo., QP$_{ESA}$
Manager – Environmental Services

6.3 Limitations

This report was prepared for the sole use of Millcroft Greens Corporation and is intended to provide an assessment of the environmental condition on the property located at Millcroft Golf Club (Block C), Burlington, Ontario. The information presented in this report is based on information collected during the completion of the Phase Two Environmental Site Assessment by DS Consultants Ltd. The material in this report reflects DS' judgment in light of the information available at the time of report preparation. This report may not be relied upon by any other person or entity without the written authorization of DS Consultants Ltd. The scope of services performed in the execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or reuse of this documents or findings, conclusions and recommendations represented herein, is at the sole risk of said users.

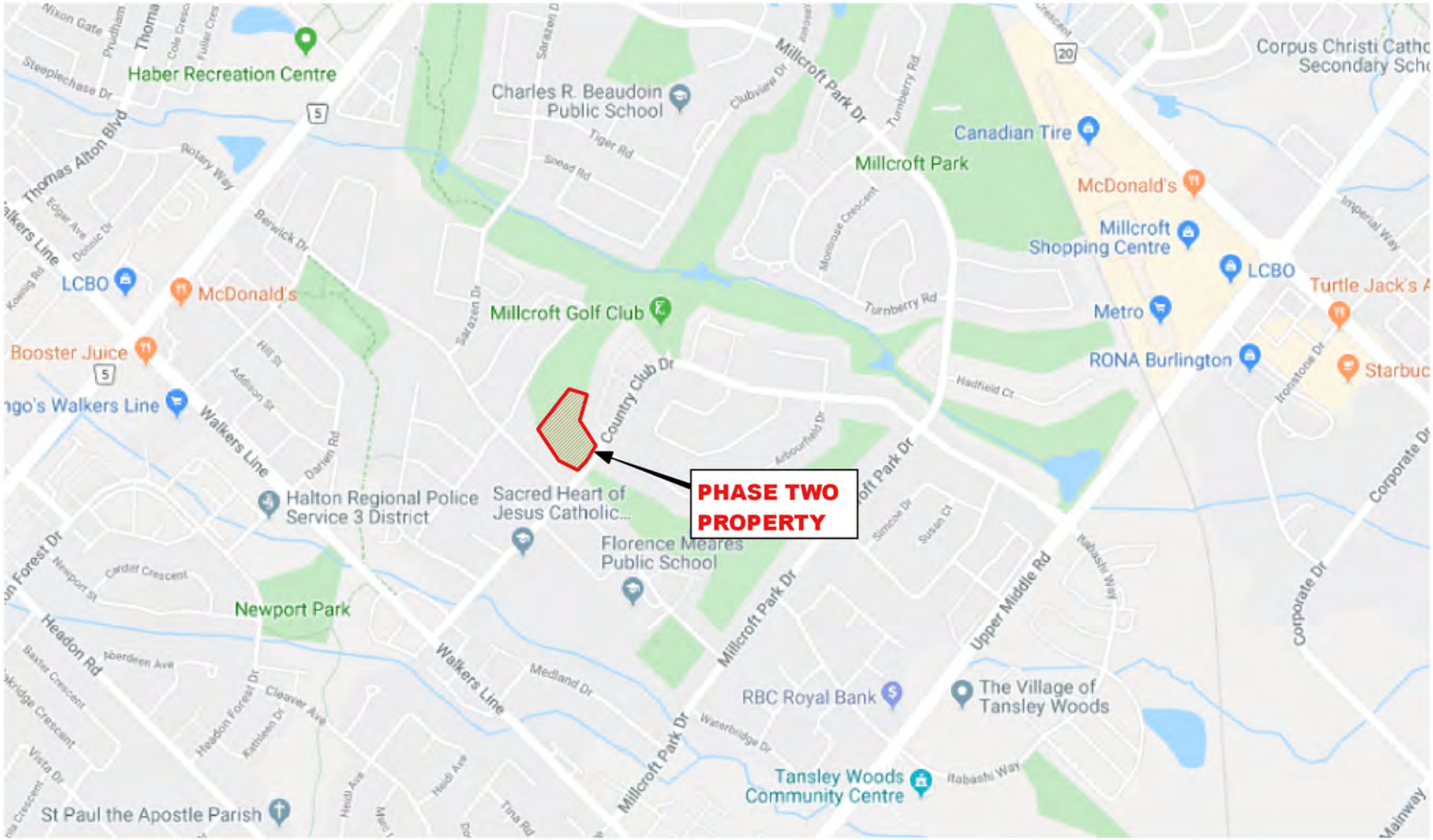
The conclusions drawn from the Phase Two ESA were based on information at selected observation and sampling locations. Conditions between and beyond these locations may become apparent during future investigations or on-site work, which could not be detected or anticipated at the time of this investigation. The sampling locations were chosen based upon a cursory historical search, visual observations and limited information provided by persons knowledgeable about past and current activities on this site during the Phase Two ESA activities. As such, DS Consultants Ltd. cannot be held responsible for environmental conditions at the site that was not apparent from the available information.

7.0 References

- Armstrong, D.K. and Dodge, J.E.P. *Paleozoic Geology Map of Southern Ontario*. Ontario Geological Survey, Miscellaneous Release--Data 219.
- Chapman, L.J. and Putnam, D.F. 2007. *The Physiography of Southern Ontario*. Ontario Geological Survey, Miscellaneous Release--Data 228.
- Freeze, R. Allen and Cherry, John A., 1979. *Ground water*. Page 29.
- Ontario Ministry of the Environment, December 1996. *Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario.*
- Ontario Ministry of Environment, 15 April 2011. *Soil, Ground Water and Sediment Standards for use under part XV.1of the Environmental Protection Act.*
- Ontario Ministry of the Environment, June 2011. *Guide for Completing Phase Two Environmental Site Assessments under Ontario regulation 153/04.*
- Ontario Ministry of the Environment, July 2011. *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.*
- The Ontario Geological Survey. 2003. *Surficial Geology of Southern Ontario*.
- *"Phase One Environmental Site Assessment, Millcroft Golf Club (Block C), Burlington, Ontario"* dated January 29, 2020, prepared for Argo (Millcroft) Limited, prepared by DS Consultants Ltd.

Figures

C:\0Sharon\19-199-100 -102 Milcroft Golf Course\1-QGIS\Phase Two\101 - Area C\Figure 1- Site Location Plan.qgs



Legend

Approx Site Boundary (Area C)

0 200 400 m

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
Millcroft Golf Course (Area C), Burlington, ON

Title: **SITE LOCATION PLAN**

N

Client: MILLCROFT GREENS CORPORATION

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	D.D	S.Y	May 2020
Rev: 0	Scale: As Shown	Project No.: 19-199-101	Figure No.: 1

Image/Map Source: *Google Street Map*

C:\0Sharon\19-199-100 -102 Milcroft Golf Course\1-QGIS\Phase Two\101 - Area C\Figure 2- Phase Two Site Plan.qgs



Legend

Approx. Site Boundary (Area C)

0 30 60 m

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
Millcroft Golf Course (Area C), Burlington, ON

Title: **PHASE TWO PROPERTY SITE PLAN**

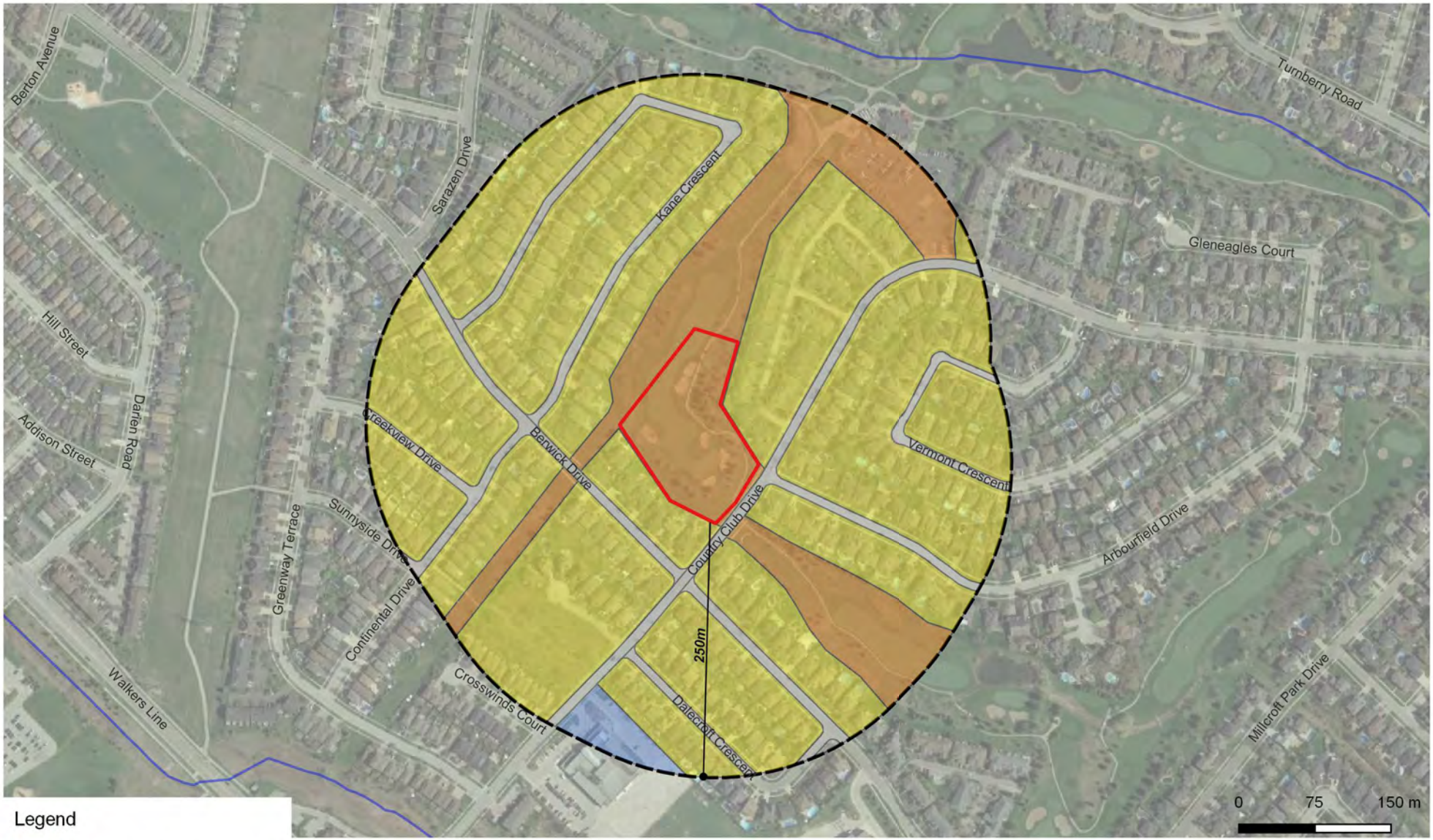
N

Client: MILLCROFT GREENS CORPORATION

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	D.D	S.Y	May 2020
Rev: 0	Scale: As Shown	Project No.: 19-199-101	Figure No.: 2

Image/Map Source: *Google Satellite Image*

C:\0Sharon\19-199-100 -102 Milcroft Golf Course\1-QGIS\Phase Two\101 - Area C\Figure 3- Phase Two Study Area.qgs



Legend

- Approx. Site Boundary (Area C)
- 250m Buffer
- Community
- Residential
- Roads
- Commercial

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
Millcroft Golf Course (Area C), Burlington, ON

Title: **PHASE TWO STUDY AREA**

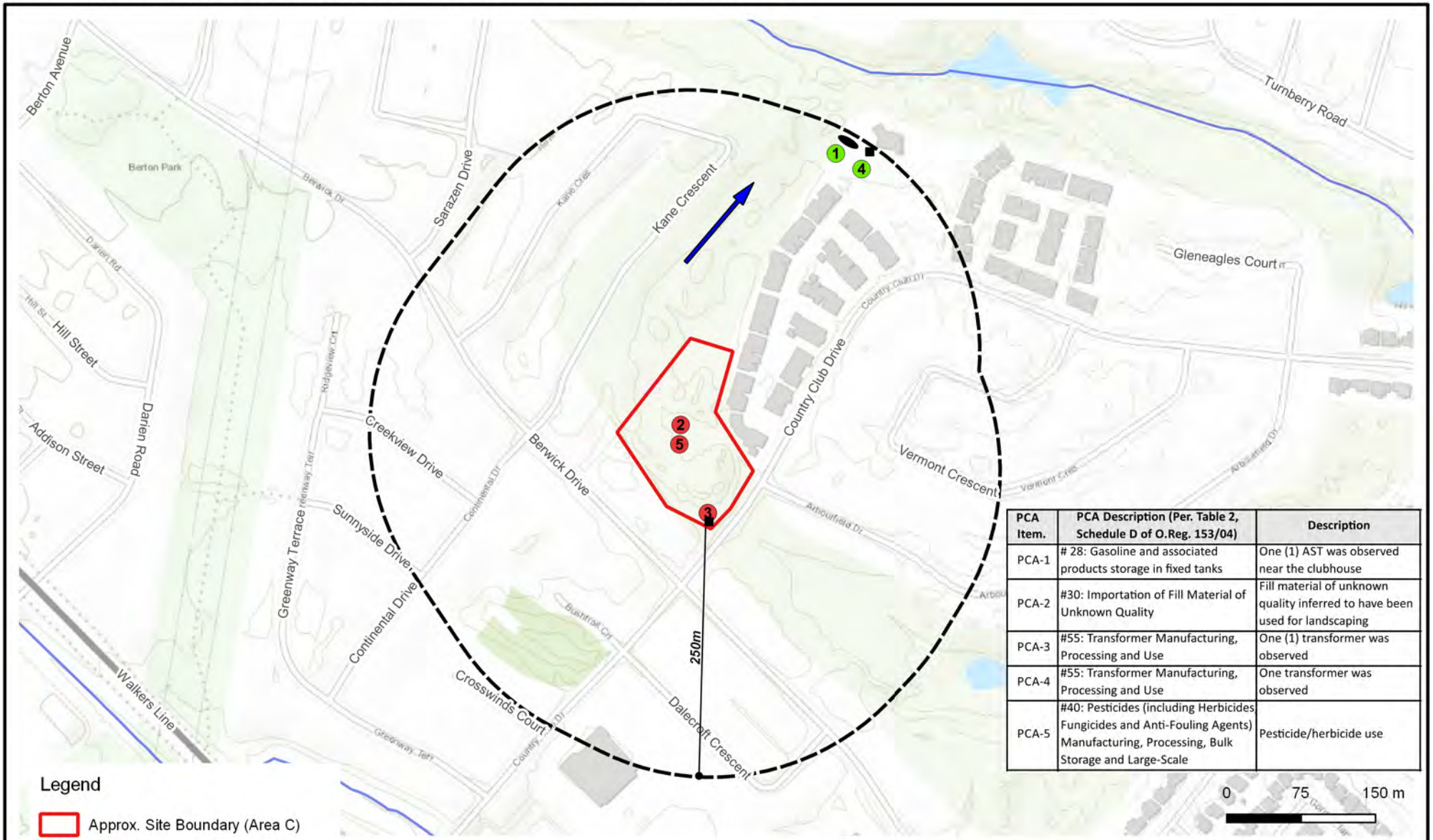
N

Client: MILLCROFT GREENS CORPORATION

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	D.D	S.Y	May 2020
Rev: 0	Scale: As Shown	Project No.: 19-199-101	Figure No.: 3

