



Phase II Environmental Site Assessment - 219 Pefferlaw Road, Pefferlaw, Ontario

May 19, 2022

Prepared for:
DM Wills Associates

In Association With:
The Town of Georgina

Cambium Reference: 14324-003

CAMBIUM INC.

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Executive Summary

DM Wills Associates retained Cambium Inc. (Cambium) to complete a Phase II Environmental Site Assessment (ESA) at 219 Pepperlaw Road in Pepperlaw, Ontario. The Site occupies the eastern and western shoreline of the Pepperlaw River, south of Pepperlaw Road. The Site includes a walking trail and parkland, and the Pepperlaw Dam, originally constructed in approximately 1828. Reportedly, the dam was constructed to supply water to power a sawmill, gristmill, and woollen mill which began operation in 1832.

Cambium completed a Phase I ESA for the Site (Cambium, 2022), which identified on-site environmental concerns related to the importation of fill material of unknown quality, and former on-site buildings that may be associated with former foundry operations.

A Phase II ESA work program was developed to investigate contaminants of potential concern: volatile organic compounds, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, and metals in soil and groundwater.

The Phase II ESA included the advancement four boreholes, three of which were completed as groundwater monitoring wells. Seven soil samples and three groundwater samples were submitted for laboratory analysis of the contaminants of potential concern.

Based on the results of the Phase II Environmental Site Assessment, contaminants are present at the Site in groundwater at concentrations greater than the applicable regulatory standards; therefore, Cambium recommends the completion of additional investigation at the Site to further assess the identified exceedances.



Table of Contents

1.0	Introduction.....	1
1.1	Previous Environmental Investigations.....	1
1.2	Scope of Work.....	1
2.0	Site Description	2
2.1	Applicable Site Condition Standards	2
3.0	Methodology	4
3.1	Soil Sampling	4
3.2	Monitoring Well Installation.....	5
3.3	Groundwater Sampling.....	6
3.4	Laboratory Testing and Analysis	6
4.0	Results.....	8
4.1	Stratigraphy	8
4.2	Water levels and Flow Direction	8
4.3	Soil Quality	8
4.4	Groundwater Quality	8
4.5	Quality Assurance / Quality Control.....	9
5.0	Discussion and Conclusions	10
6.0	Qualifications of the Assessor.....	11
7.0	References	12
8.0	Standard Limitations.....	13



List of Embedded Tables

Embedded Table 1 – Groundwater Table 1 SCS Exceedances.....	9
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List of Appended Figures

Figure 1	Site Location Map
Figure 2	Site Plan
Figure 3	Soil Results
Figure 4	Groundwater Results

List of Appended Tables

Table 1	Soil Quality – PHCs & VOCs
Table 2	Soil Quality – PAHs
Table 3	Soil Quality – Metals & Inorganics
Table 4	Groundwater Quality – PHC & VOCs
Table 5	Groundwater Quality – PAHs
Table 6	Groundwater Quality – Metals

List of Appendices

Appendix A	Site Photographs
Appendix B	Borehole Logs
Appendix C	Laboratory Certificates of Analysis
Appendix D	Curriculum Vitae



1.0 Introduction

On behalf of the Town of Pepperlaw, DM Wills Associated retained Cambium to complete a Phase II ESA at 219 Pepperlaw Road in Pepperlaw, Ontario. The Phase II ESA was completed consistent with the *Canadian Standards Association (CSA) Standard Z769-00* (CSA, 2013), with reference to Ontario Regulation (O.Reg.) 153/04.

1.1 Previous Environmental Investigations

A Phase I ESA (Cambium, 2022) identified the following on-site environmental concerns.

- Importation of fill material of unknown quality and origin at the Site. The fill is expected to be associated with general lot grading and the construction of the on-site dam.
- Former on-site buildings that may be associated with former foundry operations. The buildings are depicted in the 1927, 1959, and 1978 aerial photographs.

1.2 Scope of Work

Cambium conducted the following activities as part of the Phase II ESA.

- Review of previous environmental reports to determine contaminants of potential concern (COPCs) and areas of potential environmental concern.
- Obtained public and private locates for identification of buried services and utilities via Ontario One Call and a private locate company.
- Developed a site-specific Health and Safety Plan (HASP) prior to commencement of the fieldwork.
- Arranged for a Ministry of the Environment, Conservation and Parks (Ministry) licensed driller to advance four boreholes and install three monitoring wells on the Site.
- Arranged for a Canadian Association of Laboratory Accreditation Inc. (CALA) accredited laboratory to supply Cambium with appropriate sample containers for the proposed soil and



groundwater testing program and to undertake analytical services in accordance with standard operating protocols (MOE, 2011a).

2.0 Site Description

The Site is at 219 Pepperlaw Road in Pepperlaw, Ontario and consists of a 0.66 ha irregular land parcel. The Universal Transverse Mercator (UTM) coordinates for the centre of the Site are Zone 17T, 643,752 m east, 4,908,327 m north. The Site location is shown on Figure 1.

The Site occupies the eastern and western shoreline of the Pepperlaw River, south of Pepperlaw Road, and includes a walking trail and parkland, and the Pepperlaw Dam, originally constructed in approximately 1828. Reportedly, the dam was constructed to supply water to power a sawmill, gristmill, and woollen mill which began operation in 1832.

The Site is bound by Pepperlaw Road to the north, residential properties to the east and west, and the south side of the Site fronts onto the Pepperlaw River.

The Site slopes down towards the Pepperlaw River, which bisects the central portion of the Site from the south to the north, and flows from the south to the north. Regionally, surface elevation decreases to the north toward Lake Simcoe, roughly 3,350 m north of the Site. Based on the location of the nearest water bodies and regional topographic relief, the inferred groundwater flow direction is northerly. Photographs of the Site are included in Appendix A.

2.1 Applicable Site Condition Standards

The following site characteristics were reviewed to determine the applicable site condition standards (SCS) in the *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* (MOE, 2011b).

- The Site is a community/parkland property in the Town of Pepperlaw.
- The Site has no potable water supply. Surrounding properties rely on dug and drilled wells for their potable water supply.



- The Site is within an area of natural significance. As such, the Site is environmentally sensitive as per Section 41 of O.Reg. 153/04.
- Laboratory results indicated soil pH for surface and subsurface soil was within the acceptable ranges of 5 to 9 and 5 to 11, respectively.
- The average overburden thickness was greater than 2 m based on observations made during the subsurface investigation; as such, Section 43.1(a) of O.Reg. 153/04 does not apply.
- The Site is within 30 m of a water body as defined in O.Reg. 153/04; as such, Section 43.1(b) of O.Reg. 153/04 applies.

Based on the review of site characteristics, the Table 1 full depth background SCS for residential/parkland/institutional/industrial/commercial/community property use, are applicable.



3.0 Methodology

The following sections provide a detailed description of the investigations completed and methodologies used to conduct the Phase II ESA. The aspects of environmental concern for the Site were identified based on review of the historical and current operations at the Site and surrounding properties as described in Section 1.0.

The COPCs related to these environmental concerns are petroleum hydrocarbon fractions 1 to 4 (PHC F1-F4), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and metals.

3.1 Soil Sampling

Prior to commencing the drilling program, Cambium arranged for underground services to be located and marked for public and private utilities. Landshark Locates attended the Site on March 21, 2022, to provide clearance for buried services at the proposed drilling locations. The drilling locations were clear of utilities.

On March 21, 2022, Landshark Drilling advanced two boreholes (BH101 and BH102) to a maximum depth of 6.09 m below ground surface (mbgs) using a Mobile Drill D-50 drilling rig equipped with 15 cm (6 in) outside diameter hollow-stem augers and split-spoon sampling.

On April 4, 2022, Strata Drilling Group advanced two boreholes (BH201 and BH202) to a maximum depth of 3.96 m mbgs using a track-mounted Geoprobe 6712DT drilling rig equipped with 15 cm (6 in) outside diameter hollow-stem augers and dual tube sampling equipment with macro-core liners.

Boreholes were advanced at the following locations (Figure 2). Borehole logs are provided in Appendix B.

- Borehole BH101, on the west shoreline; investigating the import of fill of unknown quality
- Borehole BH102, on the east shoreline; investigating the import of fill of unknown quality
- Borehole BH201, on the east shoreline within the footprint of a former on-site building; investigating concerns related to possible former industrial operations

- Borehole BH202, on the east shoreline within the footprint of a former on-site building; investigating concerns related to possible former industrial operations

Samples were collected consistent with accepted industry practices and regulatory guidance. During the soil investigation program, 0.61 m soil samples were collected every 0.76 m or continuously in 0.61 to 1.5 m sections. Each sample was handled solely by the field technician using dedicated nitrile gloves to reduce the potential for cross-contamination. Gloves were replaced after collection of each sample. Samples to be submitted for analysis of VOCs and/or PHC F1 were collected using a pre-calibrated syringe sampler and methanol preserved vials.

Olfactory and visual observations of the soil samples were documented immediately upon extraction for soil characteristics and potential indicators of environmental contamination. The samples, which were placed in plastic sample bags and sealed, were used to determine if volatile and/or organic contaminants were present in the sample headspace. An RKI Eagle 2 portable gas detector was used to screen the soil samples for concentrations of combustible soil vapour (CSV) and organic vapour (OV). The RKI was calibrated to hexane and isobutylene standards. After agitating the sample, the peak concentration was recorded by inserting the RKI probe into the sample bag. Refer to the borehole logs in Appendix B for the measured vapour concentrations.

Soil samples were selected for laboratory analysis based on the soil screening results, visual and olfactory observation, and location of the sample with respect to an environmental concern. Soil samples from four boreholes were submitted to the laboratory for analysis. The soil analysis results are discussed in Section 4.3.

3.2 Monitoring Well Installation

Boreholes BH101, BH102, and BH201 were instrumented with groundwater monitoring wells in accordance with Ontario Regulation 903 - Wells. The monitoring wells were constructed using 51 mm flush-threaded environmental quality PVC well pipe. Each well was constructed with a riser pipe and 3 m section of screen installed to intersect the groundwater table. Silica sand filter-pack was placed in the annular space to approximately 0.3 m above the top of the screen. Bentonite was placed in the remaining annular space to about 6 cm below ground surface to

seal the well. The bentonite was hydrated using store bought distilled water. Steel monument style protective covers were installed at BH101 and BH102, and a flush mount protective cover was installed at BH202, to protect the wells from damage. Well construction details are shown on the borehole logs in Appendix B.

3.3 Groundwater Sampling

Following installation, the monitoring wells were developed by purging at least three well volumes, to remove sediment from the well, stabilize and grade the filter pack, improve connectivity between the well and the formation, and restore groundwater that may have been disturbed during the drilling process.

On April 6, 2022, the depth to groundwater was measured in each monitoring well prior to purging or sampling. An interface probe, which can accurately measure the depth to groundwater and the thickness of dense and light non-aqueous phase liquids (DNAPL and LNAPL, respectively) that may be present in the monitoring wells, was used to measure fluid levels. The probe was cleaned between wells with a mixture of Alconox™ soap and water and rinsed with distilled water to reduce the potential for cross-contamination between the monitoring wells.

Each well was purged of a of ten well volumes to remove stagnant water from the well prior to sampling. Groundwater samples were collected using a peristaltic pump, with dedicated tubing installed in each of the monitoring wells. The peristaltic pump reduces the amount of sediment entrained in the collected groundwater samples, as agitation of the water column is reduced by lowering the pumping rate and limiting the movement of the tubing in the water column.

Field staff wore nitrile sample gloves while collecting the groundwater samples. Gloves were replaced between each sample location. The groundwater analysis results are discussed in Section 4.4.

3.4 Laboratory Testing and Analysis

Soil and groundwater samples were maintained at a temperature less than 10°C. Select samples were transported to Caduceon Environmental Laboratories (Caduceon), a CALA



accredited analytical laboratory in Barrie, Ontario, for analysis of VOCs, PHCs, PAHs, and metals. The analysis results are discussed in Section 4.0. Copies of the original laboratory Certificates of Analysis as received from Caduceon are included in Appendix C.

