Phase Two Environmental Site Assessment Update

Domtar Lands Redevelopment

Chaudière and Albert Islands

3, 4 and 6 Booth Street

Ottawa, Ontario

Prepared for:

Windmill Development Group Ltd.
#201, 1306 Wellington Street West
Ottawa, ON
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REVISION D

DST File No.: OE-OT-018031

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EXECUTIVE SUMMARY

DST Consulting Engineers Inc. (DST) was retained by Windmill Development Group Ltd. to provide an update of a previously completed Phase Two Environmental Site Assessment (ESA) associated with the planned re-development of the Domtar Lands located on Chaudière and Albert Islands in Ottawa, Ontario.

This report was prepared to support the submission of a Record of Site Condition (RSC), in accordance with Ontario Regulation (O.Reg.) 153/04, as amended. This report serves as an update to the previously completed Phase Two ESA entitled: *"Phase II Environmental Site Assessment Update, Domtar Lands Redevelopment, Chaudi*ère and Albert Islands*, 3, 4, and 6 Booth Street Ottawa, Ontario",* DST Consulting Engineers Inc., July 2015; by incorporating the two previously omitted parcels of land on Chaudière Island: the Hydro Lease Lands on the southeast shore, and the land along the northwest shore and comparing the data collected on these parcels to the updated O.Reg. 153/04, as amended applicable standards.

The Phase Two ESA in 2015 was updated to the current O. Reg. 153/04 (as amended) in order to establish an estimate of impacted soil volume with respect to the current provincial standards. Analytical soil and groundwater results from the previous investigations, not previously updated, were compared to provincial criteria as follows:

Soil:

- Ontario Ministry of the Environment and Climate Change (MOECC) O.Reg. 153/04 "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", July, 2011 (SCS), Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Property Use, Coarse textured soils;
- MOECC SCS Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. Residential / Parkland / Institutional / Industrial / Commercial / Community Property Use. All soil textures;

Groundwater:

- MOECC SCS Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. All Types of Property Use. Coarse textured soils;
- MOECC SCS Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All Textures; and
- Compliance to the MOECC O. Reg. 153/04, Records of Site Condition – including the completion of a Conceptual Site Model.

Both tables were used to compare to all data, as MOECC Table 9 SCS are more stringent for most parameters; however, for groundwater there are some parameters where the MOECC Table 7 SCS are more stringent. Therefore, when MOECC Table 7 and Table 9 SCS parameter concentration limits differ, the most stringent standard applies. A parameter is considered an exceedance when its concentration exceeds one or both standards.

Based on the comparison of historical analytical data to the applicable updated provincial standards, DST identified soil and groundwater exceedances to provincial standards at the Site.

Limitations included the spatial separation between boreholes and limited analytical dataset. Given the geographical magnitude of the study area, an opportunity remains to further characterize and refine the contaminant boundaries. The present estimates were based on current and historical information available for the Site and may change as additional soil analytical results are available. Moreover, it should be noted that certain building footprints including the Building 541 (Area 1), Former Board Mill (Area 2) and a section of the Former Paper Mill Building (Area 3) were excluded either due to access restrictions for an intrusive investigation or on basis of the assumption that the buildings basements have been founded on bedrock, and as such no contaminated soil would be present. However, note that it is possible that the basement floor slabs may have been constructed on granular fill underlain by bedrock.

The approximate volume of contaminated soil on Site was 109,250 m^3**.** Note that a contingency factor of 15% was added to the final soil estimate calculation to account for potential uncertainties.

It is DST's understanding that all the fill material – impacted and non-impacted – would be removed from the Site as part of the future Site redevelopment. Prior to the redevelopment of the Site, DST recommends that a Remedial Options Plan (ROP) be implemented in order to evaluate the effectiveness of various remedial techniques. During the implementation of the remediation, a soil management plan should be executed to optimize the management of excess soils generated by the remedial activities. The management of excess soils shall be conducted in accordance with the MOE's *"Management of Excess Soil – A Guide for Best Management Practices"*, as this will potentially assist in minimizing the quantities of non-impacted soils that are diverted for landfill disposal

Given that the groundwater quality was assessed across the Site in 2006, DST completed an updated groundwater sampling program consisting of the re-sampling of existing monitoring wells on Albert Island in the Spring of 2014. New groundwater quality data indicated an apparent decrease in concentrations present in groundwater, so that no exceedances were identified. . Additional groundwater data is required to determine if the groundwater quality has improved, or if the difference in sampling techniques eliminated the sediment that previously impacted the groundwater quality.

As the Site still contains contaminated soil, a RSC filing is not possible based on the current investigation of the property. A RSC filing for the property requires either completion of remediation work or completion of a risk assessment for the property.

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APPENDICES

1. Introduction and Background

1.1 General

DST Consulting Engineers Inc. (DST) was retained by Windmill Development Group Ltd. (referred to as the "Client") to provide an update of a previously completed Phase Two Environmental Site Assessment (ESA) associated with the planned re-development of the Domtar Lands located on Chaudière and Albert Island in Ottawa, Ontario (referred to as the "Site"). This work was detailed in the DST work plan, dated January 21, 2014, approved by the Client.

This report serves as an update to the previously completed Phase Two ESA entitled: *"Phase Two Environmental Site Assessment Update – Domtar Land Redevelopment, Chaudière and Albert Islands, Ottawa, Ontario"* (DST, 2015). It also includes the integration of two previous reports to include the area on the north side of the western portion of Chaudière Island, and the Hydro Lease Lands. The two reports incorporated into this updated Phase Two ESA report are entitled:

- "*Phase II Environmental Site Assessment, Hydro Lease, Chaudière Island, Ottawa, Ontario",* DST Consulting Engineers Inc. March 2008
- "*Environmental Site Assessment Volume II – Phase II Environmental Site Assessment, Chaudière and Albert Islands, Ottawa, Ontario"*, DST Consulting Engineers Inc., March 2008.

This report has been prepared to support the submission of a Record of Site Condition (RSC), in accordance with Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Act under the Environmental Protection Act, R.S.O. 1990, c. E. 19, as amended (O. Reg. 153/04). A RSC will be submitted to allow the future land use to be changed from commercial/industrial to residential as part of the planned re-development of the Site.

1.2 Site Description and Study Areas

The Site is located at 3, 4, and 6 Booth Street, in Ottawa, Ontario. The Site location is illustrated on Figure 1 in Appendix A. The property identification numbers (PINs) for the lots on the Site are:

PIN 04097-0214(LT)

PIN 04097-0216(LT)

PIN 04097-0090(LT)

PIN 04097 0087(LT)

PIN 04280-0138(LT)

Plan 4R-5277

PIN 04280-0040(LT)

PIN 04280-0041(LT)

PIN 04280-0042(LT)

PIN 04280-0067(LT)

PIN 04280-0144(LT)

PIN 04280-0007(LT)

PIN 04280-139(LT)

PIN 04280-0043(LT)

Part of PIN 04097-0212(LT)

Part of PIN 04097-0089(LT)

The study limits include Albert Island, in its entirety, and Chaudière Island, excluding the Booth Street right-of-way and Chaudière Hydro lands in the north/northwest portion of the island. The Site plan is illustrated on Figure 2 in Appendix A.

The Site is composed of two islands in the Ottawa River: Chaudière and Albert Islands. Chaudière Island encompasses approximately 6 hectares of the Site area, while Albert Island covers approximately 0.4 hectares. Chaudière Island has a length of approximately 560 m and a maximum width of approximately 220 m. Albert Island has a length of approximately 200 m and a maximum width of approximately 50 m.

For the purpose of the Phase Two ESA Update, the Site was divided into three (3) areas as illustrated on Figure 2 in Appendix A. Area 1 encompasses Albert Island in its entirety. Area 2 covers the entire land area of Chaudière Island east of Booth Street, including the Hydro Lease area, while Area 3 encompasses the area of the Site on Chaudière Island west of Booth Street.

1.3 Property Ownership

The lands comprising the Site are currently owned by Domtar Inc. (Domtar), the Crown and Chaudière Hydro. Domtar is the current owner of most of the above-listed lots of land. The contact information of Mr. Paul Rankin, an employee and on-Site representative of Domtar, is provided below:

Name: Paul Rankin
Rationale: Domtar employee
Phone No.: (613) 738-5499 ext. 7065
Address: 6 Booth Street, Ottawa, ON

1.4 Current and Proposed Future Uses

The Site is currently vacant, with the buildings present but un-occupied. It is DSTs understanding that the proposed redevelopment of the Phase Two Property is for residential use.

It is DST's understanding that all the fill material – impacted and non-impacted – will be removed from the Site as part of the future Site redevelopment

1.5 Applicable Site Condition Standards

In order to support the change of land use from commercial/industrial to residential and to address the changes in Ministry of the Environment and Climate Change (MOECC) standards between 2004 and 2011, the following was considered in identifying the applicable standards:

- Rezoning of the Site to residential land use. Thus, provincial residential standards are applicable.

- Based on information provided in the Phase I ESA, one observation well was identified on the Site. Based on the location of the Site, within the City of Ottawa, and the proposed residential development, the potable water is anticipated to be municipally supplied by the City of Ottawa. Therefore, the Site is considered to have non-potable water groundwater.
- Soil pH analyses were previously completed on twenty-seven (27) samples: fifteen (15) surface soil samples (at an average depth of 0 – 1.5 m below grade (mbg)) and twelve (12) sub-surface samples (below 1.5 mbgs). The pH results for these analyses are included in Appendix B, C and D. The average analyzed soil pH was approximately 8.7 (surface) and 8.3 (sub-surface). These soil pH values are not outside the range specified by O. Reg. 153/04 for both surface soil (5 to 9) and sub-surface soil (5 to 11). Therefore, the Site is not considered environmentally sensitive according to O. Reg. 153/04 (as amended).
- According to O. Reg. 153/04 properties that include a water body or are within 30 metres of a water body are considered environmentally sensitive sites. Both islands are located on the Ottawa River.
- O. Reg. 153/04 defines “shallow soil property” as a property of which 1/3 or more of the area consists of soil equal to or less than 2 metres in depth beneath the soil surface, excluding any non-soil surface treatment such as asphalt, concrete or aggregate. Since shallow soil covers more than 1/3 of the Site, the Site is considered to be in a shallow soil condition.
- Based on the Phase Two ESA previously completed for the Site (DST 2008), the soil stratigraphy consists of fill material overlying bedrock. The fill material generally consists of sand, sand and gravel, some areas of boulders, cobbles, and occasional silt and clay layers. As such, standards for coarse textured soil were used.

Therefore, based on the above, the historical analytical soil data were compared to the following Site Condition Standards (SCSs) for updating the contaminant assessment at the Site:

- MOECC, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. Residential / Parkland / Institutional Property Use. Coarse textured soils.
- MOECC SCS Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. Residential / Parkland / Institutional / Industrial / Commercial / Community Property Use. All soil textures.

The groundwater was compared to the following:

- MOECC SCS Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. All Types of Property Use. Coarse textured soils.
- MOECC SCS Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All Soil Textures.

Both tables were used to compare to all data, as MOECC Table 9 SCSs are more stringent for most parameters; however, for groundwater there are some parameters where the MOECC Table 7 SCS are more stringent. Therefore, when MOECC Table 7 and Table 9 SCS parameter concentration limits differ, the most stringent standard applies. A parameter is considered an exceedance when its concentration exceeds one or both standards.

1.6 Physical Setting

The Site is comprised of two islands, Chaudière Island and Albert Island, located in the Ottawa River at Booth Street, Ottawa, Ontario. No areas of natural significance were identified in previous works at the Phase Two Property.

The Site is slightly sloping to the east, with an otherwise flat topography. The northwest shoreline of Chaudière Island is a steep drop off/cliff, due to the presence of the hydroelectric dam present to the west. Surface water drainage is anticipated to be through infiltration on the unpaved portions of the property, and any overland flow is anticipated to be towards the south in Area 1, to the east in Area 2, and to the north in Area 3.

The Site has been used for industrial and manufacturing purposes since the late 1800's. Industries that have occupied the Site include: pulp and paper production facilities, sawmills, grist (flour) mills, furniture manufacturing and hydroelectric generation stations. The Site was most recently used as an industrial complex for the production of paper products from dried pulp. Primary structures comprising this industrial facility included paper manufacturing and storage facilities; laboratories; administrative buildings; an effluent clarifier; and several vacant buildings in poor condition. The paper production operations ceased at the Site in March 2006.

2. Past Investigations

A Phase I ESA was completed in 2008 for the entire Site for due diligence purposes. Based on the historical industrial and manufacturing use of the Site, 13 potential environmental concerns were identified. A Phase II ESA was recommend to investigate the soil and groundwater quality at the Site.

In 2008, a Phase II ESA was completed with the installation of 32 boreholes, of which 26 were installed as monitoring wells. Soil and groundwater samples were collected, and when compared to the standards applicable at the time, exceedances of these applicable standards were identified in both soil and groundwater.

In 2014/2015, both the Phase I ESA and Phase II ESA (earlier version of this report) were updated to comply with the amendments made to the O. Reg. 153/04, specifically with the updated SCSs for soil and groundwater analytical data. These reports excluded the Hydro Lease lands on the southeast shore of the east portion of Chaudière Island, and the land along the northwest shore of the west portion of Chaudière Island. Exceedances to the updates SCSs were identified in the historical data. During the updating of the 2015 Phase II ESA, an additional groundwater sampling program was completed on the wells located in Area 1, Albert Island. A low flow sampling methodology was used and likely contributed to the apparent reduction in analytical concentrations of parameters that previously exceeding the SCSs, due to lessening of sediment in the groundwater samples.

Additional details of these reports is provided in the sections below.

2.1 Phase One ESA (2015)

DST was retained by Windmill Development Group Ltd. to conduct a Phase One ESA of the Site. DST performed this Phase One ESA in accordance with the Ontario Regulation 153/04 *Records of Site Condition* (O. Reg. 153/04), as amended. The 2015 Phase One ESA incorporated the information contained in the 2008 Phase I ESA report; also, the 2008 Phase I ESA was not completed to O. Reg. 153/04 standards. Therefore, the 2008 Phase I ESA report is not summarized in this section or considered further in this report.

The objective of the 2015 Phase One ESA was to evaluate actual and potential environmental concerns on the Site and to assess the potential for the Site to be impacted by the current and/or historical uses and surrounding properties. Information regarding the Site and Phase One study area was compiled through a records review, Site reconnaissance, and an interview with a knowledgeable Phase One Property representative. Federal, provincial, and private agencies and other databases were searched during the records review for indicators of potentially contaminating activities with regards to the Site.

DST conducted the Site reconnaissance on April 7, 2014; however, due to limited observations of exterior ground conditions, DST completed additional reconnaissance of the Site on August 12, 2014.

Eight PCAs were identified on the Phase One Property and adjacent properties. The PCAs included:

- Acid and Alkali Storage;

- Electricity Generation;
- Gasoline and Associated Products Storage in Fixed Tanks;
- Importation of Fill Material of Unknown Quality;
- Paints Bulk Storage;
- Pulp, Paper and Paperboard Manufacturing and Processing;
- Transformer Use (including PCB storage); and
- Waste Disposal (thermal treatment).

Based on the PCAs, 16 areas of potential environmental concern (APECs) were identified on the Site, as illustrated on Figure 3 in Appendix A. Two APECs were not shown on Figure 3, Appendix A, as they covered the entire Site: APEC 11 - fill of unknown quality likely brought to Site during development, and APEC 16 – the ashes of the fire of 1900 which burnt down most of the buildings on-Site. A summary of the PCA, APEC location, potential contaminants of concern and media potentially impacted is presented in Table 1 below.

Table 1: Summary of the PCAs, APECs, COCs, and Potentially Impacted Media

APEC No.	Location of APEC on the Phase One Property	Location of Potential Contaminating Activity (PCA) (on-site or off-site)	Potential Contaminants of Concern (PCOCs)	Media Potentially Impacted (Groundwater, soil, and/or sediment)
APEC 1	East side of Chaudière Island, immediately west of the Board Mill building on Chaudière Island.	PCA 1 – Former acid storage tanks.	Metals Inorganics pH	Soil Groundwater
APEC 2	Northeast end of the Board Mill Building on the eastern part of Chaudière Island.	PCA 1 – Former sulphite storage.	Metals Inorganics Sulphur compunds Phenolics	Soil Groundwater
APEC 3	Along the north side of the former Paper Mill building on Chaudière Island.	PCA18 – Former coal storage used to fuel boilers.	PAHs	Soil Groundwater
APEC 4	Northeast of the former Paper Mill building on Chaudière Island.	PCA 18 – Former Bunker C fuel oil AST	PHC F1-F4 PAHs	Soil Groundwater Sediment Surface water
APEC 5	Located west of the building on the south shore of Albert Island.	PCA 28 – Associated with former gasoline UST	PHC F1-F4 BTEX	Soil Groundwater Sediment Surface water
APEC 6	Located east of the east end of the building on the south shore of Albert Island.	PCA 28 –Suspected former gasoline UST	PHC F1-F4 BTEX	Soil Groundwater Sediment Surface water
APEC 7	North of former Paper Mill building on Chaudière Island.	PCA 28 – Former fuel oil AST with 45,500L capacity and former fuel oil 'day tank'	PHC F1-F4 BTEX	Soil Groundwater
APEC 8	At the southwest corner in the basement of former Board Mill building on Chaudière Island.	PCA 28 – Three ASTS of unknown contents.	PHC F1 – F4 VOCs PAHs Metals inorganics	Soil Groundwater
APEC 9	Located in the basement of the Former Paper Mill building on Chaudière Island.	PCA 28 – Former oiler shack; - lubricant oil AST with 1,000L capacity; - Two former kerosene ASTs, each with 1,000 L capacity; and - Former thermoil AST with 1,000 L capacity	- PHC F1-F4, BTEX - PHC F1-F4, BTEX - PHC F1-F4, VOCs, PAHs - PHC F1-F4, PAHs, VOCs.	Soil Groundwater Sediment Surface water

APEC No.	Location of APEC on the Phase One Property	Location of Potential Contaminating Activity (PCA) (on-site or off-site)	Potential Contaminants of Concern (PCOCs)	Media Potentially Impacted (Groundwater, soil, and/or sediment)
APEC 10	Northwest of former Paper Mill building on the western portion of Chaudière Island	PCA 28 – Former diesel UST.	PHC F1-F4, PAHs	Soil Groundwater Sediment Surface water
APEC 11	Chaudière and Albert Island soil cover.	PCA 30 – Fill of unknown quality throughout the Site.	Metals PAHs pH PHC F1-F4	Soil Groundwater
APEC 12	Eastern portion of the building on the south shore of Albert Island.	PCA 39 – Former paint shop.	VOCs	Soil Groundwater Sediment Surface water
APEC 13	Paper Mill buildings on western portion of Chaudière Island.	PCA 45 – Former pulp and paper manufacturing and processes.	Metals Inorganics Dioxins and furans pH Sulfur compounds	Soil Groundwater
APEC 14	Board Mill building on eastern portion of Chaudière Island.	PCA 55 –Transformer use and PCB storage	PCBs	Soil Groundwater
APEC 15	North of Paper Mill building, at the northeast corner of the Site on the western portion of Chaudière Island	PCA 58 – Former waste burner	PAHs Metals Dioxins and furans	Soil Groundwater
APEC 16	Chaudière and Albert Islands.	Fire of 1900 which burnt down most of the on-Site buildings.	PAHs Metals Dioxins and furans	Soil Groundwater

Based on the findings of the Phase One ESA, DSTs concluded an intrusive soil and groundwater quality investigation in the form of a Phase Two ESA in the areas of potential environmental concern was recommended to determine the presence/absence of contamination within the APECs.

2.2 Phase II ESAs (2008)

This is a summary of both of the 2008 reports, for the Hydro Lease lands and the remainder of the Site. The investigations were carried out as one investigation, but reported separately.

DST was retained by the National Capital Commission (NCC) in 2008 to complete a combined Phase I and II ESA for the existing buildings on the Site. The purpose of the investigation was to identify the potential for soil and/or groundwater contamination from past and then-present land uses at the Site and to assess the presence and extent of contamination above applicable federal and provincial guidelines. The information presented in the Phase I ESA portion of the 2008 report will not be considered as a Phase One ESA was completed in 2015 that incorporated the data (see Section 2.1.1).

The field program associated with the Phase II ESA consisted of the advancement of thirty-two (32) boreholes, of which twenty-six (26) were converted into monitoring wells. The current Site area includes the entire area of the previous Phase II ESA (2008) minus an area in the north/northwest portion of Chaudière Island (the area encompassing boreholes / monitoring wells BHMW7 to BHMW12). The current Site area, however, includes two buildings located along the northern limit of Chaudière Island, west of Booth Street, as well as the Hydro lease lands within the eastern portion of Chaudière Island, including two monitoring wells (BHMW20 and BHMW23). The locations of the boreholes / monitoring wells located within the current Site area are shown in Figure 2 (refer to Appendix A). For the purposes of this report, only results pertaining to the boreholes / monitoring wells within the current Site area were summarized and updated.

The scope of the Phase Two ESA investigation included collection of soil and groundwater samples. Two additional water samples were collected: one from a pit within the Board Mill (BMWGS1) and the other from the Groundwood Mill (GWM-WGS1). The exact use of these former pits is unknown.

Thirty-nine (39) soil samples and twenty-five (25) groundwater samples, collected from the boreholes / monitoring wells within the current Site area, were submitted for chemical analysis. Analytical parameters included: PHCs F1 to F4; BTEX; VOCs; PAHs; inductively coupled plasma mass spectrometry (ICPMS) metal scan (21 metal parameters); chlorinated phenolic compounds; pesticides; PCBs and other chemical compounds including sulphur, hardness and pH, as applicable.

In order to satisfy the requirements for the submission of a Record of Site Condition, DST has considered the historical soil and groundwater data and compared the analytical results against the current SCSs (see Section 1.5). This update of the Phase II ESA report also includes data from the Hydro Lease lands compared to the updated applicable standards.

The Phase II ESA report for the Hydro Lease lands was not previously completed to the current O. Reg. 153/04, as amended. The data from this report was incorporated into the analytical tables of this updated Phase Two ESA report to create the data sets found in Appendix B (Area 1), Appendix C (Area 2), and Appendix D (Area 3). The new data was compared to the updated standards.

2.2.1 Applicability of the Data

The soil stratigraphy, physical data, soil screening, and laboratory analyses was collected using methodologies compatible with those considered applicable for use in the application of an RSC. Therefore this data will be utilized in support of this RSC.

The groundwater sampling was likely completed using methodologies that are not considered applicable for all of the analysis completed. For example, low flow sampling techniques should be used for groundwater PAH sampling to reduce biases attributed to contaminants adsorbed to soil particles that would be more prevalent in samples collected using the conventional inertial foot valve and tubing methodology. In addition, the groundwater data from the 2008 DST Phase II ESA is stale dated. Therefore, groundwater analytical data from the 2008 Phase II ESA will be considered, but no relied upon in the filing of this RSC.

Since the purpose, and construction of the pits within the Board Mill and the Groundwood Mill are no known, the analytical results from samples water BMWGS1 and GWM-WGS1 will not be considered in this report.

2.2.2 Soil Stratigraphy

The soil stratigraphy within the borehole locations at the subject property generally consists of soil fill material overlying bedrock. The fill materials vary in depth on site from none under certain building footprints to greater than 7.0 m. The fill material generally consists of sand, sand and gravel, some areas of boulders, cobbles, and occasional silt and clay layers. Potentially deleterious materials such as wood, coal, brick were encountered at certain borehole/monitoring well locations. Further details of the soil conditions with respect to visual and olfactory evidence of potential contamination noted as part of the intrusive investigation are outlined in the borehole logs in the historical Phase II ESA.

2.2.3 Bedrock Conditions

Bedrock or refusal conditions were encountered at twenty-two of the thirty-two borehole locations completed on the subject property. The bedrock consisted of grey limestone with fossiliferous sections and narrow black shale horizons. Bedrock was encountered at a depth of between approximately 0.10 and 7.0 m below the existing grade surface (bgs) and the geodetic elevations of the bedrock surface was estimated to range between approximately 43.6 and 53.6 metres above sea level (masl). With the exception of eight borehole/monitoring wells (BHMW4, BHMW6 to 8, BHMW24, BH25, BHMW29 and BHMW31), the monitoring wells were installed in bedrock. Five of the monitoring wells installed in bedrock were advanced using diamond coring techniques to recover and evaluate the bedrock core. The core quality of the retrieved bedrock cores were classified in accordance with the Canadian Foundation Engineering Manual (CFEM) Rock Quality Designation (RQD). Based on field observations, the RQD of the bedrock for the subject site is classified as fair to excellent, with the quality of the bedrock generally increasing with depth. The weathered zone was found to generally extend approximately 1.5 m below the bedrock surface for the above-noted intrusive locations.

2.2.4 Groundwater Elevations and Flow Conditions

The static water levels in the monitoring wells were measured on August 1, 2006, and ranged from approximately 0.9 to 9.3 m below the existing grade surface. Most groundwater levels recorded on August 1, 2006, were measured within the bedrock underlying the subject property. The elevations of the groundwater recorded on site were measured to be between 37.7 and 52.8 masl.

Generally, groundwater on the subject property was evaluated to flow in a radial direction to the surrounding Ottawa River surrounding the islands.

2.2.5 Analytical Results Update

In order to support the change of land use from commercial/industrial to residential use and to address the changes in MOECC standards between 2004 and 2011, historical analytical soil and groundwater data were compared to the 2011 MOECC Table 7 and Table 9 SCSs as detailed in Section 1.5.

2.2.5.1 Area 1 – Albert Island

Area 1 encompasses Albert Island in its entirety. Five (5) boreholes were advanced on Albert Island, four (4) of which were converted into monitoring wells. The five (5) locations are: BH1, BHMW2, BHMW3, BHMW4 and BHMW31. Refer to Figure 2 in Appendix A for borehole and monitoring well locations.

The number of soil and groundwater samples submitted for laboratory analysis from each of the sampling locations and what PCOCs they were submitted for are summarized in Table 2 below.

Table 2: Summary of Sampling Locations and Laboratory Analyses Completed – Area 1

Location ID	Sample ID	Depth of sample (m bgs)	Soil Laboratory Analyses	Groundwater Laboratory Analyses
BH1	SS4	1.8–2.4	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
BHMW2	BHMW2-SS2	0.6–1.2	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW2	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW3	BHMW3-SS1	0.1–0.4	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW3	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW4	BHMW4-SS5	2.4–3.0	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A

Location ID	Sample ID	Depth of sample (m bgs)	Soil Laboratory Analyses	Groundwater Laboratory Analyses
	BHMW4	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW31	BHMW31 - SS1/2/3	0.1– 2.1	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW31-SS4	2.1–2.7		
	BHMW31 -SS5	3.0–3.7		
	BHMW31 – WGS1	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs

2.2.5.1.1 Soil Quality Assessment

Tables comparing soil analytical results to updated applicable provincial standards are presented in Tables B-1, B-2 and B-3 in Appendix B. Findings are summarized in Table 3 below including the parameters that exceeded and the applicable SCSs. Refer to Figure 4 in Appendix A for locations of soil quality exceedances.