Image/Map Source: *Google Satellite Image*

C:\0Sharon\19-199-100 -102 Milcroft Golf Course\1-QGIS\Phase Two\101 - Area C\Figure 4- PCA within Phase Two Study Area.qgs



PCA Item.	PCA Description (Per. Table 2, Schedule D of O.Reg. 153/04)	Description
PCA-1	# 28: Gasoline and associated products storage in fixed tanks	One (1) AST was observed near the clubhouse
PCA-2	#30: Importation of Fill Material of Unknown Quality	Fill material of unknown quality inferred to have been used for landscaping
PCA-3	#55: Transformer Manufacturing, Processing and Use	One (1) transformer was observed
PCA-4	#55: Transformer Manufacturing, Processing and Use	One transformer was observed
PCA-5	#40: Pesticides (including Herbicides Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale	Pesticide/herbicide use

Legend

- Approx. Site Boundary (Area C)
- 250m Buffer
- Inferred Groundwater Flow Direction
- PCA not contributing to APEC
- PCA contributing to APEC
- AST
- Transformer

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
Millcroft Golf Course (Area C), Burlington, ON

Title: **PCA WITHIN PHASE TWO STUDY AREA**

N

Client: MILLCROFT GREENS CORPORATION

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	D.D	S.Y	May 2020
Rev: 0	Scale: As Shown	Project No.: 19-199-101	Figure No.: 4

Image/Map Source: *Esri Topo Map*

C:\0Sharon\19-199-100 -102 Milcroft Golf Course\1-QGIS\Phase Two\101 - Area C\Figure 5 – Borehole Location Plan with APECs.qgs



Area of Potential Environmental Concern	Potentially Contaminating Activity
APEC-1	PCA1 (#30): Importation of fill material of unknown quality
APEC-2	PCA-4 (#55): Transformer
APEC-3	PCA-5 (#40): Pesticides/herbicide use

Legend

- Approx. Site Boundary (Area C)
- Monitoring Well
- Grab Sample
- APEC 1 & 3
- APEC 2
- Transformer

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
Millcroft Golf Course (Area C), Burlington, ON

Title: **BOREHOLE/MONITORING WELL LOCATIONS WITH APECs**

N

Client: MILLCROFT GREENS CORPORATION

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	D.D	S.Y	May 2020
Rev: 0	Scale: As Shown	Project No.: 19-199-101	Figure No.: 5

Image/Map Source: *Google Satellite Image*

C:\0Sharon\19-199-100 -102 Milcroft Golf Course\1-QGIS\Phase Two\101 - Area C\Figure 6 –GW elevation Contours and Flow Direction (Overburden).qgs



Legend

- Approx. Site Boundary (Area C)
- Monitoring Well
- Grab Sample
- Groundwater Elevation Contour
- Groundwater Flow Direction

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
Millcroft Golf Course (Area C), Burlington, ON

Title: **GROUNDWATER ELEVATION CONTOURS AND FLOW DIRECTION (OVERBURDEN)**

N

Client: MILLCROFT GREENS CORPORATION

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	D.D	S.Y	May 2020
Rev: 0	Scale: As Shown	Project No.: 19-199-101	Figure No.: 6

Image/Map Source: *Google Satellite Image*

C:\0Sharon\19-199-100 -102 Milcroft Golf Course\1-QGIS\Phase Two\101 - Area C\Figure 7A – Soil Characterization – Metals and Inorganics.qgs



Legend

- Approx. Site Boundary (Area C)
- Monitoring Well
- Grab Sample
- Sample Met Applicable Standards

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
Millcroft Golf Course (Area C), Burlington, ON

Title: SOIL CHARACTERIZATION – METALS AND INORGANICS

N

Client: MILLCROFT GREENS CORPORATION

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	D.D	S.Y	May 2020
Rev: 0	Scale: As Shown	Project No.: 19-199-101	Figure No.: 7A

Image/Map Source: *Google Satellite Image*

C:\0Sharon\19-199-100 -102 Milcroft Golf Course\1-QGIS\Phase Two\101 - Area C\Figure 7B – Soil Characterization –PHCs.qgs



Legend

- Approx. Site Boundary (Area C)
- Monitoring Well
- Grab Sample
- Sample Met Applicable Standards

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Client: MILLCROFT GREENS CORPORATION

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
Millcroft Golf Course (Area C), Burlington, ON

Title: **SOIL CHARACTERIZATION – PHCs**

N

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	D.D	S.Y	May 2020
Rev:	Scale:	Project No.:	Figure No.:
0	As Shown	19-199-101	**7B**

Image/Map Source: *Google Satellite Image*

C:\0Sharon\19-199-100 -102 Milcroft Golf Course\1-QGIS\Phase Two\101 - Area C\Figure 7C – Soil Characterization – VOCs.qgs



Legend

- Approx. Site Boundary (Area C)
- Monitoring Well
- Grab Sample
- Sample Met Applicable Standards

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Client: MILLCROFT GREENS CORPORATION

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
Millcroft Golf Course (Area C), Burlington, ON

Title: **SOIL CHARACTERIZATION – VOCs**

N

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	D.D	S.Y	May 2020
Rev: 0	Scale: As Shown	Project No.: 19-199-101	Figure No.: **7C**

Image/Map Source: *Google Satellite Image*

C:\0Sharon\19-199-100 -102 Milcroft Golf Course\1-QGIS\Phase Two\101 - Area C\Figure 7D – Soil Characterization –PAHs.qgs



Legend

- Approx. Site Boundary (Area C)
- Monitoring Well
- Grab Sample
- Sample Met Applicable Standards

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
Millcroft Golf Course (Area C), Burlington, ON

Title: **SOIL CHARACTERIZATION – PAHs**

N

Client: MILLCROFT GREENS CORPORATION

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	D.D	S.Y	May 2020
Rev: 0	Scale: As Shown	Project No.: 19-199-101	Figure No.: **7D**

Image/Map Source: *Google Satellite Image*

C:\0Sharon\19-199-100 -102 Milcroft Golf Course\1-QGIS\Phase Two\101 - Area C\Figure 7E – Soil Characterization –OCPs.qgs



Legend

- Approx. Site Boundary (Area C)
- Monitoring Well
- Grab Sample
- Sample Met Applicable Standards

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Client: MILLCROFT GREENS CORPORATION

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
Millcroft Golf Course (Area C), Burlington, ON

Title: **SOIL CHARACTERIZATION – OCPs**

N

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	D.D	S.Y	May 2020
Rev: 0	Scale: As Shown	Project No.: 19-199-101	Figure No.: **7E**

Image/Map Source: *Google Satellite Image*

C:\0Sharon\19-199-100 -102 Milcroft Golf Course\1-QGIS\Phase Two\101 - Area C\Figure 7F – Soil Characterization – PCBs.qgs



Legend

- Approx. Site Boundary (Area C)
- Monitoring Well
- Grab Sample
- Sample Met Applicable Standards

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Client: MILLCROFT GREENS CORPORATION

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
Millcroft Golf Course (Area C), Burlington, ON

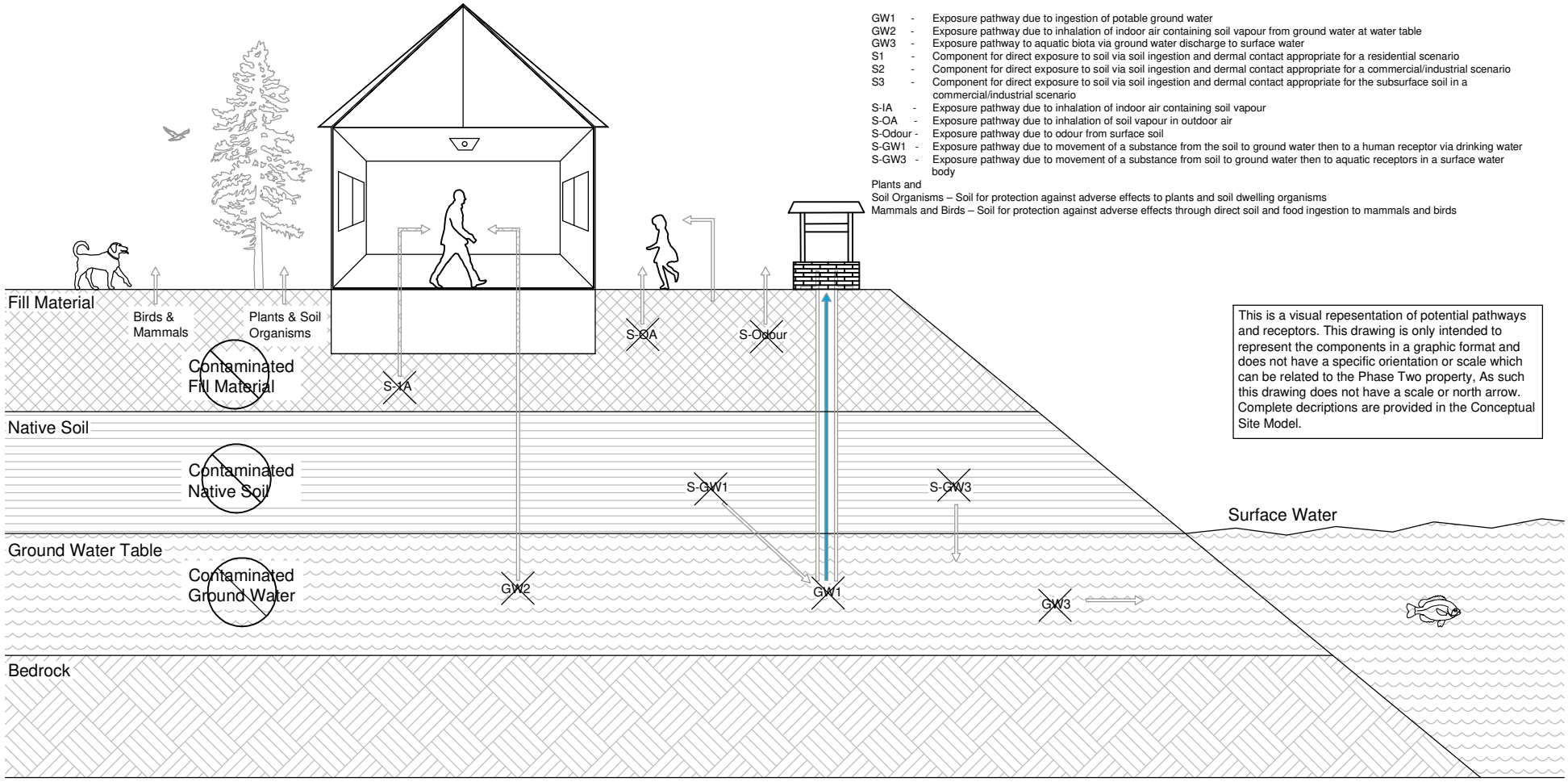
Title: **SOIL CHARACTERIZATION – PCBs**

N

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	D.D	S.Y	May 2020
Rev: 0	Scale: As Shown	Project No.: 19-199-101	Figure No.: **7F**

Image/Map Source: *Google Satellite Image*

Path:c:\0sharon\19-199-100 -102 milcroft golf course\7-misc\cad\figure 8 - contaminant transport diagram-c.dwg



Not Identified

Pathway Not Present

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
Millcroft Golf Course (Area C), Burlington, ON

Title: **CONTAMINANT TRANSPORT DIAGRAM**

Client: MILLCROFT GREENS CORPORATION

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	D.D	S.Y	May 2020
Rev.	Scale: N.T.S	Project No: 19-199-101	Figure No. 8

Tables

Table 1: Summary of Monitoring Well Installation and Groundwater Data

Well ID			BH19-1	BH19-2	BH19-3
Installed By:			DS	DS	DS
Installation Date:			26-Nov-19	26-Nov-19	27-Nov-19
Well Status:			Active	Active	Active
Inner Diameter		(mm)	50	50	50
Surface Elevation		(masl)	143.87	144.94	145.76
Bottom of Concrete Seal/Top of Bentonite Seal		mbgs	0.30	0.30	0.30
		masl	143.57	144.64	145.46
Bottom of Bentonite Seal/Top of Sand Pack		mbgs	4.30	4.30	4.40
		masl	139.57	140.64	141.36
Top of Well Screen		mbgs	4.60	4.50	4.60
		masl	139.27	140.44	141.16
Well Screen Length		m	1.50	1.50	1.50
Bottom of Well Screen		mbgs	6.10	6.00	6.10
		masl	137.77	138.94	139.36
GW Monitoring					
04-Dec-19	Depth to GW	mbgs	3.20	4.50	1.40
	GW Elevation	masl	140.67	140.44	144.36

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

Table 2: Summary of Soil Samples Submitted for Chemical Analysis

Borehole ID	Sample No.	Sample Depth (mbgs)	Soil Description	Parameter Analyzed	APEC Investigated
BH19-1	S1	0.0 - 0.6	Fill - Claye Silt	M&I, OCPs	APEC-1, APEC-3
	S2	0.8 - 1.4	Fill - Claye Silt / Clayey Silt Till	PAHs	APEC-1
	S3	1.5 - 2.1	Clayey Silt Till	PHCs, VOCs	APEC-1
BH19-2	S1	0.0 - 0.6	Fill - Claye Silt	M&I, OCPS	APEC-1, APEC-3
	DUP-1			M&I	APEC-1
	S2	0.8 - 1.4	Fill - Claye Silt / Clayey Silt Till	PAHs	APEC-1
	S4	2.3 - 3.0	Till/Shale Complex	PHCs, VOCs	APEC-3
BH19-3	S1	0.0 - 0.6	Fill - Claye Silt	OCPS	APEC-3
	S2	0.8 - 1.4	Fill - Silty Clay	M&I, PAHs, PHCs, VOCs	APEC-1
GS-1	-	0.0 - 0.3	Fill - Clayey Silt	PCBs	APEC-2

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

Table 3: Summary of APECs Investigated

APEC	Description	PCOCs	Media	Boreholes Within APEC	Samples Analysed	Parameter Analyzed
APEC-1	Fill material is inferred to have been placed for grading purposes in the past The Phase One Property started development around 1987 for what is now Millcroft Golf Club Hole 1.	M&I, PHCs, VOCs, PAHs	Soil	BH19-1	S1	M&I
					S2	PAHs
					S3	PHCs, VOCs
				BH19-2	S1	M&I
					DUP-1	M&I
					S2	PAHs
					S4	PHCs, VOCs
				BH19-3	S2	M&I, PAHs, PHCs, VOCs
APEC-2	One transformer was observed on the southwest corner of the Property.	PCB	Soil	GS1	-	PCBs
APEC-3	Pesticides are used on the grass that cover the Property.	OCPs	Soil	BH19-1	S1	OCPs
				BH19-2	S1	OCPs
				BH19-3	S1	OCPs

