



Phase II Environmental Site Assessment - 24 Alfred Street South, Thornbury, Ontario

February 10, 2022

Prepared for:
Pheasant Run Realty Holdings Inc.

Cambium Reference: 13303-001

CAMBIUM INC.

866.217.7900

cambium-inc.com

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Executive Summary

Pheasant Run Realty Holdings Inc. (Client) retained Cambium Inc. (Cambium) to complete a Phase II Environmental Site Assessment (ESA) at 24 Alfred Street South. The 0.97 ha Site consists of a vacant land parcel.

Cambium completed a Phase I ESA for the Site that identified potential off-site sources of contamination related to a former retail fuel outlet and a current automotive mechanic shop at 102 Bruce Street South.

The Phase II ESA included two boreholes, completed as groundwater monitoring wells. Two groundwater samples were submitted for laboratory analysis of contaminants of potential concern (COPCs): volatile organic compounds (VOCs), petroleum hydrocarbons (PHC F1-F4), polycyclic aromatic hydrocarbons (PAHs), and metals in groundwater.

The laboratory analysis results indicated that all analysed COPCs in the submitted groundwater samples met the applicable regulatory standards.

Cambium recommends the following work at the Site:

- When no longer required, all monitoring wells should be abandoned as per the requirements of R.R.O. 1990, Regulation 903 - Wells.
- Purge water is considered inert and can be disposed on the property, and in accordance with the regional sewer use by-law, and the drums recycled. Alternatively, Cambium can arrange for its removal from the Site.



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1.0 Introduction

Pheasant Run Realty Holdings Inc. retained Cambium to complete a Phase II ESA at 24 Alfred Street South, Thornbury, 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, 2021) identified potential off-site sources of contamination related to the operation of an historical retail fuel outlet with underground storage tanks (USTs) and the current operation of an automotive mechanic shop at 102 Bruce Street South. These off-site sources are considered an environmental concern for the Site.



2.0 Site Description

The Site consists of a 0.97 ha (2.40 acre) irregular land parcel at 24 Alfred Street in Thornbury, Ontario. The Universal Transverse Mercator coordinates for the centre of the Site are Zone 17T, 543,046 m east, 4,934,123 m north. The site location is shown on Figure 1.

The Site is vacant. The Site is generally flat, with a gradual slope down to the northwest. The Site is surrounded by residential properties, with the southwest portion of the Site fronting on Alfred Street.

2.1 Scope of Work

In accordance with our work plan and proposal to the Client dated August 26, 2021, Cambium conducted the following activities as part of the Phase II ESA.

- Determine contaminants of potential concern (COPCs) and areas of potential environmental concern.
- Obtained public locates for identification of buried services and utilities via Ontario One Call.
- 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 two boreholes and install two monitoring well 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).



2.2 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 residential property in Thornbury.
- The Site and surrounding properties rely on a municipal water supply that relies on a surface water source (no groundwater)
- The Site is not within or adjacent to an area of natural significance and does not include land within 30 m of such an area. Additionally, laboratory results identified soil pH for surface and subsurface soil were within the acceptable ranges of 5 to 9 and 5 to 11, respectively. As such, the Site is not environmentally sensitive as per Section 41 of O.Reg. 153/04.
- The average native 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 is not applicable.
- The Site is not 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 does not apply.
- The average depth to groundwater was less than 3 m below ground surface (mbgs); therefore, the SCS for shallow soil were considered applicable to account for potential deceased biodegradation and groundwater dilution and increased vapour to indoor air migration.

Based on the review of site characteristics, the Table 7 generic SCS for shallow soils in a non-potable ground water condition for residential 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 PHC F1-F4, VOCs, 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. Utility Marx attended the Site on November 4, 2021, to provide clearance for buried services at the proposed drilling locations. The drilling locations were clear of utilities.

On November 10, 2021, Strata Drilling Group advanced two boreholes (BH201 and BH202) to a maximum depth of 4.57 m below ground surface (mbgs) using a track-mounted Geoprobe drilling rig.

Boreholes were advanced at two locations along the south property boundary (Figure 2). Borehole logs are provided in Appendix A.

Samples were collected consistent with accepted industry practices and regulatory guidance. During the drilling program, soil samples were collected in 0.61 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. 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 A.

3.2 Monitoring Well Installation

BH201 and BH202 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. The 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. A steel monument style protective cover was cemented in place at the ground surface to protect the well from damage. Well construction details are shown on the borehole logs in Appendix A.