4.0 Results

4.1 Stratigraphy

Subsurface conditions at the Site generally consisted of a shallow topsoil layer, underlain by a fill layer consisting of brown, moist, sand, buried topsoil horizons, and a grey silty sand to clayey silt which terminated at depths of 3.96, 4.57, and 6.01 mbgs on grey shale bedrock. There was no olfactory evidence of hydrocarbon contamination detected in the soil samples recovered from the boreholes.

4.2 Water levels and Flow Direction

Depth to groundwater ranged from 1.67 to 4.51 mbgs on April 6, 2022. Based on the local topography, the proximity to the Pepperlaw River, and the northerly flow direction of the Pepperlaw River, the inferred shallow groundwater flow direction is northerly. Local groundwater flow direction may be affected by sub-surface utility conduits located on-site and beneath nearby streets and neighbouring properties. Additional groundwater monitoring wells are required at the Site to calculate the shallow groundwater flow direction.

4.3 Soil Quality

The submitted soil samples met the Table 1 SCS for the analyzed parameters.

The soil analysis results are presented in Table 1 to Table 3, and soil sample locations are shown on Figure 3.

4.4 Groundwater Quality

No free phase product, hydrocarbon sheen, or unusual odours or discoloration was observed in the purge water or recovered groundwater samples.

Concentrations of the select parameters exceeding the Table 1 SCS are provided in Embedded Table 1.



Embedded Table 1 – Groundwater Table 1 SCS Exceedances

Sample Location	Parameter	Reported Concentration (µg/L)	Table 1 SCS (µg/L)
BH102	Toluene	1.0	0.8
	Benzo(a)pyrene	0.018	0.01
BH202	Toluene	0.9	0.8
	Benzo(a)pyrene	0.053	0.01
	Phenanthrene	0.11	0.1

The groundwater analysis results are presented in Table 4 to Table 6, and groundwater sample locations are shown on Figure 4.

4.5 Quality Assurance / Quality Control

Caduceon reported that the laboratory analytical data is within statistical control and has met quality control and method performance criteria as provided in the appended Certificates of Analysis.

Based on the laboratory QA/QC data, the soil and groundwater analysis results can be interpreted with confidence.



5.0 Discussion and Conclusions

Conclusions regarding the current environmental conditions at the Site are based solely on the results of the Phase II ESA. The Phase II ESA included advancement of four boreholes, three of which were completed as groundwater monitoring wells.

Seven soil samples and three groundwater samples were submitted for laboratory analysis of the identified COPCs.

The laboratory analysis results indicated that all analysed contaminants of potential concern in the submitted soil samples met the Table 1 SCS. Concentrations of toluene and select PAHs exceeded the Table 1 SCS in the groundwater samples collected from BH102 and BH202.

Based on the results of the Phase II ESA, contaminants are present at the Site in groundwater at concentrations greater than the Table 1 SCS; therefore, Cambium recommends the completion of additional investigation at the Site to further assess the identified exceedances.



6.0 Qualifications of the Assessor

This Phase II ESA was completed by Matthew Cunningham, C.E.T., T.Ag, and Natalie Wright, P.Eng. Credentials are presented in Appendix D. Information presented in this report is true and accurate to the best of the assessors' knowledge.

Respectfully submitted,

Cambium Inc.

Matthew Cunningham, C.E.T., T.Ag
Project Coordinator



Natalie Wright, P.Eng.
Project Manager



7.0 References

- Cambium. (2022). *Phase I Environmental Site Assessment - 219 Pepperlaw Road, Pepperlaw, ON*. Cambium Inc. April 7, 2022.
- CSA. (2013). *CSA Standard Z769-00 Phase II Environmental Site Assessment (R2013)*. Canadian Standards Association.
- MOE. (2011a). *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*. Ministry of the Environment. July 1, 2011.
- MOE. (2011b). *Soil, Groundwater, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*. Ministry of the Environment. April 15, 2011.



8.0 Standard Limitations

Limited Warranty

In performing work on behalf of a client, Cambium relies on its client to provide instructions on the scope of its retainer and, on that basis, Cambium determines the precise nature of the work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards. Unless required under local laws, other than as expressly stated herein, no other warranties or conditions, either expressed or implied, are made regarding the services, work or reports provided.

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Site Assessments

A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

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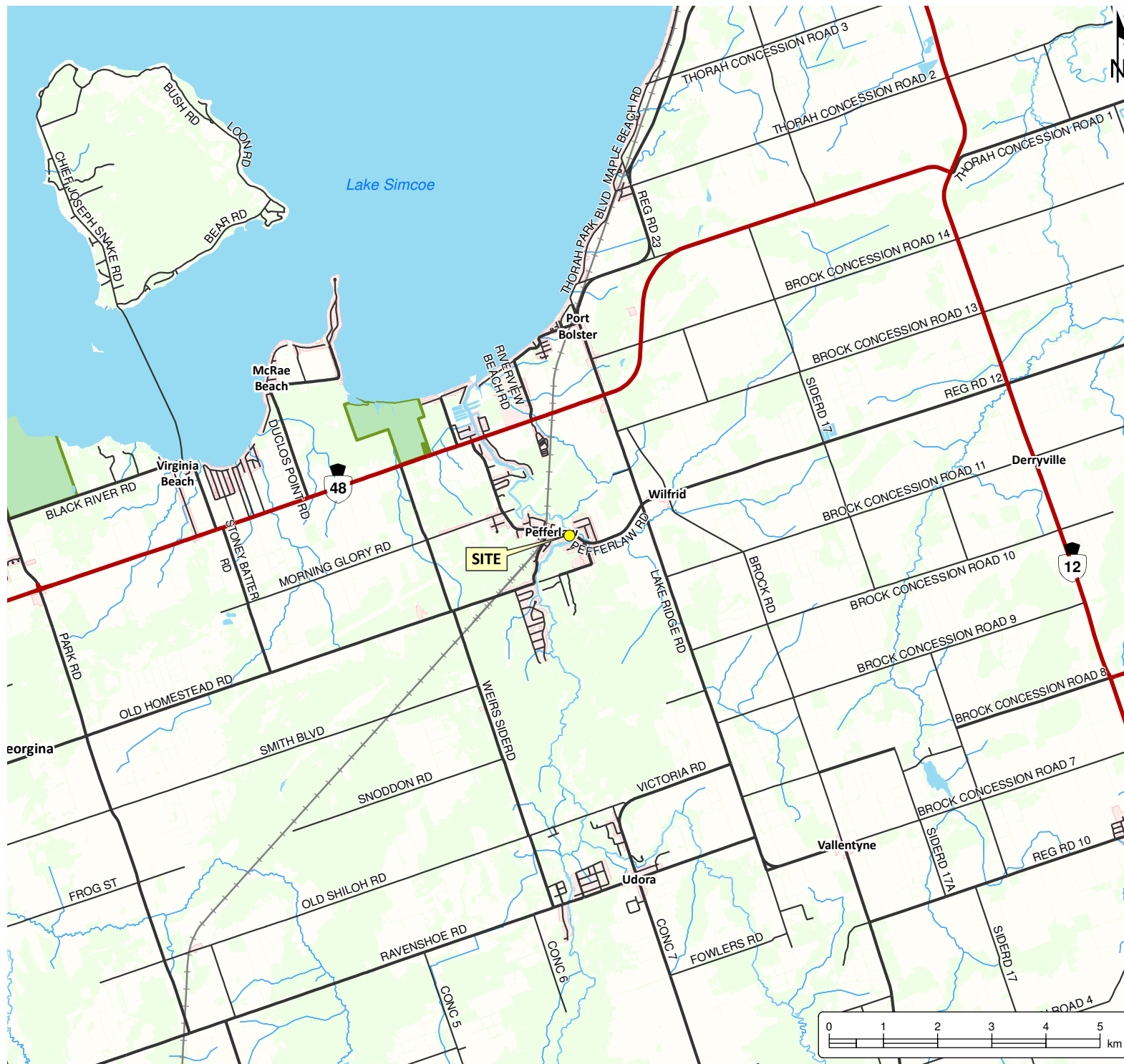
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Appended Figures



PHASE II ENVIRONMENTAL SITE ASSESSMENT

DM WILLS ASSOCIATES LTD.
IN ASSOCIATION WITH THE
TOWN OF GEORGINA
219 Pefferlaw Road,
Pefferlaw, Ontario

LEGEND

- Highway
- Major Road
- Minor Road
- Railroad
- Watercourse
- Water Area
- Provincial Park
- Wooded Area
- Built Up Area

Notes:
- Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.



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SITE LOCATION MAP

Project No.: 14324-003	Date: May 2022
Scale: 1:100,000	Rev.: NAD 1983 UTM Zone 17N
Created by: TLC	Checked by: MC
Figure: 1	



**PHASE II ENVIRONMENTAL
SITE ASSESSMENT**
DM WILLS ASSOCIATES LTD.
IN ASSOCIATION WITH THE
TOWN OF GEORGINA
219 Pepperlaw Road,
Pefferlaw, Ontario

LEGEND

-  Borehole
-  Monitoring Well
-  Site (approximate)

Notes:
- Site is approximate; boundaries were obtained from York Region online GIS database.
- Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).
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SITE PLAN

Project No.:	14324-003	Date:	May 2022
Scale:	1:2,000	Rev.:	
Created by:	TLC	Checked by:	MC
Figure:	2		

O:\GIS\MXDs\14300-14399\14324-003 DM Wills Associates Ltd - Phase II ESA - Pefferlaw Dam\2022-05-12 FIG 3 - Soil Quality.mxd



PHASE II ENVIRONMENTAL SITE ASSESSMENT

DM WILLS ASSOCIATES LTD.
IN ASSOCIATION WITH THE
TOWN OF GEORGINA
219 Pefferlaw Road,
Pefferlaw, Ontario

LEGEND

- Borehole
- Monitoring Well
- Meets Table 1, SCS
- Exceeds Table 1, SCS
- Site (approximate)

Notes:

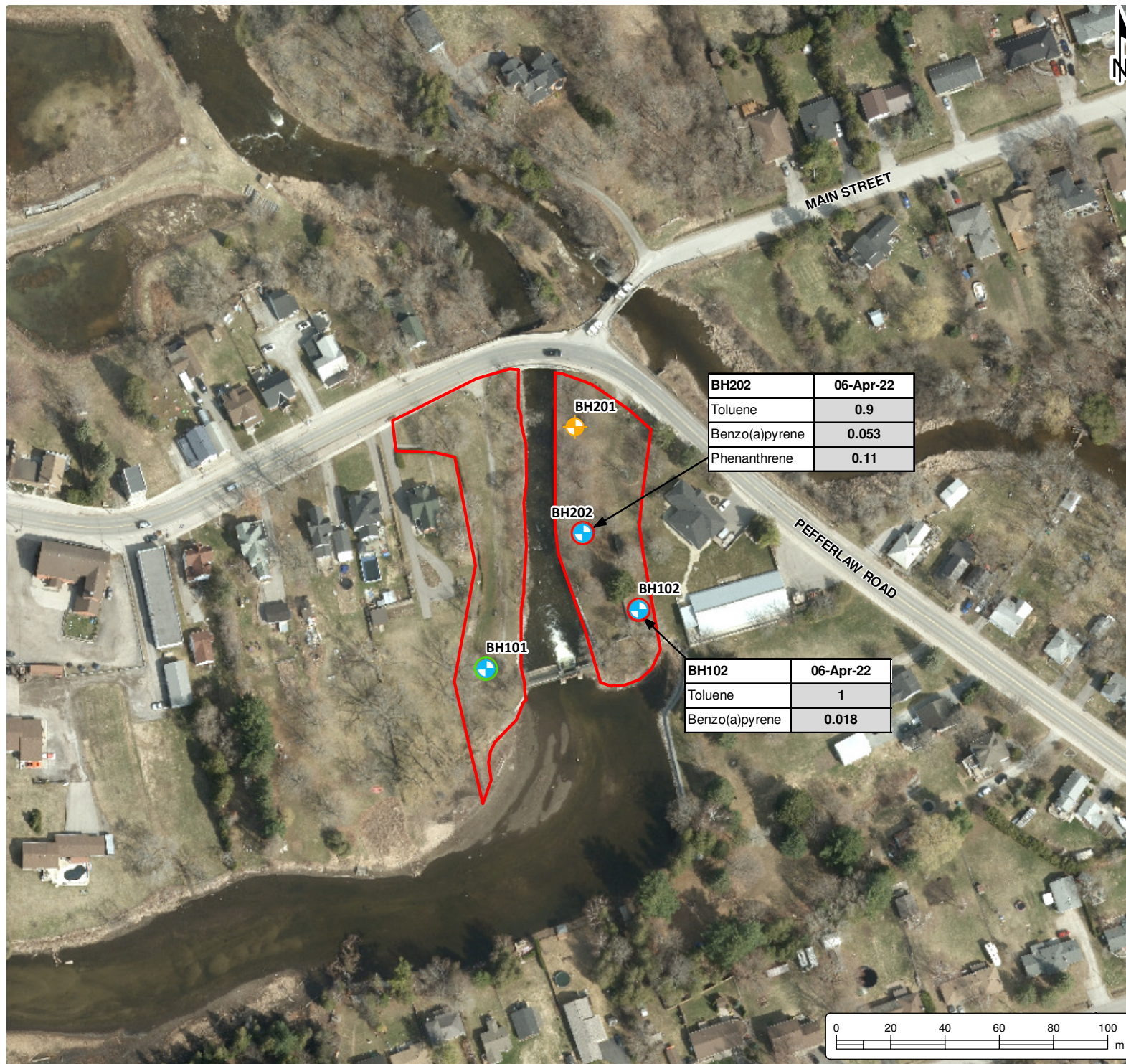
- Site is approximate; boundaries were obtained from York Region online GIS database.
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SOIL QUALITY VOCs, PHCs, PAHs AND METALS