Table 3: Soil Exceedances of the MOECC Table 7 and Table 9 SCSs – Area 1 – Albert Island

Sample ID (Sample Depth m)	Criteria	PAHs and PCBs	Metals and Sulphur	PHCs and VOCs
BHMW2 SS2 (0.6-1.2)	MOECC Table 7	Anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, fluoranthene, 2-methylnaphthalene, naphthalene, phenanthrene	None	PHCs F2 & F3
	MOECC Table 9	Acenaphthene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, fluoranthene, fluorene, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene	None	PHCs F2, F3 & F4, benzene, ethylbenzene, styrene, total xylenes
BHMW3-SS1 (0.1-0.4)	MOECC Table 7	Acenaphthylene, anthracene, benzo[a]anthracene, Benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, phenanthrene, pyrene, total PCBs	Copper, lead	PHCs F2 & F3
	MOECC Table 9	Acenaphthene, acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene, pyrene, total PCBs	Antimony, copper, lead	PHCs F2, F3 & F4
BHMW4-SS5 (2.4-3.0)	MOECC Table 7	Benzo[a]pyrene, fluoranthene	Arsenic, lead, molybdenum	None
	MOECC Table 9	Benzo[a]anthracene, Benzo[a]pyrene, fluoranthene, naphthalene	Antimony, arsenic, barium, lead, molybdenum	None
BHMW31 SS1/2/3 (0.1-2.1)	MOECC Table 7	Acenaphthylene, anthracene, benzo[a]anthracene, Benzo[a]pyrene, benzo[b]fluoranthene, dibenzo[a,h]anthracene, fluoranthene	None	PHC F3
	MOECC Table 9	Acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, phenanthrene, pyrene	None	PHCs F2, F3 & F4
BHMW31-SS4 (2.1-2.7)	MOECC Table 7	None	None	PHC F3
	MOECC Table 9	None	None	PHCs F2, F3 & F4
BHMW31-SS5 (3.1-3.7)	MOECC Table 7	None	None	PHCs F2, F3 & F4
	MOECC Table 9	None	None	PHCs F2, F3 & F4

2.2.5.1.2 Groundwater Quality Assessment

Tables comparing groundwater analytical results to updated applicable provincial standards are presented in Tables B-4, B-5 and B-6 in Appendix B. Findings are summarized in Table 4. Refer to Figure 4 in Appendix A for groundwater quality data.

Table 4: Groundwater Exceedances of the MOECC Table 7 and Table 9 SCSs – Area 1 – Albert Island

Sample ID	Criteria	PAHs and PCBs	Metals and Sulphur	PHCs and VOCs
BHMW2	MOE Table 7	None	Copper, sodium	None
	MOE Table 9	None		None
BHMW3	MOE Table 7	Benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, chrysene, indeno[1,2,3-cd]pyrene	None	None
	MOE Table 9		None	None
BHMW4	MOE Table 7	Benzo[ghi]perylene, indeno[1,2,3-cd]pyrene	None	None
	MOE Table 9		None	None

2.2.5.2 Area 2 – Chaudière Island - East

Area 2 covers the entire land area of Chaudière Island east of Booth Street, including the Hydro Lease area. Eleven (11) boreholes were advanced in Area 2, ten (10) of which were instrumented with monitoring wells. The eleven (11) locations are: BHMW16, BHMW17, BHMW18, BHMW19, BHMW20, BHMW21, BHMW22, BHMW 23, BHMW24, BH25 and BHMW26. Refer to Figure 2 in Appendix A for borehole and monitoring well locations. Note that two additional groundwater samples were collected: one sample collected from a pit within the Board Mill (BMWGS1) and one from the Groundwood Mill (GWM-WGS1).

The number of soil and groundwater samples submitted for laboratory analysis from each of the sampling locations and what PCOCs they were submitted for are summarized in Table 5 below.

Table 5: Summary of Sampling Locations and Laboratory Analyses Completed – Area 2

Location ID	Sample ID	Depth of sample (m bgs)	Soil Laboratory Analyses	Groundwater Laboratory Analyses
BHMW16	BHMW16-SS10/11	5.5-6.5	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW16-SS6	3.0-3.7	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW16	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW17	BHMW17-SS4/5	1.8-3.0	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A

Location ID	Sample ID	Depth of sample (m bgs)	Soil Laboratory Analyses	Groundwater Laboratory Analyses
	BHMW17-SS6	3.0-3.4	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW17	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW18	BHMW18-SS7	4.3-4.9	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMWSS10/11	6.1-6.7	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW18	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW19	BHMW19-SS3/4	1.2-2.1	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW19	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW20	BHMW20 -SS1	0.0-0.6	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW20	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW21-	BHMW21 –SS1/2	0.2-0.8	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW21	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW22	BHMW22-SS2	0.6-1.2	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW22	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW23	BHMW23-SS3/4	1.2-2.4	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW23	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW24	BHMW24-SS1/52	0.0-0.8	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW24	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW25	BHMW25-SS1/2	0.3-1.5	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A

Location ID	Sample ID	Depth of sample (m bgs)	Soil Laboratory Analyses	Groundwater Laboratory Analyses
	BHMW25	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW26	BHMW26-SS1/2	0.1-0.7	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW26	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs

2.2.5.2.1 Soil Quality Assessment

Tables comparing soil analytical results to updated applicable provincial standards are presented in Tables C-1, C-2 and C-3 in Appendix C. Findings are summarized below in Table 6. Refer to Figure 4 in Appendix A for soil quality exceedances.

Table 6: Soil Exceedances of the MOECC Table 7 and Table 9 SCSs – Area 2 - Chaudière Island - East

Sample ID (Sample depth m)	Criteria	PAHs and PCBs	Metals and Sulphur	PHCs and VOCs
BHMW16-SS6 (3.0-3.7)	MOECC Table 7	None	Antimony	None
	MOECC Table 9	None	None	None
BHMW17-SS4/5 (1.8-3.0)	MOECC Table 7	Acenaphthene, acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene	Lead	PHCs F2 & F3
	MOECC Table 9		Antimony, lead	PHCs F2, F3 & F4,
BHMW17-SS6 (3.0-3.4)	MOECC Table 7	Acenaphthene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, fluoranthene, fluorine, 1-Methylnaphthalene, 2-Methylnaphthalene, naphthalene, phenanthrene, pyrene	Lead	PHCs F2 & F3
	MOECC Table 9		Lead, silver	PHCs F2, F3 & F4, benzene, ethylbenzene, toluene, xylenes
BHMW18-SS7 (4.3-4.9)	MOECC Table 7	Acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, fluoranthene, indeno[1,2,3-cd]pyrene	Arsenic, lead	None
	MOECC Table 9	Acenaphthene, acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, naphthalene, phenanthrene, pyrene	Arsenic, lead, molybdenum	None
BHMW18-SS10/11 (6.1-6.7)	MOECC Table 7	Acenaphthene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, chrysene, fluoranthene, fluorine, indeno[1,2,3-cd]pyrene, naphthalene, phenanthrene, pyrene	None	PHCs F2 & F3
	MOECC Table 9		None	PHCs F2, F3 & F4
BHMW19-SS3/4 (1.2-2.1)	MOECC Table 7	Acenaphthene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, chrysene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, naphthalene, phenanthrene, pyrene	Copper, lead	PHCs F2 & F3
	MOECC Table 9			PHCs F2, F3 & F4
BHMW20-SS1 (0.0-0.6)	MOECC Table 7	Acenaphthylene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenzo[a,h]anthracene, fluoranthene, indeno[1,2,3-cd]pyrene	Antimony	None
	MOECC Table 9	Acenaphthene, acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, naphthalene, phenanthrene, pyrene	Antimony, barium, lead	None

Sample ID (Sample depth m)	Criteria	PAHs and PCBs	Metals and Sulphur	PHCs and VOCs
BHMW22-SS2 (0.6-1.2)	MOECC Table 7	Acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, fluoranthene, indeno[1,2,3-cd]pyrene	None	None
	MOECC Table 9	Acenaphthene, acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, naphthalene, phenanthrene, pyrene	None	None
BHMW23-SS3/4 (1.2-2.4)	MOECC Table 7	Anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, naphthalene	None	None
	MOECC Table 9	Acenaphthene, acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, biphenyl, dibenzo[a,h]anthracene, fluoranthene, fluorine, indeno[1,2,3-cd]pyrene, naphthalene, phenanthrene, pyrene	None	None
BHMW24-SS1/2 (0.0-0.8)	MOECC Table 7	None	Antimony, copper, lead, molybdenum	PHCs F3
	MOECC Table 9	None		PHCs F2, F3 & F4
BH25-SS1/2 (0.3-1.5)	MOECC Table 7	None	Molybdenum	PHCs F3
	MOECC Table 9	None	Antimony, copper, molybdenum	PHCs F2, F3 & F4
BHMW26-SS1/2 (0.1-0.7)	MOECC Table 7	Anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, fluoranthene, indeno[1,2,3-cd]pyrene,	Lead	PHCs F2 & F3
	MOECC Table 9	Acenaphthene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, naphthalene, phenanthrene, pyrene	Antimony, lead	PHCs F2, F3 & F4

2.2.5.2.2 Groundwater Quality Assessment

Tables comparing water analytical results to updated applicable provincial standards are presented in Tables C-4, C-5 and C-6 in Appendix C. Findings are summarized in Table 7. Refer to Figure 4 in Appendix A for groundwater quality exceedances.

Table 7: Groundwater Exceedances of the MOECC Table 7 and Table 9 SCSs – Area 2 - Chaudière Island - East

Sample ID	Criteria	PAHs and PCBs	Metals and Sulphur	PHCs and VOCs
BHMW16	MOE Table 7	Anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, chrysene, indeno[1,2,3-cd]pyrene, Total PCBs	None	PHCs F3
	MOE Table 9		None	
BHMW18	MOE Table 7	None	None	PHCs F3, benzene
	MOE Table 9	None	None	PHCs F3
BHMW19	MOE Table 7	Anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, indeno[1,2,3-cd]pyrene, naphthalene, pyrene	None	None
	MOE Table 9	Anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, indeno[1,2,3-cd]pyrene, pyrene	None	None
BHMW20	MOE Table 7	Benzo[ghi]perylene, benzo[k]fluoranthene, indeno[1,2,3-cd]pyrene	None	None
	MOE Table 9		None	None
BHMW21	MOE Table 7	None	None	PHCs F3
	MOE Table 9	None	None	
BHMW24	MOE Table 7	Total PCBs	None	PHCs F3 & F4
	MOE Table 9		None	
BHMW26	MOE Table 7	NA	None	PHCs F3 & F4
	MOE Table 9	NA	None	

- NA: Not Analyzed

2.2.5.3 Area 3 - Chaudière Island - West

Area 3 encompasses the area of the Site on Chaudière Island, west of Booth Street. Ten (10) boreholes were advanced in Area 3, six (6) of which were instrumented with monitoring wells. The ten (10) borehole / monitoring well locations are: BHMW5, BHMW6, BHMW13, BHMW14, BH15, BH27, BH28, BHMW29, BH30, and BHMW32. Refer to Figure 2 in Appendix A for borehole and monitoring well locations.

The number of soil and groundwater samples submitted for laboratory analysis from each of the sampling locations and what PCOCs they were submitted for are summarized in Table 8 below.

Table 8: Summary of Sampling Locations and Laboratory Analyses Completed – Area 3

Location ID	Sample ID	Depth of sample (m bgs)	Soil Laboratory Analyses	Groundwater Laboratory Analyses
BHMW5	BHMW5-SS5/6	2.4-3.0	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW5	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW6	BHMW6-SS1	0.0-0.6	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW6	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs
BHMW13	BHMW13-SS1	0.0-0.6	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW13-SS3	1.2-1.3	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
BHMW14	BHMW14-SS1/2	0.2-1.2	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW14	N/A	N/A	PAHs, PCBs, PHCs, VOCs
	BHMW14-WGS1	N/A	N/A	Metals, pH, hardness
BH15	BHMW15-SS1	0.0-0.3	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
BHMW29	BHMW29-SS1	0.2-0.5	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
BHMW32	BHMW32-SS1	0.1-0.6	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A
	BHMW32-SS2	0.6-0.9	PAHs, PCBs, Metals, Sulphur, pH, PHCs, VOCs	N/A

Location ID	Sample ID	Depth of sample (m bgs)	Soil Laboratory Analyses	Groundwater Laboratory Analyses
	BHMW32	N/A	N/A	PAHs, PCBs, Metals, pH, Hardness, PHCs, VOCs

2.2.5.3.1 Soil Quality Assessment

Tables comparing soil analytical results to updated applicable provincial standards are presented in Tables D-1, D-2 and D-3 in Appendix D. Findings are summarized in Table 9. Refer to Figure 4 in Appendix A for soil quality exceedances.

Table 9: Soil Exceedances of the MOECC Table 7 and Table 9 SCSs – Area 3 - Chaudière Island - West

Sample ID (Sample Depth m)	Criteria	PAHs and PCBs	Metals and Sulphur	PHCs and VOCs
BHMW6-SS1 (0.00-0.60)	MOECC Table 7	Fluoranthene	None	None
	MOECC Table 9		None	None
	MOECC Table 9	None	None	PHCs F2
BHMW13-SS1 (0.00-0.60)	MOECC Table 7	None	None	PHC F2
	MOECC Table 9	benzo[b]fluoranthene	Antimony, molybdenum	PHC F2, F3 & F4
BHMW13-SS3 (1.20-1.30)	MOECC Table 7	None	Vanadium	None
	MOECC Table 9	None	Molybdenum, Vanadium	PHCs F3
BHMW14-SS1/2 (0.25-1.22)	MOECC Table 7	Acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, biphenyl, dibenzo[a,h]anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenanthrene	None	None
	MOECC Table 9	Acenaphthene, acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, biphenyl, dibenzo[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene	Antimony, copper	PHCs F2, F3 & F4
BH15-SS1 (0.00-0.30)	MOECC Table 7	None	Antimony, lead	PHCs F3
	MOECC Table 9	1-methylnaphthalene, 2-methylnaphthalene	Antimony, copper, lead, molybdenum, zinc	PHCs F2 & F3
BHMW29-SS1 (0.15-0.50)	MOECC Table 7	benzo[a]anthracene, biphenyl, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenanthrene	Antimony, arsenic, lead	PHCs F1, F2, F3 & F4, benzene, c-1,2-dichloroethylene, toluene, trichloroethylene
	MOECC Table 9	benzo[a]anthracene, biphenyl, chrysene, fluorene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenanthrene	Antimony, arsenic, lead, molybdenum, silver	PHCs F1, F2, F3 & F4, benzene, c-1,2-dichloroethylene, toluene, trichloroethylene, m/p xylenes

Sample ID (Sample Depth m)	Criteria	PAHs and PCBs	Metals and Sulphur	PHCs and VOCs
BHMW32-SS1 and Duplicate BHMW32-SS3 (0.10-0.60)	MOECC Table 7	Acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, fluoranthene, indeno[1,2,3-cd]pyrene	Arsenic, lead, molybdenum, thallium	PHCs F3
	MOECC Table 9	Acenaphthene, acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, biphenyl, chrysene, dibenzo[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, naphthalene, phenanthrene, pyrene	Antimony, arsenic, barium, lead, molybdenum, thallium	PHCs F2, F3 & F4
BHMW32-SS2 (0.60-0.95)	MOECC Table 7	None	None	PHC F3
	MOECC Table 9	Naphthalene	Antimony	PHC F2, F3 & F4

2.2.5.3.2 Groundwater Quality Assessment

Tables comparing groundwater analytical results to updated applicable provincial standards are presented in Tables D-4, D-5 and D-6 in Appendix D. Findings are summarized in Table 10 below. Refer to Figure 4 in Appendix A for groundwater quality exceedances. Groundwater samples were not collected from BHMW13 and BHMW29.

Table 10: Groundwater Exceedances of the MOECC Table 7 and Table 9 SCSs – Area 3

Sample ID	Criteria	PAHs and PCBs	Metals and Sulphur
BHMW5	MOE Table 7	Total PCBs	None
	MOE Table 9		None
BHMW14	MOE Table 7	None	Sodium
	MOE Table 9	None	
BHMW32	MOE Table 7	None	Copper, sodium
	MOE Table 9	None	

3. Field Activities and Methodology

The field activities and methodologies employed by DST as part of the Phase Two ESA work completed in support of this RSC are described in the following sub-section.

3.1 Field Activities

Groundwater level measurements and sampling was completed by DST in April, 2014 on the four existing monitoring wells present on Albert Island, Area 1 (BHMW2, BHMW3, BHMW4, and BHMW31).

3.2 Groundwater Level Measurement Methodology

DST field personnel collected groundwater level measurements in the spring of 2014 from the existing monitoring wells prior to groundwater sampling activities. Water levels were measured using a Solinst Canada Ltd. Model 122 oil/water interface meter which is also used to confirm the presence/absence and thickness of free (petroleum) product that may potentially be residing on the surface of the groundwater table. The electronic interface probe was decontaminated with methyl hydrate and distilled water prior to the collection of each water level measurement.

3.3 Groundwater Sampling Methodology

Using dedicated Waterra^{TM} tubing and inertial lift foot valves, and new nitrile gloves donned prior to the handling of the well and sampling materials, the four existing monitoring wells were developed by extracting three well volumes or until dry on April 24, 2014. The monitoring wells were purged in order to remove any stagnant groundwater prior to sampling.

Four groundwater samples were collected on April 25, 2014, one from each existing monitoring well, and submitted for laboratory analyses of PAHs, PCBs, metals, hardness, PHC F1 to F4 and VOCs.

The groundwater samples were collected using a low flow purging methodology utilizing a peristaltic pump. The low flow purging technique was used to collect representative samples of the groundwater in the formation adjacent to the well screen without any undue disturbance of the well sediment. In order to confirm that a representative groundwater sample was collected, field measurements of several physical and chemical parameters were conducted during the purging. Water quality parameters were obtained using a Horiba U-52 water quality meter. Parameters measured on a continuous basis included: temperature, conductivity, pH, dissolved oxygen, turbidity, total dissolved solids (TDS) and oxidation reduction potential (ORP). The methodology consisted of achieving three consecutive readings for temperature, conductivity, pH, dissolved oxygen and TDS within an acceptable deviation value, then collecting a representative groundwater sample. The low flow purging process was completed in accordance with the guidance provided under American Society for Testing and Materials (ASTM) Standard D 6771. Following the stabilization of water quality parameters, laboratory-supplied containers were filled with the groundwater samples by means of the peristaltic pump used for the low flow purging.

The samples were collected directly into laboratory-supplied containers.

Groundwater samples were placed in a cooler and maintained at a temperature below 10°C. Samples were shipped under a Chain of Custody protocol to a certified laboratory for chemical analyses.

3.3.1 Analytical Testing

Soil and groundwater samples were submitted to Maxxam Analytics Inc. (Maxxam) for chemical analyses. Maxxam is a Canadian Association for Laboratory Accreditation Inc. (CALA) certified laboratory.

3.3.2 Analytical Testing

DST maintains a standard Quality Assurance / Quality Control (QA/QC) program for environmental assessments. The field sampling and QA/QC program was completed in accordance with the applicable Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario (MOE, 1996). All project documentation was maintained and controlled by the appointed field supervisor. All borehole advancement and soil and groundwater sampling was completed in accordance with industry standards, and applicable provincial standards/guidelines. DST operates under a Certificate of Authorization issued by the Professional Engineers of Ontario (PEO) and the Association of Professional Geoscientists of Ontario (APGO), and the work was carried out with due regard to PEO and APGO Standards for professional practice.

Collected soil and groundwater samples during the investigation were placed in coolers and maintained at a temperature below 10°C. Samples were shipped under a Chain of Custody protocol to Maxxam for chemical analyses.

The potential for cross-contamination between samples was minimized by, where applicable, washing sampling tools with phosphorous-free soap and water, followed by rinsing with distilled water, and by wearing new disposable nitrile gloves prior to the handling of each sample.

4. Results

4.1 Groundwater Levels

As noted in Section 3.1, DST field personnel collected groundwater level measurements from the installed monitoring wells prior to groundwater sampling activities. The groundwater levels are provided in Table 11 below.

Table 11: Groundwater Levels

Monitoring Well ID	Groundwater Depth(1)	Ground Surface Elevation (m Geodetic)	Groundwater Elevation (m Geodetic)
BHMW2	1.6 (April 25, 2014)	53.9	52.3
BHMW3	1.7 (April 25, 2014)	54.1	52.3
BHMW4	1.7 (April 25, 2014)	54.2	52.3
BHMW31	2.2 (April 25, 2014)	53.6	51.4

Note:(1) Groundwater depths measured in metres below ground surface.

4.2 2014 Groundwater Quality

Analytical results of the 2014 groundwater samples submitted for laboratory analyses were compared against the applicable MOECC Table 7 and Table 9 SCSs. Based on the laboratory analytical results, the groundwater samples collected from the monitoring wells BHMW2 to BHMW4, and BHMW31 were in compliance with the applicable MOECC Table 7 and Table 9 SCS for the parameters analyzed.

Refer to Tables B-4 to B-6 in Appendix B for the groundwater analytical results.

5. Discussion of the Results

5.1 Conceptual Site Model

The conceptual site model for the Site is provided in Appendix E. The extents of soil and groundwater impacts in terms of volumes and required additional assessment work are discussed below.

5.2 Extents of Soil Impacts

Figure 4 in Appendix A illustrates the lateral delineation of the contaminated soil across each area.

5.2.1 Area 1

The estimated volume of contaminated soil across Area 1 is approximately 11,000 m^3. This area includes soils that are contaminated with PAHs, PCBs, metals, PHCs and VOCs.

5.2.2 Area 2

The estimated volume of contaminated soil across Area 2 is approximately 44,000 m^3. This area includes soils that are contaminated with PAHs, metals, PHCs and VOCs.

5.2.3 Area 3

The estimated volume of contaminated soil across Area 3 is approximately 40,000 m^3. This area includes some soils that are contaminated with PAHs, metals, PHCs and VOCs.

The approximate volume of contaminated soil on Site (Areas 1, 2 and 3) is 95,000 m^3. Note that a contingency factor of 15% was added to the final soil estimate calculation to account for the potential uncertainties.

5.2.4 Summary of Soil Volumes

The approximate extent of the soil contamination was calculated based on the parameters exceeding the updated MOECC SCSs. The extent of contamination for the Site was evaluated by identifying the impacted boreholes on the Site plan to obtain an approximate surface area. The impacted area was defined based on the assumption that the limit of the contaminated soil is located approximately half-way between the impacted borehole and the borehole that meets the applicable MOECC SCS.

Note that certain building footprints including the building on the north side of Albert Island (Area 1), Former Board Mill (Area 2) and a section of the Former Paper Mill Building (Area 3) were excluded from the extent of contaminated soil, either due to access restrictions for an intrusive investigation or on basis that the buildings basements have been founded on bedrock, and as such no contaminated soil would be present. However, note that it is possible that the basement floor slabs may have been constructed on granular fill underlain by bedrock. Furthermore, bedrock conditions were not reached at several of the boreholes locations and depth to bedrock was estimated based on the Site stratigraphy data.

Other limitations of this estimate include the spatial separation between boreholes and limited analytical dataset. Given the geographical magnitude of the study area, an opportunity remains to further characterize and refine the contaminant boundaries. The present estimates are based on current and historical information available for the Site and may change if additional soil and groundwater quality data is available.

The estimated horizontal extent of contaminated soil and contaminants of concerns (COCs) across each area are summarized in Table 12.

Table 12: Horizontal extent of contaminated soil and COCs across Areas

Area	Approximate Horizontal Extent (m^2)	COCs
1	4,000	PAHs, PCBs, metals, PHCs and VOCs
2	17,600	PAHs, metals, PHCs and VOCs
3	20,000	PAHs, metals, PHCs and VOCs

The approximate volume of soil to be removed from Site is outlined in Table 13. A contingency factor of 15% was added to the final soil estimate calculation to account for the aforementioned uncertainties.

Table 13: Approximate volume of contaminated soil.

Area	Approximate Volume (m^3)
Area 1	11,000
Area 2	44,000
Area 3	40,000
Total	**95,000**
Contingency (15%)	**14,250**
Total (including contingency)	**109,250**

Overall, the results of the Phase Two ESA Update confirmed the presence of soil and groundwater contamination in all three areas on Site. Groundwater samples were collected in Area 1 (Albert Island) in 2014 and no exceedances were identified in those samples. The exceedances in each area are summarized as follows:

5.3 Extents of Groundwater Impacts

A groundwater sampling program is planned in the near future to assess current groundwater quality conditions across the entire Site.

5.3.1 Area 1

An overview of the comparison of historical groundwater analytical data to the updated applicable provincial standards indicates groundwater exceedances for PAHs and dissolved metals.

The spring 2014 groundwater sampling and analyses data indicated improvement of groundwater quality in this area. However, the apparent improvement may be due to the low flow sampling techniques employed in 2014 versus the non-low flow techniques previously used. All analyzed groundwater quality chemical parameters from the 2014 sampling event met the relevant MOE standards.

Groundwater samples were collected in Area 1 (Albert Island) in 2014 and no exceedances were identified in those samples.

5.3.2 Area 2

An overview of the comparison of historical groundwater analytical data to the updated applicable provincial standards indicated groundwater exceedances for PAHs, PCBs, dissolved metals, PHCs and VOCs.

5.3.3 Area 3

An overview of the comparison of historical groundwater analytical data to the updated applicable provincial SCSs indicates groundwater exceedances for PCBs and dissolved metals.

6. Conclusions

DST was retained by Windmill Development Group Ltd. to provide an amalgamation and update of previously completed Phase Two ESAs associated with the planned re-development of the Domtar Lands on Chaudière and Albert Islands in Ottawa, Ontario. It is proposed that these lands be redeveloped as residential land uses, therefore, they require a RSC.

A Phase One ESA was completed by DST in 2015 in accordance with O. Reg. 153/04.

This report has been prepared to support the submission of a RSC) in accordance with O. Reg. 153/04, as amended. This report serves as an amalgamation of and update to the previously completed Phase Two ESAs entitled:

- *"Phase Two Environmental Site Assessment Update – Domtar Land Redevelopment, Chaudière and Albert Islands, Ottawa, Ontario". DST Consulting Engineers Inc., July 2015;*
- "*Phase II Environmental Site Assessment, Hydro Lease, Chaudière Island, Ottawa, Ontario",* DST Consulting Engineers Inc. March 2008; and
- "*Environmental Site Assessment Volume II – Phase II Environmental Site Assessment, Chaudière and Albert Islands, Ottawa, Ontario"*, DST Consulting Engineers Inc., March 2008.

