



**PATERSON
GROUP**

September 8, 2023
File: PE6239-LET.02

Consulting Engineers

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Geotechnical Engineering
Environmental Engineering
Hydrogeology
Materials Testing
Building Science
Rural Development Design
Retaining Wall Design
Noise and Vibration Studies

Attention: **Mr. Said Menou**

Subject: **Phase II-Environmental Site Assessment Update**
2405 Mer Bleue Road
Ottawa, Ontario

patersongroup.ca

Dear Sir,

Further to your request, Paterson Group (Paterson) has completed a Phase II Environmental Site Assessment (ESA) Update for the aforementioned property. This report updates a Phase II ESA entitled "Phase II Environmental Site Assessment, Proposed School Development, 2405 and 2419 Mer Bleue Road, Ottawa, Ontario" prepared by Gemtec, dated May 28, 2018. For the purposes of this update, it is solely addressed to the property listed as 2405 Mer Bleue Road, Ottawa, Ontario.

This update report is intended to meet the requirements for an updated Phase II ESA, as per the MECP O.Reg. 153/04, as amended. This update report is to be read in conjunction with the 2018 report.

Background Information

The Phase II Property is located on the east side of Mer Bleue Road, in the City of Ottawa, Ontario. Refer to Figure 1 - Key Plan following the text of this letter.

The Phase I Property is a rectangular shaped lot with a footprint of 4.05 hectares. The Phase I Property is situated to the south of a newly developed residential area where municipal water and sewer systems have been installed.





Drainage on the Phase II Property consists primarily of surface infiltration throughout the property. The site is relatively at the grade of the surrounding lands with the regional topography sloping downwards in a southerly direction.

Past Assessments

- “Phase I-Environmental Site Assessment, Proposed School Development, 2405 and 2419 Mer Bleue Road, Ottawa, Ontario,” prepared by Gemtec, dated May 2018.

The 2018 Phase I ESA indicated several areas of potential environmental concern (APECs) associated with the Phase I Property and its surrounding lands, including former aboveground storage tanks (ASTs), equipment maintenance, fertilizer and pesticide use on the agricultural field and the reported placement fill material throughout the property. Equipment maintenance was associated with the property addressed 2419 Mer Bleue Road.

A Phase II-ESA was recommended and carried out to assess the site conditions due to the presence of the aforementioned APECs.

- “Phase II Environmental Site Assessment, Proposed School Development, 2405 and 2419 Mer Bleue Road, Ottawa, Ontario,” prepared by Gemtec, dated May 28, 2018.

The field program consisted of placing ten (10) boreholes on the subject site, all of which were instrumented with monitoring wells. Five (5) boreholes were associated with the property addressed 2405 Mer Bleue Road. The boreholes were placed to assess the potential impacts associated with the identified APECs on-site.

The soil profile generally consisted of a layer of fill, overlying native silty clay. Fill material was only encountered on 2419 Mer Bleue Road. Topsoil was observed in some boreholes. Refusal was not encountered in any of the boreholes.

The fill material consisted of silty sand to silty clay with some gravel and trace organics. The fill varied in thickness from 0.6 to 1.4 m.

Thirteen (13) soil samples and one (1) duplicate sample were submitted for BTEX, PHCs (F1-F4), VOCs, metals, PAHs and/or OC Pesticides analysis. All soil samples complied with the selected MECP Table 2 Standards, with the exception of SAR, conductivity and boron observed in BH18-4. BH18-4 which was located within the gravel lot of 2419 Mer Bleue Road, which is located off-site of the current Phase I Property, thus, there is no required additional testing to delineate the boron exceedance. SAR and conductivity



exceedances are likely due to impacts of road salt, as BH18-4 was located in an access road.

Based on the low permeability of the overburden material and relative distance from the Phase I Property, impacts observed in the upper fill layer in BH18-4 pose no risk to the Phase I Property.

