

PHASE 1 ENVIRONMENTAL SITE ASSESSMENT

1634 FOUR MILE CREEK ROAD,

NIAGARA-ON-THE-LAKE, ON

NOVEMBER 22, 2024

Prepared for:

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EXECUTIVE SUMMARY

At the request of Melanie Williams & Rudy Doerwald (the Clients), a Phase I Environmental Site Assessment Update was conducted of a site (the 'Site') located at 1634 Four Mile Creek Road, Niagara-On-The-Lake, Ontario.

The report was conducted to meet the requirements set out in Schedule D Phase One Environmental Site Assessments of the Ministry of Environment Conservation and Park's (MECP) O. Reg 511/09, in order to that a Record of Site Condition can be filed. The procedure involved: a review of available previous environmental assessments to determine if they meet the Schedule D requirements; a review of applicable records and site reconnaissance to determine if there any material changes since the last work of the most recent Phase I ESA; and, provide supplemental information, as required, to meet Schedule D for the submission of a RSC.

The Phase I Study Area (SA) was set at 250 m.

The Site is currently used for a flower shop and previously as a bank on the east end and the remainder is undeveloped. Prior to the 1960s the site was formerly under agricultural use mostly as cereal crops and the west end of the Site was used as an orchard in the 1930s.

One area of potential environmental concern (APEC) was identified on the Site. A 1934 aerial photograph identified orchards in the west part of the property above the Four Mile Creek ravine, and there is the possibility that organo-chlorinated (OC) pesticides or other pesticides like arsenic may have been used. Such pesticides are not highly mobile in the soil and may exist in the surface soils.

APEC 1 on the Site needs to be analyzed for contaminants of potential concern (CoPCs) and therefore a Phase II ESA will be required before a Record of Site Condition can be submitted.

2.0 INTRODUCTION

(i) Phase I Property Information

Table 1a: Site Information	
Municipal Address	1634 Four Mile Creek Road, Niagara-On-The-Lake, On.
Property Description and Property Identification Number (PIN)	PT TWP LT 113 NIAGARA; PT TWP LT 118 NIAGARA; PT RDAL BTN TWP LOTS 113 & 118 NIAGARA AS IN RO515293; NIAGARA-ON-THE-LAKE. Pin: 46385-0065(LT)
Registered Owner	Rudy Doerwald
Zoning	East half: C1 – Commercial, West Half: R1 - Residential
Site Area/Shape	0.30791 ha. – truncated rectangle
Frontage	18.288 m
Depth	169.844 m

Table 1b: Contact Information	
Organization	Melanie Williams & Rudy Doerwald
Contact	Melanie Williams & Rudy Doerwald
Title	Owners
Address	P.O. Box 1161 Virgil, ON L0S 1T0
Phone	Melanie Williams (905) 988-6818 & Rudy Doerwald (905) 327-9262

Table 1c: Client Information	
Organization	Melanie Williams & Rudy Doerwald
Contact	Melanie Williams & Rudy Doerwald
Title	Owners
Address	P.O. Box 1161 Virgil, ON L0S 1T0
Phone	Melanie Williams (905) 988-6818 & Rudy Doerwald (905) 327-9262

3.0 SCOPE OF INVESTIGATION

3.1 Purpose

This P1-ESA was carried out in accordance with Part VII of the Ministry of Environment's O. Reg 511/09 and the requirements set out in Schedule D Phase One Environmental Site Assessments .

The general objectives of the PI-ESA are:

- To develop a preliminary determination of the likelihood that one or more contaminants have affected land or water on, in or under the phase one property.
- To determine the need for a phase two environmental site assessment
- To provide a basis for carrying out any phase two environmental assessment required.
- To provide adequate preliminary information about environmental conditions in the land or water, in or under the phase one property for the conduct of a risk assessment following completion of a phase two environmental site assessment.

3.2 Scope

The report was conducted to meet the requirements set out in Schedule D Phase One Environmental Site Assessments of the Ministry of Environment Conservation and Park's (MECP) O. Reg 511/09, in order to that a Record of Site Condition can be filed. Determine if met were met. The Phase I Study Area (SA) was set at 250 m.