3.3 Groundwater Sampling

Following installation, the monitoring well was purged of a minimum of 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 November 15, 2021, the depth to groundwater was measured at monitoring wells BH201 and BH202 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 AlconoxTM soap and water and rinsed with distilled water to reduce the potential for cross-contamination between the monitoring wells.

The groundwater wells were purged to remove stagnant water from the well prior to sampling using the micropurge method. Groundwater samples were collected when groundwater parameters stabilized using a low-flow sampling technique via a peristaltic pump and



dedicated polyethylene tubing installed in the well. Field staff wore nitrile sample gloves while collecting the groundwater samples.

The groundwater analysis results are discussed in Section 4.3.

3.4 Laboratory Testing and Analysis

Groundwater samples were maintained at a temperature less than 10°C. Samples were transported to Caduceon Environmental Laboratories (Caduceon), a CALA accredited analytical laboratory in Barrie, Ontario, for analysis of PHC F1-F4, VOCs, 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 B.



4.0 Results

4.1 Stratigraphy

Subsurface conditions at the Site generally consisted of topsoil, silt, and sand underlain by silt. There was no olfactory evidence of hydrocarbon contamination detected in the soil samples recovered from the boreholes.

Bedrock was not encountered during the drilling program.

4.2 Water levels and Flow Direction

Depth to groundwater ranged from 0.84 to 0.86 mbgs on November 15, 2021.

4.3 Groundwater Quality

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

The submitted groundwater samples met the Table 7 SCS. The groundwater analysis results are provided in Appendix B.

4.4 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 two boreholes, completed as groundwater monitoring wells.

Two groundwater samples were submitted for laboratory analysis of the identified COPCs.

The laboratory analysis results indicated that all groundwaters samples met the applicable regulatory standards.

Cambium recommends the following work at the Site:

- When no longer required, all monitoring wells should be abandoned as per the requirements of R.R.O. 1990, Regulation 903 - Wells.
- Purge water is considered inert and can be disposed on the property, and in accordance with the regional sewer use by-law, and the drums recycled. Alternatively, Cambium can arrange for its removal from the Site.



6.0 Qualifications of the Assessor

This Phase II ESA was completed under the supervision of Ms. Natalie Wright, P.Eng. Credentials are presented in Appendix C. Information presented in this report is true and accurate to the best of the assessors' knowledge.

Respectfully submitted,

Cambium Inc.

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

Natalie Wright, P.Eng., PMP
Project Manager

NCW/mc

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7.0 References

- Cambium. (2021). *Phase I Environmental Site Assessment - 24 Alfred St South, Thornbury, ON*. Cambium Inc. August 13, 2021.
- 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 Qualifications and 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.

Reliance on Materials and Information

The findings and results presented in reports prepared by Cambium are based on the materials and information provided by the client to Cambium and on the facts, conditions and circumstances encountered by Cambium during the performance of the work requested by the client. In formulating its findings and results into a report, Cambium assumes that the information and materials provided by the client or obtained by Cambium from the client or otherwise are factual, accurate and represent a true depiction of the circumstances that exist. Cambium relies on its client to inform Cambium if there are changes to any such information and materials. Cambium does not review, analyze, or attempt to verify the accuracy or completeness of the information or materials provided, or circumstances encountered, other than in accordance with applicable accepted industry practice. Cambium will not be responsible for matters arising from incomplete, incorrect, or misleading information or from facts or circumstances that are not fully disclosed to or that are concealed from Cambium during the provision of services, work, or reports.

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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.

Only conditions at the site and locations chosen for study by the client are evaluated; no adjacent or other properties are evaluated unless specifically requested by the client. Any physical or other aspects of the site chosen for study by the client, or any other matter not specifically addressed in a report prepared by Cambium, are beyond the scope of the work performed by Cambium and such matters have not been investigated or addressed.