Groundwater samples were recovered from the monitoring wells BH18-3, BH18-4, BH18-6, BH18-9 and BH18-10 on April 9, 2018. No visual or olfactory signs of contamination were noted in the groundwater. The groundwater samples were submitted for PHCs (F1-F4), BTEX, VOCs, PAHs, OC Pesticides and metals and inorganics analysis. No concentrations of PHCs and/or VOCs in the groundwater samples analyzed were detected above the laboratory detection limits. VOC and PHC test results complied the MECP Table 2 Standards.

Detectable PAH parameters were identified in several of the analyzed groundwater samples. All PAH parameters in groundwater at BH18-9 and BH18-4 were in compliance with the MECP Table 2 Standards. Benzo[a]pyrene, chrysene and fluoranthene concentrations in BH18-3 were in excess of the applicable standards. BH18-3 is located on the property addressed 2419 Mer Bleue Road, to the south of the Phase I Property.

Concentrations of sodium and chloride were widely observed through the groundwater and is likely associated with the use of road salt within the area.

Based on the groundwater flow direction and low permeability of the overburden within the area, impacted groundwater within BH18-3 does not pose a risk to the Phase I Property as it is located downgradient on the property addressed 2419 Mer Bleue Road, approximately 50 m south of the Phase I Property.

A Phase I ESA Update was completed in August 2023. No new PCAs that would result in APECs on the Phase I Property were identified during the Phase I ESA Update. Continued use of the AST on our site following the Phase I ESA was still considered to be an APEC that required supplemental testing carried out herein.

Applicable Site Condition Standard

The site condition standards for the property were obtained from Table 2 of the document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", prepared by the Ontario Ministry of the Environment, Conservation and Parks (MECP), April 2011. The intended use of the Phase II Property is



institutional, and therefore, the institutional standards have been selected for the purpose of this Phase II ESA. The MECP Table 2 RPI Standards are based on the following considerations:

- Full depth generic site conditions;
- Potable groundwater conditions; and
- Institutional land use.

Section 35 of O.Reg. 153/04 does not apply to the Phase II Property in that the property, and some of the properties within the 250 m study area rely upon potable groundwater.

Section 41 of O.Reg. 153/04 does not apply to the Phase II Property, as the property is not considered an environmentally sensitive area, as the pH values of the surface and subsurface soil are between 5 and 9.

Section 43.1 of O.Reg. 153/04 does not apply to the Phase II Property in that the property is not situated where Shallow Soils are present.

Impediments

Four (4) installed wells (BH18-5, BH18-6, BH18-7, BH18-8) from 2018 could not be located on-site during the recent site visit due to overgrown vegetation throughout the eastern half of the property. BH18-9 was the only well that was located and viable for resampling. No other impediments were encountered during this Phase II ESA Update.

Investigation Method

The groundwater level was measured and then purged prior to collecting a groundwater sample and a duplicate sample on August 16, 2023 by Paterson. The groundwater sample was submitted for analytical testing.

Review and Evaluation

Geology

Site soils generally generally consisted of a layer of topsoil, overlying native silty clay with trace silty fine sand. Refusal was not encountered in any of the boreholes.



Groundwater Elevations, Flow Direction and Hydraulic Gradient

The groundwater level was measured in BH18-9 on August 16, 2023. The groundwater level was measured at approximately 0.84 m below ground surface (mbgs).

Based on the 2018 data, groundwater flow beneath the Phase II Property is in a northerly direction.

Groundwater Quality

A groundwater sample was recovered from BH18-9 on August 16, 2023. The groundwater sample was submitted for laboratory analysis of benzene, toluene, ethylbenzene and xylenes (BTEX) and petroleum hydrocarbons (PHCs). A duplicate groundwater sample was submitted and analysed for BTEX and PHCs.

The results of the analytical testing are presented in Table 1. The laboratory certificate of analysis has been appended to this report.

