

UPDATE TO PHASE I ENVIRONMENTAL SITE ASSESSMENT
613 Helena Street, Fort Erie, Ontario

Prepared for:

SS Welland Inc.

4080 Confederation Parkway, Unit 605
Mississauga, Ontario, L5B 0G1

Prepared by:



Project No. 2100394AG

December 13, 2021



December 13, 2021

ProjectNo.:2100394AG2100394A

SS Welland Inc.

4080 Confederation Parkway,
Unit 605, Mississauga, ON
L5B 0G1

Attention: Mr. Hunain Siddiqui

Dear Mr. Siddiqui,

**Re: Update to Phase I Environmental Site Assessment
613 Helena Street, Fort Erie, ON.**

Please find the enclosed copy of the Phase I Environmental Site Assessment (ESA), in accordance with the Canadian Standards Association (CSA) Standard Z768-01 related to the above-noted site.

We trust you will find this report to be complete within our terms of reference. Should you have any questions regarding the information contained in the report, or require further assistance please contact the undersigned at HLV2K's office.

For and on behalf of HLV2K Engineering Limited.

A handwritten signature in black ink, appearing to read "John Lametti", written in a cursive style.

John (Gianni) Lametti, QP_{ESA}, P.Eng.
Principal & Environmental Manager

1 EXECUTIVE SUMMARY

HLV2K Engineering Limited (HLV2K) was retained by SS Welland Inc. (hereinafter referred to as the Client) to conduct a Phase I Environmental Site Assessment (ESA) Update report for the property located at 613 Helena Street, Fort Erie, Ontario (hereinafter referred to as the site and Phase I Property). The Phase I Property is situated mainly in a forested area with some residential properties. The site is currently occupied by a two-storey residential dwelling and associated garage, a two-storey barn and two storage buildings. The western portion of the Phase I Property is occupied by a forested area. The Phase I property is in agricultural or other use operating as a horse boarding facility.

The scope of this review generally conforms to the current requirements outlined by Canadian Standards Association (CSA) Standard Z768-01 for Phase I ESA. The Phase I ESA was conducted for due diligence purposes. The client indicated that a Phase I ESA meeting the CSA Z768-01 requirements was sufficient for their requirements.

The purpose of this report is to update the findings of a previous Phase I report (TG171150 and January 19, 2017) and to discover the potential environmental liability of the site for the residential development of the property. The Phase I ESA does not include physical sampling or testing and is based solely on visual observations and a review of available or supplied factual data.

Commission and Brief	
Client	SS Welland Inc.
Commission	Canadian Standards Association (CSA) Standard Z768-01, for Phase I Environmental Site Assessments
Purpose	To review the potential environmental liabilities for residential development purposes.
Phase I Property and Study Area	
Phase I Property	The Phase I Property is located at 613 Helena Street, Fort Erie, Ontario.
Study Area	The total area of the property is 11.52 acres (4.66 ha), and it is rectangular. The footprint of the site buildings is around 1,000 square meters (10,764 square feet).
Current Land Use and Description	The current land use is agricultural or other use. There are two-storey residential dwellings and associated garage, a two-storey barn, and two storage buildings. The western portion of the site is occupied by a forested area.
Records Review	
Historical Records Review	Chain of Title Search; Fire Insurance Plans; Illustrated atlases; Topographical, Physiography and Geological Maps; Aerial photographs (Historical and Present); Government Records for Spills, Notices, and any available environmental databases including but not limited to Water Well Information; Waste disposal Sites; Waste Generator and Receiver Information, Inventory of PCB Sites, Private & Retail Fuel Storage Tanks (TSSA); Well Head Protection Areas and Areas of Natural Significance.
Critical Findings	Based upon the Historical Records Review, there is a possible impact from the Phase I Property and surrounding properties. <ul style="list-style-type: none"> • For agricultural purposes, Pesticides are believed to have been used on the site in the past. Pesticides and herbicides have traditionally been stored and used for agriculture purposes. • Lead, arsenic, and previous generation organochlorine pesticides are frequently connected with past agricultural spraying and may persist in the soil at low levels.

	<ul style="list-style-type: none"> • The barn is located on the south side of the structure, tractors, lawnmowers, other agricultural equipment, and multiple jerry cans of fuel are stored. Strong petroleum/diesel odours were also detected in this area. • Staining on the concrete floor was noted beneath the tractor. • fluorescent light ballasts containing mercury and cadmium may still be present at the Site, based on the age of construction of the site buildings (i.e., before 1934 and the mid-1970s to early 1990s).
<p>Previous Reports</p>	<p>“ESA Phase I Report – 613 Helena Street, Fort Erie, ON, L5B 0G1” dated January 19, 2017 prepared by Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited</p> <ul style="list-style-type: none"> • Amec Foster Wheeler conducted a Phase I ESA on the property at 613 Helena Street, Fort Erie, in 2017. • During the time of their investigation, A two-story residential dwelling and garage, a two-story barn, and two storage structures are now on the site (Site buildings). This site is used for agricultural (horse farm) and residential purposes. • Amec Foster Wheeler concluded for agricultural purposes; Pesticides are believed to have been used on the site in the past. Lead, arsenic, and previous generation organochlorine pesticides are frequently connected with past agricultural spraying and may persist in the soil at low levels. • The barn is located on the south side of the structure, where several jerry cans of fuel were found in the storage space. In the same space tractors, lawnmowers, other agricultural equipment, and multiple jerry cans of fuel are stored. Strong petroleum/diesel odours were also detected in this area. Under the tractor found stain as well. • Asbestos-containing materials (ACMs), lead-containing paints (LCPs), and polychlorinated biphenyl (PCB) containing fluorescent light ballasts may be present at the site, based on the age of construction of the site buildings (i.e., before 1934 and the mid-1970s to early 1990s). • They recommended further investigations be carried out.
<p>Aerial Photographs</p>	<p>Detailed assessment regarding the nature of the development of the Phase I Property was made via aerial photography from 1934 to 2021.</p> <ul style="list-style-type: none"> • The aerial photographs show the Phase I Property and surrounding areas as mainly residential, undeveloped land, and agricultural fields until sometime between 1934 to 1954. • The phase I property surrounding area was gradually developed in residential between 1954 to 2021. South of the site and south of the Washington road developed in 1954, and in 2021, more residential development occurred south and north of the site. • The Phase I Property was further developed between 1989 and 1994, where it seems to be similar to the current operations (barn, two storage buildings were added). • The surrounding areas continue to be developed throughout the years with more residential properties visible.

Geologic and Topographic Maps	<p>The ground surface elevation of the site is approximately 181 m above sea level (ASL), and it is generally flat land. The surrounding land slopes towards the south.</p> <p>The soils of the Phase I property are comprised of mainly glacial deposits of silt and clay.</p> <p>The bedrock depth is inferred to be approximately greater than 5 m below ground surface (m bgs) according to the Well Record Map of Ontario.</p>	
Hydrogeology	<p>The groundwater table lies approximately 1 to 2 meters below ground surface (m bgs).</p> <p>Groundwater flow direction at the site is inferred to be from north to south towards Lake Erie.</p> <p>The surficial soils of the Phase I Property consist of silty clay to clayey silt.</p>	
Interview		
Interviewee:	Parameters	Information
	Interviewee	Son of former owner property (Mr. Mike Bennett)
	Interviewer	Mr. Irfan Khohkar
	Interview Type	In-person interview
	Interview Date	July 20, 2021
	Climate Conditions	Cool at 2 degrees C and grounds were snow-free
	Duration	1 hour
	Interview Details	<p>1. What is the current use of the site / describe land use history? Horse farm, Agricultural / Residential</p> <p>2. Are you aware of any environmental issues associated with the subject property such as disposal, landfilling, chemical and/ or storage (including spills), above or underground storage tanks, MOE, orders etc.? None</p> <p>3. Are you aware of any environmental building management issues such as asbestos-containing materials, PCBs in electrical equipment, odour, mould, indoor air quality, UFFI, ODSs, lead-based paints etc.? No.</p> <p>4. Are you aware of any site-specific permits, waste generator number(S), certificate of approval, water well records or sewer use/ discharge permits? No.</p> <p>5. Is there a potable water well onsite? Yes, next to the house.</p> <p>6. Do you do any equipment repairs onsite for your tractors and other farm implements? Done offsite.</p> <p>7. Is there a septic system onsite? Yes. Where is it? On the south side of the house.</p> <p>8. How do you dispose of wastes domestic or otherwise. Garbage pick-up once per week and special pick-up for hazardous materials such paint etc.</p>

	<p>Evaluation of Interview</p>	<p>Information from the interview generally matched our records search with no deviations noted. No material change has taken place and the information from the interview is currently valid.</p>
Site Reconnaissance		
<p>Irfan Khokhar Date: July 20, 2021</p>	<p>The most notable observations were:</p> <ul style="list-style-type: none"> • The property is an agricultural farm with a two-storey residential building, garage, a two-storey barn, and two storage structures on-site • The site was built before 1934. • The site appeared to be well maintained except for the barn. • The barn housed a tractor, a lawnmower, and other types of farm equipment and strong odours of diesel or petroleum were noted. • Some staining was evident under the tractor. • There are no ASTs and USTs at the site. • Several empty drums were observed around the property. 	
Evaluation		
<p>Potential Contaminating Activity</p>	<p>Based upon the assessment, there are possible impacts from the Phase I Property and properties surrounding the Phase I Property. From the historical assessment and site visit, there are potential impacts from:</p> <ul style="list-style-type: none"> • On-site potential pesticide and herbicide use (PCA 40) • On-site hydraulic equipment (PCA 28) • On-site strong odours of petroleum or diesel in the barn (PCA 28) • Potential spill under the tractor on-site (PCA other – Spill) 	
<p>Uncertainty/ Absence of Information</p>	<p>Information that was requested was received with the exception of the Freedom of Information (FOI). It is unlikely that the FOI will change the conclusion of the report, however, should new information be found then this report will be amended.</p>	
Conclusions and Recommendations		
<p>Conclusions</p>	<p>The Phase I Property is located on 613 Helena Street, Fort Erie, Ontario in an agricultural and/ or other area. A two-story residential dwelling and garage, a two-story barn, and two storage structures are now on the site.</p> <p>Based on the available evidence, it appears that the site was constructed before 1934 for residential and agricultural land use till the present. According to the Aerial photography evidence, the presumed residential structure in the southwest corner of the site was built before 1934. Between the mid-1970s and the early-1990s, the barn and storage buildings were built.</p> <p>From the site visit and the historical review, there are a number of potentially contaminating activities on and surrounding the site including:</p> <ul style="list-style-type: none"> • For agricultural purposes, Pesticides are believed to have been used on the site in the past. Pesticides and herbicides have traditionally been stored and used in agriculture techniques. • Lead, arsenic, and previous generation organochlorine pesticides are frequently 	

	<p>connected with past agricultural spraying and may persist in the soil at low levels.</p> <ul style="list-style-type: none"> • The barn is located on the south side of the structure, tractors, lawnmowers, other agricultural equipment, and multiple jerry cans of fuel are stored. Strong petroleum/diesel odours were also detected in this area. • Under the tractor found stain as well. • fluorescent light ballasts may be present at the Site, based on the age of construction of the Site buildings (i.e., before 1934 and the mid-1970s to early 1990s). <p>Based on a review of the available information sources, the Site lies in an area of mixed residential, agricultural, and vacant land use. The surrounding properties of the Site were generally developed for agricultural land use prior to 1934 and residential land beginning between 1934 and 1954 into the mid to late 1980s. Prior to development, these properties appeared to be in agricultural use.</p> <p>At the time of site visit in July 2021, no material change has taken place since the last Phase I ESA report by Amec Foster Wheeler (report date January 19, 2017)</p>
Recommendations	Based on the conclusions for the potential of contaminants entering the Phase I Property, it is recommended that a limited Phase II ESA be carried out.
Limitations	The Client may use the findings in this report for these purposes subject to the <i>Statement of Limitations</i> , which forms an integral part of this document. No other third parties are entitled to rely upon this report without the express written consent of HLV2K Engineering Limited. Any use, which a third party makes of this report, is the sole responsibility of the said third party; HLV2K Engineering Limited accepts no responsibility for any damages.

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2 INTRODUCTION

HLV2K Engineering Limited (HLV2K) was retained by SS Welland Inc. (hereinafter referred to as the Client) to conduct a Phase I Environmental Site Assessment (ESA) report for the property located at 613 Helena Street, Fort Erie, Ontario (hereinafter referred to as the site and Phase I Property). The Phase I Property is situated mainly in a forested area with some residential properties. The site is currently occupied by a two-storey residential dwelling and associated garage, a two-storey barn and two storage buildings. The western portion of the Phase I Property is occupied by a forested area. The Phase I property is in agricultural or other use and is currently operating as a horse boarding facility.

The scope of this review generally conforms to the current requirements outlined by Canadian Standards Association (CSA) Standard Z768-01 for Phase I ESA. The Phase I ESA was conducted for due diligence purposes. The client indicated that a Phase I ESA meeting the CSA Z768-01 requirements was sufficient for their requirements.

2.1 Purpose

The current land use of the Phase I Property is currently residential and has been used for agricultural purposes for many years. The purpose of this report is to update the findings of a previous Phase I report (Report No. TG171150 dated January 19, 2017) and assess the potential environmental liability of the site for the development of the property into residential use. The Phase I ESA does not include physical sampling or testing and is based solely on visual observations and a review of available or supplied factual data and its interpretation of that data.

2.2 Scope of Work

The Update to Phase I ESA scope of the investigation is presented in the following **Table 1**.

Table 1: Update to Phase I ESA Scope of Investigation

Parameters	Information
Regulation/ Guideline used for Phase I ESA	The scope of this review generally conforms to the current requirements outlined by Canadian Standards Association (CSA) Standard Z768-01, for Phase I Environmental Site Assessments.
Records Review	The records review for the Phase I Property and the Phase I study area (A minimum 250-meter (m) zone around the property boundaries) will include a review and interpretation of Fire Insurance Plans, Aerial Photographs Historical and Current, Topographical, Physiography, and Geological Maps, Previous Phase One ESA, Phase Two ESA and Geotechnical Reports if available, Well Head Protection Areas, Areas of Natural and Scientific Interest (ANSI) maintained by MNR, Water Well Information System, Permits to Take Water, Waste Disposal, Sites, Waste Generator and Receiver Information (Ontario Regulation 347), Private & Retail Fuel Storage Tanks (TSSA), Coal Gasification Plants and Coal Tar and Related Tar Industries, Certificates of Approval, Environmental Compliance Reports, Orders, Spills, Notices, Offences or Inspection Reports by the MECP, Inventory of PCB Storage Sites, RSC on adjoining property, Certificates of Property Use, National Pollution Release Inventory (NPRI), National PCB Inventory and all other available illustrated atlases, land registry records and government records.

Parameters	Information
	<p>A Freedom of Information (FOI) request was ordered to the Ministry of the Environment, Conservation and Parks (MECP) for a record search in relation to any reportable spills, orders, and convictions associated with the Phase I Property.</p> <p>EcoLog Environmental Risk Information Service (ERIS) was obtained for a search in all available environmental databases, which included but not limited to the following databases:</p> <ul style="list-style-type: none"> • National Pollutant Release Inventory (NPRI); • PCB information: Environmental Approvals, permits and certificates. • Inventory of coal gas plants; Records concerning environmental incidents. • Waste management records including Ontario Regulation 347 Waste Generators. • Fuel storage tanks information including Technical Standards and Safety Authority (TSSA) database. • Landfill information; and, • Records of Site Condition.
Interviews	Interview with the knowledgeable person for the Phase I Property.
Site Reconnaissance	The site reconnaissance consisted of a walk-through of the Phase I Property and the Phase I Study Area, including a visual inspection of the current land use for the purpose of validating the current and past land uses of Phase I Property that will be identified by the historical searches. The visual inspection of the property was also used to identify the potential presence of staining and distressed vegetation on the ground surface.
Evaluation	The information gathered from the records review, interview, and site reconnaissance were reviewed and evaluated for any Potentially Contaminating Activities.
Reporting	Preparation of a Phase I ESA Report, which summarizes the findings and provides recommendations for further investigation (if necessary).

3 SITE DESCRIPTION

3.1 Site Location and Occupancy

A summary of the Phase I Property Information and the contact information of the owner are provided in the following **Table 2** and **Table 3**.

The location of the Phase I Property is presented in **Drawing 1**.

Table 2: Phase I Property Information – Authorization and Regulation

Parameters	Information
Work Authorization	Authorization to proceed with the update to Phase I ESA was received on June 14, 2021.
Purpose of Phase I ESA	To review the potential environmental liabilities for residential development purposes.
Regulation/Guideline used for Phase I ESA	The scope of this review generally conforms to the current requirements outlined by Canadian Standards Association (CSA) Standard Z768-01, for Phase I Environmental Site Assessments.
Sampling and Testing	The Phase I ESA does not include any quantifying, sampling, or testing of soil, groundwater, or building materials (if present) on the Phase I Property. This report discusses designated substances and hazardous materials normally reviewed as part of a Phase I ESA including asbestos-containing materials (ACM's), lead, mercury, ozone-depleting, substances (ODS), polychlorinated biphenyls (PCBs) and mould, the review was performed at a cursory level and for the site. Such analysis would be carried out in a Phase II ESA or a designated hazardous building materials survey if warranted.
Reliance of Report	The findings in this report may be used and relied upon by the Client. No other third parties are entitled to rely upon this report without the express written consent of HLV2K Engineering Limited. Any use that a third party makes of this report is the sole responsibility of the said third party; HLV2K Engineering Limited accepts no responsibility for any damages.

Table 3: Phase I Property Information – Location and Legal Description

Parameters	Information
Location/ Address	613 Helena Street, Fort Erie, Ontario. Drawing 1: Site Location Plan
Property Identification Numbers (PINs)	PIN # 64470-0131 (LT)
Legal Description	PT LT 1 CON 2 LAKE ERIE BERTIE BEING PART 1, 59R15248
Shape	The Phase I Property is a rectangular-shaped land parcel covering an approximate area of 11.52 acres (4.66 ha).
Access to the Phase I Property	Access to Phase I Property is from Helena Street.
Occupancy	Residential and Agricultural
Current Land Use	Agricultural or other
Proposed Future Land Use	Residential
Phase I Property Owner	SS Welland Inc. 4080 Confederation Parkway, Unit 605

Parameters	Information
	Mississauga, ON L5B 0G1
Phase I Property Contact	Mr. Hunain Siddiqui Hunain.siddiqui@thefourwalls.ca 647-405-2251

3.2 Site and Area Characteristics

The Phase I Property is situated in a residential/ forested area. The site is on the west side of Helena Street in Fort Erie, Ontario, north of the intersection of Helena Street and Washington Road (**Drawing 1**). The site is in a rural area with a mix of residential and agricultural land uses.

The current land use is agricultural or other use. There is a two-storey residential dwelling with an attached garage, a two-storey barn, and two storage buildings. The western portion of the site is a forested area. The site is used for agricultural and residential purposes.

The total site area is approximately 11.52 acres, and it is a rectangular-shaped property. The Site structures have a footprint of around 1,000 square meters (10,764 square feet).

During the site reconnaissance, the barn and the two storage buildings were evaluated. The residential dwelling and the garage were not accessible during the site visit. The residential building and garage were on the eastern side of the property, while the barn and two storage buildings were at the center of the site. Except for the driveway, the ground cover at the site was mainly grassy.

Incandescent lights were used to light the barn. There was no heat or air conditioning in the barn. An inground concrete exercise pool for the horses was in the western wing of the barn.

The earthen floor storage building to the north of the barn had a wooden and metal support structure with a canvas cover. This structure previously served as a hay storage space and, more recently, as a covered turnout place for the horses.

The earthen floor storage building south of the barn was made with a concrete block and wooden support structure, vertical metal siding, and a sloped metal roof.

A map of the current physical setting of the Phase I Property is provided in **Drawing 2**.

4 Adjacent Land Uses

The most updated uses of the adjacent properties are observed during the site reconnaissance and implemented with the records review, the present land use of the nearby properties from publicly accessible sites to determine any potential environmental impacts to the site from off-Site activities. Property in the general area surrounding the site is mixed residential, agricultural, and vacant land use.

The following are the properties that surround the Site:

North of the Phase I Property

North of the Site was residential and Vacant land use.

East of the Phase I Property

East of the Site was residential and Vacant land use.

South of the Phase I Property

South of the Site was residential and Vacant land use.

West of the Phase I Property

West of the Site was residential and Vacant land use.

Summary of the findings

In summary, based on the observations of the surrounding properties, no potentially contaminating activities were identified.

5 RECORDS REVIEW

5.1 Aerial Photographs

Aerial photographs provide a visual record of the physical conditions of the Phase I Property and Phase I Study Area. The aerial photographs are collected in five (5) to ten (10) year intervals based on availability to best assess the changes of the site. The first available aerial photographs were from 1934. The following aerial photographs were collected from Brock University (Brock) Map Library in St. Catharines, Ontario: 1934, 1954, 1965, 1972, 1989 and 1994. The following digital aerial photographs were collected from Niagara Navigator, for the years 2000, 2010, and 2015. The aerial photograph for 2021 was collected from Google Earth.

Copies of the aerial photographs are presented in **Appendix A**.

A summary of the development of the Phase I Property and Phase I Study Area, based on information from the aerial photographs, is presented in the following **Table 4**.

Table 4: Summary of Aerial Photographs

Year	Phase I Property	Phase I Study Area
1934	Phase I Property looks to be agricultural fields with a house at the eastern portion of the site.	The Phase I Study Area is mainly vacant land and agricultural fields.
1954	Phase I Property was similar to 1934.	The Phase I Study Area has increased residential development south of the site.
1965	The Phase I Property was similar to 1954.	The Phase I Study Area was similar to 1954.
1972	The Phase I Property was similar to 1965.	The Phase I Study Area was similar to 1965.
1989	The Phase I Property was similar to 1974. Barn building is present on the Site.	The Phase I Study Area was similar to 1974. More residential development can be seen south of the Site, south of Washington Road, and north of the Site along Helena Street.
1994	The Phase I Property was partly developed, there were two storage buildings added to the property.	The Phase I Study Area was similar to 1989.
2000	The Phase I Property was similar to 1994.	The Phase I Study Area was similar to 1994.

Year	Phase I Property	Phase I Study Area
2010	The Phase I Property was similar to 2000.	The Phase I Study Area was similar to 2000.
2015	The Phase I Property was similar to 2010.	The Phase I Study Area was similar to 2010.
2021	The Phase I Property was similar to 2015.	The Phase I Study Area was similar to 2015. Increased residential developments can be seen surrounding the site.

According to the observations made from the aerial photographs, the current Phase I Property has remained agricultural with a barn and storage buildings added throughout the years. The study area is mainly agricultural and residential. The first development on the site was before 1934.

5.2 Property Use Records

Based on the aerial photographs, it appears that the site was in agricultural and other use since 1934. The residential structure on the eastern portion of the site was built before 1934. Between the mid-1970s and the early-1990s, the barn and storage buildings were built.

The Site is in an area with a mix of residential, agricultural, and unoccupied land uses, according to accessible information sources. Before 1934, the neighbouring properties of the site were mostly used for agricultural activities, with residential properties being constructed between 1934 and 1954.

5.3 Fire Insurance Plans

No Fire Insurance Plans (FIPs) were available for the site or surrounding properties.

5.4 Previous Environmental and Geotechnical Reports

“ESA Phase I Report – 613 Helena Street, Fort Erie, ON, L2A 4K2” dated January 19, 2017, prepared by Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited

- Amec Foster Wheeler conducted a Phase I ESA on the property at 613 Helena Street, Fort Erie, in 2017.
- During the time of their investigation, A two-story residential dwelling and garage, a two-story barn, and two storage structures are now on the site. This site is used as an agricultural (horse farm) and for residential purposes.
- Amec Foster Wheeler concluded for agricultural purposes; Pesticides are believed to have been used on the site in the past. Lead, arsenic, and previous generation organochlorine pesticides are frequently connected with past agricultural spraying and may persist in the soil at low levels.
- The barn is located on the south side of the structure, where several jerry cans of fuel were found in the storage space. In the same space tractors, lawnmowers, other agricultural equipment, and multiple jerry cans of fuel are stored. Strong petroleum/diesel odours were also detected in this area. Under the tractor found stain as well.

- Asbestos-containing materials (ACMs), lead-containing paints (LCPs), and polychlorinated biphenyl (PCB) containing fluorescent light ballasts may be present at the site, based on the age of construction of the Site buildings (i.e., before 1934 and the mid-1970s to early 1990s).
- They recommended further investigations be carried out.

5.5 Company Records

A draft plan of subdivision is attached in **Appendix C** for the Phase I Property.

5.6 Geologic and Topographic Maps

A description of regional topography, physiography, hydrology, and geology in the Phase I study area is presented in the following **Table 5**.

Table 5: Summary of Topographical, Physiographical, Hydrological and Geological Condition

Parameters	Information Source	Description
Topography	Current Physical Setting Map (Drawing 2)	The ground surface elevation of the site is approximately 181 m above sea level (ASL), and it is generally flat land. The surrounding land slopes towards the south.
	Topographical Map (Drawing 3)	The soils of the Phase I property are mainly comprised of glacial deposits of silt and clay. The surrounding land slopes slightly towards the south.
Physiography	Physiography of Southern Ontario Map	The entire Phase I Property lies in the Haldimand Clay Plain physiographic region.
Hydrology	Topographical Map (Drawing 3)	The groundwater flow direction is inferred to be travelling south towards Lake Erie.
	Aerial Photographs (Appendix A)	The groundwater table is expected to be approximately 1 to 2 m below ground surface (bgs).
Geology	Quaternary Geology of Ontario Map 3062	The surficial soils of the Phase I Property consist of silty clay to clayey silt.
	Bedrock Geology of Ontario Map 2544	The bedrock depth is inferred to be approximately greater than 5 m below ground surface (m bgs) according to the Ontario Geological Survey Digital Map - Surficial geology of southern Ontario (OGS, 2010 and Freenstra (1984).
	Surficial Geology Map (Drawing 5)	

5.7 Freedom of Information (FOI)

A request was submitted to the MECP Freedom of Information (FOI) and Protection of Privacy Office (**Appendix D**) in order to determine if there were any environmental incidents or violations associated with the subject property. The FOI was requested in order to determine the following conditions:

- whether any Control Orders have been issued.
- whether there have been any other environmental concerns associated with the property such as complaints, inspections, etc.; and,
- whether any environmental investigations have been carried out regarding the subject property and to determine if Spills Action Centre (SAC)'s files contain any reported spills that have occurred at the subject site.

Note that the SAC's database dates back only to 1988 and many of the occurrences on file have only been reported voluntarily. In addition, MECP was requested to search their files from 1986 to the present regarding the following parameters:

- water, sewage, wastewater, and pesticides.

A response to the above-noted request was not received by this office at the time of the preparation of this report. Upon receipt, HLV2K will review the information and forward to the client any environmentally significant information under a separate cover letter.

5.8 Technical Standards and Safety Authority (TSSA)

The Technical Standards & Safety Authority (TSSA) was requested to review their computer database for the subject property with regard to registered Aboveground Storage Tanks (ASTs) or Underground Storage Tanks (USTs) containing petroleum products or fuel-related incidents, which may be registered on the subjects, or surrounding properties. No records were found for the Phase I Property (**Appendix E**).

5.9 Provincial Database/Inventory Records

5.9.1 Waste Disposal Site Inventory

The document entitled "Waste Disposal Site Inventory", prepared by the Waste Management Branch of the MECP (dated June 1991). No active or closed waste disposal sites were listed as being present within 1 km of the Site.

5.9.2 Inventory of Coal Gasification Plant Waste Sites in Ontario

The document entitled "Inventory of Coal Gasification Plant Waste Sites in Ontario", prepared for the MECP (dated April 1987). No coal tar or waste sites were listed as being present within 1 km of the Site.

5.9.3 Registered PCB Waste Storage Sites for the year 2008

The MECP database on Registered PCB Waste Storage Sites for the year 2008 (the most current). The Site and surrounding properties were not listed as PCB waste storage sites.

5.9.4 Registered Waste Generators for the year 2015

The MECP computer database on Registered Waste Generators for the year 2015. The Site and surrounding properties were not listed as current industrial waste generators.

NOTE: Not all companies are listed in the MECP's 2015 Database.

5.9.5 Registered Waste Receivers for the year 2015

The MECP database on Registered Waste Receivers for the year 2015 (the most current). The Site and surrounding properties were not listed as industrial waste receivers.

NOTE: Not all companies are listed in the MECP's 2015 Database.

5.9.6 Brownfields Environmental Site Registry

The MECP online Brownfields Environmental Site Registry was accessed on December 20, 2017 to determine if any RSCs have been filed under Part XV.1 under the EPA for the Site or any of the surrounding properties. A search of the registry indicated that there are no RSCs filed for the Site or surrounding properties.

5.10 Eris Report

A search in Federal, Provincial and Private Databases pertaining to the Phase I Property and surrounding properties within the Phase I Study Area was carried out by reference to the following information providers and is presented in **Appendix F**.

The ERIS project number for the Site is 20171215131.

Although no records were accessible for the Site, the ERIS report contained additional un-mappable records that do not have an address associated with them. According to the study, none of the un-mappable data have had an environmental impact at the Site.

A summary of the records pertaining to the study area interpreted from the ERIS report is presented in **Table 6**.