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Limitation of Liability

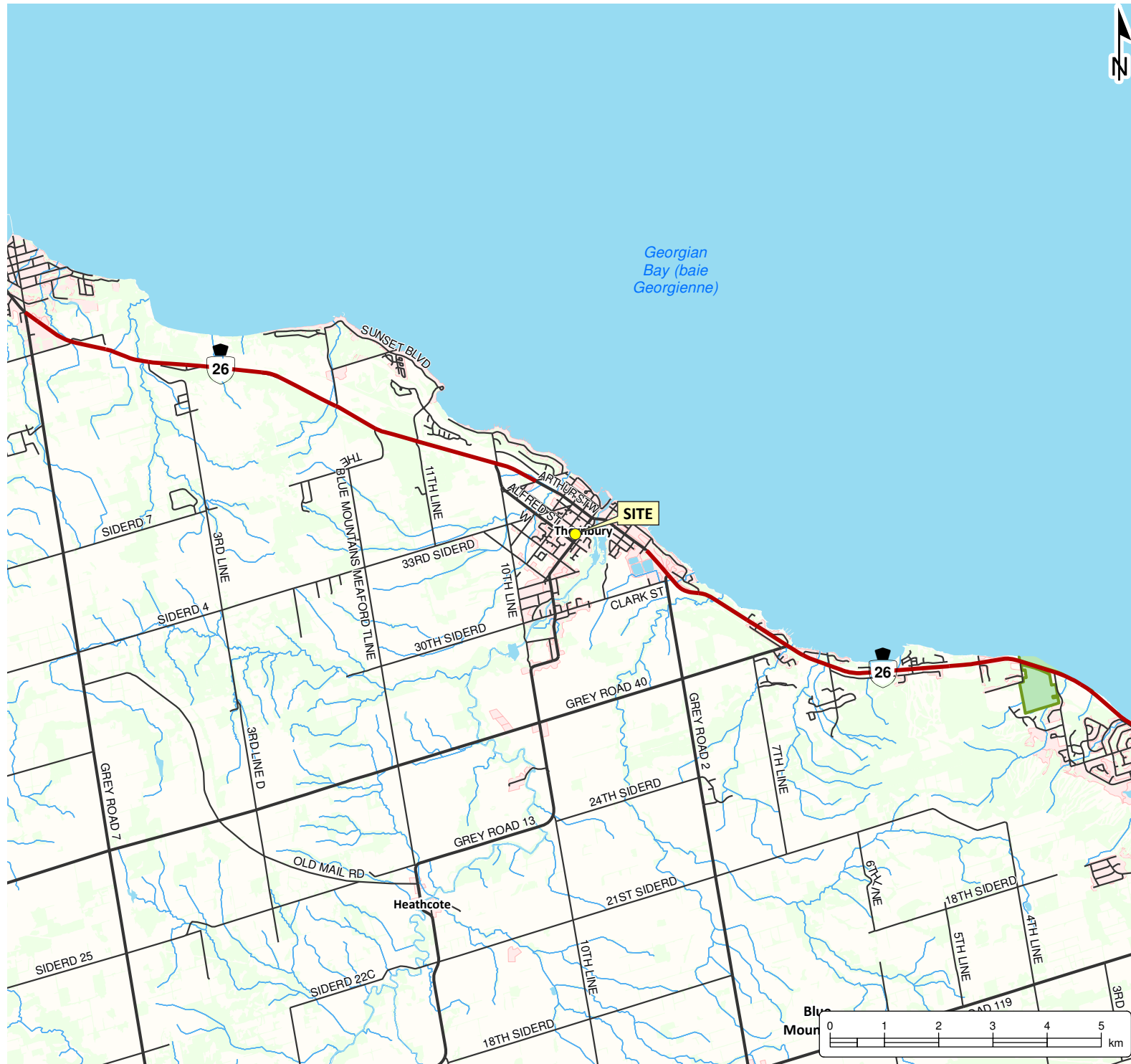
Potential liability to the client arising out of the report is limited to the amount of Cambium's professional liability insurance coverage. Cambium shall only be liable for direct damages to the extent caused by Cambium's negligence and/or breach of contract. Cambium shall not be liable for consequential damages.

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Figures



PHASE II ENVIRONMENTAL SITE ASSESSMENT PHEASANT RUN REALTY HOLDINGS INC. 24 Alfred Street South, Thornbury, Ontario