Table 1 Analytical Test Results – Groundwater – BTEX and PHCs				
Parameter	MDL (µg/L)	Groundwater Samples (µg/L)		MECP Table 2 Standards (µg/L)
		August 16, 2023		
		BH18-9-GW	BH18-901-GW	
Benzene	0.5	nd	nd	5
Toluene	0.5	nd	nd	24
Ethylbenzene	0.5	nd	nd	2.4
Xylenes	0.5	nd	nd	300
PHC F1	25	nd	nd	750
PHC F2	100	nd	nd	150
PHC F3	100	nd	nd	500
PHC F4	100	nd	nd	500

Notes:

- MDL - Method Detection Limit
- nd - Not Detected (i.e <MDL)
- BH18-901-GW – Duplicate groundwater sample from BH18-9

No BTEX or PHC concentrations were detected in the groundwater samples. All of the analytical results comply with the MECP Table 2 standards.



Phase II Conceptual Site Model

Potentially Contaminating Activity (PCA) and Area of Potential Environmental Concern (APEC)

As per the Past Assessments Section of this report, the PCAs considered to result in APECs on the Phase II Property have been summarized in Table 2.

Area of Potential Environmental Concern	Location of Potential Environmental Concern	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
APEC1: Former Aboveground Storage Tanks (ASTs)	North of the building at 2405 Mer Bleue Road	PCA 28 – <i>“Gasoline and Associated Products Storage in Fixed Tanks”</i>	On-site	BTEX PHCs	Soil and/or Groundwater

Contaminants of Potential Concern (CPCs)

The following Contaminants of Potential Concern (CPC) were identified with respect to the Phase II Property:

- Petroleum hydrocarbons (PHCs, Fractions F₂-F₄).
- Benzene, toluene, ethylbenzene and xylenes (BTEX/F₁)

The CPCs are based on the continued use of the AST on-site after the 2018 Phase II ESA, however, it has now been removed from the property.

Subsurface Structures and Utilities

The subject property is on private septic and water. Upon redevelopment, the Phase II Property will be serviced with municipal water and sewer systems, electricity and natural gas.



Physical Setting

Site Stratigraphy

The site stratigraphy consists of:

- Topsoil, consisting of brown silty clay with organics and trace sand, extending to depths ranging from 0.15 to 0.40 mbgs.
- A weathered layer of brown silty clay was observed following the topsoil layer. The layer ranged from 1.6 and 3.0 mbgs.
- Grey silty clay was observed under the weathered crust in all boreholes, extending to depths ranging from 4.57 and 10.37 mbgs. A DCPT was conducted at BH18-6, where practical refusal was encountered at a depth of 32.1 mbgs.

Hydrogeological Characteristics

Groundwater at the Phase II Property was generally encountered in the native clay ranging at depths of approximately 0.14 to 2.31 mbgs. Groundwater is expected to flow in a northerly direction.

Approximate Depth to Water Table

Depth to the water table at the Phase II Property varies between approximately 0.84 to 2.39 mbgs and is expected to fluctuate seasonal.

Approximate Depth to Bedrock

Bedrock was not confirmed during the drilling program. All boreholes were completed in native soil. Practical refusal was reached at a depth of 32.1 mbgs in BH18-6.

Sections 35, 41 and 43.1 of the Regulation

Section 35 of O.Reg. 153/04 does not apply to the Phase II Property in that the property, and some of the properties within the 250 m study area rely upon potable groundwater.

Section 41 of O.Reg. 153/04 does not apply to the Phase II Property, as the property is not considered an environmentally sensitive area.

Section 43.1 of O.Reg. 153/04 does not apply to the Phase II Property in that the property is not situated where Shallow Soils are present.



Existing Buildings and Structures

One residential building is present at the southwest corner of the Phase II Property.

Proposed Buildings and Other Structures

The proposed development for the Phase II Property includes an institutional development that will consist of a school with associated exterior amenities and parking. The footprint of the development will cover the majority of the eastern portion of the site, and it will be serviced by municipal water and sewer systems.

Drinking Water Wells

One potable water well is present on the Phase II Property. It is expected that the site will be serviced by the municipal water and sewer system, once redeveloped.

