

January 16, 2020
File: PE4809-LET.02

John Howard Society of Ottawa
550 Old St. Patrick Street
Ottawa, Ontario
K1N 5L5

Attention: **Mr. Tyler Fainstat**

Subject: **Phase II - Environmental Site Assessment Update**
289 Carling Avenue
Ottawa, Ontario

154 Colonnade Road South
Ottawa, Ontario
Canada, K2E 7J5

Tel: (613) 226-7381
Fax: (613) 226-6344

Geotechnical Engineering
Environmental Engineering
Hydrogeology
Geological Engineering
Materials Testing
Building Science
Archaeological Studies

www.patersongroup.ca

Dear Sir,

Further to your request, Paterson Group (Paterson) carried out a Phase II - Environmental Site Assessment (ESA) Update for the aforementioned property. This report updates a previous Phase II-ESA report entitled, "Phase II Environmental Site Assessment, 289 Carling Avenue, Ottawa, Ontario," prepared by DST Consulting Engineers, dated May 2017.

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 report is to be read in conjunction with the 2017 report.

Background Information

Physical Setting

The Phase II Property is a vacant, asphaltic concrete paved parking lot, situated in a mixed-use urban setting. The site is relatively flat with some depressed areas on the central portion of the property. The adjacent properties, Bell Street South and Carling Avenue are above the grade of the site. Bell Street and Carling Avenue slope in a southerly and westerly direction, respectively. The regional topography slopes down in a south-westerly direction towards Dow's Lake. Site drainage consists mainly of sheet flow to catch basins located along Bell Street with infiltration along the property boundaries.

No water bodies are present on the Phase II Property. The nearest water body is Dow's Lake, located approximately 365 m to the southwest of the site. No Areas of Natural or Scientific Interest (ANSIs) are present within the 250 m study area.

Past Investigations

The Phase I ESA Report, entitled “Phase I Environmental Site Assessment, 289 Carling Avenue, Ottawa, Ontario” prepared by DST Consulting Engineers (DST), dated March 2017 was reviewed as part of this update. Based on the report, several potentially contaminating activities (PCAs) within the Phase I Study Area were identified. These PCAs included the following:

- PCA 1: former quarry and unnamed waste disposal site on the Phase I Property, as well as reported metals contamination identified in the soil by Intera Consulting in 1997;
- PCA 2: former lumber yard, quarry and UST nest located on the neighbouring property to the west;
- PCA 3: former lumber yard on the neighbouring properties to the south;
- PCA 4: former retail fuel outlet located approximately 135 m east of the site;
- PCA 5: former retail fuel outlet located approximately 140 m southeast of the site;
- PCA 6: former retail fuel outlet located approximately 100 m west of the site;
- PCA 7: PCB spill reported in the ERIS Report at 326 Powell Street, approximately 110 m north of the site;
- PCA 8: former retail fuel outlet located approximately 125 m west of the site; and
- PCA 9: former landfill (UR-21) located at Commissioner park, approximately 120 m southwest of the site.

The PCAs identified above resulted in the following areas of potential environmental concern (APECs) on the Phase I Property:

- On-site sources: documented on-site metal concentrations exceeding the MECP site standards due to the possible former use of the Phase I Property (PCA 1).
- Off-site sources: possible former waste disposal site, near-by quarry and retail fuel outlets, lumber yard, UST nest and a PCB spill (PCA 2 through PCA 9).

A subsequent Phase II ESA (“Phase II Environmental Site Assessment, 289 Carling Avenue, Ottawa, Ontario”) was conducted by DST in May 2017 to address the APECs on the Phase I Property.

Six (6) boreholes were drilled onsite; four (4) of which were completed as monitoring wells across the site. Several soil samples were collected and submitted for laboratory analysis of BTEX, PHCs (F1-F4), PAHs and metals. Based on the analytical results, BTEX, PHC, PAH and metal parameter concentrations in the fill material were in excess of the selected MECP Table 7 Residential Standards.

Groundwater samples were also collected and submitted for PHC, BTEX, PAH, VOC and metals analyses. Based on the analytical results, only sodium and chloride concentrations were in excess of the MECP Table 7 Standards at location MW17-04. Based on the findings of the Phase II ESA, DST recommended a site remediation program and retesting of groundwater. To date, no remediation has been conducted on the Phase I Property. Therefore, the impacted soils on the Phase I Property remain an area of environmental concern.

Paterson conducted a Phase I ESA Update, dated January 15, 2020 (Report: PE4809-LET.01) for 289 Carling Avenue. Based on our finding of the historical research, it was determined that in the 1930s to 1940s the eastern half of the Phase I Property was occupied by a storage building, followed by a vacant lot used for vehicular parking circa 1958. Based on the analytical results of the 2017 Phase II Report, it is expected that the source of contamination is a result of the historical land use (storage shed) and the demolition debris of the former building. Therefore, the impacted soils on the Phase I Property remain an area of environmental concern.

It should be noted that the fill material was assessed in the 2017 Phase II ESA Report, and as such, further site soil analysis is not considered to be required for this update. The groundwater conditions on the Phase I Property are considered to require updating and were the subject of this investigation.

Impediments

Four (4) groundwater monitoring wells were installed in 2017, as part of the original Phase II ESA. As part of this update, all monitoring wells were viable for sampling. There were no impediments with regard to the work carried out for this update. All drilled boreholes and monitoring wells on the Phase II Property are shown on Drawing PE4809-3 – Test Hole Location Plan, appended to this report.