Table 6: Summary of Environmental Source Information

Required Database	Phase I Property	Phase I Study Area	Records pertaining to the required database and related optional databases
i. National Pollutant Release Inventory (NPRI)	0	0	No records were found.
ii. Certificates of Approval (CA)	0	0	No records were found.
iii. Commercial Fuel Oil Tanks (CFOT)	0	0	No records were found.
iv. Pesticide Register (PES)	0	0	No records were found.
v. <i>Permit to Take Water (PTTW)</i>	0	0	No records were found.
vi. <i>Inventory of Coal Gasification Plants and Coal Tar Sites (COAL)</i>	0	0	No records were found.
vii. <i>Environmental Activity and Sector Registry (EASR)</i>	0	0	No records were found.
viii. <i>List of Expired Fuels Safety Facilities (EXP)</i>	0	0	No records were found.
ix. <i>Ontario Regulation 347 Waste Generators Summary (GEN)</i>	0	0	No records were found.
x. <i>Record of Site Condition (RSC)</i>	0	0	No records were found.
xi. <i>Environmental Registry (EBR)</i>	0	0	No records were found.
xii. <i>ERIS Historical Searches (EHS)</i>	0	0	No records were found.
xiii. <i>Water Well Information System (WWIS)</i>	0	0	No records were found.
xiv. <i>Environmental Condition Reports</i>	0	0	No records were found.
xv. <i>Areas of Natural Significance</i>	0	0	No records were found.
xvi. <i>Pipeline Incidents (PINC)</i>	0	0	No records were found.
xvii. <i>Fuel Storage Tank (FST)</i>	0	0	No records were found.

Required Database	Phase I Property	Phase I Study Area	Records pertaining to the required database and related optional databases
<i>xviii. Fuel Storage Tank – Historic (FSTH)</i>	0	0	No records were found.
<i>xix. Ontario Spills (SPL)</i>	0	0	No records were found.
<i>xx. Fuel Oil Spills and Leaks (INC)</i>	0	0	No records were found.
<i>xxi. TSSA Historic Incidents (HINC)</i>	0	0	No records were found.
<i>xxii. Private and Retail Fuel Storage Tanks (PRT)</i>	0	0	No records were found.
<i>xxiii. Retail Fuel Storage Tanks (RST)</i>	0	0	No records were found.
<i>xxiv. Anderson’s Storage Tanks (TANK)</i>	0	0	No records were found.
<i>xxv. Scott’s Manufacturing Directory (SCT)</i>	0	0	No records were found.

6 SITE VISIT AND INTERVIEW

A summary of the interview is provided in the following **Table 7**.

Table 7: Summary of Interview

Parameters	Information
Interviewee	Son of former owner property (Mr. Mike Bennett)
Interviewer	Mr. Irfan Khokhar
Interview Type	In-person interview
Interview Date	July 20, 2021
Climate Conditions	Warm Sunny Day
Duration	1 hour
Interview Details	<p>1. What is the current use of the site / describe land use history? Horse farm, Agricultural / Residential</p> <p>2. Are you aware of any environmental issues associated with the subject property such as disposal, landfilling, chemical and/ or storage (including spills), above or underground storage tanks, MOE, orders etc.? Oil and gas spills</p> <p>3. Are you aware of any environmental building management issues such as asbestos-containing materials, PCBs in electrical equipment, odour, mould, indoor air quality, UFFI, ODSs, lead-based paints etc.? No.</p> <p>4. Are you aware of any site-specific permits, waste generator number(S), certificate of approval, water well records or sewer use/ discharge permits? No.</p> <p>5. Is there a potable water well onsite? Yes</p> <p>6. Where is the potable well located? Yes</p> <p>7. Is there a septic system on-site? Yes</p> <p>8 Where is the septic tank located? On the south side of the house.</p> <p>9 Do you do equipment repairs onsite? Done offsite.</p> <p>10. How do you dispose of garbage on-site domestic or otherwise? Garbage pick-up is once per week and hazardous materials are by special pick-up.</p>
Evaluation of Interview	<p>Information from the interview generally matched our records search with no deviations noted.</p> <p>No material change has taken place and the information from the interview is still valid.</p>

6.1 General Site Condition

6.1.1 Outside Surrounding of the Subject Site

Except for the barn, the site appeared to be well-kept in general. Leaks and water damage from exposed wood were discovered in the barn, which is typical of this sort of structure. The storage space connected to the barn to the south, where a tractor, lawnmower, and other agricultural type equipment, as well as jerry cans of gasoline, were observed. Significant petroleum/diesel odour was noticed. Some staining was observed under the tractor. The floor of the storage area was made up of wood planks and an open ground

surface below the planks.

There are no ASTs or USTs at the Site. A pile of manure was discovered south of the southern-most storage structure. There were several drums found at the site, but they were all empty.

The exterior photos of the site are provided in **Appendix G**.

6.1.2 Interior Inspection

Access for interior inspection was not granted at the time of the site visit.

6.2 Hazardous Materials in Connection with Identified Uses

Several jerry cans of fuel were observed in the barn's storage space on the south side. Strong petroleum/diesel odours were also detected in the area where a tractor, lawnmower, and other agricultural equipment were stored. Under the tractor, staining was also visible.

Hazardous materials were not observed in connection with the building use at the time of the site visit. Small volumes of household cleaning supplies are likely to be stored in the residential dwelling, but the household chemicals represent no environmental risk.

6.3 Air Emissions

No significant environmental issues regarding air emissions at the site have been identified based on the nature of the emission sources observed at the time of the site visit. The only air emission sources observed at the site were exhausts from the Site's general building ventilation and washroom vents.

6.4 Waste Management

Except for trash from the on-site septic system, the site does not create, store, or dispose of liquid wastes. At the time of the reconnaissance, there was no evidence of the generation, storage, or disposal of liquid industrial wastes at the Site.

The site was not recognized as a liquid waste generator in the current MECP database or ERIS report.

The site does not currently create hazardous solid waste, based on observations during the site reconnaissance and record review.

The site is not recognized as a registered generator of solid hazardous waste in the MECP database/ERIS report.

6.5 Water and Wastewater

The residential portion of the site is serviced through municipal water and sewers.

6.6 Storage Tanks

According to the site interview, site visit, and records review, no above-ground storage tanks (AST) or underground storage tanks (UST) are present on the site, nor were there any present historically.

6.7 Odours

During the site reconnaissance, heavy petroleum/diesel odours originating from the storage space connected to the south side of the barn were noticed. The odours can be attributed to the mechanical farm equipment being filled and topped up with fuel.

6.8 Asbestos Containing Materials (ACMs)

No asbestos investigation had been done at the site. ACMs may be present at the Site, based on the age of construction of the site buildings (i.e., before 1934 and the mid-1970s to early 1990s).

During the site reconnaissance, ACMs were not observed; however, observations were limited to visible portions of existing structures (i.e., not hidden locations such as behind walls or above ceilings). The residential dwelling and garage were not inspected.

In the event of renovations or demolition to the structures, buildings materials found to contain asbestos will be required to be managed in accordance with the Occupational Health and Safety Act (OHSA) regarding worker protection aspects to avoid the inhalation or ingestion of asbestos fibres. If friable asbestos is positively identified and is not proposed for immediate removal, O. Reg. 278/05 requires an Asbestos Management Plan (AMP) to be implemented at the subject site buildings. A Designated Substance Survey (DSS) and Hazardous Material Survey (HMS) be undertaken before renovations are undertaken.

6.9 Polychlorinated Biphenyls (PCBs)

The production and installation of PCB-containing electrical equipment were banned in 1980. No PCB containing transformers were observed on the subject site.

6.10 Ozone Depleting Substances (ODS)

No air conditioning units were observed during the site visit that could contain chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs) that are ozone-depleting substances (ODSs). The Federal Government intends to phase out the use of ODSs by the year 2030 to protect the upper atmosphere. The MECP has issued Regulation 356 regarding the use, disposal, and recycling of ODSs. Recapturing of ODS's during servicing should be done by licensed personnel.

6.11 Occupational Health and Safety Act - Designated Substances

A brief review of the site was conducted to assess the potential for designated substances identified in the Occupational Health and Safety Act, Article 18(a). The following comments related to the potential for the presence of other designated substances on the property are offered:

- Acrylonitrile potential not observed.
- Arsenic potential not observed.
- Benzene potential not observed.
- Coke oven emissions potential not observed.
- Ethylene oxide potential not observed.
- Isocyanate's potential not observed.
- Lead Based on date of the building, lead may be potentially present
- Mercury Based on date of the building, mercury may be potentially present
- Silica potential not observed.
- Vinyl chloride potential not observed.
- UFFI potential not observed.

6.12 Lead

The only painted structures were the storage building south of the barn, the main residence, and the garage buildings. Given the age of construction of the site buildings (before 1934 and the mid-1970s to early 1990s), lead-containing paints (LCPs) may be present at the site, as the regulatory definition of LCP in Canada was recently updated (2010) to include a significantly lower allowable concentration of lead than was previously controlled. The external painted surfaces of the storage building, garage, and residential house were in acceptable physical condition (i.e., no peeling and/or flaking), according to observations made at the time of the site reconnaissance.

Only by sampling and analyzing questionable paint samples can the presence of LCPs be validated. If LCPs are present at the Site, they can be handled by implementing proper management or abatement strategies to safeguard the health of those who work there, as mandated by the Occupational Safety and Health Administration (OHSA). LCPs may be encapsulated or removed if they are in poor condition (e.g., peeling or flaking) and present a threat to humans.

During the site reconnaissance, inside the house or garage was not observed.

6.13 Mercury

Mercury may be found in small levels in a range of construction materials, such as mercury vapour lamps, thermostats, and various electrical control switches. No possible issues are predicted, given the probable levels of mercury present and their intended application.

6.14 Fill Material (e.g., Soil stockpiles or elevated areas).

At the time of site visit, no suspected areas of fill were observed (e.g., Soil stockpiles or elevated areas). The Site is generally graded even with the surrounding properties.

6.15 Sodium Adsorption Ratio (SAR) and Electrical Conductivity (EC)

The subject site is not paved. It is not likely that de-icing salts were used at the site. As a result, electrical conductivity (EC) and sodium absorption ratio (SAR) impacts are not expected to be present in the subsurface soils within areas of the site. The presence of EC/SAR impacts can only be determined by soil analysis.

6.16 Pesticides and Herbicides

Pesticides and Herbicides are not used or stored at the site. During site reconnaissance, pesticides and herbicides were not found. However, given the previous agricultural land use at the site, it is likely that pesticides and herbicides were used.

6.17 Wells

A water well near the south side of the residential house at the site was discovered at the site visit. The well is exclusively used for bathwater and not for drinking water. All the nearby properties use well water as well. The 250-m search of the MECP Well Records Database surrounding the site on December 21, 2017 found several water well records for the nearby properties.

There were no test wells, disposal wells, oil wells, or gas wells found at the Site, and no more historic wells were discovered. On December 21, 2017, a check of the Ontario Oil, Gas & Salt Resource Library website revealed no other wells within 250 meters of the site.

6.18 Potential for Migration of Released Materials

The subject site is situated on clay and silt deposits. These deposits generally have low to medium permeability. Contaminants released from surface spills are not likely to contaminate the subsurface soils and contaminate the groundwater.

6.19 Heating and Cooling Systems

According to the Site representative, heating was provided by a natural gas-fired forced-air furnace in the basement. The previous heating source and the date of natural gas connection at the site were unknown. It is possible that the previous heating source could have been an oil-fired furnace with an associated aboveground storage tank (AST) in the basement of the residential dwelling.

6.20 Mechanical Equipment

Piston-type elevators, vehicle hoists, loading dock lifts, and compactors are examples of hydraulically driven mechanical equipment. Hydraulic oils are used in this equipment, which is operated at high pressures and can leak or break, releasing them into the environment.

A tractor, lawnmower, horse treadmill, and other agricultural equipment were found at the site. The storage space on the south side of the barn was the only portion of the site that had any stains or scents related to the mechanical equipment.

6.21 Mould

Mould was not observed at the time of the site visit.

Mould contaminated materials should be removed/handled in accordance with the Canadian Construction Association document CCA 82/2004. Contractors should be warned of the presence of mould and every precaution should be taken to prevent airborne exposure to workers where mould is present and where workers are likely to inhale or ingest mould or mould spores.

6.22 Vegetation

Except for minor spills in the storage area connected to the southern side of the barn, there had been no chemical spills at the site.

There was no indication of chemical spills, accidental releases, or major discoloration at the site other than minor spills. At the time of the reconnaissance, there were no regions of severe surface staining or stressed vegetation at the Site.

7 CONCLUSIONS

The Phase I Property is located on 613 Helena Street, Fort Erie, Ontario in a residential/agricultural area. The Site property is rectangular in shape with a total size of 11.52 acres. A two-story residential dwelling and garage, a two-story barn, and two storage structures are on the site. The site was mainly covered by grass.

Based on the available evidence, it appears that the site was constructed before 1934 for residential and agricultural land use. According to the Aerial photographs, the residential structure on the eastern portion of the site was built before 1934. Between the mid-1970s and the early-1990s, the barn and storage buildings were built.

For agricultural purposes, Pesticides are believed to have been used on the site in the past. Pesticides and

herbicides have traditionally been stored and used in agriculture techniques.

Lead, arsenic, and previous generation organochlorine pesticides are frequently connected with past agricultural spraying and may persist in the soil at low levels.

The barn is located on the south side of the site, where several jerry cans of fuel were found in the storage space. In the same area, tractors, lawnmowers, other agricultural equipment are stored. Strong petroleum/diesel odours were also detected in this area. Some staining was also observed under the tractor.

Asbestos-containing materials (ACMs), lead-containing paints (LCPs), and fluorescent light ballasts may be present at the site, based on the age of construction of the site buildings (i.e., before 1934 and the mid-1970s to early 1990s).

At the time of the site visit in July 2021, no material change has taken place since the last Phase I ESA report by Amec Foster Wheeler (report date January 19, 2017).

8 RECOMMENDATIONS

There is evidence of possible contamination linked with the agricultural activities on the site including the use of pesticides and herbicides, fuel storage, staining and odours in the barn. A limited Phase II ESA is recommended to validate the presence or absence of contaminants of concern in the soil.

9 ASSESSOR QUALIFICATIONS

HLV2K Engineering Limited provides geotechnical, geo-environmental engineering, environmental sciences, and material testing and inspection services. Incorporated in 2018, it operates in Ontario under a Certificate of Authorization issued by PEO and carries both general and professional liability insurance.

John (Gianni) Lametti is a Principal and Manager of Environmental Services, a Professional Engineer (P. Eng.), and a Qualified Person (QP). Mr. Lametti has over 40 years of experience in the environmental consulting industry and has managed several major Phase I/One and Phase II/Two Environmental Site Assessment and RSC submission portfolios for clients in the Greater Toronto Area.

Mr. Lametti has also managed remediation projects including but not limited to bioremediation, various in situ programs for soil and groundwater, off-site removal, design, innovative technology, and strategy implementation, insurance projects, PCB removal, soil investigations, groundwater investigations, tank removals, and design of sub-floor venting systems.

Mr. Lametti is known for maintaining high levels of communication between contractors, clients, and other stakeholders. His skills in solving environmental problems with practical solutions that deliver both value and efficiency have been refined on projects across North America, South America, and Asia.

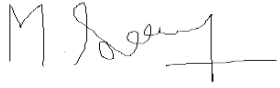
10 CLOSURE

This report is to the *Statement of Limitations*, which forms an integral part of this document. The *Statement of Limitations* is not intended to reduce the level of responsibility accepted by HLV2K, but rather to ensure that all parties who have been given reliance for this report are aware of the responsibilities each assumes

in so doing.

We trust you will find this report to be complete within our terms of reference. Should you have any questions regarding the information contained in the report, or require further assistance please contact the HLV2K office.

For and on behalf of HLV2K Engineering Limited



Swathy Mayandi
Junior Environmental Scientist

Reviewed by:



John (Gianni) Lametti, P. Eng. QP_{ESA}
Principal & Environmental Manager



REFERENCES

- Barnett, Barnett, P.J., Cowan, W.R., and Henry, A.P. 1991. Quaternary Geology of Ontario, southern sheet; Ontario Geological Survey, Map 2556, Scale 1:1000 000.
- Chapman, L.J., and Putnam, D.F. 1984: Physiography of Southern Ontario; Ontario Geological Survey, Map P.2715. Scale 1:600 000.
- Ontario Base Map
- Toporama-Topographic Atlas of Canada.

HLV2K Engineering Limited

STATEMENT OF LIMITATIONS

Your report has been developed based on your unique project specific requirements as understood by HLV2K Engineering Limited (HLV2K) and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking HLV2K to assess how factors that changed subsequent to the date of the report affect the report's recommendations. HLV2K cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions, which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult HLV2K to be advised how time may have impacted on the project.

The findings derived from this investigation were based on information collected and/or provided by the Client. It may become apparent that soil and groundwater conditions differ between and beyond the testing locations examined during future investigations or other work that could not be detected or anticipated at the time of this study. As such, HLV2K cannot be held liable for environmental conditions that were not apparent from the available information. The conclusions presented represent the best judgment of the assessors based on limited investigations.

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature, external data source review, sampling, and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions, which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of HLV2K through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only HLV2K, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and HLV2K cannot be held responsible for such misinterpretation.

To avoid misuse of the information contained in your report it is recommended that you confer with HLV2K before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

HLV2K Engineering Limited

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain HLV2K to work with other project design professionals who are affected by the report. Have HLV2K explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment.

Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact HLV2K for information relating to geoenvironmental issues.

HLV2K is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with HLV2K to develop alternative approaches to problems that may be of genuine benefit both in time and in cost.

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from HLV2K to other parties but are included to identify where HLV2K's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from HLV2K closely and do not hesitate to ask any questions you may have.

Third party information reviewed and used to formulate this report is assumed to be complete and correct. HLV2K used this information in good faith and will not accept any responsibility for deficiencies, misinterpretation or incompleteness of the information contained in documents prepared by third parties.


Nothing in this report is intended to constitute or provide a legal opinion.


Should additional information become available, HLV2K requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

Drawings





Legend



 Approx. Site Boundary

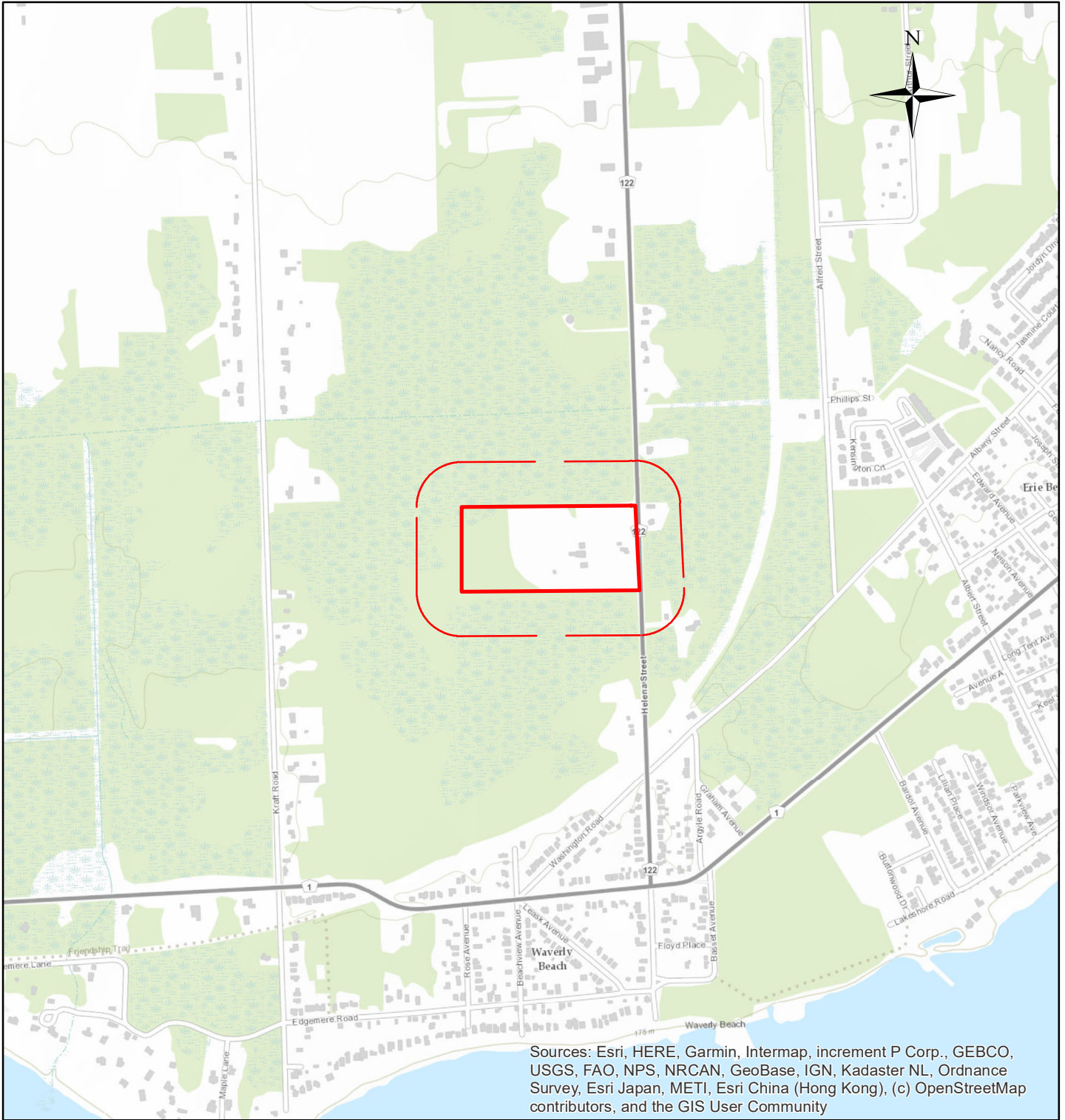
Drawn: MM	Title SITE LOCATION PLAN	
Approved: JL	Project	
Date: NOV 2021	PHASE I ENVIRONMENTAL SITE ASSESSMENT	
Project No.: 2100394AG	613 Helena Street, Fort Erie, Ontario	
	Client SS WELLAND INC.	
	0 125 250 500 Meters	Drawing 1



Legend



-  Phase I Property Boundary
-  Phase I Study Area


Drawn: MM	Title Phase I Property and Study Area	
Approved: JL	Project	
Date: NOV 2021	PHASE I ENVIRONMENTAL SITE ASSESSMENT	
Project No.: 2100394AG	613 Helena Street, Fort Erie, Ontario	
	Client SS Welland Inc.	
	0 50 100 200 Meters	Drawing 2
		

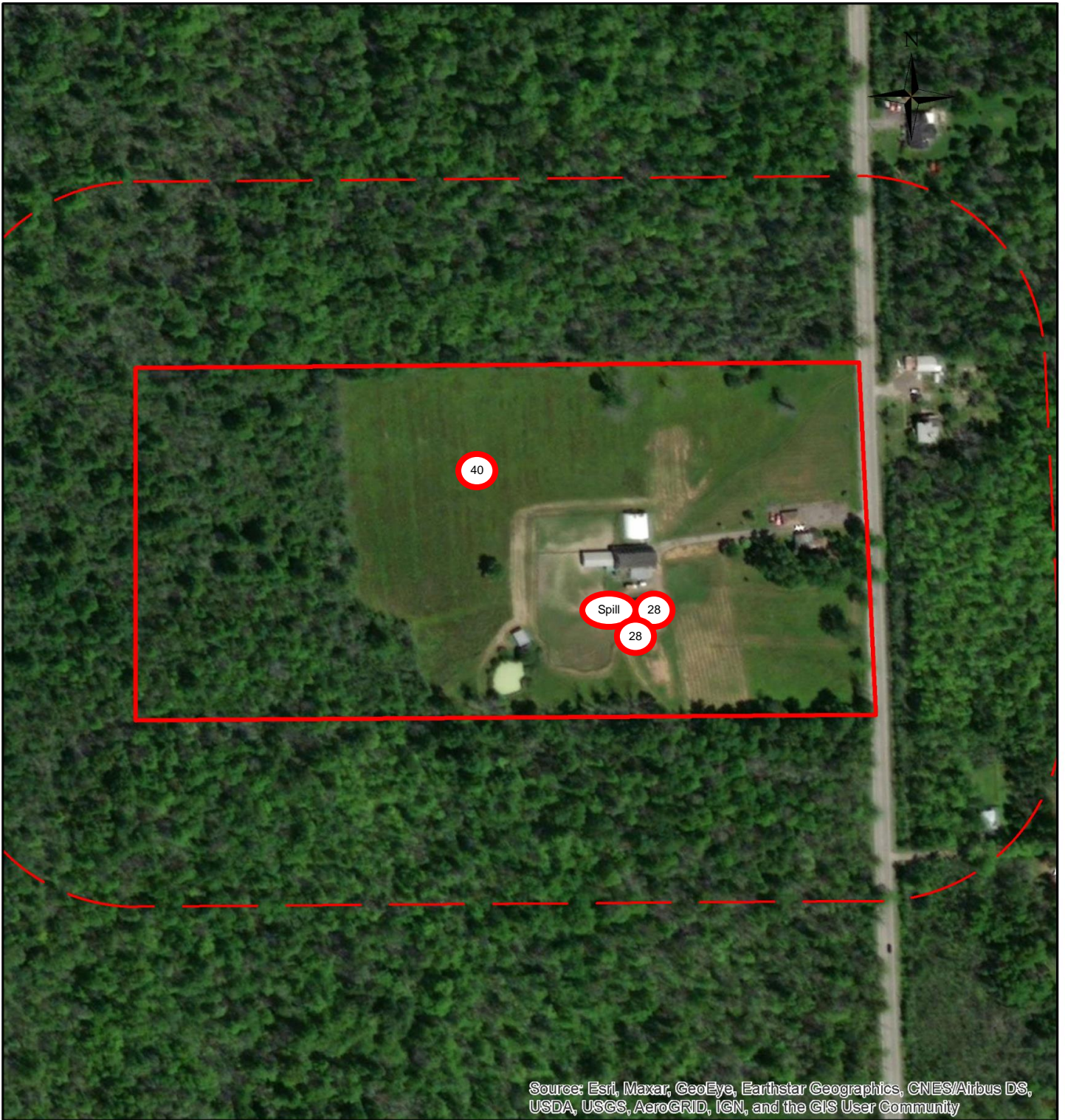


Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Legend

-  Phase I Property Boundary
-  Phase I Study Area



Drawn: MM	Title Topographic Map	
Approved: JL	Project	
Date: NOV 2021	PHASE I ENVIRONMENTAL SITE ASSESSMENT	
Project No.: 2100394AG	613 Helena Street, Fort Erie, Ontario	
	Client SS Welland Inc.	
	0 105 210 420 Meters	Drawing 3

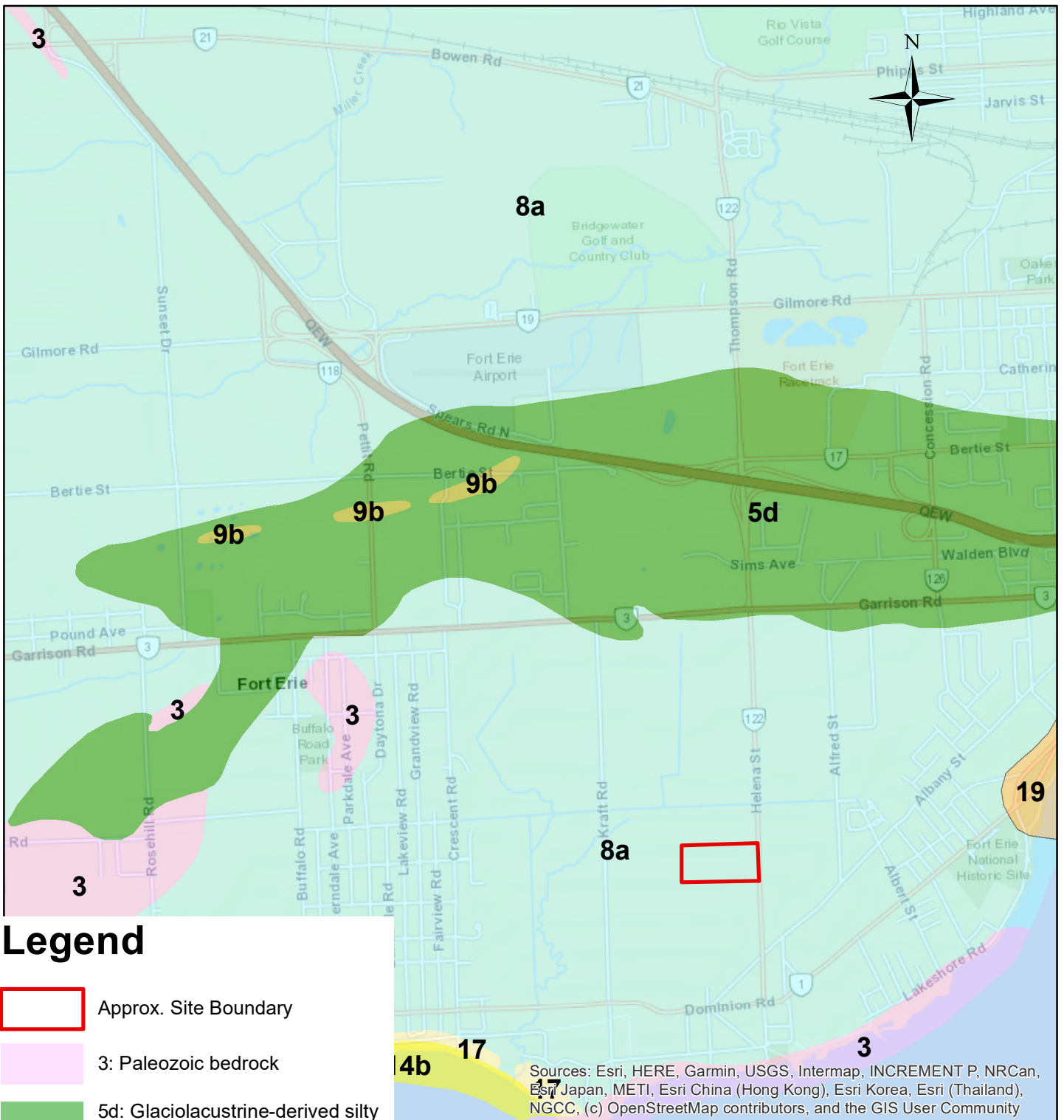


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Phase I Property Boundary
- Phase I Study Area
- 40 Potentially Contaminating Activities (PCAs) contributing to APECs
- 40 Potentially Contaminating Activities (PCAs) not contributing to APECs