Water Bodies and Areas of Natural Significance

No areas of natural significance were identified within the study area. The nearest named area of natural significance with respect to the Phase II Property is Mer Bleue Bog, approximately 2.5 km to the south. No water bodies are present within the study area. The nearest named water body with respect to the Phase II Property is McKinnon's Creek, approximately 600 m to the east.

Environmental Condition

Based on the Phase II ESA and Phase II ESA Update, there are no contaminants present at the surface or beneath the Phase II Property.

Conclusion

Based on the findings of the Phase II ESA Update, no further investigation is required on the Phase II Property.





Recommendations

Any excess soil requiring off-site disposal during construction must be managed in accordance with Ontario Regulation 406/19 – On-site and Excess Soil Management. Any soils deemed excess during development will require additional analytical testing to determine the appropriate off-site disposal method.

Statement of Limitations

This Phase II - Environmental Site Assessment Update report has been prepared under the supervision of a qualified person, in general accordance with Ontario Regulation 153/04, as amended. The conclusions presented herein are based on information gathered from a limited historical review and field inspection program.

The findings of the Phase II - ESA Update are based on the review of the previous subsurface program completed on the Phase II Property in conjunction with the most recent analytical test results.

Should any conditions be encountered at the Phase II Property that differ from our findings, we request that we be notified immediately.

This report was prepared for the sole use of CEPEO. Permission and notification from CEPEO and Paterson will be required to release this report to any other party.

We trust that this submission satisfies your current requirements. Should you have any questions please contact the undersigned.





Regards,

Paterson Group Inc.

Joshua Dempsey, B.Sc.

Mark D'Arcy, P.Eng., QP_{ESA}



Report Distribution:

- CEPEO
- Paterson Group

Appendix

- Figure 1 – Key Plan
- Drawing PE6239-3 – Test Hole Location Plan
- Laboratory Certificates of Analysis