Investigation Method

Groundwater sampling was conducted at well locations MW17-01 to MW17-04 on November 28 and December 12, 2019. Groundwater samples were collected and submitted for analytical testing of sodium, chloride and/or cyanide.

Review and Evaluation

Geology

Site geology details are provided in the 2017 Phase II ESA Report in Appendix C – Borehole Logs.

The Phase II Property is located in an area of shallow overburden soils, with bedrock encountered between 0.2 to 0.8 m below ground surface (mbgs). Groundwater was encountered at approximately 0.32m below existing grade in the upper bedrock stratigraphic unit.

Based on the 2017 subsurface investigation conducted by DST, the groundwater flow was determined to move in a north-easterly direction. Groundwater movement within the fractured upper bedrock will be confined to preferential fractured pathways.

Groundwater Elevations, Flow Direction and Hydraulic Gradient

Groundwater levels were measured during the groundwater sampling events which occurred on November 28, 2019, using an electronic water level meter. Groundwater levels are summarized below in Table 1.

TABLE 1: Groundwater Level Measurements				
Borehole Location	Ground Surface Elevation (m)	Water Level Depth (m below grade)	Water Level Elevation (m ASL)	Date of Measurement
MW17-01	73.09	2.24	70.85	November 28, 2019
MW17-02	72.71	0.32	72.39	November 28, 2019
MW17-03	73.04	2.66	70.38	November 28, 2019
MW17-04	72.55	0.46	72.09	November 28, 2019

Based on the groundwater elevations measured during the sampling event, a groundwater contour plan was completed. It is considered likely that the shallow water levels measured in MW17-02 and MW17-04 are indicative of a perched water table and nor representative of the long-term groundwater table.

The groundwater contour mapping is shown on Drawing PE4809-4 –Groundwater Contour Plan. Based on the contour mapping, groundwater flow beneath the Phase II Property is in a northerly direction. A horizontal hydraulic gradient of approximately 0.12 m/m was calculated.

Groundwater Quality

Groundwater samples from monitoring wells MW17-01 through MW17-04 were submitted for laboratory analysis of dissolved sodium and chloride as well as cyanide in MW17-03

only. The results of the analytical testing are presented in Table 2. The laboratory certificates of analysis are appended to this report.

TABLE 2: Analytical Test Results – Groundwater – Sodium, Chloride and Cyanide						
Parameter	MDL (µg/L)	Groundwater Samples (µg/L)				MECP Table 7 Standards (µg/L)
		November 28, 2019			November 28 and December 12, 2019	
		MW17-01- GW2	MW17-02- GW2	MW17-04- GW2	MW17-03-GW2	
Sodium	200	63,300	40,400	86,200	313,000	1,800,000
Chloride	1000	37,000	26,000	5,000	47,000	1,800,000
Cyanide	2	NA	NA	NA	nd	52
Notes:						
<input type="checkbox"/> MDL – Method Detection Limit <input type="checkbox"/> nd – not detected above the MDL <input type="checkbox"/> NA – Parameter not tested						

A duplicate sample was collected from MW17-02 was submitted for dissolved sodium and chloride concentrations. All analyzed parameters in groundwater comply with the selected MECP Table 7 Standards.

Phase II Conceptual Site Model

Update Contaminants of Potential Concern

The contaminants of potential concern (CPCs) in groundwater include dissolved sodium, chloride and cyanide.

Potentially Contaminating Activities and Areas of Potential Environmental Concern

One off-site potentially contaminating activity was identified in the Phase I ESA Update – a back-up generator that was observed on the property to the east; however, it was not considered to represent an APEC based on the downgradient location with respect to the Phase II Property.

Based on the 2017 analytical results, BTEX, PHC, PAH and metal parameter concentrations in the fill material are in excess of the selected MECP Table 7 Residential Standards. To date, no site remediation has been completed, and as such, the impacted fill material remains an area of environmental concern.

TABLE 3: Areas of Potential Environmental Concern					
Area of Potential Environmental Concern	Location of Area 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)
APEC 1 Impacted fill resulting from former building demolition debris and/or former use of the storage building.	Eastern half of the Phase I Property	Non-specific: Impacted soils	On-site	BTEX PHCs (F ₁ -F ₄) PAHs Metals	Soil (assessed in 2017 Phase II ESA)

Physical Setting

Site Stratigraphy

The site stratigraphy, from ground surface to the deepest aquifer or aquitard investigated, is provided in the 2017 Phase II ESA report in Appendix C - Borehole Logs. The stratigraphy of the Phase II Property generally consists of:

- Asphalt pavement structure with an approximate thickness of 0.06 m.
- Fill material consisting of sand, stained sand with ash fragments and demolition debris (glass, nails and wood), extending to depths approximately 0.6 m below grade. Groundwater was encountered in this unit at MW17-2 and MW17-04, which is likely a perched water table. The true water table is expected at depths ranging from 1.35 to 2.14 m below grade.
- Bedrock consisted of interbedded limestone and shale. All monitoring wells were completed and terminated in bedrock at 4 to 4.05 mbgs. Groundwater was encountered in this unit at MW17-01 and MW17-03 at depths of 2.24 and 2.66 m, respectively.

Hydrogeological Setting

The Geological Survey of Canada website on the Urban Geology of the National Capital Area was consulted as part of this assessment. Based on this information, bedrock in the area of the site consists of limestone and shale of the Verulam formation. Overburden soils consist of plain till, with a drift thickness on the order to 1 to 2m.

Based on the recent groundwater levels, groundwater beneath the Phase II Property flows in a northerly direction. It is considered possible that the groundwater flow beneath the site is being affected by the adjacent development to the north.

