



**Phase One Environmental
Site Assessment
1158 Second Line Road,
Ottawa, Ontario**

Client:

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Project Number:

OTT-00245054-A0

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March 2, 2018

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*Theberge Homes Ltd.
Phase One Environmental Site Assessment
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OTT-00245054-A0
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Legal Notification

This report was prepared by EXP Services Inc. for the account of **Theberge Homes Ltd.**

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. EXP Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

Executive Summary

EXP Services Inc. (EXP) was retained by Theberge Homes to complete a Phase One Environmental Site Assessment (ESA) of the property referred to as 1158 Second Line Road, located in Ottawa, Ontario. The purpose of this Phase One ESA was to determine if past or present site activities have resulted in actual or potential contamination at the site. EXP understands that Theberge Homes Ltd. plans to re-develop the land as medium density residential. Consequently, this Phase One ESA will be used in support of the City of Ottawa Site Plan Approval permitting requirements and a Record of Site Condition (RSC) is not required.

A Phase One ESA is a systematic qualitative process to assess the environmental condition of a site based on its historical and current uses. This Phase One ESA was conducted in accordance with the Phase One ESA standard as defined by Ontario Regulation 153/04, as amended by Ontario Regulation 511/09 (O.Reg. 153/04), and in accordance with generally accepted professional practices. Subject to this standard of care, EXP makes no express or implied warranties regarding its services and no third-party beneficiaries are intended. Limitation of liability, scope of report and third party reliance are outlined in Section 8 of this report.

Please note that general environmental management and housekeeping practices were reviewed as part of this assessment insofar as they could impact the environmental condition of the property, however, a detailed review of regulatory compliance issues was beyond the scope of our investigation. This Phase One ESA does not constitute an audit of environmental management practices, indicate geotechnical conditions or identify geologic hazards.

A written response from some regulatory agencies typically requires several months to receive. If upon receipt of the response from the regulatory agencies, significant environmental issues are identified, EXP will forward their response to the client as an addendum to this report.

The Site is currently occupied by a residential structure and has an area of 0.8 hectares. It is located on the north side of Second Line Road approximately 240 m southwest from the Old Carp Road and Second Line Road intersection. It is legally described as CON 3 PT LOT 11 RP 5R-1715; PARTS 1 & 2. The property identification number is 045260207. At the time of the investigation, the property was 80% woodlot and 20% building/driveway. The site was previously undeveloped until the mid 1990's when it was developed and a residential structure was constructed at the Site.

The surrounding area of the Site was observed to be vacant to the west (wetlands), a utility corridor to the east (Hydro) and residential to the north (Goward Drive) and south (Whernside Terrace). No environmentally sensitive activities or infrastructures on the surrounding properties, present any environmental concerns to the Site. Observations pertaining to the adjacent properties were made from the boundaries of the Site.

Topographically, the Site is relatively flat. The surrounding area has a slight downwards slope towards the northeast. The closest body of water is the South March Wetlands, located approximately 120 m west of the Site. Regional groundwater flow direction is inferred to be in the eastern direction towards the Rideau River.

Based on the results of the Phase One ESA completed at 1158 Second Line Road in Ottawa, EXP has identified the following areas of potential environmental concern:

Table EX-1: Areas of Potential Environmental Concern

Area of Potential Environmental Concern (APEC)	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)	Location of PCA (On-Site or Off-Site)	Contaminants of Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
1. Potential On-Site contamination from a historic AST located at 1158 Second Line Road	North side of residence	#28: Gasoline and Associated Products Storage in Fixed Tanks	On-Site	Petroleum Hydrocarbons (PHCs), Benzene, Toluene, Ethylbenzene and Xylene (BTEX)	Soil

Based on the findings of the Phase One ESA, a Phase Two ESA is required to assess the soil conditions at the Site.

The AST located in the basement was observed to be in good condition with no staining or odours and no records of spills. Therefore, it is recommended that a sample of soil at the ground surface, beneath the vent and fill pipes be obtained and analyzed for the above contaminants of concern. The vent and fill pipes represent the worst-case scenario as they would be the location where spills or overfilling issues of the AST would occur. Groundwater contamination is not a concern.

This executive summary is a brief synopsis of the report and should not be read in lieu of reading the report in its entirety.

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1. Introduction

EXP Services Inc. (EXP) was retained by Theberge Homes Ltd. to complete a Phase One Environmental Site Assessment (ESA) of the property referred to as 1158 Second Line Road, located in Ottawa, Ontario. A site location plan is presented on Figure 1 in Appendix B. At the time of the investigation, the Site was owned by Mr. Adel Houssari.

Owner Contact: Mr. Adel Houssari and Mrs. Nada Harb
1158 Second Line Road
Ottawa, Ontario K2K 1X7

A Phase One ESA is a systematic qualitative process to assess the environmental condition of a site based on its historical and current uses. This Phase One ESA was conducted in accordance with the Phase One ESA standard as defined by Ontario Regulation 153/04, as amended by Ontario Regulation 511/09 (O.Reg. 153/04), and in accordance with generally accepted professional practices. Subject to this standard of care, EXP makes no express or implied warranties regarding its services and no third-party beneficiaries are intended. The scope of report and third-party reliance are outlined in Appendix A.

1.1 Objective

The purpose of this Phase One ESA was to determine if past or present site activities have resulted in actual or potential contamination at the site. EXP understands that Theberge Homes Ltd. plans to re-develop the land as medium density residential. Consequently, this Phase One ESA will be used in support of the City of Ottawa Site Plan Approval permitting requirements and a Record of Site Condition (RSC) is not required.

1.2 Phase One Property Information

The Site is currently occupied by a residential structure and has an area of 0.8 hectares. It is located on the north side of Second Line Road approximately 240 m southwest from the Old Carp Road and Second Line Road intersection. It is legally described as CON 3 PT LOT 11 RP 5R-1715; PARTS 1 & 2. The property identification number is 045260207. At the time of the investigation, the property was 80% woodlot and 20% building/driveway. The site was previously undeveloped until the mid 1990's when it was developed and a single family residential structure was constructed at the Site.