Table 4: Summary of Metals and Inorganics in Soil

Parameter	MECP Table 2 SCS	Units	BH19-1 S1	BH19-2 S1	DUP-1 (BH19-2 S1)	BH19-3 S2
Date of Collection			06-Dec-19	06-Dec-19	06-Dec-19	06-Dec-19
Date Reported			18-Dec-19	18-Dec-19	18-Dec-19	18-Dec-19
Sampling Depth (mbgs)			0.0 - 0.6	0.0 - 0.6	0.0 - 0.6	0.8 - 1.4
Analytical Report Reference No.			CA14331-DEC19	CA14331-DEC19	CA14331-DEC19	CA14331-DEC19
Antimony	7.5	µg/g	< 0.8	< 0.8	< 0.8	< 0.8
Arsenic	18	µg/g	4.5	5.3	5.4	5.1
Barium	390	µg/g	100	110	93	90
Beryllium	4	µg/g	0.56	0.87	0.8	0.69
Boron	120	µg/g	10	7	7	8
Boron (Hot Water Soluble)	1.5	µg/g	< 0.5	< 0.5	< 0.5	< 0.5
Cadmium	1.2	µg/g	0.17	0.16	0.16	0.14
Chromium	160	µg/g	18	28	25	21
Chromium VI	8	µg/g	< 0.2	< 0.2	< 0.2	< 0.2
Cobalt	22	µg/g	11	14	14	13
Copper	140	µg/g	29	32	33	33
Cyanide	0.051	µg/g	< 0.05	< 0.05	< 0.05	< 0.05
Lead	120	µg/g	14	13	13	13
Mercury	0.27	µg/g	< 0.05	< 0.05	< 0.05	< 0.05
Molybdenum	6.9	µg/g	0.7	0.3	0.4	0.6
Nickel	100	µg/g	23	31	31	28
Selenium	2.4	µg/g	< 0.7	< 0.7	< 0.7	< 0.7
Silver	20	µg/g	< 0.05	< 0.05	< 0.05	< 0.05
Thallium	1	µg/g	0.13	0.21	0.18	0.17
Uranium	23	µg/g	0.76	0.59	0.54	0.64
Vanadium	86	µg/g	24	37	33	27
Zinc	340	µg/g	89	71	70	67
Electrical Conductivity (2:1)	0.7	µg/g	0.58	0.17	0.17	0.24
Sodium Adsorption Ratio	5	µg/g	0.5	< 0.2	< 0.2	0.4
pH, 2:1 CaCl2 Extraction	-	µg/g	7.77	7.66	7.69	7.81

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

Table 5: Summary of PHCs in Soil

Parameter	MECP Table 2 SCS	Units	BH19-1 S3	BH19-2 S4	BH19-3 S2
Date of Collection			06-Dec-19	06-Dec-19	06-Dec-19
Date Reported			18-Dec-19	18-Dec-19	18-Dec-19
Sampling Depth (mbgs)			1.5 - 2.1	2.4 - 3.0	0.8 - 1.43
Analytical Report Reference No.			CA14331-DEC19	CA14331-DEC19	CA14331-DEC19
Benzene	0.21	µg/g	< 0.02	< 0.02	< 0.02
Ethylbenzene	1.1	µg/g	< 0.05	< 0.05	< 0.05
Toluene	2.3	µg/g	< 0.05	< 0.05	< 0.05
Xylenes (Total)	3.1	µg/g	< 0.05	< 0.05	< 0.05
F1-BTEX	55	µg/g	< 10	< 10	< 10
F2 (C10-C16)	98	µg/g	< 10	< 10	< 10
F3 (C16-C34)	300	µg/g	< 50	< 50	< 50
F4 (C34-C50)	2800	µg/g	< 50	< 50	< 50

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

Table 6: Summary of VOCs in Soil

Parameter	MECP Table 2 SCS	Units	BH19-1 S3	BH19-2 S4	BH19-3 S2
Date of Collection			06-Dec-19	06-Dec-19	06-Dec-19
Date Reported			18-Dec-19	18-Dec-19	18-Dec-19
Sampling Depth (mbgs)			1.5 - 2.1	2.4 - 3.0	0.8 - 1.43
Analytical Report Reference No.			CA14331-DEC19	CA14331-DEC19	CA14331-DEC19
Acetone	16	µg/g	< 0.5	< 0.5	< 0.5
Benzene	0.21	µg/g	< 0.02	< 0.02	< 0.02
Bromodichloromethane	1.5	µg/g	< 0.05	< 0.05	< 0.05
Bromoform	0.27	µg/g	< 0.05	< 0.05	< 0.05
Bromomethane	0.05	µg/g	< 0.05	< 0.05	< 0.05
Carbon Tetrachloride	0.05	µg/g	< 0.05	< 0.05	< 0.05
Chlorobenzene	2.4	µg/g	< 0.05	< 0.05	< 0.05
Chloroform	0.05	µg/g	< 0.05	< 0.05	< 0.05
Cis- 1,2-Dichloroethylene	1.9	µg/g	< 0.05	< 0.05	< 0.05
Dibromochloromethane	2.3	µg/g	< 0.05	< 0.05	< 0.05
Dichlorobenzene, 1,2-	0.5	µg/g	< 0.05	< 0.05	< 0.05
Dichlorobenzene, 1,3-	0.05	µg/g	< 0.05	< 0.05	< 0.05
Dichlorobenzene, 1,4-	0.083	µg/g	< 0.05	< 0.05	< 0.05
Dichlorodifluoromethane	16	µg/g	< 0.05	< 0.05	< 0.05
Dichloroethane, 1,1-	0.47	µg/g	< 0.05	< 0.05	< 0.05
Dichloroethane, 1,2-	0.05	µg/g	< 0.05	< 0.05	< 0.05
Dichloroethylene, 1,1-	0.05	µg/g	< 0.05	< 0.05	< 0.05
Dichloropropane, 1,2-	0.05	µg/g	< 0.05	< 0.05	< 0.05
Dichloropropene, 1,3-	0.05	µg/g	< 0.05	< 0.05	< 0.05
Ethylbenzene	1.1	µg/g	< 0.05	< 0.05	< 0.05
Ethylene Dibromide	0.05	µg/g	< 0.05	< 0.05	< 0.05
Methyl Ethyl Ketone	16	µg/g	< 0.5	< 0.5	< 0.5
Methyl Isobutyl Ketone	1.7	µg/g	< 0.5	< 0.5	< 0.5
Methyl tert-butyl Ether	0.75	µg/g	< 0.05	< 0.05	< 0.05
Methylene Chloride	0.1	µg/g	< 0.05	< 0.05	< 0.05
n-Hexane	34	µg/g	< 0.05	< 0.05	< 0.05
Styrene	0.7	µg/g	< 0.05	< 0.05	< 0.05
Tetrachloroethane, 1,1,1,2-	0.058	µg/g	< 0.05	< 0.05	< 0.05
Tetrachloroethane, 1,1,2,2-	0.05	µg/g	< 0.05	< 0.05	< 0.05
Tetrachloroethylene	0.28	µg/g	< 0.05	< 0.05	< 0.05
Toluene	2.3	µg/g	< 0.05	< 0.05	< 0.05
Trans- 1,2-Dichloroethylene	0.084	µg/g	< 0.05	< 0.05	< 0.05
Trichloroethane, 1,1,1-	3.8	µg/g	< 0.05	< 0.05	< 0.05
Trichloroethane, 1,1,2-	0.05	µg/g	< 0.05	< 0.05	< 0.05
Trichloroethylene	0.61	µg/g	0.11	< 0.05	< 0.05
Trichlorofluoromethane	4	µg/g	< 0.05	< 0.05	< 0.05
Vinyl Chloride	0.2	µg/g	< 0.02	< 0.02	< 0.02
Xylene Mixture	3.1	µg/g	< 0.05	< 0.05	< 0.05

Table 7: Summary of PAHs in Soil

Parameter	MECP Table 2 SCS	Units	BH19-1 S2	BH19-2 S2	BH19-3 S2
Date of Collection			06-Dec-19	06-Dec-19	06-Dec-19
Date Reported			18-Dec-19	18-Dec-19	18-Dec-19
Sampling Depth (mbgs)			0.8 - 1.4	0.8 - 1.4	0.8 - 1.4
Analytical Report Reference No.			CA14331-DEC19	CA14331-DEC19	CA14331-DEC19
Acenaphthene	7.9	µg/g	< 0.05	< 0.05	< 0.05
Acenaphthylene	0.15	µg/g	< 0.05	< 0.05	< 0.05
Anthracene	0.67	µg/g	< 0.05	< 0.05	< 0.05
Benz(a)anthracene	0.5	µg/g	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	0.3	µg/g	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	0.78	µg/g	< 0.05	< 0.05	< 0.05
Benzo(g,h,i)perylene	6.6	µg/g	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	0.78	µg/g	< 0.05	< 0.05	< 0.05
Chrysene	7	µg/g	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	0.1	µg/g	< 0.06	< 0.06	< 0.06
Fluoranthene	0.69	µg/g	< 0.05	< 0.05	< 0.05
Fluorene	62	µg/g	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	0.38	µg/g	< 0.1	< 0.1	< 0.1
Naphthalene	0.6	µg/g	< 0.05	< 0.05	< 0.05
2-and 1-methyl Naphthalene	0.99	µg/g	< 0.05	< 0.05	< 0.05
Phenanthrene	6.2	µg/g	< 0.05	< 0.05	< 0.05
Pyrene	78	µg/g	< 0.05	< 0.05	< 0.05

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

Table 8: Summary of OCPs in Soil

Parameter	MECP Table 2 SCS	Units	BH19-1 S1	BH19-2 S1	BH19-3 S1
Date of Collection			06-Dec-19	06-Dec-19	06-Dec-19
Date Reported			18-Dec-19	18-Dec-19	18-Dec-19
Sampling Depth (mbgs)			0.0 - 1.6	0.0 - 1.6	0.0 - 1.6
Analytical Report Reference No.			CA14331-DEC19	CA14331-DEC19	CA14331-DEC19
Aldrin	0.05	µg/g	< 0.05	< 0.05	< 0.05
Chlordane	0.05	µg/g	< 0.05	< 0.05	< 0.05
DDD	3.3	µg/g	< 0.05	< 0.05	< 0.05
DDE	0.26	µg/g	< 0.05	< 0.05	< 0.05
DDT	1.4	µg/g	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	µg/g	< 0.05	< 0.05	< 0.05
Endosulfan	0.04	µg/g	< 0.04	< 0.04	< 0.04
Endrin	1.1	µg/g	< 0.04	< 0.04	< 0.04
Hexachlorocyclohexane Gamma-	0.056	µg/g	< 0.01	< 0.01	< 0.01
Heptachlor	0.15	µg/g	< 0.01	< 0.01	< 0.01
Heptachlor Epoxide	0.05	µg/g	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.52	µg/g	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	0.012	µg/g	< 0.01	< 0.01	< 0.01
Hexachloroethane	0.89	µg/g	< 0.01	< 0.01	< 0.01
Methoxychlor	0.13	µg/g	< 0.05	< 0.05	< 0.05

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

Table 9: Summary of PCBs in Soil

Parameter	MECP Table 2 SCS	Units	GS-1
Date of Collection			14-Apr-20
Date Reported			17-Apr-20
Sampling Depth (mbgs)			0.0 - 0.3
Analytical Report Reference No.			CA14345-APR20
Polychlorinated Biphenyls	0.35	µg/g	< 0.3

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

Table 10: Summary of Maximum Concentrations in Soil

Parameter		Standard	Maximum Concentration	Location
Metals and Inorganics	Antimony	7.5	< 0.8	All Samples
	Arsenic	18	5.4	DUP-1 (BH19-2 S1)
	Barium	390	110	BH19-2 S1
	Beryllium	4	0.87	BH19-2 S1
	Boron	120	10	BH19-1 S1
	Boron (Hot Water Soluble)	1.5	< 0.5	All Samples
	Cadmium	1.2	0.17	BH19-1 S1
	Chromium	160	28	BH19-2 S1
	Chromium VI	8	< 0.2	All Samples
	Cobalt	22	14	BH19-2 S1
	Copper	140	33	DUP-1 (BH19-2 S1)
	Cyanide	0.051	< 0.05	All Samples
	Lead	120	14	BH19-1 S1
	Mercury	0.27	< 0.05	All Samples
	Molybdenum	6.9	0.7	BH19-1 S1
	Nickel	100	31	BH19-2 S1
	Selenium	2.4	< 0.7	All Samples
	Silver	20	< 0.05	All Samples
	Thallium	1	0.21	BH19-2 S1
	Uranium	23	0.76	BH19-1 S1
	Vanadium	86	37	BH19-2 S1
	Zinc	340	89	BH19-1 S1
	Electrical Conductivity (2:1)	0.7	0.58	BH19-1 S1
	Sodium Adsorption Ratio	5	0.5	BH19-1 S1
	pH, 2:1 CaCl2 Extraction	-	7.81	BH19-3 S2
PHCs	Benzene	0.21	< 0.02	All Samples
	Ethylbenzene	1.1	< 0.05	All Samples
	Toluene	2.3	< 0.05	All Samples
	Xylenes (Total)	3.1	< 0.05	All Samples
	F1-BTEX	55	< 10	All Samples
	F2 (C10-C16)	98	< 10	All Samples
	F3 (C16-C34)	300	< 50	All Samples
	F4 (C34-C50)	2800	< 50	All Samples
VOCs	Acetone	16	< 0.5	All Samples
	Benzene	0.21	< 0.02	All Samples
	Bromodichloromethane	1.5	< 0.05	All Samples
	Bromoform	0.27	< 0.05	All Samples
	Bromomethane	0.05	< 0.05	All Samples
	Carbon Tetrachloride	0.05	< 0.05	All Samples
	Chlorobenzene	2.4	< 0.05	All Samples
	Chloroform	0.05	< 0.05	All Samples
	Cis- 1,2-Dichloroethylene	1.9	< 0.05	All Samples
	Dibromochloromethane	2.3	< 0.05	All Samples
	Dichlorobenzene, 1,2-	0.5	< 0.05	All Samples