Approximate Depth to Bedrock

At locations where bedrock was cored in 2017, bedrock was encountered at depths varying from 0.6 to 0.8 mbgs.

Approximate Depth to Water Table

Depth to water table at the Phase II Property ranged from 0.32 to 2.66 mbgs during the November 28, 2019 monitoring event.

Sections 41 and 43.1 of the Regulation

Section 41 of the Regulation (Site Condition Standards, Environmentally Sensitive Areas) does not apply to the Phase II Property.

Section 43.1 of the Regulation applies to the Phase II Property, as the site is a Shallow Soil Property. As per the Regulation, Table 7 Generic Site Condition Standards for Shallow Soils in a Non-Potable Groundwater Condition was used. The Phase II Property is not within 30 m of a water body.

Fill Placement

Fill was identified in the boreholes drilled during the previous subsurface investigation. The impacted fill material is likely a result of demolition debris from the previous building that occupied the Phase II Property circa 1930s to 1940s. Based on the soil results of the 2017 Phase II ESA, the impacted fill material covers the entire site, as shown in Figure 7, Appendix A of the 2017 Phase II ESA report.

Existing Structures and Utilities

The Phase II Property is currently vacant. No utilities are present on the Phase I Property.

Proposed Buildings and Other Structures

It is our understanding that a six (6) storey mixed-use (commercial/residential) building with a level of underground parking is proposed for the site. The footprint of the development will cover the majority of the Phase II Property.

Environmental Condition

Areas Where Contaminants are Present

Based on analytical results of the 2017 Phase II ESA, contaminants that were present in concentrations greater than the selected site condition standards are shown in Figures 4 and 5 in Appendix A of the 2017 Phase II ESA report. Soils across the entirety Phase II Property are considered to be contaminated. Based on the 2017 groundwater results combined with the most recent analytical results, groundwater beneath the Phase II Property complies with the MECP Table 7 Standards and therefore is not contaminated. The most recent groundwater results are shown on Drawing PE4809-5 – Analytical Testing Plan– Groundwater and PE4809-6-Cross Section A-A' – Groundwater.

Types of Contaminants

Contaminants found in soil/fill at concentrations greater than the selected MECP standards consist of several BTEX, PHC, PAH and metal parameters as shown in Figure 7, Appendix A of the 2017 Phase II ESA report.

All contaminant concentrations in groundwater comply with the MECP Table 7 Standards.

Contaminated Media

The fill material, as identified in the 2017 Phase II ESA, remains impacted with BTEX, PHCs, PAHs and/or metals at concentrations exceeding the MECP Standards. Based on the analytical results of the Phase II ESA Update, the groundwater beneath the Phase II Property is not contaminated.

What Is Known About Areas where Contaminants are Present

The area of contamination discussed in the 2017 Phase II ESA report, is interpreted to be across the Phase II Property. Groundwater results indicate that the contamination is confined to the fill layer only.

Distribution of Contaminants

Based on the Phase II ESA Update, there is no groundwater contamination. The horizontal and vertical distribution of soil remains unchanged from the previous 2017 Phase II ESA report.

Discharge of Contaminants

As discussed previously in the Phase I ESA Update, it is our interpretation that the contamination is a result of the former demolition of the on-site storage building. The contaminants are present in the fill. The exact mechanisms of discharge of contaminants are due to demolition debris, dating back before 1958.

Migration of Contaminants

Based on the updated groundwater results, the contaminants are present only in the fill material above the water table and are not considered to have migrated.

Climatic and Meteorological Conditions

In general, climatic and meteorological conditions have the potential to affect contaminant distribution. Two ways by which climatic and meteorological conditions may affect contaminant distribution include the downward leaching of contaminants by means of the infiltration of precipitation, and the migration of contaminants via groundwater levels and/or flow, which may fluctuate seasonally. Based on the results of the subsurface investigation, the contaminated areas appear to be restricted to the overburden soils, and as such, the aforementioned climatic and meteorological conditions are not considered to have affected contaminant distribution at the subject site.

Potential for Vapour Intrusion

There are presently no buildings on-site; therefore, there are no concerns regarding potential vapour intrusion.

It is further noted that all overburden soils will be excavated during site redevelopment. There is no potential environmental concern for the proposed building.

Recommendations

Based on the 2017 soil results, overburden exists at the Phase II Property with BTEX, PHC, PAH and metal concentrations which exceed the applicable MECF Table 7 Standards. It is our recommendation that an environmental site remediation program, involving the removal of all contaminated soil, be completed and confirmed, prior to site redevelopment.

Statement of Limitations

This Phase II - Environmental Site Assessment Update report has been prepared in general accordance with Ontario Regulation 153/04, as amended, under the Environmental Protection Act. 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 a review of readily available geological, historical and regulatory information and a cursory review made at the time of the field assessment.

Should any conditions be encountered at the subject site and/or historical information that differ from our findings, we request that we be notified immediately in order to allow for a reassessment.

This report was prepared for the sole use of John Howard Society of Ottawa. Permission and notification from the above noted party and this firm will be required to release this report to any other party.

Mr. Tyler Fainstat
Page 11
File: PE4809-LET.02

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

Paterson Group Inc.



Mandy Witteman, B.Eng., M.A.Sc.