LEGEND

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

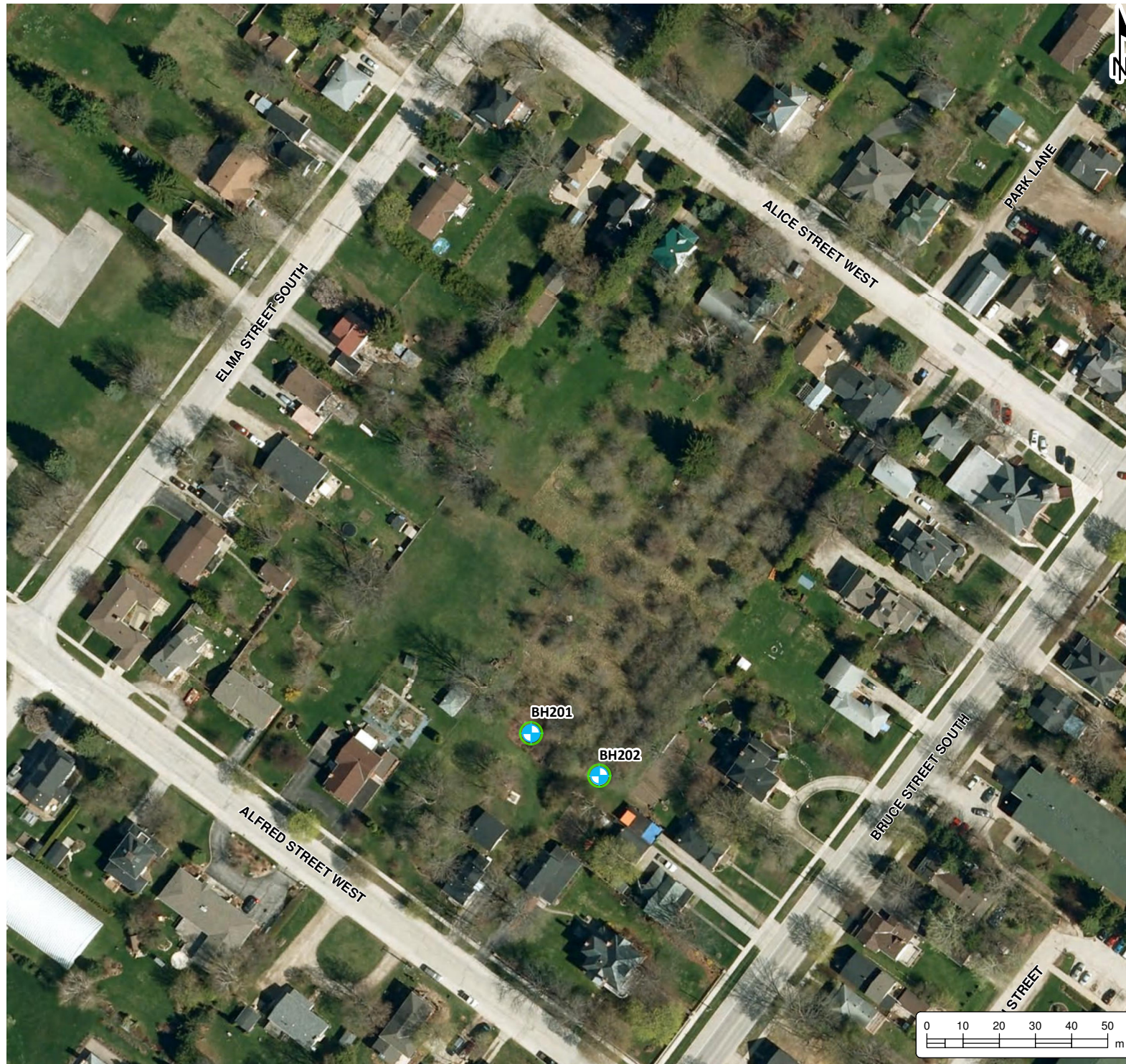
Notes:
- Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort 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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Peterborough, Ontario, K9H 1E5
Tel: (705) 742.7900 Fax: (705) 742.7907
www.cambium-inc.com

SITE LOCATION MAP

Project No.: 13303-001	Date: December 2021
Scale: 1:100,000	Rev.: NAD 1983 UTM Zone 17N
Created by: TLC	Checked by: NW
Figure: 1	



**PHASE II ENVIRONMENTAL
SITE ASSESSMENT**
PHEASANT RUN
REALTY HOLDINGS INC.
24 Alfred Street South,
Thornbury, Ontario

LEGEND

- Monitoring Well
- Meets Table 7, SCS
- Exceeds Table 7, SCS

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 PLAN

Project No.:	13303-001	Date:	December 2021
Scale:	1:1,500	Rev.:	
Created by:	TLC	Projection:	NAD 1983 UTM Zone 17N
Checked by:	NW	Figure:	2



Appendix A

Borehole Logs



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

Log of Borehole:

BH201

Page 1 of 1

Client: Pheasant Run Realty Holdings Inc.
Contractor: Strata Drilling Group
Location: 24 Alfred St W, Thornbury, ON