Analytical soil and groundwater results from previous investigations were compared to the current Ontario Regulation 153/04 (as amended) in order to establish an estimate of soil volumes with respect to the current provincial standards. The updated provincial criteria included the following:

In order to support the change of land use from commercial/industrial land to residential use, DST compared historical analytical soil data to updated provincial standards.

Soil analytical data were compared to the current MOECC O.Reg. 153/04 SCS:

- MOECC Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. Residential / Parkland / Institutional Property Use. Coarse textured soils; and
- MOECC SCS Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. Residential / Parkland / Institutional / Industrial / Commercial / Community Property Use. All soil textures.

Groundwater analytical data were compared to:

- MOECC Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. All Types of Property Use. Coarse textured soils; and
- MOECC Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All Soil Textures.

Based on the findings of the historical analytical data and 2014 groundwater sampling, DST identified areas of soil and groundwater exceedances to provincial standards at the Site, as summarized below.

6.1 Summary of Area 1 Soil and Groundwater Impacts

The estimated volume of contaminated soil across Area 1 is approximately 11,000 m^3. This area includes soils that are contaminated with PAHs, PCBs, metals, PHCs and VOCs.

An overview of the comparison of historical groundwater analytical data to the updated applicable provincial Standards indicates groundwater exceedances for PAHs and dissolved metals.

The spring 2014 groundwater sampling and analyses data indicated a change in the groundwater quality in Area 1. All analyzed groundwater quality chemical parameters from the 2014 sampling event met the relevant MOE standards. However, it is not clear if the apparent improvement was due to using a low flow sampling technique that limits the amount of sediment in the collected water versus the previous sampling methodology conducted in 2006.

6.2 Summary of Area 2 Soil and Groundwater Impacts

The estimated volume of contaminated soil across Area 2 is approximately 44,000 m^3. This area includes soils that are contaminated with PAHs, metals, PHCs and VOCs.

An overview of the comparison of historical groundwater analytical data to the updated applicable provincial Standards indicated groundwater exceedances for PAHs, PCBs, dissolved metals, PHCs and VOCs. A groundwater sampling program is to be planned in the near future to assess current groundwater quality conditions.

6.1 Summary of Area 3 Soil and Groundwater Impacts

The estimated volume of contaminated soil across Area 3 is approximately 40,000 m^3. This area includes some soils that are contaminated with PAHs, metals, PHCs and VOCs.

An overview of the comparison of historical groundwater analytical data to the updated applicable provincial Standards indicates groundwater exceedances for PCBs and dissolved metals.

6.2 Summary of Impacted Soil Volumes

The approximate volume of contaminated soil on Site (Areas 1, 2 and 3) is 109,250 m^3**.** Note that a contingency factor of 15% was added to the final soil estimate calculation to account for the potential uncertainties.

7. Recommendations

7.1 Soil Assessment and Remediation

Limitations include the spatial separation between boreholes and limited analytical dataset. Given the geographical magnitude of the study area, an opportunity remains to further characterize and refine the contaminant boundaries. The present volume estimates are based on current and historical information available for the Site and may change as additional soil analytical results are available. Moreover, it should be noted that certain building footprints including the Building 541 (Area 1), Former Board Mill (Area 2) and a section of the Former Paper Mill Building (Area 3) were excluded either due to access restrictions for an intrusive investigation, or on the basis of the assumption that the buildings basements have been founded on bedrock.

Regardless, the soil quality results indicate that contaminated soil is present at the Site. A RSC filing requires that either soil remediation or a risk assessment be completed for the property.

It is DST's understanding that all the fill material – impacted and non-impacted – will be removed from the Site as part of the future Site redevelopment. Prior to the redevelopment of the Site, DST recommends that a Remedial Options Plan (ROP) be developed in order to evaluate the effectiveness of various remedial techniques.

During the implementation of remediation actions, a soil management plan should be executed to optimize the management of excess soils generated by the remedial activities. The management of excess soils shall be conducted in accordance with the MOE's *"Management of Excess Soil – A Guide for Best Management Practices"*, as this will potentially assist in minimizing the quantities of non-impacted soils that are diverted for landfill disposal.

Once the remediation is completed, the Phase Two ESA report, which will include the remediation work and additional recommended groundwater assessment, will be submitted to the Ministry of the Environment and Climate Change (MOECC) for the filing of the RSC.

7.2 Groundwater Assessment

Groundwater quality results for Albert Island indicate a change in the groundwater quality from the 2006 sampling event. This change could be due to the sampling techniques used in the 2014 sampling.

Given that the groundwater quality was assessed across the Site in 2006, the Spring 2014 groundwater sampling and analyses data for Albert Island indicated improvement of groundwater quality in the four wells sampled in 2014. DST recommends a groundwater sampling program be completed at all existing monitoring wells prior to remediation to gain an understanding of the current groundwater conditions. In addition, DST recommends that two groundwater monitoring events (at least 90 days apart) are conducted following completion of Site remediation (in accordance with O.Reg. 153/04, as amended).

DST recommends calculation of hydraulic gradients and completion conductivity testing at the Site to capture the current hydrogeological characteristics.

8. Closure

This report was prepared for the exclusive use of Windmill Development Group Ltd. Any use of this report by any third party, or any reliance on or decisions to be made based on it, are the responsibility of such parties. DST accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

DST confirms that the completion of the Phase Two ESA Update has been supervised and approved by Curtis Schmidt, P. Eng., a Qualified Person as defined by O. Reg. 153/04 (as amended), and further confirms the findings and conclusions of this report. The limitations of this report, and qualifications of the personnel are provided in Appendix E.

We trust the information herein meets your expectations. Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,

For **DST Consulting Engineers Inc.**

Andrew Naoum, P.Eng.
Regional Manager, Jr. Associate

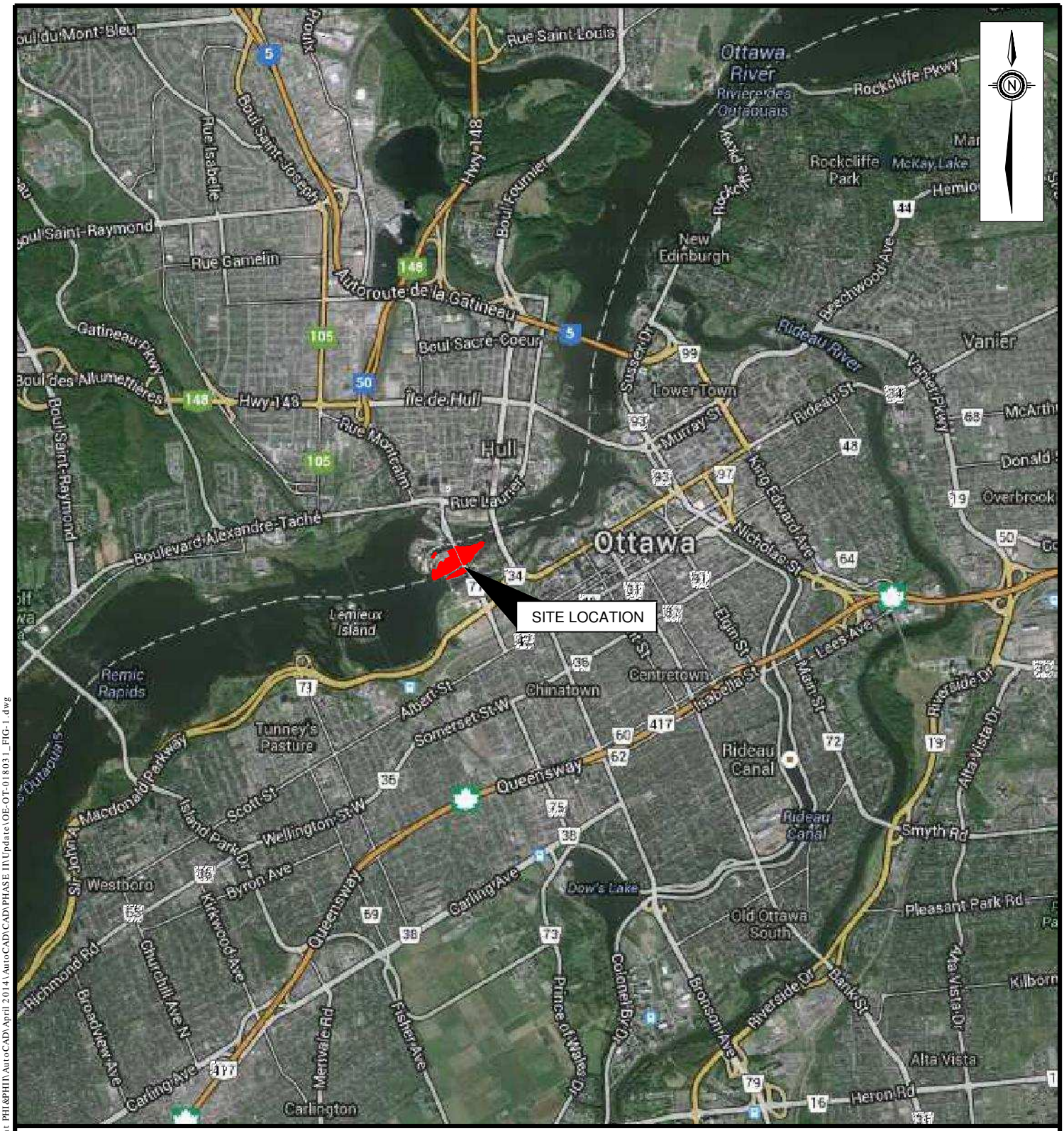
Curtis Schmidt, P. Eng., QP_{ESA}
Regional Manager, Associate

9. References

- DST Consulting Engineers Inc., 2015. *Phase One Environmental Site Assessment, Domtar Lands Redevelopment, Chaudière and Albert Islands, 3, 4 and 6 Booth Street, Ottawa, Ontario.*
- DST Consulting Engineers Inc., 2008. *Phase II Environmental Site Assessment, Hydro Lease, Chaudière Island, Ottawa, Ontario*; and
- DST Consulting Engineers Inc., 2008. *Environmental Site Assessment Volume II – Phase II Environmental Site Assessment, Chaudière and Albert Islands, Ottawa, Ontario*.
- Ontario Ministry of the Environment, 2011. *Soil, Ground Water and Sediment Standards for Use Under Part XV.I of the Environmental Protection Act.*
- https://www.ontario.ca/page/management-excess-soil-guide-best-management-practices Online update April 5, 2016.

APPENDIX A

Figures



SOURCES:
1. GOOGLE MAPS

NOTE:
1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE ASSOCIATED TECHNICAL REPORT.

APPROXIMATE SCALE
0 500 1000 2000m

REV	DATE	ISSUE	APPROVAL
0	24/06/16	ORIGINAL	A.N.

DRAWN BY: R.P.	DATE: June 2016
PROJECT MANAGER: A.N.	PROJECT NO.: OE-OT-018031
FIGURE No.: FIGURE 1	

PROJECT TITLE
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT UPDATE
CHAUDIERE AND ALBERT ISLANDS,
OTTAWA, ONTARIO

DRAWING TITLE
SITE LOCATION MAP

DST
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L:\OE\A- Projects\OE\OT\018031 - Domtar Lands Redevelopment PH1&PHII\AutoCAD\April 2014\AutoCAD\PHASE II\Update\OE-OT-018031_FIG-1.dwg

OTTAWA RIVER

OTTAWA RIVER

COVERED HYDRO FLUME

OPEN WATER HYDRO FLUME

BH15

BHMW14

BH30

AREA 3

BHMW29

BHMW32

BHMW13

PAPER MILL

BH27

BH28

CHAUDIÈRE ISLAND

BHMW5

BHMW6

BUCHANAN CHANNEL

BHMW16

BHMW18

BHMW17

AREA 2

BMWGS1

BHMW22

BOARD MILL

BHMW21

HYDRO LEASE

OPEN WATER

BHMW19

CHAUDIÈRE ISLAND

GWM-WGS1

BHMW20

BHMW26

BHMW24

BH25

BOOTH STREET

OTTAWA HYDRO FLUME

ALBERT ISLAND

BHMW3

BHMW2

BHMW31

BH1

AREA 1

BHMW4

HYDRO-ELECTRIC CHANNEL

APPROXIMATE SCALE

0 30 60 120m

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LEGEND:

- PHASE TWO ESA PROPERTY BOUNDARY
- BUILDING OUTLINE
- HYDRO LEASE LANDS
- BH30 — BOREHOLE LOCATION (DST 2008)
- BHMW31 — MONITORING WELL LOCATION (DST 2008)
- APPROXIMATE LOCATION OF WATER GRAB SAMPLE (DST 2008)
- A A' — CROSS-SECTION A-A'

NOTE:
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PROJECT TITLE

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT UPDATE
CHAUDIERE AND ALBERT ISLANDS,
OTTAWA, ONTARIO

DRAWING TITLE

PRE-REMEDIATION SITE PLAN, CROSS - SECTIONS

DESIGNED BY B.T.	SCALE AS SHOWN
DRAWN BY R.P.	DATE June 2016
PROJECT MANAGER A.N.	PROJECT NO.: OE-OT-018031

FIGURE No.: FIGURE 2

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OTTAWA RIVER

REPORTED LOCATION OF HYDRAULIC LUBRICATING OIL ASTs

REPORTED LOCATION OF HYDRAULIC LUBRICATING OIL ASTs

COVERED HYDRO FLUME

OPEN WATER HYDRO FLUME

OTTAWA HYDRO FLUME

BOOTH STREET

BUCHANAN CHANNEL

HYDRO-ELECTRIC CHANNEL

CHAUDIÈRE ISLAND

ALBERT ISLAND

OPEN WATER

HYDRO LEASE

FORMER BOARD MILL

FORMER PAPER MILL

FORMER SULPHITE STORAGE

FORMER ACID TANKS

LOW LEVEL PCB TRANSFORMERS

3 ASTs UNKNOWN CONTENT

FORMER BUNKER C FUEL OIL AST

FORMER WASTE BURNER

FORMER DIESEL UST

FORMER DIESEL PUMPING STATION

FORMER COAL BIN

TUNNEL (FORMER COAL HOPPER)

FORMER ASTs

FORMER FUEL OIL AST "DAY TANK"

FORMER ASTs

DIESEL AST

AST

FORMER OILER SHACK

SUSPECTED UST

FORMER PAINT SHOP

FORMER GASOLINE UST

ASTs

BHMW1 BHMW2 BHMW3 BHMW4 BHMW5 BHMW6 BHMW7 BHMW13 BHMW14 BHMW16 BHMW17 BHMW18 BHMW19 BHMW20 BHMW21 BHMW22 BHMW23 BHMW24 BHMW26 BHMW29 BHMW32

BH1 BH15 BH25 BH27 BH28 BH30

PCA 1 PCA 28 PCA 28 PCA 28 PCA 58

APEC 1 APEC 2 APEC 3 APEC 4 APEC 5 APEC 6 APEC 7 APEC 8 APEC 9 APEC 10 APEC 12 APEC 13 APEC 14 APEC 15

APPROXIMATE SCALE

0 30 60 120m

LEGEND:

- PHASE ONE PROPERTY BOUNDARY
- OUTLINE OF PHASE ONE PROPERTY BUILDING
- APEC 1
- APEC 2
- APEC 3
- APEC 4
- APEC 5
- APEC 6
- APEC 7
- APEC 8
- APEC 9
- APEC 10
- APEC 12
- APEC 13
- APEC 14
- APEC 15

APEC — AREA OF POTENTIAL ENVIROMENTAL CONCERN

PCA — POTENTIALLY CONTAMINATING ACTIVITY (PCAs ARE NUMBERED) IN ACCORDANCE WITH O.REG 153/04, AS AMENDED

NOTE:
1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE ASSOCIATED TECHNICAL REPORT.
2. APECs 11 AND 16 ARE NOT SHOWN ON FIGURE FOR CLARITY SINCE IT COVERS THE ENTIRE PHASE ONE PROPERTY.

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PROJECT TITLE

PHASE TWO ENVIROMENTAL SITE ASSESSMENT - UPDATED
CHAUDIERE AND ALBERT ISLANDS
OTTAWA, ONTARIO

DRAWING TITLE

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT - APEC

DESIGNED BY B.T.	SCALE AS SHOWN
DRAWN BY R.P.	DATE June 2016
PROJECT MANAGER A.N.	PROJECT NO.: OE-OT-018031

FIGURE No.: FIGURE 3

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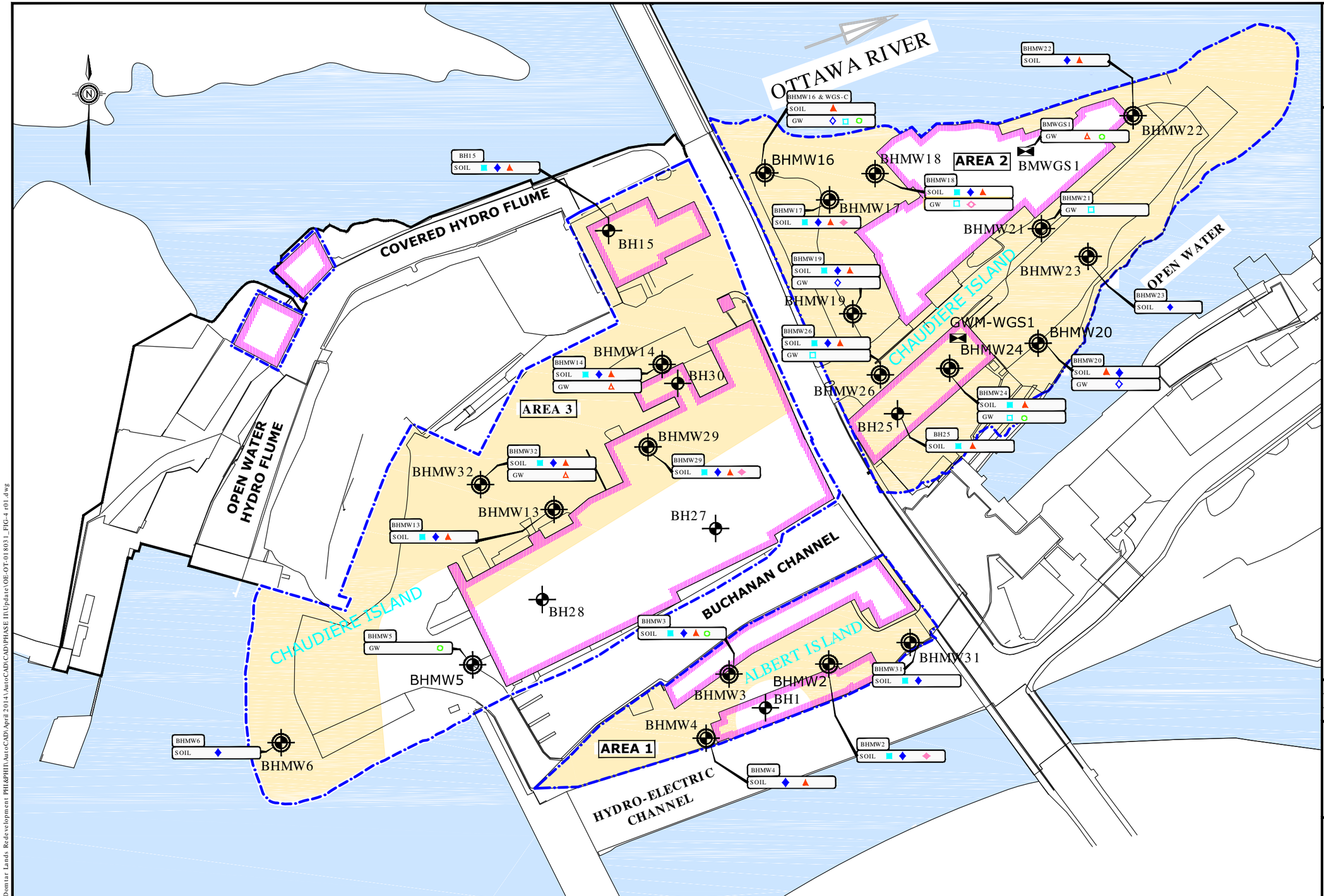

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LEGEND:

- PHASE TWO ESA PROPERTY BOUNDARY
- BUILDING OUTLINE
- INFERRED SOIL QUALITY EXCEEDANCES ABOVE APPLICABLE MOECC TABLE 7 AND 9 STANDARDS
- BH30 — BOREHOLE LOCATION (DST 2008)
- BHMW31 — MONITORING WELL LOCATION (DST 2008)
- APPROXIMATE LOCATION OF WATER GRAB SAMPLE (DST 2008)

SOIL QUALITY

SOIL EXCEEDANCES OF MOECC PROVINCIAL STANDARDS TABLES 7 AND/OR 9:

- *PETROLEUM HYDROCARBONS*
- *POLYCYCLIC AROMATIC HYDROCARBONS*
- *METALS*
- *VOLATILE ORGANIC COMPOUNDS*
- *POLYCHLORINATED BIPHENYLS*

GROUNDWATER (GW) QUALITY
(AREA 1 - 2014 DATA)
(AREAS 2 AND 3 - 2006 DATA)

GROUNDWATER EXCEEDANCES OF MOECC PROVINCIAL STANDARDS TABLES 7 AND/OR 9:

- *PETROLEUM HYDROCARBONS*
- *POLYCYCLIC AROMATIC HYDROCARBONS*
- *METALS*
- *VOLATILE ORGANIC COMPOUNDS*
- *POLYCHLORINATED BIPHENYLS*

NOTE:
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PROJECT TITLE

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT UPDATE
CHAUDIERE AND ALBERT ISLANDS,
OTTAWA, ONTARIO

DRAWING TITLE

SOIL AND GROUNDWATER QUALITY

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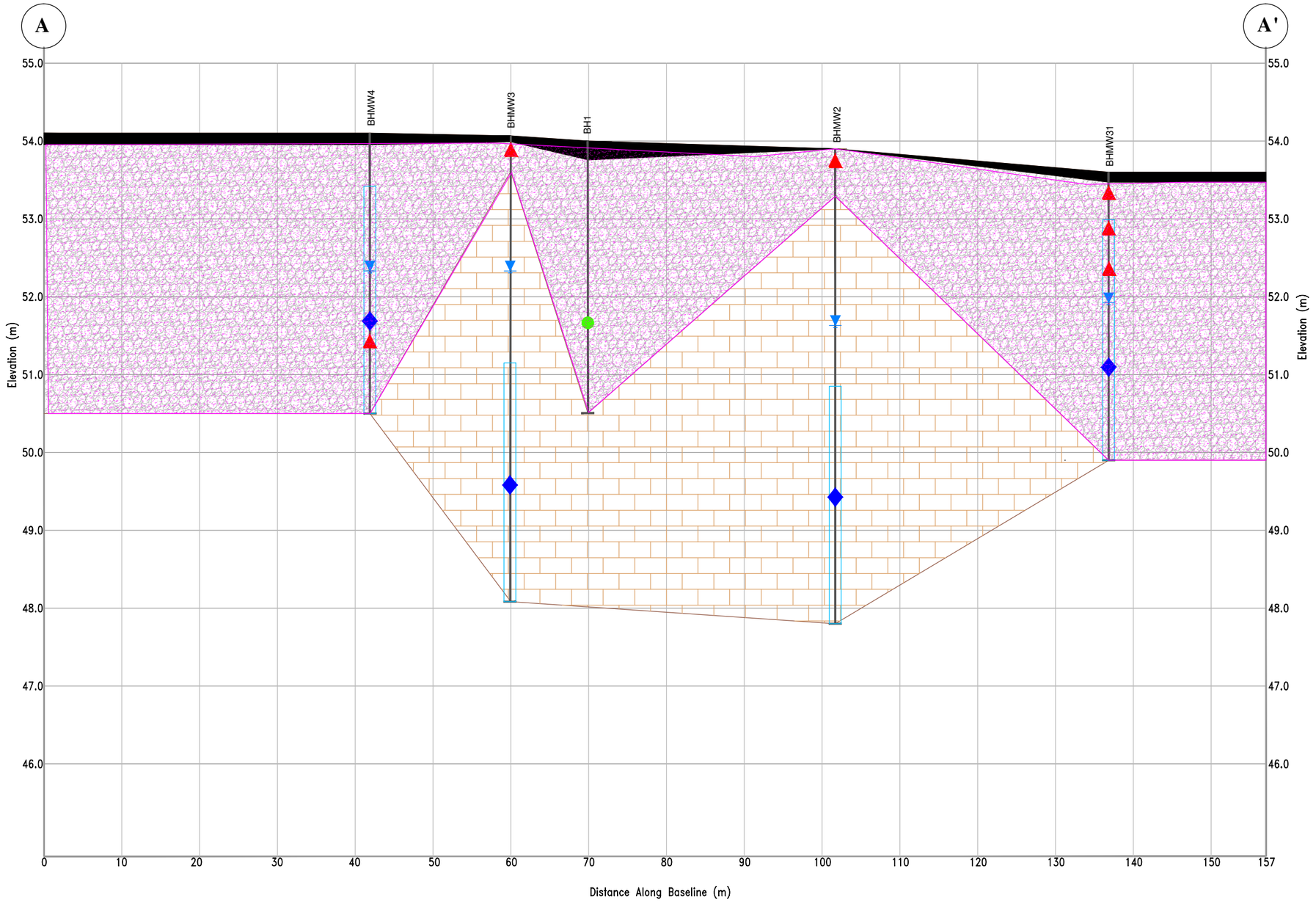
DRAWN BY R.P.	DATE June 2016
PROJECT MANAGER A.N.	PROJECT NO.: OE-OT-018031
FIGURE No.: FIGURE 4	



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LEGEND:

- SAND AND GRAVEL
- ASPHALT
- BEDROCK
- APPROXIMATE AREA OF IMPACTED SOIL
- BOREHOLE LOCATION
- WELL SCREEN AND WELL LOCATION
- GROUNDWATER ELEVATION (2014)
- LOCATION OF 2014 GROUNDWATER SAMPLE -MEETS MOECC STANDARDS
- LOCATION OF SOIL SAMPLE - EXCEEDS MOECC STANDARDS
- LOCATION OF SOIL SAMPLE -MEETS MOECC STANDARDS

NOTE:
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REV	DATE	ISSUE	APPROVAL
0	24/06/16	ORIGINAL	A.N.