At the time of the investigation, the property was predominately woodlot with gravel and landscaping located around the residence. The site was previously undeveloped until it was developed in the late 1990's for residential use. There is currently one (1) residential building present at the Site. The property is currently serviced a private sewage system and private potable water well. The neighbouring residential properties to the north and south are expected to be serviced by City of Ottawa water and sewage.

Topographically, the Site is relatively flat. The surrounding area has a slight downwards slope towards the northeast. The closest body of water is the South March Wetlands, located approximately 120 m west of the Site. Regional groundwater flow direction is inferred to be in the eastern direction towards the Rideau River.

The approximate Universal Transverse Mercator (UTM) coordinates for the Site centroid is NAD83, Zone 18, 425677.33 m E, 5022173.13 m N. The UTM coordinates were based on an estimate derived using Google Earth™. The accuracy of the centroid is estimated to range from 5 to 50 m.

2. Scope of Investigation

The scope of work for the Phase One ESA consisted of the following activities:

- Reviewing the historical occupancy of the site through the use of available archived and relevant municipal and business directories, fire insurance plans (FIPs), topographical maps, and aerial photographs;
- Contacting municipal and provincial agencies to determine the existence of records of environmental regulatory non-compliance, if any, and reviewing such records where available;
- Obtaining an EcoLog Environmental Risk Information Services Ltd. (ERIS) report for the site and surrounding properties within a 250 metre radius of the site;
- Reviewing available geological maps, well records and utility maps for the vicinity of the site;
- Obtaining a search of land title and assessment rolls for the site;
- Conducting at least one site reconnaissance of the site and building facilities in order to identify the presence of actual and/or potential environmental contaminants or concerns of significance;
- Conducting interviews with designated site representative(s) as a resource for current and historical site information, as well as to provide EXP staff with unrestricted access to all areas of the site and site buildings (as required by O.Reg 153/04);
- Reviewing the current use of the site and any land use practices that may have impacted its environmental condition;
- Reviewing the current use of the surrounding properties and any land use practices that may have impacted the environmental condition of the site; and,
- Preparing a report to document the findings.

In completing the scope of work, EXP did not conduct any intrusive investigations, including sampling, analyses, or monitoring.

EXP has confirmed neither the completeness nor the accuracy of any of the records that were obtained or of any of the statements made by others.

EXP personnel who conducted assessment work for this project included Matthew Laneville, B.A., and Mark McCalla, P. Geo. An outline of their qualifications is provided in Appendix A.

3. Records Review

3.1 Phase One ESA Study Area Determination

The Phase One ESA study area consisted of the neighbourhood and extending a distance of 250 metres from the Site. Surrounding properties consist of vacant to the east and west and residential to the north and south. A site plan is presented as Figure 2 in Appendix B.

3.2 First Developed Use Determination

Based on a review of historical aerial photographs, chain of title for the property, historical maps, and other records review, it appears that the Site was developed as residential in the late 1990s.

3.3 Fire Insurance Plans

A search of The Catalogue of Canadian Fire Insurance Plans 1875 – 1975 (Catalogue) was conducted to determine if fire insurance plans for the site existed. No fire insurance plans exist for the site or surrounding area.

3.4 Chain of Title

A chain of title was obtained from Read Abstracts Inc. for the subject site. Based on the information gathered from the title search, the following was found:

Mr Adel Houssari and Mrs. Nada Harb have been the owners of the Site since December 2009. Before 2009 the property changed hands ten (10) times dating back to June 1875. The Site has had exclusively private ownership since 1875. No notable environmental concerns were identified based on the title search.

Refer to Appendix C for the title search.

3.5 Previous Reports

The following previous reports were provided to EXP for review.

- *Phase I Environmental Site Assessment – 1158 Second Line Road, Ottawa, Ontario*, dated October 16, 2012, prepared by EXP Services Inc.

The report indicated that an above ground storage tank was present in the basement to provide fuel to the oil fired central air furnace. It was also noted that a potable water well and septic system are present at the Site. EXP did not identify any areas of potential environmental concern based on the Site review and review of historical documents.

- *Stage 1 and 2 Archaeological Assessment for 1158 Second Line Road, Part of Lot 11, Concession 3, Registered Plan 5R-1715 – Parts 1 & 2 and Plan 5R-2564 – Parts 1 & 2 Geographic Township of March, Ottawa, Ontario*, dated September 10, 2013, prepared by The Archaeologist Inc.

The report indicates that a Stage 1 and Stage 2 archaeological assessment was performed at 1158 Second Line Road. The Stage 1 assessment was conducted in order to determine the possibility of archeological artifacts being present at the Site. The Stage 1 assessment indicated that there was potential for archaeological artifacts to be present at the Site. Based on this discovery a Stage 2 assessment was performed which included a test pit survey. The Stage 2 assessment did not identify any archeological resources.

- *1158 Second Line Road, Ottawa, Ontario – Environmental Impact Assessment and Tree Conservation Report. Phase I Environmental Site Assessment*, dated September 2013, prepared by CJB Environmental Inc. 400-445 Saint-Jean-Baptiste, Quebec City, Quebec G2E 5N7.

The report indicated that the property located to southwest of the Site is considered as a Natural Environmental Area based on the City of Ottawa's official plan and is considered an Area of Natural and Scientific Interest. The study did not identify any species at risk at the time of the investigation. It was noted that special attention was given to the Whip-poor-will and the Blanding's Turtle, and the study did not identify either of these species as being present at the Site. The Site was not found to have any wetland/swamp habitats. This report also included the 2013 assessment of the former Township of March Closed Landfill (March Landfill) located within a 500 m radius of the Site.

- *Clearance Letter for March Landfill, Development of 1158 Second Line Road*, dated April 2013, prepared by AMEC Environment and Infrastructure. 300-210 Colonnade Road South, Ottawa, Ontario K2E 7L5.