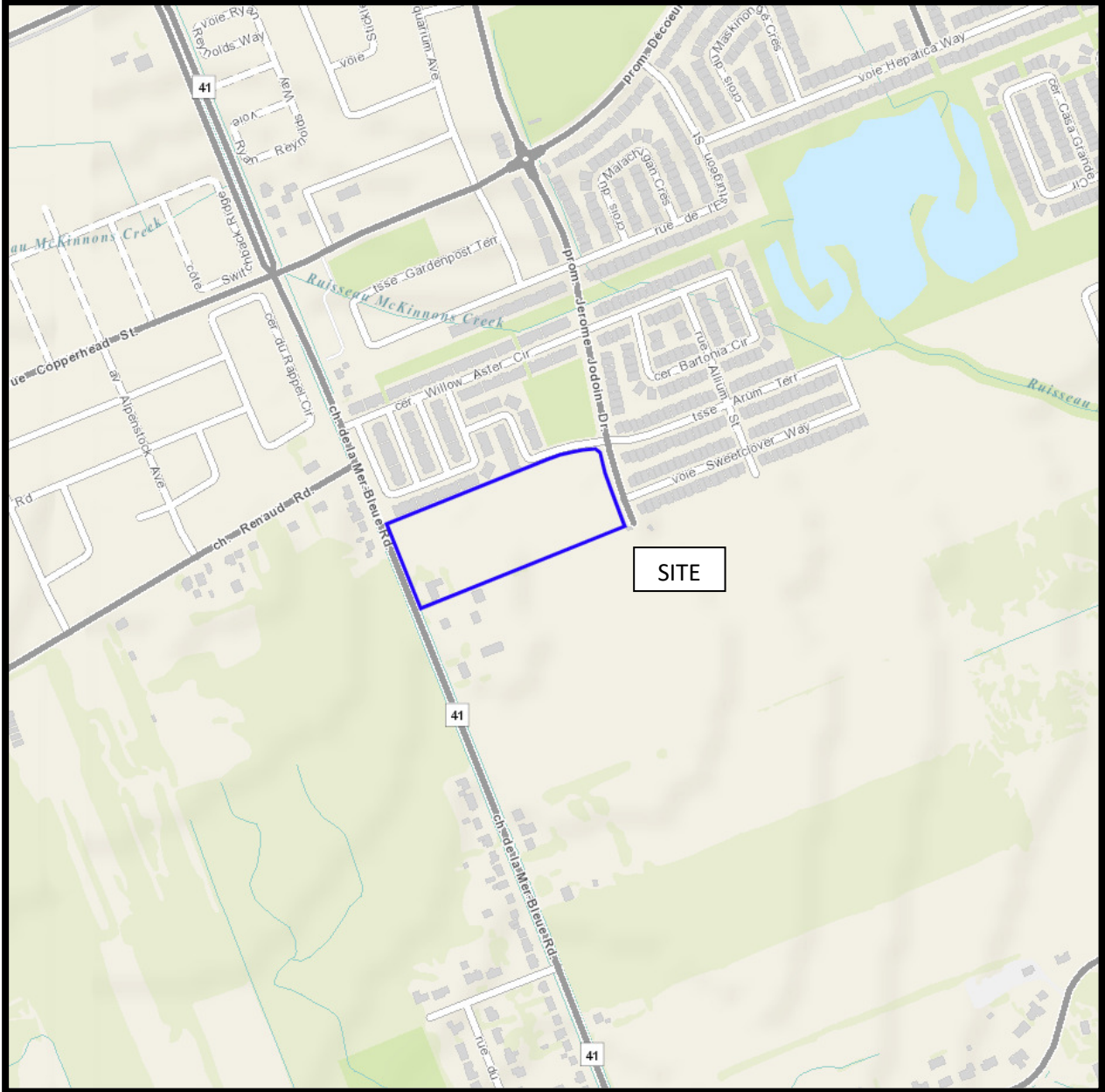
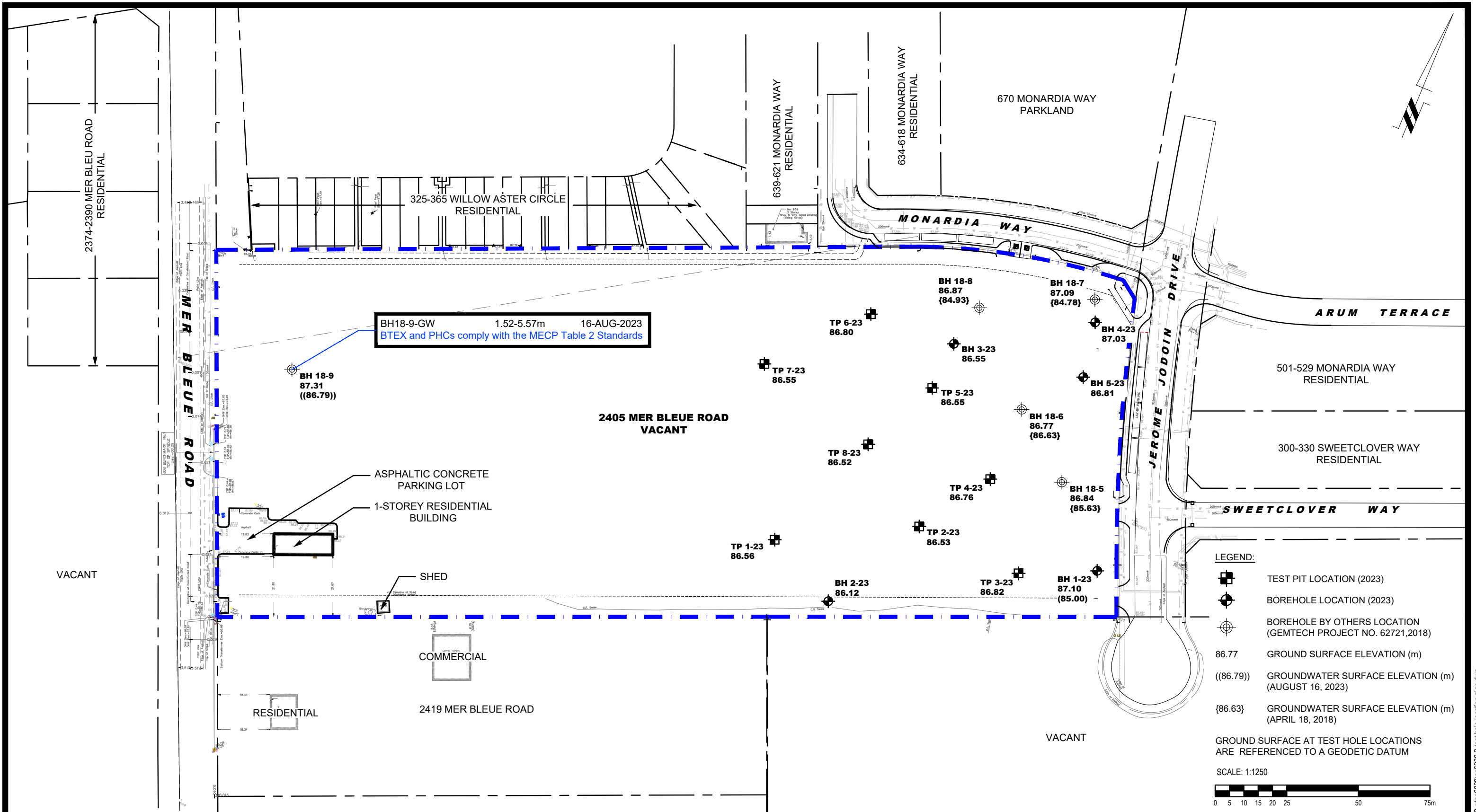