Project No.: 14324-003		Date: May 2022	
Scale: 1:2,000		Rev.: Projection: NAD 1983 UTM Zone 17N	
Created by: TLC	Checked by: MC	Figure: 3	



PHASE II ENVIRONMENTAL SITE ASSESSMENT

DM WILLS ASSOCIATES LTD.
IN ASSOCIATION WITH THE
TOWN OF GEORGINA
219 Pepperlaw Road,
Pepperlaw, Ontario

LEGEND

- Borehole
- Monitoring Well
- Meets Table 1, SCS
- Exceeds Table 1, SCS
- Site (approximate)

Parameter	Table 1 SCS
Toluene	0.8
Benzo(a)pyrene	0.01
Phenanthrene	0.05

Table 1 Standards - Full Depth Background Site
Condition Standards - Residential/Parkland/
Institutional/Industrial/Commercial/
Community Property Use

Notes:

- Site is approximate; boundaries were obtained from York Region online GIS database.
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GROUNDWATER QUALITY VOCs, PHCs, PAHs AND METALS

Project No.: 14324-003	Date: May 2022
Scale: 1:2,000	Rev.: Rev.:
Created by: TLC	Checked by: MC
Figure: 4	



Tables



Table 1 - Summary of Soil Quality: VOCs & PHCs

Sample Location	Units	RDL	Table 1	BH101	BH102	BH201	BH202
Sample ID				BH101-22-0.8-1.4	BH102-22-1.5-2.1	BH201_3.05-3.66	BH202_2.13-3.05
Sample Date (dd-mmm-yy)				21-Mar-22	21-Mar-22	04-Apr-22	04-Apr-22
Sample Depth (mbgs)				0.80 - 1.40	1.50 - 2.10	3.05 - 3.66	2.13 - 3.05
Acetone	µg/g	0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	µg/g	0.02	0.02	< 0.02	< 0.02	< 0.02	< 0.02
Bromodichloromethane	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Bromoform	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Bromomethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Carbon Tetrachloride	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Monochlorobenzene (Chlorobenzene)	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Chloroform	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Dibromochloromethane	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Dichlorobenzene, 1,2-	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dichlorobenzene, 1,3-	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dichlorobenzene, 1,4-	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dichlorodifluoromethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dichloroethane, 1,1-	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Dichloroethane, 1,2-	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Dichloroethylene, 1,1-	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Dichloroethene, cis-1,2-	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Dichloroethene, trans-1,2-	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Dichloropropane, 1,2-	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Dichloropropene, cis-1,3-	µg/g	0.02	NV	< 0.02	< 0.02	< 0.02	< 0.02
Dichloropropene, trans-1,3-	µg/g	0.02	NV	< 0.02	< 0.02	< 0.02	< 0.02
Dichloropropene 1,3- cis+trans	µg/g	0.02	NV	< 0.02	< 0.02	< 0.02	< 0.02
Ethylbenzene	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Hexane	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Methyl Ethyl Ketone	µg/g	0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Isobutyl Ketone	µg/g	0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Methyl-t-butyl Ether	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dichloromethane (Methylene Chloride)	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Styrene	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Tetrachloroethane, 1,1,1,2-	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Tetrachloroethane, 1,1,2,2-	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Tetrachloroethylene	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	µg/g	0.2	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Trichloroethane, 1,1,1-	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Trichloroethane, 1,1,2-	µg/g	0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02
Trichloroethylene	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Trichlorofluoromethane	µg/g	0.02	0.25	< 0.02	< 0.02	< 0.02	< 0.02
Vinyl Chloride	µg/g	0.02	0.02	< 0.02	< 0.02	< 0.02	< 0.02
Xylene, m,p-	µg/g	0.03	NV	< 0.03	< 0.03	< 0.03	< 0.03
Xylene, o-	µg/g	0.03	NV	< 0.03	< 0.03	< 0.03	< 0.03
Xylene, m,p,o-	µg/g	0.03	0.05	< 0.03	< 0.03	< 0.03	< 0.03
PHC F1 (C6-C10)	µg/g	10	25	< 10	< 10	< 10	< 10
PHC F1 - BTEX	µg/g	10	25	< 10	< 10	< 10	< 10
PHC F2 (>C10-C16)	µg/g	5	10	< 5	< 5	< 5	< 5
PHC F3 (>C16-C34)	µg/g	10	240	10	12	< 10	10
PHC F4 (>C34-C50)	µg/g	10	120	< 10	< 10	< 10	< 10
% moisture	%	-	V	10.7	12.4	8.9	7.5

Notes:

Table 1 Standards - Full Depth Background Site Condition Standards - All Types

Bold and shaded grey - value exceeds Table 1

Bold and underline - RDL exceeds standard

N/A - not applicable

NC - The duplicate RPD was not calculated. One or both samples < 5x RDL.

NV - no value



Table 2 - Summary of Soil Quality: PAHs

Sample Location	Units	RDL	Table 1	BH101	BH102	BH201	BH202
Sample ID				BH101-22-0.8-1.4	BH102-22-1.5-2.1	BH201_3.05-3.66	BH202_2.13-3.05
Sample Date (dd-mmm-yy)				21-Mar-22	21-Mar-22	04-Apr-22	04-Apr-22
Sample Depth (mbgs)				0.80 - 1.40	1.50 - 2.10	3.05 - 3.66	2.13 - 3.05
Acenaphthene	µg/g	0.05	0.072	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/g	0.05	0.093	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	µg/g	0.05	0.16	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/g	0.05	0.36	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	µg/g	0.05	0.3	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	µg/g	0.05	0.47	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b+k)fluoranthene	µg/g	0.05	NV	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(g,h,i)perylene	µg/g	0.05	0.68	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	µg/g	0.05	0.48	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	µg/g	0.05	2.8	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzo(a,h)anthracene	µg/g	0.05	0.1	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/g	0.05	0.56	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/g	0.05	0.12	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3,-cd)pyrene	µg/g	0.05	0.23	< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene, 1-	µg/g	0.05	0.59	< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene, 2-	µg/g	0.05	0.59	< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene 2-(1-)	µg/g	0.05	0.59	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/g	0.05	0.09	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/g	0.05	0.69	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	µg/g	0.05	1	< 0.05	< 0.05	< 0.05	< 0.05

Notes:

Table 1 Standards - Full Depth Background Site Condition Standards - All Types

Bold and shaded grey - value exceeds Table 1

Bold and underline - RDL exceeds standard

N/A - not applicable

NC - The duplicate RPD was not calculated. One or both samples < 5x RDL.

NV - no value



Table 3 - Summary of Soil Quality: Metals

Sample Location	Units	RDL	Table 1	BH101	BH102	BH201	BH202
Sample ID				BH101-22_0.0-0.61	BH102-22_0.0-0.61	BH201_1.52-2.29	BH202_0.22-0.61
Sample Date (dd-mmm-yy)				04-Apr-22	04-Apr-22	04-Apr-22	04-Apr-22
Sample Depth (mbgs)				0.00 - 0.61	0.00 - 0.61	1.52 - 2.29	0.22 - 0.61
pH @25°C	N/A	-	NV	7.7	7.54	7.98	10.5
Conductivity @25°C	mS/cm	0.001	0.57	0.144	0.175	0.181	0.298
Cyanide (Free)	µg/g	0.05	0.051	< 0.05	< 0.05	< 0.05	< 0.05
Sodium Adsorption Ratio	N/A	NV	2.4	0.047	0.0514	1.49	0.0924
Antimony	µg/g	0.5	1.3	< 0.5	< 0.5	< 0.5	< 0.5
Arsenic	µg/g	0.5	18	1.5	1.8	1.4	1.8
Barium	µg/g	1	220	42	44	30	48
Beryllium	µg/g	0.2	2.5	0.2	0.2	0.2	0.2
Boron	µg/g	0.5	36	4	5.1	4.7	5.4
Boron (HWS)	µg/g	0.02	NV	0.09	0.13	0.03	0.04
Cadmium	µg/g	0.5	1.2	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	µg/g	1	70	9	10	12	11
Chromium (VI)	µg/g	0.2	0.66	< 0.2	< 0.2	< 0.2	< 0.2
Cobalt	µg/g	1	21	3	3	3	3
Copper	µg/g	1	92	6	7	6	9
Lead	µg/g	5	120	7	38	5	26
Mercury	µg/g	0.005	0.27	0.025	0.023	0.007	0.016
Molybdenum	µg/g	1	2	< 1	< 1	< 1	< 1
Nickel	µg/g	1	82	6	6	7	6
Selenium	µg/g	0.5	1.5	0.5	0.6	0.5	0.6
Silver	µg/g	0.2	0.5	< 0.2	< 0.2	< 0.2	< 0.2
Thallium	µg/g	0.1	1	< 0.1	< 0.1	< 0.1	< 0.1
Uranium	µg/g	0.1	2.5	0.4	0.4	0.4	0.5
Vanadium	µg/g	1	86	18	19	16	18
Zinc	µg/g	3	290	27	49	30	38

Notes:
Table 1 Standards - Full Depth Background Site Condition Standards - All Types
Bold and shaded grey - value exceeds Table 1
Bold and underline - RDL exceeds standard
N/A - not applicable
NC - The duplicate RPD was not calculated. One or both samples < 5x RDL.
NV - no value