This letter indicated that the former March Landfill is located approximately 370 m south of the Site. The former March Landfill was operated by the former Township of March between 1963 and 1974. It was noted that groundwater contamination (petroleum hydrocarbons, petroleum aromatic hydrocarbons, and volatile organic compounds) was observed to be present and was delineated over a distance of 1.5 km heading toward the southeast from the landfill. The groundwater plume was monitored from 2000-2013 and is located at least 310 m south of the Site. The data acquired from the studies (since 2000) show that the former March Landfill poses no environmental concern with respect to the Site.

3.6 Regulatory Environmental Source Information

The appropriate regulatory agencies at the provincial and municipal levels were contacted to obtain information regarding environmental permits, past or pending environmental control orders or complaints, outstanding environmental regulatory non-compliance issues and Sewer Use By-Law infractions. EXP did not identify the need to contact any federal agencies.

The following agencies were contacted:

- The Ontario Ministry of the Environment and Climate Change (MOECC) Freedom of Information, Protection of Privacy Office; and,
- The City of Ottawa.

Written responses from the regulatory agencies and copies of the requests are included in Appendix C.

3.6.1 Ontario Ministry of the Environment and Climate Change Records

Records pertaining to the site were requested from the MOECC through the *Freedom of Information and Protection of Privacy Act* (FOI). A response has not yet been received. A copy of the request is provided in Appendix C.

- On February 13, 2018, the MOECC Environmental Bill of Rights (EBR) registry website was searched by ERIS for postings in the vicinity of the subject site using 250 m radius. No areas of potential environmental concern were identified.
- On February 13, 2018, the MOECC Hazardous Waste Information Network (HWIN) database was searched by ERIS for registered waste generators in the vicinity of the subject site. No postings were listed.

- On February 13, 2018, the MOECC Brownfields Registry website was searched by ERIS for postings of Records of Site Condition (RSC). No postings for the Site or for the surrounding properties were listed.

3.6.2 Municipal Records

3.6.3.1 City Hall Records

A request for the Site was made to the City of Ottawa for the Hazardous Land Use Index (HLUI). A response (received October 2012) which indicated that the subject property is within 500 m of a City owned former landfill. A data gap analysis was conducted on this former landfill site to identify any potential human health risks associated with the site's current land use and none were identified. No APECs were identified. A copy of the reply is provided in Appendix C.

3.6.3.2 City Directory Search

EXP reviewed city directories dating from 1961 to 2011 from an ERIS search of Vernon's Ottawa in order to identify the occupancy history of the site and neighbouring properties for potential environmental concerns. A copy of the directory search is included in Appendix D. The following table summarizes the directory search.

Table 1: City Directory Search

Address	Direction from Site	Year	Occupant	Concern (yes/no)
1158 Second Line Road	Subject site	2001/02 – 2011	Residential (one tenant)	No
		1961 – 1996/97	Not listed	
1155 Second Line Road	Adjacent to the west (across Second Line Road)	1961 - 2011	Not listed	No
1190 Second Line Road	80 m northwest from Site	1961 - 2011	Not listed	No
1220 Second Line Road	220 m northwest from Site	1992 - 2011	Residential (one tenant)	No
		1961 - 1987	Not listed	
1292 Old Carp Road	186 m north from Site	2011	Not listed	No
		1996/97 – 2006/07	Residential (one tenant)	
		1961 - 1992	Not listed	
1350 Old Carp Road	160 m west from Site	2011	Residential (two tenants)	No
		1992 – 2006/07	Residential (one tenant)	
		1961 - 1987	Not listed	

Based on a review of the city directories, none of the surrounding properties were identified as potential sources of environmental concern to the site.

3.6.3 Land Use Documents

A review of the following publications was carried out as part of this Phase One ESA:

- Old Landfill Management Strategy Phase 1 – Identification of Sites, City of Ottawa, Ontario (Golder Associates, October 2004);
- Inventory of Coal Gasification Plant Waste Sites in Ontario (Intera, April 1987);
- Mapping and Assessment of Former Industrial Sites – City of Ottawa (Intera, July 1988); and,
- Ontario Inventory of PCB Storage Sites (Ontario Ministry of the Environment; 1993).

3.6.4 Old Landfill Management Strategy Phase 1 – Identification of Sites - Golder (2004)

No former landfills were identified within 250 m of the subject site. In addition, there is no visual evidence of a landfill in the area. A former landfill was located approximately 370 m to the south from the edge of the Site. Since 2000, the landfill has been monitored and groundwater contamination was identified. A contaminant plume consisting petroleum hydrocarbons, petroleum aromatic hydrocarbons, and volatile organic compounds was discovered. This plume is located approximately 300 m to the southeast from the Site and is observed to be headed in an easterly direction. A data gap analysis was conducted on this former landfill site to identify any potential human health risks associated with the site's current land use and none were identified.

Based on the distance of the plume from the Site and groundwater flow direction, this does not represent a PCA.

3.6.5 Inventory of Coal Gasification Plant Waste Sites in Ontario - Ontario MOE (1987)

There were no coal gasification plants identified within 250 m of the subject site.

3.6.6 Mapping and Assess Former Industrial Sites – Intera (1988)

There are no Intera sites identified within 250 m of the subject Site.

3.6.7 Ontario Inventory of PCB Storage Sites - Ontario MOE (1993)

No records pertaining to PCB storage sites were identified within 250 m of the subject site in this document.

3.7 EcoLog ERIS Database Search

A search of provincial and federal databases for records pertaining to the subject site and properties within 250 metres of the subject site was conducted by EcoLog Environmental Risk Information Services (or EcoLog ERIS). EcoLog ERIS is an environmental database and information service provider. EXP has confirmed neither the completeness nor the accuracy of the records that were provided. A summary of the more significant findings is provided below. A copy of the EcoLog ERIS report is provided in Appendix D.

Based on the EcoLog search, the following was identified:

- One listing was identified for the Site. The listing consisted of a record of an ERIS historical search and does not represent an APEC.