PROJECT TITLE

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT UPDATE
CHAUDIERE AND ALBERT ISLANDS,
OTTAWA, ONTARIO

DRAWING TITLE

AREA 1 CROSS - SECTIONS A - A'
PRE - REMEDIATION

DESIGNED BY: B.T.	SCALE: AS SHOWN
DRAWN BY: R.P.	DATE: June 2016
PROJECT MANAGER: A.N.	PROJECT NO.: OE-OT-018031

FIGURE No.: FIGURE 5

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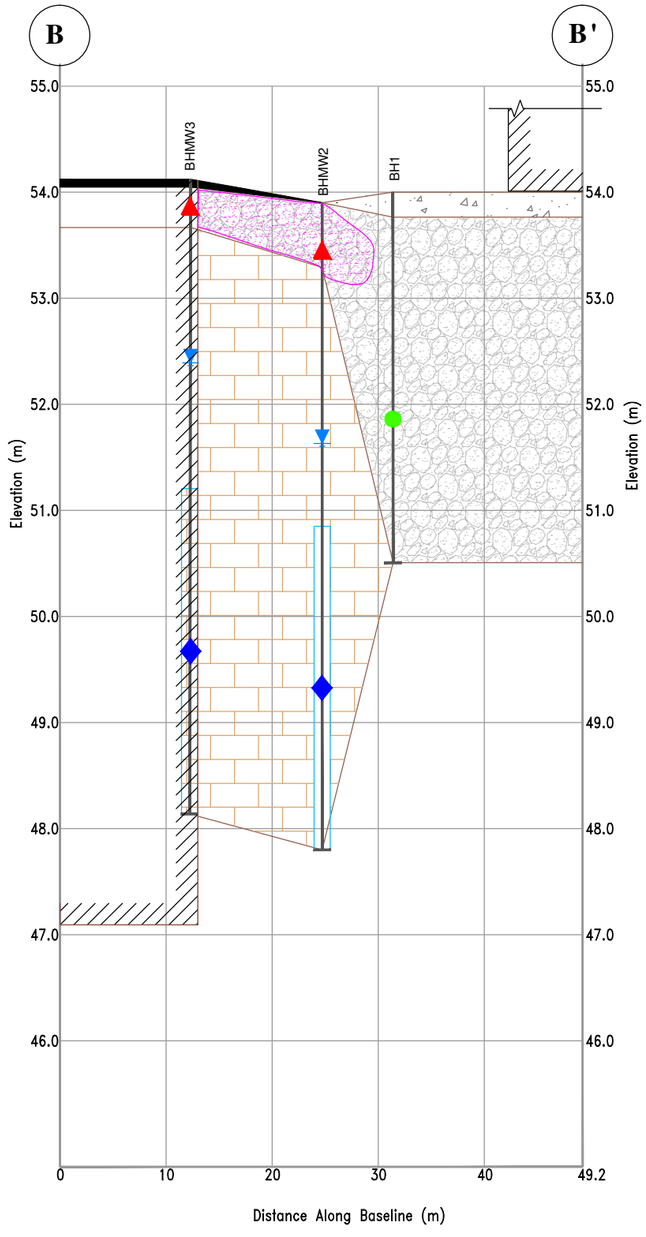

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LEGEND:

- SAND AND GRAVEL
- ASPHALT
- BEDROCK
- CONCRETE
- APPROXIMATE AREA OF IMPACTED SOIL
- APPROXIMATE LOCATION OF BUILDING/BUILDING BASEMENT
- BOREHOLE LOCATION
- WELL SCREEN AND WELL LOCATION
- GROUNDWATER ELEVATION (2014)
- LOCATION OF 2014 GROUNDWATER SAMPLE -MEETS MOECC STANDARDS
- LOCATION OF SOIL SAMPLE - EXCEEDS MOECC STANDARDS
- LOCATION OF SOIL SAMPLE -MEETS MOECC STANDARDS

NOTE:
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DRAWING TITLE

AREA 1 CROSS - SECTIONS B - B'
PRE - REMEDIATION

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FIGURE No.: FIGURE 6	

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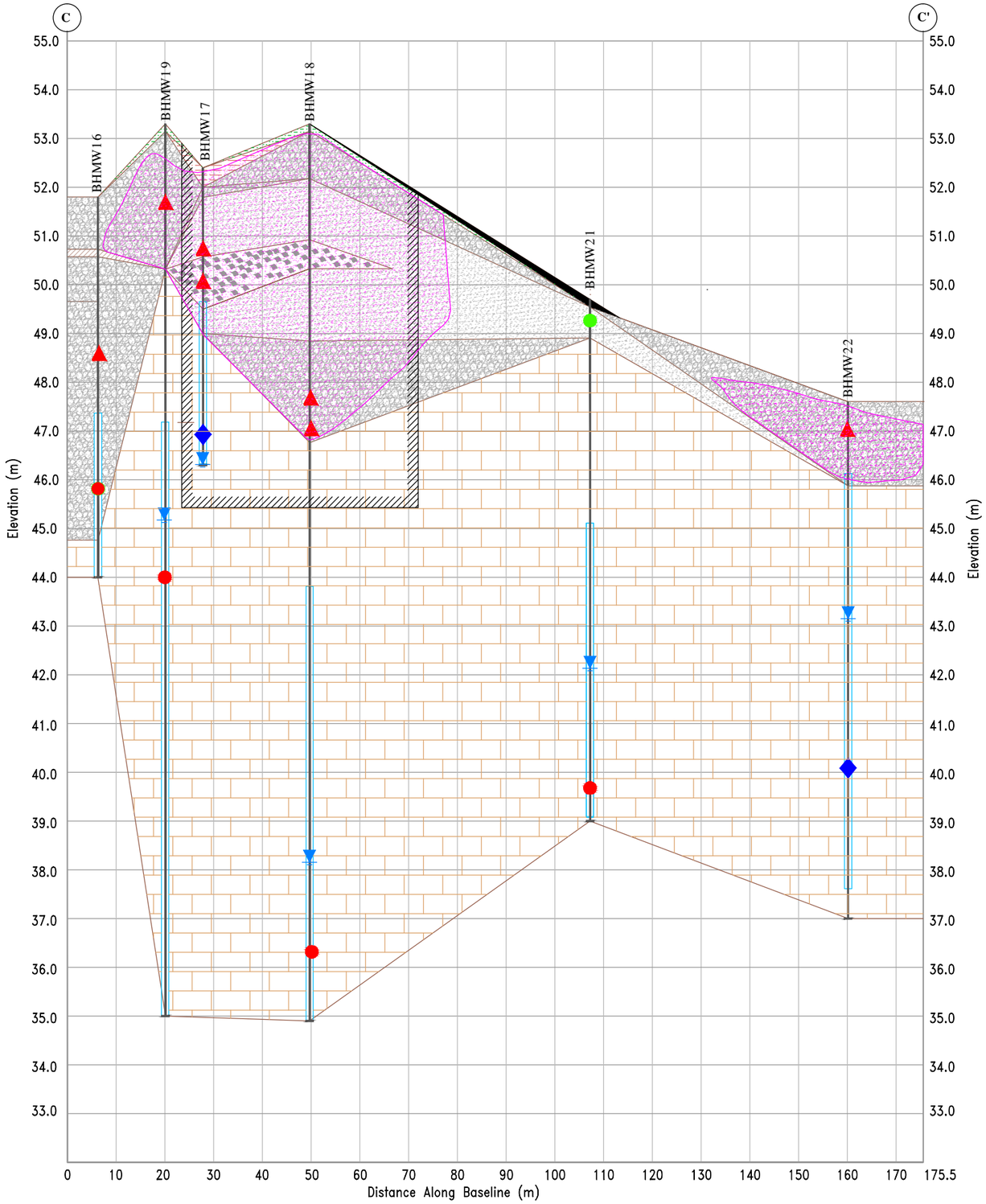

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- APPROXIMATE LOCATION OF BUILDING BASEMENT
- BOREHOLE LOCATION
- WELL SCREEN AND WELL LOCATION
- GROUNDWATER ELEVATION (2006)
- LOCATION OF 2006 GROUNDWATER SAMPLE -MEETS MOECC STANDARDS
- LOCATION OF SOIL SAMPLE - EXCEEDS MOECC STANDARDS
- LOCATION OF SOIL SAMPLE - MEETS MOECC STANDARDS
- LOCATION OF 2006 GROUNDWATER SAMPLE - EXCEEDS MOECC STANDARDS

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DRAWING TITLE

AREA 2 CROSS - SECTIONS C - C'
PRE - REMEDIATION

DESIGNED BY B.T.	SCALE AS SHOWN
DRAWN BY R.P.	DATE June 2016
PROJECT MANAGER A.N.	PROJECT NO.: OE-OT-018031

FIGURE No.: FIGURE 7

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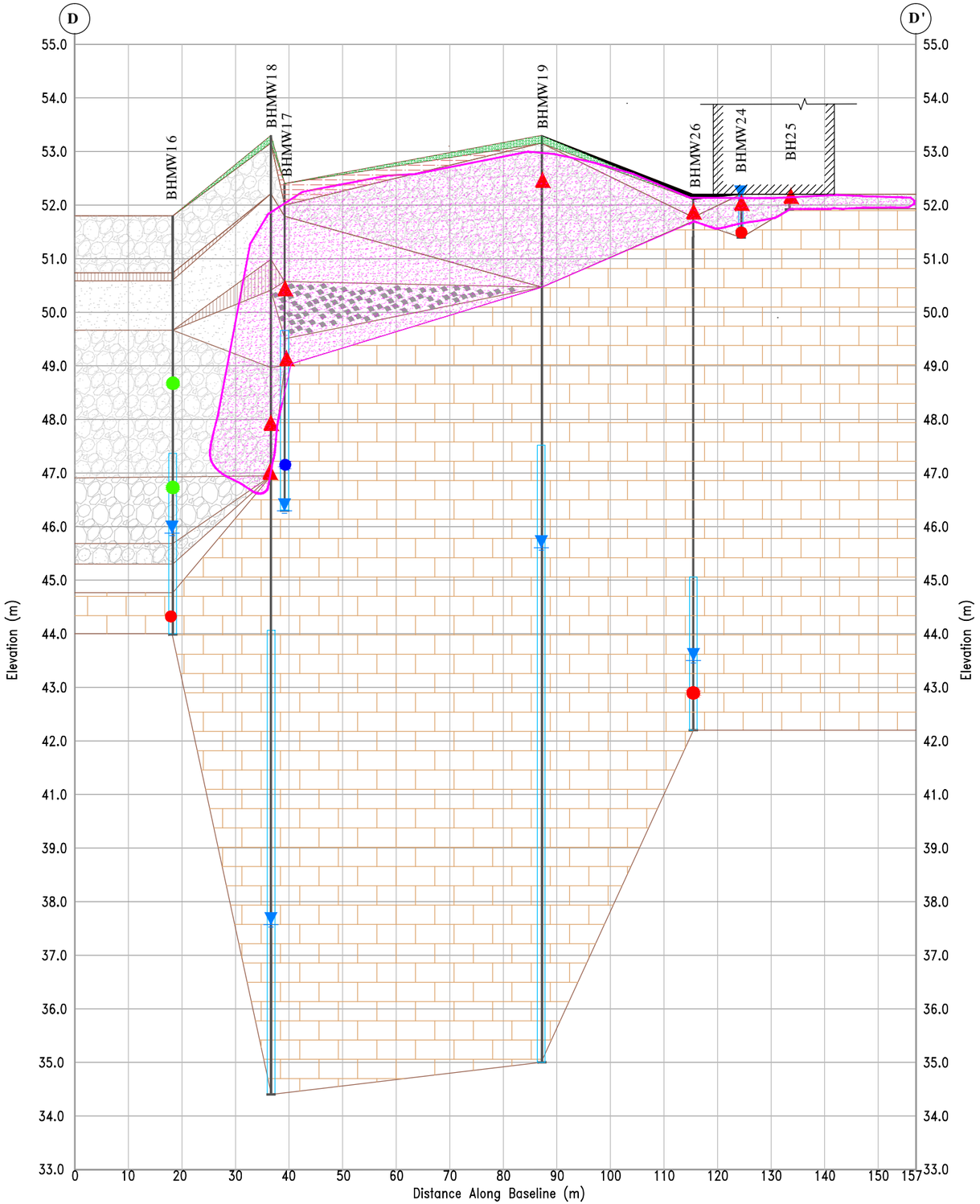

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- CLAY
- APPROXIMATE LOCATION OF BUILDING BASEMENT
- BOREHOLE LOCATION
- WELL SCREEN AND WELL LOCATION
- GROUNDWATER ELEVATION (2006)
- LOCATION OF 2006 GROUNDWATER SAMPLE -MEETS MOECC STANDARDS
- LOCATION OF SOIL SAMPLE - EXCEEDS MOECC STANDARDS
- LOCATION OF SOIL SAMPLE - MEETS MOECC STANDARDS
- LOCATION OF 2006 GROUNDWATER SAMPLE - EXCEEDS MOECC STANDARDS

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DRAWING TITLE

AREA 2 CROSS - SECTIONS D - D'
PRE - REMEDIATION

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PROJECT MANAGER: A.N.	PROJECT NO.: OE-OT-018031

FIGURE No.: FIGURE 8

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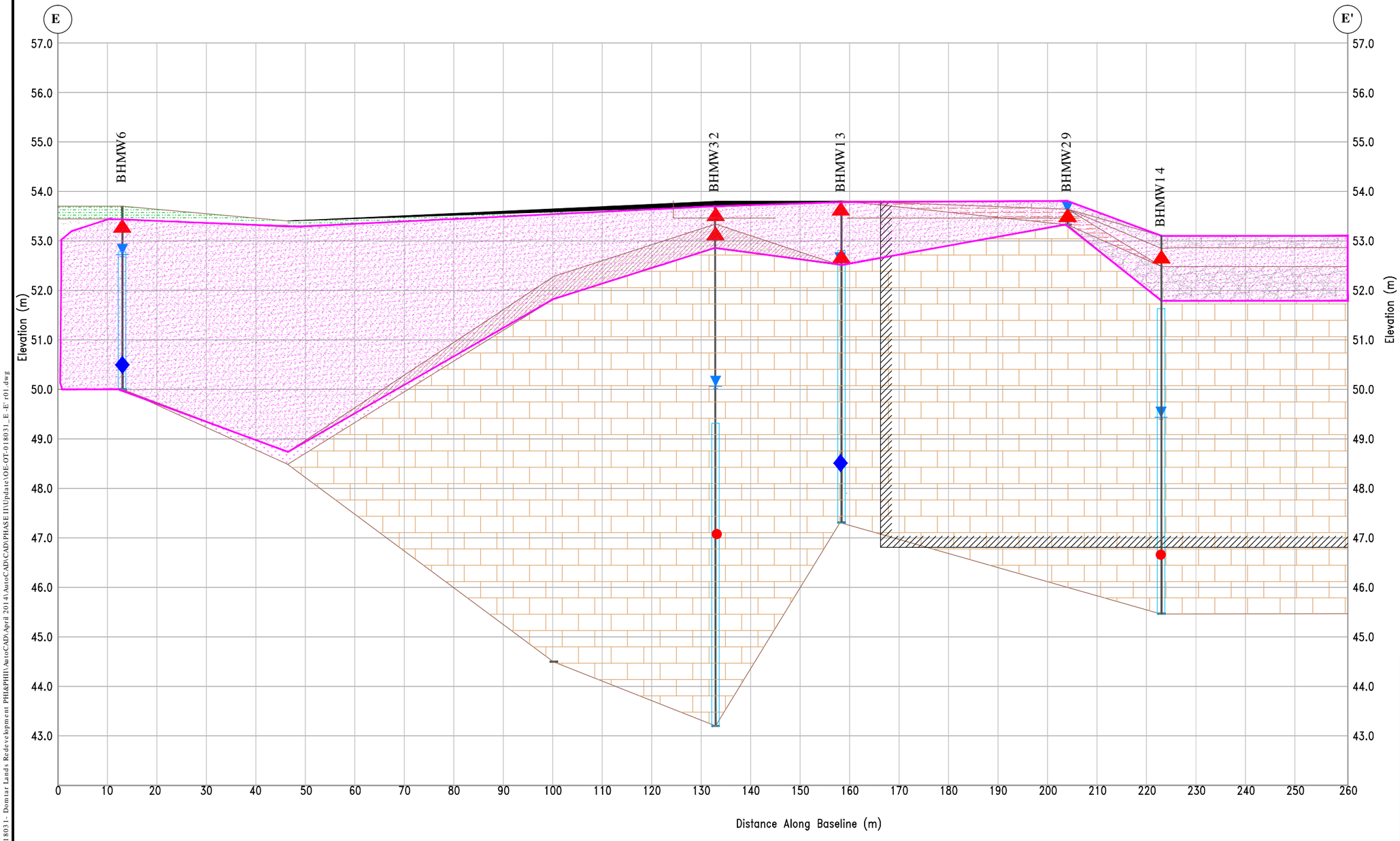

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- CLAY
- APPROXIMATE LOCATION OF BUILDING BASEMENT
- BOREHOLE LOCATION
- WELL SCREEN AND WELL LOCATION
- GROUNDWATER ELEVATION (2006)
- LOCATION OF 2006 GROUNDWATER SAMPLE -MEETS MOECC STANDARDS
- LOCATION OF SOIL SAMPLE - EXCEEDS MOECC STANDARDS
- LOCATION OF SOIL SAMPLE - MEETS MOECC STANDARDS
- LOCATION OF 2006 GROUNDWATER SAMPLE - EXCEEDS MOECC STANDARDS

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PRE - REMEDIATION

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DRAWN BY: R.P.	DATE: June 2016
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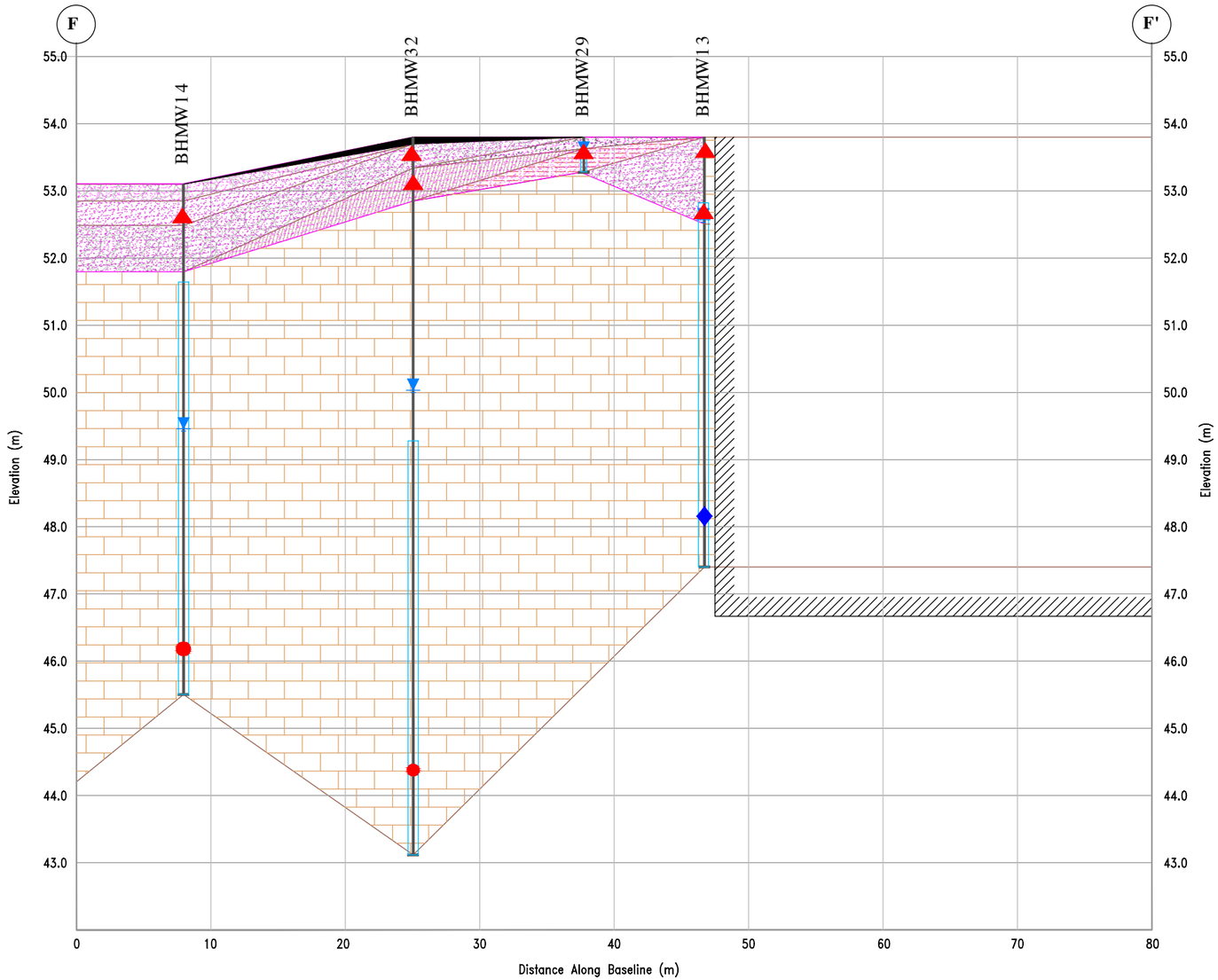
FIGURE No.: FIGURE 9



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- CLAY
- WOOD
- APPROXIMATE LOCATION OF BUILDING BASEMENT
- BOREHOLE LOCATION
- WELL SCREEN AND WELL LOCATION
- GROUNDWATER ELEVATION (2006)
- LOCATION OF 2006 GROUNDWATER SAMPLE -MEETS MOECC STANDARDS
- LOCATION OF SOIL SAMPLE - EXCEEDS MOECC STANDARDS
- LOCATION OF 2006 GROUNDWATER SAMPLE - EXCEEDS MOECC STANDARDS

NOTE:
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DRAWING TITLE

AREA 3 CROSS - SECTIONS F - F'
PRE - REMEDIATION

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DRAWN BY R.P.	DATE June 2016
PROJECT MANAGER A.N.	PROJECT NO.: OE-OT-018031
FIGURE No.: FIGURE 10	

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APPENDIX B

Summary Tables of Comparison of Historical Analytical Data to Updated Standards – Area 1

Table B-1
Area 1 - Soil Sample Analytical Results - Polycyclic Aromatic Hydrocarbons (PAHs) & Polychlorinated Biphenyls (PCBs)

Parameter Description	Standards		Analytical Results (Sample ID / Depth - mbgs / Sampling Date)						
	MOE Table 7 [1]	MOE Table 9 [2]	544-BHMW2-SS2 0.60 m - 1.20 m July 24, 2006	544-BHMW3-SS1 0.08 m - 0.43 m July 24, 2006	544-BHMW4-SS5 2.45 m - 3.05 m July 24, 2006	544-BHMW31-SS1/2/3* 0.13 m - 2.13 m July 24, 2006	544-BHMW31-SS4 2.13 m - 2.74 m July 24, 2006	544-BHMW31-SS5 3.05 m - 3.70 m July 24, 2006	544-BH1-SS4 1.83 m - 2.44 m July 25, 2006
Acenaphthene	7.9	0.072	**3**	**7**	0.06	0.06	*< 0.4*	*< 0.4*	< 0.02
Acenaphthylene	0.15	0.093	*< 1*	**6**	< 0.02	**0.22**	*< 0.4*	*< 0.4*	< 0.02
Anthracene	0.67	0.22	**6**	**38**	0.14	**0.76**	*< 0.4*	*< 0.4*	< 0.02
Benzo[a]anthracene	0.5	0.36	**5**	**130**	**0.40**	**1.4**	*< 0.4*	*< 0.4*	< 0.02
Benzo[a]pyrene	0.3	0.3	**3**	**98**	**0.32**	**1.1**	*< 0.4*	*< 0.4*	< 0.02
Benzo[b]fluoranthene	0.78	0.47	**3**	**120**	0.26	**1.1**	< 0.4	< 0.4	< 0.02
Benzo[ghi]perylene	6.6	0.68	*< 1*	**34**	0.14	0.42	< 0.4	< 0.4	< 0.02
Benzo[k]fluoranthene	0.78	0.48	**2**	**45**	0.14	**0.70**	< 0.4	< 0.4	< 0.02
Biphenyl	0.31	0.05	*< 1*	*< 1*	< 0.02	< 0.02	*< 0.4*	*< 0.4*	< 0.02
Chrysene	7	2.8	**4**	**100**	0.34	1.2	< 0.4	< 0.4	< 0.02
Dibenzo[a,h]anthracene	0.1	0.1	*< 1*	**17**	0.04	**0.20**	*< 0.4*	*< 0.4*	< 0.02
Fluoranthene	0.69	0.69	**8**	**230**	**1.0**	**2.7**	< 0.4	< 0.4	< 0.02
Fluorene	62	0.19	**4**	**7**	0.04	< 0.02	*< 0.4*	*< 0.4*	< 0.02
Indeno[1,2,3-cd]pyrene	0.38	0.23	*< 1*	**38**	0.12	**0.38**	*< 0.4*	*< 0.4*	< 0.02
1-Methylnaphthalene	0.99	0.59	*< 1*	*< 1*	0.08	< 0.02	< 0.4	< 0.4	< 0.02
2-Methylnaphthalene			**4**	*< 1*	0.12	0.04	< 0.4	< 0.4	< 0.02
Naphthalene	0.6	0.09	**9**	*< 1*	**0.14**	< 0.02	*< 0.4*	*< 0.4*	< 0.02
Phenanthrene	6.2	0.69	**13**	**82**	0.52	**1.4**	< 0.4	< 0.4	< 0.02
Pyrene	78	1	**7**	**200**	0.76	**2.2**	< 0.4	< 0.4	< 0.02
Total PCBs	0.35	0.3	*< 1*	**0.60**	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05

Notes: - All units are in micrograms per gram (µg/g).

MOE [1] - Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional Property Use. Coarse textured soils.

MOE [2] - Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use. All soil textures.

* - Due to poor sample recovery, the sample collected above and/ or below were provided to the laboratory as composite samples.

mbgs - Meters below grade surface

Value - Laboratory method detection limit exceeds applicable standards

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table B-2

Area 1 - Soil Sample Analytical Results - Metals, Sulphur and pH

Parameter Description	Standards		Analytical Results (Sample ID / Depth - mbgs / Sampling Date)						
	MOE Table 7 [1]	MOE Table 9 [2]	544-BHMW2-SS2 0.60 m - 1.20 m July 24, 2006	544-BHMW3-SS1 0.08 m - 0.43 m July 24, 2006	544-BHMW4-SS5 2.45 m - 3.05 m July 24, 2006	544-BHMW31-SS1/2/3* 0.13 m - 2.13 m July 24, 2006	544-BHMW31-SS4 2.13 m - 2.74 m July 24, 2006	544-BHMW31-SS5 3.05 m - 3.70 m July 24, 2006	544-BH1-SS4 1.83 m - 2.44 m July 25, 2006
Antimony	7.5	1.3	< 1	**3**	**2**	< 1	< 1	< 1	< 1
Arsenic	18	18	< 1	3	**37**	2	< 1	< 1	< 1
Barium	390	220	40	80	**380**	100	30	10	20
Beryllium	4	2.5	< 0.5	< 0.5	2.0	< 0.5	< 0.5	< 0.5	< 0.5
Cadmium	1.2	1.2	< 0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Calcium	NG	NG	230,000	200,000	51,000	150,000	31,000	7,600	2,600
Chromium	160	70	10	15	35	20	10	5	5
Cobalt	22	22	< 5	< 5	15	5	< 5	< 5	< 5
Copper	140	92	< 5	**390**	65	20	< 5	< 5	5
Iron	NG	NG	3,200	6,200	47,000	8,200	2,200	2,400	9,000
Lead	120	120	37	**160**	**190**	48	9	3	4
Magnesium	NG	NG	7,000	9,400	5,000	11,000	4,000	1,000	1,400
Molybdenum	6.9	2	< 1	1	**9**	< 1	< 1	< 1	< 1
Nickel	100	82	20	25	35	20	5	< 5	5
Selenium	2.4	1.5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Silver	20	0.5	< 0.3	0.3	0.3	< 0.3	< 0.3	< 0.3	< 0.3
Sodium	NG	NG	400	2,400	1,000	600	200	< 200	200
Thallium	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tin	NG	NG	< 5	65	10	< 5	< 5	< 5	< 5
Vanadium	86	86	< 10	20	50	30	< 10	< 10	30
Zinc	340	290	< 20	140	120	40	20	< 20	< 20
Sulphur	NG	NG	980	1,900	2,000	3,000	1,900	740	110
pH	NG	NG	8.70	8.3	7.99	8.61	8.10	7.60	9.07

Notes: - All units are in micrograms per gram (µg/g).