Table 10: Summary of Maximum Concentrations in Soil

	Parameter	Standard	Maximum Concentration	Location
VOCs	Dichlorobenzene, 1,3-	0.05	< 0.05	All Samples
	Dichlorobenzene, 1,4-	0.083	< 0.05	All Samples
	Dichlorodifluoromethane	16	< 0.05	All Samples
	Dichloroethane, 1,1-	0.47	< 0.05	All Samples
	Dichloroethane, 1,2-	0.05	< 0.05	All Samples
	Dichloroethylene, 1,1-	0.05	< 0.05	All Samples
	Dichloropropane, 1,2-	0.05	< 0.05	All Samples
	Dichloropropene, 1,3-	0.05	< 0.05	All Samples
	Ethylbenzene	1.1	< 0.05	All Samples
	Ethylene Dibromide	0.05	< 0.05	All Samples
	Methyl Ethyl Ketone	16	< 0.5	All Samples
	Methyl Isobutyl Ketone	1.7	< 0.5	All Samples
	Methyl tert-butyl Ether	0.75	< 0.05	All Samples
	Methylene Chloride	0.1	< 0.05	All Samples
	n-Hexane	34	< 0.05	All Samples
	Styrene	0.7	< 0.05	All Samples
	Tetrachloroethane, 1,1,1,2-	0.058	< 0.05	All Samples
	Tetrachloroethane, 1,1,2,2-	0.05	< 0.05	All Samples
	Tetrachloroethylene	0.28	< 0.05	All Samples
	Toluene	2.3	< 0.05	All Samples
	Trans- 1,2-Dichloroethylene	0.084	< 0.05	All Samples
	Trichloroethane, 1,1,1-	3.8	< 0.05	All Samples
	Trichloroethane, 1,1,2-	0.05	< 0.05	All Samples
	Trichloroethylene	0.61	0.11	BH19-1 S3
	Trichlorofluoromethane	4	< 0.05	All Samples
	Vinyl Chloride	0.2	< 0.02	All Samples
	Xylene Mixture	3.1	< 0.05	All Samples
PAHs	Acenaphthene	7.9	< 0.05	All Samples
	Acenaphthylene	0.15	< 0.05	All Samples
	Anthracene	0.67	< 0.05	All Samples
	Benz(a)anthracene	0.5	< 0.05	All Samples
	Benzo(a)pyrene	0.3	< 0.05	All Samples
	Benzo(b)fluoranthene	0.78	< 0.05	All Samples
	Benzo(g,h,i)perylene	6.6	< 0.1	All Samples
	Benzo(k)fluoranthene	0.78	< 0.05	All Samples
	Chrysene	7	< 0.05	All Samples
	Dibenz(a,h)anthracene	0.1	< 0.06	All Samples
	Fluoranthene	0.69	< 0.05	All Samples
	Fluorene	62	< 0.05	All Samples
	Indeno(1,2,3-cd)pyrene	0.38	< 0.1	All Samples
	Naphthalene	0.6	< 0.05	All Samples
	2-and 1-methyl Naphthalene	0.99	< 0.05	All Samples
	Phenanthrene	6.2	< 0.05	All Samples
	Pyrene	78	< 0.05	All Samples

Table 10: Summary of Maximum Concentrations in Soil

Parameter		Standard	Maximum Concentration	Location
OCPs	Aldrin	0.05	< 0.05	All Samples
	Chlordane	0.05	< 0.05	All Samples
	DDD	3.3	< 0.05	All Samples
	DDE	0.26	< 0.05	All Samples
	DDT	1.4	< 0.05	All Samples
	Dieldrin	0.05	< 0.05	All Samples
	Endosulfan	0.04	< 0.04	All Samples
	Endrin	1.1	< 0.04	All Samples
	Hexachlorocyclohexane Gamma-	0.056	< 0.01	All Samples
	Heptachlor	0.15	< 0.01	All Samples
	Heptachlor Epoxide	0.05	< 0.01	All Samples
	Hexachlorobenzene	0.52	< 0.01	All Samples
	Hexachlorobutadiene	0.012	< 0.01	All Samples
	Hexachloroethane	0.89	< 0.01	All Samples
	Methoxychlor	0.13	< 0.05	All Samples
PCBs	Polychlorinated Biphenyls	0.35	< 0.3	All Samples

Notes for Soil & Groundwater Summary Tables

1.	mbgs =	Meters below ground surface
2.	masl =	Meters above sea level
3.		Units for all soil analyses are in µg/g (ppm) unless otherwise indicated
4.		Units for all groundwater analyses are in µg/L (ppb) unless otherwise indicated
5.	MECP Table 3 RPI SCS =	Table 3 SCS: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition for Residential/Parkland/Institutional Use with medium-fine textured soilsy as contained in Table 3 of the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", published by the MOECC on April 15, 2011
7.		For soil and groundwater analytical results, concentration exceeds the applicable Standards
8.	NM =	Not Monitored
9.	PHC =	Petroleum Hydrocarbon
10.	M&I =	Metals and Inorganics
11.	PAH =	Polyaromatic Hydrocarbon
12.	BTEX =	Benzene, Toluene, Ethylbenzene, Xylene
13.	OCPs =	Organochlorine Pesticides

Appendix A

PLAN OF SURVEY OF
BLOCK 247,
PLAN 20M–235
CITY OF BURLINGTON
REGIONAL MUNICIPALITY OF HALTON

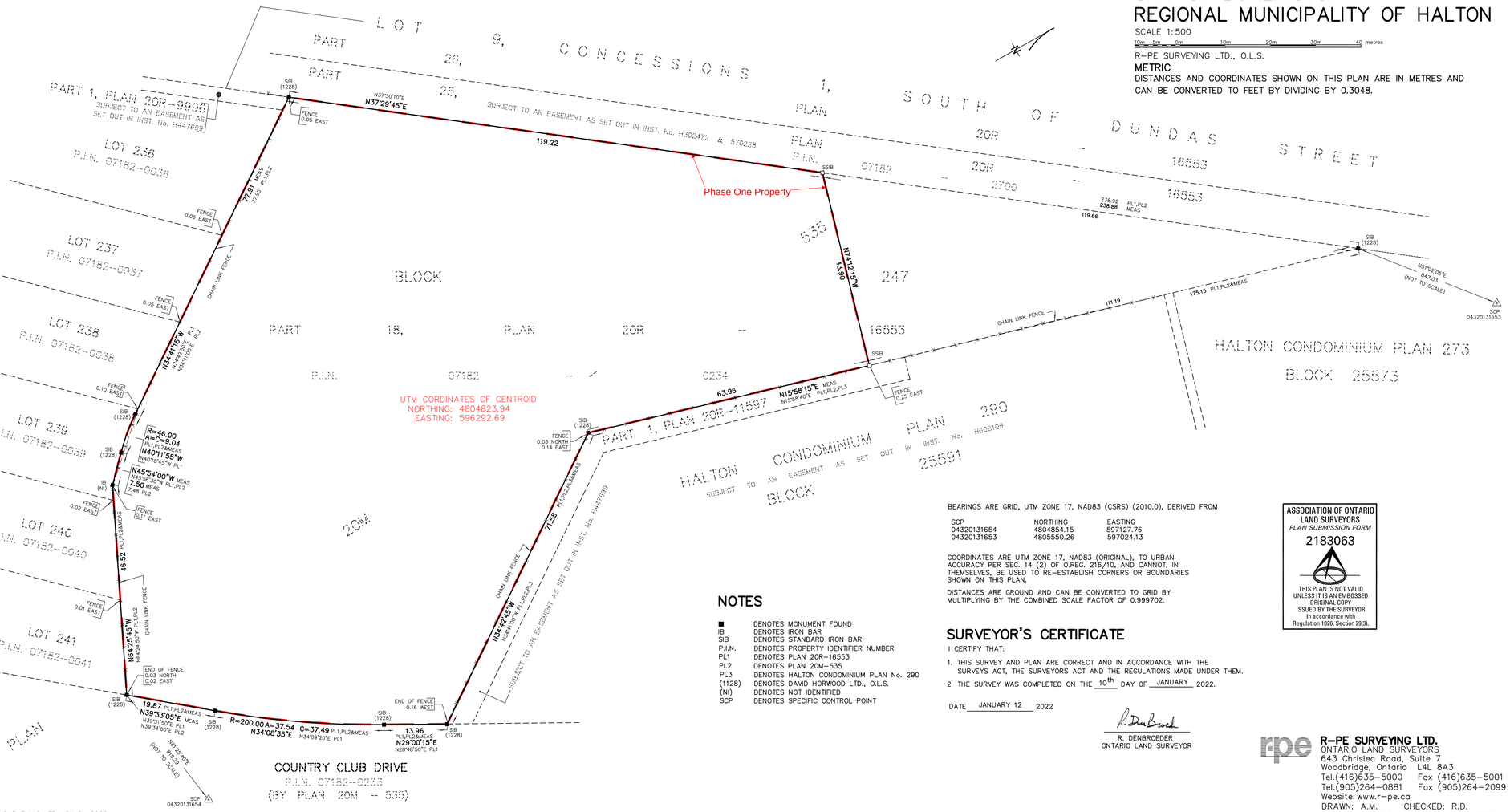
SCALE 1:500

10m 5m 0m 10m 20m 30m 40 metres

R–PE SURVEYING LTD., O.L.S.

METRIC

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.



NOTES

■	DENOTES MONUMENT FOUND
IB	DENOTES IRON BAR
SIB	DENOTES STANDARD IRON BAR
P.I.N.	DENOTES PROPERTY IDENTIFIER NUMBER
PL1	DENOTES PLAN 20R–16553
PL2	DENOTES PLAN 20M–535
PL3	DENOTES HALTON CONDOMINIUM PLAN No. 290
(1128)	DENOTES DAVID HORWOOD LTD., O.L.S.
(NI)	DENOTES NOT IDENTIFIED
SCP	DENOTES SPECIFIC CONTROL POINT

BEARINGS ARE GRID, UTM ZONE 17, NAD83 (CSRS) (2010.0), DERIVED FROM

SCP	NORTHING	EASTING
04320131654	4804854.15	597127.76
04320131653	4805550.26	597024.13

COORDINATES ARE UTM ZONE 17, NAD83 (ORIGINAL), TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10, AND CANNOT, IN THEMSELVES, BE USED TO RE–ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999702.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 10th DAY OF JANUARY 2022.

DATE JANUARY 12 2022

R. DENBROEDER
ONTARIO LAND SURVEYOR

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2183063
THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29(3).

R–PE SURVEYING LTD.
ONTARIO LAND SURVEYORS
643 Chrislea Road, Suite 7
Woodbridge, Ontario L4L 8A3
Tel.(416)635–5000 Fax (416)635–5001
Tel.(905)264–0881 Fax (905)264–2099
Website: www.r–pe.ca

DRAWN: A.M. CHECKED: R.D.
JOB No. 16–073 CAD FILE No.16073RSC2–C

©R–PE SURVEYING LTD., O.L.S., 2022.

Appendix B

Project Number: 19-199-101 **2019-11-28**

Argo (Millcroft) Limited
2173 Turnberry Road
Burlington, Ontario
L7M 4P8

Attention: **Mr. Matthew Marsili,**
Sent via email: **matthew@argoland.com**

RE: **Sampling and Analysis Plan**
Phase Two Environmental Site Assessment
Millcroft Golf Club (Block C), Burlington, Ontario

Dear: Mr. Matthew Marsili,

1. Introduction

DS Consultants Limited (DS) is pleased to present the Sampling and Analysis Plan (SAP) for the proposed Phase Two Environmental Site Assessment of Millcroft Golf Club (Block C), Burlington, Ontario , (the Site).The purpose of the proposed Phase Two ESA program is to assess the current subsurface environmental conditions in support of the proposed redevelopment of the Site.

The Phase Two ESA will involve intrusive investigation in the areas determined in the Site visit to be Areas of Potential Environmental Concern (APECs), and will be completed in general accordance with O.Reg 153/04. Based on the findings of the field and laboratory analyses, a Phase Two ESA report will be prepared.

2. Background

Based on the Phase One Environmental Site Assessment, it is DS's understanding that the Site is a 1.4 hectare (3.46 acres) parcel of land which is currently used for commercial purposes. The first developed use of the Site is interpreted to be Agricultural based on findings of the Phase One ESA. A total of three (3) potentially contaminating activities were identified on the Phase One Property or on neighbouring properties within the Phase One Study Area which are considered to be contributing to Areas of Potential Environmental Concern (APECs) on the Phase Two Property. A summary of the APECs identified, the potential contaminants of concern, and the media potentially impacted is presented in Table 1 below:

Table 1: Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of APECs on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC-1	Entire Property	PCA1 (#30): Importation of Fill Material of Unknown Quality	On Site	PHCs, VOCs, BTEX, Metals, As, Sb, Se, B-HWS, CN-, EC, Cr (VI), Hg, low or high pH, SAR, PAHs	Soil
APEC-2	Southwest portion of the Property	PCA-4 (#55): Transformer Manufacturing, Processing and Use	On Site	PCBs	Soil
APEC-3	Entire Property	PCA-5 (#40): Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Application	On Site	OCPs	Soil

Notes:
1. PHC (F1-F4) = Petroleum Hydrocarbons in the F1-F4 fraction ranges
2. VOCs = Volatile Organic Compounds
3. PAHs = Polycyclic Aromatic Hydrocarbons
4. PCBs = Polychlorinated Biphenyls
5. OCPs = Organochlorine Pesticides

3. Site Investigation Program

The Site Investigation Program will be completed as follows:

- Public and private underground utilities and services will be cleared prior to commencement of intrusive investigation activities;
- A Health and Safety Plan will be prepared, and all work will be executed safely;
- Three (3) boreholes will be advanced on the Phase Two Property, to an approximate maximum depth of 6.2 mbgs, using a truck-mounted drill rig, and one (1) grab sample will be collected using a hand toll to a maximum depth of 0.3 ,mbgs . The soil profile from each borehole will be logged in the field and samples will be screened for total organic vapours (TOV) with a photoionization detector (PID) and combustible gas detector (CGD). The location of the boreholes will be selected to investigate any APECs identified during the Phase One ESA, as well as to delineate the horizontal and vertical extents of relevant

parameters of concern; it is anticipated that bedrock will be encountered at an approximate depth range of 3.3 to 6.2 mbgs;

- Groundwater monitoring wells will be installed in all (3) the boreholes advanced on the Phase Two Property to facilitate the collection of water levels and the assessment of groundwater flow direction;
- Based on field screening and visual/olfactory observations, worst-case/representative soil samples from the boreholes will be submitted for laboratory testing of relevant parameters of concern;
- The groundwater levels in the wells will be measured at least 24 hours after well development has been completed, to determine the groundwater elevation. The wells will be surveyed to a geodetic benchmark to determine groundwater flow direction;
- Soil samples will be submitted for chemical analysis by a CALA laboratory in accordance with the Ontario MECP standards and requirements of O.Reg. 153/04 under the Environmental Protection Act.

All field equipment is to be calibrated at the start of each field day, in accordance with DS's Standard Operating Procedures (SOPs). Clean, disposable Nitrile™ gloves will be used at each sampling interval to reduce the risk of cross contamination. All non-dedicated equipment (e.g. split spoon sampler, interface probe, etc.) will be decontaminated between each borehole. The equipment will be brushed free of debris, washed with phosphate-free detergent, and then rinsed with analyte free water.

The proposed monitoring wells will be installed using 50 mm inner diameter Schedule 40 polyvinyl chloride (PVC), equipped with 50 mm inner diameter Schedule 40 PVC with #10 slot well screens. A silica sand filter pack will be placed around the well screen and up to 0.61 metres above the top of the well screen. The well annulus will be sealed with hydrated bentonite. All wells will be protected with either a flush mount well casing, or a locked monument style casing.

The proposed analytical program is outlined below (proposed program subject to change as a result of site observations/findings). All soil and groundwater sampling will be carried out in accordance with DS's SOPs.

<u>Soils:</u>

- Three (3) soil samples for analysis of metals and inorganics, three (3) samples for petroleum hydrocarbons (PHCs) (F1-F4) and BTEX, three (3) samples for Volatile Organic Compounds (VOCs), three (3) Polycyclic Aromatic Hydrocarbons (PAHs), one (1) sample for Polychlorinated Biphenyls (PCBs) and three (3) samples for organochlorine pesticides (OCPs). One (1) sample will be submitted for QA/QC purposes.

One quality control/quality assurance (QAQC) sample will be submitted for analysis per ten (10) samples analyzed in accordance with O.Reg. 153/04.