- The property located at 108 Whernside Terrace (50 m east from the Site), had a historic incident where an unknown quantity of natural gas was released in 2008. Due to the nature of this incident, it does not represent an APEC to the Site.
- A waste generator was identified along Second Line Road (90 m west southwest from the Site) in 2013. The wastes generated included halogenated solvents and landfill leachates. This is likely in response to the City of Ottawa's monitoring of the historic landfill located 400 m to the south from the Site and was generated to address the purge water from the wells associated with this ongoing study. This landfill was assessed by AMEC Environment and Infrastructure (AMEC) in 2013 and it was found that a contaminant plume is originating from the landfill and heading north northeast from the landfill and is approximately 300 m south from the Site. It was reported that the landfill has been annually monitored since 2000 and does not pose a risk to the Site. Based on the waste generated and the 2013 study by AMEC this does not represent an APEC to the Site.
- Several water wells were identified in the study area, but do not represent APECs.

3.8 Physical Setting Review

3.8.1 Aerial Photographs

The following table summarizes the development and land use history of the subject site and adjacent properties as depicted on the reviewed aerial photographs.

Table 2: Development and Land Use History Summary

Aerial Photograph (year)	Details
1946	The subject Site and surrounding properties appear to be undeveloped. The utility corridor is present to the northeast from the Site.
1968	The subject Site and surrounding properties appear to be undeveloped. The utility corridor is present to the northeast from the Site.
1987	The subject Site and surrounding properties appear to be undeveloped. The utility corridor is present to the northeast from the Site.
1993	The subject Site appears undeveloped, the surrounding properties also appear undeveloped. A utility corridor (Hydro) can be seen to the north of the Site and a wetland is located to the South.
1999	The subject Site has been developed to its current configuration. Surrounding properties remain vacant with the exception of the utility corridor to the north of the Site.
2002	The subject Site remains unchanged. The properties to the west and south remain vacant. The property to the southeast and across the utility corridor have begun undergoing development (clearing of land)
2005	The subject Site remains unchanged. The property to the northwest of the Site has begun to be developed (clearing of land). Surrounding properties to the south, southeast and north remain unchanged.
2007	The subject Site remains unchanged. Surrounding properties (with the exception of the wetlands to the southwest) have begun undergoing residential development as road networks have been created and the appearance of foundations can be seen.

Aerial Photograph (year)	Details
2008	The subject Site remains unchanged. Surrounding properties (with the exception of the wetlands to the southwest) have completed residential development. Additionally, the properties across the utility (corridor) have undergone residential development.
2009-2017	The Site and surrounding properties remain unchanged.

Based on the review of the aerial photography, APECs were not identified.

3.8.2 Geology, Hydrogeology and Topography

The following information sources were reviewed to determine the nature of the subsurface materials at the site:

1. *Bedrock Geology of Southern Ontario* – Ontario Geological Survey. Scale 1:50,000. Electronic resource Issued 2003.
2. *Surficial Geology of Southern Ontario* – Ontario Geological Survey. Scale 1:50,000. Electronic resource Issued 2003.
3. Ontario Geotechnical Boreholes – Electronic Resource.
4. MOE Water Well Records – Electronic Resource.
5. Department of Natural Resources, Topographic Mapping. Electronic Resource.

Based on review of the above information, the subject Site is located in the physiographic region known as the Nepean Formation. The bedrock in the general area is a combination of sandstone and granite at a depth of approximately 0.3 - 2 m with regards to the sandstone. Granite was also observed at a depth of 30-35 m. With respect to surficial geology, beneath any fill, the site is underlain by Paleozoic bedrock.

The local topography of the Site relatively flat. The area around the house was observed to be on a slight hill and therefore has a slight downward slope towards the northeast. Regional groundwater flow direction, based on the previous landfill studies is reported to be in the eastern direction towards the Rideau River (approximately 9 km to the east of the Site).

3.8.3 Fill Materials

Significant amounts of fill are not present at the Site. The Site is along the same topography when compared to the neighbouring properties.

3.8.4 Water Bodies and Areas of Natural Significance (ANSI)

There were no water bodies on the subject site. The nearest surface water body to the subject Site is the South March Highlands located approximately 120 m to the west from the Site. The subject site is not located in close proximity to an ANSI, according to the Ministry of Natural Resources Natural Heritage website.

Based on previously reported information, groundwater flow is to the east toward the Rideau River located 9 km west of the Site.

3.8.5 Well Records

Local MOECC water wells records show that bedrock was found at 0.3 - 2 m from surface. The overburden consists of sand and sandy clay from the ground surface to 0.6 – 2.0 m. Bedrock in the area was found to be sandstone and granite.

3.9 Site Operating Records

No site operating records were available for review.

3.10 Summary of Records Review

Based on a review of the available records, PCAs were not identified.

4. Interviews

Interviews were attempted by EXP with any individuals identified to be the most knowledgeable about both the current and historical site uses. The purpose of interviews is to obtain information to assist in identifying areas of potential environmental concern and identify details of potentially contaminating activities or potential contaminant pathways, in, on or below the site.

During the completion of this Phase One ESA, the following individual was interviewed:

- Mr. Adel Houssari, current owner of the Site, was interviewed in person on the day of the Site visit.

He indicated that the Site was developed in the late 1990s, when a single-family residence was constructed at the Site. Prior to this the Site was undeveloped. Mr. Houssari indicated that the residence is now heated by a forced air propane furnace, however the aboveground storage tank (no longer in use) is still present within the basement as the residence was originally heated by a forced air oil fired furnace (PCA1). The Site is serviced by a septic system located to the south of the residence and a private potable water well located to the north of the residence.

5. Site Reconnaissance

5.1 General Requirements

On February 8, 2018, Mr. Matthew Laneville, B.A. of EXP conducted the site visit for the property. The Site visit was conducted in accordance with EXP’s internal health and safety protocols and with the Ministry of Labour health and safety regulations. The purpose of the site visit was to assess the current conditions of the Site.

The general environmental management and housekeeping practices at the site were reviewed as part of this assessment insofar as they could impact the environmental condition of the property; however, a detailed review of regulatory compliance issues was beyond the scope of EXP’s investigation.