FIGURE 1
KEY PLAN



NO.	REVISIONS	DATE	INITIAL

CEPEO
PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE
2405 MER BLEU ROAD
 OTTAWA, ONTARIO
TEST HOLE LOCATION PLAN

Scale:	1:1250	Date:	09/2023
Drawn by:	YA	Report No.:	PE6239-LET.02
Checked by:	JD	Dwg. No.:	PE6239-3
Approved by:	MSD	Revision No.:	

Certificate of Analysis

Paterson Group Consulting Engineers

9 Auriga Drive
Ottawa, ON K2E 7T9
Attn: Mark D'Arcy

Client PO: 58174
Project: PE6239
Custody: 141884

Report Date: 22-Aug-2023
Order Date: 17-Aug-2023

Order #: 2333437

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
2333437-01	BH18-9-GW
2333437-02	BH18-901-GW

Approved By:



Dale Robertson, BSc

Laboratory Director

Certificate of Analysis

Report Date: 22-Aug-2023

Client: **Paterson Group Consulting Engineers**

Order Date: 17-Aug-2023

Client PO: 58174

Project Description: **PE6239**

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	19-Aug-23	19-Aug-23
PHC F1	CWS Tier 1 - P&T GC-FID	18-Aug-23	19-Aug-23
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	18-Aug-23	18-Aug-23

Certificate of Analysis

Report Date: 22-Aug-2023

Client: Paterson Group Consulting Engineers

Order Date: 17-Aug-2023

Client PO: 58174

Project Description: PE6239

Client ID:	BH18-9-GW	BH18-901-GW	-	-	
Sample Date:	16-Aug-23 09:00	16-Aug-23 09:00	-	-	-
Sample ID:	2333437-01	2333437-02	-	-	-
Matrix:	Ground Water	Ground Water	-	-	-
MDL/Units					

Volatiles

Benzene	0.5 ug/L	<0.5	<0.5	-	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-	-	-
Toluene-d8	Surrogate	103%	102%	-	-	-	-

Hydrocarbons

F1 PHCs (C6-C10)	25 ug/L	<25	<25	-	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	-	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	-	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	-	-	-	-