Following receipt of all of the results, a report in accordance with O.Reg. 153/04 will be prepared.

It is noted that if the Phase Two ESA reveals parameter concentrations greater than the applicable standards set out in *Ontario Regulation 153/04,* then additional work (i.e., supplemental delineation, additional drilling, sampling, analysis, and/or site remediation activities) will be deemed necessary prior to RSC filing, should an RSC be required. The costs for any additional work, if necessary, are beyond the current scope of work.

The SAP was created based on the request to complete a Phase Two ESA in support of the proposed redevelopment of the Site. The SAP was compiled to collect data to provide information on soil and/or groundwater quality in each APEC.

Additional delineation may be required following the implementation of this SAP to meet the requirements of O.Reg. 153/04 which requires delineation of all areas where concentrations are above the applicable SCS such as in the following conditions:

- Unexpected contamination not previously discovered, or not related to identified APECs, is discovered which will require further delineation to identify source(s); and
- If the sampling results indicate that the soil and/or groundwater impacts are deeper than initially expected.

We trust that this Sampling and Analysis Plan meets the objectives of the Client. If further assistance is required on this matter, please do not hesitate to contact the undersigned.

Yours Very Truly,

DS Consultants Ltd.



Drew Doak, B.Sc.E., P.Eng., QP_{ESA}
Environmental Project Manager

Appendix C

LOG OF BOREHOLE BH19-1

PROJECT: Phase Two ESA - Millcroft Golf Club "Block'C"
CLIENT: Argo (Milcroft) Limited
PROJECT LOCATION: Millcroft Golf Club, Burlington, ON
DATUM: Geodetic
BH LOCATION: See Figure 5 N 4804785.16 E 596345.5

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Nov/26/2019

REF. NO.: 19-199-101
ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	PID (ppm)	CGD (ppm)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS
143.9								Soil Head Space Vapors					
0.0 / 143.7	**TOPSOIL:** 150mm												
0.2	**FILL:** clayey silt, trace gravel, brown, moist, very stiff		1	SS	18								M&I, OCPs
142.8			2	SS	19		143						
1.1	**CLAYEY SILT TILL:** some sand, trace gravel, brown, moist, very stiff to hard reddish brown below 1.5m		3	SS	32		142						PAHs 6 17 59 18 PHCs, VOCs
	trace shale fragments below 2.3m		4	SS	59		141						
	sandy below 3.1m		5	SS	79/ 230	▽							
139.3							140						
4.6	**SHALE:** weathered, reddish brown		6	SS	50/ 50mm		139						
137.7			7	SS	50/ 50mm		138						
6.2	**END OF BOREHOLE:** Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water level Reading: Date: Water Level (mbgl): Dec 04, 2019 3.2												

Bentonite
W. L. 140.7 masl Dec 04, 2019
Filter Pack
Slotted Pipe

0~10 PPM AND 0~10% LEL-2016 19-199-101_C.GPJ DS.GDT 5/16/20

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH19-2

PROJECT: Phase Two ESA - Millcroft Golf Club "Block'C"
CLIENT: Argo (Milcroft) Limited
PROJECT LOCATION: Millcroft Golf Club, Burlington, ON
DATUM: Geodetic
BH LOCATION: See Figure 5 N 4804895.06 E 596313.79

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Nov/26/2019

REF. NO.: 19-199-101
ENCL NO.: 3

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Soil Head Space Vapors PID (ppm)	Soil Head Space Vapors CGD (ppm)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS
144.9													
0.0 / 144.7	**TOPSOIL:** 180mm												
0.2 / 143.9	**FILL:** clayey silt, trace rootlets/ topsoil, brown, moist, stiff		1	SS	8								M&I, OCPs, DUP-1(M&I)
1.0	**CLAYEY SILT TILL:** some sand, trace gravel, greyish brown, moist, hard		2	SS	31		144						PAHs
			3	SS	30		143						
	- at 2.3 mbgs till/shale complex, trace cobble, brown, moist, hard		4	SS	49								PHCs, VOCs
141.7			5	SS	50/ 50		142						
3.3	**SHALE:** weathered, reddish brown						141						
			6	SS	50/ 50mm		140						
138.7			7	SS	50/ 50mm		139						
6.2	**END OF BOREHOLE:**												

Bentonite
W. L. 140.4 masl Dec 04, 2019
Filter Pack
Slotted Pipe

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water level Reading:

Date:	Water Level (mbgl):
Dec 04, 2019	4.5

0~10 PPM AND 0~10% LEL-2016 19-199-101_C.GPJ DS.GDT 5/16/20

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +³, ×³: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH19-3

PROJECT: Phase Two ESA - Millcroft Golf Club "Block'C"
CLIENT: Argo (Milcroft) Limited
PROJECT LOCATION: Millcroft Golf Club, Burlington, ON
DATUM: Geodetic
BH LOCATION: See Figure 5 N 4804795.87 E 596253.44

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Nov/27/2019

REF. NO.: 19-199-101
ENCL NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	REMARKS
145.8					
0.0	**FILL:** clayey silt, trace rootlets/ topsoil, brown, wet, firm	1	SS	6	OCPs
145.0					
0.8	**FILL:** silty clay, trace gravel, brown, very moist, firm to stiff	2	SS	6	M&I, PHCs, VOCs, PAHsPAHs
		3	SS	9	
143.2		4	SS	18	
2.6	**CLAYEY SILT TILL:** some sand, trace gravel, trace shale fragments, brown, moist, very stiff to hard	5	SS	46	
	sandy below 4.6m	6	SS	50/ 50mm	27 24 36 13
139.7					
139.6	**SHALE:** weathered, reddish brown	7	SS	50/ 25mm	
6.2	**END OF BOREHOLE:**				

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water level Reading:

Date:	Water Level (mbgl):
Dec 04, 2019	1.4

Soil Head Space Vapors: PID (ppm), CGD (ppm)

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)

POCKET PEN. (Cu) (kPa): 50, 50, 50, 225, 225

NATURAL UNIT WT (kN/m³)

ELEVATION: 145, 144, 143, 142, 141, 140

W. L. 144.3 masl Dec 04, 2019

Bentonite

Filter Pack

Slotted Pipe

0~10 PPM AND 0~10% LEL-2016 19-199-101_C.GPJ DS.GDT 5/16/20

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; $\circ^6$=3% Strain at Failure

Appendix D





FINAL REPORT

CA14331-DEC19 R1

19-199-101

Prepared for

DS Consultants

FINAL REPORT

CA14331-DEC19 R1

First Page

CLIENT DETAILS

Client	DS Consultants
Address	6221 Highway 7 Vaughan, Ontario L4H 0K8. Canada
Contact	Drew Doak
Telephone	905-264-9393
Facsimile	905-264-2685
Email	drew.doak@dsconsultants.ca
Project	19-199-101
Order Number	
Samples	Soil (9)

LABORATORY DETAILS

Project Specialist	Brad Moore Hon. B.Sc
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2143
Facsimile	705-652-6365
Email	brad.moore@sgs.com
SGS Reference	CA14331-DEC19
Received	12/10/2019
Approved	12/18/2019
Report Number	CA14331-DEC19 R1
Date Reported	05/25/2020

COMMENTS

CCME Method Compliance: Analyses were conducted using analytical procedures that comply with the Reference Method for the CWS for Petroleum Hydrocarbons in Soil and have been validated for use at the SGS laboratory, Lakefield, ON site.

Quality Compliance: Instrument performance / calibration quality criteria were met and extraction and analysis limits for holding times were met.

nC6 and nC10 response factors within 30% of response factor for toluene: YES

nC10, nC16 and nC34 response factors within 10% of the average response for the three compounds: YES

C50 response factors within 70% of nC10 + nC16 + nC34 average: YES

Linearity is within 15%: YES

F4G - gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
The results for F4 and F4G are both reported and the greater of the two values is to be used in application to the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

Benzo(b)fluoranthene results for comparison to the standard are reported as benzo(b+j)fluoranthene. Benzo(b)fluoranthene and benzo(j)fluoranthene co-elute and cannot be reported individually by the analytical method used.

Temperature of Sample upon Receipt: 7 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:012376

SIGNATORIES

Brad Moore Hon. B.Sc

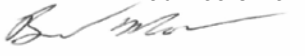


TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-12

Exceedance Summary..... 13

QC Summary..... 14-24

Legend..... 25

Annexes..... 26

Client: DS Consultants

Project: 19-199-101

Project Manager: Drew Doak

Samplers: Drew Doak

PACKAGE: **REG153 - BTEX** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

				Sample Number	11	15	17
				Sample Name	BH19-1-S3	BH19-2-S4	BH19-3-S2
				Sample Matrix	Soil	Soil	Soil
				Sample Date	26/11/2019	26/11/2019	26/11/2019
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	
BTEX							
Benzene	µg/g	0.02	0.17	< 0.02	< 0.02	< 0.02	
Ethylbenzene	µg/g	0.05	15	< 0.05	< 0.05	< 0.05	
Toluene	µg/g	0.05	6	< 0.05	< 0.05	< 0.05	
Xylene (total)	µg/g	0.05	25	< 0.05	< 0.05	< 0.05	
m/p-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	
o-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	

PACKAGE: **REG153 - Hydrides** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

				Sample Number	9	12	13	17
				Sample Name	BH19-1-S1	BH19-2-S1	DUP1	BH19-3-S2
				Sample Matrix	Soil	Soil	Soil	Soil
				Sample Date	26/11/2019	26/11/2019	26/11/2019	26/11/2019
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	
Hydrides								
Antimony	µg/g	0.8	7.5	< 0.8	< 0.8	< 0.8	< 0.8	
Arsenic	µg/g	0.5	18	4.5	5.3	5.4	5.1	
Selenium	µg/g	0.7	2.4	< 0.7	< 0.7	< 0.7	< 0.7	

Client: DS Consultants
Project: 19-199-101
Project Manager: Drew Doak
Samplers: Drew Doak

PACKAGE: **REG153 - Metals and Inorganics** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

	Sample Number	9	10	11	12	13	14	15	16
	Sample Name	BH19-1-S1	BH19-1-S2	BH19-1-S3	BH19-2-S1	DUP1	BH19-2-S2	BH19-2-S4	BH19-3-S1
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Sample Date	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics											
Moisture Content	%	-		15.0	14.5	10.2	17.4	20.4	11.1	7.9	18.3
Barium	µg/g	0.1	390	100			110	93			
Beryllium	µg/g	0.02	5	0.56			0.87	0.80			
Boron	µg/g	1	120	10			7	7			
Cadmium	µg/g	0.02	1.2	0.17			0.16	0.16			
Chromium	µg/g	0.5	160	18			28	25			
Cobalt	µg/g	0.01	22	11			14	14			
Copper	µg/g	0.1	180	29			32	33			
Lead	µg/g	0.1	120	14			13	13			
Molybdenum	µg/g	0.1	6.9	0.7			0.3	0.4			
Nickel	µg/g	0.5	130	23			31	31			
Silver	µg/g	0.05	25	< 0.05			< 0.05	< 0.05			
Thallium	µg/g	0.02	1	0.13			0.21	0.18			
Uranium	µg/g	0.002	23	0.76			0.59	0.54			
Vanadium	µg/g	3	86	24			37	33			
Zinc	µg/g	0.7	340	89			71	70			
Water Soluble Boron	µg/g	0.5	1.5	< 0.5			< 0.5	< 0.5			

Client: DS Consultants
Project: 19-199-101
Project Manager: Drew Doak
Samplers: Drew Doak

PACKAGE: **REG153 - Metals and Inorganics** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

Sample Number	17
Sample Name	BH19-3-S2
Sample Matrix	Soil
Sample Date	26/11/2019

Metals and Inorganics

Parameter	Units	RL	L1	Result
Moisture Content	%	-		14.8
Barium	µg/g	0.1	390	90
Beryllium	µg/g	0.02	5	0.69
Boron	µg/g	1	120	8
Cadmium	µg/g	0.02	1.2	0.14
Chromium	µg/g	0.5	160	21
Cobalt	µg/g	0.01	22	13
Copper	µg/g	0.1	180	33
Lead	µg/g	0.1	120	13
Molybdenum	µg/g	0.1	6.9	0.6
Nickel	µg/g	0.5	130	28
Silver	µg/g	0.05	25	< 0.05
Thallium	µg/g	0.02	1	0.17
Uranium	µg/g	0.002	23	0.64
Vanadium	µg/g	3	86	27
Zinc	µg/g	0.7	340	67
Water Soluble Boron	µg/g	0.5	1.5	< 0.5

Client: DS Consultants
Project: 19-199-101
Project Manager: Drew Doak
Samplers: Drew Doak

PACKAGE: **REG153 - Organochlorine Pests (OCs)**
(SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

Sample Number	9	12	16
Sample Name	BH19-1-S1	BH19-2-S1	BH19-3-S1
Sample Matrix	Soil	Soil	Soil
Sample Date	26/11/2019	26/11/2019	26/11/2019

Organochlorine Pests (OCs)

Parameter	Units	RL	L1	Result	Result	Result
Aldrin	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05
alpha-Chlordane	µg/g	0.02		< 0.02	< 0.02	< 0.02
gamma-Chlordane	µg/g	0.02		< 0.02	< 0.02	< 0.02
Chlordane (total)	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05
o,p-DDD	µg/g	0.02		< 0.02	< 0.02	< 0.02
pp-DDD	µg/g	0.02		< 0.02	< 0.02	< 0.02
DDD (total)	µg/g	0.05	3.3	< 0.05	< 0.05	< 0.05
o,p-DDE	µg/g	0.02		< 0.02	< 0.02	< 0.02
pp-DDE	µg/g	0.02		< 0.02	< 0.02	< 0.02
DDE (total)	µg/g	0.05	0.33	< 0.05	< 0.05	< 0.05
op-DDT	µg/g	0.02		< 0.02	< 0.02	< 0.02
pp-DDT	µg/g	0.02		< 0.02	< 0.02	< 0.02
DDT (total)	µg/g	0.05	1.4	< 0.05	< 0.05	< 0.05
Dieldrin	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05
gamma-BHC	µg/g	0.01	0.063	< 0.01	< 0.01	< 0.01
Endosulfan I	µg/g	0.02		< 0.02	< 0.02	< 0.02
Endosulfan II	µg/g	0.02		< 0.02	< 0.02	< 0.02
Endosulfan (total)	µg/g	0.04	0.04	< 0.04	< 0.04	< 0.04
Endrin	µg/g	0.04	0.04	< 0.04	< 0.04	< 0.04
Heptachlor	µg/g	0.01	0.15	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	µg/g	0.01	0.05	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	µg/g	0.01	0.52	< 0.01	< 0.01	< 0.01

PACKAGE: **REG153 - Organochlorine Pests (OCs)** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

			Sample Number	9	12	16	
			Sample Name	BH19-1-S1	BH19-2-S1	BH19-3-S1	
			Sample Matrix	Soil	Soil	Soil	
			Sample Date	26/11/2019	26/11/2019	26/11/2019	
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	
Organochlorine Pests (OCs) (continued)							
Hexachlorobutadiene	µg/g	0.01	0.014	< 0.01	< 0.01	< 0.01	
Hexachloroethane	µg/g	0.01	0.071	< 0.01	< 0.01	< 0.01	
Methoxychlor	µg/g	0.05	0.13	< 0.05	< 0.05	< 0.05	