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

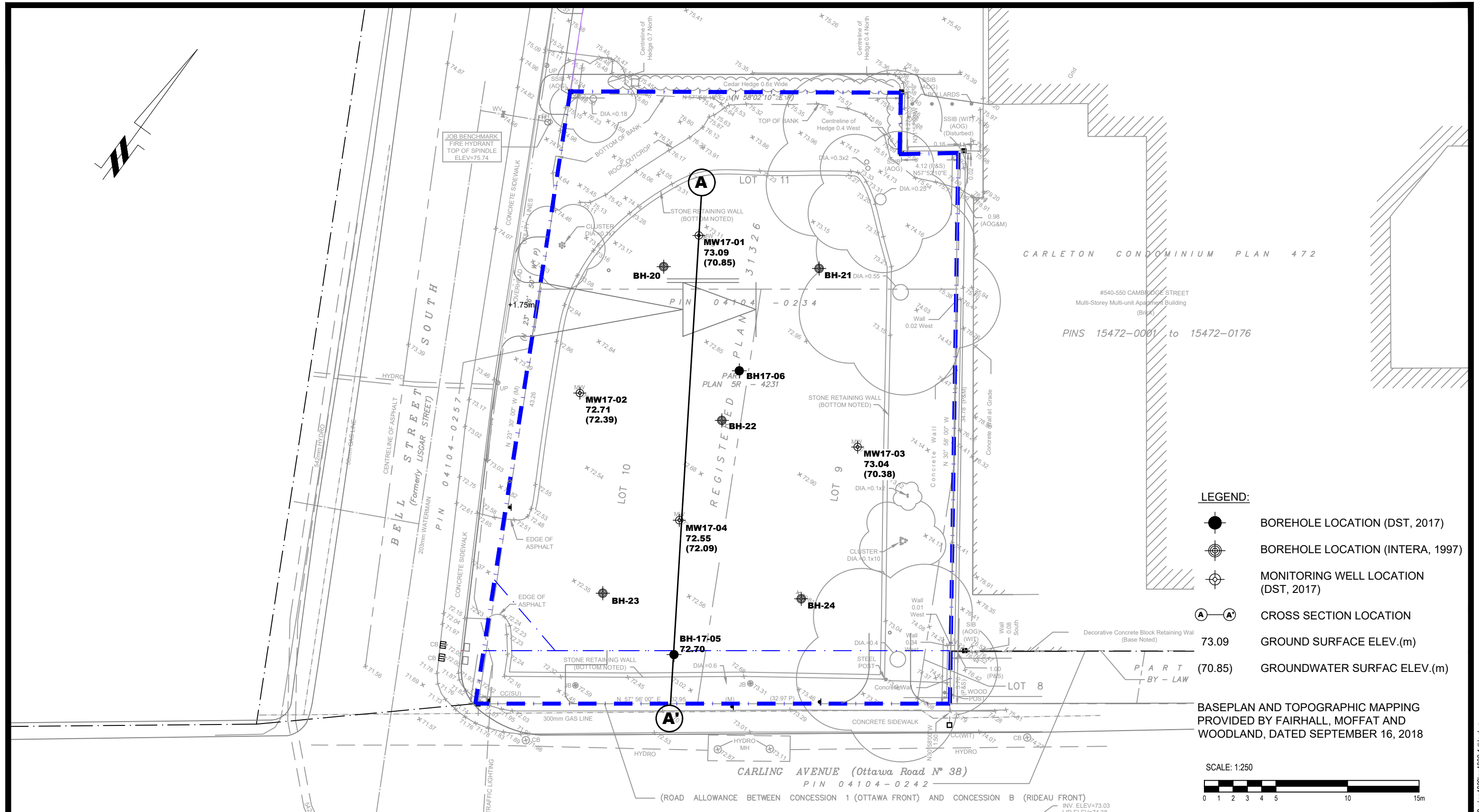
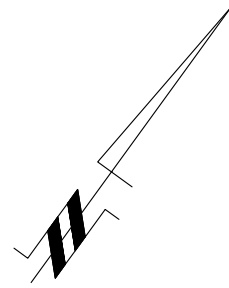


Report Distribution

- John Howard Society of Ottawa
- Paterson Group (1 copy)

Appendix

- Key Plan
- Drawing PE4809-3 – Test Hole Location Plan
- Drawing PE4809-4 – Groundwater Contour Plan
- Drawing PE4809-5 – Analytical Test Plan - Groundwater
- Drawing PE4809-6 – Cross-section A-A' - Groundwater
- Laboratory Certificates of Analysis



CARLETON CONDOMINIUM PLAN 472
 #540-550 CAMBRIDGE STREET
 Multi-Storey Multi-unit Apartment Building
 (Brick)
 PINS 15472-0001 to 15472-0176

LEGEND:

- BOREHOLE LOCATION (DST, 2017)
- BOREHOLE LOCATION (INTERA, 1997)
- MONITORING WELL LOCATION (DST, 2017)
- CROSS SECTION LOCATION
- 73.09 GROUND SURFACE ELEV.(m)
- (70.85) GROUNDWATER SURFAC ELEV.(m)