Project Name: Phase II ESA
Method: Direct Push
UTM: -

Project No.: 13303-001
Date Completed: 2021-11-10
Elevation: -

SUBSURFACE PROFILE				SAMPLING INFO					Well Installation	Remarks
Elevation (m)	Depth (m)	Lithology	Description	Number	% Recovery	Type	CSV (ppm)	OV (ppm)		
0			Topsoil: Dark brown, moist, no odour, no staining				< 2	< 2		WL measured at 0.86 mbgs on Nov 15, 2021 Groundwater analysis: VOCs, PHCs, PAHs, metals
			Sand: Medium brown, trace gravel, moist, no odour, no staining		70		< 2	< 2		
-1	1		Silt: Medium brown, trace clay, moist, no odour, no staining				< 2	< 2		
			Medium brown, some sand, trace gravel, saturated, no odour, no staining				< 2	< 2		
-2	2		Gleyed grey, some clay and trace sand, wet, no odour, no staining		100	DP	< 2	< 2		
			Gleyed grey, some clay and trace sand, moist, no odour, no staining				< 2	< 2		
-3	3		Gleyed grey, some clay and trace sand, moist, no odour, no staining				< 2	< 2		
			Gleyed grey, trace sand and trace clay, saturated, no odour, no staining		100		< 2	< 2		
-4	4		Borehole terminated at 4.57 mbgs in silt				< 2	< 2		
-5	5									
-6	6									

Logged By: MC

Input By: MC



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

Log of Borehole:

BH202

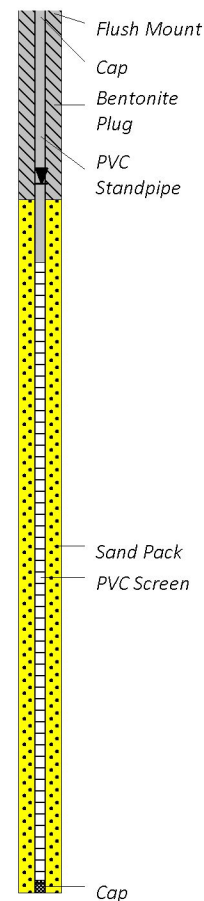
Page 1 of 1

Client: Pheasant Run Realty Holdings Inc.
Contractor: Strata Drilling Group
Location: 24 Alfred St W, Thornbury, ON

Project Name: Phase II ESA
Method: Direct Push
UTM: -

Project No.: 13303-001
Date Completed: 2021-11-10
Elevation: -

SUBSURFACE PROFILE				SAMPLING INFO					Well Installation	Remarks
Elevation (m)	Depth (m)	Lithology	Description	Number	% Recovery	Type	CSV (ppm)	OV (ppm)		
0			Topsoil: Dark brown, moist, no odour, no staining				< 2	< 2		
			Sand: Medium brown, some stone, wet, no odour, no staining		70		< 2	< 2		
-1	1		Medium brown, some gravel, trace silt, saturated, no odour, no staining				< 2	< 2		
-2	2		Silt: Gleyed grey, some clay, moist, no odour, no staining		100	DP	< 2	< 2		
-3	3		Sand: Grey-brown, saturated, no odour, no staining				< 2	< 2		
-4	4		Silt: Gleyed grey, some clay, moist, no odour, no staining		100		< 2	< 2		
			Borehole terminated at 4.57 mbgs in silt							
-5	5									
-6	6									



WL measured at 0.84 mbgs on Nov 15, 2021

Groundwater analysis: VOCs, PHCs, PAHs, metals

Logged By: MC

Input By: MC



Appendix B

Laboratory Certificates of Analysis

C.O.C.: ---

REPORT No. B21-37513 (i)

Rev. 1

Report To:

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

Attention: Natalie Wright

Caduceon Environmental Laboratories

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

DATE RECEIVED: 15-Nov-21

JOB/PROJECT NO.:

DATE REPORTED: 02-Dec-21

P.O. NUMBER: 13303-001

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Mercury	2	Holly Lane	PBK	19-Nov-21	D-HG-02 (o)	SM 3112 B
Metals - ICP-OES	2	Holly Lane	AHM	18-Nov-21	D-ICP-01 (o)	SM 3120
Metals - ICP-MS	2	Holly Lane	TPR	18-Nov-21	D-ICPMS-01 (o)	EPA 200.8

O. Reg. 153 - Soil, Ground Water and Sediment Standards
 Tbl. 7 - NPGW (µg/L) - Table 7 - Non-Potable Ground Water Soil Std



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

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: ---

REPORT No. B21-37513 (i)

Rev. 1

Report To:

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

Attention: Natalie Wright

Caduceon Environmental Laboratories

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

DATE RECEIVED: 15-Nov-21

JOB/PROJECT NO.:

DATE REPORTED: 02-Dec-21

P.O. NUMBER: 13303-001

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH201 B21-37513-1 15-Nov-21	BH202 B21-37513-2 15-Nov-21	O. Reg. 153 Tbl. 7 - NPGW (µg/L)		
	Units	R.L.					
Antimony	µg/L	0.1	0.3	0.3	16000		
Arsenic	µg/L	0.1	0.6	0.6	1500		
Barium	µg/L	1	23	14	23000		
Beryllium	µg/L	0.1	< 0.1	< 0.1	53		
Boron	µg/L	5	67	33	36000		
Cadmium	µg/L	0.015	0.017	< 0.015	2.1		
Chromium	µg/L	2	< 2	2	640		
Cobalt	µg/L	0.1	0.3	0.1	52		
Copper	µg/L	2	4	3	69		
Lead	µg/L	0.02	0.02	< 0.02	20		
Mercury	µg/L	0.02	< 0.02	< 0.02	0.1		
Molybdenum	µg/L	0.1	12.9	3.5	7300		
Nickel	µg/L	0.2	1.6	0.8	390		
Selenium	µg/L	1	< 1	< 1	50		
Silver	µg/L	0.1	< 0.1	< 0.1	1.2		
Thallium	µg/L	0.05	< 0.05	< 0.05	400		
Uranium	µg/L	0.05	0.69	0.23	330		
Vanadium	µg/L	0.1	0.3	0.4	200		
Zinc	µg/L	5	< 5	< 5	890		

1 Revised report to change guidelines as per client request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 7 - NPGW (µg/L) - Table 7 - Non-Potable Ground Water Soil Std



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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Caduceon Environmental Laboratories.

C.O.C.: ---

REPORT No. B21-37513 (i)

Rev. 1

Report To:

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

Attention: Natalie Wright

Caduceon Environmental Laboratories

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

DATE RECEIVED: 15-Nov-21
DATE REPORTED: 02-Dec-21
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.:
P.O. NUMBER: 13303-001
WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 7 - NPGW (µg/L) - Table 7 - Non-Potable Ground Water Soil Std

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. B21-37513 (ii)

Rev. 1

Report To:

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

Attention: Natalie Wright

Caduceon Environmental Laboratories

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

DATE RECEIVED: 15-Nov-21

JOB/PROJECT NO.:

DATE REPORTED: 02-Dec-21

P.O. NUMBER: 13303-001

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
PHC(F2-F4)	2	Kingston	KPR	18-Nov-21	C-PHC-W-001 (k)	MOE E3421
VOC's	2	Richmond Hill	JE	18-Nov-21	C-VOC-02 (rh)	EPA 8260
PHC(F1)	2	Richmond Hill	JE	18-Nov-21	C-VPHW-01 (rh)	MOE E3421

O. Reg. 153 - Soil, Ground Water and Sediment Standards
 Tbl. 7 - NPGW (µg/L) - Table 7 - Non-Potable Ground Water Soil Std



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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. B21-37513 (ii)

Rev. 1

Report To:

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

Attention: Natalie Wright

Caduceon Environmental Laboratories

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

DATE RECEIVED: 15-Nov-21

JOB/PROJECT NO.:

DATE REPORTED: 02-Dec-21

P.O. NUMBER: 13303-001

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH201 B21-37513-1 15-Nov-21	BH202 B21-37513-2 15-Nov-21	O. Reg. 153 Tbl. 7 - NPGW (µg/L)		
	Units	R.L.					
Acetone	µg/L	30	< 30	< 30	100000		
Benzene	µg/L	0.5	< 0.5	< 0.5	0.5		
Bromodichloromethane	µg/L	2	< 2	< 2	67000		
Bromoform	µg/L	5	< 5	< 5	5		
Bromomethane	µg/L	0.5	< 0.5	< 0.5	0.89		
Carbon Tetrachloride	µg/L	0.2	< 0.2	< 0.2	0.2		
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	< 0.5	< 0.5	140		
Chloroform	µg/L	1	< 1	< 1	2		
Dibromochloromethane	µg/L	2	< 2	< 2	65000		
Dichlorobenzene,1,2-	µg/L	0.5	< 0.5	< 0.5	150		
Dichlorobenzene,1,3-	µg/L	0.5	< 0.5	< 0.5	7600		
Dichlorobenzene,1,4-	µg/L	0.5	< 0.5	< 0.5	0.5		
Dichlorodifluoromethane	µg/L	2	< 2	< 2	3500		
Dichloroethane,1,1-	µg/L	0.5	< 0.5	< 0.5	11		
Dichloroethane,1,2-	µg/L	0.5	< 0.5	< 0.5	0.5		
Dichloroethylene,1,1-	µg/L	0.5	< 0.5	< 0.5	0.5		
Dichloroethene, cis-1,2-	µg/L	0.5	< 0.5	< 0.5	1.6		
Dichloroethene, trans-1,2-	µg/L	0.5	< 0.5	< 0.5	1.6		
Dichloropropane,1,2-	µg/L	0.5	< 0.5	< 0.5	0.58		
Dichloropropene, cis-1,3-	µg/L	0.5	< 0.5	< 0.5			
Dichloropropene, trans-1,3-	µg/L	0.5	< 0.5	< 0.5			