PACKAGE: **REG153 - Other (ORP)** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

			Sample Number	9	12	13	17	
			Sample Name	BH19-1-S1	BH19-2-S1	DUP1	BH19-3-S2	
			Sample Matrix	Soil	Soil	Soil	Soil	
			Sample Date	26/11/2019	26/11/2019	26/11/2019	26/11/2019	
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	
Other (ORP)								
Mercury	µg/g	0.05	1.8	< 0.05	< 0.05	< 0.05	< 0.05	
Sodium Adsorption Ratio	---	0.2	5	0.5	< 0.2	< 0.2	0.4	
SAR Calcium	mg/L	0.09		80.9	30.9	31.9	35.9	
SAR Magnesium	mg/L	0.02		22.4	3.1	3.0	6.9	
SAR Sodium	mg/L	0.15		20.8	4.2	3.1	9.7	
Conductivity	mS/cm	0.002	0.7	0.58	0.17	0.17	0.24	
pH	pH Units	0.05		7.77	7.66	7.69	7.81	
Chromium VI	µg/g	0.2	10	< 0.2	< 0.2	< 0.2	< 0.2	
Free Cyanide	µg/g	0.05	0.051	< 0.05	< 0.05	< 0.05	< 0.05	

Client: DS Consultants

Project: 19-199-101

Project Manager: Drew Doak

Samplers: Drew Doak

PACKAGE: **REG153 - PAHs** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

			Sample Number	10	14	17
			Sample Name	BH19-1-S2	BH19-2-S2	BH19-3-S2
			Sample Matrix	Soil	Soil	Soil
			Sample Date	26/11/2019	26/11/2019	26/11/2019
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
PAHs						
Acenaphthene	µg/g	0.05	58	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/g	0.05	0.17	< 0.05	< 0.05	< 0.05
Anthracene	µg/g	0.05	0.74	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/g	0.05	0.63	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	µg/g	0.05	0.3	< 0.05	< 0.05	< 0.05
Benzo(b+j)fluoranthene	µg/g	0.05	0.78	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	µg/g	0.1	7.8	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	µg/g	0.05	0.78	< 0.05	< 0.05	< 0.05
Chrysene	µg/g	0.05	7.8	< 0.05	< 0.05	< 0.05
Dibenzo(a,h)anthracene	µg/g	0.06	0.1	< 0.06	< 0.06	< 0.06
Fluoranthene	µg/g	0.05	0.69	< 0.05	< 0.05	< 0.05
Fluorene	µg/g	0.05	69	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.1	0.48	< 0.1	< 0.1	< 0.1
1-Methylnaphthalene	µg/g	0.05		< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/g	0.05		< 0.05	< 0.05	< 0.05
Methylnaphthalene, 2-(1-)	µg/g	0.05	3.4	< 0.05	< 0.05	< 0.05
Naphthalene	µg/g	0.05	0.75	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/g	0.05	7.8	< 0.05	< 0.05	< 0.05
Pyrene	µg/g	0.05	78	< 0.05	< 0.05	< 0.05

Client: DS Consultants

Project: 19-199-101

Project Manager: Drew Doak

Samplers: Drew Doak

PACKAGE: **REG153 - Pesticides Surrogate** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

			Sample Number	9	12	16
			Sample Name	BH19-1-S1	BH19-2-S1	BH19-3-S1
			Sample Matrix	Soil	Soil	Soil
			Sample Date	26/11/2019	26/11/2019	26/11/2019
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
Pesticides Surrogate						
Surr Decachlorobiphenyl	Surr Rec %	-		94	104	75

PACKAGE: **REG153 - PHCs** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

			Sample Number	11	15	17
			Sample Name	BH19-1-S3	BH19-2-S4	BH19-3-S2
			Sample Matrix	Soil	Soil	Soil
			Sample Date	26/11/2019	26/11/2019	26/11/2019
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
PHCs						
F1 (C6-C10)	µg/g	10	65	< 10	< 10	< 10
F1-BTEX (C6-C10)	µg/g	10		< 10	< 10	< 10
F2 (C10-C16)	µg/g	10	150	< 10	< 10	< 10
F3 (C16-C34)	µg/g	50	1300	< 50	< 50	< 50
F4 (C34-C50)	µg/g	50	5600	< 50	< 50	< 50
Chromatogram returned to baseline at nC50	Yes / No	-		YES	YES	YES

Client: DS Consultants
Project: 19-199-101
Project Manager: Drew Doak
Samplers: Drew Doak

PACKAGE: **REG153 - SVOC Surrogates** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

			Sample Number	10	14	17
			Sample Name	BH19-1-S2	BH19-2-S2	BH19-3-S2
			Sample Matrix	Soil	Soil	Soil
			Sample Date	26/11/2019	26/11/2019	26/11/2019
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
SVOC Surrogates						
Surr Nitrobenzene-d5	Surr Rec %	-		77	87	86
Surr 2-Fluorobiphenyl	Surr Rec %	-		76	73	62
Surr 4-Terphenyl-d14	Surr Rec %	-		75	87	78
Surr 2-Fluorophenol	Surr Rec %	-		75	73	73
Surr Phenol-d6	Surr Rec %	-		79	76	75
Surr 2,4,6-Tribromophenol	Surr Rec %	-		71	77	72

PACKAGE: **REG153 - THMs (VOC)** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

			Sample Number	11	15	17
			Sample Name	BH19-1-S3	BH19-2-S4	BH19-3-S2
			Sample Matrix	Soil	Soil	Soil
			Sample Date	26/11/2019	26/11/2019	26/11/2019
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
THMs (VOC)						
Bromodichloromethane	µg/g	0.05	13	< 0.05	< 0.05	< 0.05
Bromoform	µg/g	0.05	0.26	< 0.05	< 0.05	< 0.05
Dibromochloromethane	µg/g	0.05	9.4	< 0.05	< 0.05	< 0.05

Client: DS Consultants
Project: 19-199-101
Project Manager: Drew Doak
Samplers: Drew Doak

PACKAGE: **REG153 - VOC Surrogates** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

	Sample Number			9	11	12	15	16	17		
	Sample Name			BH19-1-S1	BH19-1-S3	BH19-2-S1	BH19-2-S4	BH19-3-S1	BH19-3-S2		
	Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil		
	Sample Date			26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**		
VOC Surrogates											
Surr 1,2-Dichloroethane-d4	Surr Rec %	-			101		100		98		
Surr 4-Bromofluorobenzene	Surr Rec %	-			92		90		90		
Surr 2-Bromo-1-Chloropropane	Surr Rec %	-			90		89		87		
Surr TCMX	Surr Rec %	-		86		86		65			

PACKAGE: **REG153 - VOCs** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

	Sample Number			11	15	17					
	Sample Name			BH19-1-S3	BH19-2-S4	BH19-3-S2					
	Sample Matrix			Soil	Soil	Soil					
	Sample Date			26/11/2019	26/11/2019	26/11/2019					
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**					
VOCs											
Acetone	µg/g	0.5	28	< 0.5	< 0.5	< 0.5					
Bromomethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05					
Carbon tetrachloride	µg/g	0.05	0.12	< 0.05	< 0.05	< 0.05					
Chlorobenzene	µg/g	0.05	2.7	< 0.05	< 0.05	< 0.05					
Chloroform	µg/g	0.05	0.18	< 0.05	< 0.05	< 0.05					
1,2-Dichlorobenzene	µg/g	0.05	4.3	< 0.05	< 0.05	< 0.05					
1,3-Dichlorobenzene	µg/g	0.05	6	< 0.05	< 0.05	< 0.05					
1,4-Dichlorobenzene	µg/g	0.05	0.097	< 0.05	< 0.05	< 0.05					
Dichlorodifluoromethane	µg/g	0.05	25	< 0.05	< 0.05	< 0.05					
1,1-Dichloroethane	µg/g	0.05	11	< 0.05	< 0.05	< 0.05					
1,2-Dichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05					
1,1-Dichloroethylene	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05					

Client: DS Consultants
Project: 19-199-101
Project Manager: Drew Doak
Samplers: Drew Doak

PACKAGE: **REG153 - VOCs** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

			Sample Number	11	15	17
			Sample Name	BH19-1-S3	BH19-2-S4	BH19-3-S2
			Sample Matrix	Soil	Soil	Soil
			Sample Date	26/11/2019	26/11/2019	26/11/2019
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
VOCs (continued)						
trans-1,2-Dichloroethylene	µg/g	0.05	0.75	< 0.05	< 0.05	< 0.05
cis-1,2-Dichloroethylene	µg/g	0.05	30	< 0.05	< 0.05	< 0.05
1,2-Dichloropropane	µg/g	0.05	0.085	< 0.05	< 0.05	< 0.05
cis-1,3-dichloropropene	µg/g	0.03		< 0.03	< 0.03	< 0.03
trans-1,3-dichloropropene	µg/g	0.03		< 0.03	< 0.03	< 0.03
1,3-dichloropropene (total)	µg/g	0.05	0.083	< 0.05	< 0.05	< 0.05
Ethylenedibromide	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05
n-Hexane	µg/g	0.05	34	< 0.05	< 0.05	< 0.05
Methyl ethyl ketone	µg/g	0.5	44	< 0.5	< 0.5	< 0.5
Methyl isobutyl ketone	µg/g	0.5	4.3	< 0.5	< 0.5	< 0.5
Methyl-t-butyl Ether	µg/g	0.05	1.4	< 0.05	< 0.05	< 0.05
Methylene Chloride	µg/g	0.05	0.96	< 0.05	< 0.05	< 0.05
Styrene	µg/g	0.05	2.2	< 0.05	< 0.05	< 0.05
Tetrachloroethylene	µg/g	0.05	2.3	< 0.05	< 0.05	< 0.05
1,1,1,2-Tetrachloroethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05
1,1,1-Trichloroethane	µg/g	0.05	3.4	< 0.05	< 0.05	< 0.05
1,1,2-Trichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05
Trichloroethylene	µg/g	0.05	0.52	0.11	< 0.05	< 0.05
Trichlorofluoromethane	µg/g	0.05	5.8	< 0.05	< 0.05	< 0.05
Vinyl Chloride	µg/g	0.02	0.022	< 0.02	< 0.02	< 0.02

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

QC SUMMARY

Conductivity

Method: EPA 6010/SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0203-DEC19	mS/cm	0.002	<0.002	0	10	99	90	110	NA		

Cyanide by SFA

Method: SM 4500 | Internal ref.: ME-CA-IENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Free Cyanide	SKA5038-DEC19	µg/g	0.05	<0.05	ND	20	89	80	120	88	75	125

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A | Internal ref.: ME-CA-IENVISKA-LAK-AN-012

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chromium VI	SKA5069-DEC19	ug/g	0.2	<0.2	NV	20	94	80	120	97	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/EPA 245 | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury	EMS0067-DEC19	µg/g	0.05	<0.05	ND	20	NV	80	120	103	70	130

Metals in aqueous samples - ICP-OES

Method: MOE 4696e01/EPA 6010 | Internal ref.: ME-CA-IENVISPE-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
SAR Calcium	ESG0038-DEC19	mg/L	0.09	-0.0058	2	20	102	80	120	101	70	130
SAR Magnesium	ESG0038-DEC19	mg/L	0.02	<0.02	ND	20	101	80	120	104	70	130
SAR Sodium	ESG0038-DEC19	mg/L	0.15	<0.15	ND	20	99	80	120	107	70	130

QC SUMMARY

Metals in Soil - Aqua-regia/ICP-MS

Method: EPA 3050/EPA 200.8 | Internal ref.: ME-CA-[ENV]SPE-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver	EMS0067-DEC19	ug/g	0.05	<0.05	8	20	102	70	130	100	70	130
Arsenic	EMS0067-DEC19	µg/g	0.5	<0.5	0	20	106	70	130	105	70	130
Barium	EMS0067-DEC19	ug/g	0.1	<0.1	2	20	102	70	130	98	70	130
Beryllium	EMS0067-DEC19	µg/g	0.02	<0.02	3	20	104	70	130	107	70	130
Boron	EMS0067-DEC19	µg/g	1	<1	3	20	105	70	130	108	70	130
Cadmium	EMS0067-DEC19	µg/g	0.02	<0.02	11	20	107	70	130	119	70	130
Cobalt	EMS0067-DEC19	µg/g	0.01	<0.01	7	20	107	70	130	115	70	130
Chromium	EMS0067-DEC19	µg/g	0.5	<0.5	4	20	109	70	130	113	70	130
Copper	EMS0067-DEC19	µg/g	0.1	<0.1	3	20	110	70	130	105	70	130
Molybdenum	EMS0067-DEC19	µg/g	0.1	<0.1	8	20	104	70	130	128	70	130
Nickel	EMS0067-DEC19	ug/g	0.5	<0.5	3	20	107	70	130	110	70	130
Lead	EMS0067-DEC19	ug/g	0.1	<0.1	2	20	107	70	130	102	70	130
Antimony	EMS0067-DEC19	µg/g	0.8	<0.8	ND	20	100	70	130	104	70	130
Selenium	EMS0067-DEC19	µg/g	0.7	<0.7	ND	20	105	70	130	106	70	130
Thallium	EMS0067-DEC19	µg/g	0.02	<0.02	8	20	106	70	130	115	70	130
Uranium	EMS0067-DEC19	µg/g	0.002	<0.002	3	20	104	70	130	100	70	130
Vanadium	EMS0067-DEC19	µg/g	3	<3	2	20	107	70	130	114	70	130
Zinc	EMS0067-DEC19	µg/g	0.7	<0.7	3	20	107	70	130	101	70	130

QC SUMMARY

Pesticides

Method: EPA 3541/8270D | Internal ref.: ME-CA-[ENVIGC-LAK-AN-018

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Heptachlor	GCM0131-DEC19	µg/g	0.01	< 0.01	ND	40	93	50	140	89	50	140
Aldrin	GCM0131-DEC19	µg/g	0.05	< 0.05	ND	40	92	50	140	90	50	140
alpha-Chlordane	GCM0131-DEC19	µg/g	0.02	< 0.02	ND	40	94	50	140	89	50	140
Dieldrin	GCM0131-DEC19	µg/g	0.05	< 0.05	ND	40	93	50	140	87	50	140
Endosulfan I	GCM0131-DEC19	µg/g	0.02	< 0.02	ND	40	93	50	140	89	50	140
Endosulfan II	GCM0131-DEC19	µg/g	0.02	< 0.02	ND	40	91	50	140	86	50	140
Endrin	GCM0131-DEC19	µg/g	0.04	< 0.04	ND	40	91	50	140	97	50	140
gamma-BHC	GCM0131-DEC19	µg/g	0.01	< 0.01	ND	40	96	50	140	89	50	140
gamma-Chlordane	GCM0131-DEC19	µg/g	0.02	< 0.02	ND	40	94	50	140	89	50	140
Heptachlor epoxide	GCM0131-DEC19	µg/g	0.01	< 0.01	ND	40	93	50	140	88	50	140
Hexachlorobenzene	GCM0131-DEC19	µg/g	0.01	< 0.01	ND	40	96	50	140	90	50	140
Hexachlorobutadiene	GCM0131-DEC19	µg/g	0.01	< 0.01	ND	40	97	50	140	87	50	140
Hexachloroethane	GCM0131-DEC19	µg/g	0.01	< 0.01	ND	40	95	50	140	85	50	140
Methoxychlor	GCM0131-DEC19	µg/g	0.05	< 0.05	ND	40	93	50	140	103	50	140
o,p-DDD	GCM0131-DEC19	µg/g	0.02	< 0.02	ND	40	90	50	140	89	50	140
o,p-DDE	GCM0131-DEC19	µg/g	0.02	< 0.02	ND	40	96	50	140	90	50	140
op-DDT	GCM0131-DEC19	µg/g	0.02	< 0.02	ND	40	91	50	140	88	50	140
pp-DDD	GCM0131-DEC19	µg/g	0.02	< 0.02	ND	40	83	50	140	87	50	140
pp-DDE	GCM0131-DEC19	µg/g	0.02	< 0.02	ND	40	96	50	140	91	50	140
pp-DDT	GCM0131-DEC19	µg/g	0.02	< 0.02	ND	40	95	50	140	96	50	140