BASEPLAN AND TOPOGRAPHIC MAPPING PROVIDED BY FAIRHALL, MOFFAT AND WOODLAND, DATED SEPTEMBER 16, 2018



patersongroup
 consulting engineers

154 Colonnade Road South
 Ottawa, Ontario K2E 7J5
 Tel: (613) 226-7381 Fax: (613) 226-6344

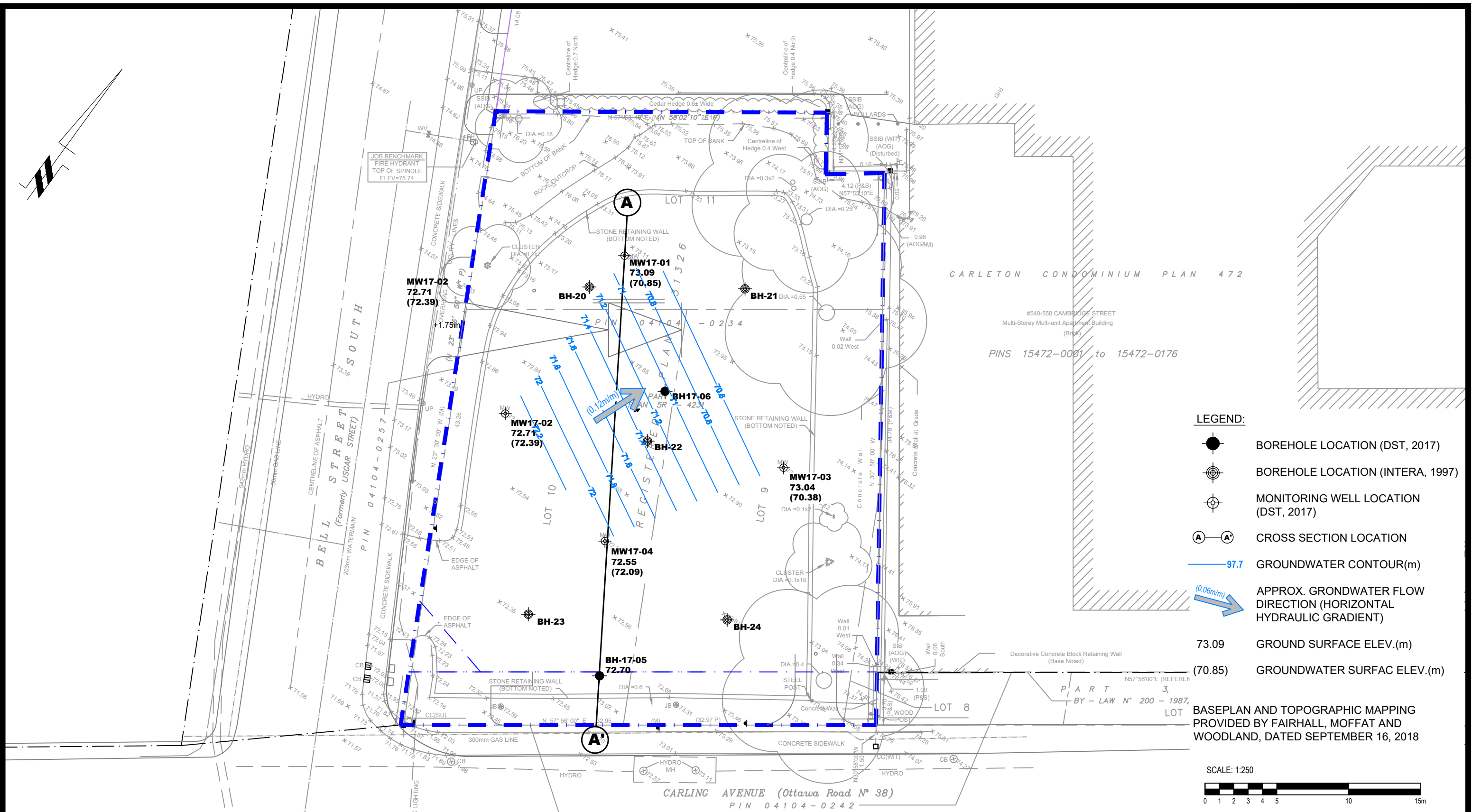
NO.	REVISIONS	DATE	INITIAL

JOHN HOWARD SOCIETY OF OTTAWA
PHASE II ENVIRONMENTAL SITE ASSESSMENT UPDATE
 289 CARLING AVENUE
 OTTAWA, ONTARIO

TEST HOLE LOCATION PLAN

Scale:	1:250	Date:	01/2020
Drawn by:	RCG	Report No.:	PE4809-LET.02
Checked by:	RG	PE4809-3	Revision No.:
Approved by:	SD		

p:\autocad\drawings\environmental\pe4809\pe4809-1.tlp.dwg



- LEGEND:**
- BOREHOLE LOCATION (DST, 2017)
 - BOREHOLE LOCATION (INTERA, 1997)
 - MONITORING WELL LOCATION (DST, 2017)
 - CROSS SECTION LOCATION
 - 97.7 GROUNDWATER CONTOUR(m)
 - APPROX. GRONDWATER FLOW DIRECTION (HORIZONTAL HYDRAULIC GRADIENT)
 - 73.09 GROUND SURFACE ELEV.(m)
 - (70.85) GROUNDWATER SURFAC ELEV.(m)