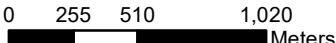
Drawn: MM	Title Phase I Property PCA Location Plan	
Approved: JL	Project	
Date: NOV 2021	PHASE I ENVIRONMENTAL SITE ASSESSMENT 613 Helena Street, Fort Erie, Ontario	
Project No.: 2100394AG	Client SS Welland Inc.	
	0 25 50 100  Meters	Drawing 4



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Legend

- Approx. Site Boundary
- 3: Paleozoic bedrock
- 5d: Glaciolacustrine-derived silty to clayey till
- 8a: Glaciolacustrine deep water deposits
- 9b: Littoral-foreshore deposits
- 14b: Littoral-foreshore deposits
- 17: Eolian deposits
- 19: Modern alluvial deposits

Drawn:	MM	Title	SURFICIAL GEOLOGY MAP	
Approved:	JL	Project	PHASE I ENVIRONMENTAL SITE ASSESSMENT 613 Helena Street, Fort Erie, Ontario	
Date:	NOV 2021	Client		SS WELLAND INC.
Project No.:	2100394AG			
			Drawing 5	

Appendix A: Aerial Photographs



1934 Aerial Photograph of Subject Site and Surrounding Area



1954 Aerial Photograph of Subject Site and Surrounding Area



1965 Aerial Photograph of Subject Site and Surrounding Area



1972 Aerial Photograph of Subject Site and Surrounding Area



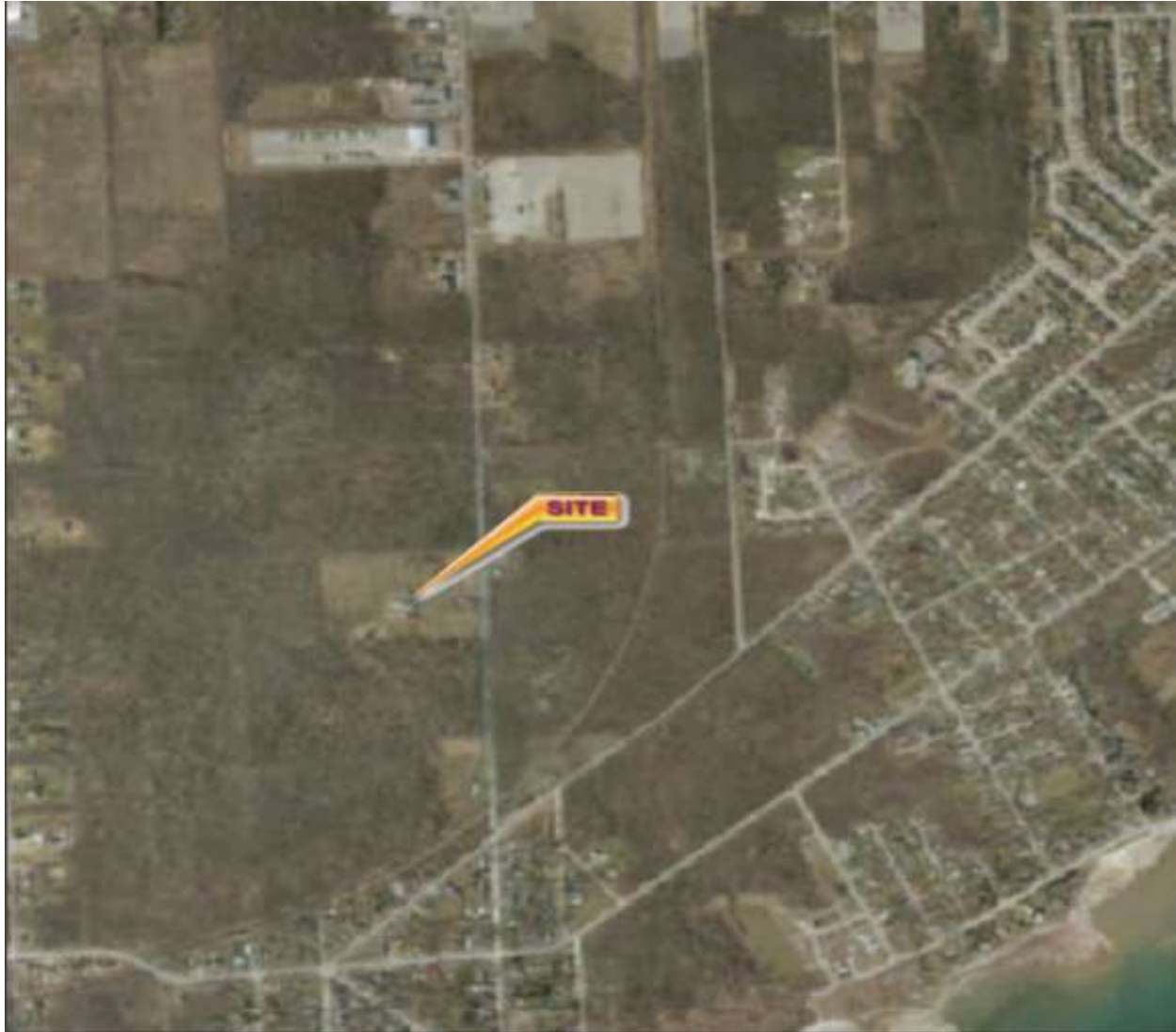
1989 Aerial Photograph of Subject Site and Surrounding Area



1994 Aerial Photograph of Subject Site and Surrounding Area



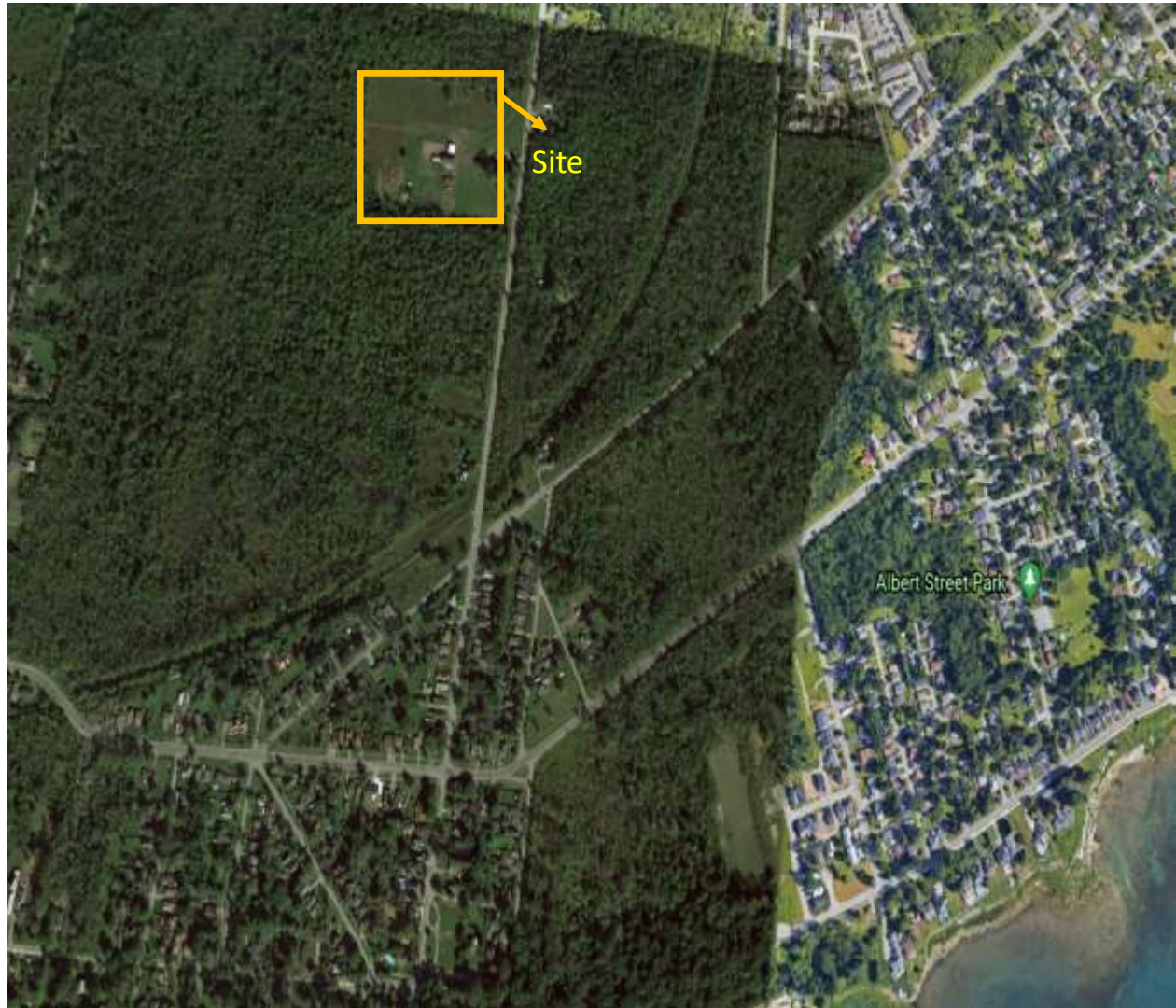
2000 Aerial Photograph of Subject Site and Surrounding Area



2010 Aerial Photograph of Subject Site and Surrounding Area



2015 Aerial Photograph of Subject Site and Surrounding Area



2021 Aerial Photograph of Subject Site and Surrounding Area

Appendix B: Fire Insurance Maps and Inspection Reports



enviroscan



An SCM Company

175 Commerce Valley Drive W
Markham, Ontario L3T 7Z3

T: 905-882-6300
W: www.optaintel.ca

Report Completed By:

Catherine

Site Address:

613 Helena St Fort Erie ON

Project No:

20171215131

Opta Order ID:

44038

Requested by:

Eleanor Goolab
Eris

Date Completed:

12/21/2017 8:02:18 AM



Opta Historical Environmental Services EnviroscanTM Terms and Conditions

Report

The documents (hereinafter referred to as the "Documents") to be released as part of the report (hereinafter referred to as the "Report") to be delivered to the purchaser as set out above are documents in Opta's records relating to the described property (hereinafter referred to as the "Property"). Opta makes no representations or warranties respecting the Documents whatsoever, including, without limitation, with respect to the completeness, accuracy or usefulness of the Documents, and does not represent or warrant that these are the only plans and reports prepared in association with the Property or in Opta's possession at the time of Report delivery to the purchaser. The Documents are current as of the date(s) indicated on them. Interpretation of the Documents, if any, is by inference based upon the information which is apparent and obvious on the face of the Documents only. Opta does not represent, warrant or guarantee that interpretations other than those referred to do not exist from other sources. The Report will be prepared for use by the purchaser of the services as shown above hereof only.

Disclaimer

Opta disclaims responsibility for any losses or damages of any kind whatsoever, whether consequential or other, however caused, incurred or suffered, arising directly or indirectly as a result of the services (which services include, but are not limited to, the preparation of the Report provided hereunder), including but not limited to, any losses or damages arising directly or indirectly from any breach of contract, fundamental or otherwise, from reliance on Opta Reports or from any tortious acts or omissions of Opta's agents, employees or representatives.

Entire Agreement

The parties hereto acknowledge and agree to be bound by the terms and conditions hereof. The request form constitutes the entire agreement between the parties pertaining to the subject matter hereof and supersedes all prior and contemporaneous agreements, negotiations and discussions, whether oral or written, and there are no representations or warranties, or other agreements between the parties in connection with the subject matter hereof except as specifically set forth herein. No supplement, modification, waiver, or termination of the request shall be binding, unless confirmed in writing by the parties hereto.

Governing Document

In the event of any conflicts or inconsistencies between the provisions hereof and the Reports, the rights and obligations of the parties shall be deemed to be governed by the request form, which shall be the paramount document.

Law

This agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein.

Page: 4

Project Name: 613 Helena Street
Fort Erie

Project #: 20171215131
P.O. #: TG171150

ENVIROSCAN Report

No Records Found

Requested by:
Eleanor Goolab

Date Completed: 12/21/2017 08:02:18



OPTA INFORMATION INTELLIGENCE

No Records Found

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Appendix C: Draft Plan of Subdivision

Appendix D: Freedom of Information (FOI) Request

Appendix E: TSSA Inquiry

RE: TSSA Search for Records - 613 Helena Street, Fort Erie, Ontario

Public Information Services <publicinformationservices@tssa.org>

Fri 12/3/2021 12:52 PM

To: Mariam Mohammadi <mariam.mohammadi@hlv2k.com>

Please refrain from sending documents to head office and only submit your requests electronically via email along with credit card payment. We are all working remotely and mailing in applications with cheques will lengthen the overall processing time.

NO RECORD FOUND

Hello Mariam,

Thank you for your request for confirmation of public information.

- We confirm that there are no records in our database of any fuel storage tanks at the subject addresses. For a further search in our archives please complete our release of public information form found at https://www.tssa.org/en/about-tssa/release-of-public-information.aspx?_mid_=392 and email the completed form to publicinformationservices@tssa.org along with a fee of \$56.50 (including HST) per location. The fee is payable with credit card (Visa or MasterCard).

Although TSSA believes the information provided pursuant to your request is accurate, please note that TSSA does not warrant this information in any way whatsoever.

Kind regards,

Sherees

**Public Information Agent**

Facilities and Business Services

345 Carlingview Drive

Toronto, Ontario M9W 6N9

Tel: +1-416-734-6222 | Fax: +1-416-734-3568 | E-Mail: publicinformationservices@tssa.orgwww.tssa.org

From: Mariam Mohammadi <mariam.mohammadi@hlv2k.com>**Sent:** December 3, 2021 10:17 AM**To:** Public Information Services <publicinformationservices@tssa.org>**Cc:** Swathy Maya <swathy.maya@hlv2k.com>**Subject:** TSSA Search for Records - 613 Helena Street, Fort Erie, Ontario

[CAUTION]: This email originated outside the organisation.

Please do not click links or open attachments unless you recognise the source of this email and know the content is safe.

Hello,

For the purpose of a Phase I Environmental Assessment, can you please conduct a search for any available records for the following location?

613 Helena Street, Fort Erie, Ontario

Thank you,

Mariam Mohammadi, M.A.Sc.

Environmental Specialist

HLV2K Engineering Limited
2179 Dunwin Dr. Unit #4
Mississauga, ON L5L 1X2

📞 phone: (647) 975-3676

✉ email: mariam.mohammadi@hlv2k.com

🌐 web: hlv2k.com



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Appendix F: EcoLog ERIS

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES



DATABASE REPORT

Project Property: *613 Helena Street, Fort Erie
613 Helena St
Fort Erie ON L2A4K2
TG171150*

Project No: *TG171150*

Report Type: *Site Report*

Order No: *20171215131*

Requested by: *AMEC Foster Wheeler Environment &
Infrastructure*

Date Completed: *December 18, 2017*

**Environmental Risk
Information Services**
A division of Glacier Media Inc.
P: 1.866.517.5204
E: info@erisinfo.com

www.erisinfo.com

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Executive Summary

Property Information:

Project Property: 613 Helena Street, Fort Erie
613 Helena St Fort Erie ON L2A4K2

Project No: TG171150

Coordinates:

Latitude: 42.893057
Longitude: -78.940525
UTM Northing: 4,750,996.53
UTM Easting: 668,157.97
UTM Zone: UTM Zone 17T

Elevation: 593 FT
180.86 M

Order Information:

Order No: 20171215131
Date Requested: December 15, 2017
Requested by: AMEC Foster Wheeler Environment & Infrastructure
Report Type: Site Report

Historical/Products:

City Directory Search Subject Site plus 5 Adjacent Properties
Insurance Products Fire Insurance Maps/Inspection Reports/Site Specific Plans

Executive Summary: Report Summary

Database	Name	Searched	Project Property
AAGR	<i>Abandoned Aggregate Inventory</i>	Y	0
AGR	<i>Aggregate Inventory</i>	Y	0
AMIS	<i>Abandoned Mine Information System</i>	Y	0
ANDR	<i>Anderson's Waste Disposal Sites</i>	Y	0
AUWR	<i>Automobile Wrecking & Supplies</i>	Y	0
BORE	<i>Borehole</i>	Y	0
CA	<i>Certificates of Approval</i>	Y	0
CFOT	<i>Commercial Fuel Oil Tanks</i>	Y	0
CHEM	<i>Chemical Register</i>	Y	0
CNG	<i>Compressed Natural Gas Stations</i>	Y	0
COAL	<i>Inventory of Coal Gasification Plants and Coal Tar Sites</i>	Y	0
CONV	<i>Compliance and Convictions</i>	Y	0
CPU	<i>Certificates of Property Use</i>	Y	0
DRL	<i>Drill Hole Database</i>	Y	0
EASR	<i>Environmental Activity and Sector Registry</i>	Y	0
EBR	<i>Environmental Registry</i>	Y	0
ECA	<i>Environmental Compliance Approval</i>	Y	0
EEM	<i>Environmental Effects Monitoring</i>	Y	0
EHS	<i>ERIS Historical Searches</i>	Y	0
EIIS	<i>Environmental Issues Inventory System</i>	Y	0
EMHE	<i>Emergency Management Historical Event</i>	Y	0
EXP	<i>List of TSSA Expired Facilities</i>	Y	0
FCON	<i>Federal Convictions</i>	Y	0
FCS	<i>Contaminated Sites on Federal Land</i>	Y	0
FOFT	<i>Fisheries & Oceans Fuel Tanks</i>	Y	0
FST	<i>Fuel Storage Tank</i>	Y	0
FSTH	<i>Fuel Storage Tank - Historic</i>	Y	0
GEN	<i>Ontario Regulation 347 Waste Generators Summary</i>	Y	0
GHG	<i>Greenhouse Gas Emissions from Large Facilities</i>	Y	0
HINC	<i>TSSA Historic Incidents</i>	Y	0
IAFT	<i>Indian & Northern Affairs Fuel Tanks</i>	Y	0
INC	<i>TSSA Incidents</i>	Y	0
LIMO	<i>Landfill Inventory Management Ontario</i>	Y	0
MINE	<i>Canadian Mine Locations</i>	Y	0
MNR	<i>Mineral Occurrences</i>	Y	0
NATE	<i>National Analysis of Trends in Emergencies System (NATES)</i>	Y	0

Database	Name	Searched	Project Property
NCPL	<i>Non-Compliance Reports</i>	Y	0
NDFT	<i>National Defense & Canadian Forces Fuel Tanks</i>	Y	0
NDSP	<i>National Defense & Canadian Forces Spills</i>	Y	0
NDWD	<i>National Defence & Canadian Forces Waste Disposal Sites</i>	Y	0
NEBI	<i>National Energy Board Pipeline Incidents</i>	Y	0
NEBW	<i>National Energy Board Wells</i>	Y	0
NEES	<i>National Environmental Emergencies System (NEES)</i>	Y	0
NPCB	<i>National PCB Inventory</i>	Y	0
NPRI	<i>National Pollutant Release Inventory</i>	Y	0
OGW	<i>Oil and Gas Wells</i>	Y	0
OOGW	<i>Ontario Oil and Gas Wells</i>	Y	0
OPCB	<i>Inventory of PCB Storage Sites</i>	Y	0
ORD	<i>Orders</i>	Y	0
PAP	<i>Canadian Pulp and Paper</i>	Y	0
PCFT	<i>Parks Canada Fuel Storage Tanks</i>	Y	0
PES	<i>Pesticide Register</i>	Y	0
PINC	<i>TSSA Pipeline Incidents</i>	Y	0
PRT	<i>Private and Retail Fuel Storage Tanks</i>	Y	0
PTTW	<i>Permit to Take Water</i>	Y	0
REC	<i>Ontario Regulation 347 Waste Receivers Summary</i>	Y	0
RSC	<i>Record of Site Condition</i>	Y	0
RST	<i>Retail Fuel Storage Tanks</i>	Y	0
SCT	<i>Scott's Manufacturing Directory</i>	Y	0
SPL	<i>Ontario Spills</i>	Y	0
SRDS	<i>Wastewater Discharger Registration Database</i>	Y	0
TANK	<i>Anderson's Storage Tanks</i>	Y	0
TCFT	<i>Transport Canada Fuel Storage Tanks</i>	Y	0
VAR	<i>TSSA Variances for Abandonment of Underground Storage Tanks</i>	Y	0
WDS	<i>Waste Disposal Sites - MOE CA Inventory</i>	Y	0
WDSH	<i>Waste Disposal Sites - MOE 1991 Historical Approval Inventory</i>	Y	0
WWIS	<i>Water Well Information System</i>	Y	0
Total:			0

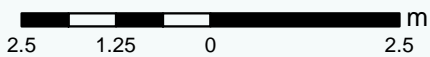
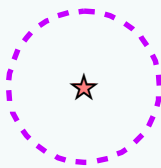
Executive Summary: Site Report Summary - Project Property

<i>Map Key</i>	<i>DB</i>	<i>Company/Site Name</i>	<i>Address</i>	<i>Page Number</i>
--------------------	-----------	--------------------------	----------------	------------------------

No records found in the selected databases for the project property.

Executive Summary: Summary By Data Source

No records found in the selected databases for the project property.



1:100

Map : 0.001 Kilometer Radius

Order No: 20171215131

Address: 613 Helena St, Fort Erie, ON, L2A4K2



Project Property	Expressway	Industrial and Resource - Regions	National Park
Buffer Outline	Principal Highway	Main Line	Provincial or Territorial Park
Eris Sites with Higher Elevation	Secondary Highway	Sidetrack	Other Park
Eris Sites with Same Elevation	Major Road	Transit Line	Golf Course or Driving Range
Eris Sites with Lower Elevation	Local road	Abandoned Line	Park or Sports Field
Eris Sites with Unknown Elevation	Trail		Other Recreation Area
	Proposed Road		
	Ferry Route/Ice Road		



Aerial (2014)

Address: 613 Helena St, Fort Erie, ON, L2A4K2

Source: ESRI World Imagery

Order No: 20171215131



© ERIS Information Limited Partnership

Detail Report

<i>Map Key</i>	<i>Number of Records</i>	<i>Elevation (m)</i>	<i>Site</i>	<i>DB</i>
----------------	--------------------------	----------------------	-------------	-----------

No records found in the selected databases for the project property.

Unplottable Summary

Total: 1 Unplottable sites

DB	Company Name/Site Name	Address	City	Postal
WWIS		lot 1	ON	

Unplottable Report

Site: lot 1 ON

Database:
WWIS

Well ID: 6603469
Construction Date:
Primary Water Use: Domestic
Sec. Water Use:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src: 1
Date Received: 12/11/1981
Selected Flag: 1
Abandonment Rec:
Contractor: 1918
Form Version: 1
Owner:
Street Name:
County: NIAGARA (WELLAND)
Municipality: FORT ERIE TOWN (BERTIE)
Site Info:
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10463081
DP2BR: 6
Code OB: r
Code OB Desc: Bedrock
Open Hole:
Elevation:
Elevrc:
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Spatial Status:
Cluster Kind:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na
Org CS:
Date Completed: 8/14/1979

Overburden and Bedrock Materials Interval

Formation ID: 932598368
Layer: 1
Color: 8
General Color: BLACK
Mat1: 02
Most Common Material: TOPSOIL
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 0.00
Formation End Depth: 6.00
Formation End Depth UOM: ft

Formation ID: 932598369
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 6.00
Formation End Depth: 44.00
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 966603469
Method Construction Code: 0
Method Construction: Not Known
Other Method Construction:

Pipe Information

Pipe ID: 11011651
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930752400
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 6.00
Casing Diameter: 6.00
Casing Diameter UOM: inch
Casing Depth UOM: ft

Casing ID: 930752401
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 41.00
Casing Diameter: 6.00
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996603469
Pump Set At:
Static Level: 20.00
Final Level After Pumping:
Recommended Pump Depth: 40.00
Pumping Rate: 5.00
Flowing Rate:
Recommended Pump Rate: 5.00
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR

Pumping Test Method: 2
Pumping Duration HR: 2
Pumping Duration MIN: 0
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 935129783
Test Type:
Test Duration: 60
Test Level: 36.00
Test Level UOM: ft

Water Details

Water ID: 933950728
Layer: 1
Kind Code: 3
Kind: SULPHUR
Water Found Depth: 41.00
Water Found Depth UOM: ft

Appendix: Database Descriptions

*Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. **Note:** Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

Abandoned Aggregate Inventory:

Provincial [AAGR](#)

The MAAP Program maintains a database of abandoned pits and quarries. Please note that the database is only referenced by lot and concession and city/town location. The database provides information regarding the location, type, size, land use, status and general comments.*

Government Publication Date: Sept 2002*

Aggregate Inventory:

Provincial [AGR](#)

The Ontario Ministry of Natural Resources maintains a database of all active pits and quarries. The database provides information regarding the registered owner/operator, location name, operation type, approval type, and maximum annual tonnage.

Government Publication Date: Up to Sep 2017

Abandoned Mine Information System:

Provincial [AMIS](#)

The Abandoned Mines Information System contains data on known abandoned and inactive mines located on both Crown and privately held lands. The information was provided by the Ministry of Northern Development and Mines (MNDM), with the following disclaimer: "the database provided has been compiled from various sources, and the Ministry of Northern Development and Mines makes no representation and takes no responsibility that such information is accurate, current or complete". Reported information includes official mine name, status, background information, mine start/end date, primary commodity, mine features, hazards and remediation.

Government Publication Date: 1800-Nov 2016

Anderson's Waste Disposal Sites:

Private [ANDR](#)

The information provided in this database was collected by examining various historical documents which aimed to characterize the likely position of former waste disposal sites from 1860 to present. The research initiative behind the creation of this database was to identify those sites that are missing from the Ontario MOE Waste Disposal Site Inventory, as well as to provide revisions and corrections to the positions and descriptions of sites currently listed in the MOE inventory. In addition to historic waste disposal facilities, the database also identifies certain auto wreckers and scrap yards that have been extrapolated from documentary sources. Please note that the data is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1860s-Present

Automobile Wrecking & Supplies:

Private [AUWR](#)

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999-May 2017

Borehole:

Provincial [BORE](#)

A borehole is the generalized term for any narrow shaft drilled in the ground, either vertically or horizontally. The information here includes geotechnical investigations or environmental site assessments, mineral exploration, or as a pilot hole for installing piers or underground utilities. Information is from many sources such as the Ministry of Transportation (MTO) boreholes from engineering reports and projects from the 1950 to 1990's in Southern Ontario. Boreholes from the Ontario Geological Survey (OGS) including The Urban Geology Analysis Information System (UGAIS) and the York Peel Durham Toronto (YPDT) database of the Conservation Authority Moraine Coalition. This database will include fields such as location, stratigraphy, depth, elevation, year drilled, etc. For all water well data or oil and gas well data for Ontario please refer to WWIS and OOGW.

Government Publication Date: 1875-Jul 2014

Certificates of Approval:

Provincial [CA](#)

This database contains the following types of approvals: Air & Noise, Industrial Sewage, Municipal & Private Sewage, Waste Management Systems and Renewable Energy Approvals. The MOE in Ontario states that any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste, must have a Certificate of Approval before it can operate lawfully. Fields include approval number, business name, address, approval date, approval type and status. This database will no longer be updated, as CofA's have been replaced by either Environmental Activity and Sector Registry (EASR) or Environmental Compliance Approval (ECA). Please refer to those individual databases for any information after Oct.31, 2011.

Government Publication Date: 1985-Oct 30, 2011*

Commercial Fuel Oil Tanks:

Provincial [CFOT](#)

Since May 2002, Ontario developed a new act where it became mandatory for fuel oil tanks to be registered with Technical Standards & Safety Authority (TSSA). This data would include all commercial underground fuel oil tanks in Ontario with fields such as location, registration number, tank material, age of tank and tank size.

Government Publication Date: Feb 28, 2017

Chemical Register:

Private [CHEM](#)

This database includes information from both a one time study conducted in 1992 and private source and is a listing of facilities that manufacture or distribute chemicals. The production of these chemical substances may involve one or more chemical reactions and/or chemical separation processes (i.e. fractionation, solvent extraction, crystallization, etc.).

Government Publication Date: 1999-May 2017

Compressed Natural Gas Stations:

Private [CNG](#)

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 31, 2012

Inventory of Coal Gasification Plants and Coal Tar Sites:

Provincial [COAL](#)

This inventory includes both the "Inventory of Coal Gasification Plant Waste Sites in Ontario-April 1987" and the Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario-November 1988) collected by the MOE. It identifies industrial sites that produced and continue to produce or use coal tar and other related tars. Detailed information is available and includes: facility type, size, land use, information on adjoining properties, soil condition, site operators/occupants, site description, potential environmental impacts and historic maps available. This was a one-time inventory.*

Government Publication Date: Apr 1987 and Nov 1988*

Compliance and Convictions:

Provincial [CONV](#)

This database summarizes the fines and convictions handed down by the Ontario courts beginning in 1989. Companies and individuals named here have been found guilty of environmental offenses in Ontario courts of law.

Government Publication Date: 1989-Sep 2017

Certificates of Property Use:

Provincial [CPU](#)

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all CPU's on the registry such as (EPA s. 168.6) - Certificate of Property Use.

Government Publication Date: 1994-Oct 2017

Drill Hole Database:

Provincial [DRL](#)

The Ontario Drill Hole Database contains information on more than 113,000 percussion, overburden, sonic and diamond drill holes from assessment files on record with the department of Mines and Minerals. Please note that limited data is available for southern Ontario, as it was the last area to be completed. The database was created when surveys submitted to the Ministry were converted in the Assessment File Research Image Database (AFRI) project. However, the degree of accuracy (coordinates) as to the exact location of drill holes is dependent upon the source document submitted to the MNDM. Levels of accuracy used to locate holes are: centering on the mining claim; a sketch of the mining claim; a 1:50,000 map; a detailed company map; or from submitted a "Report of Work".