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
F1 (C6-C10)	GCM0130-DEC19	µg/g	10	<10	ND	30	90	80	120	111	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
F2 (C10-C16)	GCM0133-DEC19	µg/g	10	<10	ND	30	102	80	120	106	60	140
F3 (C16-C34)	GCM0133-DEC19	µg/g	50	<50	ND	30	102	80	120	106	60	140
F4 (C34-C50)	GCM0133-DEC19	µg/g	50	<50	ND	30	102	80	120	106	60	140

QC SUMMARY

pH

Method: SM 4500 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	ARD0038-DEC19	pH Units	0.05		0	20	100	80	120			

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3541/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Fluoranthene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	92	50	140	91	50	140
Fluorene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	96	50	140	93	50	140
Indeno(1,2,3-cd)pyrene	GCM0154-DEC19	µg/g	0.1	< 0.1	ND	40	87	50	140	83	50	140
Naphthalene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	92	50	140	87	50	140
Phenanthrene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	94	50	140	91	50	140
Pyrene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	99	50	140	93	50	140
1-Methylnaphthalene	GCM0194-DEC19	µg/g	0.05	< 0.05	ND	40	86	50	140	88	50	140
2-Methylnaphthalene	GCM0194-DEC19	µg/g	0.05	< 0.05	ND	40	86	50	140	86	50	140
Acenaphthene	GCM0194-DEC19	µg/g	0.05	< 0.05	ND	40	90	50	140	90	50	140
Acenaphthylene	GCM0194-DEC19	µg/g	0.05	< 0.05	ND	40	86	50	140	88	50	140
Anthracene	GCM0194-DEC19	µg/g	0.05	< 0.05	ND	40	92	50	140	88	50	140
Benzo(a)anthracene	GCM0194-DEC19	µg/g	0.05	< 0.05	13	40	89	50	140	89	50	140
Benzo(a)pyrene	GCM0194-DEC19	µg/g	0.05	< 0.05	19	40	79	50	140	83	50	140
Benzo(b+j)fluoranthene	GCM0194-DEC19	µg/g	0.05	< 0.05	19	40	84	50	140	87	50	140
Benzo(ghi)perylene	GCM0194-DEC19	µg/g	0.1	< 0.1	ND	40	87	50	140	95	50	140
Benzo(k)fluoranthene	GCM0194-DEC19	µg/g	0.05	< 0.05	ND	40	89	50	140	91	50	140
Chrysene	GCM0194-DEC19	µg/g	0.05	< 0.05	16	40	89	50	140	87	50	140
Dibenzo(a,h)anthracene	GCM0194-DEC19	µg/g	0.06	< 0.06	ND	40	86	50	140	92	50	140
Fluoranthene	GCM0194-DEC19	µg/g	0.05	< 0.05	14	40	96	50	140	89	50	140
Fluorene	GCM0194-DEC19	µg/g	0.05	< 0.05	ND	40	94	50	140	90	50	140

QC SUMMARY

Semi-Volatile Organics (continued)

Method: EPA 3541/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Indeno(1,2,3-cd)pyrene	GCM0194-DEC19	µg/g	0.1	< 0.1	ND	40	85	50	140	92	50	140
Naphthalene	GCM0194-DEC19	µg/g	0.05	< 0.05	ND	40	86	50	140	90	50	140
Phenanthrene	GCM0194-DEC19	µg/g	0.05	< 0.05	26	40	92	50	140	87	50	140
Pyrene	GCM0194-DEC19	µg/g	0.05	< 0.05	16	40	90	50	140	87	50	140
1-Methylnaphthalene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	90	50	140	85	50	140
2-Methylnaphthalene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	85	50	140	80	50	140
Acenaphthene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	96	50	140	93	50	140
Acenaphthylene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	89	50	140	89	50	140
Anthracene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	92	50	140	89	50	140
Benzo(a)anthracene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	93	50	140	90	50	140
Benzo(a)pyrene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	87	50	140	83	50	140
Benzo(b+j)fluoranthene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	92	50	140	82	50	140
Benzo(ghi)perylene	GCM0154-DEC19	µg/g	0.1	< 0.1	ND	40	89	50	140	84	50	140
Benzo(k)fluoranthene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	87	50	140	88	50	140
Chrysene	GCM0154-DEC19	µg/g	0.05	< 0.05	ND	40	94	50	140	86	50	140
Dibenzo(a,h)anthracene	GCM0154-DEC19	µg/g	0.06	< 0.06	ND	40	87	50	140	84	50	140

QC SUMMARY

Volatile Organics

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,1,2-Tetrachloroethane	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	88	60	130	88	50	140
1,1,1-Trichloroethane	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	82	60	130	86	50	140
1,1,2,2-Tetrachloroethane	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	83	60	130	72	50	140
1,1,2-Trichloroethane	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	83	60	130	74	50	140
1,1-Dichloroethane	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	82	60	130	85	50	140
1,1-Dichloroethylene	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	75	60	130	73	50	140
1,2-Dichlorobenzene	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	88	60	130	79	50	140
1,2-Dichloroethane	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	83	60	130	75	50	140
1,2-Dichloropropane	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	86	60	130	86	50	140
1,3-Dichlorobenzene	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	89	60	130	83	50	140
1,4-Dichlorobenzene	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	88	60	130	81	50	140
Acetone	GCM0129-DEC19	µg/g	0.5	< 0.5	ND	50	70	50	140	59	50	140
Benzene	GCM0129-DEC19	µg/g	0.02	< 0.02	ND	50	87	60	130	86	50	140
Bromodichloromethane	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	87	60	130	88	50	140
Bromoform	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	82	60	130	79	50	140
Bromomethane	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	105	50	140	79	50	140
Carbon tetrachloride	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	87	60	130	88	50	140
Chlorobenzene	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	89	60	130	88	50	140
Chloroform	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	88	60	130	86	50	140
cis-1,2-Dichloroethylene	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	86	60	130	86	50	140

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-[ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
cis-1,3-dichloropropene	GCM0129-DEC19	µg/g	0.03	< 0.03	ND	50	87	60	130	88	50	140
Dibromochloromethane	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	84	60	130	79	50	140
Dichlorodifluoromethane	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	70	50	140	59	50	140
Ethylbenzene	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	91	60	130	95	50	140
Ethylenedibromide	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	85	60	130	75	50	140
n-Hexane	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	90	60	130	79	50	140
m/p-xylene	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	91	60	130	93	50	140
Methyl ethyl ketone	GCM0129-DEC19	µg/g	0.5	< 0.5	ND	50	75	50	140	70	50	140
Methyl isobutyl ketone	GCM0129-DEC19	µg/g	0.5	< 0.5	ND	50	80	50	140	72	50	140
Methyl-t-butyl Ether	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	86	60	130	82	50	140
Methylene Chloride	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	82	60	130	81	50	140
o-xylene	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	91	60	130	92	50	140
Styrene	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	90	60	130	89	50	140
Tetrachloroethylene	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	90	60	130	85	50	140
Toluene	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	89	60	130	88	50	140
trans-1,2-Dichloroethylene	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	80	60	130	85	50	140
trans-1,3-dichloropropene	GCM0129-DEC19	µg/g	0.03	< 0.03	ND	50	85	60	130	83	50	140
Trichloroethylene	GCM0129-DEC19	µg/g	0.05	< 0.05	3	50	88	60	130	89	50	140
Trichlorofluoromethane	GCM0129-DEC19	µg/g	0.05	< 0.05	ND	50	87	50	140	75	50	140
Vinyl Chloride	GCM0129-DEC19	µg/g	0.02	< 0.02	ND	50	73	50	140	71	50	140

QC SUMMARY

Water Soluble Boron

Method: O.Reg. 153/04 | Internal ref.: ME-CA-IENVI SPE-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Water Soluble Boron	ESG0028-DEC19	µg/g	0.5	<0.5	7	20	98	80	120	90	70	130

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.
RL Reporting Limit.
↑ Reporting limit raised.
↓ Reporting limit lowered.
NA The sample was not analysed for this analyte
ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

This report must not be reproduced, except in full. This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

No: 012376

Page 1 of 1

SGS Environment, Health & Safety - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

Laboratory Information Section - Lab use only

By: Oleg Mozhin
Date: 12/10/19 (mm/dd/yy)
Time: 12:20 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ice
Temperature Upon Receipt (°C) 7.7.7
LAB LIMS #: CA14331-DEC19

REPORT INFORMATION

y: DS Consultants
Drew Dodk
:16 - 6221 Hwy 7
ngLa ON
905 - 264 - 9383
drew.dodk@dsconsultants.ca

INVOICE INFORMATION

☐ (same as Report Information)
Company:
Contact: Accounting
Address:
Phone:
Email:

Quotation #:
Project #: 19-199-101
P.O. #:
Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☑ Regular TAT (5-7days)

TAT's are quoted in business days (exclude statutory holidays & weekends).
Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

tion 153/04:
le 1 ☑ Res/Park Soil Texture: ☑ Coarse
le 2 ☐ Ind/Com ☐ Medium
le 3 ☐ Agri/Other ☐ Fine
ole ____

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA

Sewer By-Law:
☐ Sanitary
☐ Storm
Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN, Hg pH,(B(HWS),EC,SAR–soil) (Cl, Na–water)	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only), Hg, CrVI	M&I: ICP Metals only (Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni, Se,Ag,Tl,U,V,Zn	SVOC: PAHs only	SVOC: SVOCs (all incl PAHs, ABNs, CPs	PCB: PCBs Total ☐ Aroclor ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only (no BTEX	VOC: VOCs (all incl BTEX	VOC: BTEX only	Pest: Pesticides (Organochlorine or specify other	Other (please specify)	Other (please specify)	Other (please specify)	Other (please specify)	Other (please specify)	Other (please specify)	Other (please specify)	Sewer Use: (Specify pkg:)	Water Characterization Pkg ☐ (General / Extended)	TCLP (Specify TCLP tests ☐M&I ☐VOC ☐PCB ☐B(a)P ☐ABN ☐Ignit.)	COMMENTS:
BH19-1-S1	26/12/19	4pm	2	Soil		X										X										
BH19-1-S2			1						X																	
BH19-1-S3			3									X		X												
BH19-2-S1			2			X										X										
DUP1			1			X																				
BH19-2-S2			1						X																	
BH19-2-S4			3									X		X												
BH19-3-S1	27/12/19		1													X										
BH19-3-S2	27/12/19	↓	5	↓		X			X			X		X												

Observations/Comments/Special Instructions

Sampled By (NAME): Drew Dodk
Signature:
Date: 12/6/19 (mm/dd/yy)

Relinquished by (NAME): Drew Dodk
Signature:
Date: 12/10/19 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.





FINAL REPORT

CA14345-APR20 R1

19-199-101

Prepared for

DS Consultants

FINAL REPORT

First Page

CLIENT DETAILS

Client	DS Consultants
Address	6221 Highway 7 Vaughan, Ontario L4H 0K8. Canada
Contact	Drew Doak
Telephone	905-264-9393
Facsimile	905-264-2685
Email	drew.doak@dsconsultants.ca
Project	19-199-101
Order Number	
Samples	Soil (1)

LABORATORY DETAILS

Project Specialist	Brad Moore Hon. B.Sc
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2143
Facsimile	705-652-6365
Email	brad.moore@sgs.com
SGS Reference	CA14345-APR20
Received	04/14/2020
Approved	04/17/2020
Report Number	CA14345-APR20 R1
Date Reported	05/25/2020

COMMENTS

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:NA

SIGNATORIES

Brad Moore Hon. B.Sc

TABLE OF CONTENTS

First Page..... 1
Index..... 2
Results..... 3
Exceedance Summary..... 4
QC Summary..... 5
Legend..... 6
Annexes..... 7

Client: DS Consultants
Project: 19-199-101
Project Manager: Drew Doak
Samplers: Sarth Sheth

PACKAGE: **REG153 - Metals and Inorganics** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

Sample Number	8
Sample Name	Area C GS1
Sample Matrix	Soil
Sample Date	14/04/2020

Parameter	Units	RL	L1	Result
Metals and Inorganics				
Moisture Content	%	-		20.9

PACKAGE: **REG153 - PCBs** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Residential/Parkland - UNDEFINED

Sample Number	8
Sample Name	Area C GS1
Sample Matrix	Soil
Sample Date	14/04/2020

Parameter	Units	RL	L1	Result
PCBs				
Polychlorinated Biphenyls (PCBs) - Total	µg/g	0.3	0.35	< 0.3

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

QC SUMMARY

Polychlorinated Biphenyls

Method: EPA 3570/8082A/8270C | Internal ref.: ME-CA-[ENV]GC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0179-APR20	µg/g	0.3	< 0.3	ND	40	96	60	140	94	60	140

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.
RL Reporting Limit.
↑ Reporting limit raised.
↓ Reporting limit lowered.
NA The sample was not analysed for this analyte
ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

This report must not be reproduced, except in full. This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No:

Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Caylin Graham
Received Date: 04/14/20 (mm/dd/yy)
Received Time: 09:00 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☐ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ice
Temperature Upon Receipt (°C) 9 , 9 , 9
LAB LIMS #: CA14345-Ap20

REPORT INFORMATION	INVOICE INFORMATION
Company: DS Consultants	☐ (same as Report Information)
Contact: Drew Doak	Company:
Address: Highway 27, Unit 16, Vaughan ON	Contact: Accounting
Phone: 905-264-9393	Address:
Fax:	Phone:
Email: drew.doak@dsconsultants.ca	Email:

Quotation #: P.O. #:
Project #: 19-199-101 Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☑ Regular TAT (5-7days) — TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

Regulation 153/04: ☐ Table 1 ☑ Res/Park ☐ Table 2 ☐ Ind/Com ☑ Table 3 ☐ Agri/Other ☐ Table ____ — Soil Texture: ☐ Coarse ☐ Medium ☐ Fine

Other Regulations: ☐ Reg 347/558 (3 Day min TAT) ☐ PWQO ☐ MMER ☐ CCME ☐ Other: ☐ MISA

Sewer By-Law: ☐ Sanitary ☐ Storm Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	Area C GS1	April 14, 2020	11 AM	1	Soil
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

	M & I				SVOC		PCB	PHC		VOC		Pest	Other (please specify)							TCLP	
	Field Filtered (Y/N)	Metals & Inorganics incl CrVI, CN, Hg pH, (B(HWS),EC,SAR-soil) (Cl, Na-water)	Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni, Se,Ag,Tl,U,V,Zn	PAHs only	SVOCs all incl PAHs, ABNs, CPs	PCBs Total ☐ Aroclor ☐	F1-F4 + BTEX	F1-F4 only no BTEX	VOCs all incl BTEX	BTEX only	Pesticides Organochlorine or specify other						Sewer Use: Specify pkg:	Water Characterization Pkg General ☐ Extended ☐	Specify TCLP tests ☐M&I ☐VOC ☐PCB ☐B(a)P ☐ABN ☐gnit.	COMMENTS:
1							✓														

Observations/Comments/Special Instructions

Sampled By (NAME):	Sarth Sheth	Signature:	Date: 04 / 14 / 20 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME):	Drew Doak	Signature: Drew Doak Digitally signed by Drew Doak Date: 2020.04.15 09:15:34 -04'00'	Date: 04 / 15 / 20 (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.2
Date of Issue: 09 Sept, 2019

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. (2) Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). (3) Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Appendix E

Phase Two Conceptual Site Model

This Phase Two Conceptual Site Model (CSM) has been prepared for a portion of the Millcroft Golf Club, designated "Block C" located at 2155 Country Club Drive in Burlington, Ontario. This Phase Two CSM has developed through a synthesis of the information obtained through the completion of the Phase One ESA, and the data collected as part of the Phase Two ESA.