Certificate of Analysis

Report Date: 22-Aug-2023

Client: Paterson Group Consulting Engineers

Order Date: 17-Aug-2023

Client PO: 58174

Project Description: PE6239

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons								
F1 PHCs (C6-C10)	ND	25	ug/L					
F2 PHCs (C10-C16)	ND	100	ug/L					
F3 PHCs (C16-C34)	ND	100	ug/L					
F4 PHCs (C34-C50)	ND	100	ug/L					
Volatiles								
Benzene	ND	0.5	ug/L					
Ethylbenzene	ND	0.5	ug/L					
Toluene	ND	0.5	ug/L					
m,p-Xylenes	ND	0.5	ug/L					
o-Xylene	ND	0.5	ug/L					
Xylenes, total	ND	0.5	ug/L					
Surrogate: Toluene-d8	88.6		%	111	50-140			

Certificate of Analysis

Report Date: 22-Aug-2023

Client: Paterson Group Consulting Engineers

Order Date: 17-Aug-2023

Client PO: 58174

Project Description: PE6239

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	86.5		%		108	50-140			

Certificate of Analysis

Report Date: 22-Aug-2023

Client: Paterson Group Consulting Engineers

Order Date: 17-Aug-2023

Client PO: 58174

Project Description: PE6239

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1880	25	ug/L	ND	110	85-115			
F2 PHCs (C10-C16)	1830	100	ug/L	ND	114	60-140			
F3 PHCs (C16-C34)	4190	100	ug/L	ND	107	60-140			
F4 PHCs (C34-C50)	2600	100	ug/L	ND	105	60-140			
Volatiles									
Benzene	38.3	0.5	ug/L	ND	95.7	60-130			
Ethylbenzene	39.8	0.5	ug/L	ND	99.4	60-130			
Toluene	40.2	0.5	ug/L	ND	100	60-130			
m,p-Xylenes	81.2	0.5	ug/L	ND	101	60-130			
o-Xylene	40.0	0.5	ug/L	ND	99.9	60-130			
Surrogate: Toluene-d8	79.6		%		99.5	50-140			

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 58174

Report Date: 22-Aug-2023

Order Date: 17-Aug-2023

Project Description: PE6239

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Parcel ID: 2333437



Parcel Order Number (Lab Use Only) 2333437	Chain Of Custody (Lab Use Only) No 141884
---	--

Client Name: Paterson Group	Project Ref: PE6239	Page 1 of 1
Contact Name: Mark D'Arcy; Joshua Dempsey	Quote #:	Turnaround Time <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular
Address: 9 Anviza Drive	PO #: 58174	
Telephone: 613-226-7381	E-mail: mdarcy@patersongroup.ca jdempsey@patersongroup.ca	
REG 153/04 <input checked="" type="checkbox"/> REG 406/19 <input type="checkbox"/>		Date Required: _____

Other Regulation		Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)		Required Analysis																
<input type="checkbox"/> Table 1 <input type="checkbox"/> Res/Park <input type="checkbox"/> Med/Fine	<input type="checkbox"/> REG 558 <input type="checkbox"/> PWQO	Matrix	Air Volume	# of Containers	Sample Taken	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CWI	B (HWS)								
<input type="checkbox"/> Table 2 <input type="checkbox"/> Ind/Comm <input type="checkbox"/> Coarse	<input type="checkbox"/> CCME <input type="checkbox"/> MISA																			
<input type="checkbox"/> Table 3 <input type="checkbox"/> Agri/Other	<input type="checkbox"/> SU - Sani <input type="checkbox"/> SU - Storm																			
<input type="checkbox"/> Table _____	Mun: _____																			
For RSC: <input type="checkbox"/> Yes <input type="checkbox"/> No																				
1	BH18-9-GW	GW		3	Aug 16/23															
2	BH18-901-GW	GW		3	Aug 16/23	X														
3						X														
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments:		Method of Delivery: Paracel Com	
Relinquished By (Sign): Joshua Dempsey	Received By Driver/Depot:	Received at Lab: [Signature]	Verified By: [Signature]
Relinquished By (Print): Joshua Dempsey	Date/Time:	Date/Time: Aug 17/23 1628	Date/Time: Aug 17/23 1643
Date/Time: Aug 17/2023	Temperature: _____ °C	Temperature: 84 °C	pH Verified: <input type="checkbox"/> By: _____

Chain of Custody (En) 1/15/18