Observations of the subject property and surrounding properties were conducted. The exterior observations were recorded by walking over the grounds at approximately 9:00am. The temperature was approximately -0.3 °C and overcast. Adjoining properties were observed from within the grounds of the Site.

Mr. Laneville was accompanied by Mr. Houssari during the site visit. Photographs were taken at the Site on February 8, 2018 and are included in Appendix E.

5.2 Specific Observations at Phase One ESA Property

5.2.1 Site Description and Buildings

The Site is currently occupied by single-family residence (bungalow with full height basement) and has an area of 0.8 hectares. The residence is currently serviced by a private well and sewage system. At the time of the investigation, the Site was mostly treed. Areas around the residence were observed to be landscaped or gravel covered to facilitate driveways and parking areas.

The properties to the north and south is anticipated to be municipally serviced by City of Ottawa water and sewer.

5.2.2 Heating and Cooling Systems

Heating within the office building is provided by a propane fired forced air furnace and cooling is provided by a central air conditioning system. Historically the residence was heated by an oil fired forced air furnace. The AST was observed to be empty and within the northern section of the residence basement. The historic use and presence of the AST is considered a PCA (PCA1/APEC1).

5.2.3 Site Utilities and Services

The Site utilities and services identified at the Site are summarized in the table below:

Table 3: Summary of Utilities

Utility	Source
Potable Water	Private Well
Propane (heating source)	Budget (propane tanks)
Sanitary System	Private (septic tank and bed)
Storm Water	Municipal
Electricity	Hydro Ottawa

5.2.4 Site Use

At the time of the investigation, the Site was occupied by a single-family residence.

5.2.5 Drains, Pits and Sumps

A sump pit was observed in the north corner (basement) of the Site building. No visual indications of impact were noted when the sump was examined. The sump was observed to be dry at the time of the Site visit.

5.2.6 Storage Tanks

5.2.6.1 Underground Storage Tanks

EXP did not observe any underground storage tanks (UST) during the site reconnaissance. No visual evidence such as fill / vent pipes, levelometers or oil fill lines associated with USTs were observed at the site.

5.2.6.2 Aboveground Storage Tanks

One AST was identified at the subject Site and are summarized in the table below.

Table 4: Summary of Aboveground Storage Tanks

AST#	Location	Type	Volume (approximately)		Contents	Year	
			Litres	Gallons (UK)		Installed	Removed
AST-1	North side of basement	Steel	910	200	Furnace Oil	2000	Still present however no longer in use

AST-1 was located inside the building along the northern wall in the basement.

Although this tank is considered newer and in good condition the historic use of furnace oil at the Site is considered a PCA (PCA1/APEC1).

5.2.7 Chemical Storage and Handling and Floor Condition

No chemicals were observed at the Site.

5.2.8 Areas of Stained Soil, Pavement or Stressed Vegetation

Areas of stained soil, pavement or stressed vegetation were difficult to ascertain due to snow coverage.

5.2.9 Fill, Debris and Methane

The Site is similar in elevation to the surrounding properties. It is anticipated that fill was not imported to the Site during development as bedrock is located approximately close to the surface based on local well records. There are no sources of methane at the surface of the Site.

5.2.10 Air Emissions

Regulatory control of air emissions in Ontario is the responsibility of the MOECC. According to the Environmental Protection Act (EPA), a Certificate of Approval (CofA) (Air) is required for the ongoing operation of any equipment that may discharge a contaminant into the natural environment if the equipment was installed, modified or altered after June 29th, 1988. Retroactive approval should be sought for equipment installed and unchanged between 1972 and June 29th, 1988 when the requirement for a CofA was added to the EPA. Unless explicitly exempted, most industrial processes or modifications to industrial processes and equipment require a CofA. The EPA provides a list of specific equipment and conditions, which are exempt from CofA (Air) requirements (i.e. fuel burning equipment for comfort heating in a building using natural gas or number 2 fuel oil at a rate of less than 1.5 million British Thermal Units per hour [BTU/hour]).

No air emissions concerns were identified at the time of the site visit.

5.2.11 Odours

No strong odours were detected during the site visit.

5.2.12 Noise

No excessive noise was detected during the site visit.

5.2.13 Special Attention Items, Hazardous Building Materials and Designated Substances

5.2.13.1 Asbestos

Asbestos-containing materials (ACMs) are fibrous hydrated silicates, and can be found in building materials as either "unbound" or "bound" asbestos. Friable asbestos refers to materials where the asbestos fibres can be separated from the material with which it is associated. Non-Friable asbestos refers to asbestos, which is associated with a binding agent (such as tar or cement). Friable asbestos is commonly found in boiler and pipe insulation. Non-Friable asbestos is typically found in roofing tars, floor and ceiling tiles, and asbestos-containing cement.

ACMs in the workplace are defined as a Designated Substance under the Ontario Occupational Health and Safety Act (OHSA). Under OHSA, persons in the workplace are required to be notified of the presence of ACMs once they are suspected to be present, and if there is a potential for workers to be exposed. The use of ACMs was discontinued in Canada in the late 1970s/early 1980s, although non-friable asbestos can still be found in recently constructed buildings.

Based on the age of the building at the Site (constructed mid-late 1990's), it is EXP's opinion that it is unlikely for ACMs to be present within the Site building. EXP did not conduct any sampling for asbestos during the site reconnaissance.

5.2.13.2 Lead

Lead has frequently been used in oil-based paints, roofing materials, cornices, tank linings, electrical conduits and soft solders for tinplate and plumbing. The use of lead based paints (LBPs) was phased out circa 1976. Paint that was produced or used between 1976 and 1980 may contain small amounts of lead. Paint that was produced or used prior to 1950 may contain high levels of lead. The main concern regarding lead paint is its potential to become lead dust or chips either through deterioration and/or mechanical means (i.e., sanding, abrasion, etc.). Exposure to lead dust or chips occurs by ingestion or inhalation.

Based on the age of the building at the Site (constructed mid-late 1990's), it is EXP's opinion that it is unlikely for LBPs to be contained within the Site buildings. The painted surfaces noted during EXP's site visit were observed to be in good condition.