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 7 - NPGW (µg/L) - Table 7 - Non-Potable Ground Water Soil Std



Christine Burke
Lab Manager

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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH201 B21-37513-1 15-Nov-21	BH202 B21-37513-2 15-Nov-21	O. Reg. 153 Tbl. 7 - NPGW (µg/L)	
	Units	R.L.				
Dichloropropene 1,3-cis+trans	µg/L	0.5	< 0.5	< 0.5	0.5	
Ethylbenzene	µg/L	0.5	< 0.5	< 0.5	54	
Dibromoethane,1,2-(Ethylene Dibromide)	µg/L	0.2	< 0.2	< 0.2	0.2	
Hexane	µg/L	5	< 5	< 5	5	
Methyl Ethyl Ketone	µg/L	20	< 20	< 20	21000	
Methyl Isobutyl Ketone	µg/L	20	< 20	< 20	5200	
Methyl-t-butyl Ether	µg/L	2	< 2	< 2	15	
Dichloromethane (Methylene Chloride)	µg/L	5	< 5	< 5	26	
Styrene	µg/L	0.5	< 0.5	< 0.5	43	
Tetrachloroethane,1,1,1,2-	µg/L	0.5	< 0.5	< 0.5	1.1	
Tetrachloroethane,1,1,2,2-	µg/L	0.5	< 0.5	< 0.5	0.5	
Tetrachloroethylene	µg/L	0.5	< 0.5	< 0.5	0.5	
Toluene	µg/L	0.5	< 0.5	< 0.5	320	
Trichloroethane,1,1,1-	µg/L	0.5	< 0.5	< 0.5	23	
Trichloroethane,1,1,2-	µg/L	0.5	< 0.5	< 0.5	0.5	
Trichloroethylene	µg/L	0.5	< 0.5	< 0.5	0.5	
Trichlorofluoromethane	µg/L	5	< 5	< 5	2000	
Vinyl Chloride	µg/L	0.2	< 0.2	< 0.2	0.5	
Xylene, m,p-	µg/L	1.0	< 1.0	< 1.0		
Xylene, o-	µg/L	0.5	< 0.5	< 0.5		

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 7 - NPGW (µg/L) - Table 7 - Non-Potable Ground Water Soil Std



Christine Burke
Lab Manager

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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH201 B21-37513-1 15-Nov-21	BH202 B21-37513-2 15-Nov-21	O. Reg. 153 Tbl. 7 - NPGW (µg/L)		
	Units	R.L.					
Xylene, m,p,o-	µg/L	1.1	< 1.1	< 1.1	72		
PHC F1 (C6-C10)	µg/L	25	< 25	< 25	420		
PHC F2 (>C10-C16)	µg/L	50	< 50	< 50	150		
PHC F3 (>C16-C34)	µg/L	400	< 400	< 400	500		
PHC F4 (>C34-C50)	µg/L	400	< 400	< 400	500		

1 Revised report to change guidelines as per client request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 7 - NPGW (µg/L) - Table 7 - Non-Potable Ground Water Soil Std



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JOB/PROJECT NO.:
P.O. NUMBER: 13303-001
WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 7 - NPGW (µg/L) - Table 7 - Non-Potable Ground Water Soil Std

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DATE REPORTED: 02-Dec-21

P.O. NUMBER: 13303-001

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
SVOC	2	Kingston	sge	18-Nov-21	C-NAB-W-001 (k)	EPA 8270