Table 4 - Summary of Water Quality: VOCs & PHCs

Sample Location	Note	Units	RDL	Table 1 Standards	BH101	BH102	BH202
Sample ID					BH101	BH102	BH202
Sample Date (dd-mmm-yy)					06-Apr-22	06-Apr-22	06-Apr-22
Acetone		µg/L	30	2700	< 30	< 30	< 30
Benzene		µg/L	0.5	0.5	< 0.5	0.7	< 0.5
Bromodichloromethane		µg/L	2	2	< 2	< 2	< 2
Bromoform		µg/L	5	5	< 5	< 5	< 5
Bromomethane		µg/L	0.5	0.89	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride		µg/L	0.2	0.2	< 0.2	< 0.2	< 0.2
Monochlorobenzene (Chlorobenzene)		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Chloroform		µg/L	1	2	< 1	< 1	< 1
Dibromochloromethane		µg/L	2	2	< 2	< 2	< 2
Dichlorobenzene, 1,2-		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,3-		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,4-		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane		µg/L	2	590	< 2	< 2	< 2
Dichloroethane, 1,1-		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,2-		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Dichloroethylene, 1,1-		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Dichloroethene, cis-1,2-		µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5
Dichloroethene, trans-1,2-		µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5
Dichloropropane, 1,2-		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Dichloropropene, cis-1,3-	5	µg/L	0.5	NV	< 0.5	< 0.5	< 0.5
Dichloropropene, trans-1,3-	5	µg/L	0.5	NV	< 0.5	< 0.5	< 0.5
Dichloropropene 1,3- cis+trans	5	µg/L	0.5	NV	< 0.5	< 0.5	< 0.5
Ethylbenzene		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Dibromoethane, 1,2- (Ethylene Dibromide)		µg/L	0.2	0.2	< 0.2	< 0.2	< 0.2
Hexane		µg/L	5	5	< 5	< 5	< 5
Methyl Ethyl Ketone		µg/L	20	400	< 20	< 20	< 20
Methyl Isobutyl Ketone		µg/L	20	640	< 20	< 20	< 20
Methyl-t-butyl Ether		µg/L	2	15	< 2	< 2	< 2
Dichloromethane (Methylene Chloride)		µg/L	5	5	< 5	< 5	< 5
Styrene		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,1,2-		µg/L	0.5	1.1	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,2,2-		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethylene		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Toluene		µg/L	0.5	0.8	< 0.5	1	0.9
Trichloroethane, 1,1,1-		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Trichloroethane, 1,1,2-		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene		µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane		µg/L	5	150	< 5	< 5	< 5
Vinyl Chloride		µg/L	0.2	0.5	< 0.2	< 0.2	< 0.2
Xylene, m,p-	4	µg/L	1	NV	< 1.0	< 1.0	< 1.0
Xylene, o-	4	µg/L	0.5	NV	< 0.5	< 0.5	< 0.5
Xylene, m,p,o-	4	µg/L	1.1	72	< 1.1	< 1.1	< 1.1
PHC F1 (C6-C10)	1	µg/L	25	420	< 25	< 25	< 25
PHC F2 (>C10-C16)	2	µg/L	50	150	< 50	< 50	< 50
PHC F3 (>C16-C34)	3	µg/L	400	500	< 400	< 400	< 400
PHC F4 (>C34-C50)		µg/L	400	500	< 400	< 400	< 400

Notes:

Table 1 Standards - Full Depth Background Site Condition Standards - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

N/A - not applicable

NC - The duplicate RPD was not calculated. One or both samples < 5x RDL.

NV - no value

"-" not analyzed

Bold and shaded - value exceeds standard

Bold and underline - RDL exceeds standard

1 - Standard is applicable to PHC in the F1 range minus BTEX.

2 - Standard is applicable to PHC F2 minus naphthalene. If naphthalene is not analyzed, the standard is applied to F2.

3 - Standard is applicable to PHC F3 minus PAHs (other than naphthalene). If PAHs have not been measured, the standard is applied to F3.

4 - Standard is applicable to total xylenes, and m & p-xylenes and o-xylenes should be summed for comparison.

5 - Standard is applicable to 1,3-Dichloropropene, and the individual isomers (cis + trans) should be added for comparison.



Table 5 - Summary of Water Quality: PAHs

Sample Location	Note	Units	RDL	Table 1 Standards	BH101	BH102	BH202
Sample ID					BH101	BH102	BH202
Sample Date (dd-mmm-yy)					06-Apr-22	06-Apr-22	06-Apr-22
Acenaphthene		µg/L	0.05	4.1	< 0.05	< 0.05	< 0.05
Acenaphthylene		µg/L	0.05	1	< 0.05	< 0.05	< 0.05
Anthracene		µg/L	0.05	0.1	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene		µg/L	0.05	0.2	< 0.05	0.06	0.06
Benzo(a)pyrene		µg/L	0.01	0.01	< 0.01	0.018	0.053
Benzo(b)fluoranthene	2	µg/L	0.05	0.1	< 0.05	< 0.05	0.06
Benzo(b+k)fluoranthene	2	µg/L	0.1	0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene		µg/L	0.05	0.2	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene		µg/L	0.05	0.1	< 0.05	< 0.05	< 0.05
Chrysene		µg/L	0.05	0.1	< 0.05	< 0.05	0.1
Dibenzo(a,h)anthracene		µg/L	0.05	0.2	< 0.05	< 0.05	< 0.05
Fluoranthene		µg/L	0.05	0.4	< 0.05	< 0.05	0.08
Fluorene		µg/L	0.05	120	< 0.05	< 0.05	< 0.05
Indeno(1,2,3,-cd)pyrene		µg/L	0.05	0.2	< 0.05	< 0.05	< 0.05
Methylnaphthalene, 1-	1	µg/L	0.05	2	< 0.05	0.07	0.06
Methylnaphthalene, 2-	1	µg/L	0.05	2	< 0.05	0.06	0.08
Methylnaphthalene 2-(1-)	1	µg/L	1	2	< 1	< 1	< 1
Naphthalene		µg/L	0.05	7	< 0.05	0.09	0.08
Phenanthrene		µg/L	0.05	0.1	< 0.05	< 0.05	0.11
Pyrene		µg/L	0.05	0.2	< 0.05	< 0.05	0.12
PHC F4 (>C34-C50)		µg/L	400	500	< 400	< 400	< 400

Notes:

Table 1 Standards - Full Depth Background Site Condition Standards - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

N/A - not applicable

NC - The duplicate RPD was not calculated. One or both samples < 5x RDL.

NV - no value

"-" not analyzed

Bold and shaded - value exceeds standard

Bold and underline - RDL exceeds standard

1 - Standard is applicable to 1-methylnaphthalene and 2- methylnaphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.

2 - Standard is for benzo(b)fluoranthene; however, the laboratory can not distinguish between benzo(b)fluoranthene and benzo(k)fluoranthene.



Table 6 - Summary of Water Quality: Metals

Sample Location	Note	Units	RDL	Table 1 Standards	BH101	BH102	BH202
Sample ID					BH101	BH102	BH202
Sample Date (dd-mmm-yy)					06-Apr-22	06-Apr-22	06-Apr-22
Antimony		µg/L	0.1	1.5	< 0.2	< 0.1	< 0.5
Arsenic		µg/L	0.1	13	0.5	2.7	< 0.5
Barium		µg/L	1	610	103	207	346
Beryllium		µg/L	0.1	0.5	< 0.2	< 0.1	< 0.5
Boron		µg/L	5	1700	78	51	47
Cadmium		µg/L	0.015	0.5	< 0.028	< 0.015	< 0.070
Chromium		µg/L	2	11	< 2	< 2	< 2
Cobalt		µg/L	0.1	3.8	0.8	0.3	1
Copper		µg/L	2	5	< 2	< 2	< 2
Lead		µg/L	0.02	1.9	0.08	0.09	0.13
Molybdenum		µg/L	0.1	23	0.4	1.2	2.7
Nickel		µg/L	0.2	14	2	2.6	3
Selenium		µg/L	1	5	< 2	< 1	< 5
Silver		µg/L	0.1	0.3	< 0.1	< 0.1	< 0.1
Thallium		µg/L	0.05	0.5	< 0.1	< 0.05	< 0.3
Uranium		µg/L	0.05	8.9	0.24	0.55	0.41
Vanadium		µg/L	0.1	3.9	0.7	0.4	< 0.5
Zinc		µg/L	5	160	5	< 5	< 5

Notes:

Table 1 Standards - Full Depth Background Site Condition Standards - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

N/A - not applicable

NC - The duplicate RPD was not calculated. One or both samples < 5x RDL.

NV - no value

"-" not analyzed

Bold and shaded - value exceeds standard

Bold and underline - RDL exceeds standard



Appendix A

Site Photographs



Photo 1 Phase II ESA Drilling, March 2022.



Photo 2 Phase II ESA Drilling, March 2022.



Appendix B

Borehole Logs



**Peterborough
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Log of Borehole:

BH101

Page 1 of 1

Client: D.M. Wills Associates Ltd.
Contractor: Landshark Drilling
Location: 219 Pepperlaw Rd., Pepperlaw, ON

Project Name: Phase II ESA
Method: Hollow Stem Auger
UTM:

Project No.: 14324-003
Date Completed: 2022/03/21
Elevation: 103.129 masl

SUBSURFACE PROFILE				SAMPLING INFO					Well Installation	Remarks
Elevation (m)	Depth (m)	Lithology	Description	Number	% Recovery	Type	CSV (ppm)	OV (ppm)		
103			TOPSOIL: Sand, trace gravel, organics, loose to compact	1	80		< 1	< 1		Soil Analysis: Metals Soil Analysis: VOCs, PHCs, PAHs
			Fill: Brown sand, some silt, some gravel, trace clay, trace organics, dry, compact							
102	1			2	70		< 1	< 1		
			-loose							
101	2			3	10		< 1	< 1		
			SILT AND SAND: Grey silt and sand, some gravel, some clay, wet, compact	4	70		< 1	< 1		
100	3									Groundwater Analysis: VOCs, PHCs, PAHs, Metals
			-Brown to grey, less silt, dense	5	80	SS	< 1	< 1		
99	4									Groundwater levels measured on April 4, 2022 at 4.51 mb top
98	5		Sand: Grey sandy gravel, some silt, trace clay, saturated, very dense	6	50		< 1	< 1		
97	6									
			Borehole terminated in sandy gravel at 6.1 mbgs (refusal).	7	30		< 1	< 1		
96	7									

Logged By: J. Schweighofer **Input By:** M. Cunningham



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Log of Borehole:

BH102

Page 1 of 1

Client: D.M. Wills Associates Ltd.
Contractor: Landshark Drilling
Location: 219 Pepperlaw Rd., Pepperlaw, ON

Project Name: Phase II ESA
Method: Hollow Stem Auger
UTM:

Project No.: 14324-003
Date Completed: 2022/03/21
Elevation: 103.54 masl

SUBSURFACE PROFILE				SAMPLING INFO					Well Installation	Remarks
Elevation (m)	Depth (m)	Lithology	Description	Number	% Recovery	Type	CSV (ppm)	OV (ppm)		
103.5	0	TOPSOIL: Sand and silt, organics, compact		1	20		< 1	< 1		Soil Analysis: Metals Soil Analysis: VOCs, PHCs, PAHs
103.0	1	Fill: Brown sand, some gravel, dry, compact		2	10		< 1	< 1		
102.0	2	Grey to brown silt and sand, some gravel, trace clay, dry to moist, loose		3	70		< 1	< 1		
101.0	3	Sand: Grey silty sand with some clay and trace gravel, moist, compact		4	70		< 1	< 1		Groundwater Analysis: VOCs, PHCs, PAHs, Metals
100.0	4			5	85	SS	< 1	< 1		
99.0	5	Clay: Grey silty clay with some sand and trace gravel, moist to wet, dense		6	85		< 1	< 1		
98.0	6	-saturated, very dense								Groundwater levels measured on April 4, 2022 at 4.00 mb top
97.0	7	Borehole terminated in clayey silt at 6.2 mbgs (refusal).		7	20		< 1	< 1		
96.0										

Logged By: J. Schweighofer **Input By:** M. Cunningham



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Log of Borehole:

BH201

Page 1 of 1

Client: D.M. Wills Associates Ltd.
Contractor: Landshark Drilling
Location: 219 Pepperlaw Rd., Pepperlaw, ON

Project Name: Phase II ESA
Method: Dual Tube
UTM:

Project No.: 14324-003
Date Completed: 2022/04/04
Elevation:

SUBSURFACE PROFILE				SAMPLING INFO					Well Installation	Remarks
Elevation (m)	Depth (m)	Lithology	Description	Number	% Recovery	Type	CSV (ppm)	OV (ppm)		
0			TOPSOIL: Sand, trace gravel, organics, loose to compact	1			< 1	< 1		Soil Analysis: Metals Soil Analysis: VOCs, PHCs, PAHs
			Fill: Brown, moist, sand with trace silt and clay, no odour, no staining,	2	53		< 1	< 1		
-1	1			3			< 1	< 1		
-2	2		Clay: Medium brown silty clay, wet, trace sand and gravel, no odour, no staining	4	53	DT	< 1	< 1		
-3	3			5	100		35	< 1		
			Clay: Gleyed grey clayey silt, saturated, trace sand, cobbles, no odour, no staining							
-4	4		Borehole terminated in clayey silt at 3.96 mbgs on top of bedrock							
-5	5									
-6	6									
-7	7									

Logged By: M. Cunningham

Input By: M. Cunningham



**Peterborough
Barrie
Oshawa
Kingston**
T: 866-217-7900
www.cambium-inc.com

Log of Borehole:

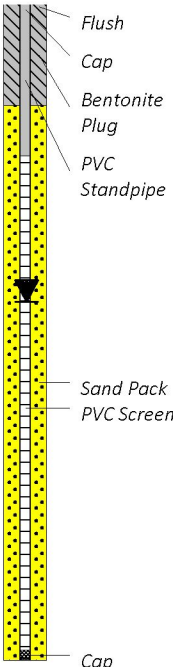
BH202

Page 1 of 1

Client: D.M. Wills Associates Ltd.
Contractor: Strata Drilling Group
Location: 219 Pepperlaw Rd., Pepperlaw, ON

Project Name: Phase II ESA
Method: Dual Tube
UTM:

Project No.: 14324-003
Date Completed: 2022/04/04
Elevation: 101.05 masl

SUBSURFACE PROFILE				SAMPLING INFO					Well Installation	Remarks
Elevation (m)	Depth (m)	Lithology	Description	Number	% Recovery	Type	CSV (ppm)	OV (ppm)		
101			TOPSOIL: Sand, trace gravel, organics, loose to compact	1			< 1	< 1		Soil Analysis: Metals Soil Analysis: VOCs, PHCs, PAHs Groundwater levels measured on April 4, 2022 at 1.67 mb top Groundwater Analysis: VOCs, PHCs, PAHs, Metals
			Fill: Brown, moist, sand with trace silt and clay, no odour, no staining,	2	40		< 1	< 1		
100	1			3		DT	< 1	< 1		
99	2		Clay: Gleyed grey,silty clay saturated, trace sand and cobble present, no odour, no staining	4	100		< 1	< 1		
98	3			5	100		< 1	< 1		
97	4		Borehole terminated in clayey silt at 3.96 mbgs on top of bedrock							
96	5									
95	6									
94	7									



Appendix C

Laboratory Certificates of Analysis

C.O.C.: ---

REPORT No. B22-08418 (i)

Report To:

Cambium Environmental
135 Bayfield Street, Unit 102
Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 28-Mar-22

JOB/PROJECT NO.:

DATE REPORTED: 01-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
% Moisture	2	Richmond Hill	FAL	30-Mar-22	A-% moisture RH	
PHC(F2-F4)	2	Kingston	KPR	30-Mar-22	C-PHC-S-001 (k)	CWS Tier 1
VOC's	2	Richmond Hill	FAL	30-Mar-22	C-VOC-02 (rh)	EPA 8260
PHC(F1)	2	Richmond Hill	FAL	30-Mar-22	C-VPHS-01 (rh)	CWS Tier 1

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

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

nC10,nC16 and nC34 response factors within 10% of each other:

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

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met. If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC QC will be made available upon request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - Agricultural - Table 1 - Agricultural/Other Soil Std
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



Christine Burke
Lab Manager

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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Report To:

Cambium Environmental
135 Bayfield Street, Unit 102
Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 28-Mar-22

JOB/PROJECT NO.:

DATE REPORTED: 01-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Parameter	Client I.D.		BH101-22-0.8-1.4 B22-08418-1 21-Mar-22	BH102-22-1.5-2.1 B22-08418-2 21-Mar-22			O. Reg. 153	
	Sample I.D.	Date Collected					Tbl. 1 - Agricultural	Tbl. 1 - All
Units	R.L.							
Acetone	µg/g	0.5	< 0.5	< 0.5			0.5	0.5
Benzene	µg/g	0.02	< 0.02	< 0.02			0.02	0.02
Bromodichloromethane	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Bromoform	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Bromomethane	µg/g	0.05	< 0.05	< 0.05			0.05	0.05
Carbon Tetrachloride	µg/g	0.05	< 0.05	< 0.05			0.05	0.05
Monochlorobenzene (Chlorobenzene)	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Chloroform	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Dibromochloromethane	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Dichlorobenzene, 1,2-	µg/g	0.05	< 0.05	< 0.05			0.05	0.05
Dichlorobenzene, 1,3-	µg/g	0.05	< 0.05	< 0.05			0.05	0.05
Dichlorobenzene, 1,4-	µg/g	0.05	< 0.05	< 0.05			0.05	0.05
Dichlorodifluoromethane	µg/g	0.05	< 0.05	< 0.05			0.05	0.05
Dichloroethane, 1,1-	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Dichloroethane, 1,2-	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Dichloroethylene, 1,1-	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Dichloroethene, cis-1,2-	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Dichloroethene, trans-1,2-	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Dichloropropane, 1,2-	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Dichloropropene, cis-1,3-	µg/g	0.02	< 0.02	< 0.02				
Dichloropropene, trans-1,3-	µg/g	0.02	< 0.02	< 0.02				

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - Agricultural - Table 1 - Agricultural/Other Soil Std
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



Christine Burke
Lab Manager

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REPORT No. B22-08418 (i)

Report To:

Cambium Environmental
135 Bayfield Street, Unit 102
Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 28-Mar-22

JOB/PROJECT NO.:

DATE REPORTED: 01-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Parameter	Client I.D.		BH101-22-0.8-1.4 B22-08418-1 21-Mar-22	BH102-22-1.5-2.1 B22-08418-2 21-Mar-22			O. Reg. 153	
	Sample I.D.	Date Collected					Tbl. 1 - Agricultural	Tbl. 1 - All
Units	R.L.							
Dichloropropene 1,3-cis+trans	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Ethylbenzene	µg/g	0.05	< 0.05	< 0.05			0.05	0.05
Dibromoethane,1,2-(Ethylene Dibromide)	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Hexane	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Methyl Ethyl Ketone	µg/g	0.5	< 0.5	< 0.5			0.5	0.5
Methyl Isobutyl Ketone	µg/g	0.5	< 0.5	< 0.5			0.5	0.5
Methyl-t-butyl Ether	µg/g	0.05	< 0.05	< 0.05			0.05	0.05
Dichloromethane (Methylene Chloride)	µg/g	0.05	< 0.05	< 0.05			0.05	0.05
Styrene	µg/g	0.05	< 0.05	< 0.05			0.05	0.05
Tetrachloroethane,1,1,1,2-	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Tetrachloroethane,1,1,2,2-	µg/g	0.05	< 0.05	< 0.05			0.05	0.05
Tetrachloroethylene	µg/g	0.05	< 0.05	< 0.05			0.05	0.05
Toluene	µg/g	0.2	< 0.2	< 0.2			0.2	0.2
Trichloroethane,1,1,1-	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Trichloroethane,1,1,2-	µg/g	0.02	< 0.02	< 0.02			0.05	0.05
Trichloroethylene	µg/g	0.05	< 0.05	< 0.05			0.05	0.05
Trichlorofluoromethane	µg/g	0.02	< 0.02	< 0.02			0.05	0.25
Vinyl Chloride	µg/g	0.02	< 0.02	< 0.02			0.02	0.02
Xylene, m,p-	µg/g	0.03	< 0.03	< 0.03				

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - Agricultural - Table 1 - Agricultural/Other Soil Std
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



Christine Burke
Lab Manager

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REPORT No. B22-08418 (i)

Report To:

Cambium Environmental
135 Bayfield Street, Unit 102
Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 28-Mar-22

JOB/PROJECT NO.:

DATE REPORTED: 01-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.			BH101-22-0.8-1.4	BH102-22-1.5-2.1			O. Reg. 153	
Sample I.D.			B22-08418-1	B22-08418-2			Tbl. 1 - Agricultural	Tbl. 1 - All
Date Collected			21-Mar-22	21-Mar-22				
Parameter	Units	R.L.						
Xylene, o-	µg/g	0.03	< 0.03	< 0.03				
Xylene, m,p,o-	µg/g	0.03	< 0.03	< 0.03			0.05	0.05
PHC F1 (C6-C10)	µg/g	10	< 10	< 10			17	25
PHC F1 - BTEX	µg/g	10	< 10	< 10			17	25
PHC F2 (>C10-C16)	µg/g	5	< 5	< 5			10	10
PHC F3 (>C16-C34)	µg/g	10	10	12			240	240
PHC F4 (>C34-C50)	µg/g	10	< 10	< 10			120	120
% moisture	%		10.7	12.4				

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - Agricultural - Table 1 - Agricultural/Other Soil Std
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



Christine Burke
Lab Manager

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REPORT No. B22-08418 (i)

Report To:

Cambium Environmental

135 Bayfield Street, Unit 102

Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 28-Mar-22

JOB/PROJECT NO.:

DATE REPORTED: 01-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - Agricultural - Table 1 - Agricultural/Other Soil Std
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



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Christine Burke
Lab Manager

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Caduceon Environmental Laboratories.

C.O.C.: ---

REPORT No. B22-08418 (ii)

Report To:

Cambium Environmental
135 Bayfield Street, Unit 102
Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 28-Mar-22

JOB/PROJECT NO.:

DATE REPORTED: 01-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
SVOC	2	Kingston	sge	31-Mar-22	C-NAB-S-001 (k)	EPA 8270

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

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

nC10,nC16 and nC34 response factors within 10% of each other:

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

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met. If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC QC will be made available upon request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - Agricultural - Table 1 - Agricultural/Other Soil Std
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



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Christine Burke
Lab Manager

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REPORT No. B22-08418 (ii)

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135 Bayfield Street, Unit 102
Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 28-Mar-22

JOB/PROJECT NO.:

DATE REPORTED: 01-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Parameter	Client I.D.		BH101-22-0.8-1.4 B22-08418-1 21-Mar-22	BH102-22-1.5-2.1 B22-08418-2 21-Mar-22			O. Reg. 153	
	Sample I.D.	Date Collected					Tbl. 1 - Agricultural	Tbl. 1 - All
Units	R.L.							
Acenaphthene	µg/g	0.05	< 0.05	< 0.05			0.05	0.072
Acenaphthylene	µg/g	0.05	< 0.05	< 0.05			0.093	0.093
Anthracene	µg/g	0.05	< 0.05	< 0.05			0.05	0.16
Benzo(a)anthracene	µg/g	0.05	< 0.05	< 0.05			0.095	0.36
Benzo(a)pyrene	µg/g	0.05	< 0.05	< 0.05			0.05	0.3
Benzo(b)fluoranthene	µg/g	0.05	< 0.05	< 0.05			0.3	0.47
Benzo(b+k)fluoranthene	µg/g	0.05	< 0.05	< 0.05				
Benzo(g,h,i)perylene	µg/g	0.05	< 0.05	< 0.05			0.2	0.68
Benzo(k)fluoranthene	µg/g	0.05	< 0.05	< 0.05			0.05	0.48
Chrysene	µg/g	0.05	< 0.05	< 0.05			0.18	2.8
Dibenzo(a,h)anthracene	µg/g	0.05	< 0.05	< 0.05			0.1	0.1
Fluoranthene	µg/g	0.05	< 0.05	< 0.05			0.24	0.56
Fluorene	µg/g	0.05	< 0.05	< 0.05			0.05	0.12
Indeno(1,2,3,-cd)pyrene	µg/g	0.05	< 0.05	< 0.05			0.11	0.23
Methylnaphthalene,1-	µg/g	0.05	< 0.05	< 0.05			0.05	0.59
Methylnaphthalene,2-	µg/g	0.05	< 0.05	< 0.05			0.05	0.59
Methylnaphthalene 2-(1-)	µg/g	0.05	< 0.05	< 0.05			0.05	0.59
Naphthalene	µg/g	0.05	< 0.05	< 0.05			0.05	0.09
Phenanthrene	µg/g	0.05	< 0.05	< 0.05			0.19	0.69
Pyrene	µg/g	0.05	< 0.05	< 0.05			0.19	1