5.2.13.3 Mercury

Mercury could be found in some batteries, light bulbs, old paints, thermostats, old mirrors, etc. Based on an investigation by Consumer and Corporate Affairs Canada, and an assessment of potential health risks by Health and Welfare Canada, in 1991 the decision was made to eliminate the use of mercury compounds in indoor latex paints. The Canadian Paint and Coatings Association (CPCA) supported the withdrawal and all Canadian manufacturers and formulators of the preservative voluntarily agreed to remove "interior uses" from their product labels.

Mercury containing equipment was not observed during the Site visit. Based on the age of the building (constructed mid-late 1990's), it is unlikely for mercury containing paints to be present at the Site.

5.2.13.4 Polychlorinated Biphenyls (PCBs)

The manufacture of PCBs in North America was prohibited under the Toxic Substances Control Act (1977). Their use as a constituent of new products manufactured in or imported into Canada was prohibited by regulations in 1977 and 1980. As such, sites developed or significantly renovated after 1980 are unlikely to have PCBs-containing equipment on the Site. Potential equipment, which could contain PCBs include fluorescent mercury and sodium vapour light ballasts, oil filled capacitors and transformers. Any electrical equipment containing PCBs must be disposed in accordance with Ontario Regulation 362 when it is removed from service. Ongoing operation of equipment containing PCBs is permissible.

A review of the Site was conducted to evaluate the potential presence of PCBs-containing equipment in use or stored at the Site.

Potential sources of PCBs were not observed during the Site visit.

5.2.13.5 Urea Formaldehyde Foam Insulation

Formaldehyde is a pungent, colourless gas commonly used in water solution as a preservative and disinfectant. It is also a basis for major plastics, including durable adhesives. It occurs naturally in the human body and in the outdoor environment. Formaldehyde is used to bond plywood, particleboard, carpets and fabrics, and it contributes to "that new house smell."

Formaldehyde is also a by-product of combustion; it is found in tobacco smoke, vehicle exhaust and the fumes from furnaces, fireplaces and wood stoves. While small amounts of formaldehyde are harmless, it is an irritating and toxic gas in significant concentrations. Symptoms of overexposure to formaldehyde include irritation to eyes, nose and throat; persistent cough and respiratory distress; skin irritation; nausea; headache; and dizziness.

Urea-formaldehyde foam insulation (UFFI) was developed in Europe in the 1950s as an improved means of insulating difficult-to-reach cavities in the walls. It is typically made at a construction site from a mixture of urea-formaldehyde resin, a foaming agent and compressed air. When the mixture is injected into the wall, urea and formaldehyde unite and "cure" into an insulating foam plastic.

During the 1970s, when concerns about energy efficiency led to efforts to improve building insulation in Canada, UFFI became an important insulation product for existing buildings. Most installations occurred between 1977 and the further use of UFFI was banned in Canada in 1980.

No evidence of UFFI was observed during the site visit.

5.2.13.6 Radon

Radon is a colourless, odourless, radioactive gas that occurs naturally in the environment. It comes from the natural breakdown of uranium in soils and rocks. Exposure to high levels of radon increases the risk of developing lung cancer. This relationship has prompted concern that radon levels in some Canadian buildings may pose a health risk. Radon gas can move through small spaces in the soil and rock and seep into a building through cracks in concrete, sumps, joints and basement drains. Concrete-block walls are particularly porous to radon and radon trapped in water from wells can be released into the air when the water is used.

Due to the potential health concerns associated with radon, Health Canada released a guideline in June 2007 for a maximum acceptable level of radon gas of 200 Becquerel's per cubic metre (Bq/m³). Where radon gas is present and the annual radon concentration exceeds 200 Bq/m³ in the normal occupancy area, Health Canada recommends taking the necessary actions to reduce radon levels.

Based on local well records and geologic investigations, the bedrock underlying the Site is sandstone. Based on the rock type, radon gas is not considered a concern.

5.2.13.7 Mould

Mould is found in the natural environment and is required for the breakdown of plant debris such as leaves and wood. Mould spores are found in the air in both the indoor and outdoor environments. In order for mould to grow it requires a food source (i.e. gypsum wallboard, wallpaper, wood, etc.) combined with moist conditions. Mould can have an impact on human health depending on the species and concentration of the airborne mould spores. Health effects can include allergies and mucous membrane irritation.

Currently there are no regulations governing mould; however, there are several guidelines addressing mould assessments and abatement. At the moment, the industry standards include the Canadian Construction Association (CCA) document 82-2004 titled "mould guidelines for the Canadian construction industry" and the Environmental Abatement Council of Ontario (EACO) guidelines titled "EACO Mould Abatement Guidelines, Edition 2 (2010)."

It is important to note that the Ministry of Labour (MOL) has governed protecting workers under the Occupational Health and Safety Act, which states that employers are required to take every precaution reasonable to protect their workers. This includes protecting workers from mould within workplace buildings.

No suspect mould was observed during the site visit.

5.2.13.8 Other Substances

No other special attention substances (such as acrylonitrile or isocyanates) were suspected to be present at the Site at the time of this Phase One ESA.

5.2.14 Processing and Manufacturing Operations

No processing or manufacturing operations were observed or reported to have been conducted at the Site.

5.2.15 Hazardous Materials Use and Storage

No hazardous materials are used or stored at the Site.

5.2.16 Vehicle and Equipment Maintenance Areas

Vehicle and equipment maintenance areas were not observed at the Site.

5.2.17 Oil/Water Separators

No oil water separators are present at the Site.

5.2.18 Sewage and Wastewater Disposal

Sewage generated at the Site is handled by the private septic system. No other wastewater is generated at the Site.

5.2.19 Solid Waste Generation, Storage & Disposal

Solid wastes generated at the Site are limited to household wastes and are picked up on a weekly basis through municipal services.

5.2.20 Liquid Waste Generation, Storage & Disposal

Liquid wastes generated at the Site are limited to household liquid wastes.