Government Publication Date: 1886-Aug 2015

Environmental Activity and Sector Registry:

Provincial [EASR](#)

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. The EASR allows businesses to register certain activities with the ministry, rather than apply for an approval. The registry is available for common systems and processes, to which preset rules of operation can be applied. The EASR is currently available for: heating systems, standby power systems and automotive refinishing. Businesses whose activities aren't subject to the EASR may apply for an ECA (Environmental Compliance Approval), Please see our ECA database.

Government Publication Date: Oct 2011-Oct 2017

Environmental Registry:

Provincial [EBR](#)

The Environmental Registry lists proposals, decisions and exceptions regarding policies, Acts, instruments, or regulations that could significantly affect the environment. Through the Registry, thirteen provincial ministries notify the public of upcoming proposals and invite their comments. For example, if a local business is requesting a permit, license, or certificate of approval to release substances into the air or water; these are notified on the registry. Data includes: Approval for discharge into the natural environment other than water (i.e. Air) - EPA s. 9, Approval for sewage works - OWRA s. 53(1), and EPA s. 27 - Approval for a waste disposal site. For information regarding Permit to Take Water (PTTW), Certificate of Property Use (CPU) and (ORD) Orders please refer to those individual databases.

Government Publication Date: 1994-Oct 2017

Environmental Compliance Approval:

Provincial **ECA**

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. In the past, a business had to apply for multiple approvals (known as certificates of approval) for individual processes and pieces of equipment. Today, a business either registers itself, or applies for a single approval, depending on the types of activities it conducts. Businesses whose activities aren't subject to the EASR may apply for an ECA. A single ECA addresses all of a business's emissions, discharges and wastes. Separate approvals for air, noise and waste are no longer required. This database will also include Renewable Energy Approvals. For certificates of approval prior to Nov 1st, 2011, please refer to the CA database. For all Waste Disposal Sites please refer to the WDS database.

Government Publication Date: Oct 2011-Oct 2017

Environmental Effects Monitoring:

Federal **EEM**

The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.

Government Publication Date: 1992-2007*

ERIS Historical Searches:

Private **EHS**

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Government Publication Date: 1999-Aug 2016

Environmental Issues Inventory System:

Federal **EIIS**

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

Government Publication Date: 1992-2001*

Emergency Management Historical Event:

Provincial **EMHE**

List of locations of historical occurrences of emergency events, including those assigned to the Ministry of Natural Resources by Order-In-Council (OIC) under the Emergency Management and Civil Protection Act, as well as events where MNR provided requested emergency response assistance. Many of these events will have involved community evacuations, significant structural loss, and/or involvement of MNR emergency response staff. These events fall into one of ten (10) type categories: Dam Failure; Drought / Low Water; Erosion; Flood; Forest Fire; Soil and Bedrock Instability; Petroleum Resource Center Event, EMO Requested Assistance, Continuity of Operations Event, Other Requested Assistance. EMHE record details are reproduced by ERIS under License with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2017.

Government Publication Date: Dec 31, 2016

List of TSSA Expired Facilities:

Provincial **EXP**

List of facilities with removed tanks which were once registered with the Fuels Safety Program of the Technical Standards and Safety Authority (TSSA). Includes private fuel outlets, bulk plants, fuel oil tanks, gasoline stations, marinas, propane filling stations, liquid fuel tanks, piping systems, etc. Tanks which have been removed automatically fall under the expired facilities inventory held by TSSA.

Government Publication Date: Feb 28, 2017

Federal Convictions:

Federal **FCON**

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

Government Publication Date: 1988-Jun 2007*

Contaminated Sites on Federal Land:

Federal **FCS**

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government.

Government Publication Date: Jun 2000-Mar 2017

Fisheries & Oceans Fuel Tanks:

Federal **FOFT**

Fisheries & Oceans Canada maintains an inventory of aboveground & underground fuel storage tanks located on Fisheries & Oceans property or controlled by DFO. Our inventory provides information on the site name, location, tank owner, tank operator, facility type, storage tank location, tank contents & capacity, and date of tank installation.

Government Publication Date: 1964-Apr 2015

Fuel Storage Tank:

Provincial **FST**

The Technical Standards & Safety Authority (TSSA), under the Technical Standards & Safety Act of 2000 maintains a database of registered private and retail fuel storage tanks in Ontario with fields such as location, tank status, license date, tank type, tank capacity, fuel type, installation year and facility type.

Government Publication Date: Feb 28, 2017

Fuel Storage Tank - Historic:

Provincial **FSTH**

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks. Public records of private fuel storage tanks are only available since the registration became effective in September 1989. This information is now collected by the Technical Standards and Safety Authority.

Government Publication Date: Pre-Jan 2010*

Ontario Regulation 347 Waste Generators Summary:

Provincial **GEN**

Regulation 347 of the Ontario EPA defines a waste generation site as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled, or stored at the site. This database contains the registration number, company name and address of registered generators including the types of hazardous wastes generated. It includes data on waste generating facilities such as: drycleaners, waste treatment and disposal facilities, machine shops, electric power distribution etc. This information is a summary of all years from 1986 including the most currently available data. Some records may contain, within the company name, the phrase "See & Use..." followed by a series of letters and numbers. This occurs when one company is amalgamated with or taken over by another registered company. The number listed as "See & Use", refers to the new ownership and the other identification number refers to the original ownership. This phrase serves as a link between the 2 companies until operations have been fully transferred.

Government Publication Date: 1986-Jun 2017

Greenhouse Gas Emissions from Large Facilities:

Federal **GHG**

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO2 eq).

Government Publication Date: 2013-Dec 2015

TSSA Historic Incidents:

Provincial **HINC**

This database will cover all incidences recorded by TSSA with their older system, before they moved to their new management system. TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. The TSSA works to protect the public, the environment and property from fuel-related hazards such as spills, fires and explosions. This database will include spills and leaks from pipelines, diesel, fuel oil, gasoline, natural gas, propane and hydrogen recorded by the TSSA.

Government Publication Date: 2006-June 2009*

Indian & Northern Affairs Fuel Tanks:

Federal **IAFT**

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

Government Publication Date: 1950-Aug 2003*

TSSA Incidents:

Provincial **INC**

TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. Includes incidents from fuel-related hazards such as spills, fires and explosions. This database will include spills and leaks from diesel, fuel oil, gasoline, natural gas, propane and hydrogen recorded by the TSSA.

Government Publication Date: Feb 28, 2017

Landfill Inventory Management Ontario:

Provincial **LIMO**

The Landfill Inventory Management Ontario (LIMO) database is updated every year, as the ministry compiles new and updated information. The inventory will include small and large landfills. Additionally, each year the ministry will request operators of the larger landfills complete a landfill data collection form that will be used to update LIMO and will include the following information from the previous operating year. This will include additional information such as estimated amount of total waste received, landfill capacity, estimated total remaining landfill capacity, fill rates, engineering designs, reporting and monitoring details, size of location, service area, approved waste types, leachate of site treatment, contaminant attenuation zone and more. The small landfills will include information such as site owner, site location and certificate of approval # and status.

Government Publication Date: Dec 31, 2013

Canadian Mine Locations:

Private

MINE

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Government Publication Date: 1998-2009*

Mineral Occurrences:

Provincial

MNR

In the early 70's, the Ministry of Northern Development and Mines created an inventory of approximately 19,000 mineral occurrences in Ontario, in regard to metallic and industrial minerals, as well as some information on building stones and aggregate deposits. Please note that the "Horizontal Positional Accuracy" is approximately +/- 200 m. Many reference elements for each record were derived from field sketches using pace or chain/tape measurements against claim posts or topographic features in the area. The primary limiting factor for the level of positional accuracy is the scale of the source material. The testing of horizontal accuracy of the source materials was accomplished by comparing the plan metric (X and Y) coordinates of that point with the coordinates of the same point as defined from a source of higher accuracy.

Government Publication Date: 1846-Feb 2017

National Analysis of Trends in Emergencies System (NATES):

Federal

NATE

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Government Publication Date: 1974-1994*

Non-Compliance Reports:

Provincial

NCPL

The Ministry of the Environment provides information about non-compliant discharges of contaminants to air and water that exceed legal allowable limits, from regulated industrial and municipal facilities. A reported non-compliance failure may be in regard to a Control Order, Certificate of Approval, Sectoral Regulation or specific regulation/act.

Government Publication Date: Dec 31, 2014

National Defense & Canadian Forces Fuel Tanks:

Federal

NDFT

The Department of National Defense and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.

Government Publication Date: Up to May 2001*

National Defense & Canadian Forces Spills:

Federal

NDSP

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

Government Publication Date: Mar 1999-Aug 2010

National Defence & Canadian Forces Waste Disposal Sites:

Federal

NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents:

Federal

NEBI

Locations of pipeline incidents from 2008 to present, made available by the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008 -Jun 2017

National Energy Board Wells:

Federal

NEBW

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES):

Federal

NEES

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory:

Federal

NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory:

Federal

NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.

Government Publication Date: 1993-May 2017

Oil and Gas Wells:

Private

OGW

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-Sep 2017

Ontario Oil and Gas Wells:

Provincial

OOGW

In 1998, the MNR handed over to the Ontario Oil, Gas and Salt Resources Corporation, the responsibility of maintaining a database of oil and gas wells drilled in Ontario. The OGSR Library has over 20,000+ wells in their database. Information available for all wells in the ERIS database include well owner/operator, location, permit issue date, and well cap date, license No., status, depth and the primary target (rock unit) of the well being drilled. All geology/stratigraphy table information, plus all water table information is also provide for each well record.

Government Publication Date: 1800-Oct 2017

Inventory of PCB Storage Sites:

Provincial

OPCB

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of PCB storage sites within the province. Ontario Regulation 11/82 (Waste Management - PCB) and Regulation 347 (Generator Waste Management) under the Ontario EPA requires the registration of inactive PCB storage equipment and/or disposal sites of PCB waste with the Ontario Ministry of Environment. This database contains information on: 1) waste quantities; 2) major and minor sites storing liquid or solid waste; and 3) a waste storage inventory.

Government Publication Date: 1987-Oct 2004; 2012-Dec 2013

Orders:

Provincial

ORD

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all Orders on the registry such as (EPA s. 17) - Order for remedial work, (EPA s. 18) - Order for preventative measures, (EPA s. 43) - Order for removal of waste and restoration of site, (EPA s. 44) - Order for conformity with Act for waste disposal sites, (EPA s. 136) - Order for performance of environmental measures.

Government Publication Date: 1994-Oct 2017

Canadian Pulp and Paper:

Private

PAP

This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

Government Publication Date: 1999, 2002, 2004, 2005, 2009

Parks Canada Fuel Storage Tanks:

Federal

PCFT

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Government Publication Date: 1920-Jan 2005*

Pesticide Register:

Provincial PES

The Ontario Ministry of the Environment and Climate Change maintains a database of licensed operators and vendors of registered pesticides.

Government Publication Date: 1988-Aug 2017

TSSA Pipeline Incidents:

Provincial PINC

TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. This database will include spills, strike and leaks from recorded by the TSSA.

Government Publication Date: Feb 28, 2017

Private and Retail Fuel Storage Tanks:

Provincial PRT

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks and licensed retail fuel outlets. This database includes an inventory of locations that have gasoline, oil, waste oil, natural gas and/or propane storage tanks on their property. The MCCR no longer collects this information. This information is now collected by the Technical Standards and Safety Authority (TSSA).

Government Publication Date: 1989-1996*

Permit to Take Water:

Provincial PTTW

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all PTTW's on the registry such as OWRA s. 34 - Permit to take water.

Government Publication Date: 1994-Oct 2017

Ontario Regulation 347 Waste Receivers Summary:

Provincial REC

Part V of the Ontario Environmental Protection Act ("EPA") regulates the disposal of regulated waste through an operating waste management system or a waste disposal site operated or used pursuant to the terms and conditions of a Certificate of Approval or a Provisional Certificate of Approval. Regulation 347 of the Ontario EPA defines a waste receiving site as any site or facility to which waste is transferred by a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents registered receivers of regulated wastes, identified by registration number, company name and address, and includes receivers of waste such as: landfills, incinerators, transfer stations, PCB storage sites, sludge farms and water pollution control plants. This information is a summary of all years from 1986 including the most currently available data.

Government Publication Date: 1986-2016

Record of Site Condition:

Provincial RSC

The Record of Site Condition (RSC) is part of the Ministry of the Environment's Brownfields Environmental Site Registry. Protection from environmental cleanup orders for property owners is contingent upon documentation known as a record of site condition (RSC) being filed in the Environmental Site Registry. In order to file an RSC, the property must have been properly assessed and shown to meet the soil, sediment and groundwater standards appropriate for the use (such as residential) proposed to take place on the property. The Record of Site Condition Regulation (O. Reg. 153/04) details requirements related to site assessment and clean up.

RSCs filed after July 1, 2011 will also be included as part of the new (O.Reg. 511/09).

Government Publication Date: 1997-Sept 2001, Oct 2004-Aug 2017

Retail Fuel Storage Tanks:

Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999-May 2017

Scott's Manufacturing Directory:

Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Ontario Spills:

Provincial SPL

This database identifies information such as location (approximate), type and quantity of contaminant, date of spill, environmental impact, cause, nature of impact, etc. Information from 1988-2002 was part of the ORIS (Occurrence Reporting Information System). The SAC (Spills Action Centre) handles all spills reported in Ontario. Regulations for spills in Ontario are part of the MOE's Environmental Protection Act, Part X.

Government Publication Date: 1988-Jun 2017

Wastewater Discharger Registration Database:

Provincial **SRDS**

Information under this heading is combination of the following 2 programs. The Municipal/Industrial Strategy for Abatement (MISA) division of the Ontario Ministry of Environment maintained a database of all direct dischargers of toxic pollutants within nine sectors including: Electric Power Generation; Mining; Petroleum Refining; Organic Chemicals; Inorganic Chemicals; Pulp & Paper; Metal Casting; Iron & Steel; and Quarries. All sampling information is now collected and stored within the Sample Result Data Store (SRDS).

Government Publication Date: 1990-2014

Anderson's Storage Tanks:

Private **TANK**

The information provided in this database was collected by examining various historical documents, which identified the location of former storage tanks, containing substances such as fuel, water, gas, oil, and other various types of miscellaneous products. Information is available in regard to business operating at tank site, tank location, permit year, permit & installation type, no. of tanks installed & configuration and tank capacity. Data contained within this database pertains only to the city of Toronto and is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1915-1953*

Transport Canada Fuel Storage Tanks:

Federal **TCFT**

List of fuel storage tanks currently or previously owned or operated by Transport Canada. This inventory also includes tanks on The Pickering Lands, which refers to 7,530 hectares (18,600 acres) of land in Pickering, Markham, and Uxbridge owned by the Government of Canada since 1972; properties on this land has been leased by the government since 1975, and falls under the Site Management Policy of Transport Canada, but is administered by Public Works and Government Services Canada. This inventory provides information on the site name, location, tank age, capacity and fuel type.

Government Publication Date: 1970-Aug 2017

TSSA Variances for Abandonment of Underground Storage Tanks:

Provincial **VAR**

List of variances granted for abandoned tanks. Under the Technical Standards and Safety Authority (TSSA) Liquid Fuels Handling Code and Fuel Oil Code, all underground storage tanks must be removed within two years of disuse. If removal of a tank is not feasible, an application may be sought for a variance from this code requirement.

Government Publication Date: Feb 28, 2017

Waste Disposal Sites - MOE CA Inventory:

Provincial **WDS**

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of known open (active or inactive) and closed disposal sites in the Province of Ontario. Active sites maintain a Certificate of Approval, are approved to receive and are receiving waste. Inactive sites maintain Certificate(s) of Approval but are not receiving waste. Closed sites are not receiving waste. The data contained within this database was compiled from the MOE's Certificate of Approval database. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number. All new Environmental Compliance Approvals handed out after Oct 31, 2011 for Waste Disposal Sites will still be found in this database.

Government Publication Date: Oct 31, 2017

Waste Disposal Sites - MOE 1991 Historical Approval Inventory:

Provincial **WDSH**

In June 1991, the Ontario Ministry of Environment, Waste Management Branch, published the "June 1991 Waste Disposal Site Inventory", of all known active and closed waste disposal sites as of October 30st, 1990. For each "active" site as of October 31st 1990, information is provided on site location, site/CA number, waste type, site status and site classification. For each "closed" site as of October 31st 1990, information is provided on site location, site/CA number, closure date and site classification. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number.

Government Publication Date: Up to Oct 1990*

Water Well Information System:

Provincial **WWIS**

This database describes locations and characteristics of water wells found within Ontario in accordance with Regulation 903. It includes such information as coordinates, construction date, well depth, primary and secondary use, pump rate, static water level, well status, etc. Also included are detailed stratigraphy information, approximate depth to bedrock and the approximate depth to the water table.

Government Publication Date: Mar 31, 2017

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

Appendix G: Site Reconnaissance Photographs



SITE PHOTOGRAPHS

PHASE I ENVIRONMENTAL SITE ASSESSMENT
613 Helena Street, Fort Erie, Ontario
Project Number: 2100394AG

Photograph 1
West View

View of the residential dwelling and garage facing west.



Photograph 2
Northwest View

View of the garage building facing northwest on the Phase I Property.





SITE PHOTOGRAPHS

PHASE I ENVIRONMENTAL SITE ASSESSMENT
613 Helena Street, Fort Erie, Ontario
Project Number: 2100394AG

Photograph 3
West View

View of the barn and storage buildings facing west on the Phase I Property.



Photograph 4
North View

View of the storage building north of the barn, primarily used for hay storage and horse turnout on the Phase I Property.





SITE PHOTOGRAPHS

PHASE I ENVIRONMENTAL SITE ASSESSMENT
613 Helena Street, Fort Erie, Ontario
Project Number: 2100394AG

Photograph 5
South View

View of the storage building south of the barn on the Phase I Property.



Photograph 6

View of the interior of the barn facing west.





SITE PHOTOGRAPHS

PHASE I ENVIRONMENTAL SITE ASSESSMENT
613 Helena Street, Fort Erie, Ontario
Project Number: 2100394AG

Photograph 7

View of feed and general storage at the west end of the barn facing south of the Phase I Property.



Photograph 8

View of the horse exercise pool in the west end of the barn facing west.





SITE PHOTOGRAPHS

PHASE I ENVIRONMENTAL SITE ASSESSMENT
613 Helena Street, Fort Erie, Ontario
Project Number: 2100394AG

Photographs 9

View of storage area attached to the south side of the barn facing west on the Phase I Property.



Photograph 10

View of staining in the storage area attached to the south side of the barn facing northwest on the Phase I Property.





SITE PHOTOGRAPHS

PHASE I ENVIRONMENTAL SITE ASSESSMENT
613 Helena Street, Fort Erie, Ontario
Project Number: 2100394AG

Photograph 11

View of interior of storage building south of the barn facing west on the Phase I Property.



Photographs 12

Overall view of the Phase I Property including all building on the site.



PHASE II ENVIRONMENTAL SITE ASSESSMENT

613 Helena Street, Fort Erie, Ontario

Prepared for:

SS Welland Inc.

4080 Confederation Parkway, Unit 605
Mississauga, Ontario, L5B 0G1

Prepared by:



Project No. 2100394AG

December 15, 2021



December 15, 2021

Project No.: 2100394AG

SS Welland Inc.

4080 Confederation Parkway,
Unit 605, Mississauga, ON
L5B 0G1

ATTENTION: Mr. Hunain Siddiqui

**Re: Phase II Environmental Site Assessment
613 Helena Street, Fort Erie, ON**

Please find the enclosed copy of the Phase II Environmental Site Assessment, in accordance with the Canadian Standards Association (CSA) Z769-00 (Reaffirmed 2019) related to the above-noted site.

We trust you will find this report to be complete within our terms of reference. Should you have any questions regarding the information contained in the report, or require further assistance please contact the undersigned at HLV2K's office.

For and behalf of HLV2K Engineering Limited

A handwritten signature in black ink, appearing to read "John Lametti", is written over a faint circular stamp.

John (Gianni) Lametti, P.Eng. QPESA
Principal Environmental Engineer

1 EXECUTIVE SUMMARY

HLV2K Engineering Limited (HLV2K) was retained by SS Welland Inc. (hereinafter referred to as the Client) to conduct a Limited Phase II Environmental Site Assessment (ESA) report for the property located at 613 Helena Street, Fort Erie, Ontario (hereinafter referred to as the site and Phase II Property). The location of the Phase II Property is shown in **Drawing 1**.

The purpose of the Limited Phase II ESA (Site) was to determine the condition of soil on the property for due diligence purposes. The Phase II ESA was completed in accordance with the Scope of Work detailed in HLV2K's Proposal Number 2100394AG dated June 14, 2021.

HLV2K and the clients are aware that the Phase II ESA was carried out in accordance with the Canadian Standards Association (CSA) Z769-00 (Reaffirmed 2008). The report used Ontario Regulation 153/04, as amended (O. Reg. 153/04), as a guideline, however, it was understood that the report would not be completely in accordance with O. Reg. 153/04 and will not be submitted for a Record of Site Condition (RSC) with the Ministry Environment Conservation Parks (MECP).

The findings in this report may be used by the Client for these purposes subject to the Statement of Limitations which forms an integral part of this document.

The Phase II ESA investigation was comprised of the advancement of a total of eleven (11) boreholes drilled to a maximum depth of approximately 4.6 m to 6.9 m below ground surface (bgs). Only four of the boreholes were converted to groundwater monitoring wells called BH5, BH6, BH7, and BH11. The locations of the boreholes were established in the field by HLV2K based on the plan provided by the client. The borehole elevations and locations were surveyed and established by the HLV2K staff. The approximate borehole locations are shown in **Drawing 2**.

BH5 was drilled behind the storage building which is in southwest portion, BH6 was drilled at the front of the property in the southeast corner, BH7 was drilled on the northwest side of the property in the farmland area, and BH11 was drilled at the front of the property on the northeast side of the phase II Property. Selected samples for soil obtained during the course of the Phase II ESA were submitted for chemical laboratory analysis, the scope which was agreed to by the Clients.

Selected soil samples were collected for metals and inorganics (M&I), Petroleum Hydrocarbons F1 to F4 fractions (PHCS), Volatile Organic Compounds (VOCs), Poly Aromatic Hydrocarbons (PAH), Poly Chlorinated Bi Phenyls (PCB) and Organo Chlorine Pesticides (OCs Pesticides) submitted for chemical laboratory analysis including one duplicate sample in accordance to O.Reg 153/04 as amended.

The chemical analysis results were compared to the values stated in the MECP document titled "Soil,

Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act”. The site was compared to Table 2 Standards in a Potable Ground Water Condition for Residential Parkland Institutional (RPI) use site conditions standards for all parameters sampled in the soil.

The soil samples at the site were found to meet the MECP Table 2 Standards RPI in a Potable Groundwater Condition for PHCs, Metals and Inorganics, VOCs, PAH, PCBs, and OC Pesticides.

The soil encountered in the area are considered to be tight soils comprising of clay to silty clay till, which is not conducive for the spread of contaminants in the subsurface soils and via the groundwater table.

The groundwater table was encountered at depths ranging from 0.41 m to 1.36 m bgs. The measured groundwater flow is generally flat with a slight gradient towards the west towards the forested area of the site.

These findings suggest that the surrounding properties and Phase II Property activities have not adversely impacted the site at the locations sampled,.

We trust you will find this report complete within our terms of reference. Should you have any further questions regarding this report or require further assistance please contact HLV2K Engineering Limited.

Yours very truly,



John (Gianni) Lametti, P.Eng. QP_{ESA}
Vice President & Principal Engineer

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Drawings

- Drawing 1: Phase II Property Location
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- Drawing 3: Groundwater Flow Direction

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- Appendix A: Borehole Logs
- Appendix B: Certificates of Laboratory Analysis

2 INTRODUCTION

HLV2K Engineering Limited (HLV2K) was retained by SS Welland Inc. (hereinafter referred to as the Client) to conduct a Phase II Environmental Site Assessment (ESA) report for the property located at 613 Helena Street, Fort Erie, Ontario (hereinafter referred to as the site and Phase II Property).

The purpose of the Phase II ESA was to determine the condition of soil and groundwater on the property for due diligence purposes. The Phase II ESA was completed in accordance with the Scope of Work detailed in HLV2K's Proposal Number 2100394AG dated June 4, 2021.

The drilling was undertaken on September 8, 2021 and September 9, 2021.

HLV2K and the clients are aware that the Phase II ESA was carried out in accordance with the Canadian Standards Association (CSA) Z769-00 (Reaffirmed 2012). The report also relied upon Ontario Regulation 153/04, as amended (O. Reg. 153/04), for Brownfield Sites as a guideline, however, it was understood that the report would not be completely in accordance with O. Reg. 153/04 and will not be submitted for Record of Site Condition (RSC) with the Ministry Environment Conservation Parks (MECP) since the land use will remain as industrial.

The Client may use the findings in this report for these purposes subject to the *Statement of Limitations*, which forms an integral part of this document. No other third parties are entitled to rely upon this report without the express written consent of HLV2K Engineering Limited. Any use, which a third party makes of this report, is the sole responsibility of the said third party; HLV2K Engineering Limited accepts no responsibility for any damages.

3 SITE DESCRIPTION

The Phase I Property is situated in a residential/ forested area on the west side of Helena Street in Fort Erie, Ontario, north of the intersection of Helena Street and Washington Road. The site location is illustrated in **Drawing 1**. The site is in a rural area with a mix of residential, agricultural, and unoccupied land.

The current land use is agricultural or other use. There is a two-storey residential dwelling with an attached garage, a two-storey barn, and two storage buildings on the Phase I Property. The site was used for agricultural purposes before these structures were built. A forested area makes up the western portion of the site.

The total site area is approximately 11.52 hectares and it is a rectangular-shaped property. The site buildings accounted for roughly 15% of the total property area. . The site is located at approximately 181.1 m above sea level (ASL) and is generally flat land.

3.1 Phase II Property Ownership

The Phase II Property is currently owned by SS Welland Inc.

3.2 Current and Proposed Future Uses

At the time of the Phase I ESA site reconnaissance, the Phase II Property was operating as an agricultural or other use along with the less sensitive residential land use. HLV2K inspected the property on three (3) occasions in September 2021 for the private locates followed by drilling of the boreholes and for the elevation survey and found the operations to be the same. The land use is to remain in agricultural and residential use for the near future.

3.3 Applicable Site Condition Standards

The applicable site condition standard for the property is Ministry of Environment Conservation Parks (MECP) Table 2 RPI standards for coarse sand and Potable groundwater. The details of the site are presented in **Table A**.

Table A – Phase II Property Details

Parameters	Information
Land Use	Historically the Phase II Property was used for agricultural or other and residential use since the property was first developed before 1934.
Site Location relative to Municipal Potable Water Wells	There is one well on-site for non drinking water use.
Potable or Non-potable Groundwater	Potable Groundwater since the property receives its potable water supply from wells.
Regulation/Guideline used for Phase II ESA	Phase II Environmental Site Assessment (ESA) to the CSA Standard for Due Diligence Report and O. Reg 153/04 as amended.
Proximity to Surface Water	The nearest surface water body is Lake Erie located approximately 1.1 km south of the site.
Areas of Natural Significance or Sensitive Area	According to the Niagara Peninsula Conservation Authority website, the site is in the area of the provincially significant Kraft Drain Wetland

Parameters	Information
	Complex. However, the site itself is not a wetland and it is not part of an Area of Natural and Scientific Interest (ANSI).
Depth to Bedrock	Weathered Dolomite bedrock was encountered at the location of four (4) boreholes namely BH1, BH4, BH7, and BH11 at depths of 6.8, 4.9, 4.5, and 6.1 m below ground surface (bgs), respectively.
Groundwater Flow Direction	The groundwater flow was determined to be generally flat with a slight gradient towards the west towards the forested area of the site.
Bedrock Details	The bedrock in the area is described as Middle Devonian Age, consisting of limestone, dolostone, and shale of the Detroit River Group and Onondaga Formations.

Given that the purpose of this Phase II ESA is to determine the baseline soil conditions in support of the potential purchase of the property, the applicable criteria to be used in this Chemical Analysis Program is the Ontario Regulation 153/04 "Table 2 Standards in a Potable Groundwater Condition for RPI use site conditions standards, (Table 2 Standards) as per the MECP document titled "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act: dated April 15, 2011, as amended.

4 BACKGROUND INFORMATION

4.1 Physical Settings

A summary of the physical settings of the Phase II Property is provided in **Table C**, below.

Table B – Physical Setting Summary

Parameters	Information
Location	613 Helena Street, Fort Erie, Ontario in an agricultural and residential area.
Surficial Geology	Surficial deposits in the immediate vicinity of the site are mapped as deeper water glaciolacustrine deposits consisting of silt, clay, and minor sand.
Soil	Below the topsoil materials soil are clay and silty clay till, trace with trace gravel.
Physiography	The Site is located in Haldimand Clay Plain physiographic region. The Haldimand Clay Plain consists of fine-grained silts and clays deposited at the bottom of a deep glacial lake basin.
Depth to Bedrock	Weathered Dolomite bedrock was encountered at the location of four (4) boreholes namely BH1, BH4, BH7, and BH11 at depths of 6.8, 4.9, 4.5, and 6.1 m below ground surface (bgs), respectively.
Topography	The site and surrounding areas are typically flat with a gentle slope towards the south. The geodetic elevation of the site is approximately 181 m above sea level (ASL).
Radon Gas	According to the Ontario Geological Survey entitled “Soil Radon Gas Study of Southern Ontario”, the site is not within the four main study areas investigated.
Hydrology	The nearest surface water body is Lake Erie located approximately 1.1 km south of the site.
Hydrogeology	Groundwater was detected at approximately 0.76, 0.41, 1.36, and 1.09 m bgs as measured in BH5, BH6, BH7, and BH11, respectively. The local groundwater flow is generally flat with a slight gradient towards the west towards the forested portion of the site. The groundwater elevations may not be at static conditions due to the hinderance to groundwater flow noted by the silty clay soils. The hydraulic conductivity of silty clay soil is generally in the range of 10^{-6} cm/sec to 10^{-8} cm/sec.