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - Agricultural - Table 1 - Agricultural/Other Soil Std
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



Christine Burke
Lab Manager

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REPORT No. B22-08418 (ii)

Report To:

Cambium Environmental

135 Bayfield Street, Unit 102

Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 28-Mar-22

JOB/PROJECT NO.:

DATE REPORTED: 01-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - Agricultural - Table 1 - Agricultural/Other Soil Std
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



R.L. = Reporting Limit

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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke
Lab Manager

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C.O.C.: ---

REPORT No. B22-09735 (i)

Report To:

Cambium Environmental
 135 Bayfield Street, Unit 102
 Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive
 Barrie ON L4N 8W8
 Tel: 705-252-5743
 Fax: 705-252-5746

DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 19-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Metals - ICP-OES	3	Holly Lane	AHM	13-Apr-22	D-ICP-01 (o)	SM 3120
Metals - ICP-MS	3	Holly Lane	TPR	18-Apr-22	D-ICPMS-01 (o)	EPA 200.8

O. Reg. 153 - Soil, Ground Water and Sediment Standards
 Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke
 Lab Manager

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C.O.C.: ---

REPORT No. B22-09735 (i)

Report To:

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135 Bayfield Street, Unit 102
Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 19-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH101 B22-09735-1 06-Apr-22	BH102 B22-09735-2 06-Apr-22	BH202 B22-09735-3 06-Apr-22	O. Reg. 153 Tbl. 1 - GW (µg/L)	
	Units	R.L.					
Antimony	µg/L	0.1	< 0.2	< 0.1	< 0.5	1.5	
Arsenic	µg/L	0.1	0.5	2.7	< 0.5	13	
Barium	µg/L	1	103	207	346	610	
Beryllium	µg/L	0.1	< 0.2	< 0.1	< 0.5	0.5	
Boron	µg/L	5	78	51	47	1700	
Cadmium	µg/L	0.015	< 0.028	< 0.015	< 0.070	0.5	
Chromium	µg/L	2	< 2	< 2	< 2	11	
Cobalt	µg/L	0.1	0.8	0.3	1.0	3.8	
Copper	µg/L	2	< 2	< 2	< 2	5	
Lead	µg/L	0.02	0.08	0.09	0.13	1.9	
Molybdenum	µg/L	0.1	0.4	1.2	2.7	23	
Nickel	µg/L	0.2	2.0	2.6	3.0	14	
Selenium	µg/L	1	< 2	< 1	< 5	5	
Silver	µg/L	0.1	< 0.1	< 0.1	< 0.1	0.3	
Thallium	µg/L	0.05	< 0.1	< 0.05	< 0.3	0.5	
Uranium	µg/L	0.05	0.24	0.55	0.41	8.9	
Vanadium	µg/L	0.1	0.7	0.4	< 0.5	3.9	
Zinc	µg/L	5	5	< 5	< 5	160	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



Christine Burke
Lab Manager

R.L. = Reporting Limit

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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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C.O.C.: ---

REPORT No. B22-09735 (i)

Report To:

Cambium Environmental
135 Bayfield Street, Unit 102
Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 07-Apr-22
DATE REPORTED: 19-Apr-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.:
P.O. NUMBER: 14324-003
WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW (µg/L) - Table 1 - Ground Water

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Christine Burke
Lab Manager

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REPORT No. B22-09735 (ii)

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 135 Bayfield Street, Unit 102
 Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive
 Barrie ON L4N 8W8
 Tel: 705-252-5743
 Fax: 705-252-5746

DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 19-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
PHC(F2-F4)	3	Kingston	KPR	12-Apr-22	C-PHC-W-001 (k)	MOE E3421
VOC's	3	Richmond Hill	JE	12-Apr-22	C-VOC-02 (rh)	EPA 8260
PHC(F1)	3	Richmond Hill	JE	12-Apr-22	C-VPHW-01 (rh)	MOE E3421

O. Reg. 153 - Soil, Ground Water and Sediment Standards
 Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



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Christine Burke
 Lab Manager

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REPORT No. B22-09735 (ii)

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DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 19-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH101 B22-09735-1 06-Apr-22	BH102 B22-09735-2 06-Apr-22	BH202 B22-09735-3 06-Apr-22	O. Reg. 153 Tbl. 1 - GW (µg/L)	
	Units	R.L.					
Acetone	µg/L	30	< 30	< 30	< 30	2700	
Benzene	µg/L	0.5	< 0.5	0.7	< 0.5	0.5	
Bromodichloromethane	µg/L	2	< 2	< 2	< 2	2	
Bromoform	µg/L	5	< 5	< 5	< 5	5	
Bromomethane	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.89	
Carbon Tetrachloride	µg/L	0.2	< 0.2	< 0.2	< 0.2	0.2	
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Chloroform	µg/L	1	< 1	< 1	< 1	2	
Dibromochloromethane	µg/L	2	< 2	< 2	< 2	2	
Dichlorobenzene, 1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichlorobenzene, 1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichlorobenzene, 1,4-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichlorodifluoromethane	µg/L	2	< 2	< 2	< 2	590	
Dichloroethane, 1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichloroethane, 1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichloroethylene, 1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichloroethene, cis-1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloroethene, trans-1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloropropane, 1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichloropropene, cis-1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5		
Dichloropropene, trans-1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5		

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



Christine Burke
Lab Manager

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REPORT No. B22-09735 (ii)

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135 Bayfield Street, Unit 102
Barrie ON L4M 3B3

Attention: Matt Cunningham

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112 Commerce Park Drive
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Tel: 705-252-5743
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DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 19-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH101 B22-09735-1 06-Apr-22	BH102 B22-09735-2 06-Apr-22	BH202 B22-09735-3 06-Apr-22	O. Reg. 153 Tbl. 1 - GW (µg/L)	
	Units	R.L.					
Dichloropropene 1,3-cis+trans	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Ethylbenzene	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dibromoethane, 1,2-(Ethylene Dibromide)	µg/L	0.2	< 0.2	< 0.2	< 0.2	0.2	
Hexane	µg/L	5	< 5	< 5	< 5	5	
Methyl Ethyl Ketone	µg/L	20	< 20	< 20	< 20	400	
Methyl Isobutyl Ketone	µg/L	20	< 20	< 20	< 20	640	
Methyl-t-butyl Ether	µg/L	2	< 2	< 2	< 2	15	
Dichloromethane (Methylene Chloride)	µg/L	5	< 5	< 5	< 5	5	
Styrene	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	1.1	
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Tetrachloroethylene	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Toluene	µg/L	0.5	< 0.5	1.0	0.9	0.8	
Trichloroethane, 1,1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Trichloroethane, 1,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Trichloroethylene	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Trichlorofluoromethane	µg/L	5	< 5	< 5	< 5	150	
Vinyl Chloride	µg/L	0.2	< 0.2	< 0.2	< 0.2	0.5	
Xylene, m,p-	µg/L	1.0	< 1.0	< 1.0	< 1.0		
Xylene, o-	µg/L	0.5	< 0.5	< 0.5	< 0.5		

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



Christine Burke
Lab Manager

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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REPORT No. B22-09735 (ii)

Report To:

Cambium Environmental
135 Bayfield Street, Unit 102
Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 19-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH101 B22-09735-1 06-Apr-22	BH102 B22-09735-2 06-Apr-22	BH202 B22-09735-3 06-Apr-22	O. Reg. 153 Tbl. 1 - GW (µg/L)	
	Units	R.L.					
Xylene, m,p,o-	µg/L	1.1	< 1.1	< 1.1	< 1.1	72	
PHC F1 (C6-C10)	µg/L	25	< 25	< 25	< 25	420	
PHC F2 (>C10-C16)	µg/L	50	< 50	< 50	< 50	150	
PHC F3 (>C16-C34)	µg/L	400	< 400	< 400	< 400	500	
PHC F4 (>C34-C50)	µg/L	400	< 400	< 400	< 400	500	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



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Christine Burke
Lab Manager

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DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 19-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Summary of Exceedances

Table 1 - Ground Water

BH102	Found Value	Limit
Toluene (µg/L)	1.0	0.8
Benzene (µg/L)	0.7	0.5
BH202	Found Value	Limit
Toluene (µg/L)	0.9	0.8

O. Reg. 153 - Soil, Ground Water and Sediment Standards
 Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



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 Lab Manager

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REPORT No. B22-09735 (iii)

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Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive

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DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 19-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
SVOC	3	Kingston	sge	13-Apr-22	C-NAB-W-001 (k)	EPA 8270

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



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Lab Manager

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DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 19-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH101 B22-09735-1 06-Apr-22	BH102 B22-09735-2 06-Apr-22	BH202 B22-09735-3 06-Apr-22	O. Reg. 153 Tbl. 1 - GW (µg/L)	
	Units	R.L.					
Acenaphthene	µg/L	0.05	< 0.05	< 0.05	< 0.05	4.1	
Acenaphthylene	µg/L	0.05	< 0.05	< 0.05	< 0.05	1	
Anthracene	µg/L	0.05	< 0.05	< 0.05	< 0.05	0.1	
Benzo(a)anthracene	µg/L	0.05	< 0.05	0.06	0.06	0.2	
Benzo(a)pyrene	µg/L	0.01	< 0.01	0.018	0.053	0.01	
Benzo(b)fluoranthene	µg/L	0.05	< 0.05	< 0.05	0.06	0.1	
Benzo(b+k)fluoranthene	µg/L	0.1	< 0.1	< 0.1	< 0.1		
Benzo(g,h,i)perylene	µg/L	0.05	< 0.05	< 0.05	< 0.05	0.2	
Benzo(k)fluoranthene	µg/L	0.05	< 0.05	< 0.05	< 0.05	0.1	
Chrysene	µg/L	0.05	< 0.05	< 0.05	0.10	0.1	
Dibenzo(a,h)anthracene	µg/L	0.05	< 0.05	< 0.05	< 0.05	0.2	
Fluoranthene	µg/L	0.05	< 0.05	< 0.05	0.08	0.4	
Fluorene	µg/L	0.05	< 0.05	< 0.05	< 0.05	120	
Indeno(1,2,3,-cd)pyrene	µg/L	0.05	< 0.05	< 0.05	< 0.05	0.2	
Methylnaphthalene,1-	µg/L	0.05	< 0.05	0.07	0.06	2	
Methylnaphthalene,2-	µg/L	0.05	< 0.05	0.06	0.08	2	
Methylnaphthalene 2-(1-)	µg/L	1	< 1	< 1	< 1	2	
Naphthalene	µg/L	0.05	< 0.05	0.09	0.08	7	
Phenanthrene	µg/L	0.05	< 0.05	< 0.05	0.11	0.1	
Pyrene	µg/L	0.05	< 0.05	< 0.05	0.12	0.2	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



Christine Burke
Lab Manager

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DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 19-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Summary of Exceedances

Table 1 - Ground Water

Table 1 - Ground Water		
BH102	Found Value	Limit
Benzo(a)pyrene (µg/L)	0.018	0.01
BH202	Found Value	Limit
Phenanthrene (µg/L)	0.11	0.1
Benzo(a)pyrene (µg/L)	0.053	0.01

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



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Lab Manager

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REPORT No. B22-09740 (i)

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Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 14-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Cyanide	4	Kingston	kwe	13-Apr-22	A-CN s K	in house
Conductivity	4	Holly Lane	ST	12-Apr-22	A-COND-01 (o)	SM 2510B
pH	4	Richmond Hill	nka	11-Apr-22	A-pH-02 (rh)	MOEE3530
Chromium (VI)	4	Holly Lane	ST	13-Apr-22	D-CRVI-02 (o)	EPA7196A
Mercury	4	Holly Lane	NHG	13-Apr-22	D-HG-01 (o)	EPA 7471A
Boron - HWS	4	Holly Lane	AHM	13-Apr-22	D-HWE s	MOE3470
Sodium Adsorption Ratio	4	Holly Lane	AHM	13-Apr-22	D-ICP-01 SAR (o)	SM 3120
Metals - ICP-OES	4	Holly Lane	AHM	13-Apr-22	D-ICP-02 (o)	EPA 6010
Metals - ICP-MS	4	Holly Lane	TPR	13-Apr-22	D-ICPMS-01 (o)	EPA 6020