5.2.21 Unidentified Substances

No unidentified substances were observed on the Site at the time of the Site visit. No dumping or any other deleterious materials were identified.

5.2.22 Hydraulic Lift Equipment

No hydraulic equipment was observed the Site.

5.2.23 Mechanical Equipment

No mechanical equipment of concern was present on the Site.

5.2.24 Abandoned and Existing Wells

A private drinking water well is located on the north side of the Site building. Mr. Houssari, reported that he has never had any issues with the well.

5.2.25 Roads, Parking Facilities and Right of Ways

Access to the Site is via Second Line Road.

5.3 Adjacent and Surrounding Properties

A visual inspection of the adjacent properties and properties within 250 m of the site was conducted from publicly accessible areas to identify the occupants and document the uses and sources of potential environmental concerns that may impact the Site. Refer to Figure 2 in Appendix B for the adjacent land uses.

The following land uses border the subject property:

- North: Residential;
- East: Utility Corridor (hydro) then residential;
- West: Wetlands; and,
- South: Residential.

The neighbouring properties are not considered to have caused any environmental concern to the Site.

5.4 Summary of Site Reconnaissance

Based on the site reconnaissance of the Phase One ESA, the AST located at the Site is a PCA (PCA#28 – Gasoline and Associated Products Stored in Fixed Tanks). Based on the historic use of heating oil at the Site and shallow soils present in the area this is considered an APEC.

6. Phase One ESA Conceptual Site Model

6.1 Current and Past Uses

Based on a review chain of title information, air photos, and other records, the Site had been developed as residential since the late 1990's.

6.2 Summary of Potentially Contaminating Activities

As per Ontario Regulation (O.Reg.) 153/04, a Potential Contaminating Activity (PCA) is defined as one of fifty-nine (59) industrial operations set out in Table 2 of Schedule D that occurs or has occurred in a Phase One study area. The following PCAs were identified:

- PCA1 – Current On-Site heating oil AST located along north side of the basement. (PCA#28 – Gasoline and Associated Products Stored in Fixed Tanks).

No potentially contaminating activities that took place within the vicinity of the Site (approximately 250 m radius) were identified.

6.3 Areas of Potential Environmental Concern

As a result of the PCAs, the report identified the following APECs at the Site:

- APEC 1 – (central eastern part of Site) Contaminated soil. This APEC is associated with PCA1. The PCOCs include PHC and BTEX.

It is noted that any significant uncertainty or absence of information has the ability to affect the Phase One Conceptual Site Model. However, based on the information and findings presented within the Phase One ESA, it is EXP's opinion that any uncertainty would be minimal, and it would not alter the validity of the model presented above.

6.4 Site Characteristics

In order to develop a conceptual model for the subject Site and surrounding study area, the following physical characteristics and pathways were considered. A conceptual site model showing the inferred groundwater flow direction and general site is shown in Figure 3 in Appendix B.

6.4.1 Subsurface Stratigraphy

The bedrock in the general area is sandstone at a depth of approximately 0.3 - 2 m. Granite was also observed at a depth of 30-35 m. With respect to surficial geology, beneath any fill, the site is underlain by Paleozoic Sandstone bedrock.

6.4.2 Estimated Groundwater Flow Direction

Topographically, the Site relatively flat with a slight downwards slope towards the northeast. Regional groundwater flow direction is to be in the eastern direction towards the Rideau River.

6.4.3 Underground Utilities

Currently, the underground utilities at the Site include water and sewage (septic tank and bed) and electricity/telephone.

7. Findings and Recommendations

Based on the results of the Phase One ESA completed at 1158 Second Line Road in Ottawa, EXP has identified the following areas of potential environmental concern:

Table 5: Areas of Potential Environmental Concern

Area of Potential Environmental Concern (APEC)	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)	Location of PCA (On-Site or Off-Site)	Contaminants of Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
1. Potential On-Site contamination from a historic AST located at 1158 Second Line Road	North side of residence	#28: Gasoline and Associated Products Storage in Fixed Tanks	On-Site	Petroleum Hydrocarbons (PHCs), Benzene, Toluene, Ethylbenzene and Xylene (BTEX)	Soil

Based on the findings of the Phase One ESA, a Phase Two ESA is required to assess the soil conditions at the Site.

The AST located in the basement was observed to be in good condition with no staining or odours and no records of spills. Therefore, it is recommended that a sample of soil at the ground surface, beneath the vent and fill pipes be obtained and analyzed for the above contaminants of concern. The vent and fill pipes represent the worst-case scenario as they would be the location where spills or overfilling issues of the AST would occur. Groundwater contamination is not a concern.

8. References

1. AMEC Environment and Infrastructure; April 2013; *Clearance Letter for March Landfill, Development of 1158 Second Line Road.*
2. Canadian Standards Association; November 2001; *Z768-0 Phase I Environmental Site Assessment.*
3. CJB Environmental Inc.; September 2013; *1158 Second Line Road, Ottawa, Ontario – Environmental Impact Assessment and Tree Conservation Report. Phase I Environmental Site Assessment.*
4. Dubreuil, L. and C. Woods; 2002; *Catalogue of Canadian Fire Insurance Plans, 1875 – 1975.*
5. Department of Energy Mines and Resources, Surveys and Mapping Branch; 1976; *Ottawa Map 31 G/5, Scale 1:50,000.*
6. EXP Services Inc.; October 2016; *Phase I Environmental Site Assessment – 1158 Second Line Road, Ottawa, Ontario.*
- 7.
8. Geological Survey of Canada; 1982; *Generalized Bedrock Geology – Ottawa-Hull, Ontario-Quebec: Map 1508A. Scale 1:50,000.*
9. Geological Survey of Canada; 1976; *Surficial Geology – Ottawa, Ontario: Map 1507A. Scale 1:50,000.*
10. Golder Associates Inc.; October 2004; *Old Landfill Management Strategy, City of Ottawa.*
11. Intera Technologies Ltd.; July 1998; *Mapping and Assessment of Former Industrial Sites, City of Ottawa.*
12. Ministry of Labour (MOL); *Occupational Health and Safety Act.*
13. Ontario Ministry of the Environment, *Environmental Registry website* (www.ene.gov.on.ca/envision/env_reg/ebr/english/index.htm)
14. Ontario Ministry of the Environment; 1993- 2003-2004; *Ontario Inventory of PCB Storage Sites.*
15. Ontario Ministry of the Environment; *Brownfields Registry website* (www.ene.gov.on.ca/envirnet/BESR/index.htm)
16. Ontario Ministry of the Environment; *Hazardous Waste Information Network website* (www.hwin.ca).
17. Ontario Ministry of the Environment; November 1988; *Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario.*
18. Ontario Ministry of the Environment, Waste Management Branch; June 1991; *Waste Disposal Site Inventory.*
19. Ontario Ministry of the Environment and Intera Technologies Ltd.; June 1991; *Inventory of Coal Gasification Plant Waste Sites in Ontario;*
20. Ontario Ministry of Natural Resources, Natural Heritage website (www.mnr.gov.on.ca/MNR/nhic/areas.cfm).