The Phase Two CSM is comprised of the following figures and text:

Figure 1 – Site Location Plan
Figure 2 – Phase Two Property Site Plan
Figure 3 – Phase Two Property Study Area
Figure 4 – PCA within Phase Two Property Study Area
Figure 5 – Borehole Location Plan with APECs
Figure 6 – Groundwater Elevation Contours and Flow Direction (Overburden)
Figure 7A – Soil Characterization – Metals and Inorganics
Figure 7B – Soil Characterization –PHCs
Figure 7C – Soil Characterization – VOCs
Figure 7D – Soil Characterization –PAHs
Figure 7E – Soil Characterization –OCPs
Figure 7F – Soil Characterization – PCBs
Figure 8 - Exposure Pathways and Receptors

The Phase Two Property is a 1.4-hectare (3.46 acres) parcel of land comprising a portion of the first hole of the golf course. The Property was first developed for agricultural purposes from the late 1800s, in l 1987 the Site developed to operate as the 1st hole of Millcroft Golf Club. The Phase Two Property has been operated as part of the golf course since.

A total of three (3) Potentially Contaminating Activities (PCAs) were identified in the Phase One ESA, which were considered to be contributing to three (3) APECs on the Phase Two Property.

DS completed the Phase Two ESA drilling activities in November 20219, and the sampling fieldwork in December 2019, and April 2020. The investigation included the advancement of three (3) boreholes up to 6.1 mbgs and one (1) grab sample up to 0.3 mbgs, and the collection of soil samples that were submitted for chemical analysis of Metals and ORPs, Petroleum Hydrocarbons (PHCs), Volatile Organic Compounds (VOCs), Organochlorine Pesticides (OCPs) and Polychlorinated Biphenyls (PCBs).

The results of the Phase Two ESA soil analysis indicated that all samples meet the Table 3 RPI SCS for all parameters analysed.

I. Description and Assessment of:

A. Areas where potentially contaminating activity has occurred

A total of three (3) PCAs were identified in the Phase One ESA. A summary of the PCAs considered to be contributing to APECs on the Phase Two Property is provided in the table below.

PCA Item.	PCA Description (Per. Table 2, Schedule D of O.Reg. 153/04)	Description	Rationale
PCA-2	#30: Importation of Fill Material of Unknown Quality	Fill material is inferred to have been imported for grading purposes in the past. The Phase One Property started development around 1987 for what is now Millcroft Golf Club - Hole 1.	PCA is located in the Phase One Property
PCA-4	#55: Transformer Manufacturing, Processing and Use	One transformer was observed on the southwest corner of the Property.	PCA is located in the Phase One Property
PCA-5	#40: Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Pesticides are used on the grass that cover the Phase One Property.	PCA is located in the Phase One Property

N/S - not specified in Table 2, Schedule D, of O.Reg. 153/04

B. Areas of potential environmental concern

A total of three (3) APECs were identified to be present on the Phase Two Property through the completion of the Phase One ESA. A summary of the APECs identified, and the associated COPCs is provided in the table below.

Area of Potential Environmental Concern	Location of APECs on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC-1	Entire Property	PCA-2 (#30): Importation of Fill Material of Unknown Quality	On Site	PHCs, VOCs, BTEX, Metals, As, Sb, Se, B-HWS, CN-, EC, Cr (VI), Hg, low	Soil

Area of Potential Environmental Concern	Location of APECs on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Ground water, soil and/or sediment)
				or high pH, SAR, PAHs	
APEC-2	Southwest portion of the Property	PCA-4 (#55): Transformer Manufacturing, Processing and Use	On Site	PCBs	Soil
APEC-3	Entire Property	PCA-5 (#40): Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	On Site	OCPs	Soil

C. <u>Any subsurface structures and utilities on, in or under the Phase Two Property that may affect contaminant distribution and transport</u>

The groundwater table was encountered at depths ranging from 1.4 to 4.5 mbgs on the Phase Two Property. Public and private locates were performed in the Property a gas main was identified at 6.2 mbgs, across the Property. However, no groundwater impacts were identified, therefore the potential for preferential migration of contaminants is not of concern at this time.

II. Description of, and as appropriate, figures illustrating, the physical setting of the Phase Two Property and any areas under it including:

A. <u>Stratigraphy from ground surface to the deepest aquifer or aquitard investigated</u>

A layer of surficial topsoil of 150 to 180 mm thickness was encounter in all of the boreholes advanced. Fill material consisting of clayey silt to silty clay, trace rootlets was found below the topsoil to depths ranging from 0.8 to 2.6 mbgs. The fill was underlain by clayey silt till extending to depths ranging from 2.3 to 3.4 mbgs. A Sandy silt till deposit was encountered in BH19-2 below the clayey silt till layer, extending to a depth of 6.1 mbgs. Shale bedrock of Queenston Formation was encountered at depths ranging from 3.3 to 6.1 mbgs;

Table Error! No text of specified style in document.**-1: Summary of Geologic Units Investigated**

Geologic Unit	Inferred Thickness (m)	Top Elevation (masl)	Bottom Elevation (masl)	Properties
Fill material: Clayey Silt	1.0 - 2.6	145.8	142.8	Moist, very stiff, 20% - 25 % moisture content (MC)
Clayey Silt Till	2.3 - 3.5	143.9	139.3	Trace gravel, moist, very stiff to hard, shale fragments, 10%-15% MC, contains groundwater table
Shale Bedrock	>3.0	141.7-	Unknown	Weathered, red to brown, contains groundwater table

The clayey silt till layer and the weathered shale were identified as a water bearing formation and it is considered an unconfined aquifer. The borehole locations are depicted on Figure 5. A visual representation of the stratigraphy investigated is presented on the cross-sections provided in Appendix C.

B. Hydrogeological Characteristics, including aquifers, aquitards and, in each hydrostratigraphic unit where one or more contaminants is present at concentrations above the applicable site condition standards, lateral and vertical gradients

The groundwater table was encountered in a clayey silt till layer and the weathered shale units which are considered to be an unconfined.

Based on the groundwater elevations, the groundwater flow direction is interpreted to be easterly direction towards Appleby Creek.

The horizontal hydraulic gradient was calculated based on the groundwater levels recorded on December 4, 2019.

Hydrogeological Unit	Calculated Horizontal Hydraulic Gradient
Shallow Aquifer	Min: 0.0356 Max: 0.0401 Average: 0.0378

C. Depth to bedrock

Bedrock was encounter at depths ranging from 3.3 to 6.2 mbgs.

D. Approximate depth to water table

The depth to groundwater was found to be 1.4 to 4.5 mbgs on December 4, 2019.

E. Any respect in which section 41 or 43.1 of the regulation applies to the property

The pH values measured were within the acceptable limits for non-sensitive sites. There are no areas of natural significance on the Phase Two Property, or within 30 m of the Phase Two Property. As such the Phase Two Property is not considered to be environmentally sensitive as defined by Section 41 or 43.1.

F. Areas where soil has been brought from another property and placed on, in or under the Phase Two Property

According to observed aerial photographs, fill material may have been imported circa 1987 for landscaping and grading purposes as part of the Millcroft Golf Club development. The ground surface on the Phase One Property was observed to be undulating, suggesting placement of fill material.

G. Approximate locations, if known, of any proposed buildings and other structures

It is our understanding that redevelopment of the Site for residential purposes has been proposed, and that the development will feature sixteen (16) single detached residential units.

III. Where a contaminant is present on, in or under the Phase Two Property at a concentration greater than the applicable site condition standard, identification of

A. Each area where a contaminant is present on, in or under the Phase Two Property at a concentration greater than the applicable SCS

No impacts were encounter in the soil investigated. All samples met Table 3 RPI SCS.

B. The contaminants associated with each of the areas

No impacts were encounter in the soil investigated.

C. Medium that contaminants were identified in

No contaminants were identified at concentrations greater than the applicable SCS in soil.

D. Description and assessment of what is know about each of the areas

No impacts were encounter in the areas where COPCs were a potential for contamination.

E. Distribution in which the areas of each contaminant is present in the area at a concentration greater than the applicable SCS, for each medium in which the contaminant is present, together with figures showing the distribution

No impacts were encounter in the soil investigated.

F. Anything known about the reason for the discharge of the contaminants present on, in or under the Phase Two Property at a concentration greater than the applicable SCS

No discharge of contaminants was present on, in or under the Phase Two Property. No impacts were encounter in the soil investigated. All samples met Table 3 RPI SCS.

G. Anything known about migration of the contaminants present on, in or under the phase two property at a concentration greater than the applicable SCS away from any area of potential environmental concern, including the identification of any preferential pathways

All of the soil samples analysed met the applicable Site Condition Standards. There is no indication of contaminant migration on the Property.

H. Climatic or meteorological conditions that may have influenced distribution and migration of the contaminants, such as temporal fluctuations in groundwater levels

The groundwater levels may be impacted by other factors such as historical infilling activities, subsurface utility trenches, and similar subsurface anomalies. The groundwater flow direction can only be confirmed through long term monitoring.

The Phase Two Property is primarily covered by grass. Impacted soils were not identified on the property, therefore meteorological conditions resulting in temporal fluctuations in

groundwater levels are not considered to be of concern at this time with respect to contaminant migration.

I. Information concerning soil vapour intrusion of the contaminants into buildings

No volatile parameters were identified at concentrations greater than the applicable SCS, therefore vapour intrusion is not considered to be an exposure pathway at this time.

IV. Where contaminants on, in or under the Phase Two Property are present at concentrations greater than the applicable SCS, one or more cross-sections showing

A. The lateral and vertical distribution of a contaminant in each area where the contaminants are present at concentrations greater than the applicable SCS in soil, groundwater and sediment

B. Approximate depth to water table

C. Stratigraphy from ground surface to the deepest aquifer or aquitard investigated

D. Any subsurface structures and utilities that may affect contaminants distribution and transport

There are no contaminants present on, in or under the Phase Two Property exceeding the SCS in the soil.

V. For each area where a contaminant is present on, in or under the property at a concentration greater than the applicable SCS for the contaminant, a diagram identifying, with narrative explanatory notes

A. The release mechanisms

B. Contaminant transport pathway

C. The human and ecological receptors located on, in or under the phase two property

D. Receptor exposure points

E. Routes of exposure

There were no contaminants identified to exceed the Table 3 RPI SCS for the Phase Two Property. The route exposure is depicted in Figure 8.

VI. If a non-standard delineation was conducted in accordance with section 7.1 of this Schedule as part of preparing the phase two environmental site assessment report, provide a narrative description of how the non-standard delineation satisfies the requirements in that section.

There were no contaminants identified to exceed the Table 3 RPI SCS for the Phase Two Property in the soil.

I. If a non-standard delineation was conducted in accordance with section 7.1 of this Schedule as part of preparing the phase two environmental site assessment report, provide a narrative description of how the non-standard delineation satisfies the requirements in that section.

Not applicable.

II. If the exemption set out in paragraph 1, 1.1 or 2 of section 49.1 of the regulation is being relied upon, provide a statement as to the reliance upon the exemption and a narrative description of the rationale for relying upon the exemption, which may be based on information gathered during the site investigation.

Not applicable.

III. If the exemption set out in paragraph 3 of section 49.1 of the regulation is being relied upon, provide:
i. a statement as to the reliance upon the exemption,
ii. a narrative description of the rationale for relying upon the exemption, which may be based on information gathered during the site investigation, and
iii. one or more cross-sections and one or more figures in plan view of the phase two property that demonstrate, through identification of sample locations, sample depths and contaminant concentrations, the distribution of the contaminant in question laterally and vertically and the range of concentrations of that contaminant on, in or under the phase two property.

Not applicable.

Appendix F

Planning & Public Works
Tel: 905-825-6000 Fax: 905-825-8822
Toll Free: 1-866-4HALTON (1-866-442-5866)
www.halton.ca

Environmental Site-Screening Questionnaire

Legal/Municipal Address 2155 Country Club Drive, "Block C", Burlington, Ontario (PIN 0718-2700) **Applicant:** Millcroft Greens Corporation

1.	Was the subject property ever used for industrial purposes?	yes	(no)	uncertain
2.	Was the subject property ever used for commercial purposes that may have caused contamination (e.g. gasoline station, dry cleaners, etc.)	yes	(no)	uncertain
3.	Has fill ever been placed on the property?	(yes)	no	uncertain
4.	Is there any reason to believe that the subject property is potentially contaminated based on historic use of the property or a neighbouring lot located within 100m of the property?	yes	(no)	uncertain
5.	Are there or were there ever any above-ground or underground storage tanks or waste disposal activities on the property?	yes	(no)	uncertain
6.	For existing or previous buildings on the property, are there building materials that may be potentially hazardous to human health (i.e. asbestos, lead-based paints, etc.)?	yes	(no)	uncertain
7.	For agricultural properties, were pesticides or herbicides ever applied to the property?	(yes)	no	uncertain
8.	Have any of the buildings on the property been heated by fuel oil?	yes	(no)	uncertain
9.	Is the land use changing to a more sensitive land use (e.g. industrial/ commercial to residential/institutional)? Note: Daycare uses are defined in O.Reg.153/04 as institutional.	(yes)	no	uncertain

General Information:

1.	Have any environmental documents (e.g. Phase I and II Environmental Site Assessments, Records of Site Condition, etc) ever been prepared for the property? If yes, please submit these documents in digital and hardcopy format with your application together with a letter of reliance granting third party reliance on the documents to the Region of Halton.	(yes)	no

Certification

I, _____ am the registered owner of the land that is the subject of this document and to the best of my knowledge, the information provided in this questionnaire is true.

Sworn (or declared) and stamped before me _____
Commissioner of Oaths (Print Name)

in the _____ , this _____ day of _____ 20____
City/Town/Municipality Day Month Year

_____ _____
Commissioner of Oaths (Signature) Registered Owner (Signature)

Regional File #: _____ Local Municipal File #: _____