MOE [1] - Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional Property Use. Coarse textured soils.

MOE [2] - Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use. All soil textures.

NG - No guideline available

* - Due to poor sample recovery, the sample collected above and/ or below were provided to the laboratory as composite samples.

mbgs - Meters below grade surface

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table B-3

Area 1 - Soil Sample Analytical Results-Petroleum Hydrocarbons (PHCs) and Volatile Organic Compounds (VOCs)

Parameter Description	Standards		Analytical Results (Sample ID / Depth - mbgs / Sampling Date)						
	MOE Table 7 (1)	MOE Table 9 (2)	544-BHMW2-SS2 0.60 m - 1.20 m July 24, 2006	544-BHMW3-SS1 0.08 m - 0.43 m July 24, 2006	544-BHMW4-SS5 2.45 m - 3.05 m July 24, 2006	544-BHMW31-SS1/2/3* 0.13 m - 2.13 m July 24, 2006	544-BHMW31-SS4 2.13 m - 2.74 m July 24, 2006	544-BHMW31-SS5 3.05 m - 3.70 m July 24, 2006	544-BH1-SS4 1.83 m - 2.44 m July 25, 2006
PHC F1 (C6-C10)	55	25	< 20	< 20	< 20	< 20	< 20	< 20	< 20
PHC F2 (C10-C16)	98	10	**1,900**	**100**	< 10	**40**	**60**	**6,000**	< 10
PHC F3 (C16-C34)	300	240	**6,100**	**4,300**	< 10	**1,200**	**1,500**	**21,000**	240
PHC F4 (C34-C50)	2800	120	**730**	**850**	< 10	**910**	**150**	**3,200**	20
Benzene	0.21	0.02	**0.036**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Bromodichloromethane	13	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Bromoform	0.27	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Bromomethane	0.05	0.05	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Carbon Tetrachloride	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Chlorobenzene	2.4	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Chloroethane	NG	NG	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chloroform	0.05	0.05	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Chloromethane	NG	NG	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Dibromochloromethane	9.4	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
1,2-Dibromoethane	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
m-Dichlorobenzene	3.4	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
o-Dichlorobenzene	4.8	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
p-Dichlorobenzene	0.083	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
1,1-Dichloroethane	3.5	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
1,2-Dichloroethane	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
1,1-Dichloroethylene	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
c-1,2-Dichloroethylene	3.4	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
t-1,2-Dichloroethylene	0.084	0.05	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
1,2-Dichloropropane	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
c-1,3-Dichloropropene	0.05	0.05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
t-1,3-Dichloropropene			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	2	0.05	**0.058**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	0.1	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Styrene	0.7	0.05	**0.082**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
1,1,1,2-Tetrachloroethane	0.058	0.05	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
1,1,2,2-Tetrachloroethane	0.05	0.05	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Tetrachloroethylene	0.28	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Toluene	2.3	0.2	0.15	< 0.002	< 0.002	< 0.002	0.014	0.048	< 0.002
1,1,1-Trichloroethane	0.38	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
1,1,2-Trichloroethane	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Trichloroethylene	0.061	0.05	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Trichlorofluoromethane	4	0.25	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,3,5-Trimethylbenzene	NG	NG	0.006	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Vinyl Chloride	0.02	0.02	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
m/p-Xylene	3.1	0.05	**0.19**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene			**0.076**	< 0.002	< 0.002	< 0.002	0.002	< 0.002	< 0.002

Notes: - All units are in micrograms per gram (µg/g).

MOE (1) - Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. Residential /Parkland/Institutional Property Use. Coarse textured soils.

MOE (2) - Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use. All soil textures.

NG - No guideline available

* - Due to poor sample recovery, the sample collected above and/ or below were provided to the laboratory as composite samples.

mbgs - Meters below grade surface

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table B-4

Area 1 - Groundwater Sample Analytical Results - Polycyclic Aromatic Hydrocarbons (PAHs) and Polychlorinated Biphenyls (PCBs)

Parameter Description	Standards		Analytical Results (Sample ID / Sampling Date)								
	MOE Table 7[1]	MOE Table 9[2]	BHMW31-WGS1 August 1, 2006	BHMWB-WGSB (Blind Duplicate of BHMW31-WGS1) August 1, 2006	544-BHMW2 August 2, 2006	544-BHMW3 August 2, 2006	544-BHMW4 August 2, 2006	BHMW31 April 24, 2014	BHMW2 April 24, 2014	BHMW3 April 24, 2014	BHMW4 April 24, 2014
Acenaphthene	17	600	< 0.05	< 0.05	< 0.05	0.10	0.15	<0.050	<0.050	<0.050	<0.050
Acenaphthylene	1	1.4	< 0.05	< 0.05	< 0.05	0.10	0.05	<0.050	<0.050	<0.050	<0.050
Anthracene	1	1	0.04	0.50	< 0.01	0.39	0.22	<0.050	<0.050	0.11	<0.050
Benzo[a]anthracene	1.8	1.8	0.13	0.23	< 0.01	**1.9**	0.52	<0.050	<0.050	0.23	0.055
Benzo[a]pyrene	0.81	0.81	0.08	0.15	< 0.01	**1.5**	0.51	<0.010	<0.010	0.21	0.065
Benzo[b]fluoranthene	0.75	0.75	0.10	0.20	< 0.05	**2.1**	0.75	<0.050	<0.050	0.28	0.095
Benzo[ghi]perylene	0.2	0.2	< 0.05	0.10	< 0.05	**0.75**	**0.4**	<0.050	<0.050	0.09	<0.050
Benzo[k]fluoranthene	0.4	0.4	0.05	0.10	< 0.05	**1.1**	0.35	<0.050	<0.050	0.095	<0.050
Biphenyl	1000	1700	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	N/A	N/A	N/A	N/A
Chrysene	0.7	0.7	0.10	0.2	< 0.05	**1.7**	0.55	<0.050	<0.050	0.23	0.06
Dibenzo[a,h]anthracene	0.4	0.4	< 0.05	< 0.05	< 0.05	0.25	< 0.05	<0.050	<0.050	<0.050	<0.050
Fluoranthene	44	73	0.18	0.30	< 0.01	3.0	1.2	<0.050	<0.050	0.51	0.15
Fluorene	290	290	< 0.05	0.05	< 0.05	0.10	0.15	<0.050	<0.050	<0.050	<0.050
Indeno[1,2,3-cd]pyrene	0.2	0.2	< 0.05	0.05	< 0.05	**0.65**	**0.3**	<0.050	<0.050	0.09	<0.050
1-Methylnaphthalene	1500	1500	< 0.05	0.05	< 0.05	< 0.05	0.1	<0.050	<0.050	<0.050	<0.050
2-Methylnaphthalene			< 0.05	< 0.05	< 0.05	< 0.05	0.1	<0.050	<0.050	<0.050	<0.050
Naphthalene	7	1400	< 0.05	0.1	< 0.05	< 0.05	0.25	<0.050	<0.050	<0.050	<0.050
Phenanthrene	380	380	0.10	0.25	< 0.05	0.75	0.8	<0.030	<0.030	0.25	0.08
Pyrene	5.7	5.7	0.16	0.31	< 0.01	2.9	0.93	<0.050	<0.050	0.44	0.13
Total PCBs	0.2	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	<0.05	<0.05	<0.05

Notes: All units are in micrograms per litre (µg/L).

MOE [1] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. All Types of Property Use. Coarse textured soils.

MOE [2] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All soil textures.

N/A - Parameter not analyzed

NG - No guideline available

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table B-5

Area 1 - Groundwater Sample Analytical Results - Metals, pH and Hardness

Parameter Description	Standards		Analytical Results (Sample ID / Sampling Date)								
	MOE Table 7 [1]	MOE Table 9 [2]	BHMW31-WGS1 August 1, 2006	BHMWB-WGSB (Blind Duplicate of BHMW31-WGS1) August 1, 2006	544-BHMW2 August 2, 2006	544-BHMW3 August 2, 2006	544-BHMW4 August 2, 2006	BHMW31 April 24, 2014	BHMW2 April 24, 2014	BHMW3 April 24, 2014	BHMW4 April 24, 2014
Aluminum	NG	NG	0.16	0.20	< 0.01	0.077	1	N/A	N/A	N/A	N/A
Antimony	16	16	< 0.001	< 0.001	0.002	0.004	< 0.001	<0.0005	0.0042	0.0013	0.0023
Arsenic	1.5	1.5	< 0.001	< 0.001	< 0.01	< 0.001	< 0.001	<0.001	<0.005	<0.002	0.0018
Barium	23	23	0.015	0.015	0.34	0.55	0.09	0.016	0.21	0.14	0.052
Beryllium	0.053	0.053	< 0.0005	< 0.0005	< 0.001	< 0.0005	< 0.0005	<0.0005	<0.0025	<0.0005	<0.0005
Boron	36	36	< 0.1	< 0.1	0.20	0.1	< 0.1	<0.010	0.15	0.42	0.012
Cadmium	0.0021	0.0021	< 0.0001	< 0.0001	< 0.001	< 0.0001	< 0.0001	<0.0001	<0.0005	<0.0001	<0.0001
Calcium	NG	NG	6.5	6.3	1,200	140	78	N/A	N/A	N/A	N/A
Chromium	0.64	0.64	0.006	0.005	< 0.05	0.022	0.013	<0.005	<0.025	<0.005	<0.005
Cobalt	0.052	0.052	0.0090	0.0020	0.030	0.012	0.0065	<0.0005	<0.0025	0.00058	<0.0005
Copper	0.069	0.069	< 0.0005	0.0025	**0.093**	0.035	< 0.0005	0.0026	<0.005	0.024	0.0052
Iron	NG	NG	0.1	0.1	3.0	< 0.1	0.3	N/A	N/A	N/A	N/A
Lead	0.02	0.02	0.0009	0.0008	< 0.001	0.0015	0.014	<0.0005	<0.0025	<0.0005	0.0069
Magnesium	NG	NG	2.0	1.8	200	28	1.8	N/A	N/A	N/A	N/A
Manganese	NG	NG	0.020	0.010	0.40	0.045	0.035	N/A	N/A	N/A	N/A
Molybdenum	7.3	7.3	< 0.001	< 0.001	0.005	0.012	< 0.001	<0.0005	0.0063	0.016	0.00071
Nickel	0.39	0.39	0.002	0.001	0.040	0.016	0.005	0.0012	<0.005	0.0063	0.0025
Potassium	NG	NG	0.7	0.7	49	40	4.7	N/A	N/A	N/A	N/A
Selenium	0.05	0.05	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	<0.002	<0.010	<0.002	<0.002
Silver	0.0012	0.0012	< 0.0001	< 0.0001	< 0.001	< 0.0001	< 0.0001	<0.0001	<0.0005	<0.0001	<0.0001
Sodium	1800	1800	4.6	4.0	**3,000**	200	140	4.6	1300	410	14
Strontium	NG	NG	0.06	0.06	NA	5.5	0.45	N/A	N/A	N/A	N/A
Thallium	0.4	0.4	< 0.0001	< 0.0001	< 0.001	0.0006	0.0001	<0.00005	<0.00025	<0.00005	<0.00005
Tin	NG	NG	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005	N/A	N/A	N/A	N/A
Titanium	NG	NG	< 0.005	< 0.005	NA	0.010	0.015	N/A	N/A	N/A	N/A
Tungsten	NG	NG	< 0.01	< 0.01	NA	0.08	< 0.01	N/A	N/A	N/A	N/A
Uranium	0.33	0.33	< 0.005	< 0.005	NA	0.005	< 0.005	0.00013	0.0011	0.0036	0.00026
Vanadium	0.2	0.2	< 0.001	< 0.001	< 0.01	< 0.001	< 0.001	<0.0005	<0.0025	<0.001	0.0014
Zinc	0.89	0.89	< 0.01	< 0.01	0.02	0.02	< 0.01	0.01	0.07	0.022	0.011
Total Sulphur	NG	NG	5.2	5.3	230	26	54	N/A	N/A	N/A	N/A
Hardness, CaCO3	NG	NG	24	23	3,800	460	200	43	1500	1100	110
pH	NG	NG	8.86	8.71	6.72	7.39	8.85	7.78	7.58	7.54	7.98

Notes: All units are in milligrams per litre (mg/L)

MOE [1] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. All Types of Property Use. Coarse textured soils.

MOE [2] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All soil textures.

NG - No guideline available

N/A - Parameter not analyzed

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table B-6

Area 1 - Groundwater Sample Analytical Results - Volatile Organic Compounds (VOCs) and Petroleum Hydrocarbons (PHCs)

Parameter Description	Standards		Analytical Results (Sample ID / Sampling Date)								
	MOE Table 7 [1]	MOE Table 9 [2]	544-BHMW31 August 1, 2006	544-BHMWB (Blind Duplicate of 544-BHMW31) August 1, 2006	544-BHMW2 August 2, 2006	544-BHMW3 August 2, 2006	544-BHMW4 August 2, 2006	BHMW31 April 24, 2014	BHMW2 April 24, 2014	BHMW3 April 24, 2014	BHMW4 April 24, 2014
F1 PHCs (C6-C10)	0.42	0.42	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.032	<0.025	<0.025	<0.025
F2 PHCs (C10-C16)	0.15	0.15	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.1	<0.1
F3 PHCs (C16-C34)	0.5	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.2	<0.2	<0.2	<0.2
F4 PHCs (C34-C50)	0.5	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.2	<0.2	<0.2	<0.2
Benzene	0.0005	0.044	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0002	<0.0002	<0.0002	<0.0002
Bromodichloromethane	67	67	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.0005	<0.0005	<0.0005	<0.0005
Bromoform	0.005	0.38	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	<0.001	<0.001	<0.001	<0.001
Bromomethane	0.00089	0.0056	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007	<0.0005	<0.0005	<0.0005	<0.0005
Carbon Tetrachloride	0.0002	0.00079	*< 0.0005*	*< 0.0005*	*< 0.0005*	*< 0.0005*	*< 0.0005*	<0.0002	<0.0002	<0.0002	<0.0002
Chlorobenzene	0.14	0.5	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.0002	<0.0002	<0.0002	<0.0002
Chloroethane	NG	NG	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	N/A
Chloroform	0.002	0.0024	*< 0.0006*	*< 0.0006*	< 0.0006	< 0.0006	< 0.0006	<0.0002	<0.0002	<0.0002	<0.0002
Chloromethane	NG	NG	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	N/A	N/A	N/A	N/A
Dibromochloromethane	65	65	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.005	<0.005	<0.005	<0.005
1,2-Dibromoethane	0.0002	0.00025	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	N/A	N/A	N/A	N/A
m-Dichlorobenzene	0.15	4.6	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.0005	<0.0005	<0.0005	<0.0005
o-Dichlorobenzene	7.6	7.6	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.0005	<0.0005	<0.0005	<0.0005
p-Dichlorobenzene	0.0005	0.008	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethane	0.011	0.32	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0002	<0.0002	<0.0002	<0.0002
1,2-Dichloroethane	0.0005	0.0016	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	0.0005	0.0016	*< 0.0006*	*< 0.0006*	*< 0.0006*	*< 0.0006*	*< 0.0006*	<0.0002	<0.0002	<0.0002	<0.0002
c-1,2-Dichloroethylene	0.0016	0.0016	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.0005	<0.0005	<0.0005	<0.0005
t-1,2-Dichloroethylene	0.0016	0.0016	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.0005	<0.0005	<0.0005	<0.0005
1,2-Dichloropropane	0.00058	0.016	*< 0.0007*	*< 0.0007*	*< 0.0007*	*< 0.0007*	*< 0.0007*	<0.0002	<0.0002	<0.0002	<0.0002
c-1,3-Dichloropropene	0.0005	0.0052	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.0003	<0.0003	<0.0003	<0.0003
t-1,3-Dichloropropene			< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0004	<0.0004	<0.0004	<0.0004
Ethylbenzene	0.054	1.8	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0002	<0.0002	<0.0002	<0.0002
Methylene Chloride	0.026	0.61	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	<0.002	<0.002	<0.002	<0.002
Styrene	0.043	1.3	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.0005	<0.0005	<0.0005	<0.0005
1,1,1,2-Tetrachloroethane	0.0011	0.0033	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1,2,2-Tetrachloroethane	0.0005	0.0032	*< 0.0006*	*< 0.0006*	*< 0.0006*	*< 0.0006*	*< 0.0006*	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	0.0005	0.0016	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0002	<0.0002	<0.0002	<0.0002
Toluene	0.32	14	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0002	<0.0002	<0.0002	<0.0002
1,1,1-Trichloroethane	0.023	0.64	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.0002	<0.0002	<0.0002	<0.0002
1,1,2-Trichloroethane	0.0005	0.0047	*< 0.0006*	*< 0.0006*	*< 0.0006*	*< 0.0006*	*< 0.0006*	<0.0005	<0.0005	<0.0005	<0.0005
Trichloroethylene	0.0005	0.0016	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.0002	<0.0002	<0.0002	<0.0002
Trichlorofluoromethane	2	2	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.0005	<0.0005	<0.0005	<0.0005
1,3,5-Trimethylbenzene	NG	NG	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	N/A	N/A	N/A	N/A
Vinyl Chloride	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0002	<0.0002	<0.0002	<0.0002
m/p-Xylene	0.072	3.3	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0002	<0.0002	<0.0002	<0.0002
o-Xylene			< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0002	<0.0002	<0.0002	<0.0002

Notes: All units are in milligrams per litre (mg/L)

MOE [1] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. All Types of Property Use. Coarse textured soils.

MOE [2] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All soil textures.

NG - No guideline available

N/A - Patameter not analyzed

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Value - Laboratory method detection limit exceeds applicable standards

APPENDIX C

Summary Tables of Comparison of Historical Analytical Data to Updated Standards – Area 2

Table C-1
Area 2 - Soil Sample Analytical Results - Polycyclic Aromatic Hydrocarbons (PAHs) & Polychlorinated Biphenyls (PCBs)

Parameter Description	Standards		Analytical Results (Sample ID / Depth - mbgs / Sampling Date)					
	MOE Table 7 (1)	MOE Table 9 (2)	544-BHMW16-SS10/11* 5.50 m - 6.50 m July 25, 2006	544-BHMW17-SS4/5* 1.83 m - 3.05 m July 25, 2006	544-BHMW18-SS7 4.26 m - 4.88 m July 25, 2006	544-BHMW22-SS2 0.61 m - 1.22 m July 25, 2006	544-BHMW16-SS6 3.05 m - 3.66 m July 26, 2006	544-BHMW18-SS10/11* 6.10 m - 6.73 m July 26, 2006
Acenaphthene	7.9	0.072	0.02	140	0.20	0.38	< 0.02	120
Acenaphthylene	0.15	0.093	0.02	50	0.22	0.24	0.02	< 40
Anthracene	0.67	0.22	0.10	420	0.90	1.2	0.10	240
Benzo[a]anthracene	0.5	0.36	0.18	720	1.8	2.1	0.26	480
Benzo[a]pyrene	0.3	0.3	0.16	630	1.6	1.8	0.20	280
Benzo[b]fluoranthene	0.78	0.47	0.28	730	2.3	2.5	0.26	240
Benzo[ghi]perylene	6.6	0.68	0.10	320	0.80	0.94	0.10	120
Benzo[k]fluoranthene	0.78	0.48	0.12	420	1.3	1.4	0.12	120
Biphenyl	0.31	0.05	< 0.02	< 10	0.02	0.04	< 0.02	< 40
Chrysene	7	2.8	0.18	670	1.7	2.0	0.22	360
Dibenzo[a,h]anthracene	0.1	0.1	0.04	100	0.26	0.30	< 0.02	< 40
Fluoranthene	0.69	0.69	0.32	2,200	4.3	5.7	0.60	640
Fluorene	62	0.19	0.04	190	0.30	0.54	0.06	160
Indeno[1,2,3-cd]pyrene	0.38	0.23	0.08	290	0.74	0.88	0.10	120
1-Methylnaphthalene	0.99	0.59	0.04	30	0.10	0.20	0.08	< 40
2-Methylnaphthalene			0.04	40	0.14	0.22	0.08	< 40
Naphthalene	0.6	0.09	0.04	80	0.18	0.34	0.06	120
Phenanthrene	6.2	0.69	0.32	1,700	2.9	5.4	0.46	920
Pyrene	78	1	0.24	1,600	3.3	4.1	0.46	440
Total PCBs	0.35	0.3	< 0.05	< 0.05	< 0.5	< 0.05	< 0.05	< 1

Notes:
- All units are in micrograms per gram (µg/g).
- Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional Property Use. Coarse textured soils.

MOE (1)

MOE (2) - Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use. All soil textures.

NG - No guideline available

* - Due to poor sample recovery, the sample collected above and/ or below were provided to the laboratory as composite samples.

mbgs - Meters below grade surface

Value - Laboratory method detection limit exceeds applicable standards

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table C-1 (cont.'d)
Area 2 - Soil Sample Analytical Results - Polycyclic Aromatic Hydrocarbons (PAHs) & Polychlorinated Biphenyls (PCBs)

Parameter Description	Standards		Analytical Results (Sample ID / Depth - mbgs / Sampling Date)							
	MOE Table 7 [1]	MOE Table 9 [2]	544-BHMW19-SS3/4* 1.22 m - 2.08 m July 26, 2006	544-BHMW24-SS1/2* 0.00 m - 0.80 m July 26, 2006	544-BH25-SS1/2* 0.30 m - 1.50 m July 26, 2006	544-BHMW17-SS6 3.05 m - 3.43 m July 27, 2006	544-BHMW20-SS1 0.00 m - 0.56 m July 27, 2006	544-BHMW21-SS1/2* 0.15 m - 0.79 m July 27, 2006	544-BHMW23-SS3/4 1.22 m - 2.44 m July 27, 2006	544-BHMW26-SS1/2* 0.10 m - 0.70 m July 27, 2006
Acenaphthene	7.9	0.072	160	< 0.02	< 0.02	1,200	0.20	< 0.02	0.54	0.4
Acenaphthylene	0.15	0.093	< 80	< 0.02	< 0.02	< 600	0.30	< 0.02	0.14	< 0.2
Anthracene	0.67	0.22	480	< 0.02	< 0.02	2,400	0.48	0.08	1.6	1.0
Benzo[a]anthracene	0.5	0.36	720	< 0.02	0.12	3,000	1.30	0.10	1.8	1.2
Benzo[a]pyrene	0.3	0.3	320	< 0.02	0.10	2,400	1.60	0.10	1.8	1.2
Benzo[b]fluoranthene	0.78	0.47	320	< 0.02	0.16	3,000	1.70	0.10	1.6	1.4
Benzo[ghi]perylene	6.6	0.68	160	< 0.02	0.04	< 600	0.70	0.06	0.68	0.6
Benzo[k]fluoranthene	0.78	0.48	240	< 0.02	0.08	1,200	0.76	0.04	0.82	0.6
Biphenyl	0.31	0.05	< 80	< 0.02	< 0.02	< 600	0.02	< 0.02	0.1	< 0.2
Chrysene	7	2.8	480	< 0.02	0.14	1,800	1.70	0.14	2.1	1.6
Dibenzo[a,h]anthracene	0.1	0.1	< 80	< 0.02	< 0.02	< 600	0.22	< 0.02	0.24	< 0.2
Fluoranthene	0.69	0.69	880	< 0.02	0.24	9,000	2.80	0.26	5.2	3.4
Fluorene	62	0.19	240	< 0.02	< 0.02	1,200	0.12	0.04	0.9	0.4
Indeno[1,2,3-cd]pyrene	0.38	0.23	160	< 0.02	0.04	< 600	0.64	0.04	0.62	0.4
1-Methylnaphthalene	0.99	0.59	< 80	< 0.02	< 0.02	600	0.06	< 0.02	0.14	< 0.2
2-Methylnaphthalene			< 80	< 0.02	< 0.02	1,200	0.08	< 0.02	0.24	0.2
Naphthalene	0.6	0.09	160	< 0.02	< 0.02	3,600	0.10	< 0.02	0.62	0.4
Phenanthrene	6.2	0.69	1,400	< 0.02	0.12	11,000	1.60	0.26	6.1	3.4
Pyrene	78	1	560	< 0.02	0.18	6,600	2.50	0.20	3.7	2.6
Total PCBs	0.35	0.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.30	< 0.05	< 0.05

Notes: - All units are in micrograms per gram (µg/g).

MOE [1] - Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional Property Use. Coarse textured soils.

MOE [2] - Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use. All soil textures.

NG - No guideline available

* - Due to poor sample recovery, the sample collected above and/ or below were provided to the laboratory as composite samples.

mbgs - Meters below grade surface

Value - Laboratory Reportable Detection Limit exceeds applicable standard.