21. Technical Standards and Safety Authority; May 2007; *Environmental Management Protocol for Fuel Handling Sites in Ontario.*
22. The Archaeologist Inc.; September 2013; *Stage 1 and 2 Archaeological Assessment for 1158 Second Line Road, Part of Lot 11, Concession 3, Registered Plan 5R-1715 – Parts 1 & 2 and Plan 5R-2564 – Parts 1 & 2 Geographic Township of March, Ottawa, Ontario.*

9. Scope of Report, and Third Party Reliance

Basis of Report

This report ("Report") is based on site conditions known or inferred by the investigation undertaken as of the date of the Report. Should changes occur which potentially impact the condition of the site the recommendations of EXP may require re-evaluation.

Reliance on Information Provided

The evaluation and conclusions contained in the Report are based on conditions in evidence at the time of site inspections and information provided to EXP by Theberge Homes Ltd. The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose as communicated by Theberge Homes Ltd. EXP has relied in good faith upon such representations, information and instructions and accepts no responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of any misstatements, omissions, misrepresentation or fraudulent acts of persons providing information. Unless specifically stated otherwise, the applicability and reliability of the findings, recommendations, suggestions or opinions expressed in the Report are only valid to the extent that there has been no material alteration to or variation from any of the information provided to exp. If new information about the environmental conditions at the Site is found, the information should be provided to EXP so that it can be reviewed and revisions to the conclusions and/or recommendations can be made, if warranted.

Standard of Care

The Report has been prepared in a manner consistent with the degree of care and skill exercised by engineering consultants currently practicing under similar circumstances and locale and in accordance with the MOE Reg. 511 standard. No other warranty, expressed or implied, is made. Unless specifically stated otherwise, the Report does not contain environmental consulting advice.

Complete Report

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment form part of the Report. This material includes, but is not limited to, the terms of reference given to EXP by Theberge Homes Ltd., communications between EXP and Theberge Homes Ltd., other reports, proposals or documents prepared by EXP for Theberge Homes Ltd. in connection with the site described in the Report. In order to properly understand the suggestions, recommendations and opinions expressed in the Report, reference must be made to the Report in its entirety. EXP is not responsible for use by any party of portions of the Report.

Use of Report

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of Theberge Homes Ltd.. No other party may use or rely upon the Report in whole or in part without the written consent of EXP. Any use of the Report, or any portion of the Report, by a third party are the sole responsibility of such third party. EXP is not responsible for damages suffered by any third party resulting from unauthorised use of the Report.

Report Format

Where EXP has submitted both electronic file and a hard copy of the Report, or any document forming part of the Report, only the signed and sealed hard copy shall be the original documents for record and working purposes. In the event of a dispute or discrepancy, the hard copy shall govern. Electronic files transmitted by EXP utilize specific software and hardware systems. EXP makes no representation about the compatibility of these files with Theberge Homes Ltd. current or future software and hardware systems. Regardless of format, the documents described herein are EXP's instruments of professional service and shall not be altered without the written consent of EXP.

We trust this report satisfies your immediate requirements. If you have any questions regarding the information in this report, please do not hesitate to contact this office.

EXP Services Inc.

*Theberge Homes Ltd.
Phase One Environmental Site Assessment
1158 Second Line Road, Ottawa, Ontario
OTT-00245054-A0
March 2, 2018*

Appendices



EXP Services Inc.

*Theberge Homes Ltd.
Phase One Environmental Site Assessment
1158 Second Line Road, Ottawa, Ontario
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March 2, 2018*

Appendix A: Qualifications of Assessors



Qualifications of Assessors

EXP provides a full range of environmental services through a full-time Environmental Services Group. EXP's Earth and Environment Group has developed a strong working relationship with clients in both the private and public sectors and has developed a positive relationship with Ontario Ministry of the Environment. Personnel in the numerous branch offices form part of a large network of full-time dedicated environmental professionals in the EXP organization.

Matthew Laneville, B.A., has 11 years of experience in the environmental consulting field. Technical undertakings have included: project coordination; Phase I Environmental Site Assessments; ground water monitoring, environmental sampling and data evaluation; and technical report preparation.

Mark McCalla, P.Geo., is a senior Environmental Scientist with EXP who has 27 years of experience in the environmental consulting field. His technical undertakings have including work in the following fields: Phase I and II Environmental Site Assessments; Site Specific Risk Assessments; Petroleum and chlorinated hydrocarbon contaminated sites; Soil and groundwater remediation technologies; Hydrogeological, Terrain Analysis and Aggregate Assessments; Preparation of Ontario Ministry of Environment Certificate of Approvals and Records of Site Condition. Mr. McCalla is a Qualified Person for completing Phase I and II Environmental Site Assessments as per O.Reg 153/04

EXP Services Inc.

*Theberge Homes Ltd.
Phase One Environmental Site Assessment
1158 Second Line Road, Ottawa, Ontario
OTT-00245054-A0
March 2, 2018*

Appendix B: Figures





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