4.2 Past Investigation

HLV2K Engineering reviewed one (1) report provided pertaining to this file. The reports that were reviewed are as followed:

“Phase I Environmental Assessment, 613 Helena Street, Fort Erie, Ontario”, prepared by Amec

Foster Wheeler Environmental & Infrastructure (Report TG171150, dated January 19, 2017) (Author: Patrick Shriner, P. Geo.)

Environmental Report

- Amec Foster Wheeler conducted a Phase I ESA on the property at 613 Helena Street, Fort Erie, in 2017.
- During the time of their investigation, A two-story residential dwelling and garage, a two-story barn, and two storage structures are now on the site. This site is used as an agricultural (horse farm) and for residential purposes.
- Amec Foster Wheeler concluded for agricultural purposes; Pesticides are believed to have been used on the site in the past. Lead, arsenic, and previous generation organochlorine pesticides are frequently connected with past agricultural spraying and may persist in the soil at low levels.
- The barn is located on the south side of the structure, where several jerry cans of fuel were found in the storage space. In the same space tractors, lawnmowers, other agricultural equipment, and multiple jerry cans of fuel are stored. Strong petroleum/diesel odours were also detected in this area. Under the tractor found stain as well.
- Asbestos-containing materials (ACMs), lead-containing paints (LCPs), and polychlorinated biphenyl (PCB) containing fluorescent light ballasts may be present at the site, based on the age of construction of the Site buildings (i.e., before 1934 and the mid-1970s to early 1990s).
- They recommended further investigations be carried out.

4.3 New Investigation by HLV2K

- The site visit conducted by HLV2K in 2021 along with the records review indicated that no material change has taken place since the Phase I ESA report conducted by Amec Foster Wheeler in 2017 and the conclusions of the report remain true.

Upon further investigation by HLV2K, a Phase II ESA was conducted to address the potential impact on the soil due to the farm operations of the property and the monitoring wells were installed based on the site inspection carried out during the clearance of the boreholes and via historical aerial photographs obtained by HLV2K for the Phase II Property. Boreholes were placed as close as possible near the location of stainings and agricultural activities.

HLV2K chose to analyze the soil for Petroleum Hydrocarbons (F1 to F4) fractions (PHCs), Volatile Organic Compounds (VOCs), PAH, Metals and Inorganics, pH, SAR, EC and OC Pesticides in soil. The soils in the area were considered to not be very impermeable hence a limited Phase II ESA was conducted since the groundwater on the site was considered not to vulnerable to surface activities such as farming.

5 SCOPE OF INVESTIGATION

5.1 Overview of the Phase II Investigation

The Phase II ESA field activities were conducted from September 8, 2021 to October 21, 2021 to investigate the environmental conditions of the soil and groundwater at the site. The tasks carried out during the investigation are summarized below:

- Private and public locates completed on the first day of the fieldwork;
- Geodetic elevations for borehole locations or to a local benchmark;
- Advancement of a total of eleven (11) boreholes to a maximum depth of 4.6 to 6.9 m bgs;
- Four (4) of the eleven (11) boreholes were completed to monitoring wells designed to intercept the water table;
- Samples were retrieved at intervals of 0.75 m from the split spoon rig.
- Groundwater elevation measurements using an interphase probe for the potential measurements of free phase product was conducted as part of the hydrogeological investigation of the property; and,
- Chemical analyses on the representative soil samples.

The Phase II ESA site investigation included a design for sampling locations, parameters and frequency as summarised in **Table C** below.

Table C – Phase II ESA Sampling Design

Potentially Contaminating Activity	Boreholes	Sampling Frequency	Parameters	Rational
PCA 28, PCA Spill, PCA 40	BH5	1-S	PHC F1 to F4	Farm equipment using hydraulic oils, staining, and petroleum/diesel odours
		1-S	VOC	
		1-S	PAH	
		1-S	M & I	
		1-S	OC Pesticides	
PCA 40	BH6	1-S	PHC F1 to F4	Farm operations and pesticide use
		1-S	VOC	
		1-S	PAH	
		1-S	M & I	
		1-S	OC pesticides	
	BH7	1-S	PHC F1 to F4	Farm operations and pesticide use
		1-S	VOC	
		1-S	PAH	
		1-S	M & I	
		1-S	OC pesticides	
	BH11	1-S	PHC F1 to F4	Farm operations and pesticide use
		1-S	VOC	
		1-S	PAH	
		1-S	M & I	
1-S		OC pesticides		

- S - Soil media
 GW - Groundwater media
 PHC - Petroleum Hydrocarbons F1 to F4 Fractions
 PAH - Polycyclic Aromatic Hydrocarbons
 M&I - Metals and Inorganics includes (EC, SAR and pH)

OC's - Organochlorine pesticides
VOC - Volatile Organic Compounds

Monitoring well screen were installed at an approximate depth of 1.5 to 3.0 m bgs in an attempt to intercept the shallow water table and meet the requirements of O. Reg. 903 requiring a minimum bentonite seal of 1.5 m bgs. The locations of the boreholes and monitoring wells are shown in **Drawing 2**.

5.2 Media Investigated

Soil quality was investigated during the current Limited Phase II ESA work. The investigation of sediment was not applicable due to the absence of surface water bodies on the site.

5.3 Phase One Conceptual Site Model

A Phase One ESA has not been conducted for the site and as such, a Phase One Conceptual Site Model was not generated for a CSA Phase II ESA Property. The Phase One ESA refers to O. Reg 153/04 as amended for which the CSA standard report is not compatible.

5.4 Site Investigation Methodology

HLV2K developed Standard Operating Procedures (SOPs) and field forms that follow O. Reg. 153/04 (as amended) to complete the Phase II ESA. The following is a list of SOPs and forms that were used.

- HLV2Ks Health and Safety manual;
- Soil Sampling for VOCs in Methanol Vials;
- Soil Vapour Head Space Measurement;
- Logging Forms;
- Groundwater Purging and Sampling Procedures; and,
- Sample Packing and Transportation.

HLV2K did not deviate from the SOPs and forms outlined above.

5.4.1 Borehole Drilling

Prior to subsurface activities on the site, HLV2K contacted the Ontario One Call for the public locates. A private utility contractor (Utility Marx) was retained to verify all borehole positions were remote from buried utilities.

BH5 was drilled behind the storage building which is in southwest direction, BH6 was drilled at the front of the property at southeast corner, and BH7 was drilled on the northwest side of the property and BH11 at the front of the property on Northeast side of the phase II Property.

Eleven (11) boreholes were drilled on the property to depths of 4.6 m to 6.9 m below ground surface with a

track mounted CME 55 drill rig by Landshark Drilling. The work was undertaken on September 8, 2021 and September 9, 2021.

5.4.2 Soil Sampling

Soil samples were collected and handled in accordance with generally accepted sampling procedures used by the environmental consulting industry. For guidance, these practises were relied upon the O. Reg. 153/04 as amended.

Soil samples for the Phase II ESA were collected from the 0.75 m split spoon sampler. Quality control measures were used to minimize cross-contamination, such as cleaning of the sampler, cleaning of the augers after each use, and using disposable items/equipment for each discrete sample. New disposable gloves were used during each sampling event to remove soil from the sampling device and transfer the soil samples into the appropriate sample containers.

The soil samples were examined in the field for lithology as well as physical evidence of impacts (i.e., debris, staining, colour, and odours). The samples were kept out of direct sunlight during the field storage and cooled with ice, in accordance with the MECP sampling protocols.

No sediment sampling was performed as there were no surface water bodies onsite.

5.4.3 Field Screening Measurements

Soil samples collected were screened for vapours using the RKI-Eagle 2 gas portable vapour monitor, which includes a Photo-Ionization Detector (PID) and was calibrated prior to use. The RKI Eagle 2 includes a PID sensor for detecting high and low parts per million (ppm) levels (0-50 and 0-2,000) of VOC gases with a maximum accuracy variance of +/- 5 %. The VOC measurements were taken by collecting soil samples into dedicated sampling bags and allowing the sample to reach room temperature. The sampling probe of the RKI Eagle 2 was then placed into the bag while best maintaining a seal. The measurements taken represent the highest value found within the first 30 seconds of field screening. Measurements were then documented into HLV2K field notes.

The soil was characterized based on a qualitative field study to determine colour, odour discoloration, and texture.

5.4.4 Ground Water Monitoring Well Installation (Not Part of the Scope)

The monitoring well installations in HLV2K are installed to the specification provided below;

- 50 mm diameters Schedule 40 Poly Vinyl Chloride (PVC) risers;
- 50 mm diameter Schedule 40 PVC, Screen with a maximum screen length 3.0 m with factory machined slot width of 0.25 mm;
- Sand pack to approximately 0.3 m above the top of the screen;
- Bentonite seal above the sand pack; and,
- 1.0 m monument well casings.

The PVC pipes and screens were wrapped in plastic that was removed just prior to installation to minimize the potential for cross-contamination. The base of the monitoring well was covered with a PVC cap to prevent the influx of sediment from entering from the end of the pipe. Clean silica sand supplied in bags, was placed in the annular space between the pipe wall and the borehole to filter out sediment from entering the well during well development. A bentonite seal was added above the sand pack and was extended to the surface to prevent surface intrusion into the well. The well was capped below the surface and fitted with a flush mount casing.

No groundwater sampling was collected during the drilling process.

5.4.5 Groundwater Monitoring Well Development and Sampling

Groundwater sampling was not conducted as part of this Limited Phase II ESA.

5.4.6 Residue Management Procedures

Most soil samples produced by the drilling process were collected by HLV2K for characterization and submission for analytical purposes. Excess cuttings and groundwater waste generated from the field activities were placed in drums. Disposal of the soil and groundwater will be done at a later date. No groundwater was collected from the site since it was not part of the environmental scope of work.

5.4.7 Elevation Survey

An elevation survey was performed by HLV2K using a Total Station measuring device which produced the coordinates and elevations. The elevations for the monitoring wells were surveyed using the Total Station and a local benchmark and can be found in **Appendix A**.

5.4.8 Chemical Analysis

The Client agreed upon the following scope of chemical laboratory analysis of the soil samples collected during the Phase II ESA investigation:

- Metals and inorganics (M&I);
- Polycyclic Aromatic Hydrocarbons (PAHs);

- Petroleum Hydrocarbon fractions F1 to F4 (PHCs);
- Organochlorine Pesticides (OC Pesticides); and,
- Volatile Organic Compounds (VOCs).

Soil samples were submitted to ALS Laboratories (ALS), an analytical laboratory accredited by the Canadian Association for Laboratory Accreditation (CALA) and the International Standard ISO/IEC 17025 certified. The analysis was performed in compliance with the MECP Laboratory Services Branch, "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act", as amended.

Samples submitted to the laboratory represent the 'worst-case" sample based on field screening measurements, visual and olfactory observations.

All samples submitted for M&I, PHC fractions F2 to F4, PAHs, OC pesticides were stored in glass jars provided by ALS. VOC samples were collected in vials including the PHC F1 fraction for soil. All samples requiring laboratory chemical analysis were placed in an ice-filled cooler and transported to the laboratory. The samples were collected and submitted for regular turn-around time (TAT) as requested by the client.

5.4.9 Quality Assurance and Quality Control Measures

Soil samples were collected using dedicated 250 ml jars, syringes and methanol vials provided by ALS. Soil samples that required VOC analysis involved placing approximately 5 g of soil into dedicated methanol-filled vials. This method was used to ensure no loss of VOC during transportation.

Soil samples were collected using dedicated nitrile gloves that were disposed of after each sample, to mitigate cross-contamination. Sampling equipment for soil was cleaned with Alconox Powdered Precision Cleaner, as it has biodegradable, interfering-residue free and corrosion inhibited properties. The Alconox was not used for the cleaning of the groundwater sampling devices, because it can interfere with the performance of the interface probe and there was no visible oil sheen noted during the development phase of the work. The QP made the call in the field to use distilled water and cotton cloths to wash and dry the equipment before re-use on the next monitoring well.

The following packaging and transportation procedures were followed:

- Review of proposal and amendments (written and verbal) to verify the parameters for analysis;
- Packing properly labelled samples with ice to maintain temperatures below 10°C for the duration of the trip from the site to the laboratory; and,
- A copy of the Chain-of-Custody was archived by HLV2K.

5.5 Impediments

No physical impediments were encountered during the Limited Phase II ESA investigation.

5.6 Deviations from Sampling and Analysis Plan

No deviations were encountered.

6 SUBSURFACE CONDITIONS

6.1 Soil Conditions

6.1.1 Generalized Stratigraphy

Detailed descriptions of the subsurface conditions at the investigated locations are presented in the borehole logs in **Appendix A**. The following is a summary of the general stratigraphy revealed by the boreholes at the site:

- The topsoil layer ranged in thickness from 0.15 to 0.3 m;
- The gravely sand fill layer extended from 0.2 to 0.8 m bgs at the boreholes located on access roads;
- Native soil was encountered to the end of boreholes comprised of brown silty clay to silty clay till with traces of gravel.

The soil was free of odours, debris, and staining in all of the boreholes drilled onsite.

6.1.2 Soil Texture

Under Ontario Regulation 153/04 (as amended), "coarse-textured soil" is soil that contains more than 50 percent by mass of particles that are 75 micrometres (µm) or larger in mean diameter. According to O. Reg. 153/04 (as amended), if one-third (1/3) of the soils at the Phase II Property are coarse-grained, then the more stringent coarse textured soil standards apply to the site; otherwise, the fine-medium grained soil standards are applicable. The soil at this property was considered mostly fine to medium coarse-grained sand and as such can be classified as fine grained soils, which requires a grain size analysis as proof. A grain size analysis was not conducted at this site.

6.2 Groundwater Conditions

6.2.1 Field Measurement of Groundwater (Hydrogeological Investigation)

The groundwater elevation measurements to the top of the pipe were collected to the ground surface prior to well development. Groundwater development was not conducted as part of this assessment. Temperature, pH, and conductivity measurements in the field are presented in **Table D**.

Table D – Field Measurements (October 21, 2021)

Monitoring Wells	Volume of Water Removed (L)	Groundwater Level (m bgs)	Depth of Water Column (m bgs)	Temp (°C)	pH	Conductivity (µS/cm)
BH5	-	0.76	4.44	10	7.34	952
BH6	-	0.41	4.79	11	8.04	977
BH7	-	1.36	3.24	10	7.95	843

BH11	-	1.09	5.01	10	7.43	915
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6.2.2 Elevations and Flow Direction

Subsequent to the monitoring well installations, two (2) visits to the Phase II Property were made to measure the static water levels. The groundwater level measurements are summarized in **Table E**.

Table E – Groundwater Level Measurements

Monitoring Wells ID	Monitoring Date	Ground Surface Elevation (m asl)	Depth to Water (m bgs)	Groundwater Elevation (m asl)	Observations (LNAPL/ DNAPL)
BH5	September 28, 2021	181.4	0.82	180.58	None Detected
	October 21, 2021		0.76	180.64	None Detected
BH6	September 28, 2021	181.2	0.90	180.35	None Detected
	October 21, 2021		0.41	180.89	None Detected
BH7	September 28, 2021	181.7	1.43	180.31	None Detected
	October 21, 2021		1.36	180.34	None Detected
BH11	September 28, 2021	181.9	2.59	179.31	None Detected
	October 21, 2021		1.09	180.81	None Detected

Based on the above groundwater measurements, hydraulic gradient calculations were calculated with the data collected from BH5, BH6, BH7, and BH11. The groundwater flow is generally flat throughout the site with a slight gradient to the west. Groundwater flow direction is presented in **Drawing 3**.

No sheen or evidence of Light Non-Aqueous Phase Liquid (LNAPL) and Dense Non-Aqueous Phase Liquid (DNAPL) as free products were observed in any of the monitoring wells. No hydrocarbon odours were detected in any of the monitoring wells.

6.2.3 Hydraulic Gradient

The average Hydraulic Gradient was determined to be approximately 0.0023 m/m.

Table F – Hydraulic Gradient

Parameter	Hydraulic Gradient (m/m)	Remarks
Average	0.0023	Referenced from BH5 to BH6

6.2.4 Groundwater Flow Discussion

The Lake Erie lies approximately 1.1 km to the south of Phase II Property. Based upon the proximity of Lake Erie and the topography of the land, the regional groundwater flow direction is inferred to be from north to south towards Lake Erie. The measured groundwater flow on the property was generally the same throughout the site with a slight gradient towards the west towards the forested area.

7 CHEMICAL ANALYSIS

7.1 Sample Screening

7.1.1 Soil Screening

Field screening of the soil involved the use of a portable RKI Eagle 2 monitor, in methane elimination mode, to measure the VOCs in parts per million (ppm) calibrated to Hexane and Isobutylene. The RKI Eagle 2 monitor measurements were performed in conjunction with visual and olfactory observations. This combination of field screening tools was used to determine the "worst-case" sample of the site.

7.1.2 Sample Selection

The selection of soil samples for laboratory analysis was based on the Limited Phase II ESA Preliminary Design (**Table C**), where necessary, using the "worst-case" samples as defined by the visual, olfactory, and combustible vapour screening measurements. In addition, samples were selected to provide representative site coverage. A summary of the soil headspace measurements is presented in **Table G**.

Table G – Head Vapour Analysis on Soil Samples

Location and Date	Sample No.	Sample Depth (m)	Geologic Layer	Aesthetic Evidence of Potential Impact	Headspace Measurements	
					HEX (% LEL)	IBL (ppm)
BH5 November 12, 2021	1	0.2 – 0.6	Disturbed native silty clay, trace gravel	None Detected	0	0
	2	0.8 – 1.4	Silty clay till, trace gravel	None Detected	0	0
	3	1.5 – 2.2	Silty clay till, trace gravel	None Detected	0	0
	4	2.3 – 2.9	Silty clay till, trace gravel	None Detected	0	0
	5	3.0 – 3.7	Silty clay till, trace gravel	None Detected	0	0
	6	4.6 – 5.2	Silty clay, trace sand and gravel	None Detected	0	0
BH6 November 12, 2021	1	0.2 – 0.6	Disturbed native silty clay, trace gravel	None Detected	0	0
	2	0.8 – 1.4	Silty clay till, trace sand and gravel	None Detected	0	0
	3	1.5 – 2.2	Silty clay till, trace sand and gravel	None Detected	0	0
	4	2.3 – 2.9	Silty clay till, trace sand and gravel	None Detected	0	0
	5	3.0 – 3.7	Silty clay till, trace sand and gravel	None Detected	0	0
	6	4.6 – 5.2	Silty clay, trace sand and gravel	None Detected	0	0
BH7 November 12, 2021	1	0.2 – 0.6	Disturbed native silty clay, trace gravel	None Detected	0	0
	2	0.8 – 1.4	Silty clay till, trace gravel	None Detected	0	0
	3	1.5 – 2.2	Silty clay till, trace gravel	None Detected	0	0
	4	2.3 – 2.9	Silty clay till, trace gravel	None Detected	0	0
	5	3.0 – 3.7	Silty clay, trace sand and gravel	None Detected	0	0
BH11 November 12, 2021	1	0.2 – 0.6	Disturbed native silty clay, trace gravel	None Detected	0	0
	2	0.8 – 1.4	Silty clay till, trace sand and gravel	None Detected	0	0
	3	1.5 – 2.2	Silty clay till, trace sand and gravel	None Detected	0	0
	4	2.3 – 2.9	Silty clay till, trace sand and gravel	None Detected	0	0
	5	3.0 – 3.7	Silty clay till, trace sand and gravel	None Detected	0	0
	6	4.6 – 5.2	Silty clay, trace sand and gravel	None Detected	0	0

In the absence of any significant screening measurements (visual, olfactory and headspace vapour

measurements), the following rationale was applied to sample selection for laboratory chemical analysis:

- Metals were sampled at the surface and in the areas where fill material was encountered.
- PAHs are not very mobile in the natural environment but can be present in soil due to man-made chemicals such as creosote and asphalt tars or can be formed naturally by the breakdown of plant and animal matter. Therefore, PAH analysis was conducted on samples obtained from shallow depths.
- OCPs are not very mobile and would tend to accumulate at or near to the ground surface.
- VOCs and PHCs F1 to F4 fractions were sampled in the water table.

7.2 Soil Quality

A total of thirty (30) soil sample parameters were submitted for chemical analysis of soil including one duplicate sample. The analysis indicates that soil concentration measured met the requirements of the MECP Table 2 Standards RPI for coarse-grained soils in a non potable groundwater condition. A summary of the results is provided in **Table H** and the Laboratory Certificate of Analysis is presented in **Appendix B**.

Table H – Summary of Soil Chemical Analysis Results

Sample Location	Parameters Analyzed	Parameters With Exceedances Table 2 Standards RPI
BH5	PHC, VOC, PAH, M&I, OC Pesticides	No Exceedances
BH6	PHC, VOC, PAH, M&I, OC Pesticides	No Exceedances
BH7	PHC, VOC, PAH, M&I, OC Pesticides	No Exceedances
BH11	PHC, VOC, PAH, M&I, OC Pesticides	No Exceedances

PHC – Petroleum Hydrocarbons F1 to F4 Fractions
 M&I – Metals and Inorganics
 VOC – Volatile Organic Compounds
 PAH – Polycyclic Aromatic Hydrocarbons
 OC Pesticides – Organochlorine Pesticides

There were no exceedances in soil for the MECP Table 2 Standards RPI at the locations sampled.

7.3 Groundwater Quality

Groundwater analysis was not required as part of this Limited Phase II ESA. There were no exceedances in soil therefore, it is highly unlikely that contaminants from site operations are present in the groundwater.

8 QUALITY ASSURANCE AND QUALITY CONTROL RESULTS

The Phase II ESA was performed under the supervision and direction of a Qualified Person.

HLV2K collected soil samples in conformance with HLV2K's SOPs, which were developed in accordance with Ontario Regulation 153/04 (as amended).

HLV2K's personnel used appropriate measures (such as disposable gloves, dedicated sampling equipment, laboratory supplied containers, proper cleaning procedures, labelling and Chain of Custody documents) to ensure data quality.

As part of the Quality Assurance and Quality Control Program, duplicate samples for soil was submitted for Quality Assurance and Quality Control (QA/QC) and meet the requirements set for in O. Reg. 153/04 as amended. One (1) duplicate sample was collected for every ten (10) sample parameters.

Samples were transported in ice-filled coolers to ensure temperatures were maintained below 10°C, along with a Chain of Custody to ALS. ALS performed the chemical analysis in compliance with the MECP "Laboratory Services Branch, Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act", as amended. No discrepancies were noted as samples were properly handled with regards to the following:

- Holding time;
- Preservation method;
- Storage requirement; and,
- Container type.

The Laboratory Certificates of Analysis are presented in **Appendix B**.

A review of the data collected suggests that there was good agreement between the samples collected and their duplicates in all cases.

The Qualified Person concluded that the data met the data quality objective, and the decision-making was not affected. The Qualified Person has concluded that the overall objectives of the investigation and assessment were met.

9 CONCLUSIONS

On the basis that the Phase II Property is in an agricultural and residential area and will be developed for residential use, the property was determined to be an MECP Table 2 Standard RPI coarse-grained soils in a Potable Groundwater condition.

The groundwater flow was measured to be generally similar throughout the site with a slight gradient towards the west towards the forested area of the site. The groundwater table was between 0.4 to 1.36 m bgs.

Based upon the results of the parameters tested across the four (4) monitoring well locations during the Limited Phase II ESA investigation, the soil samples collected met the applicable MECP Table 2 RPI Standards, including the duplicates. These findings suggest that the surrounding properties and Phase II Property activities have not impacted the site at the locations sampled.

10 RECOMMENDATIONS

At this time, further investigation of the property is not required. However, should the municipality request a Record of Site Condition (RSC) be carried out at a later date due to the redevelopment of the property, the groundwater on the site may need to be investigated.

We trust you will find this report complete within our terms of reference. Should you have any further questions regarding this report or require further assistance please contact HLV2K Engineering Limited.

Respectfully Submitted,
HLV2K Engineering Limited



Mariam Mohammadi, M.A.Sc.
Environmental Specialist



John G. Lametti, P.Eng. QPESA
Principal and Environmental Manager



REFERENCES

- Barnett, P.J., Cowan, W.R. and Henry, A.P. 1991. Quaternary Geology of Ontario, southern sheet; Ontario Geological Survey, Map 2556, Scale 1:1000 000.
- Chapman, L.J., and Putnam, D.F. 1984: Physiography of Southern Ontario; Ontario Geological Survey, Map P.2715. Scale 1:600 000.
- Ontario Base Map
- Toporama-Topographic Atlas of Canada

HLV2K Engineering Limited

STATEMENT OF LIMITATIONS

Your report has been developed based on your unique project specific requirements as understood by HLV2K Engineering Limited (HLV2K) and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking HLV2K to assess how factors that changed subsequent to the date of the report affect the report's recommendations. HLV2K cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions, which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult HLV2K to be advised how time may have impacted on the project.

The findings derived from this investigation were based on information collected and/or provided by the Client. It may become apparent that soil and groundwater conditions differ between and beyond the testing locations examined during future investigations or other work that could not be detected or anticipated at the time of this study. As such, HLV2K cannot be held liable for environmental conditions that were not apparent from the available information. The conclusions presented represent the best judgment of the assessors based on limited investigations.

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature, external data source review, sampling, and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions, which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of HLV2K through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only HLV2K, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and HLV2K cannot be held responsible for such misinterpretation.

To avoid misuse of the information contained in your report it is recommended that you confer with HLV2K before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

HLV2K Engineering Limited

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain HLV2K to work with other project design professionals who are affected by the report. Have HLV2K explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment.

Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact HLV2K for information relating to geoenvironmental issues.

HLV2K is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with HLV2K to develop alternative approaches to problems that may be of genuine benefit both in time and in cost.

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from HLV2K to other parties but are included to identify where HLV2K's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from HLV2K closely and do not hesitate to ask any questions you may have.

Third party information reviewed and used to formulate this report is assumed to be complete and correct. HLV2K used this information in good faith and will not accept any responsibility for deficiencies, misinterpretation or incompleteness of the information contained in documents prepared by third parties.


Nothing in this report is intended to constitute or provide a legal opinion.