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table C-2
Area 2 - Soil Sample Analytical Results - Metals, Sulphur and pH

Parameter Description	Standards		Analytical Results (Sample ID / Depth - mbgs / Sampling Date)						
	MOE Table 7 (1)	MOE Table 9 (2)	544-BHMW16-SS10/11* 5.50 m - 6.50 m July 25, 2006	544-BHMW17-SS4/5* 1.83 m - 3.05 m July 25, 2006	544-BHMW18-SS7 4.26 m - 4.88 m July 25, 2006	544-BHMW22-SS2 0.61 m - 1.22 m July 25, 2006	544-BHMW16-SS6 3.05 m - 3.66 m July 26, 2006	544-BHMW18-SS10/11* 6.10 m - 6.73 m July 26, 2006	544-BHMW19-SS3/4* 1.22 m - 2.08 m July 26, 2006
Antimony	7.5	1.3	1	2	1	3	3	< 1	1
Arsenic	18	18	3	3	34	4	12	5	7
Barium	390	220	90	100	150	150	110	170	140
Beryllium	4	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Cadmium	1.2	1.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1
Calcium	NG	NG	230,000	200,000	120,000	190,000	220,000	200,000	140,000
Chromium	160	70	25	25	30	15	20	20	20
Cobalt	22	22	10	10	15	10	10	5	5
Copper	140	92	25	40	45	30	35	15	300
Iron	NG	NG	10,000	8,800	20,000	9,800	27,000	12,000	17,000
Lead	120	120	93	170	130	750	80	87	210
Magnesium	NG	NG	5,600	4,600	5,800	4,600	6,200	7,600	5,000
Molybdenum	6.9	2	2	1	5	< 1	2	2	2
Nickel	100	82	25	20	25	20	30	20	20
Selenium	2.4	1.5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Silver	20	0.5	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	0.3
Sodium	NG	NG	600	< 200	200	200	200	400	400
Thallium	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tin	NG	NG	< 5	5	5	5	10	< 5	20
Vanadium	86	86	50	40	50	30	20	20	20
Zinc	340	290	60	60	40	60	40	60	200
Sulphur	NG	NG	3,700	2,900	4,700	2,600	2,800	7,000	3,700
pH	NG	NG	8.58	8.82	8.85	8.81	8.26	7.32	9.15

Notes:
- All units are in micrograms per gram (µg/g).

MOE (1) - Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional Property Use. Coarse textured soils.

MOE (2) - Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use. All soil textures.

NG - No guideline available

* - Due to poor sample recovery, the sample collected above and/ or below were provided to the laboratory as composite samples.

mbgs - Meters below grade surface

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table C-2 (cont.'d)

Area 2 - Soil Sample Analytical Results - Metals, Sulphur and pH

Parameter Description	Standards		Analytical Results (Sample ID / Depth - mbgs / Sampling Date)							
	MOE Table 7 [1]	MOE Table 9 [2]	544-BHMW24-SS1/2* 0.00 m - 0.80 m July 26, 2006	544-BH25-SS1/2* 0.30 m - 1.50 m July 26, 2006	544-BHMW22-SS2 0.61 m - 1.22 m July 25, 2006	544-BHMW17-SS6 3.05 m - 3.43 m July 27, 2006	544-BHMW20-SS1 0.00 m - 0.56 m July 27, 2006	544-BHMW21-SS1/2* 0.15 m - 0.79 m July 27, 2006	544-BHMW23-SS3/4 1.22 m - 2.44 m July 27, 2006	544-BHMW26-SS1/2* 0.10 m - 0.70 m July 27, 2006
Antimony	7.5	1.3	22	2	< 1	< 1	19	< 1	< 1	4
Arsenic	18	18	4	< 1	< 1	11	5	< 1	< 1	7
Barium	390	220	180	140	130	100	340	80	130	150
Beryllium	4	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5
Cadmium	1.2	1.2	1.0	0.5	< 0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5
Calcium	NG	NG	87,000	130,000	140,000	40,000	130,000	97,000	140,000	150,000
Chromium	160	70	40	45	25	25	30	10	25	20
Cobalt	22	22	5	5	5	< 5	10	< 5	5	10
Copper	140	92	190	140	30	15	440	< 5	30	40
Iron	NG	NG	25,000	14,000	15,000	11,000	20,000	5,000	15,000	21,000
Lead	120	120	250	98	65	160	620	110	65	160
Magnesium	NG	NG	6,600	7,200	7,400	2,400	6,400	4,800	7,400	4,800
Molybdenum	6.9	2	15	12	< 1	2	2	< 1	< 1	1
Nickel	100	82	35	35	20	10	20	10	20	20
Selenium	2.4	1.5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Silver	20	0.5	< 0.3	< 0.3	< 0.3	1.8	< 0.3	< 0.3	< 0.3	0.3
Sodium	NG	NG	1,000	1,000	200	< 200	< 200	< 200	200	< 200
Thallium	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tin	NG	NG	130	30	15	15	120	40	15	15
Vanadium	86	86	20	20	40	20	40	20	40	20
Zinc	340	290	260	120	80	60	200	20	80	80
Sulphur	NG	NG	11,000	3,200	3,000	3,700	1,500	3,300	3,000	3,100
pH	NG	NG	9.05	10.37	10.25	8.37	8.08	9.45	10.25	7.79

Notes:
- All units are in micrograms per gram (µg/g).

MOE [1] - Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional Property Use. Coarse textured soils.

MOE [2] - Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. Residential/ Parkland/ Institutional/ Industrial/ Commercial/ Community Property Use. All soil textures.

NG - No guideline available

* - Due to poor sample recovery, the sample collected above and/ or below were provided to the laboratory as composite samples.

mbgs - Meters below grade surface

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table C-3
Area 2 - Soil Sample Analytical Results-Petroleum Hydrocarbons (PHCs) and Volatile Organic Compounds (VOCs)

Parameter Description	Standards		Analytical Results (Sample ID / Depth - mbgs / Sampling Date)					
	MOE Table 7 [1]	MOE Table 9 [2]	544-BHMW16-SS10/11* 5.50 m - 6.50 m July 25, 2006	544-BHMW17-SS4/5* 1.83 m - 3.05 m July 25, 2006	544-BHMW18-SS7 4.26 m - 4.88 m July 25, 2006	544-BHMW22-SS2 0.61 m - 1.22 m July 25, 2006	544-BHMW16-SS6 3.05 m - 3.66 m July 26, 2006	544-BHMW18-SS10/11* 6.10 m - 6.73 m July 26, 2006
PHC F1 (C6-C10)	55	25	< 20	< 20	< 20	< 20	< 20	< 20
PHC F2 (C10-C16)	98	10	< 10	700	10	< 10	10	400
PHC F3 (C16-C34)	300	240	40	5,900	110	60	30	4,000
PHC F4 (C34-C50)	2800	120	30	500	10	20	30	500
Benzene	0.21	0.02	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Bromodichloromethane	13	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Bromoform	0.27	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Bromomethane	0.05	0.05	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Carbon Tetrachloride	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Chlorobenzene	2.4	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Chloroethane	NG	NG	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chloroform	0.05	0.05	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Chloromethane	NG	NG	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Dibromochloromethane	9.4	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
1,2-Dibromoethane	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
m-Dichlorobenzene	3.4	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
o-Dichlorobenzene	4.8	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
p-Dichlorobenzene	0.083	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
1,1-Dichloroethane	3.5	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
1,2-Dichloroethane	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
1,1-Dichloroethylene	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
c-1,2-Dichloroethylene	3.4	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
t-1,2-Dichloroethylene	0.084	0.05	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
1,2-Dichloropropane	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
c-1,3-Dichloropropene	0.05	0.05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
t-1,3-Dichloropropene			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	2	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	0.1	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Styrene	0.7	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
1,1,1,2-Tetrachloroethane	0.058	0.05	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
1,1,2,2-Tetrachloroethane	0.05	0.05	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Tetrachloroethylene	0.28	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Toluene	2.3	0.2	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.002
1,1,1-Trichloroethane	0.38	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
1,1,2-Trichloroethane	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Trichloroethylene	0.061	0.05	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Trichlorofluoromethane	4	0.25	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,3,5-Trimethylbenzene	NG	NG	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Vinyl Chloride	0.02	0.02	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
m/p-Xylene	3.1	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.004
o-Xylene			< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

Notes: All units are in micrograms per gram (µg/g).

MOE [1] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional Property Use. Coarse textured soils.

MOE [2] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use. All soil textures.

NG - No guideline available

. - Due to poor sample recovery, the sample collected above and/ or below were provided to the laboratory as composite samples.

mbgs - Meters below grade surface

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table C-3 (cont.'d)

Area 2 - Soil Sample Analytical Results-Petroleum Hydrocarbons (PHCs) and Volatile Organic Compounds (VOCs)

Parameter Description	Standards		Analytical Results (Sample ID / Depth - mbgs / Sampling Date)							
	MOE Table 7 (1)	MOE Table 9 (2)	544-BHMW19-SS3/4* 1.22 m - 2.08 m July 26, 2006	544-BHMW24-SS1/2* 0.00 m - 0.80 m July 26, 2006	544-BH25-SS1/2* 0.30 m - 1.50 m July 26, 2006	544-BHMW17-SS6 3.05 m - 3.43 m July 27, 2006	544-BHMW20-SS1 0.00 m - 0.56 m July 27, 2006	544-BHMW21-SS1/2* 0.15 m - 0.79 m July 27, 2006	544-BHMW23-SS3/4 1.22 m - 2.44 m July 27, 2006	544-BHMW26-SS1/2* 0.10 m - 0.70 m July 27, 2006
PHC F1 (C6-C10)	55	25	< 20	< 20	< 20	20	< 20	< 20	< 20	< 20
PHC F2 (C10-C16)	98	10	1,100	40	50	4,300	< 10	< 10	< 10	100
PHC F3 (C16-C34)	300	240	4,700	2,100	1,400	22,000	90	50	130	900
PHC F4 (C34-C50)	2800	120	220	2,700	500	500	20	70	50	2,200
Benzene	0.21	0.02	< 0.002	< 0.002	< 0.002	0.09	< 0.002	< 0.002	< 0.002	< 0.002
Bromodichloromethane	13	0.05	< 0.002	< 0.002	< 0.002	< 0.02	< 0.002	< 0.002	< 0.002	< 0.002
Bromoform	0.27	0.05	< 0.002	< 0.002	< 0.002	< 0.04	< 0.002	< 0.002	< 0.002	< 0.002
Bromomethane	0.05	0.05	< 0.003	< 0.003	< 0.003	< 0.05	< 0.003	< 0.003	< 0.003	< 0.003
Carbon Tetrachloride	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.03	< 0.002	< 0.002	< 0.002	< 0.002
Chlorobenzene	2.4	0.05	< 0.002	< 0.002	< 0.002	< 0.02	< 0.002	< 0.002	< 0.002	< 0.002
Chloroethane	NG	NG	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005	< 0.005	< 0.005
Chloroform	0.05	0.05	< 0.003	< 0.003	< 0.003	< 0.03	< 0.003	< 0.003	< 0.003	< 0.003
Chloromethane	NG	NG	< 0.02	< 0.02	< 0.02	< 0.2	< 0.02	< 0.02	< 0.02	< 0.02
Dibromochloromethane	9.4	0.05	< 0.002	< 0.002	< 0.002	< 0.02	< 0.002	< 0.002	< 0.002	< 0.002
1,2-Dibromoethane	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.01	< 0.002	< 0.002	< 0.002	< 0.002
m-Dichlorobenzene	3.4	0.05	< 0.002	< 0.002	< 0.002	< 0.02	< 0.002	< 0.002	< 0.002	< 0.002
o-Dichlorobenzene	4.8	0.05	< 0.002	< 0.002	< 0.002	< 0.02	< 0.002	< 0.002	< 0.002	< 0.002
p-Dichlorobenzene	0.083	0.05	< 0.002	< 0.002	< 0.002	< 0.02	< 0.002	< 0.002	< 0.002	< 0.002
1,1-Dichloroethane	3.5	0.05	< 0.002	< 0.002	< 0.002	< 0.03	< 0.002	< 0.002	< 0.002	< 0.002
1,2-Dichloroethane	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.02	< 0.002	< 0.002	< 0.002	< 0.002
1,1-Dichloroethylene	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.03	< 0.002	< 0.002	< 0.002	< 0.002
c-1,2-Dichloroethylene	3.4	0.05	< 0.002	< 0.002	< 0.002	< 0.02	< 0.002	< 0.002	< 0.002	< 0.002
t-1,2-Dichloroethylene	0.084	0.05	< 0.003	< 0.003	< 0.003	< 0.05	< 0.003	< 0.003	< 0.003	< 0.003
1,2-Dichloropropane	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.03	< 0.002	< 0.002	< 0.002	< 0.002
c-1,3-Dichloropropene	0.05	0.05	< 0.001	< 0.001	< 0.001	< 0.02	< 0.001	< 0.001	< 0.001	< 0.001
t-1,3-Dichloropropene			< 0.001	< 0.001	< 0.001	< 0.02	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	2	0.05	< 0.002	< 0.002	< 0.002	0.15	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	0.1	0.05	< 0.002	< 0.002	< 0.002	< 0.2	< 0.002	< 0.002	< 0.002	< 0.002
Styrene	0.7	0.05	< 0.002	< 0.002	< 0.002	< 0.02	< 0.002	< 0.002	< 0.002	< 0.002
1,1,1,2-Tetrachloroethane	0.058	0.05	< 0.003	< 0.003	< 0.003	< 0.03	< 0.003	< 0.003	< 0.003	< 0.003
1,1,2,2-Tetrachloroethane	0.05	0.05	< 0.003	< 0.003	< 0.003	< 0.03	< 0.003	< 0.003	< 0.003	< 0.003
Tetrachloroethylene	0.28	0.05	< 0.002	< 0.002	< 0.002	< 0.02	< 0.002	< 0.002	< 0.002	< 0.002
Toluene	2.3	0.2	0.004	< 0.002	< 0.002	0.25	< 0.002	< 0.002	< 0.002	< 0.002
1,1,1-Trichloroethane	0.38	0.05	< 0.002	< 0.002	< 0.002	< 0.02	< 0.002	< 0.002	< 0.002	< 0.002
1,1,2-Trichloroethane	0.05	0.05	< 0.002	< 0.002	< 0.002	< 0.03	< 0.002	< 0.002	< 0.002	< 0.002
Trichloroethylene	0.061	0.05	< 0.003	< 0.003	< 0.003	< 0.03	< 0.003	< 0.003	< 0.003	< 0.003
Trichlorofluoromethane	4	0.25	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005	< 0.005	< 0.005
1,3,5-Trimethylbenzene	NG	NG	< 0.003	< 0.003	< 0.003	< 0.03	< 0.003	< 0.003	< 0.003	< 0.003
Vinyl Chloride	0.02	0.02	< 0.002	< 0.002	< 0.002	< 0.03	< 0.002	< 0.002	< 0.002	< 0.002
m/p-Xylene	3.1	0.05	0.006	< 0.002	< 0.002	0.43	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene			0.004	< 0.002	< 0.002	0.30	< 0.002	< 0.002	< 0.002	< 0.002

Notes: All units are in micrograms per gram (µg/g).

MOE (1) Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional Property Use. Coarse textured soils.

MOE (2) Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use. All soil textures.

NG - No guideline available

* - Due to poor sample recovery, the sample collected above and/ or below were provided to the laboratory as composite samples.

mbgs - Meters below grade surface

Value - Laboratory Reportable Detection Limit exceeds applicable standard

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table C-4
Area 2 - Groundwater Sample Analytical Results - Polycyclic Aromatic Hydrocarbons (PAHs) and Polychlorinated Biphenyls (PCBs)

Parameter Description	Standards		Analytical Results (Sample ID / Sampling Date)					
	MOE Table 7[1]	MOE Table 9[2]	BHMW19-WGS1 August 1, 2006	544-BMWGS1 (Board Mill) August 2, 2006	544-BHMW16 August 2, 2006	544-WGSC (Blind Duplicate of 544-BHMW16) August 2, 2006	544-BHMW18 August 2, 2006	544-BHMW21 August 2, 2006
Acenaphthene	17	600	3.2	< 0.05	0.45	0.35	< 0.05	0.20
Acenaphthylene	1	1.4	0.70	< 0.05	0.40	0.25	< 0.05	< 0.05
Anthracene	1	1	6.7	< 0.01	1.1	0.54	< 0.01	< 0.01
Benzo[a]anthracene	1.8	1.8	7.5	< 0.01	1.1	0.57	< 0.01	< 0.01
Benzo[a]pyrene	0.81	0.81	6.1	< 0.01	1.1	0.55	< 0.01	< 0.01
Benzo[b]fluoranthene	0.75	0.75	7.0	< 0.05	1.9	1.0	< 0.05	< 0.05
Benzo[ghi]perylene	0.2	0.2	3.1	< 0.05	0.85	0.45	< 0.05	< 0.05
Benzo[k]fluoranthene	0.4	0.4	3.6	< 0.05	1.1	0.50	< 0.05	< 0.05
Biphenyl	1000	1700	0.50	< 0.05	0.10	0.05	0.10	0.15
Chrysene	0.7	0.7	6.9	< 0.05	1.3	0.70	< 0.05	< 0.05
Dibenzo[a,h]anthracene	0.4	0.4	1.1	< 0.05	0.20	< 0.05	< 0.05	< 0.05
Fluoranthene	44	73	22	< 0.01	2.8	1.7	0.06	< 0.01
Fluorene	290	290	4.7	< 0.05	0.75	0.50	< 0.05	< 0.05
Indeno[1,2,3-cd]pyrene	0.2	0.2	2.8	< 0.05	0.65	0.35	< 0.05	< 0.05
1-Methylnaphthalene	1500	1500	2.0	< 0.05	0.20	0.15	0.30	< 0.05
2-Methylnaphthalene			2.4	< 0.05	0.25	0.15	0.40	< 0.05
Naphthalene	7	1400	15	< 0.05	0.30	0.20	0.60	0.50
Phenanthrene	380	380	26	< 0.05	2.5	1.5	0.20	< 0.05
Pyrene	5.7	5.7	15	< 0.01	2.1	1.3	< 0.01	< 0.01
Total PCBs	0.2	0.2	< 0.05	0.3	0.25	< 0.05	NA	NA

Notes: All units are in micrograms per litre (µg/L).

MOE [1] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. All Types of Property Use. Coarse textured soils.

MOE [2] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All soil textures.

NG - No guideline available
NA - Parameter not analyzed
Value - Sample result exceeds applicable MOE Table 7 standard.
Value - Sample result exceeds applicable MOE Table 9 standard.

Table C-4 (cont.'d)
Area 2 - Groundwater Sample Analytical Results - Polycyclic Aromatic Hydrocarbons (PAHs) and Polychlorinated Biphenyls (PCBs)

Parameter Description	Standards		Analytical Results (Sample ID / Sampling Date)						
	MOE Table 7 [1]	MOE Table 9 [2]	544-BHMW22 August 2, 2006	544-BHMW23 August 2, 2006	544-BHMW24 August 2, 2006	544-BHMW20 August 3, 2006	544-BHMW21 August 3, 2006	GWM-WGS1 (Groundwood Mill) Sept. 1, 2006	BHMW-17 WGS1 September 1, 2006
Acenaphthene	17	600	< 0.05	0.15	< 0.05	0.2	0.20	< 0.05	0.30
Acenaphthylene	1	1.4	< 0.05	< 0.05	< 0.05	0.15	< 0.05	< 0.05	< 0.08
Anthracene	1	1	< 0.01	0.17	< 0.01	0.22	< 0.01	< 0.01	0.51
Benzo[a]anthracene	1.8	1.8	< 0.01	0.38	0.17	0.45	< 0.01	< 0.01	0.27
Benzo[a]pyrene	0.81	0.81	< 0.01	0.31	0.11	0.48	< 0.01	< 0.01	0.18
Benzo[b]fluoranthene	0.75	0.75	< 0.05	0.5	0.25	0.75	< 0.05	< 0.05	0.23
Benzo[ghi]perylene	0.2	0.2	< 0.05	0.2	0.1	0.35	< 0.05	< 0.05	0.08
Benzo[k]fluoranthene	0.4	0.4	< 0.05	0.25	0.1	0.45	< 0.05	< 0.05	0.15
Biphenyl	1000	1700	< 0.05	< 0.05	< 0.05	< 0.05	0.10	< 0.05	< 0.08
Chrysene	0.7	0.7	< 0.05	0.35	0.25	0.5	< 0.05	< 0.05	0.23
Dibenzo[a,h]anthracene	0.4	0.4	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.08
Fluoranthene	44	73	< 0.01	0.66	0.49	0.57	< 0.01	< 0.01	1.3
Fluorene	290	290	< 0.05	0.15	< 0.05	< 0.05	< 0.05	< 0.05	0.38
Indeno[1,2,3-cd]pyrene	0.2	0.2	< 0.05	0.15	0.05	0.3	< 0.05	< 0.05	< 0.08
1-Methylnaphthalene	1500	1500	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.15
2-Methylnaphthalene			< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.15
Naphthalene	7	1400	< 0.05	0.1	< 0.05	0.1	0.25	< 0.05	1.1
Phenanthrene	380	380	< 0.05	0.9	< 0.05	0.45	< 0.05	< 0.05	2.2
Pyrene	5.7	5.7	< 0.01	0.5	0.45	0.47	< 0.01	< 0.01	0.92
Total PCBs	0.2	0.2	< 0.05	<0.05	0.25	<1	< 5	< 0.05	NA

Notes: All units are in micrograms per litre (µg/L).

MOE [1] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. All Types of Property Use. Coarse textured soils.

MOE [2] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All soil textures.

NG - No guideline available
NA - Parameter not analyzed
Value - Laboratory Reportable Detection Limit exceeds applicable standard.
Value - Sample result exceeds applicable MOE Table 7 standard.
Value - Sample result exceeds applicable MOE Table 9 standard.

Table C-5
Area 2 - Groundwater Sample Analytical Results - Metals, pH and Hardness

Parameter Description	Standards		Analytical Results (Sample ID / Sampling Date)						
	MOE Table 7 [1]	MOE Table 9 [2]	BHMW19-WGS1 August 1, 2006	544-BMWGS1 (Board Mill) August 2, 2006	544-BHMW16 August 2, 2006	544-WGSC (Blind Duplicate of BHMW16) August 2, 2006	544-BHMW18 August 2, 2006	544-BHMW21 August 2, 2006	544-BHMW22 August 2, 2006
Aluminum	NG	NG	0.04	< 0.001	0.23	0.26	0.29	0.020	< 0.001
Antimony	16	16	0.001	0.001	0.005	0.005	0.002	0.004	0.004
Arsenic	1.5	1.5	< 0.01	< 0.001	< 0.01	< 0.01	0.009	< 0.001	< 0.001
Barium	23	23	0.17	0.010	0.24	0.25	0.11	0.075	0.085
Beryllium	0.053	0.053	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.0005	< 0.0005	0.0010
Boron	36	36	0.15	< 0.1	0.10	0.10	0.2	0.2	< 0.1
Cadmium	0.0021	0.0021	< 0.001	0.0012	< 0.001	< 0.001	< 0.0001	0.0008	0.0004
Calcium	NG	NG	260	3.7	54	55	210	110	25
Chromium	0.64	0.64	< 0.05	0.015	< 0.05	< 0.05	0.019	0.012	0.016
Cobalt	0.052	0.052	< 0.005	0.0010	0.010	< 0.005	0.022	0.0090	0.0050
Copper	0.069	0.069	< 0.001	0.016	0.035	0.030	0.017	< 0.0005	0.046
Iron	NG	NG	0.4	2.3	< 0.2	< 0.2	< 0.1	< 0.1	0.5
Lead	0.02	0.02	< 0.001	0.030	0.002	0.004	0.0012	0.0014	0.0044
Magnesium	NG	NG	56	0.8	12	12	45	11	4.0
Manganese	NG	NG	0.20	0.035	0.20	0.20	0.12	0.085	0.040
Molybdenum	7.3	7.3	0.010	0.001	0.015	0.015	0.012	0.050	0.028
Nickel	0.39	0.39	0.010	0.003	< 0.005	< 0.005	0.020	0.014	0.007
Potassium	NG	NG	19	23	10	10	12	29	9.0
Selenium	0.05	0.05	< 0.005	< 0.001	< 0.005	< 0.005	0.028	0.014	< 0.001
Silver	0.0012	0.0012	< 0.001	< 0.0001	< 0.001	< 0.001	< 0.0001	< 0.0001	< 0.0001
Sodium	1800	1800	930	49	1,400	1,400	280	230	240
Strontium	NG	NG	NA	0.05	NA	NA	9.5	4.6	1.1
Thallium	0.4	0.4	< 0.001	0.0002	< 0.001	< 0.001	< 0.0001	0.0006	0.0002
Tin	NG	NG	< 0.01	< 0.005	< 0.01	< 0.01	0.015	0.005	< 0.005
Titanium	NG	NG	NA	< 0.005	NA	NA	0.010	0.005	0.010
Tungsten	NG	NG	NA	< 0.01	NA	NA	< 0.01	< 0.01	0.08
Uranium	0.33	0.33	NA	< 0.005	NA	NA	0.010	0.010	0.010
Vanadium	0.2	0.2	< 0.01	0.009	< 0.01	< 0.01	< 0.001	< 0.001	< 0.001
Zinc	0.89	0.89	< 0.02	0.10	< 0.02	< 0.02	0.02	0.03	0.01
Total Sulphur	NG	NG	120	16	64	64	130	180	37
Hardness, CaCO3	NG	NG	890	13	190	190	710	320	79
pH	NG	NG	7.88	8.07	7.38	7.38	7.25	7.33	8.16

Notes: All units are in milligrams per litre (mg/L)

MOE [1] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. All Types of Property Use. Coarse textured soils.

MOE [2] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All soil textures.

NG - No guideline available

NA - Parameter not analyzed

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table C-5 (cont.'d)
Area 2 - Groundwater Sample Analytical Results - Metals, pH and Hardness

Parameter Description	Standards		Analytical Results (Sample ID / Sampling Date)					
	MOE Table 7 (1)	MOE Table 9 (2)	544-BHMW23 August 2, 2006	544-BHMW20 August 3, 2006	544-BHMW21 August 3, 2006	GWM-WGS1 (Groundwood Mill) Sept. 1, 2006	BHMW-17 WGS1 September 1, 2006	BHMW-26 September 1, 2006
Aluminum	NG	NG	< 0.001	2.2	0.026	0.035	0.003	NA
Antimony	16	16	0.002	0.018	0.003	< 0.001	0.001	NA
Arsenic	1.5	1.5	< 0.001	0.006	< 0.001	0.004	0.002	NA
Barium	23	23	0.035	0.055	0.075	0.020	0.085	NA
Beryllium	0.053	0.053	0.0015	< 0.0005	< 0.0005	< 0.0005	< 0.0005	NA
Boron	36	36	< 0.1	0.3	0.5	< 0.1	0.2	NA
Cadmium	0.0021	0.0021	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0001	NA
Calcium	NG	NG	31	20	110	31	550	NA
Chromium	0.64	0.64	0.01	0.002	0.002	0.002	0.008	NA
Cobalt	0.052	0.052	0.028	0.025	0.023	< 0.0005	0.0015	NA
Copper	0.069	0.069	< 0.0005	0.036	0.0065	0.0025	0.0020	NA
Iron	NG	NG	0.5	0.3	< 0.1	0.1	< 0.1	NA
Lead	0.02	0.02	0.0013	0.0039	0.0002	0.0002	0.0001	NA
Magnesium	NG	NG	3.4	4.2	12	3.6	31	NA
Manganese	NG	NG	0.1	0.055	0.10	0.005	0.015	NA
Molybdenum	7.3	7.3	0.006	0.049	0.048	0.003	0.010	NA
Nickel	0.39	0.39	0.007	0.013	0.013	0.002	0.012	NA
Potassium	NG	NG	5.2	17	23	4.1	32	NA
Selenium	0.05	0.05	< 0.001	0.017	< 0.001	0.004	0.003	NA
Silver	0.0012	0.0012	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	NA
Sodium	1800	1800	13	300	220	79	150	NA
Strontium	NG	NG	0.26	0.36	4.5	NA	NA	NA
Thallium	0.4	0.4	0.0002	0.0003	0.0003	0.0001	0.0001	NA
Tin	NG	NG	< 0.005	< 0.005	< 0.005	< 0.005	0.010	NA
Titanium	NG	NG	< 0.005	< 0.005	< 0.005	NA	NA	NA
Tungsten	NG	NG	< 0.01	< 0.01	< 0.01	NA	NA	NA
Uranium	0.33	0.33	< 0.005	0.02	0.010	NA	NA	NA
Vanadium	0.2	0.2	< 0.001	< 0.001	< 0.001	< 0.001	0.003	NA
Zinc	0.89	0.89	0.01	0.01	0.03	0.02	< 0.01	NA
Total Sulphur	NG	NG	14	97	140	12	330	190
Hardness, CaCO3	NG	NG	90	66	330	100	1,600	290
pH	NG	NG	7.3	7.81	7.36	7.70	8.08	7.85

Notes: All units are in milligrams per litre (mg/L)

MOE (1) Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. All Types of Property Use. Coarse textured soils.