BASEPLAN AND TOPOGRAPHIC MAPPING PROVIDED BY FAIRHALL, MOFFAT AND WOODLAND, DATED SEPTEMBER 16, 2018

SCALE: 1:250

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL

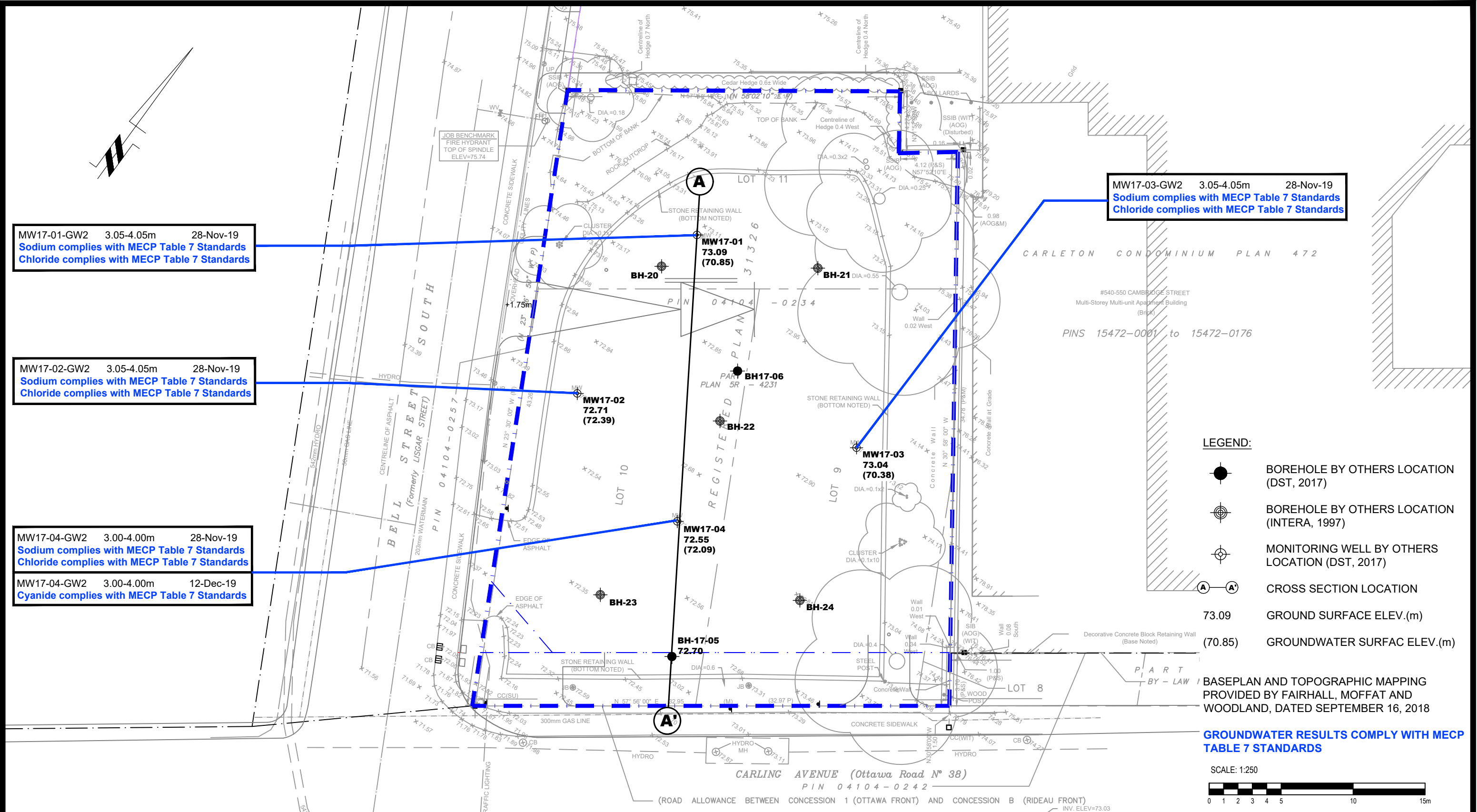
JOHN HOWARD SOCIETY OF OTTAWA
PHASE II ENVIRONMENTAL SITE ASSESSMENT UPDATE
289 CARLING AVENUE

OTTAWA, ONTARIO

GROUNDWATER CONTOUR PLAN

Scale:	1:250	Date:	01/2020
Drawn by:	RCG	Report No.:	PE4809-LET.02
Checked by:	RG	PE4809-4	Revision No.:
Approved by:	SD		

p:\autocad\drawings\environmental\pe4809\pe4809-1.tlp.dwg



MW17-01-GW2 3.05-4.05m 28-Nov-19
 Sodium complies with MECP Table 7 Standards
 Chloride complies with MECP Table 7 Standards

MW17-02-GW2 3.05-4.05m 28-Nov-19
 Sodium complies with MECP Table 7 Standards
 Chloride complies with MECP Table 7 Standards

MW17-04-GW2 3.00-4.00m 28-Nov-19
 Sodium complies with MECP Table 7 Standards
 Chloride complies with MECP Table 7 Standards

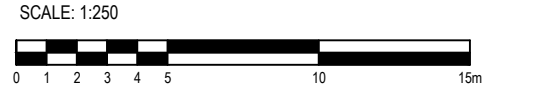
MW17-04-GW2 3.00-4.00m 12-Dec-19
 Cyanide complies with MECP Table 7 Standards

MW17-03-GW2 3.05-4.05m 28-Nov-19
 Sodium complies with MECP Table 7 Standards
 Chloride complies with MECP Table 7 Standards

- LEGEND:**
- BOREHOLE BY OTHERS LOCATION (DST, 2017)
 - BOREHOLE BY OTHERS LOCATION (INTERA, 1997)
 - MONITORING WELL BY OTHERS LOCATION (DST, 2017)
 - CROSS SECTION LOCATION
 - 73.09 GROUND SURFACE ELEV.(m)
 - (70.85) GROUNDWATER SURFAC ELEV.(m)