O. Reg. 153 - Soil, Ground Water and Sediment Standards
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Parameter	Client I.D. Sample I.D. Date Collected		BH201 B21-37513-1 15-Nov-21	BH202 B21-37513-2 15-Nov-21	O. Reg. 153 Tbl. 7 - NPGW (µg/L)		
	Units	R.L.					
Acenaphthene	µg/L	0.05	< 0.05	< 0.05	17		
Acenaphthylene	µg/L	0.05	< 0.05	< 0.05	1		
Anthracene	µg/L	0.05	< 0.05	< 0.05	1		
Benzo(a)anthracene	µg/L	0.05	< 0.05	< 0.05	1.8		
Benzo(a)pyrene	µg/L	0.01	< 0.01	< 0.01	0.81		
Benzo(b)fluoranthene	µg/L	0.05	< 0.05	< 0.05	0.75		
Benzo(b+k)fluoranthene	µg/L	0.1	< 0.1	< 0.1			
Benzo(g,h,i)perylene	µg/L	0.05	< 0.05	< 0.05	0.2		
Benzo(k)fluoranthene	µg/L	0.05	< 0.05	< 0.05	0.4		
Chrysene	µg/L	0.05	< 0.05	< 0.05	0.7		
Dibenzo(a,h)anthracene	µg/L	0.05	< 0.05	< 0.05	0.4		
Fluoranthene	µg/L	0.05	< 0.05	< 0.05	44		
Fluorene	µg/L	0.05	< 0.05	< 0.05	290		
Indeno(1,2,3,-cd)pyrene	µg/L	0.05	< 0.05	< 0.05	0.2		
Methylnaphthalene,1-	µg/L	0.05	< 0.05	< 0.05	1500		
Methylnaphthalene,2-	µg/L	0.05	< 0.05	< 0.05	1500		
Methylnaphthalene 2-(1-)	µg/L	1	< 1	< 1	1500		
Naphthalene	µg/L	0.05	< 0.05	< 0.05	7		
Phenanthrene	µg/L	0.05	< 0.05	< 0.05	380		
Pyrene	µg/L	0.05	< 0.05	< 0.05	5.7		

1. Revised report to change guidelines as per client request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 7 - NPGW (µg/L) - Table 7 - Non-Potable Ground Water Soil Std



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Lab Manager

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Appendix C

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 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 | <p>Project Manager. Cambium Inc.
Barrie, Ontario, Canada</p> <p><i>Ms. Wright's responsibilities include the coordination 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 including data compilation, interpretation, and completion of final reports.</i></p> |
| 2013 - 2015 | <p>Environmental Scientist. MTE Consultants Inc.
Kitchener, Ontario, Canada</p> <p><i>Completed environmental site assessments for various industrial, commercial, and residential properties and for future filing for Records of Site Condition. Responsibilities included conducting detailed site inspections, designing work plans for field activities, soil/groundwater sampling, surveying, data collection and completion of final reports.</i></p> |
| 2011 | <p>Water Resources Intern. Water Resources Commission
Bolgatanga, Upper East Region, Ghana</p> <p><i>Conducted field visits and met with community members and government representatives to assess the progress of pilot projects in rainwater harvesting, environmental restoration, and climate change adaptation.</i></p> |
| 2008-2011 | <p>Project Manager. Teva Canada Limited
Toronto, Ontario, Canada</p> <p><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></p> |



EDUCATION & TRAINING

2020	WHMIS 2015 including GHS for Workers and Supervisors
2019	Working at Heights Refresher
2017	Working at Heights
2017	Workplace Hazardous Materials Information System (WHIMIS)
2015	Traffic Control Persons for Construction
2015	Worker Health and Safety Awareness in 4 Steps
2014	Standard First Aid and CPR/AED
2013	Hazardous Waste Operations and Emergency Response (HAZWOPER)
2013	Environmental Engineering Applications Post-Graduate Co-op 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.

PHASE II ESA AND REMEDIATION OF PHC IMPACTS AT TWO ADJACENT PROPERTIES – BRADFORD, ONTARIO

Completion of a Phase II ESA at a commercial property which identified potential on-site sources of contamination relating to current and former operations of a repair garage which included 2 exterior storage tanks and a former building of unknown use. Subsequent removal of petroleum hydrocarbon impacted soil and the completion of a Verification Soil Sampling program within the excavation. The petroleum-related impacts identified in soil as part of the Phase II ESA were removed where practically feasible, and additional recommendations were provided to the client going forward.



MATTHEW CUNNINGHAM, TAg., C.E.T

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 8 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 (C.E.T); Ontario Association of Certified Engineering Technicians and Technologists
- Technical Agrologist (TAg); Ontario Institute of Agrologists

EDUCATION & TRAINING

2015 Standard First Aid Recertification

Ground Disturbance Level II Training

ATV Safety Training Recertification

Wildlife Awareness Training Recertification



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 - 2018

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.