MOE (2) Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All soil textures.

NG - No guideline available

NA - Parameter not analyzed

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table C-6

Area 2 - Groundwater Sample Analytical Results - Volatile Organic Compounds (VOCs) and Petroleum Hydrocarbons (PHCs)

Parameter Description	Standards		Analytical Results (Sample ID / Sampling Date)						
	MOE Table 7 [1]	MOE Table 9 [2]	544-BHMW19 August 1, 2006	544-BMWGS1 (Board Mill) August 2, 2006	544-BHMW16 August 2, 2006	544-WGSC Blind Duplicate of 544-BHMW16 August 2, 2006	544-BHMW18 August 2, 2006	544-BHMW21 August 2, 2006	544-BHMW22 August 2, 2006
F1 PHCs (C6-C10)	0.42	0.42	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
F2 PHCs (C10-C16)	0.15	0.15	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
F3 PHCs (C16-C34)	0.5	0.5	< 0.1	< 0.1	0.2	0.9	0.7	3.3	< 0.1
F4 PHCs (C34-C50)	0.5	0.5	< 0.1	< 0.1	0.2	0.2	< 0.1	0.2	< 0.1
Benzene	0.0005	0.044	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0010	< 0.0005	< 0.0005
Bromodichloromethane	67	67	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Bromoform	0.005	0.38	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Bromomethane	0.00089	0.0056	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
Carbon Tetrachloride	0.0002	0.00079	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Chlorobenzene	0.14	0.5	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Chloroethane	NG	NG	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Chloroform	0.002	0.0024	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Chloromethane	NG	NG	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Dibromochloromethane	65	65	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,2-Dibromoethane	0.0002	0.00025	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
m-Dichlorobenzene	0.15	4.6	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
o-Dichlorobenzene	7.6	7.6	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
p-Dichlorobenzene	0.0005	0.008	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
1,1-Dichloroethane	0.011	0.32	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,2-Dichloroethane	0.0005	0.0016	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,1-Dichloroethylene	0.0005	0.0016	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
c-1,2-Dichloroethylene	0.0016	0.0016	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
t-1,2-Dichloroethylene	0.0016	0.0016	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1,2-Dichloropropane	0.00058	0.016	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
c-1,3-Dichloropropene	0.0005	0.0052	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
t-1,3-Dichloropropene			< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Ethylbenzene	0.054	1.8	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005	< 0.0005	< 0.0005
Methylene Chloride	0.026	0.61	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004
Styrene	0.043	1.3	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
1,1,1,2-Tetrachloroethane	0.0011	0.0033	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,1,2,2-Tetrachloroethane	0.0005	0.0032	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Tetrachloroethylene	0.0005	0.0016	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Toluene	0.32	14	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0025	< 0.0005	< 0.0005
1,1,1-Trichloroethane	0.023	0.64	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
1,1,2-Trichloroethane	0.0005	0.0047	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Trichloroethylene	0.0005	0.0016	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Trichlorofluoromethane	2	2	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1,3,5-Trimethylbenzene	NG	NG	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Vinyl Chloride	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
m/p-Xylene	0.072	3.3	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
o-Xylene			< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005

Notes: All units are in milligrams per litre (mg/L)

MOE [1] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. All Types of Property Use. Coarse textured soils.

MOE [2] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All soil textures.

NG - No guideline available

Value - Laboratory method detection limit exceeds applicable standards

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table C-6 (cont.'d)

Area 2 - Groundwater Sample Analytical Results - Volatile Organic Compounds (VOCs) and Petroleum Hydrocarbons (PHCs)

Parameter Description	Standards		Analytical Results (Sample ID / Sampling Date)						
	MOE Table 7 [1]	MOE Table 9 [2]	544-BHMW23 August 2, 2006	544-BHMW24 August 2, 2006	544-BHMW26 August 2, 2006	544-BHMW20 August 3, 2006	544-BHMW21 August 3, 2006	GWM-WGS1 (Groundwood Mill) Sept. 1, 2006	BHMW-17 WGS1 September 1, 2006
F1 PHCs (C6-C10)	0.42	0.42	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
F2 PHCs (C10-C16)	0.15	0.15	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
F3 PHCs (C16-C34)	0.5	0.5	< 0.1	6.3	18	< 0.1	2.7	< 0.1	< 0.1
F4 PHCs (C34-C50)	0.5	0.5	< 0.1	7.9	1.2	< 0.1	0.2	< 0.1	< 0.1
Benzene	0.0005	0.044	< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Bromodichloromethane	67	67	< 0.0004	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Bromoform	0.005	0.38	< 0.0008	< 0.0008	NA	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Bromomethane	0.00089	0.0056	< 0.0007	< 0.0007	NA	< 0.0007	< 0.0007	< 0.0007	< 0.0007
Carbon Tetrachloride	0.0002	0.00079	< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Chlorobenzene	0.14	0.5	< 0.0004	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Chloroethane	NG	NG	< 0.001	< 0.001	NA	< 0.001	< 0.001	< 0.001	< 0.001
Chloroform	0.002	0.0024	< 0.0006	< 0.0006	NA	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Chloromethane	NG	NG	< 0.003	< 0.003	NA	< 0.003	< 0.003	< 0.003	< 0.003
Dibromochloromethane	65	65	< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,2-Dibromoethane	0.0002	0.00025	< 0.001	< 0.001	NA	< 0.001	< 0.001	< 0.001	< 0.001
m-Dichlorobenzene	0.15	4.6	< 0.0004	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
o-Dichlorobenzene	7.6	7.6	< 0.0004	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
p-Dichlorobenzene	0.0005	0.008	< 0.0004	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
1,1-Dichloroethane	0.011	0.32	< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,2-Dichloroethane	0.0005	0.0016	< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,1-Dichloroethylene	0.0005	0.0016	< 0.0006	< 0.0006	NA	< 0.0006	< 0.0006	< 0.0006	< 0.0006
c-1,2-Dichloroethylene	0.0016	0.0016	< 0.0004	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
t-1,2-Dichloroethylene	0.0016	0.0016	< 0.001	< 0.001	NA	< 0.001	< 0.001	< 0.001	< 0.001
1,2-Dichloropropane	0.00058	0.016	< 0.0007	< 0.0007	NA	< 0.0007	< 0.0007	< 0.0007	< 0.0007
c-1,3-Dichloropropene	0.0005	0.0052	< 0.0004	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
t-1,3-Dichloropropene			< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Ethylbenzene	0.054	1.8	< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Methylene Chloride	0.026	0.61	< 0.004	< 0.004	NA	< 0.004	< 0.004	< 0.004	< 0.004
Styrene	0.043	1.3	< 0.0004	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
1,1,1,2-Tetrachloroethane	0.0011	0.0033	< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,1,2,2-Tetrachloroethane	0.0005	0.0032	< 0.0006	< 0.0006	NA	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Tetrachloroethylene	0.0005	0.0016	< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Toluene	0.32	14	< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,1,1-Trichloroethane	0.023	0.64	< 0.0004	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
1,1,2-Trichloroethane	0.0005	0.0047	< 0.0006	< 0.0006	NA	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Trichloroethylene	0.0005	0.0016	< 0.0004	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Trichlorofluoromethane	2	2	< 0.001	< 0.001	NA	< 0.001	< 0.001	< 0.001	< 0.001
1,3,5-Trimethylbenzene	NG	NG	< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Vinyl Chloride	0.0005	0.0005	< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
m/p-Xylene	0.072	3.3	< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
o-Xylene			< 0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005

Notes: All units are in milligrams per litre (mg/L)

MOE [1] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. All Types of Property Use. Coarse textured soils.

MOE [2] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All soil textures.

NG - No guideline available

NA - Parameter not analyzed

Value - Laboratory method detection limit exceeds applicable standards

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

APPENDIX D

Summary Tables of Comparison of Historical Analytical Data to Updated Standards – Area 3

Table D-4

Area 3 - Groundwater Sample Analytical Results - Polycyclic Aromatic Hydrocarbons (PAHs) and Polychlorinated Biphenyls (PCBs)

Parameter Description	Standards		Analytical Results (Sample ID / Sampling Date)					
	MOE Table 7[1]	MOE Table 9[2]	544-BHMW14 August 1, 2006	544-BHMWA Blind Duplicate of 544-BHMW14 August 1, 2006	544-BHMW32 August 1, 2006	544-BHMW5 August 2, 2006	544-BHMW6 August 2, 2006	544-BHMW13 August 2, 2006
Acenaphthene	17	600	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	1	1.4	< 0.05	< 0.05	< 0.05	< 0.05	0.10	< 0.05
Anthracene	1	1	< 0.01	< 0.01	< 0.01	< 0.01	0.14	< 0.01
Benzo[a]anthracene	1.8	1.8	< 0.01	< 0.01	< 0.01	< 0.01	0.27	< 0.01
Benzo[a]pyrene	0.81	0.81	< 0.01	< 0.01	< 0.01	< 0.01	0.28	< 0.01
Benzo[b]fluoranthene	0.75	0.75	< 0.05	< 0.05	< 0.05	< 0.05	0.45	< 0.05
Benzo[ghi]perylene	0.2	0.2	< 0.05	< 0.05	< 0.05	< 0.05	0.20	< 0.05
Benzo[k]fluoranthene	0.4	0.4	< 0.05	< 0.05	< 0.05	< 0.05	0.20	< 0.05
Biphenyl	1000	1700	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	0.7	0.7	< 0.05	< 0.05	< 0.05	< 0.05	0.30	< 0.05
Dibenzo[a,h]anthracene	0.4	0.4	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	44	73	< 0.01	< 0.01	< 0.01	< 0.01	0.46	< 0.01
Fluorene	290	290	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno[1,2,3-cd]pyrene	0.2	0.2	< 0.05	< 0.05	< 0.05	< 0.05	0.15	< 0.05
1-Methylnaphthalene	1500	1500	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	7	1400	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	380	380	< 0.05	< 0.05	< 0.05	< 0.05	0.25	< 0.05
Pyrene	5.7	5.7	< 0.01	< 0.01	< 0.01	< 0.01	0.42	< 0.01
Total PCBs	0.2	0.2	< 0.05	NA	< 0.05	**1.4**	< 0.05	< 0.05

Notes: All units are in micrograms per litre (µg/L).

MOE [1] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition. All Types of Property Use. Coarse textured soils.

MOE [2] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All soil textures.

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table D-5

Area 3 - Groundwater Sample Analytical Results - Metals, pH and Hardness

Parameter Description	Standards		Analytical Results (Sample ID / Sampling Date)					
	MOE Table 7 [1]	MOE Table 9 [2]	BHMW14-WGS1 August 1, 2006	544-BHMWA Blind Duplicate of 544-BHMW14 August 1, 2006	544-BHMW32 August 1, 2006	544-BHMW5 August 2, 2006	544-BHMW6 August 2, 2006	544-BHMW13 August 2, 2006
Aluminum	NG	NG	0.05	< 0.001	0.04	0.079	0.81	0.38
Antimony	16	16	0.003	< 0.001	0.001	0.001	< 0.001	0.005
Arsenic	1.5	1.5	< 0.01	< 0.001	< 0.01	< 0.001	< 0.001	< 0.01
Barium	23	23	0.68	< 0.005	0.32	0.24	0.025	0.15
Beryllium	0.053	0.053	< 0.001	< 0.0005	< 0.001	< 0.0005	< 0.0005	< 0.001
Boron	36	36	0.15	< 0.1	0.15	0.2	< 0.1	0.35
Cadmium	0.0021	0.0021	< 0.001	< 0.0001	< 0.001	< 0.0001	< 0.0001	< 0.001
Calcium	NG	NG	640	0.2	900	150	9.3	170
Chromium	0.64	0.64	< 0.05	0.001	< 0.05	0.021	0.005	0.05
Cobalt	0.052	0.052	0.015	< 0.0005	0.015	0.019	0.016	0.030
Copper	0.069	0.069	0.008	< 0.0005	**0.10**	0.0090	0.0085	0.046
Iron	NG	NG	2.0	< 0.1	24	< 0.1	0.3	< 0.2
Lead	0.02	0.02	0.002	< 0.0001	< 0.001	< 0.0001	0.0043	0.001
Magnesium	NG	NG	140	< 0.2	190	29	2.0	16
Manganese	NG	NG	0.40	< 0.005	0.95	0.10	0.035	0.45
Molybdenum	7.3	7.3	0.010	< 0.001	< 0.005	0.019	< 0.001	0.015
Nickel	0.39	0.39	0.040	< 0.001	0.030	0.014	0.003	0.020
Potassium	NG	NG	30	< 0.1	28	14	0.6	20
Selenium	0.05	0.05	< 0.005	< 0.001	< 0.005	0.005	< 0.001	< 0.005
Silver	0.0012	0.0012	< 0.001	< 0.0001	< 0.001	< 0.0001	< 0.0001	< 0.001
Sodium	1800	1800	**3,900**	< 0.2	**2,400**	350	3.2	1,600
Strontium	NG	NG	NA	< 0.01	NA	9.4	0.06	NA
Thallium	0.4	0.4	< 0.001	< 0.0001	< 0.001	< 0.0001	0.0001	< 0.001
Tin	NG	NG	< 0.01	< 0.005	< 0.01	< 0.005	< 0.005	< 0.01
Titanium	NG	NG	NA	< 0.005	NA	< 0.005	0.015	NA
Tungsten	NG	NG	NA	< 0.01	NA	< 0.01	< 0.01	NA
Uranium	0.33	0.33	NA	< 0.005	NA	0.010	< 0.005	NA
Vanadium	0.2	0.2	< 0.01	< 0.001	< 0.01	< 0.001	0.005	< 0.01
Zinc	0.89	0.89	< 0.02	< 0.01	0.02	< 0.01	< 0.01	0.02
Total Sulphur	NG	NG	150	NA	260	56	2.4	200
Hardness, CaCO3	NG	NG	2,200	NA	3,000	500	31	500
pH	NG	NG	6.75	NA	6.35	7.16	8.43	6.81

Notes: All units are in milligrams per litre (mg/L)

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MOE [2] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All soil textures.

NG - No guideline available

NA - Parameter not analyzed

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

Table D-6

Area 3 - Groundwater Sample Analytical Results - Volatile Organic Compounds (VOCs) and Petroleum Hydrocarbons (PHCs)

Parameter Description	Standards		Analytical Results (Sample ID / Sampling Date)					
	MOE Table 7 [1]	MOE Table 9 [2]	544-BHMW14 August 1, 2006	544-BHMWA Blind Duplicate of 544-BHMW14 August 1, 2006	544-BHMW32 August 1, 2006	544-BHMW5 August 2, 2006	544-BHMW6 August 2, 2006	544-BHMW13 August 2, 2006
F1 PHCs (C6-C10)	0.42	0.42	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
F2 PHCs (C10-C16)	0.15	0.15	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
F3 PHCs (C16-C34)	0.5	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
F4 PHCs (C34-C50)	0.5	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzene	0.0005	0.044	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Bromodichloromethane	67	67	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Bromoform	0.005	0.38	< 0.0008	NA	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Bromomethane	0.00089	0.0056	< 0.0007	NA	< 0.0007	< 0.0007	< 0.0007	< 0.0007
Carbon Tetrachloride	0.0002	0.00079	*< 0.0005*	NA	*< 0.0005*	*< 0.0005*	*< 0.0005*	*< 0.0005*
Chlorobenzene	0.14	0.5	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Chloroethane	NG	NG	< 0.001	NA	< 0.001	< 0.001	< 0.001	< 0.001
Chloroform	0.002	0.0024	< 0.0006	NA	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Chloromethane	NG	NG	< 0.003	NA	< 0.003	< 0.003	< 0.003	< 0.003
Dibromochloromethane	65	65	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,2-Dibromoethane	0.0002	0.00025	*< 0.001*	NA	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*
m-Dichlorobenzene	0.15	4.6	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
o-Dichlorobenzene	7.6	7.6	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
p-Dichlorobenzene	0.0005	0.008	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
1,1-Dichloroethane	0.011	0.32	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,2-Dichloroethane	0.0005	0.0016	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,1-Dichloroethylene	0.0005	0.0016	*< 0.0006*	NA	*< 0.0006*	*< 0.0006*	*< 0.0006*	*< 0.0006*
c-1,2-Dichloroethylene	0.0016	0.0016	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
t-1,2-Dichloroethylene	0.0016	0.0016	< 0.001	NA	< 0.001	< 0.001	< 0.001	< 0.001
1,2-Dichloropropane	0.00058	0.016	*< 0.0007*	NA	*< 0.0007*	*< 0.0007*	*< 0.0007*	*< 0.0007*
c-1,3-Dichloropropene	0.0005	0.0052	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
t-1,3-Dichloropropene			< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Ethylbenzene	0.054	1.8	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Methylene Chloride	0.026	0.61	< 0.004	NA	< 0.004	< 0.004	< 0.004	< 0.004
Styrene	0.043	1.3	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
1,1,1,2-Tetrachloroethane	0.0011	0.0033	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,1,2,2-Tetrachloroethane	0.0005	0.0032	*< 0.0006*	NA	*< 0.0006*	*< 0.0006*	*< 0.0006*	*< 0.0006*
Tetrachloroethylene	0.0005	0.0016	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Toluene	0.32	14	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,1,1-Trichloroethane	0.023	0.64	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
1,1,2-Trichloroethane	0.0005	0.0047	*< 0.0006*	NA	*< 0.0006*	*< 0.0006*	*< 0.0006*	*< 0.0006*
Trichloroethylene	0.0005	0.0016	< 0.0004	NA	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Trichlorofluoromethane	2	2	< 0.001	NA	< 0.001	< 0.001	< 0.001	< 0.001
1,3,5-Trimethylbenzene	NG	NG	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Vinyl Chloride	0.0005	0.0005	< 0.0005	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
m/p-Xylene	0.072	3.3	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
o-Xylene			< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005

Notes: All units are in milligrams per litre (mg/L)

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MOE [2] Ontario Ministry of the Environment, "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 2011. Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition. All Types of Property Use. All soil textures.

Value - Laboratory method detection limit exceeds applicable guidelines/standards

Value - Sample result exceeds applicable MOE Table 7 standard.

Value - Sample result exceeds applicable MOE Table 9 standard.

APPENDIX E

Conceptual Site Model

Phase II Conceptual Site Model

Domtar Lands Redevelopment – Chaudière and Albert Islands, Ottawa, Ontario

The Phase II ESA property is located at 3, 4, and 6 Booth Street, Ottawa, Ontario (the Site). The legal descriptions of the Site are provided in Table 1 below. The Site is approximately 7.6 hectares in size, with Chaudière Island covering approximately 6 hectares and Albert Island covering approximately 0.4 hectares. The Site has historically been used for industrial and manufacturing purposes since the late 1800's, including pulp and paper production facilities, sawmills, grist (flour) mills, furniture manufacturing and hydroelectric power generation. The Site was most recently used as an industrial complex for the production of pulp and paper products from dried pulp, with production ceasing in March 2006. The Site is currently zoned for industrial use, and the Site is currently vacant. For the purpose of the Phase Two ESA Update, the Site was divided into three (3) areas as illustrated on Figure 2 in Appendix A. Area 1 encompasses Albert Island in its entirety. Area 2 covers the entire land area of Chaudière Island east of Booth Street, including the Hydro Lease area. Area 3 encompasses Chaudière Island land parcel west of Booth Street.

Based on the Phase II ESA results, DST has prepared a Conceptual Site Model (CSM).

Table 1: Summary of Legal Descriptions and Property Identification Numbers (PINs) of the Site

PIN	Legal Description
04097-0214(LT)	Parcel Water Lot-17, Section Ottawa River A; Part of the Bed of the Ottawa River lying in front of Lot 40, Concession A, Broken Front, formerly in the Township of Nepean, City of Ottawa, being also parts of Water Lot Location CL4467, designated as Parts 4 and 36 on Reference Plan 4R-26534.
04097-0216(LT)	Lots 12, 13, 14, 15, 16, and 17, Plan 10, except part of Lot 18 as in Instrument CR259644 on the south side of Head Street; Part of Head Street, lying west of Booth Street as in Instrument No. CR416955; Lots 1, 2, 3, 4, 5, and 6, Plan 10, north side of Head Street; Lots 22, 23 and 24 and Part of Lots 19, 20 and 21, Plan 10, south side of Chaudière Street; Part of Lot 40, Concession A, Ottawa Front, shown as Union Square on Plan 10, as in Instrument CR259644, designated as parts 7 and 37 on Reference Plan 4R-26534, save and except Parts 10, 11 and 13 on Reference Plan 4R-26574, in the City of Ottawa.
04097-0090(LT)	Part of Albert Island, Plan 10, as in Instrument No. NS120593; Lots 1, 2, 3, 4 and 5, Plan 10, Albert Island, City of Ottawa.

PIN	Legal Description
04097-0087(LT)	Parcel Water Lot-17, Section Ottawa River A, Part of the Bed of the Ottawa River lying in front of Lot 40, Concession A, Broken Front, Ottawa River, formerly in the Township of Nepean, City of Ottawa, being also part of Water Lot CL4467, designated as Part 3 on Reference Plan 4R-5277.
04280-0138(LT)	Part of Lot 40, Concession A, Ottawa Front, shown as Union Square, Plan 10 as in Instrument No. CR259644 (Secondly); Lots 7, 8, 9, 10, 11, north side of Head Street, Plan 10; Part of Chaudière Street, Plan 10, lying east of Booth Street as closed by By-Law registered as Instrument No. CR410131, as in Instrument No. CR416955; Part of Head Street, Plan 10, lying east of Booth Street, closed by By-law registered as Instrument No. CR410131, as in Instrument No. CR416955, except part of Lot 9 and Lots 10, 11, north side of Head Street, Plan 10, designated as Part 9 on Reference Plan 5R-8158, City of Ottawa.
04280-0040(LT) **04280-0041(LT)** **04280-0042(LT)**	Parcel Water Lot-17, Section Ottawa River A, Part of the Bed of the Ottawa River in front of Lot 40, Concession A, Broken Front, City of Ottawa, designated as Parts 4, 5 and 9 on Reference Plan 4R-5277.
04280-0067(LT)	Part of Booth Street, Plan 10, as in Instrument No. CR259644, City of Ottawa.
Part of PIN 04097-0212(LT)	Part of Chaudière Island, Plan 10, lying west of Chaudière Street and Head Street, lying south of Lots 12, 13 and 14 on the south side of Head Street, Plan 10, City of Ottawa.
04280-0144(LT)	Lots H, I and J, Plan 10, south side of Head Street, City of Ottawa.
04280-0007(LT)	Part of Lot 40, Concession A, Ottawa Front, designated as Part 7 on Plan 4R-10322 (shown as Bridge Reserve, Plan 10), City of Ottawa.
04280-139(LT)	Part of Lot 9, Lots 10 and 11, Plan 10, designated as Part 9 on Plan 5R-8158, City of Ottawa.
04280-0043(LT)	Parcel Water Lot 12, Section of Ottawa River A; Part of the bed of the Ottawa River adjacent to Chaudière Island and Alberta Island in front of Lot 40, Concession A Broken Front, designated as Parts 6, 7 and 8 on Plan 4R-5277, City of Ottawa.
	Unpatented land designated as Parts 1 and 3 on Plan 4R-24620.
PIN 04097-0212(LT)	Part of Chaudière Island, Plan 10, lying west of Chaudière Street and Head Street, lying south of Lots 15, 16, 17 and 18 on the south side of Head Street, Plan 10, City of Ottawa.
Part of PIN 04097-0089(LT)	Water Lot Parcel 12; being Part of the Bed of the Ottawa River lying in front of Lot 40, Concession A, Broken Front, formerly in the Township of Nepean, now in the City of Ottawa, designated as Parts 19 and 35 on Reference Plan 4R- 26534.

1 (A) Areas Where Potentially Contaminating Activity Has Occurred

DST conducted a Phase I ESA for the Site in 2008, and an update of that report in July 2015. The following areas with Potentially Contaminated Activities (PCAs) were identified at the Site:

- An area with a former acid and alkali storage tanks in Area 2, immediately west of the Board Mill building.
- An area that was formerly used for coal storage along the north side of the former Paper Mill building. The coal was used to fuel the boilers in the building.
- A number of current and former fuel/oil ASTs and USTs on the Site. Multiple locations on all three areas. See Figure 3 in Appendix A.
- An area of fill material of unknown quality overlying bedrock across the majority of the Site.
- An area of former paint storage at the eastern end of the building on the south shore of Albert Island.
- The Site was operated as a pulp and paper mill from approximately 1905-2006 in Area 3 of the Site.
- The presence of transformers in the west end of the Board Mill building in Area 2. The Board Mill building was also used for PCB storage in the 1980s and 1990s.
- The presence of a former waste burner in the northeast corner of Area 3.

No PCAs were identified offsite within a 250 m radius of the Site boundaries.

1 (B) Areas of Potential Environmental Concern

Based upon the identified PCAs described in Section 1 (A) of this CSM, 16 APECs were identified at the Site. A Summary of PCAs, identified APECs, COCs and potentially impacted medium is provided in the following table.