BASEPLAN AND TOPOGRAPHIC MAPPING PROVIDED BY FAIRHALL, MOFFAT AND WOODLAND, DATED SEPTEMBER 16, 2018

GROUNDWATER RESULTS COMPLY WITH MECP TABLE 7 STANDARDS



patersongroup
 consulting engineers

154 Colonnade Road South
 Ottawa, Ontario K2E 7J5
 Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL

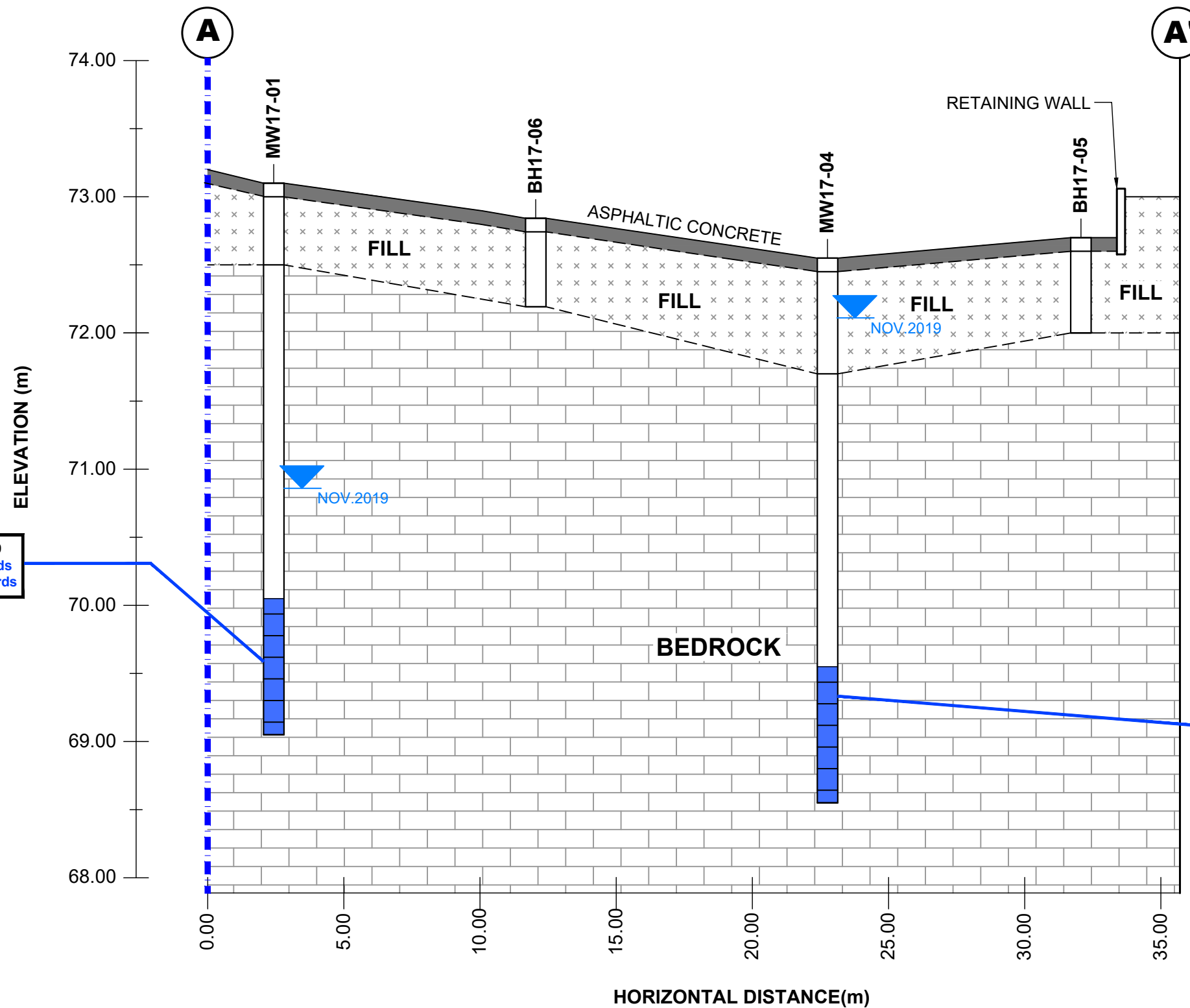
JOHN HOWARD SOCIETY OF OTTAWA
PHASE II ENVIRONMENTAL SITE ASSESSMENT UPDATE
289 CARLING AVENUE

OTTAWA, ONTARIO

ANALYTICAL TESTING PLAN - GROUNDWATER

Scale:	1:250	Date:	01/2020
Drawn by:	RCG	Report No.:	PE4809-LET.02
Checked by:	RG	PE4809-5	Revision No.:
Approved by:	SD		

p:\autocad\drawings\environmental\pe4809\pe4809-1.tlp.dwg



MW17-01-GW2 3.05-4.05m 28-Nov-19
 Sodium complies with MECP Table 7 Standards
 Chloride complies with MECP Table 7 Standards

MW17-04-GW2 3.00-4.00m 28-Nov-19
 Sodium complies with MECP Table 7 Standards
 Chloride complies with MECP Table 7 Standards
 MW17-04-GW2 3.00-4.00m 12-Dec-19
 Cyanide complies with MECP Table 7 Standards

GROUNDWATER RESULTS COMPLY WITH MECP
 TABLE 7 STANDARDS

patersongroup
 consulting engineers

154 Colonnade Road South
 Ottawa, Ontario K2E 7J5
 Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL

JOHN HOWARD SOCIETY OF OTTAWA
 PHASE II ENVIRONMENTAL SITE ASSESSMENT UPDATE
 289 CARLING AVENUE

OTTAWA,
 Title:

ONTARIO

CROSS SECTION A-A'

Scale:	1:250	Date:	01/2020
Drawn by:	RCG	Report No.:	PE4809-LET.02
Checked by:	RG	PE4809-6	Revision No.:
Approved by:	SD		

Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 29204
Project: PE4809
Custody: 51728