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

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

nC10, nC16 and nC34 response factors within 10% of each other:

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

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met. If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC QC will be made available upon request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



Christine Burke
Lab Manager

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REPORT No. B22-09740 (i)

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Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
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DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 14-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.			BH201_1.52-2.29	BH202_0.22-0.61	BH101-22_0.0-0.61	BH102-22_0.0-0.61	O. Reg. 153	
Sample I.D.			B22-09740-1	B22-09740-3	B22-09740-5	B22-09740-6	Tbl. 1 - All	
Date Collected			04-Apr-22	04-Apr-22	04-Apr-22	04-Apr-22		
Parameter	Units	R.L.						
pH @25°C	pH Units		7.98	10.5	7.70	7.54		
Conductivity @25°C	mS/cm	0.001	0.181	0.298	0.144	0.175	0.57	
Cyanide (Free)	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.051	
Sodium Adsorption Ratio	units		1.49	0.0924	0.0470	0.0514	2.4	
Antimony	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.3	
Arsenic	µg/g	0.5	1.4	1.8	1.5	1.8	18	
Barium	µg/g	1	30	48	42	44	220	
Beryllium	µg/g	0.2	0.2	0.2	0.2	0.2	2.5	
Boron	µg/g	0.5	4.7	5.4	4.0	5.1	36	
Boron (HWS)	µg/g	0.02	0.03	0.04	0.09	0.13		
Cadmium	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2	
Chromium	µg/g	1	12	11	9	10	70	
Chromium (VI)	µg/g	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.66	
Cobalt	µg/g	1	3	3	3	3	21	
Copper	µg/g	1	6	9	6	7	92	
Lead	µg/g	5	5	26	7	38	120	
Mercury	µg/g	0.005	0.007	0.016	0.025	0.023	0.27	
Molybdenum	µg/g	1	< 1	< 1	< 1	< 1	2	
Nickel	µg/g	1	7	6	6	6	82	
Selenium	µg/g	0.5	0.5	0.6	0.5	0.6	1.5	
Silver	µg/g	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.5	
Thallium	µg/g	0.1	< 0.1	< 0.1	< 0.1	< 0.1	1	
Uranium	µg/g	0.1	0.4	0.5	0.4	0.4	2.5	
Vanadium	µg/g	1	16	18	18	19	86	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



Christine Burke
Lab Manager

R.L. = Reporting Limit

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C.O.C.: ---

REPORT No. B22-09740 (i)

Report To:

Cambium Environmental
135 Bayfield Street, Unit 102
Barrie ON L4M 3B3

Attention: Matt Cunningham

Caduceon Environmental Laboratories

112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 14-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

			Client I.D.	BH201_1.52-2.29	BH202_0.22-0.61	BH101-22_0.0-0.61	BH102-22_0.0-0.61	O. Reg. 153 Tbl. 1 - All	
			Sample I.D.	B22-09740-1	B22-09740-3	B22-09740-5	B22-09740-6		
			Date Collected	04-Apr-22	04-Apr-22	04-Apr-22	04-Apr-22		
Parameter	Units	R.L.							
Zinc	µg/g	3		30	38	27	49	290	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



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DATE RECEIVED: 07-Apr-22

DATE REPORTED: 14-Apr-22

SAMPLE MATRIX: Soil

JOB/PROJECT NO.:

P.O. NUMBER: 14324-003

WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun

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JOB/PROJECT NO.:

DATE REPORTED: 14-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
% Moisture	2	Richmond Hill	FAL	11-Apr-22	A-% moisture RH	
PHC(F2-F4)	2	Kingston	KPR	11-Apr-22	C-PHC-S-001 (k)	CWS Tier 1
VOC's	2	Richmond Hill	FAL	08-Apr-22	C-VOC-02 (rh)	EPA 8260
PHC(F1)	2	Richmond Hill	FAL	08-Apr-22	C-VPHS-01 (rh)	CWS Tier 1

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

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

nC10,nC16 and nC34 response factors within 10% of each other:

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

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met. If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC QC will be made available upon request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



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Lab Manager

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DATE REPORTED: 14-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.			BH201_3.05-3.66	BH202_2.13-3.05	O. Reg. 153		
Sample I.D.			B22-09740-2	B22-09740-4	Tbl. 1 - All		
Date Collected			04-Apr-22	04-Apr-22			
Parameter	Units	R.L.					
Acetone	µg/g	0.5	< 0.5	< 0.5		0.5	
Benzene	µg/g	0.02	< 0.02	< 0.02		0.02	
Bromodichloromethane	µg/g	0.02	< 0.02	< 0.02		0.05	
Bromoform	µg/g	0.02	< 0.02	< 0.02		0.05	
Bromomethane	µg/g	0.05	< 0.05	< 0.05		0.05	
Carbon Tetrachloride	µg/g	0.05	< 0.05	< 0.05		0.05	
Monochlorobenzene (Chlorobenzene)	µg/g	0.02	< 0.02	< 0.02		0.05	
Chloroform	µg/g	0.02	< 0.02	< 0.02		0.05	
Dibromochloromethane	µg/g	0.02	< 0.02	< 0.02		0.05	
Dichlorobenzene, 1,2-	µg/g	0.05	< 0.05	< 0.05		0.05	
Dichlorobenzene, 1,3-	µg/g	0.05	< 0.05	< 0.05		0.05	
Dichlorobenzene, 1,4-	µg/g	0.05	< 0.05	< 0.05		0.05	
Dichlorodifluoromethane	µg/g	0.05	< 0.05	< 0.05		0.05	
Dichloroethane, 1,1-	µg/g	0.02	< 0.02	< 0.02		0.05	
Dichloroethane, 1,2-	µg/g	0.02	< 0.02	< 0.02		0.05	
Dichloroethylene, 1,1-	µg/g	0.02	< 0.02	< 0.02		0.05	
Dichloroethene, cis-1,2-	µg/g	0.02	< 0.02	< 0.02		0.05	
Dichloroethene, trans-1,2-	µg/g	0.02	< 0.02	< 0.02		0.05	
Dichloropropane, 1,2-	µg/g	0.02	< 0.02	< 0.02		0.05	
Dichloropropene, cis-1,3-	µg/g	0.02	< 0.02	< 0.02			
Dichloropropene, trans-1,3-	µg/g	0.02	< 0.02	< 0.02			

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



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Lab Manager

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DATE REPORTED: 14-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.			BH201_3.05-3.66	BH202_2.13-3.05			O. Reg. 153	
Sample I.D.			B22-09740-2	B22-09740-4			Tbl. 1 - All	
Date Collected			04-Apr-22	04-Apr-22				
Parameter	Units	R.L.						
Dichloropropene 1,3-cis+trans	µg/g	0.02	< 0.02	< 0.02			0.05	
Ethylbenzene	µg/g	0.05	< 0.05	< 0.05			0.05	
Dibromoethane,1,2-(Ethylene Dibromide)	µg/g	0.02	< 0.02	< 0.02			0.05	
Hexane	µg/g	0.02	< 0.02	< 0.02			0.05	
Methyl Ethyl Ketone	µg/g	0.5	< 0.5	< 0.5			0.5	
Methyl Isobutyl Ketone	µg/g	0.5	< 0.5	< 0.5			0.5	
Methyl-t-butyl Ether	µg/g	0.05	< 0.05	< 0.05			0.05	
Dichloromethane (Methylene Chloride)	µg/g	0.05	< 0.05	< 0.05			0.05	
Styrene	µg/g	0.05	< 0.05	< 0.05			0.05	
Tetrachloroethane,1,1,1,2-	µg/g	0.02	< 0.02	< 0.02			0.05	
Tetrachloroethane,1,1,2,2-	µg/g	0.05	< 0.05	< 0.05			0.05	
Tetrachloroethylene	µg/g	0.05	< 0.05	< 0.05			0.05	
Toluene	µg/g	0.2	< 0.2	< 0.2			0.2	
Trichloroethane,1,1,1-	µg/g	0.02	< 0.02	< 0.02			0.05	
Trichloroethane,1,1,2-	µg/g	0.02	< 0.02	< 0.02			0.05	
Trichloroethylene	µg/g	0.05	< 0.05	< 0.05			0.05	
Trichlorofluoromethane	µg/g	0.02	< 0.02	< 0.02			0.25	
Vinyl Chloride	µg/g	0.02	< 0.02	< 0.02			0.02	
Xylene, m,p-	µg/g	0.03	< 0.03	< 0.03				

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



Christine Burke
Lab Manager

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Attention: Matt Cunningham

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112 Commerce Park Drive
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Fax: 705-252-5746

DATE RECEIVED: 07-Apr-22

JOB/PROJECT NO.:

DATE REPORTED: 14-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.			BH201_3.05-3.66	BH202_2.13-3.05			O. Reg. 153	
Sample I.D.			B22-09740-2	B22-09740-4			Tbl. 1 - All	
Date Collected			04-Apr-22	04-Apr-22				
Parameter	Units	R.L.						
Xylene, o-	µg/g	0.03	< 0.03	< 0.03				
Xylene, m,p,o-	µg/g	0.03	< 0.03	< 0.03			0.05	
PHC F1 (C6-C10)	µg/g	10	< 10	< 10			25	
PHC F1 - BTEX	µg/g	10	< 10	< 10			25	
PHC F2 (>C10-C16)	µg/g	5	< 5	< 5			10	
PHC F3 (>C16-C34)	µg/g	10	< 10	10			240	
PHC F4 (>C34-C50)	µg/g	10	< 10	< 10			120	
% moisture	%		8.9	7.5				

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



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Tel: 705-252-5743

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DATE REPORTED: 14-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
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Lab Manager

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JOB/PROJECT NO.:

DATE REPORTED: 14-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
SVOC	2	Kingston	sge	12-Apr-22	C-NAB-S-001 (k)	EPA 8270

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

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

nC10,nC16 and nC34 response factors within 10% of each other:

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

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met. If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC QC will be made available upon request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



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DATE REPORTED: 14-Apr-22

P.O. NUMBER: 14324-003

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.			BH201_3.05-3.66	BH202_2.13-3.05			O. Reg. 153	
Sample I.D.			B22-09740-2	B22-09740-4			Tbl. 1 - All	
Date Collected			04-Apr-22	04-Apr-22				
Parameter	Units	R.L.						
Acenaphthene	µg/g	0.05	< 0.05	< 0.05			0.072	
Acenaphthylene	µg/g	0.05	< 0.05	< 0.05			0.093	
Anthracene	µg/g	0.05	< 0.05	< 0.05			0.16	
Benzo(a)anthracene	µg/g	0.05	< 0.05	< 0.05			0.36	
Benzo(a)pyrene	µg/g	0.05	< 0.05	< 0.05			0.3	
Benzo(b)fluoranthene	µg/g	0.05	< 0.05	< 0.05			0.47	
Benzo(b+k)fluoranthene	µg/g	0.05	< 0.05	< 0.05				
Benzo(g,h,i)perylene	µg/g	0.05	< 0.05	< 0.05			0.68	
Benzo(k)fluoranthene	µg/g	0.05	< 0.05	< 0.05			0.48	
Chrysene	µg/g	0.05	< 0.05	< 0.05			2.8	
Dibenzo(a,h)anthracene	µg/g	0.05	< 0.05	< 0.05			0.1	
Fluoranthene	µg/g	0.05	< 0.05	< 0.05			0.56	
Fluorene	µg/g	0.05	< 0.05	< 0.05			0.12	
Indeno(1,2,3,-cd)pyrene	µg/g	0.05	< 0.05	< 0.05			0.23	
Methylnaphthalene,1-	µg/g	0.05	< 0.05	< 0.05			0.59	
Methylnaphthalene,2-	µg/g	0.05	< 0.05	< 0.05			0.59	
Methylnaphthalene 2-(1-)	µg/g	0.05	< 0.05	< 0.05			0.59	
Naphthalene	µg/g	0.05	< 0.05	< 0.05			0.09	
Phenanthrene	µg/g	0.05	< 0.05	< 0.05			0.69	
Pyrene	µg/g	0.05	< 0.05	< 0.05			1	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun



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DATE RECEIVED: 07-Apr-22

DATE REPORTED: 14-Apr-22

SAMPLE MATRIX: Soil

JOB/PROJECT NO.:

P.O. NUMBER: 14324-003

WATERWORKS NO.