APEC No.	Location of APEC on the Phase One Property	Location of Potential Contaminating Activity (PCA) (on-site or off-site)	Potential Contaminants of Concern (PCOCs)	Media Potentially Impacted (Groundwater, soil, and/or sediment)
APEC 1	East side of Chaudière Island, immediately west of the Board Mill building on Chaudière Island.	PCA 1 – Former acid storage tanks.	Metals Inorganics pH	Soil Groundwater

APEC No.	Location of APEC on the Phase One Property	Location of Potential Contaminating Activity (PCA) (on-site or off-site)	Potential Contaminants of Concern (PCOCs)	Media Potentially Impacted (Groundwater, soil, and/or sediment)
APEC 2	Northeast end of the Board Mill Building on the eastern part of Chaudière Island.	PCA 1 – Former sulphite storage.	Metals Inorganics Sulphur compunds Phenolics	Soil Groundwater
APEC 3	Along the north side of the former Paper Mill building on Chaudière Island.	PCA18 – Former coal storage used to fuel boilers.	PAHs	Soil Groundwater
APEC 4	Northeast of the former Paper Mill building on Chaudière Island.	PCA 18 – Former Bunker C fuel oil AST	PHC F1-F4 PAHs	Soil Groundwater
APEC 5	Located west of the building on the south shore of Albert Island.	PCA 28 – Associated with former gasoline UST	PHC F1-F4 BTEX	Soil Groundwater
APEC 6	Located east of the east end of the building on the south shore of Albert Island.	PCA 28 –Suspected former gasoline UST	PHC F1-F4 BTEX	Soil Groundwater
APEC 7	North of former Paper Mill building on Chaudière Island.	PCA 28 – Former fuel oil AST with 45,500L capacity and former fuel oil 'day tank'	PHC F1-F4 BTEX	Soil Groundwater
APEC 8	At the southwest corner in the basement of former Board Mill building on Chaudière Island.	PCA 28 – Three ASTS of unknown contents.	PHC F1 – F4 VOCs PAHs Metals inorganics	Soil Groundwater
APEC 9	Located in the basement of the Former Paper Mill building on Chaudière Island.	PCA 28 – Former oiler shack; - lubricant oil AST with 1,000L capacity; - Two former kerosene ASTs, each with 1,000 L capacity; and - Former thermoil AST with 1,000 L capacity	- PHC F1-F4, BTEX - PHC F1-F4, BTEX - PHC F1-F4, VOCs, PAHs - PHC F1-F4, PAHs, VOCs.	Soil Groundwater
APEC 10	Northwest of former Paper Mill building on the western portion of Chaudière Island	PCA 28 – Former diesel UST.	PHC F1-F4, PAHs	Soil Groundwater
APEC 11	Chaudière and Albert Island soil cover.	PCA 30 – Fill of unknown quality throughout the Site.	Metals PAHs pH PHC F1-F4	Soil Groundwater
APEC 12	Eastern portion of the building on the south shore of Albert Island.	PCA 39 – Former paint shop.	VOCs	Soil Groundwater

APEC No.	Location of APEC on the Phase One Property	Location of Potential Contaminating Activity (PCA) (on-site or off-site)	Potential Contaminants of Concern (PCOCs)	Media Potentially Impacted (Groundwater, soil, and/or sediment)
APEC 13	Paper Mill buildings on western portion of Chaudière Island.	PCA 45 – Former pulp and paper manufacturing and processes.	Metals Inorganics Dioxins and furans pH Sulfur compounds	Soil Groundwater
APEC 14	Board Mill building on eastern portion of Chaudière Island.	PCA 55 –Transformer use and PCB storage	PCBs	Soil Groundwater
APEC 15	North of Paper Mill building, at the northeast corner of the Site on the western portion of Chaudière Island	PCA 58 – Former waste burner	PAHs Metals Dioxins and furans	Soil Groundwater
APEC 16	Chaudière and Albert Islands.	Fire of 1900 which burnt down most of the on-Site buildings.	PAHs Metals Dioxins and furans	Soil Groundwater

1 (C) Subsurface Structures and Utilities

Indicators of underground and above ground utilities were observed during the 2008 Phase I ESA, including storm sewer catch basins, pole mounted light fixtures, fire lines, telephone cables, sanitary sewers, water lines, steam lines and process line for chemical distribution and process effluent.

2 (A) Stratigraphy

The topography of the Site is gently sloping to the east. Albert Island and the western portion of Chaudière Island are close to the water in the river, whereas parts of the northwestern shore of Chaudière Island, east of the dam, are up to 5 meters above the water level of the Ottawa River, with steep, near vertical, shoreline in places.

The soil encountered during DST's Phase II ESA (2008) investigation was fill material overlying bedrock. The fill consisted of sand, sand and gravel, some areas with boulders and cobbles, and occasional silt and clay layers. The maximum thickness of fill encountered in each area is as follows:

- Area 1: 3.7 m at BHMW4;

- Area 2: 7.0 m at BHMW16; and
- Area 3: 3.7 m at BHMW6.

2 (B) Hydrogeological Characteristics

The groundwater is present in both the fill and bedrock at the Site. Updated groundwater levels and calculation of hydraulic gradients are required at the Site to capture the current hydrogeological characteristics.

Groundwater flow impacting potential contaminant transport is interpreted to take place predominately in the fractured and weathered limestone bedrock. Localized groundwater flow direction, from the 2008 groundwater data, is inferred to the north in Area 3, to the northeast in Area 2, and to the south in Area 1.

2 (C) Approximate Depth to Bedrock

Depth to bedrock within boreholes from 2008 ranges are the following for each area:

- Area 1: from 0.6 m at borehole BHMW2 to 3.7 m in BHMW31;
- Area 2: from 0.6 m in BHMW20 to 7.0 m in BHMW16; and
- Area 3: from 0.5 in BHMW29 to 3.6 m in BHMW5.

Ontario Geological Survey mapping shows the bedrock at the Site to be limestone bedrock with shaly partings and some sandstone in the basal part. Typically the upper 1.5 meters of the bedrock may be weathered

2 (D) Approximate Depth to Water Table

Depths to groundwater measured by DST in 2006 and 2014 are summarized in the following table.

Monitoring Well Identification	Ground Surface Elevation (m Geodetic)	Date (mm/dd/yyyy)	Groundwater Level (m bsg)	GW Elevation (m Geodetic)	Subsurface Formation Screened
BHMW2	53.9	08/01/2006	2.3	51.6	Bedrock
		04/25/2014	1.6	52.3	
BHMW3	54.1	08/01/2006	1.7	52.4	Bedrock
		04/25/2014	1.7	52.4	
BHMW4	54.2	08/01/2006	1.8	52.4	Fill
		04/25/2014	1.7	52.5	
BHMW5	55.5	08/01/2006	6.7	48.8	Bedrock
BHMW6	53.7	08/01/2006	0.9	52.8	Fill
BHMW13	53.8	08/01/2006	3.9	49.9	Bedrock

Monitoring Well Identification	Ground Surface Elevation (m Geodetic)	Date (mm/dd/yyyy)	Groundwater Level (m bsg)	GW Elevation (m Geodetic)	Subsurface Formation Screened
BHMW14	53.1	08/01/2006	3.6	49.5	Bedrock
BHMW16	51.8	08/01/2006	5.9	45.9	Fill/Bedrock
BHMW17	52.4	08/01/2006	6.1	46.3	Fill/Bedrock
BHMW18	53.3	08/01/2006	15.6	37.7	Bedrock
BHMW19	53.3	08/01/2006	8.2	45.1	Bedrock
BHMW21	49.7	08/01/2006	7.6	42.1	Bedrock
BHMW22	47.6	08/01/2006	4.5	43.1	Bedrock
BHMW24	N/A	08/01/2006	0.0	N/A	Fill
BHMW26	52.9	08/01/2006	9.2	43.7	Bedrock
BHMW29	N/A	08/01/2006	Dry	Dry	Fill
BHMW31	53.6	08/01/2006	1.7	51.9	Fill
		04/25/2014	2.2	51.4	
BHMW32	53.8	08/01/2006	3.7	50.1	Bedrock

2 (E) Application of Section 41 or 43.1 to the Property

Section 43.1 of the O. Reg.153/04 applies to the Site as it is located within the Ottawa River and also features shallow bedrock. The applicable site condition standards (SCSs) for the Site are the MOECC S*oil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act,* Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition, All Types of Property Use, Coarse Grained Soils (Herein referred to as the "Table 7 SCSs"); and Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition, All Types of Property Use, Coarse-Grained Soils (herein referred to as the "Table 9 SCSs").

There were no other triggers present to classify the Site as "environmentally sensitive". As such, MOECC (2011) Table 1 SCSs (Full Depth Background SCSs, i.e. more sensitive) were not applied to this Site.

2 (F) Areas Where Soil Has Been Brought from Another Property and Placed Onsite

There has been soil brought from another property to the Site during site development. Some contaminant characterization of this fill has been completed. It is understood that all of this material will be removed from the Site prior to redevelopment for residential land use.

2 (G) Approximate Locations of Proposed Buildings and Structures

No information regarding the future development was made available to DST.

3 (A) Areas Where Contaminants Are Present

Several groups of contaminants were identified in the soil with concentrations of contaminants of concern found to be present on, in or under the Site at a concentration greater than the applicable SCSs (refer to Figure 4 in Appendix A).

The contaminants of concern present in concentrations greater than the applicable SCSs have not been delineated. It is DSTs understanding that for re-development of the Site, the fill material will be removed; however, to create a soil management plan for the Site, additional characterization is required. .

The exceedances of parameters in Area 1, Albert Island, are shown on Figures 4, 5 and 6, and include:

- polycyclic aromatic hydrocarbons (PAHs) in four of the five locations sampled (BHMW2 to 4 and BHMW31);
- petroleum hydrocarbons (PHCs) in three locations (BHMW2, BMHW3, BHMW31);
- metals in two locations at the west end of the buildings (BHMW3 and BHMW4);
- volatile organic compounds (VOCs) in one location, BHMW2; and
- polychlorinated biphenyls (PCBs) in one location BHMW3.

The groups of parameters in Area 2, east Chaudière Island present in soil greater than the applicable SCSs are presented on Figures 4, 7 and 8, and include:

- PHCs in BHMW17 to BHMW19, BHMW24, BH25, and BHMW26;
- PAHs in BHMW17 to BHMW20, BHMW22, BHMW23, and BHMW26;
- Metals in BHMW16 to BHMW 20, BHMW22, BHMW24, BH25 and BHMW26; and
- VOCs in BHMW17.

The groups of parameters in Area 3, west Chaudière Island present in soil greater than the applicable SCSs are presented on Figures 4, 9 and 10, and include:

- PHCs in BHMW13, BHMW 14, BHMW29, and BHMW32;
- PAHs in BHMW6, BHMW13, BHMW14, BHMW29, and BHMW32;
- Metals in BHMW13, BHMW14, and BHMW32; and,

- VOCs in BHMW29.

Based on the groundwater sampling results from 2006, concentrations of contaminants of concerns were identified greater than the applicable SCSs in all three areas. However, the groundwater sampling program completed in 2014 in only Area 1, Albert Island, the samples did not contain concentrations of contaminants of concern greater than the applicable SCSs. This apparent reduction of concentration may be due to the sampling methodologies (low flow) performed in the 2014 sampling to reduce sediment in the groundwater samples.

The groundwater concentrations greater than the applicable SCSs in Area 2, east Chaudière Island, include:

- PHCs in BHMW16, BHMW18, BHMW21, BHMW24, and BHMW26;
- PAHs in BHMW16, BHMW19, and BHMW20;
- Metals in BHMW18;
- VOCs in BHMW18; and
- PCBs in BHMW24.

The groundwater concentrations greater than the applicable SCSs in Area 3, west Chaudière Island, include:

- Metals in BHMW14 and BHMW32;
- PCBs in BHMW5.

The locations of areas with MOECC Table 9 SCSs exceedances in soil and groundwater samples are shown in Figure 4 and in cross sections (Figures 5 to 7DB).

3 (B) Contaminants Associated with Each Area Referenced in 3 (A)

Detailed information regarding contaminants in each identified area of concern is provided above in the section 3 (A). Areas of contamination are shown in Figures 4A, 4B and in cross sections (Figures 5 to 10).

3 (C) Media in Which Contaminants are Present

Concentrations of contaminants exceeding MOECC Table 7 SCSs or Table 9 SCSs were identified in soil samples at the Site. A review of contaminants in each media provides the following table.

Media	Contaminant Groups Present
Soil	PHCs, PAHs, metals, VOCs, and PCBs
Groundwater	PHCs, PAHs, metals, VOCs, and PCBs

3 (D) Description and Assessment of Each Area Referenced in 3 (A)

Further delineation of the contaminant groups present in each area is required to provide a more accurate representation of impacted areas around the Site.

3 (E) Distribution of Contaminants Referred to in Each Area Referenced in 3 (A)

The lateral distribution of contaminants in each area is presented on Figure 4, Appendix A.

In Area 1, Albert Island the lateral distribution of contaminants is anticipated to be in the soil around the two buildings, and under the eastern half of the building along the south shore. The building on the north shore is anticipated to be constructed directly on bedrock.

In Area 2, the east half of Chaudière Island, the entire area with the exception of under the former Board Mill is considered to be contaminated. The former board mill is anticipated to be constructed directly on bedrock.

In Area 3, the west half of Chaudière Island, the entire island is considered to be contaminated with the exception of two areas: 1) along the south shore and under the south half of the former Paper Mill building, and 2) in the northwest corner of the area. These areas did not contain soil exceedances from the samples collected in 2008.

3 (F) Reason for Discharge of Contaminants

The presence of PHCs contamination is attributable to historical bulk fuel storage of PHCs in ASTs and USTs across the Site. Increased metal concentrations are likely attributable to the historical use of poor quality fill material onsite, the presence of a waste burner, sulphite storage, three ASTs of unknown contents, pulp and paper manufacturing and processes, and the fire of 1900 that destroyed all of the former on-site buildings. The presence of PAHs contamination is likely attributable to the historical coal storage used for fuel in the boilers, bulk storage of kerosene, multiple ASTs with unknown contents, former waste burner, the fire of 1900 which levelled the Site, and fill of unknown quality. VOCs in concentrations above the Table 7 or Table

9 SCSs can be attributed to a former paint shop, bulk storage of kerosene, and other ASTs of unknown contents, though presumably contained fuels. The PCB contamination can be attributed to PCB containing transformers and storage of PCBs.

3 (G) Migration of Contaminants

Migration of contaminants at the Site is possible within the groundwater flow regime, with shallow soil/sediment migration in surface water runoff and by atmospheric transport. Detected contaminants exhibiting exceedances of the SCSs are soluble in groundwater, to various degrees, and the migration toward The Ottawa River is anticipated. Completed monitoring wells are located close to the shore of the Ottawa River and are downgradient of the identified sources of contamination and the locations of the detected exceedances at the Site. Based on the apparent decrease in concentration between the 2006 groundwater sampling, and the 2014 groundwater sampling programs, the contaminants detected in 2006 may be within sediment in the samples. However, more recent data is required to determine if the groundwater across the Site is below the SCSs, as the 2014 groundwater sampling program was only completed on Albert Island.

Shallow soil may become eroded after heavy rain events and sediment in surface water runoff would flow toward the Ottawa River. The area on the northwestern shore of Chaudière Island has a relatively steep slope/cliff toward the Ottawa River and there is potential for surface water runoff to flow from the Site toward the Ottawa River. Non vegetated areas may be prone to wind erosion during dryer seasons and contaminants may migrate by atmospheric transport toward adjacent areas and the Ottawa River.

During the proposed development of the Site, the soil is anticipated to be removed. A soil management plan is proposed to correctly identify the disposal location based on contaminants present. Additional detailed sampling is required to identify contaminants contained within areas, so the soil can be transported and disposed appropriately.

3 (H) Influence of Climatic or Meteorological Conditions on Contaminants

As the Site is adjacent to the Ottawa River, seasonal groundwater table fluctuation is expected to be minimal. This is corroborated by the similar groundwater levels observed in the wells monitored in 2006 and 2014. However, addition data is required to confirm the seasonal fluctuations. As contaminants were observed in both shallow and deep soil, snow melt and precipitation will facilitate leaching of contaminants from the unsaturated zone to the saturated

zone. The extent of this effect would depend on the contaminant, the thickness and characteristics of the vadose zone material and the volume of infiltrating water.

3 (I) Soil Vapour Intrusion into Buildings

There are currently no occupied buildings at the Site. It is anticipated that all existing buildings will be demolished in the near future. The location of future buildings and the exact nature of remedial efforts to be completed is unknown at this time.

4 (A) Lateral and Vertical Distribution of Contaminants

Detailed characterization of the areas with contamination requires further investigation. Lateral and vertical delineation of contaminated areas has not been completed. Vertical distribution of contaminants is shown in Figures 5 through 10. As, for the most part, only one soil sample was collected in the completed boreholes, it was conservatively assumed that contamination extended vertically from the ground surface to the top of bedrock.

4 (B) Approximate Depth to Water Table

The groundwater was observed in monitoring wells at the Site with widely varying depths (depth to groundwater ranged from 0.9 m to 15.6 m bgs in 2006).

4 (C) Stratigraphy from Ground Surface to Deepest Aquifer or Aquitard Investigated

The soil encountered during DST's Phase II investigation was a mixture of sand, sand and gravel, some areas with boulders and cobbles, and occasional silt and clay layers all identified as fill material. Based on the 2006 borehole logs, no native soil was identified in the boreholes advanced on-Site. The maximum thickness of the fill was identified long the northern shore of Chaudière Island and was determined to be approximately 7 m at borehole BHMW16.

Underlying bedrock is represented by weathered limestone with shaly partings and sandstone in the basal part.

4 (D) Subsurface Structures and Utilities Affecting Contaminant Distribution and Transport

Previously existing preferential pathways for the migration of contaminants on the property include storm and sanitary sewers, water lines and steam lines, which likely remain on-site. In addition, granular or coarse grained material around building foundations or under floor slabs may present preferential contaminant migration pathways.

Despite the coarse grained overburden, these preferential pathways could influence groundwater flow in localized areas at the Site and could impact contaminant migration. There may be current subsurface structures present onsite, and other utilities identified which are suspected of affecting contaminant distribution and transport. The locations of former and existing utility lines will be assessed during site decommissioning.

5 (A) Contaminant Release Mechanisms

Contaminant concentrations that exceeded of the Table 7 and/or Table 9 SCSs are present in the soil media at the Site. The identified contaminants at the Site include PHCs, PAHs, PCBs, metals and VOCs. The locations of soil concentrations in excess of applicable SCSs are shown in Figure 4 and in the cross sections (Figures 5 to Figure 10). A summary of the PCAs and release mechanisms is provided in the following table.

Potential Contaminating Activity (PCA) And Associated APEC	Potential Contaminants of Concern (PCOCs)	Release Mechanism	Location of Release
PCA 1 – Former acid storage tanks.	Metals Inorganics pH	-Spills during filling and use -Leaks	-Surface soil
PCA 1 – Former sulphite storage.	Metals Inorganics Sulphur compunds Phenolics	-Spills during use -Leaks	-Within former Board Mill building
PCA18 – Former coal storage used to fuel boilers.	PAHs	-Filling of coal hopper and bin -Spills during usage and transport	-Surface soil on the north side of the former Paper Mill building -Within the basement of the former Paper Mill building.
PCA 18 – Former Bunker C fuel oil AST	PHC F1-F4 PAHs	-Spills during filling and use -Leaks from tanks	Surface soil
PCA 28 – Associated with former gasoline UST	PHC F1-F4 BTEX	-Spills during filling and use -Leaks from tank	Surface soil Subsurface soil
PCA 28 –Suspected former gasoline UST	PHC F1-F4 BTEX	-Spills during filling and use -Leaks from tank	Surface soil Subsurface soil
PCA 28 – Former fuel oil AST with 45,500L capacity and former fuel oil 'day tank'	PHC F1-F4 BTEX	-Spills during filling and use -Leaks from tanks	Surface soil

Potential Contaminating Activity (PCA) And Associated APEC	Potential Contaminants of Concern (PCOCs)	Release Mechanism	Location of Release
PCA 28 – Three ASTS of unknown contents.	PHC F1 – F4 VOCs PAHs Metals inorganics	-Spills during filling and use -Leaks from tanks	Subsurface soil under former Board Mill building. Within basement of former Board Mill building.
PCA 28 – Former oiler shack; - lubricant oil AST with 1,000L capacity; - Two former kerosene ASTs, each with 1,000 L capacity; and - Former thermoil AST with 1,000 L capacity	- PHC F1-F4, BTEX - PHC F1-F4, BTEX - PHC F1-F4, VOCs, PAHs - PHC F1-F4, PAHs, VOCs.	-Spills during filling and use -Leaks from tanks	Subsurface soil under former Paper Mill building. Within basement of former Paper Mill building.
PCA 28 – Former diesel UST.	PHC F1-F4, PAHs	-Spills during filling and use -Leaks from tank	Surface soil during use Subsurface soil
PCA 30 – Fill of unknown quality throughout the Site.	Metals PAHs pH PHC F1-F4	Migration of contaminants during placement	Formerly surface soil
PCA 39 – Former paint shop.	VOCs	Atmospheric	Surface soil Atmosphere
PCA 45 – Former pulp and paper manufacturing and processes.	Metals Inorganics Dioxins and furans pH Sulfur compounds	Spills during manufacturing Waste disposal	Surface Soil Groundwater Surface water
PCA 55 –Transformer use and PCB storage	PCBs	Spills Leaks from transformers	Subsurface soil beneath former Board Mill building Within basement of former Board Mill Building
PCA 58 – Former waste burner	PAHs Metals Dioxins and furans	Dust Ashes from waste	Atmospheric Surface soil Surface water
Fire of 1900 which burnt down most of the on-Site buildings.	PAHs Metals Dioxins and furans	During fire Ashes from former buildings	Surface soil Surface water

All the contaminants are soluble in water to some extent, and migrate with groundwater flow. The depth of detected exceedances varies from near the ground surface (soil sample collected from interval 0.1 – 0.4 m bgs) to 6.7 m (exceedance of PAHs and PHCs in soil sample collected from

borehole BHMW18). The groundwater at the Site varies in depth (depth to groundwater varied from 0.9 m in BHMW6 to 15.6 m bgs in BHMW18 in 2006). This indicates that contaminants are present in the saturated and unsaturated zones. Contaminants occurring in the saturated zones are released continuously as long as there is a contaminant mass available to be dissolved in the groundwater. This mass is decreasing over time, as will the dissolved concentrations in the groundwater. Contaminants present in unsaturated zone are released occasionally after significant precipitation and spring snow melt. The effect of infiltration on groundwater quality is described in Section 3(H) above.

5 (B) Contaminant Transport Pathway

Several potential contaminant transport pathways were identified for the Site:

- Leaching of contaminants present in the vadose zone carried by precipitation and snow melt waters to groundwater;
- Migration of contaminants within the saturated zone;
- Migration of dissolved contaminants in groundwater flow toward the Ottawa River surface water;
- Migration of eroded soil with surface water runoff toward the Ottawa River surface water and sediments;
- Indoor and outdoor vapour inhalation;
- Atmospheric migration of soil particles (dust) released by wind erosion to adjacent areas and the Ottawa River.

The results of repeated groundwater sampling indicate that the contamination previously identified in the groundwater may be attributed to high levels of sediment in the samples collected in 2006. Additional groundwater sampling is required to determine the current condition of the groundwater.

5 (C) Human and Ecological Receptors

The planned future use of the property is residential. Human receptors include site personnel, construction workers/environmental consultants, visitors, users of the Ottawa River, and residents (children, teen and adult). These receptors are anticipated to frequent to the Site for moderate periods of time.

Based on the Site conditions and presence of the Ottawa River adjacent to the property, the following ecological receptors were identified:

- Terrestrial plants and animals living on or visiting the Site; and,
- Aquatic plants and animals (off-site).

5 (D) Receptor Exposure Points

Receptor exposure points for human and ecological receptors include:

- Surface soil
- Dust;
- Subsurface soil (construction worker);
- Groundwater (construction worker); and
- Sediment and surface water (off-site).

5 (E) Routes of Exposure

Routes of exposure include direct and indirect exposure routes include:

- Vapour inhalation;
- Dust inhalation;
- Soil dermal contact;
- Groundwater dermal contact and ingestion (construction worker); and

Surface water and sediments ingested by aquatic life (off-site).

APPENDIX F

Limitations of the Report and Qualifications of Assessors

Limitations

DST has prepared this report for the exclusive use of Windmill Development Group Ltd. to evaluate the present environmental condition of the Site.

The information, conclusions and recommendations given herein are specifically for this project and this Client only, and for the scope of work described herein. It may not be sufficient for other uses. DST does not accept responsibility for use by third parties.

The data, conclusions and recommendations which are presented in this report, and the quality thereof, are based on a scope of work authorized by the Client. Note, however, that no scope of work, no matter how exhaustive, can identify all contaminants or all conditions above and below ground. For example, conditions between test holes may differ from those encountered in the investigation and observed or measured conditions may change with time. This report therefore cannot warrant that all conditions on or off the site are represented by those identified at specific locations.

Any recommendations and conclusions provided that are based on conditions or assumptions reported herein will inherently include any uncertainty associated with those conditions or assumptions. In fact many aspects involving professional judgement such as subsurface models and remediation criteria contain a degree of uncertainty which cannot be eliminated. This uncertainty should be managed by periodic review and refinement as additional information becomes available.

Note also that standards, guidelines and practices related to environmental investigations may change with time. Those which were applied at the time of this investigation may be obsolete or unacceptable at a later date.

Any topographic benchmarks and elevations documented in this report are primarily to establish relative elevation differences between test locations and should not be used for other purposes such as grading, excavation, planning, development, etc.

Any comments given in this report on potential remediation problems and possible methods are intended only for the guidance of the designer. The scope of work may not be sufficient to determine all of the factors that may affect construction or clean-up methods and costs. Contractors bidding on this project or undertaking clean-ups should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the conditions may affect their work.

Any results from an analytical laboratory, title searcher or other subcontractor reported herein have been carried out by others, and DST Consulting Engineers Inc. cannot warranty their accuracy. Similarly, DST cannot warranty the accuracy of information supplied by the client.

Qualifications of Assessors

Andrew Naoum, P.Eng.: Mr. Naoum is a Project Manager with DST Consulting Engineers Inc. with over 7 years' experience in the environmental industry. Mr. Naoum is currently the Sector Head for the Outdoor Environment group in Ottawa with DST. His responsibilities include project management, including budget control, staff scheduling and client liaison, as well as engineering investigations and field work. Mr. Naoum has worked and managed various types of environmental project, including Phase I and II Environmental Site Assessments (ESAs) throughout Canada, site remediation programs, risk assessments, storage tank compliance audits and designs, remedial action plans (RAPs) and building demolition / site decommissioning.

Curtis Schmidt, P.Eng.: Mr. Schmidt holds a degree in environmental engineering from the University of Guelph and is registered as a professional engineer in Ontario. He is also registered as a Qualified Person (QP) by the Ontario Ministry of the Environmental and Climate Chance to perform environmental assessments in Ontario. With 16 years of environmental consulting experience in Alberta, Saskatchewan, and Ontario, Mr. Schmidt has completed all aspects of a wide range of Phase I, II, and III ESAs, soil and groundwater remediation, hydrogeological investigations, and surface water studies.