Should additional information become available, HLV2K requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

DRAWINGS



Legend



 Approx. Site Boundary

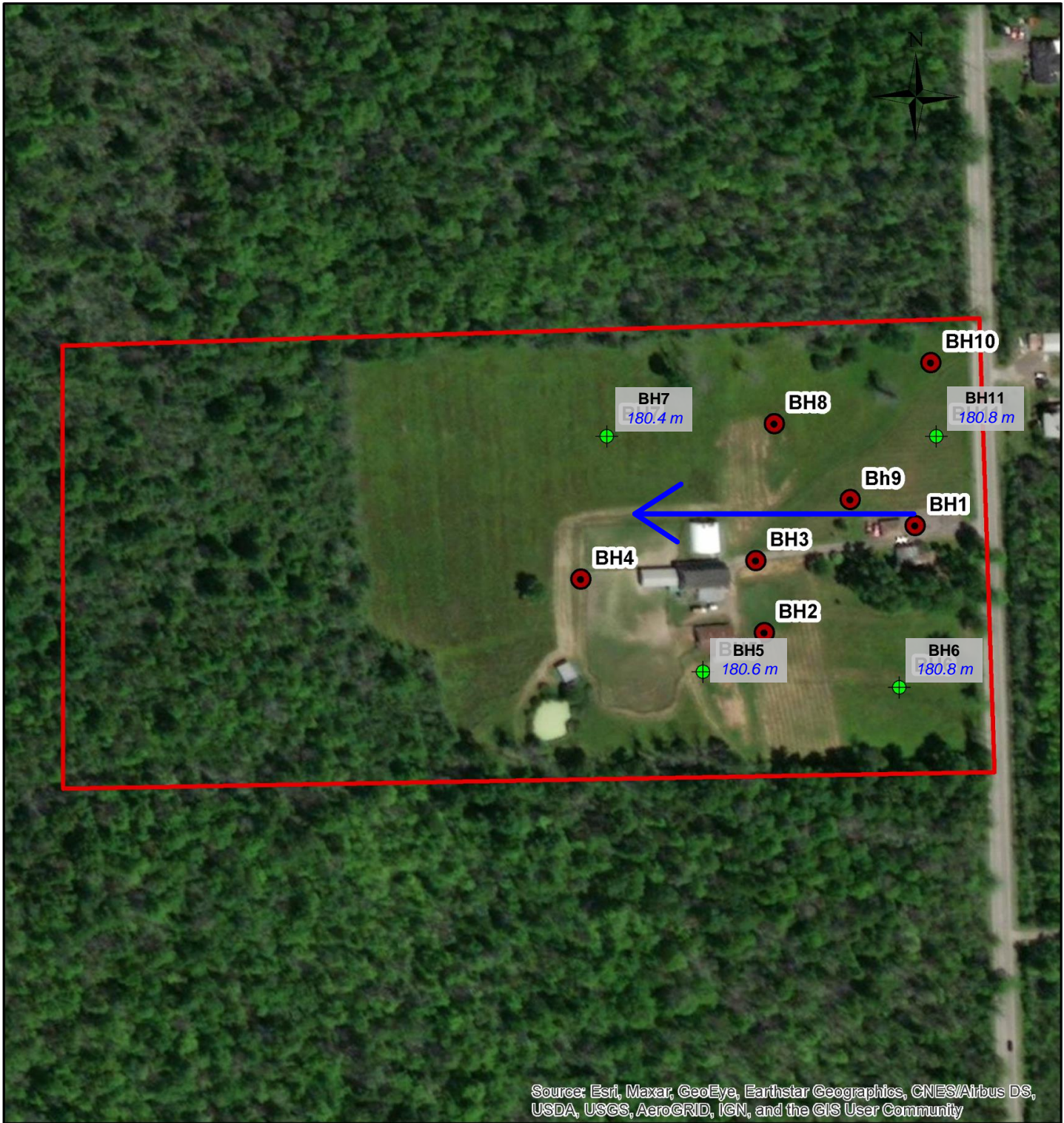
Drawn: MM	Title Phase II Property Location	
Approved: JL	Project	
Date: NOV 2021	PHASE I ENVIRONMENTAL SITE ASSESSMENT 613 Helena Street, Fort Erie, Ontario	
Project No.: 2100394AG		
	Client SS WELLAND INC.	
	0 125 250 500 Meters	Drawing 1



Legend

- Approx. Site Boundary
- Borehole
- ⊕ Monitoring Well
- 181.4 Ground Surface Elevation (m asl)



Drawn: MM	Title Phase II Borehole and Monitoring Well Locations	
Approved: JL	Project	
Date: DEC 2021	PHASE II ENVIRONMENTAL SITE ASSESSMENT 613 Helena Street, Fort Erie, Ontario	
Project No.: 2100394AG		
	Client SS WELLAND INC.	
		Drawing 2



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Approx. Site Boundary
- Borehole
- ⊕ Monitoring Well
- 180.8 Groundwater Elevation (m asl)
- ➔ Groundwater Flow

Drawn: MM	Title Groundwater Flow Direction	
Approved: JL	Project	
Date: DEC 2021	PHASE II ENVIRONMENTAL SITE ASSESSMENT 613 Helena Street, Fort Erie, Ontario	
Project No.: 2100394AG		
	Client SS WELLAND INC.	
		Drawing 3

APPENDIX A

Borehole Logs

PROJECT: Sabrina Homes
 CLIENT: Sabrina Homes
 PROJECT LOCATION: 613 Helena Street, Fort Erie, ON
 DATUM: Geodetic
 BH LOCATION: See Borehole Location Plan N 4751014.752 E 668156.609

DRILLING DATA
 Method: Hollow Stem Augur
 Diameter: 150mm
 Date: Sep/08/2021
 REF. NO.: 2100394AG
 DRAWING NO.: 2

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)					
(m) ELEV. / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m			20	40	60	80				100	PLASTIC LIMIT (W _p)	NATURAL MOISTURE CONTENT (w)	LIQUID LIMIT (W _L)	GR
182.2	Asphalt: 150mm	[Solid Black]																	
182.0	Fill: sand and gravel, trace silt and clay, brown, moist, compact	[Cross-hatch]	1	SS	57														
181.4	Silty Clay Till: trace gravel and sand, brown, very moist, firm to very stiff	[Diagonal Hatch]	2	SS	7														
181.0			3	SS	16														
180.0			4	SS	27														
179.0			5	SS	17														
178.0																			
177.6	Silty Clay: trace sand, brown, moist, firm to very stiff	[Diagonal Hatch]	6	SS	6														
177.0																			

1 7 45 47

Continued Next Page

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES

+ 3, × 3: Numbers refer to Sensitivity

○ = 3% Strain at Failure

PROJECT: Sabrina Homes
 CLIENT: Sabrina Homes
 PROJECT LOCATION: 613 Helena Street, Fort Erie, ON
 DATUM: Geodetic
 BH LOCATION: See Borehole Location Plan N 4751014.752 E 668156.609

DRILLING DATA
 Method: Hollow Stem Augur
 Diameter: 150mm
 Date: Sep/08/2021
 REF. NO.: 2100394AG
 DRAWING NO.: 2

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT					POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)				
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80	100				PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	GR
175.3	Silty Clay: trace sand, brown, moist, firm to very stiff(Continued)		7	SS	8														
176.0																			
6.9	Bedrock: weathered, black dolomite End of Borehole: borehole terminated at 6.9m Upon completion: 1) Cave-in: open 2) Water: dry		8	SS	50/50mm														

GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Sabrina Homes
 CLIENT: Sabrina Homes
 PROJECT LOCATION: 613 Helena Street, Fort Erie, ON
 DATUM: Geodetic
 BH LOCATION: See Borehole Location Plan N 4750966.835 E 668089.3891

DRILLING DATA
 Method: Soild Stern Augur
 Diameter: 150mm
 Date: Sep/08/2021
 REF. NO.: 2100394AG
 DRAWING NO.: 3

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)					
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80				100	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	GR
181.6	0.0	Topsoil:300mm																	
181.3	0.3	Disturbed Native/Fill: silty clay, trace sand and gravel, trace rootlets, brown to black, very moist, loose Silty Clay Till: trace sand, trace gravel, brown to black, very moist, stiff to very stiff	1	SS	4														
181.0	0.6		2	SS	16														
			3	SS	20														
			4	SS	15														
			5	SS	8														
177.0	4.6	Silty Clay: trace sand, brown, very moist, soft	6	SS	3													1 7 52 40	
176.4	5.2	End of Borehole:borehole terminated at 5.2m Upon completion: 1) Cave-in: open 2) Water: dry																	

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Sabrina Homes
 CLIENT: Sabrina Homes
 PROJECT LOCATION: 613 Helena Street, Fort Erie, ON
 DATUM: Geodetic
 BH LOCATION: See Borehole Location Plan N 4750999.13 E 668085.3975

DRILLING DATA
 Method: Soild Stern Augur
 Diameter: 150mm
 Date: Sep/09/2021
 REF. NO.: 2100394AG
 DRAWING NO.: 4

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)						
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80				100	PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT		
181.7																				
180.6	Gravel: 100mm																			
0.1	Fill: sandy silt with some gravel, organic inclusions, brown, very moist, loose		1	SS	6															
181.3	Silty Clay Till: trace sand and gravel, trace rootlets, brown, very moist, firm to stiff																			
0.4																				
			2	SS	13															
			3	SS	18															
			4	SS	15															
			5	SS	10															
			6	SS	4															
177.2	Silty Clay: trace sand, brown, very moist, soft																			
4.6																				
176.6	End of Borehole: borehole terminated at 5.2m Upon completion: 1) Cave-in: open 2) Water: dry																			

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Sabrina Homes
 CLIENT: Sabrina Homes
 PROJECT LOCATION: 613 Helena Street, Fort Erie, ON
 DATUM: Geodetic
 BH LOCATION: See Borehole Location Plan N 4750990.884 E 668007.3711

DRILLING DATA
 Method: Soild Stem Augur
 Diameter: 150mm
 Date: Sep/09/2021
 REF. NO.: 2100394AG
 DRAWING NO.: 5

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80							100	
181.4	Topsoil: 150mm																		
0.0 181.3	Disturbed Native/Fill: silty clay, trace gravel, trace rootlets, brown, very moist, loose		1	SS	5														
0.2																			
181.0	Silty Clay Till: trace gravel, brown, very moist, firm to very stiff		2	SS	18														
0.5																			
1																			
2																			
3																			
4																			
176.6	Bedrock: weathered dolomite		4	SS	14														
176.4																			
5.0	End of Borehole: borehole terminated at 5.0m Upon completion: 1) Cave-in: open 2) Water: dry		6	SS50/130mm	10														

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Sabrina Homes
 CLIENT: Sabrina Homes
 PROJECT LOCATION: 613 Helena Street, Fort Erie, ON
 DATUM: Geodetic
 BH LOCATION: See Borehole Location Plan N 4750949.591 E 668062.0856

DRILLING DATA
 Method: Soild Stem Augur
 Diameter: 150mm
 Date: Sep/08/2021
 REF. NO.: 2100394AG
 DRAWING NO.: 6

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)	
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80				100
181.4	Topsoil: 150mm													
0.0 181.3	Disturbed Native/Fill: silty clay, trace gravel, trace rootlets, brown, very moist, loose	1	SS	5										
0.2														
180.9	Silty Clay Till: trace gravel, brown, very moist, firm to very stiff	2	SS	14										
0.5														
1														
2														
3														
179	Silty Clay: trace sand and gravel, brown, very moist, firm	4	SS	16										
178														
177														
176.8	Silty Clay: trace sand and gravel, brown, very moist, firm	5	SS	10										
4.6														
176.2	End of Borehole: borehole terminated at 5.2m Upon completion: 1) Cave-in: open 2) Water: dry 3) Monitoring well installed upon completion	6	SS	6										
5.2														

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES +3, x3: Numbers refer to Sensitivity ○ =3% Strain at Failure

PROJECT: Sabrina Homes
 CLIENT: Sabrina Homes
 PROJECT LOCATION: 613 Helena Street, Fort Erie, ON
 DATUM: Geodetic
 BH LOCATION: See Borehole Location Plan N 4751054.703 E 668018.9953

DRILLING DATA
 Method: Soild Stern Augur
 Diameter: 150mm
 Date: Sep/08/2021
 REF. NO.: 2100394AG
 DRAWING NO.: 8

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT			POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20 40 60 80 100	20 40 60 80 100	W _p W W _L	10 20 30				
181.7	Topsoil: 150mm													GR SA SI CL
0.0 181.6														
0.2 181.4	Disturbed Native/Fill: silty clay, trace gravel, trace rootlets, brown, very moist, loose Silty Clay Till: trace gravel, brown, very moist, firm to very stiff	1	SS	7										
0.3														
1		2	SS	12										
2		3	SS	22										
3		4	SS	16										
3.1 178.7	Silty Clay: trace sand and gravel, brown, very moist, firm	5	SS	6										
4														
177.2 4.5 177.4	Bedrock: weathered dolomite													
4.6	End of Borehole: borehole terminated at 4.6m Upon completion: 1) Cave-in: open 2) Water: dry 3) Monitoring well installed upon completion	6	SS	50/50mm										

W. L. 179.5 m
Oct 21, 2021

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Sabrina Homes
 CLIENT: Sabrina Homes
 PROJECT LOCATION: 613 Helena Street, Fort Erie, ON
 DATUM: Geodetic
 BH LOCATION: See Borehole Location Plan N 4751060.32 E 668093.7114

DRILLING DATA
 Method: Soild Stern Augur
 Diameter: 150mm
 Date: Sep/08/2021
 REF. NO.: 2100394AG
 DRAWING NO.: 9

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)		
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80				100	PLASTIC LIMIT
181.8	0.0	Topsoil: 230mm														
181.5	0.2	Disturbed Native/Fill: silty clay, trace gravel, trace rootlets, brown, very moist, loose Silty Clay Till: trace sand and gravel, brown, very moist, firm to very stiff	1	SS	5											
181.3	0.5															
	1			2	SS	15										
	2			3	SS	21										
	3			4	SS	18										
178.7	3.1	Silty Clay: trace sand and gravel, brown, very moist, firm turning soft	5	SS	6											
	4															
	5		6	SS	3											
176.6	5.2	End of Borehole: borehole terminated at 5.2m Upon completion: 1) Cave-in: open 2) Water: dry														

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Sabrina Homes
 CLIENT: Sabrina Homes
 PROJECT LOCATION: 613 Helena Street, Fort Erie, ON
 DATUM: Geodetic
 BH LOCATION: See Borehole Location Plan N 4751026.281 E 668127.6148

DRILLING DATA
 Method: Soild Stern Augur
 Diameter: 150mm
 Date: Sep/09/2021
 REF. NO.: 2100394AG
 DRAWING NO.: 10

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)		
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80				100	PLASTIC LIMIT W _p
181.8	0.0	Topsoil: 230mm														
181.6	0.2	Disturbed Native/Fill: silty clay, trace gravel, trace rootlets, brown, very moist, loose Silty Clay Till: trace sand and gravel, brown, very moist, firm to very stiff	1	SS	6											
181.3	0.5															
	1			2	SS	16										
	2			3	SS	20										
	3			4	SS	16										
178.7	3.1	Silty Clay: trace sand, brown, very moist, firm turning soft	5	SS	8											
	4															
	5			6	SS	3										
176.6	5.2	End of Borehole: borehole terminated at 5.2m Upon completion: 1) Cave-in: open 2) Water: dry														

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Sabrina Homes
 CLIENT: Sabrina Homes
 PROJECT LOCATION: 613 Helena Street, Fort Erie, ON
 DATUM: Geodetic
 BH LOCATION: See Borehole Location Plan N 4750966.835 E 668089.3891

DRILLING DATA
 Method: Soild Stern Augur
 Diameter: 150mm
 Date: Sep/09/2021
 REF. NO.: 2100394AG
 DRAWING NO.: 11

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)		
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80				100	PLASTIC LIMIT W _p
181.6	Topsoil: 150mm															
181.4	Disturbed Native/Fill: silty clay, trace gravel, trace rootlets, brown, very moist, loose Silty Clay Till: trace sand and gravel, brown, very moist, firm to very stiff		1	SS	5											
181.1			2	SS	13											
181.0			3	SS	20											
180.5			4	SS	23											
179.5			5	SS	8											
178.5			6	SS	4											
178.5	Silty Clay: trace sand, brown, very moist, firm															
176.4	End of Borehole: borehole terminated at 5.2m Upon completion: 1) Cave-in: open 2) Water: dry															

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Sabrina Homes
 CLIENT: Sabrina Homes
 PROJECT LOCATION: 613 Helena Street, Fort Erie, ON
 DATUM: Geodetic
 BH LOCATION: See Borehole Location Plan N 4751054.793 E 668166.184

DRILLING DATA
 Method: Soild Stern Augur
 Diameter: 150mm
 Date: Sep/08/2021
 REF. NO.: 2100394AG
 DRAWING NO.: 12

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE			"N" BLOWS 0.3 m	20 40 60 80 100						
0.0	Topsoil: 150mm													
181.8	Disturbed Native/Fill: silty clay, trace gravel, trace rootlets, brown, moist, loose		1	SS	5									
0.2														
181.4	Silty Clay Till: trace sand and gravel, brown, very moist, firm to very stiff		2	SS	14									
0.5														
1			3	SS	18									
2														
3			4	SS	20									
4														
5			5	SS	14									
6														
177.3	Silty Clay: trace sand, brown, very moist, firm		6	SS	4									
4.6														
5														
6														
175.9	Bedrock: weathered, dolomite		7	CS	50/60mm									
176.8	End of Borehole: borehole terminated at 6.1m													
6.1	Upon completion: 1) Cave-in: open 2) Water: dry 3) Monitoring well installed upon completion													

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

APPENDIX B

Laboratory Certificates of Analysis



HLV2K Engineering Limited (Brampton)
ATTN: Miriam Mohammadi
2179 Dunwin Drive
Unit 4
Mississauga ON L5L 1X2

Date Received: 12-NOV-21
Report Date: 19-NOV-21 13:18 (MT)
Version: FINAL

Client Phone: 437-370-0317

Certificate of Analysis

Lab Work Order #: L2662272
Project P.O. #: NOT SUBMITTED
Job Reference: 2100394AG
C of C Numbers:
Legal Site Desc: Helena Street

Amanda Overholster
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 5730 Coopers Avenue, Unit #26, Mississauga, ON L4Z 2E9 Canada | Phone: +1 905 507 6910 | Fax: +1 905 507 6927
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ANALYTICAL REPORT

Summary of Guideline Exceedances

Guideline		Client ID	Grouping	Analyte	Result	Guideline Limit	Unit
ALS ID							
Ontario Regulation 153/04 - April 15, 2011 Standards - T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use							
L2662272-4		DUP1	Physical Tests	Conductivity	0.575	0.57	mS/cm

Physical Tests - SOIL

Analyte	Unit	Guide Limits		Lab ID	Sample Date	Sample ID	
		#1	#2	L2662272-1	L2662272-2	L2662272-3	L2662272-4
Conductivity	mS/cm	0.57	-	0.370	0.362	0.231	0.575
% Moisture	%	-	-	16.1	20.5	19.7	15.6
pH	pH units	-	-	7.92	7.95	7.93	8.01

Guide Limit #1: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

ANALYTICAL REPORT

Cyanides - SOIL

	Lab ID	L2662272-1	L2662272-2	L2662272-3	L2662272-4
	Sample Date	12-NOV-21	12-NOV-21	12-NOV-21	12-NOV-21
	Sample ID	BH5	BH6	BH7	DUP1
	Guide Limits				
Analyte	Unit	#1	#2		
Cyanide, Weak Acid Diss	ug/g	0.051	-	<0.050	<0.050
		<0.050	<0.050	<0.050	<0.050

Guide Limit #1: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Saturated Paste Extractables - SOIL

Analyte	Unit	Guide Limits					
		#1	#2				
SAR	SAR	2.4	-	0.41	0.23	0.38	0.19
Calcium (Ca)	mg/L	-	-	37.2	38.4	14.0	70.3
Magnesium (Mg)	mg/L	-	-	16.7	16.2	14.8	32.1
Sodium (Na)	mg/L	-	-	12.1	6.67	8.51	7.47

Guide Limit #1: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Metals - SOIL

Analyte	Unit	Guide Limits		Lab ID	L2662272-1	L2662272-2	L2662272-3	L2662272-4
		#1	#2	Sample Date	12-NOV-21	12-NOV-21	12-NOV-21	12-NOV-21
				Sample ID	BH5	BH6	BH7	DUP1
Antimony (Sb)	ug/g	1.3	-	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic (As)	ug/g	18	-	8.4	6.9	6.3	6.3	6.3
Barium (Ba)	ug/g	220	-	128	132	124	139	139
Beryllium (Be)	ug/g	2.5	-	1.05	0.96	0.98	1.03	1.03
Boron (B)	ug/g	36	-	9.4	12.0	14.5	10.7	10.7
Boron (B), Hot Water Ext.	ug/g	36	-	0.18	0.19	0.10	0.12	0.12
Cadmium (Cd)	ug/g	1.2	-	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium (Cr)	ug/g	70	-	28.7	26.8	29.1	29.8	29.8
Cobalt (Co)	ug/g	21	-	16.3	13.4	15.2	15.3	15.3
Copper (Cu)	ug/g	92	-	19.4	25.6	25.9	21.3	21.3
Lead (Pb)	ug/g	120	-	18.0	18.4	14.9	18.3	18.3
Mercury (Hg)	ug/g	0.27	-	0.0263	0.0242	0.0181	0.0342	0.0342
Molybdenum (Mo)	ug/g	2	-	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel (Ni)	ug/g	82	-	27.1	28.7	31.6	30.5	30.5
Selenium (Se)	ug/g	1.5	-	<1.0	<1.0	<1.0	<1.0	<1.0
Silver (Ag)	ug/g	0.5	-	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium (Tl)	ug/g	1	-	<0.50	<0.50	<0.50	<0.50	<0.50
Uranium (U)	ug/g	2.5	-	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium (V)	ug/g	86	-	46.4	41.5	42.9	45.9	45.9
Zinc (Zn)	ug/g	290	-	94.6	77.5	75.4	95.5	95.5

Guide Limit #1: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Speciated Metals - SOIL

			Lab ID			
			L2662272-1	L2662272-2	L2662272-3	L2662272-4
			Sample Date			
			Sample ID			
			BH5	BH6	BH7	DUP1
			Guide Limits			
Analyte	Unit	#1	#2			
Chromium, Hexavalent	ug/g	0.66	-	<0.20	<0.20	<0.20

Guide Limit #1: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Volatile Organic Compounds - SOIL

Analyte	Unit	Guide Limits		Lab ID	L2662272-1	L2662272-2	L2662272-3	L2662272-4
		#1	#2	Sample Date	12-NOV-21	12-NOV-21	12-NOV-21	12-NOV-21
				Sample ID	BH5	BH6	BH7	DUP1
Acetone	ug/g	0.5	-		<0.50	<0.50	<0.50	<0.50
Benzene	ug/g	0.02	-		<0.0068	<0.0068	<0.0068	<0.0068
Bromodichloromethane	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Bromoform	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Bromomethane	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Carbon tetrachloride	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Chlorobenzene	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Dibromochloromethane	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Chloroform	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
1,2-Dibromoethane	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
1,2-Dichlorobenzene	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
1,3-Dichlorobenzene	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
1,4-Dichlorobenzene	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Dichlorodifluoromethane	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
1,1-Dichloroethane	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
1,2-Dichloroethane	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
1,1-Dichloroethylene	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
cis-1,2-Dichloroethylene	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
trans-1,2-Dichloroethylene	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Methylene Chloride	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
1,2-Dichloropropane	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
cis-1,3-Dichloropropene	ug/g	-	-		<0.030	<0.030	<0.030	<0.030
trans-1,3-Dichloropropene	ug/g	-	-		<0.030	<0.030	<0.030	<0.030
1,3-Dichloropropene (cis & trans)	ug/g	0.05	-		<0.042	<0.042	<0.042	<0.042
Ethylbenzene	ug/g	0.05	-		<0.018	<0.018	<0.018	<0.018
n-Hexane	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Methyl Ethyl Ketone	ug/g	0.5	-		<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	ug/g	0.5	-		<0.50	<0.50	<0.50	<0.50
MTBE	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Styrene	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050

Guide Limit #1: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

Volatile Organic Compounds - SOIL

Analyte	Unit	Guide Limits		Lab ID	L2662272-1	L2662272-2	L2662272-3	L2662272-4
		#1	#2	Sample Date	12-NOV-21	12-NOV-21	12-NOV-21	12-NOV-21
				Sample ID	BH5	BH6	BH7	DUP1
1,1,1,2-Tetrachloroethane	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
1,1,2,2-Tetrachloroethane	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Tetrachloroethylene	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Toluene	ug/g	0.2	-		<0.080	<0.080	<0.080	<0.080
1,1,1-Trichloroethane	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
1,1,2-Trichloroethane	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Trichloroethylene	ug/g	0.05	-		<0.010	<0.010	<0.010	<0.010
Trichlorofluoromethane	ug/g	0.25	-		<0.050	<0.050	<0.050	<0.050
Vinyl chloride	ug/g	0.02	-		<0.020	<0.020	<0.020	<0.020
o-Xylene	ug/g	-	-		<0.020	<0.020	<0.020	<0.020
m+p-Xylenes	ug/g	-	-		<0.030	<0.030	<0.030	<0.030
Xylenes (Total)	ug/g	0.05	-		<0.050	<0.050	<0.050	<0.050
Surrogate: 4-Bromofluorobenzene	%	-	-		75.2	78.3	79.3	75.4
Surrogate: 1,4-Difluorobenzene	%	-	-		85.2	84.7	85.6	83.4

Guide Limit #1: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Hydrocarbons - SOIL

Analyte	Unit	Guide Limits		Lab ID	L2662272-1	L2662272-2	L2662272-3	L2662272-4
		#1	#2	Sample Date	12-NOV-21	12-NOV-21	12-NOV-21	12-NOV-21
				Sample ID	BH5	BH6	BH7	DUP1
F1 (C6-C10)	ug/g	25	-	<5.0	<5.0	<5.0	<5.0	<5.0
F1-BTEX	ug/g	25	-	<5.0	<5.0	<5.0	<5.0	<5.0
F2 (C10-C16)	ug/g	10	-	<10	<10	<10	<10	<10
F2-Naphth	ug/g	-	-	<10	<10	<10	<10	<10
F3 (C16-C34)	ug/g	240	-	<50	<50	<50	<50	<50
F3-PAH	ug/g	-	-	<50	<50	<50	<50	<50
F4 (C34-C50)	ug/g	120	-	<50	<50	<50	<50	<50
Total Hydrocarbons (C6-C50)	ug/g	-	-	<72	<72	<72	<72	<72
Chrom. to baseline at nC50		-	-	YES	YES	YES	YES	YES
Surrogate: 2-Bromobenzotrifluoride	%	-	-	97.0	95.9	95.2	94.7	
Surrogate: 3,4-Dichlorotoluene	%	-	-	77.3	83.1	90.3	82.8	

Guide Limit #1: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Polycyclic Aromatic Hydrocarbons - SOIL

Analyte	Unit	Guide Limits		Lab ID	L2662272-1	L2662272-2	L2662272-3	L2662272-4
		#1	#2	Sample Date	12-NOV-21	12-NOV-21	12-NOV-21	12-NOV-21
				Sample ID	BH5	BH6	BH7	DUP1
Acenaphthene	ug/g	0.072	-	<0.050	<0.050	<0.050	<0.050	<0.050
Acenaphthylene	ug/g	0.093	-	<0.050	<0.050	<0.050	<0.050	<0.050
Anthracene	ug/g	0.16	-	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(a)anthracene	ug/g	0.36	-	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(a)pyrene	ug/g	0.3	-	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(b&j)fluoranthene	ug/g	0.47	-	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(g,h,i)perylene	ug/g	0.68	-	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	ug/g	0.48	-	<0.050	<0.050	<0.050	<0.050	<0.050
Chrysene	ug/g	2.8	-	<0.050	<0.050	<0.050	<0.050	<0.050
Dibenz(a,h)anthracene	ug/g	0.1	-	<0.050	<0.050	<0.050	<0.050	<0.050
Fluoranthene	ug/g	0.56	-	<0.050	<0.050	<0.050	<0.050	<0.050
Fluorene	ug/g	0.12	-	<0.050	<0.050	<0.050	<0.050	<0.050
Indeno(1,2,3-cd)pyrene	ug/g	0.23	-	<0.050	<0.050	<0.050	<0.050	<0.050
1+2-Methylnaphthalenes	ug/g	0.59	-	<0.042	<0.042	<0.042	<0.042	<0.042
1-Methylnaphthalene	ug/g	0.59	-	<0.030	<0.030	<0.030	<0.030	<0.030
2-Methylnaphthalene	ug/g	0.59	-	<0.030	<0.030	<0.030	<0.030	<0.030
Naphthalene	ug/g	0.09	-	<0.013	<0.013	<0.013	<0.013	<0.013
Phenanthrene	ug/g	0.69	-	<0.046	<0.046	<0.046	<0.046	<0.046
Pyrene	ug/g	1	-	<0.050	<0.050	<0.050	<0.050	<0.050
Surrogate: 2-Fluorobiphenyl	%	-	-	94.3	106.8	91.2	92.3	
Surrogate: d14-Terphenyl	%	-	-	97.4	110.4	95.2	97.8	

Guide Limit #1: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Organochlorine Pesticides - SOIL

Analyte	Unit	Guide Limits		Lab ID	L2662272-1	L2662272-2	L2662272-3	L2662272-4
		#1	#2	Sample Date	12-NOV-21	12-NOV-21	12-NOV-21	12-NOV-21
				Sample ID	BH5	BH6	BH7	DUP1
Aldrin	ug/g	0.05	-		<0.00020	<0.00020	<0.00020	<0.00020
Lindane	ug/g	0.01	-		<0.00020	<0.00020	<0.00020	<0.00020
a-chlordane	ug/g	-	-		<0.00030	<0.00030	<0.00030	<0.00030
Chlordane (Total)	ug/g	0.05	-		<0.00042	<0.00042	<0.00042	<0.00042
g-chlordane	ug/g	-	-		<0.00030	<0.00030	<0.00030	<0.00030
o,p-DDD	ug/g	-	-		<0.00030	<0.00030	<0.00030	<0.00030
pp-DDD	ug/g	-	-		<0.00030	<0.00030	<0.00030	<0.00030
Total DDD	ug/g	0.05	-		<0.00042	<0.00042	<0.00042	<0.00042
o,p-DDE	ug/g	-	-		<0.00030	<0.00030	<0.00030	<0.00030
pp-DDE	ug/g	-	-		<0.00030	<0.00030	<0.00030	<0.00030
Total DDE	ug/g	0.05	-		<0.00042	<0.00042	<0.00042	<0.00042
op-DDT	ug/g	-	-		<0.00030	<0.00030	<0.00030	<0.00030
pp-DDT	ug/g	-	-		<0.00030	<0.00030	<0.00030	<0.00030
Total DDT	ug/g	1.4	-		<0.00042	<0.00042	<0.00042	<0.00042
Dieldrin	ug/g	0.05	-		<0.00020	<0.00020	<0.00020	<0.00020
alpha-Endosulfan	ug/g	-	-		<0.00030	<0.00030	<0.00030	<0.00030
beta-Endosulfan	ug/g	-	-		<0.00030	<0.00030	<0.00030	<0.00030
Endosulfan (Total)	ug/g	0.04	-		<0.00042	<0.00042	<0.00042	<0.00042
Endrin	ug/g	0.04	-		<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor	ug/g	0.05	-		<0.00020	<0.00020	<0.00020	<0.00020
Heptachlor Epoxide	ug/g	0.05	-		<0.00020	<0.00020	<0.00020	<0.00020
Hexachlorobenzene	ug/g	0.01	-		<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobutadiene	ug/g	0.01	-		<0.00050	<0.00050	<0.00050	<0.00050
Hexachloroethane	ug/g	0.01	-		<0.00050	<0.00050	<0.00050	<0.00050
Methoxychlor	ug/g	0.05	-		<0.00050	<0.00050	<0.00050	<0.00050
Surrogate: Decachlorobiphenyl	%	-	-		91.6	87.8	91.1	96.3
Surrogate: Tetrachloro-m-xylene	%	-	-		80.3	77.9	82.4	83.8

Guide Limit #1: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
B-HWS-R511-WT	Soil	Boron-HWE-O.Reg 153/04 (July 2011)	HW EXTR, EPA 6010B
<p>A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CHLORDANE-T-CALC-WT	Soil	Chlordane Total sums	CALCULATION
<p>Aqueous sample is extracted by liquid/liquid extraction with a solvent mix. After extraction, a number of clean up techniques may be applied, depending on the sample matrix and analyzed by GC/MS.</p>			
CN-WAD-R511-WT	Soil	Cyanide (WAD)-O.Reg 153/04 (July 2011)	MOE 3015/APHA 4500CN I-WAD
<p>The sample is extracted with a strong base for 16 hours, and then filtered. The filtrate is then distilled where the cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Soil	Hexavalent Chromium in Soil	SW846 3060A/7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DDD-DDE-DDT-CALC-WT	Soil	DDD, DDE, DDT sums	CALCULATION
<p>Aqueous sample is extracted by liquid/liquid extraction with a solvent mix. After extraction, a number of clean up techniques may be applied, depending on the sample matrix and analyzed by GC/MS.</p>			
EC-WT	Soil	Conductivity (EC)	MOEE E3138
<p>A representative subsample is tumbled with de-ionized (DI) water. The ratio of water to soil is 2:1 v/w. After tumbling the sample is then analyzed by a conductivity meter.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
ENDOSULFAN-T-CALC-WT	Soil	Endosulfan Total sums	CALCULATION
<p>Aqueous sample is extracted by liquid/liquid extraction with a solvent mix. After extraction, a number of clean up techniques may be applied, depending on the sample matrix and analyzed by GC/MS.</p>			
F1-F4-511-CALC-WT	Soil	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-S

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
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In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Soil	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by extracting a soil or sediment sample as received with methanol, then analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Soil	F2-F4-O.Reg 153/04 (July 2011)	CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from soil with 1:1 hexane:acetone using a rotary extractor. Extracts are treated with silica gel to remove polar organic interferences. F2, F3, & F4 are analyzed by GC-FID. F4G-sg is analyzed gravimetrically.