Report Date: 3-Dec-2019
Order Date: 29-Nov-2019

Order #: 1948627

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

Parcel ID	Client ID
1948627-01	MW17-01-GW2
1948627-02	MW17-02-GW2
1948627-03	MW17-03-GW2
1948627-04	MW17-04-GW2
1948627-05	DUP1

Approved By:



Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: **Paterson Group Consulting Engineers**
Client PO: 29204

Report Date: 03-Dec-2019
Order Date: 29-Nov-2019
Project Description: **PE4809**

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	2-Dec-19	2-Dec-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	2-Dec-19	3-Dec-19

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 29204

Report Date: 03-Dec-2019

Order Date: 29-Nov-2019

Project Description: PE4809

Client ID:	MW17-01-GW2	MW17-02-GW2	MW17-03-GW2	MW17-04-GW2
Sample Date:	28-Nov-19 12:10	28-Nov-19 11:15	28-Nov-19 12:45	28-Nov-19 10:30
Sample ID:	1948627-01	1948627-02	1948627-03	1948627-04
MDL/Units	Water	Water	Water	Water

Anions

Chloride	1 mg/L	37	26	47	5
----------	--------	----	----	----	---

Metals

Sodium	200 ug/L	63300	40400	313000	86200
--------	----------	-------	-------	--------	-------

Client ID:	DUP1	-	-	-
Sample Date:	28-Nov-19 10:30	-	-	-
Sample ID:	1948627-05	-	-	-
MDL/Units	Water	-	-	-

Anions

Chloride	1 mg/L	43	-	-	-
----------	--------	----	---	---	---

Metals

Sodium	200 ug/L	41100	-	-	-
--------	----------	-------	---	---	---

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 29204

Report Date: 03-Dec-2019
 Order Date: 29-Nov-2019
 Project Description: PE4809

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Metals									
Sodium	ND	200	ug/L						

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 29204

Report Date: 03-Dec-2019
 Order Date: 29-Nov-2019
 Project Description: PE4809

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	84.4	1	mg/L	77.4			8.7	10	
Metals									
Sodium	ND	200	ug/L	ND			0.0	20	

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 29204

Report Date: 03-Dec-2019

Order Date: 29-Nov-2019

Project Description: PE4809

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	10.3	1	mg/L		103	85-115			
Metals									
Sodium	9830		ug/L	ND	96.7	80-120			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 29204

Report Date: 03-Dec-2019
Order Date: 29-Nov-2019
Project Description: PE4809

Qualifier Notes:

None

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.

Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mike Beaudoin

Client PO: 29289
Project: PE4809
Custody: 51763

Report Date: 17-Dec-2019
Order Date: 12-Dec-2019

Order #: 1950493

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

Parcel ID	Client ID
1950493-01	MW17-03-GW2

Approved By:



Mark Foto, M.Sc.
Lab Supervisor

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 circumstances be liable to you in connection with this work

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 29289

Report Date: 17-Dec-2019
Order Date: 12-Dec-2019
Project Description: PE4809

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Cyanide, free	MOE E3015 - Auto Colour	12-Dec-19	12-Dec-19

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.

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 29289

Report Date: 17-Dec-2019
 Order Date: 12-Dec-2019
 Project Description: PE4809

Sample Results

Cyanide, free				Matrix: Water	
				Sample Date: 12-Dec-19	
Paracel ID	Client ID	Units	MDL	Result	
1950493-01	MW17-03-GW2	ug/L	2	<2	

Laboratory Internal QA/QC

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Matrix Blank									
Cyanide, free	ND	2	ug/L						
Matrix Duplicate									
Cyanide, free	ND	2	ug/L	ND				20	
Matrix Spike									
Cyanide, free	33.5	2	ug/L	ND	112	70-130			



1950493

Nº 51763

Client Name: <u>Paterson Group</u>	Project Ref: <u>PE4809</u>	Page <u>1</u> of <u>1</u>
Contact Name: <u>Mike Beaudoin</u>	Quote #:	Turnaround Time <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular Date Required: _____
Address: <u>154 Colonnade Rd. S.</u>	PO #: <u>29289</u>	
Telephone: <u>613-226-7381</u>	Email: <u>mbeaudoin@patersongroup.ca</u>	

Regulation 153/04		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		CYANIDE	X												
<input type="checkbox"/> Table 2	<input type="checkbox"/> Ind/Comm	<input type="checkbox"/> Coarse	<input type="checkbox"/> CCME	<input type="checkbox"/> MISA				Date	Time														
<input checked="" type="checkbox"/> Table 3	<input type="checkbox"/> Agri/Other		<input type="checkbox"/> SU - Sani	<input type="checkbox"/> SU - Storm																			
For RSC: <input type="checkbox"/> Yes <input type="checkbox"/> No		Mun: _____		Other: _____																			
Sample ID/Location Name																							
1	<u>MW17-03-GW2</u>		<u>GW</u>	<u>1</u>	<u>Dec. 12. 19</u>	<u>12:30</u>																	
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Comments:		Method of Delivery: <u>walk in</u>	
Relinquished By (Sign): <u>Nick Sullivan</u>	Received By Driver/Depot:	Received at Lab: <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>Nick Sullivan</u>	Date/Time: _____	Date/Time: <u>12/12/19 1:50</u>	Date/Time: <u>12 Dec 19/45</u>
Date/Time: <u>Dec. 12. 19. @ 1:50 PM</u>	Temperature: _____ °C	Temperature: <u>10.9</u> °C	pH Verified: <input type="checkbox"/> By: <u>[Signature]</u>