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Appendix D

Curriculum Vitae



NATALIE WRIGHT, P.Eng., PMP

Project Manager

Ms. Wright holds a Bachelor of Engineering degree from Western University and a Post-Graduate Certificate in Environmental Engineering Applications from Conestoga College. Ms. Wright is a licensed Professional Engineer (P.Eng.) with Professional Engineers Ontario (PEO) and is a Qualified Person (QP_{ESA}) for Environmental Site Assessments under the Environmental Protection Act. Ms. Wright is certified as a Project Management Professional (PMP) with the Project Management Institute. Ms. Wright's professional experience includes over 7 years in the environmental consulting industry, where she has developed extensive experience completing Environmental Site Assessments, remediation projects, monitoring of Brownfield sites, and excess soils management.

SUMMARY OF PROFESSIONAL EXPERIENCE

- | | |
|----------------|--|
| 2015 - Present | Project Manager. Cambium Inc.
Barrie, Ontario, Canada
<i>Ms. Wright's responsibilities include the supervision and management of projects related to brownfield redevelopment, environmental site assessments, soil and groundwater remediation, and excess soil management. Ms. Wright has extensive experience with proposal and report preparation, data interpretation, and review of final reports.</i> |
| 2013 - 2015 | Environmental Scientist. MTE Consultants Inc.
Kitchener, Ontario, Canada
<i>Completed environmental site assessments for various industrial, commercial, and residential properties and for future filing for Records of Site Condition. Responsibilities included conducting site inspections, designing work plans, driller supervision, sampling, surveying, and completion of final reports.</i> |
| 2011 | Water Resources Intern. Water Resources Commission
Bolgatanga, Upper East Region, Ghana
<i>Conducted field visits and met with community members and government representatives to assess the progress of projects in rainwater harvesting, environmental restoration, and climate change adaptation.</i> |
| 2008-2011 | Project Manager. Teva Canada Limited
Toronto, Ontario, Canada
<i>Led the successful launch of products in 10 European countries ensuring all country-specific regulatory, quality and design requirements were met. Designed detailed phase-in plans to complete a successful company name change preventing product supply and service interruptions.</i> |

EDUCATION

- | | |
|------|--|
| 2013 | Environmental Engineering Applications, Post-Graduate Certificate. Conestoga College
Cambridge, Ontario, Canada |
| 2010 | Project Management Professional Certification. Project Management Institute
Toronto, Ontario, Canada |
| 2004 | Bachelor of Engineering Science, Chemical Engineering. Western University
London, Ontario, Canada |



SELECTED EXPERIENCE

RISK MANAGEMENT MONITORING AND ENVIRONMENTAL PROTECTION – ORILLIA, ONTARIO

Annual assessment of on- and off-site groundwater, surface water and sediment sampling, soil vapour sampling, in addition to an ecological assessment of plants, the aquatic community, and wildlife. Environmental services are conducted as per the Certificate of Property Use (CPU) and the Risk Management Measures developed for the site.

Once approved for development, the City moved forward to prepare the site as home for their future Recreation Centre. Cambium continues to work on the project as an environmental consultant for the use and management of this brownfield site. Activities coordinated or completed by Ms. Wright include dewatering treatment system sampling, construction air monitoring, soil and water sampling, risk management measures oversight, soil management, etc.

FORMER BULK FUEL PLAN AND RETAIL SERVICE STATION, PHASE ONE AND PHASE TWO ESA AND RSC – PETERBOROUGH, ONTARIO

Phase One and Phase Two ESA conducted at a former bulk fuel plant and retail service station site to summarize existing conditions, including the delineation of soil and groundwater impacts (PHCs, PAHs and metals), for the purpose of filing an RSC.

RECORD OF SITE CONDITION (RSC)

Successful filing and acceptance by the MECP of RSCs for numerous sites of varying complexity throughout the GTA, including the required framework for completion of Risk Assessments. Ms. Wright designed Phase One and Two Environmental Site Assessment (ESA) work plans, conducted fieldwork and/or coordinated field staff for the collection of soil and groundwater samples, completed Phase One and Two ESA reports in accordance with O.Reg. 153/04, and corresponded with the MECP on the filing and review process.

LIMITED PHASE II ESA AND REMEDIATION OF HEATING TANK SPILL – TINY, ONTARIO

A limited Phase II ESA conducted determined the presence of environmental impacts resulting from an oil spill at a residential property. Scope consisted of a soil investigation conducted by use of a hand auger, and advancing up to 7 boreholes in the vicinity of the suspected spills. Contaminants of concern included petroleum hydrocarbons (PHC) fractions 1 through 4 (F1-F4), and benzene, toluene, ethylbenzene, and xylenes (BTEX). Cambium completed confirmatory soil and groundwater sampling following the excavation of impacted soils located beneath the basement floor, in addition to a temporary monitoring well. The remediation was successful with no significant environmental liability in soil or groundwater.



MATTHEW CUNNINGHAM, C.E.T., T.Ag.

Project Coordinator

Mr. Cunningham graduated from McMaster University in 2011 with an Honours Degree in Physical Geography and Environmental Studies, and from Niagara College with a Post Graduate Diploma in Environmental Management and Assessment in 2012, and is currently employed as an Environmental Technologist with Cambium. Mr. Cunningham's professional experience includes 6 years in the environmental consulting industry, during which he has developed extensive experience completing Phase I and Phase II Environmental Site Assessments, Pre-Disturbance Soil and Vegetation Assessments, Contaminated Site Remediation projects, Environmental Monitoring for construction sites and large scale oil and gas facilities, Peatland Assessments, and he has personally overseen over 15,000 soil inspection sites.

SUMMARY OF PROFESSIONAL EXPERIENCE

2015 – Present Project Coordinator, Cambium Inc.

Barrie, Ontario, Canada

Mr. Cunningham's responsibilities include project support, coordination, and field work related to environmental site assessments, soil and groundwater remediation, Feed-In Tariff Land Evaluation Assessments, and environmental monitoring at construction and contaminated sites. Mr. Cunningham has extensive experience with report preparation including project costing, data compilation, interpretation, and completion of final reports.

2012 – 2015 Project Manager, Navus Environmental.

Edmonton, Alberta, Canada

Mr. Cunningham's responsibilities included project coordination and field work related to Pre-Disturbance Assessments, Environmental Oilfield Site Monitoring, Site Remediation, Phase I and Phase II Environmental Site Assessments, Peatland Assessments, Vegetation Assessments, and Long-Term Plot Network Assessments in accordance with applicable provincial and federal standards. Mr. Cunningham was involved with providing project proposals and costing for all aspects of a project, the scheduling of staff and field work, arranging for required sub-contractors, hiring and training new staff, and analyzing and interpreting the field data in order to write the related reports.

PROFESSIONAL ASSOCIATIONS

- Certified Engineering Technologist (CET); Ontario Association of Certified Engineering Technicians and Technologists
- Technical Agrologist (T.Ag); Ontario Institute of Agrologists



EDUCATION & TRAINING

- 2018 Class II Backpack Electrofishing Certification
- 2015 Standard First Aid Recertification
Ground Disturbance Level II Training
ATV Safety Training Recertification
Wildlife Awareness Training Recertification
Workplace Hazardous Materials Information System Training
- 2014 Wilderness First Aid Training Level III
- 2012 Post Graduate Diploma in Environmental Management and Assessment,
Niagara College, Saint Catharines, Ontario, Canada
- 2011 Honours Bachelor of Arts in Geography and Environmental Studies,
McMaster University, Hamilton, Ontario, Canada

SELECTED PROJECT EXPERIENCE

ENVIRONMENTAL SITE ASSESSMENTS – ALBERTA & ONTARIO: 2012 - 2021

Mr. Cunningham has completed multiple Phase I and Phase II Environmental Site Assessments on Brownfield sites, existing commercial and industrial properties, vacant lands, and residential properties to evaluate environmental liability for clients. Phase I assessments typically require a desktop review of historical materials, a site walkover, personnel interviews and report preparation. Phase II assessments typically require a detailed subsurface investigation that includes the excavation of test pits or boreholes, advancement of overburden and bedrock groundwater wells, obtaining overburden soil samples and groundwater samples, and report preparation. These subsurface investigations determine the extent of contamination, if any, and to delineate both horizontally and vertically, the area of impact.

IMPACTED SOIL REMEDIATION

Orillia, Ontario: 2017 to 2018 – Project included the remediation of 16,177 tonnes of contaminated soil impacted by petroleum hydrocarbons at an abandoned industrial yard in Orillia, Ontario. The work involved the delineation and excavating of impacted material, the removal of below-ground piping, the disposal of impacted material at a suitable landfill facility, and backfilling and contouring the excavation.

Camrose, Alberta: 2013 – Project included the remediation of 21,678 tonnes of contaminated soil impacted by produced water and petroleum hydrocarbons at a sour-gas plant near Camrose, Alberta. The



work involved the delineation and excavating of impacted material, the removal of five underground storage tanks and associated above-ground and below-ground piping, the disposal of impacted material at a suitable landfill facility, and backfilling and contouring the excavation.

Bonnyville, Alberta: 2012 – Project included the remediation of 40,509 tonnes of contaminated soil caused by a brackish water leak at a sand holding facility near Bonnyville, Alberta. The work involved the delineation and excavating of impacted material, the disposal of impacted material at a suitable landfill facility, and backfilling and contouring the excavation.

ENVIRONMENTAL MONITORING – ORILLIA RECREATION CENTRE – ONTARIO

Environmental Specialist for the construction of Orillia, Ontario's Recreation Centre facility. Within this project, Mr. Cunningham's role included risk management and mitigation, PHC remediation, DNAPL air monitoring system installation and inspections, ongoing sampling for groundwater, sediment, soil vapour, air quality and surface water monitoring, and daily, monthly and annual reporting duties.

LAND EVALUATION AND SOIL STUDY – ONTARIO

Mr. Cunningham completed the work necessary to classify a 60 hectare site for a FIT Land Evaluation Study. Within this project Mr. Cunningham's role included: planning field logistics, data and sample collection, soil database development, soil and vegetation mapping, and reporting. Using the analysis of the FIT Land Evaluation soil survey data and laboratory analysis data, a determination of soil subclasses and a final CLI class was achieved; each of the subclasses were reviewed to determine the breadth of severity of potentially limiting factors for soil productivity and crop production.

PRE-DISTURBANCE ASSESSMENTS – ALBERTA: 2012 - 2015

Completion of detailed large-scale pre-disturbance vegetation and soil assessment projects in remote-access northern Alberta for sites up to 400 hectares in size. Within these projects Mr. Cunningham's role included the hiring and training of new staff, planning field logistics, client coordination, daily cost tracking, and billing, acting as a field lead, daily data QA/QC, data entry QA/QC, soil database development, soil and vegetation mapping, and reporting.

ENVIRONMENTAL MONITORING – STEAM ASSISTED GRAVITY DRAINAGE (SAGD) OILFIELD FACILITY – LAC LA BICHE AND COLD LAKE, ALBERTA: 2012 - 2015

Environmental Coordinator and Environmental Site Specialist for two SAGD facilities based in the Lac La Biche and Cold Lake areas of Alberta. Within these projects Mr. Cunningham's role included training new staff, client coordination, daily cost tracking and billing, soil salvage monitoring, wildlife monitoring and



reporting, GIS technician, spill response, drilling for subsurface investigations, groundwater well sampling and characterization, soil sampling and characterization, and daily reporting duties.