Notes:

1. F2 (C10-C16): Sum of all hydrocarbons that elute between nC10 and nC16.
2. F3 (C16-C34): Sum of all hydrocarbons that elute between nC16 and nC34.
3. F4 (C34-C50): Sum of all hydrocarbons that elute between nC34 and nC50.
4. F4G: Gravimetric Heavy Hydrocarbons
5. F4G-sg: Gravimetric Heavy Hydrocarbons (F4G) after silica gel treatment.
6. Where both F4 (C34-C50) and F4G-sg are reported for a sample, the larger of the two values is used for comparison against the relevant CCME guideline for F4.
7. F4G-sg cannot be added to the C6 to C50 hydrocarbon results to obtain an estimate of total extractable hydrocarbons.
8. This method is validated for use.
9. Data from analysis of validation and quality control samples is available upon request.
10. Reported results are expressed as milligrams per dry kilogram, unless otherwise indicated.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-200.2-CVAA-WT	Soil	Mercury in Soil by CVAAS	EPA 200.2/1631E (mod)
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Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

MET-200.2-CCMS-WT	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020B (mod)
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Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
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Soil/sediment is dried, disaggregated, and sieved (2 mm). For tests intended to support Ontario regulations, the <2mm fraction is ground to pass through a 0.355 mm sieve. Strong Acid Leachable Metals in the <2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS.

Limitations: This method is intended to liberate environmentally available metals. Silicate minerals are not solubilized. Some metals may be only partially recovered (matrix dependent), including Al, Ba, Be, Cr, S, Sr, Ti, Tl, V, W, and Zr. Elemental Sulfur may be poorly recovered by this method. Volatile forms of sulfur (e.g. sulfide, H₂S) may be excluded if lost during sampling, storage, or digestion.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

METHYLNAPS-CALC-WT	Soil	ABN-Calculated Parameters	SW846 8270
MOISTURE-WT	Soil	% Moisture	CCME PHC in Soil - Tier 1 (mod)
OCP-TRACE-WT	Soil	Low level OC Pesticides in Soil/Sediment	SW846 8270

A 5g representative sub-sample of the soil sample is mixed with methanol and extracted with toluene. An aliquot is taken and analyzed by GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PAH-511-WT	Soil	PAH-O.Reg 153/04 (July 2011)	SW846 3510/8270
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A representative sub-sample of soil is fortified with deuterium-labelled surrogates and a mechanical shaking technique is used to extract the sample with a mixture of methanol and toluene. The extracts are concentrated and analyzed by GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PH-WT	Soil	pH	MOEE E3137A
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A minimum 10g portion of the sample is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil and then analyzed using a pH meter and electrode.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

SAR-R511-WT	Soil	SAR-O.Reg 153/04 (July 2011)	SW846 6010C
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A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

VOC-1,3-DCP-CALC-WT	Soil	Regulation 153 VOCs	SW8260B/SW8270C
VOC-511-HS-WT	Soil	VOC-O.Reg 153/04 (July 2011)	SW846 8260 (511)

Soil and sediment samples are extracted in methanol and analyzed by headspace-GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
XYLENES-SUM-CALC-WT	Soil	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guideline limits are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.



Quality Control Report

Workorder: L2662272

Report Date: 19-NOV-21

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Client: HLV2K Engineering Limited (Brampton)
 2179 Dunwin Drive Unit 4
 Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
B-HWS-R511-WT								
	Soil							
Batch	R5651959							
WG3659668-4	DUP	L2662253-9						
Boron (B), Hot Water Ext.		0.35	0.38		ug/g	8.6	30	17-NOV-21
WG3659668-2	IRM	WT SAR4						
Boron (B), Hot Water Ext.			112.7		%		70-130	17-NOV-21
WG3659668-3	LCS							
Boron (B), Hot Water Ext.			116.0		%		70-130	17-NOV-21
WG3659668-1	MB							
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	17-NOV-21
CN-WAD-R511-WT								
	Soil							
Batch	R5654130							
WG3658141-3	DUP	L2662197-4						
Cyanide, Weak Acid Diss		<0.050	<0.050	RPD-NA	ug/g	N/A	35	18-NOV-21
WG3658836-3	DUP	L2662199-1						
Cyanide, Weak Acid Diss		<0.050	<0.050	RPD-NA	ug/g	N/A	35	18-NOV-21
WG3658141-2	LCS							
Cyanide, Weak Acid Diss			93.4		%		80-120	18-NOV-21
WG3658836-2	LCS							
Cyanide, Weak Acid Diss			87.7		%		80-120	18-NOV-21
WG3658141-1	MB							
Cyanide, Weak Acid Diss			<0.050		ug/g		0.05	18-NOV-21
WG3658836-1	MB							
Cyanide, Weak Acid Diss			<0.050		ug/g		0.05	18-NOV-21
WG3658141-4	MS	L2662197-4						
Cyanide, Weak Acid Diss			95.1		%		70-130	18-NOV-21
WG3658836-4	MS	L2662199-1						
Cyanide, Weak Acid Diss			97.6		%		70-130	18-NOV-21
CR-CR6-IC-WT								
	Soil							
Batch	R5653743							
WG3658158-4	CRM	WT-SQC012						
Chromium, Hexavalent			78.8		%		70-130	18-NOV-21
WG3658158-3	DUP	L2659965-16						
Chromium, Hexavalent		<0.20	<0.20	RPD-NA	ug/g	N/A	35	18-NOV-21
WG3658158-2	LCS							
Chromium, Hexavalent			90.7		%		80-120	18-NOV-21
WG3658158-1	MB							
Chromium, Hexavalent			<0.20		ug/g		0.2	18-NOV-21
EC-WT								
	Soil							



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Client: HL2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-WT		Soil						
Batch	R5652709							
WG3659658-5	DUP	WG3659658-4						
Conductivity		0.190	0.194		mS/cm	1.8	20	17-NOV-21
WG3659658-2	IRM	WT SAR4						
Conductivity			110.3		%		70-130	17-NOV-21
WG3660457-1	LCS							
Conductivity			95.6		%		90-110	17-NOV-21
WG3659658-1	MB							
Conductivity			<0.0040		mS/cm		0.004	17-NOV-21
F1-HS-511-WT		Soil						
Batch	R5651659							
WG3658919-4	DUP	WG3658919-3						
F1 (C6-C10)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	17-NOV-21
WG3658919-2	LCS							
F1 (C6-C10)			108.1		%		80-120	17-NOV-21
WG3658919-1	MB							
F1 (C6-C10)			<5.0		ug/g		5	17-NOV-21
Surrogate: 3,4-Dichlorotoluene			96.3		%		60-140	17-NOV-21
WG3658919-5	MS	WG3658919-3						
F1 (C6-C10)			129.5		%		60-140	17-NOV-21
F2-F4-511-WT		Soil						
Batch	R5651026							
WG3658723-3	DUP	WG3658723-5						
F2 (C10-C16)		<10	<10	RPD-NA	ug/g	N/A	30	16-NOV-21
F3 (C16-C34)		<50	<50	RPD-NA	ug/g	N/A	30	16-NOV-21
F4 (C34-C50)		<50	<50	RPD-NA	ug/g	N/A	30	16-NOV-21
WG3658723-2	LCS							
F2 (C10-C16)			79.1	LCS-L	%		80-120	16-NOV-21
F3 (C16-C34)			75.6	LCS-L	%		80-120	16-NOV-21
F4 (C34-C50)			78.7	LCS-L	%		80-120	16-NOV-21
WG3658723-1	MB							
F2 (C10-C16)			<10		ug/g		10	16-NOV-21
F3 (C16-C34)			<50		ug/g		50	16-NOV-21
F4 (C34-C50)			<50		ug/g		50	16-NOV-21
Surrogate: 2-Bromobenzotrifluoride			103.1		%		60-140	16-NOV-21
WG3658723-4	MS	WG3658723-5						
F2 (C10-C16)			96.5		%		60-140	16-NOV-21
F3 (C16-C34)			96.5		%		60-140	16-NOV-21



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Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT	Soil							
Batch	R5651026							
WG3658723-4 MS		WG3658723-5						
F3 (C16-C34)			96.5		%		60-140	16-NOV-21
F4 (C34-C50)			101.0		%		60-140	16-NOV-21
HG-200.2-CVAA-WT	Soil							
Batch	R5652098							
WG3659672-2 CRM		WT-SS-2						
Mercury (Hg)			97.5		%		70-130	17-NOV-21
WG3659672-7 DUP		WG3659672-6						
Mercury (Hg)		0.0143	0.0145		ug/g	1.5	40	17-NOV-21
WG3659672-3 LCS								
Mercury (Hg)			96.5		%		80-120	17-NOV-21
WG3659672-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	17-NOV-21
MET-200.2-CCMS-WT	Soil							
Batch	R5652504							
WG3659672-2 CRM		WT-SS-2						
Antimony (Sb)			101.0		%		70-130	17-NOV-21
Arsenic (As)			101.0		%		70-130	17-NOV-21
Barium (Ba)			100.5		%		70-130	17-NOV-21
Beryllium (Be)			98.5		%		70-130	17-NOV-21
Boron (B)			8.2		mg/kg		3.5-13.5	17-NOV-21
Cadmium (Cd)			112.3		%		70-130	17-NOV-21
Chromium (Cr)			95.6		%		70-130	17-NOV-21
Cobalt (Co)			99.0		%		70-130	17-NOV-21
Copper (Cu)			103.0		%		70-130	17-NOV-21
Lead (Pb)			102.3		%		70-130	17-NOV-21
Molybdenum (Mo)			107.1		%		70-130	17-NOV-21
Nickel (Ni)			100.8		%		70-130	17-NOV-21
Selenium (Se)			0.13		mg/kg		0-0.34	17-NOV-21
Silver (Ag)			91.5		%		70-130	17-NOV-21
Thallium (Tl)			0.074		mg/kg		0.029-0.129	17-NOV-21
Uranium (U)			92.3		%		70-130	17-NOV-21
Vanadium (V)			99.1		%		70-130	17-NOV-21
Zinc (Zn)			95.8		%		70-130	17-NOV-21
WG3659672-7 DUP		WG3659672-6						
Antimony (Sb)		<0.10	<0.10		ug/g			17-NOV-21



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Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT		Soil						
Batch	R5652504							
WG3659672-7	DUP	WG3659672-6						
Antimony (Sb)		<0.10	<0.10	RPD-NA	ug/g	N/A	30	17-NOV-21
Arsenic (As)		2.77	2.59		ug/g	6.7	30	17-NOV-21
Barium (Ba)		62.9	58.4		ug/g	7.4	40	17-NOV-21
Beryllium (Be)		0.41	0.37		ug/g	7.9	30	17-NOV-21
Boron (B)		6.5	5.7		ug/g	14	30	17-NOV-21
Cadmium (Cd)		0.087	0.080		ug/g	7.9	30	17-NOV-21
Chromium (Cr)		19.2	17.4		ug/g	9.3	30	17-NOV-21
Cobalt (Co)		6.48	5.95		ug/g	8.6	30	17-NOV-21
Copper (Cu)		14.3	12.8		ug/g	11	30	17-NOV-21
Lead (Pb)		7.88	7.35		ug/g	6.9	40	17-NOV-21
Molybdenum (Mo)		0.47	0.45		ug/g	3.8	40	17-NOV-21
Nickel (Ni)		15.1	13.8		ug/g	9.3	30	17-NOV-21
Selenium (Se)		<0.20	<0.20	RPD-NA	ug/g	N/A	30	17-NOV-21
Silver (Ag)		<0.10	<0.10	RPD-NA	ug/g	N/A	40	17-NOV-21
Thallium (Tl)		0.103	0.092		ug/g	12	30	17-NOV-21
Uranium (U)		0.479	0.442		ug/g	7.9	30	17-NOV-21
Vanadium (V)		29.6	26.9		ug/g	9.3	30	17-NOV-21
Zinc (Zn)		35.0	32.5		ug/g	7.5	30	17-NOV-21
WG3659672-4	LCS							
Antimony (Sb)			97.3		%		80-120	17-NOV-21
Arsenic (As)			103.6		%		80-120	17-NOV-21
Barium (Ba)			102.8		%		80-120	17-NOV-21
Beryllium (Be)			90.2		%		80-120	17-NOV-21
Boron (B)			85.7		%		80-120	17-NOV-21
Cadmium (Cd)			99.0		%		80-120	17-NOV-21
Chromium (Cr)			100.4		%		80-120	17-NOV-21
Cobalt (Co)			102.2		%		80-120	17-NOV-21
Copper (Cu)			100.6		%		80-120	17-NOV-21
Lead (Pb)			93.1		%		80-120	17-NOV-21
Molybdenum (Mo)			97.6		%		80-120	17-NOV-21
Nickel (Ni)			100.0		%		80-120	17-NOV-21
Selenium (Se)			98.4		%		80-120	17-NOV-21
Silver (Ag)			89.3		%		80-120	17-NOV-21



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Client: HLV2K Engineering Limited (Brampton)
 2179 Dunwin Drive Unit 4
 Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT								
	Soil							
Batch	R5652504							
WG3659672-4	LCS							
Thallium (Tl)			89.5		%		80-120	17-NOV-21
Uranium (U)			90.6		%		80-120	17-NOV-21
Vanadium (V)			104.1		%		80-120	17-NOV-21
Zinc (Zn)			96.5		%		80-120	17-NOV-21
WG3659672-1	MB							
Antimony (Sb)			<0.10		mg/kg		0.1	17-NOV-21
Arsenic (As)			<0.10		mg/kg		0.1	17-NOV-21
Barium (Ba)			<0.50		mg/kg		0.5	17-NOV-21
Beryllium (Be)			<0.10		mg/kg		0.1	17-NOV-21
Boron (B)			<5.0		mg/kg		5	17-NOV-21
Cadmium (Cd)			<0.020		mg/kg		0.02	17-NOV-21
Chromium (Cr)			<0.50		mg/kg		0.5	17-NOV-21
Cobalt (Co)			<0.10		mg/kg		0.1	17-NOV-21
Copper (Cu)			<0.50		mg/kg		0.5	17-NOV-21
Lead (Pb)			<0.50		mg/kg		0.5	17-NOV-21
Molybdenum (Mo)			<0.10		mg/kg		0.1	17-NOV-21
Nickel (Ni)			<0.50		mg/kg		0.5	17-NOV-21
Selenium (Se)			<0.20		mg/kg		0.2	17-NOV-21
Silver (Ag)			<0.10		mg/kg		0.1	17-NOV-21
Thallium (Tl)			<0.050		mg/kg		0.05	17-NOV-21
Uranium (U)			<0.050		mg/kg		0.05	17-NOV-21
Vanadium (V)			<0.20		mg/kg		0.2	17-NOV-21
Zinc (Zn)			<2.0		mg/kg		2	17-NOV-21
MOISTURE-WT								
	Soil							
Batch	R5646652							
WG3658121-3	DUP	L2662246-3						
% Moisture		15.4	15.5		%	0.7	20	16-NOV-21
WG3658121-2	LCS							
% Moisture			100.4		%		90-110	16-NOV-21
WG3658121-1	MB							
% Moisture			<0.25		%		0.25	16-NOV-21
OCP-TRACE-WT								
	Soil							



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Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OCP-TRACE-WT		Soil						
Batch	R5653682							
WG3659519-3	DUP	WG3659519-5						
Aldrin		<0.00020	<0.00020	RPD-NA	ug/g	N/A	50	18-NOV-21
a-chlordane		<0.00030	<0.00030	RPD-NA	ug/g	N/A	50	18-NOV-21
g-chlordane		<0.00030	<0.00030	RPD-NA	ug/g	N/A	50	18-NOV-21
o,p-DDD		<0.00030	<0.00030	RPD-NA	ug/g	N/A	50	18-NOV-21
pp-DDD		<0.00030	<0.00030	RPD-NA	ug/g	N/A	50	18-NOV-21
o,p-DDE		<0.00030	<0.00030	RPD-NA	ug/g	N/A	50	18-NOV-21
pp-DDE		<0.00030	<0.00030	RPD-NA	ug/g	N/A	50	18-NOV-21
op-DDT		<0.00030	<0.00030	RPD-NA	ug/g	N/A	50	18-NOV-21
pp-DDT		<0.00030	<0.00030	RPD-NA	ug/g	N/A	50	18-NOV-21
Dieldrin		<0.00020	<0.00020	RPD-NA	ug/g	N/A	50	18-NOV-21
alpha-Endosulfan		<0.00030	<0.00030	RPD-NA	ug/g	N/A	50	18-NOV-21
beta-Endosulfan		<0.00030	<0.00030	RPD-NA	ug/g	N/A	50	18-NOV-21
Endrin		<0.00050	<0.00050	RPD-NA	ug/g	N/A	50	18-NOV-21
Heptachlor		<0.00020	<0.00020	RPD-NA	ug/g	N/A	50	18-NOV-21
Heptachlor Epoxide		<0.00020	<0.00020	RPD-NA	ug/g	N/A	50	18-NOV-21
Hexachlorobenzene		<0.00050	<0.00050	RPD-NA	ug/g	N/A	50	18-NOV-21
Hexachlorobutadiene		<0.00050	<0.00050	RPD-NA	ug/g	N/A	50	18-NOV-21
Hexachloroethane		<0.00050	<0.00050	RPD-NA	ug/g	N/A	50	18-NOV-21
Lindane		<0.00020	<0.00020	RPD-NA	ug/g	N/A	50	18-NOV-21
Methoxychlor		<0.00050	<0.00050	RPD-NA	ug/g	N/A	50	18-NOV-21
WG3659519-2	LCS							
Aldrin			90.0		%		50-150	18-NOV-21
a-chlordane			86.4		%		50-150	18-NOV-21
g-chlordane			94.1		%		50-150	18-NOV-21
o,p-DDD			79.6		%		50-150	18-NOV-21
pp-DDD			80.8		%		50-150	18-NOV-21
o,p-DDE			81.0		%		50-150	18-NOV-21
pp-DDE			88.4		%		50-150	18-NOV-21
op-DDT			78.0		%		50-150	18-NOV-21
pp-DDT			87.9		%		50-150	18-NOV-21
Dieldrin			91.5		%		50-150	18-NOV-21
alpha-Endosulfan			86.4		%		50-150	18-NOV-21
beta-Endosulfan			81.8		%		50-150	18-NOV-21



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Client: HLV2K Engineering Limited (Brampton)
 2179 Dunwin Drive Unit 4
 Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OCP-TRACE-WT								
	Soil							
Batch	R5653682							
WG3659519-2	LCS							
Endrin			80.0		%		50-150	18-NOV-21
Heptachlor			80.8		%		50-150	18-NOV-21
Heptachlor Epoxide			90.3		%		50-150	18-NOV-21
Hexachlorobenzene			86.0		%		50-150	18-NOV-21
Hexachlorobutadiene			79.0		%		50-150	18-NOV-21
Hexachloroethane			84.0		%		50-150	18-NOV-21
Lindane			86.2		%		50-150	18-NOV-21
Methoxychlor			84.5		%		50-150	18-NOV-21
WG3659519-1	MB							
Aldrin			<0.00020		ug/g		0.0002	18-NOV-21
a-chlordane			<0.00030		ug/g		0.0003	18-NOV-21
g-chlordane			<0.00030		ug/g		0.0003	18-NOV-21
o,p-DDD			<0.00030		ug/g		0.0003	18-NOV-21
pp-DDD			<0.00030		ug/g		0.0003	18-NOV-21
o,p-DDE			<0.00030		ug/g		0.0003	18-NOV-21
pp-DDE			<0.00030		ug/g		0.0003	18-NOV-21
op-DDT			<0.00030		ug/g		0.0003	18-NOV-21
pp-DDT			<0.00030		ug/g		0.0003	18-NOV-21
Dieldrin			<0.00020		ug/g		0.0002	18-NOV-21
alpha-Endosulfan			<0.00030		ug/g		0.0003	18-NOV-21
beta-Endosulfan			<0.00030		ug/g		0.0003	18-NOV-21
Endrin			<0.00050		ug/g		0.0005	18-NOV-21
Heptachlor			<0.00020		ug/g		0.0002	18-NOV-21
Heptachlor Epoxide			<0.00020		ug/g		0.0002	18-NOV-21
Hexachlorobenzene			<0.00050		ug/g		0.0005	18-NOV-21
Hexachlorobutadiene			<0.00050		ug/g		0.0005	18-NOV-21
Hexachloroethane			<0.00050		ug/g		0.0005	18-NOV-21
Lindane			<0.00020		ug/g		0.0002	18-NOV-21
Methoxychlor			<0.00050		ug/g		0.0005	18-NOV-21
Surrogate: Tetrachloro-m-xylene			85.1		%		50-150	18-NOV-21
Surrogate: Decachlorobiphenyl			98.1		%		50-150	18-NOV-21
WG3659519-4	MS	WG3659519-5						
Aldrin			79.5		%		50-150	18-NOV-21
a-chlordane			75.7		%		50-150	18-NOV-21



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Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
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OCP-TRACE-WT **Soil**

Batch **R5653682**

WG3659519-4 **MS**

WG3659519-5

g-chlordane			73.4		%		50-150	18-NOV-21
o,p-DDD			65.4		%		50-150	18-NOV-21
pp-DDD			70.9		%		50-150	18-NOV-21
o,p-DDE			66.1		%		50-150	18-NOV-21
pp-DDE			72.8		%		50-150	18-NOV-21
op-DDT			66.7		%		50-150	18-NOV-21
pp-DDT			82.1		%		50-150	18-NOV-21
Dieldrin			74.2		%		50-150	18-NOV-21
alpha-Endosulfan			64.5		%		50-150	18-NOV-21
beta-Endosulfan			68.1		%		50-150	18-NOV-21
Endrin			74.6		%		50-150	18-NOV-21
Heptachlor			75.0		%		50-150	18-NOV-21
Heptachlor Epoxide			74.6		%		50-150	18-NOV-21
Hexachlorobenzene			75.6		%		50-150	18-NOV-21
Hexachlorobutadiene			69.9		%		50-150	18-NOV-21
Hexachloroethane			71.7		%		50-150	18-NOV-21
Lindane			76.2		%		50-150	18-NOV-21
Methoxychlor			87.2		%		50-150	18-NOV-21

PAH-511-WT **Soil**

Batch **R5652493**

WG3658866-37 **DUP**

WG3658866-39

1-Methylnaphthalene	<0.030	<0.030	RPD-NA	ug/g	N/A	40	17-NOV-21
2-Methylnaphthalene	<0.030	<0.030	RPD-NA	ug/g	N/A	40	17-NOV-21
Acenaphthene	<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Acenaphthylene	<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Anthracene	<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Benzo(a)anthracene	<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Benzo(a)pyrene	<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Benzo(b&j)fluoranthene	<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Benzo(g,h,i)perylene	<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Benzo(k)fluoranthene	<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Chrysene	<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Dibenz(a,h)anthracene	<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21



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Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT		Soil						
Batch	R5652493							
WG3658866-37 DUP		WG3658866-39						
Fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Fluorene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Indeno(1,2,3-cd)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Naphthalene		<0.013	<0.013	RPD-NA	ug/g	N/A	40	17-NOV-21
Phenanthrene		<0.046	<0.046	RPD-NA	ug/g	N/A	40	17-NOV-21
Pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
WG3658866-36 LCS								
1-Methylnaphthalene			96.4		%		50-140	17-NOV-21
2-Methylnaphthalene			92.6		%		50-140	17-NOV-21
Acenaphthene			91.8		%		50-140	17-NOV-21
Acenaphthylene			87.5		%		50-140	17-NOV-21
Anthracene			82.7		%		50-140	17-NOV-21
Benzo(a)anthracene			91.4		%		50-140	17-NOV-21
Benzo(a)pyrene			78.9		%		50-140	17-NOV-21
Benzo(b&j)fluoranthene			85.3		%		50-140	17-NOV-21
Benzo(g,h,i)perylene			91.0		%		50-140	17-NOV-21
Benzo(k)fluoranthene			90.3		%		50-140	17-NOV-21
Chrysene			96.0		%		50-140	17-NOV-21
Dibenz(a,h)anthracene			95.0		%		50-140	17-NOV-21
Fluoranthene			90.9		%		50-140	17-NOV-21
Fluorene			90.5		%		50-140	17-NOV-21
Indeno(1,2,3-cd)pyrene			95.9		%		50-140	17-NOV-21
Naphthalene			88.8		%		50-140	17-NOV-21
Phenanthrene			91.3		%		50-140	17-NOV-21
Pyrene			90.2		%		50-140	17-NOV-21
WG3658866-35 MB								
1-Methylnaphthalene			<0.030		ug/g		0.03	17-NOV-21
2-Methylnaphthalene			<0.030		ug/g		0.03	17-NOV-21
Acenaphthene			<0.050		ug/g		0.05	17-NOV-21
Acenaphthylene			<0.050		ug/g		0.05	17-NOV-21
Anthracene			<0.050		ug/g		0.05	17-NOV-21
Benzo(a)anthracene			<0.050		ug/g		0.05	17-NOV-21
Benzo(a)pyrene			<0.050		ug/g		0.05	17-NOV-21
Benzo(b&j)fluoranthene			<0.050		ug/g		0.05	17-NOV-21



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Client: HLV2K Engineering Limited (Brampton)
 2179 Dunwin Drive Unit 4
 Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Soil							
Batch	R5652493							
WG3658866-35 MB								
Benzo(g,h,i)perylene			<0.050		ug/g		0.05	17-NOV-21
Benzo(k)fluoranthene			<0.050		ug/g		0.05	17-NOV-21
Chrysene			<0.050		ug/g		0.05	17-NOV-21
Dibenz(a,h)anthracene			<0.050		ug/g		0.05	17-NOV-21
Fluoranthene			<0.050		ug/g		0.05	17-NOV-21
Fluorene			<0.050		ug/g		0.05	17-NOV-21
Indeno(1,2,3-cd)pyrene			<0.050		ug/g		0.05	17-NOV-21
Naphthalene			<0.013		ug/g		0.013	17-NOV-21
Phenanthrene			<0.046		ug/g		0.046	17-NOV-21
Pyrene			<0.050		ug/g		0.05	17-NOV-21
Surrogate: 2-Fluorobiphenyl			86.0		%		50-140	17-NOV-21
Surrogate: d14-Terphenyl			86.9		%		50-140	17-NOV-21
WG3658866-38 MS		WG3658866-39						
1-Methylnaphthalene			95.6		%		50-140	17-NOV-21
2-Methylnaphthalene			92.0		%		50-140	17-NOV-21
Acenaphthene			91.0		%		50-140	17-NOV-21
Acenaphthylene			87.1		%		50-140	17-NOV-21
Anthracene			79.9		%		50-140	17-NOV-21
Benzo(a)anthracene			92.0		%		50-140	17-NOV-21
Benzo(a)pyrene			79.0		%		50-140	17-NOV-21
Benzo(b&j)fluoranthene			86.9		%		50-140	17-NOV-21
Benzo(g,h,i)perylene			87.9		%		50-140	17-NOV-21
Benzo(k)fluoranthene			88.7		%		50-140	17-NOV-21
Chrysene			94.6		%		50-140	17-NOV-21
Dibenz(a,h)anthracene			94.2		%		50-140	17-NOV-21
Fluoranthene			90.4		%		50-140	17-NOV-21
Fluorene			88.7		%		50-140	17-NOV-21
Indeno(1,2,3-cd)pyrene			95.9		%		50-140	17-NOV-21
Naphthalene			87.9		%		50-140	17-NOV-21
Phenanthrene			90.7		%		50-140	17-NOV-21
Pyrene			89.3		%		50-140	17-NOV-21

PH-WT **Soil**



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Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-WT		Soil						
Batch	R5654235							
WG3658145-1	DUP	L2662154-1						
pH		7.86	7.92	J	pH units	0.06	0.3	19-NOV-21
WG3661509-1	LCS							
pH			7.00		pH units		6.9-7.1	19-NOV-21
SAR-R511-WT		Soil						
Batch	R5652297							
WG3659658-5	DUP	WG3659658-4						
Calcium (Ca)		27.0	27.5		mg/L	1.8	30	17-NOV-21
Sodium (Na)		0.78	0.77		mg/L	1.0	30	17-NOV-21
Magnesium (Mg)		2.42	2.36		mg/L	2.5	30	17-NOV-21
WG3659658-2	IRM	WT SAR4						
Calcium (Ca)			109.1		%		70-130	17-NOV-21
Sodium (Na)			93.0		%		70-130	17-NOV-21
Magnesium (Mg)			106.8		%		70-130	17-NOV-21
WG3659658-3	LCS							
Calcium (Ca)			104.0		%		80-120	17-NOV-21
Sodium (Na)			100.0		%		80-120	17-NOV-21
Magnesium (Mg)			100.8		%		80-120	17-NOV-21
WG3659658-1	MB							
Calcium (Ca)			<0.50		mg/L		0.5	17-NOV-21
Sodium (Na)			<0.50		mg/L		0.5	17-NOV-21
Magnesium (Mg)			<0.50		mg/L		0.5	17-NOV-21
VOC-511-HS-WT		Soil						
Batch	R5651659							
WG3658919-4	DUP	WG3658919-3						
1,1,1,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
1,1,2,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
1,1,1-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
1,1,2-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
1,1-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
1,1-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
1,2-Dibromoethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
1,2-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
1,2-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
1,2-Dichloropropane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21



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Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Soil						
Batch	R5651659							
WG3658919-4	DUP	WG3658919-3						
1,3-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
1,4-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Acetone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	17-NOV-21
Benzene		<0.0068	<0.0068	RPD-NA	ug/g	N/A	40	17-NOV-21
Bromodichloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Bromoform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Bromomethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Carbon tetrachloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Chlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Chloroform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
cis-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
cis-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	17-NOV-21
Dibromochloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Dichlorodifluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Ethylbenzene		<0.018	<0.018	RPD-NA	ug/g	N/A	40	17-NOV-21
n-Hexane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Methylene Chloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
MTBE		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
m+p-Xylenes		<0.030	<0.030	RPD-NA	ug/g	N/A	40	17-NOV-21
Methyl Ethyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	17-NOV-21
Methyl Isobutyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	17-NOV-21
o-Xylene		<0.020	<0.020	RPD-NA	ug/g	N/A	40	17-NOV-21
Styrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Tetrachloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Toluene		<0.080	<0.080	RPD-NA	ug/g	N/A	40	17-NOV-21
trans-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
trans-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	17-NOV-21
Trichloroethylene		<0.010	<0.010	RPD-NA	ug/g	N/A	40	17-NOV-21
Trichlorofluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	17-NOV-21
Vinyl chloride		<0.020	<0.020	RPD-NA	ug/g	N/A	40	17-NOV-21
WG3658919-2	LCS							
1,1,1,2-Tetrachloroethane			92.0		%		60-130	17-NOV-21
1,1,2,2-Tetrachloroethane			127.1		%		60-130	17-NOV-21



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 2179 Dunwin Drive Unit 4
 Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Soil							
Batch	R5651659							
WG3658919-2 LCS								
1,1,1-Trichloroethane			95.1		%		60-130	17-NOV-21
1,1,2-Trichloroethane			99.7		%		60-130	17-NOV-21
1,1-Dichloroethane			98.9		%		60-130	17-NOV-21
1,1-Dichloroethylene			91.3		%		60-130	17-NOV-21
1,2-Dibromoethane			99.2		%		70-130	17-NOV-21
1,2-Dichlorobenzene			101.8		%		70-130	17-NOV-21
1,2-Dichloroethane			103.6		%		60-130	17-NOV-21
1,2-Dichloropropane			101.4		%		70-130	17-NOV-21
1,3-Dichlorobenzene			88.1		%		70-130	17-NOV-21
1,4-Dichlorobenzene			94.4		%		70-130	17-NOV-21
Acetone			115.3		%		60-140	17-NOV-21
Benzene			99.1		%		70-130	17-NOV-21
Bromodichloromethane			108.0		%		50-140	17-NOV-21
Bromoform			107.6		%		70-130	17-NOV-21
Bromomethane			96.6		%		50-140	17-NOV-21
Carbon tetrachloride			96.5		%		70-130	17-NOV-21
Chlorobenzene			97.4		%		70-130	17-NOV-21
Chloroform			100.2		%		70-130	17-NOV-21
cis-1,2-Dichloroethylene			99.1		%		70-130	17-NOV-21
cis-1,3-Dichloropropene			106.9		%		70-130	17-NOV-21
Dibromochloromethane			98.1		%		60-130	17-NOV-21
Dichlorodifluoromethane			54.2		%		50-140	17-NOV-21
Ethylbenzene			89.4		%		70-130	17-NOV-21
n-Hexane			88.5		%		70-130	17-NOV-21
Methylene Chloride			101.7		%		70-130	17-NOV-21
MTBE			99.6		%		70-130	17-NOV-21
m+p-Xylenes			92.7		%		70-130	17-NOV-21
Methyl Ethyl Ketone			112.7		%		60-140	17-NOV-21
Methyl Isobutyl Ketone			112.5		%		60-140	17-NOV-21
o-Xylene			90.0		%		70-130	17-NOV-21
Styrene			94.7		%		70-130	17-NOV-21
Tetrachloroethylene			90.4		%		60-130	17-NOV-21
Toluene			92.6		%		70-130	17-NOV-21



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Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Soil						
Batch	R5651659							
WG3658919-2	LCS							
trans-1,2-Dichloroethylene			98.7		%		60-130	17-NOV-21
trans-1,3-Dichloropropene			103.4		%		70-130	17-NOV-21
Trichloroethylene			96.6		%		60-130	17-NOV-21
Trichlorofluoromethane			85.6		%		50-140	17-NOV-21
Vinyl chloride			76.4		%		60-140	17-NOV-21
WG3658919-1	MB							
1,1,1,2-Tetrachloroethane			<0.050		ug/g		0.05	17-NOV-21
1,1,2,2-Tetrachloroethane			<0.050		ug/g		0.05	17-NOV-21
1,1,1-Trichloroethane			<0.050		ug/g		0.05	17-NOV-21
1,1,2-Trichloroethane			<0.050		ug/g		0.05	17-NOV-21
1,1-Dichloroethane			<0.050		ug/g		0.05	17-NOV-21
1,1-Dichloroethylene			<0.050		ug/g		0.05	17-NOV-21
1,2-Dibromoethane			<0.050		ug/g		0.05	17-NOV-21
1,2-Dichlorobenzene			<0.050		ug/g		0.05	17-NOV-21
1,2-Dichloroethane			<0.050		ug/g		0.05	17-NOV-21
1,2-Dichloropropane			<0.050		ug/g		0.05	17-NOV-21
1,3-Dichlorobenzene			<0.050		ug/g		0.05	17-NOV-21
1,4-Dichlorobenzene			<0.050		ug/g		0.05	17-NOV-21
Acetone			<0.50		ug/g		0.5	17-NOV-21
Benzene			<0.0068		ug/g		0.0068	17-NOV-21
Bromodichloromethane			<0.050		ug/g		0.05	17-NOV-21
Bromoform			<0.050		ug/g		0.05	17-NOV-21
Bromomethane			<0.050		ug/g		0.05	17-NOV-21
Carbon tetrachloride			<0.050		ug/g		0.05	17-NOV-21
Chlorobenzene			<0.050		ug/g		0.05	17-NOV-21
Chloroform			<0.050		ug/g		0.05	17-NOV-21
cis-1,2-Dichloroethylene			<0.050		ug/g		0.05	17-NOV-21
cis-1,3-Dichloropropene			<0.030		ug/g		0.03	17-NOV-21
Dibromochloromethane			<0.050		ug/g		0.05	17-NOV-21
Dichlorodifluoromethane			<0.050		ug/g		0.05	17-NOV-21
Ethylbenzene			<0.018		ug/g		0.018	17-NOV-21
n-Hexane			<0.050		ug/g		0.05	17-NOV-21
Methylene Chloride			<0.050		ug/g		0.05	17-NOV-21
MTBE			<0.050		ug/g		0.05	17-NOV-21



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Client: HLV2K Engineering Limited (Brampton)
 2179 Dunwin Drive Unit 4
 Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Soil							
Batch	R5651659							
WG3658919-1	MB							
m+p-Xylenes			<0.030		ug/g		0.03	17-NOV-21
Methyl Ethyl Ketone			<0.50		ug/g		0.5	17-NOV-21
Methyl Isobutyl Ketone			<0.50		ug/g		0.5	17-NOV-21
o-Xylene			<0.020		ug/g		0.02	17-NOV-21
Styrene			<0.050		ug/g		0.05	17-NOV-21
Tetrachloroethylene			<0.050		ug/g		0.05	17-NOV-21
Toluene			<0.080		ug/g		0.08	17-NOV-21
trans-1,2-Dichloroethylene			<0.050		ug/g		0.05	17-NOV-21
trans-1,3-Dichloropropene			<0.030		ug/g		0.03	17-NOV-21
Trichloroethylene			<0.010		ug/g		0.01	17-NOV-21
Trichlorofluoromethane			<0.050		ug/g		0.05	17-NOV-21
Vinyl chloride			<0.020		ug/g		0.02	17-NOV-21
Surrogate: 1,4-Difluorobenzene			93.3		%		50-140	17-NOV-21
Surrogate: 4-Bromofluorobenzene			82.5		%		50-140	17-NOV-21
WG3658919-5	MS	WG3658919-3						
1,1,1,2-Tetrachloroethane			104.9		%		50-140	17-NOV-21
1,1,1,2,2-Tetrachloroethane			134.2		%		50-140	17-NOV-21
1,1,1-Trichloroethane			116.3		%		50-140	17-NOV-21
1,1,2-Trichloroethane			119.2		%		50-140	17-NOV-21
1,1-Dichloroethane			119.7		%		50-140	17-NOV-21
1,1-Dichloroethylene			120.5		%		50-140	17-NOV-21
1,2-Dibromoethane			111.5		%		50-140	17-NOV-21
1,2-Dichlorobenzene			117.1		%		50-140	17-NOV-21
1,2-Dichloroethane			122.9		%		50-140	17-NOV-21
1,2-Dichloropropane			117.1		%		50-140	17-NOV-21
1,3-Dichlorobenzene			101.8		%		50-140	17-NOV-21
1,4-Dichlorobenzene			107.9		%		50-140	17-NOV-21
Acetone			142.3	MES	%		50-140	17-NOV-21
Benzene			117.0		%		50-140	17-NOV-21
Bromodichloromethane			125.6		%		50-140	17-NOV-21
Bromoform			114.5		%		50-140	17-NOV-21
Bromomethane			132.7		%		50-140	17-NOV-21
Carbon tetrachloride			118.6		%		50-140	17-NOV-21
Chlorobenzene			112.5		%		50-140	17-NOV-21



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Client: HLV2K Engineering Limited (Brampton)
 2179 Dunwin Drive Unit 4
 Mississauga ON L5L 1X2

Contact: Miriam Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Soil							
Batch	R5651659							
WG3658919-5 MS		WG3658919-3						
Chloroform			118.9		%		50-140	17-NOV-21
cis-1,2-Dichloroethylene			116.8		%		50-140	17-NOV-21
cis-1,3-Dichloropropene			114.0		%		50-140	17-NOV-21
Dibromochloromethane			110.6		%		50-140	17-NOV-21
Dichlorodifluoromethane			130.9		%		50-140	17-NOV-21
Ethylbenzene			104.8		%		50-140	17-NOV-21
n-Hexane			120.6		%		50-140	17-NOV-21
Methylene Chloride			120.3		%		50-140	17-NOV-21
MTBE			116.9		%		50-140	17-NOV-21
m+p-Xylenes			108.4		%		50-140	17-NOV-21
Methyl Ethyl Ketone			122.1		%		50-140	17-NOV-21
Methyl Isobutyl Ketone			119.4		%		50-140	17-NOV-21
o-Xylene			104.4		%		50-140	17-NOV-21
Styrene			106.5		%		50-140	17-NOV-21
Tetrachloroethylene			114.2		%		50-140	17-NOV-21
Toluene			116.0		%		50-140	17-NOV-21
trans-1,2-Dichloroethylene			120.4		%		50-140	17-NOV-21
trans-1,3-Dichloropropene			115.3		%		50-140	17-NOV-21
Trichloroethylene			113.2		%		50-140	17-NOV-21
Trichlorofluoromethane			123.2		%		50-140	17-NOV-21
Vinyl chloride			123.7		%		50-140	17-NOV-21

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Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2

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Contact: Miriam Mohammadi

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-L	Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

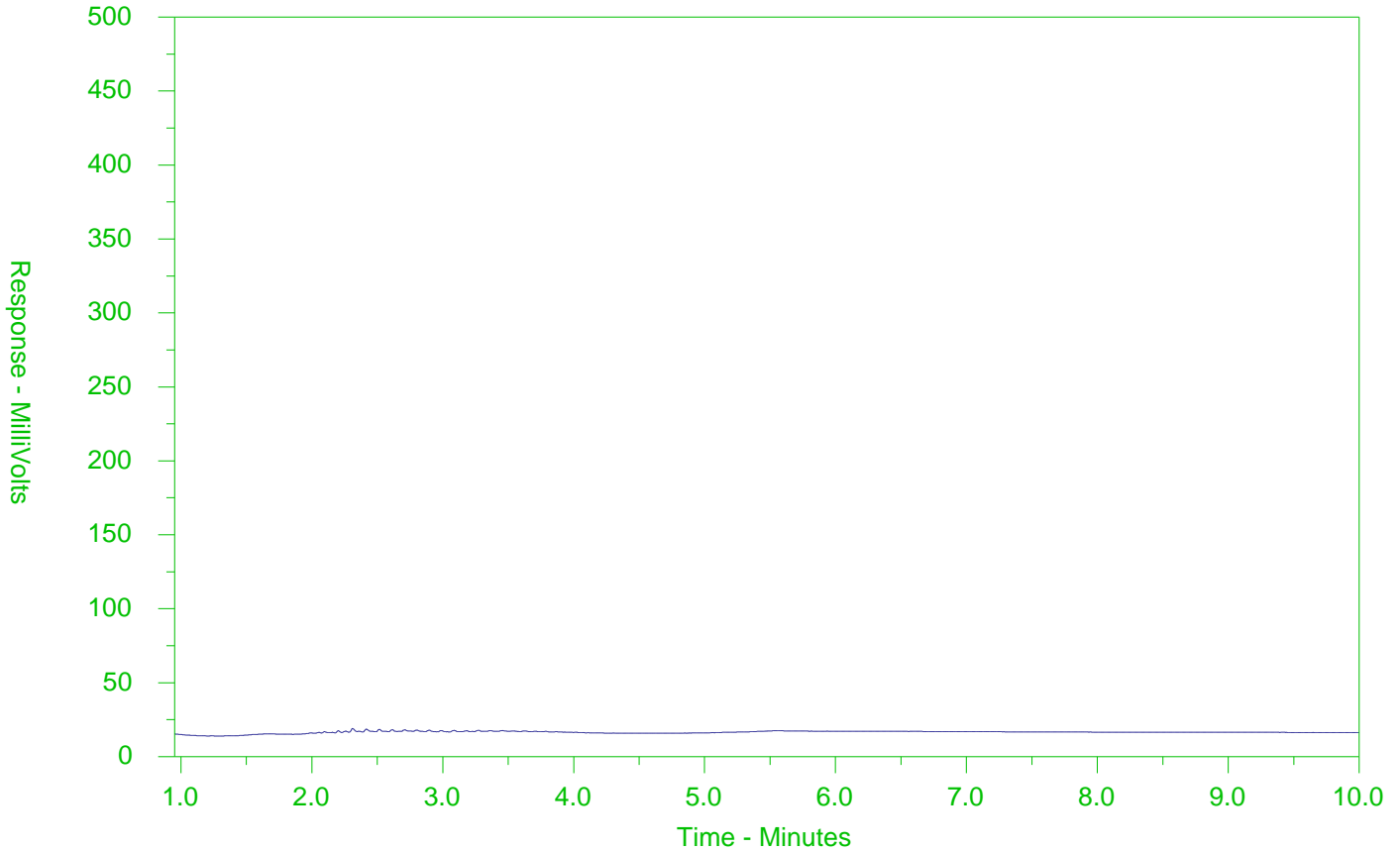
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2662272-1
 Client Sample ID: BH5



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

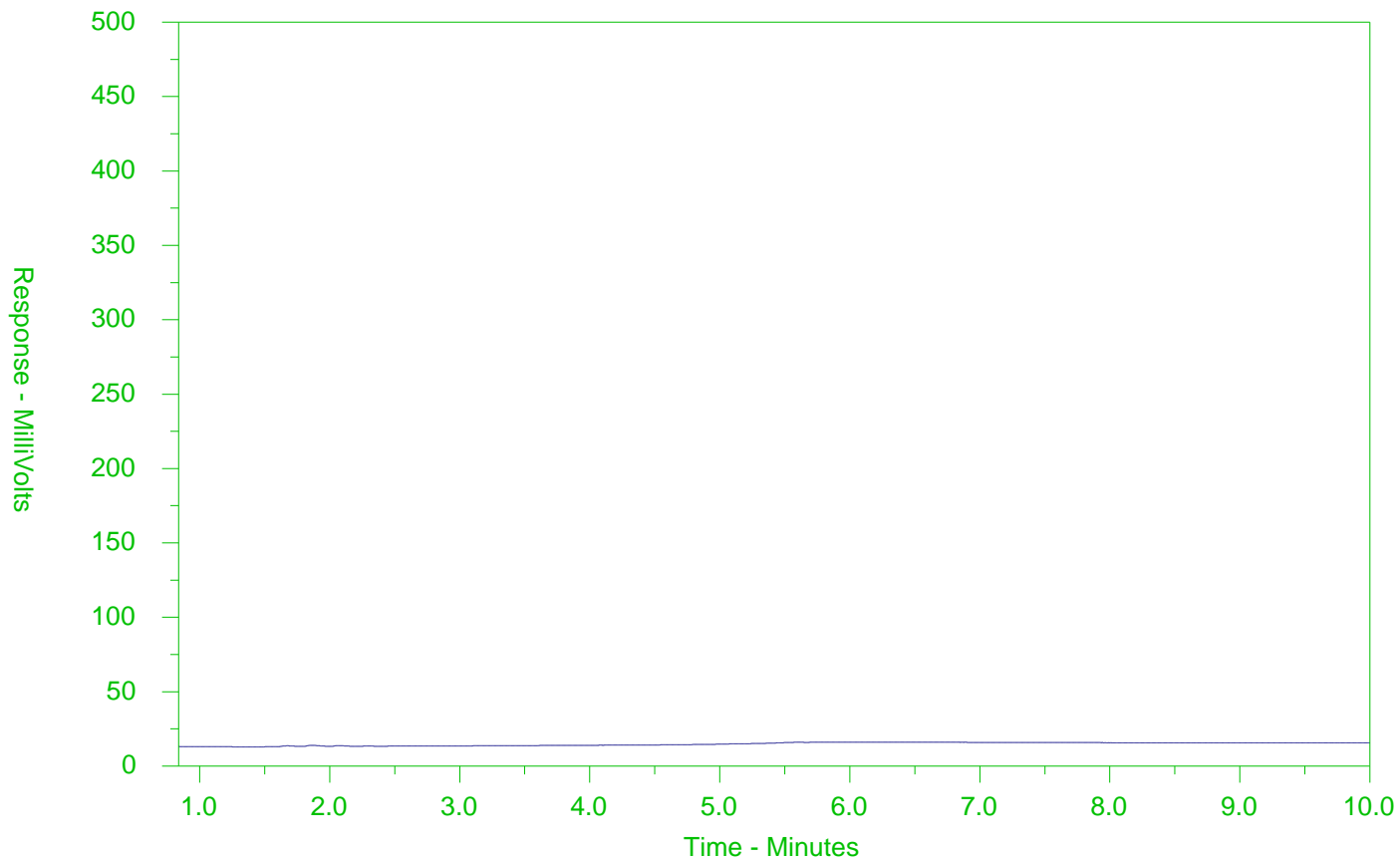
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2662272-2
 Client Sample ID: BH6



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

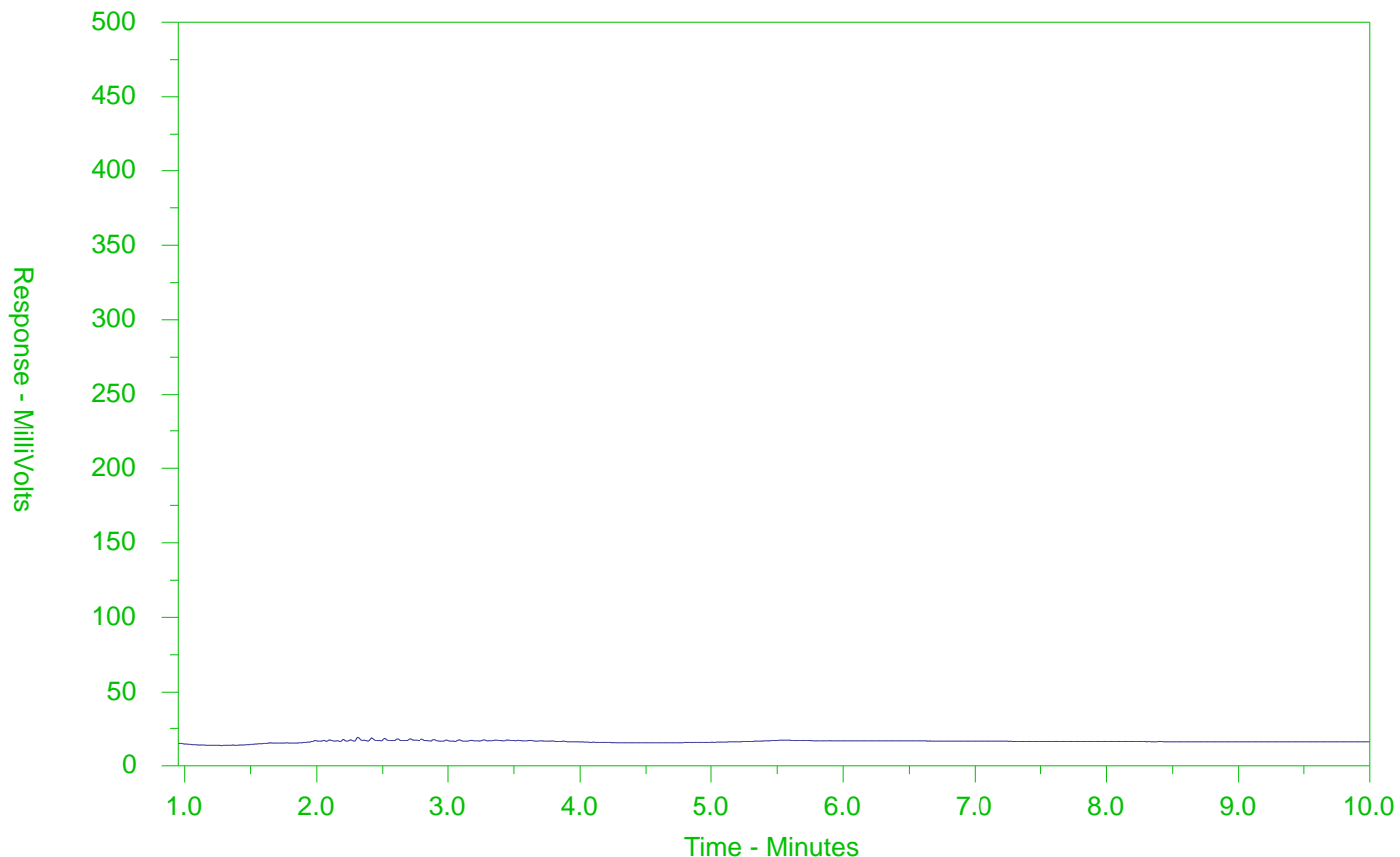
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2662272-3
 Client Sample ID: BH7



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

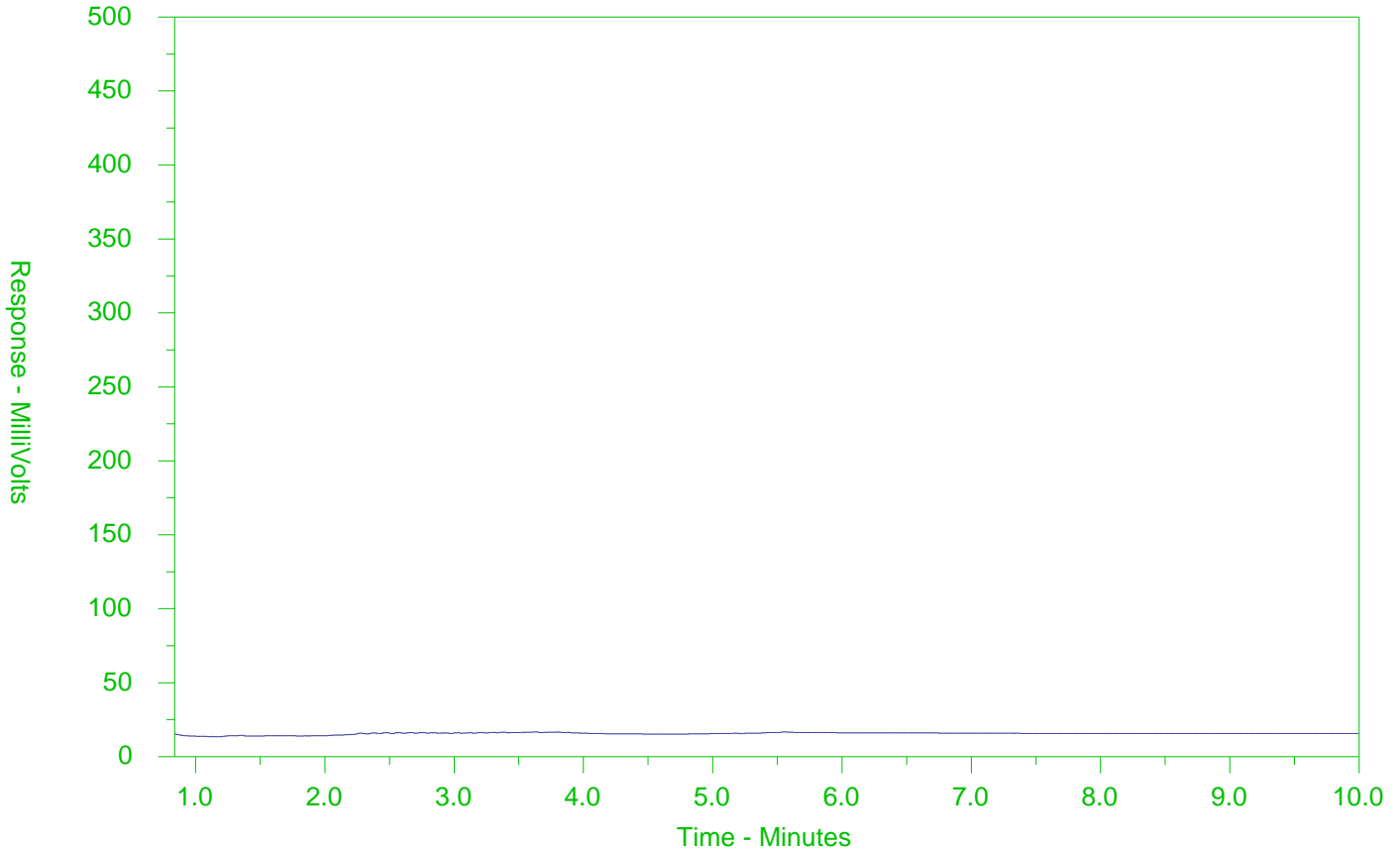
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2662272-4
 Client Sample ID: DUP1



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

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www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

COC Number: 20 -

Page of



L2662272-COFC

Report To Contact and company name below will appear on the final report

Company: HLV2K Engineering Limited
 Contact: Mariam Mohammadi
 Phone: 6479753676

Company address below will appear on the final report

Street: 4-2179 Dunwin Drive
 City/Province: Mississauga, ON
 Postal Code: L5L 1X2

Select Distribution: EMAIL MAIL FAX

Email 1 or Fax: john.lametti@HLV2K.com
 Email 2: mariam.mohammadi@HLV2K.com
 Email 3: irfan.khokhar@hlv2k.com

Turnaround Time (TAT) Requested

Routine [R] if received by 3pm M-F - no surcharges apply
 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
 Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Invoice To Same as Report To YES NO

Copy of Invoice with Report YES NO

Company: HLV2K Engineering Limited
 Contact: Manny Virani

Invoice Recipients

Select Invoice Distribution: EMAIL MAIL FAX

Email 1 or Fax: Invoice@HLV2K.com
 Email 2:

Date and Time Required for all E&P TATs: dd/mm/yyyy hh:mm:ss

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Account # / Quote #: 84316
 Job #: 2100394AG
 PO / AFE:
 LSD: Helena Street

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#
 Major/Minor Code: Routing Code:
 Requisitioner:
 Location:

NUMBER OF CONTAINERS	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below										SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	O.Reg. 153/04 - Metals & Inorganics	O.Reg. 153/04 - VOCs	O.Reg. 153/04 - PHC F1-F4	O.Reg. 153/04 - PAH	O.Reg. 153/04 - OC Pesticides	O.Reg. 153/04 - PCB	O.Reg. 153/04 - BTEX	O.Reg. 153/04 - EC and SAR					
6	R	R	R	R	R								
6	R	R	R	R	R								
6	R	R	R	R	R								
6	R	R	R	R	R								

ALS Lab Work Order # (ALS use only): **L2662272UM**

ALS Contact: Sampler:

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type
	BH5	12-Nov-21	9:00	Soil
	BH6	12-Nov-21	9:00	Soil
	BH7	12-Nov-21	9:00	Soil
	Dup1	12-Nov-21	9:00	Soil

Drinking Water (DW) Samples¹ (client use)

Are samples taken from a Regulated DW System?
 YES NO

Are samples for human consumption/ use?
 YES NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Ontario Regulation 153/04 - April 15, 2011 Standards - T1 - Soil - RPI/ICC Property Use

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: NONE ICE ICE PACKS FROZEN COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: YES NO

Cooler Custody Seals Intact: YES N/A Sample Custody Seals Intact: YES N/A

INITIAL COOLER TEMPERATURES °C: 6.2 FINAL COOLER TEMPERATURES °C: 4.7

SHIPMENT RELEASE (client use)

Released by: Date: Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Time: HK 11/12/21 15:25

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Time: MC Nov 12 18