The Phase I ESA Update scope of work included:

- A review of available previous environmental assessments to determine if they meet the Schedule D requirements;
- A review of applicable records and site reconnaissance to determine if there any material changes since the last work of the most recent Phase I ESA;
- Provide supplemental information, as required, to meet Schedule D for the submission of a RSC.
- An evaluation of the information gathered from the records review, interviews, and the site reconnaissance.
- A phase one conceptual site model
- Conclusions determining whether a phase two environmental site assessment is required before a record of site condition can be submitted.

3.3 Disclosure of Interest

The author does not have any material interest, direct or indirect, in the Site or the Client. Except for remuneration and information research fees received for the performance of this assessment, the author will not receive any profit or specialized information from the Client that would benefit the author.

3.4 Limitations and Use of this Report

The data reported and the findings, observations, and conclusions expressed in this report are limited by the Scope of Work.

The author has conducted this assessment in accordance with generally accepted professional practices, as performed at the same or similar locations related to the nature of this assigned work. The author's services are not subject to any expressed or implied warranties whatsoever.

The author has accepted information provided by third parties in good faith, but has not completed independent evaluations as to the accuracy or completeness of such information, and shall therefore not be responsible for any errors or omissions contained in such information.

The Site inspection pertaining to this assessment, and associated findings, observations, and opinions, are based solely on the Site conditions encountered at the time of the investigation. Changes in conditions may occur after the completion of this investigation. The passage of time, manifestation of latent conditions, or future events, may require further study, analysis of data, and re-evaluation of the findings, observations, and conclusions in this report.

This report is provided as a measure of due diligence and to assess risks with respect to environmental soil impairment, but it should not be considered as exhaustive or absolute in coverage; no investigation can totally eliminate the possibility that environmental impairment may exist at a site.

Regulatory requirements or their interpretations may be revised by the governing agencies, resulting in future changes to the recommended works, or remediation needs.

The conclusions presented in this report are professional opinions based upon data and conditions described herein. They are intended only for the purpose, site, and project indicated. This report is not a definitive study of contamination at the site, and should not be interpreted as such. A qualitative evaluation of soil conditions was not performed as part of this investigation. No sampling or chemical analyses of structural materials or other equipment, processes, or related media was performed in this study unless explicitly stated.

This report presents professional opinions and findings of a scientific and technical nature. Because of the stated limitations, the findings, observations, opinions and conclusions expressed by the author in this report are not, nor should not be, considered an opinion concerning the compliance of any past or present owner of the site, with any Federal, Provincial, or municipal law or regulation.

The report shall not be construed to offer legal opinion or representations as to the requirements of, nor compliance with, environmental laws, rules, regulations or policies of Federal, Provincial or local government agencies.

The author has prepared this report for the exclusive use of the Client. This report shall not be used or relied upon by outside parties without the written consent of the author. Any use of this report constitutes acceptance of the limits of liability that may apply to the author. Any such liability extends only to the client of the author and not to any other parties who may obtain the report.

If new information or conditions of concern are discovered during future work, including Site assessments, excavations, borings, or other studies, the author should be requested to re-evaluate the assessments and conclusions presented in this report and to provide amendments as required.

4.0 RECORDS REVIEW

(i) **General**

(i) Phase One Study Area Determination

The Phase I Study Area (SA) was set at 250 m. The general area beyond the study area is rural and there was no evidence of significant sources of potential contamination within a kilometer of the Site. Therefore, properties beyond 250 m of the site were not considered part of the Phase I Study Area.

(ii) First Developed Use Determination

According to the aerial photographs, land title search and information taken from interviews the Phase One Property was first developed in the early 1960s.

(iii) Fire Insurance Plans

Available Fire insurance plans (FIP) on file at the Brock University Special Collections Library reviewed. No FIPs with coverage of the area were identified.

(iv) Street Directories

Street Directories on file with the Brock University Special Collections Library were reviewed for occupancies of the Site and properties in the study area. No directories with coverage for the area were identified.

(v) Chain of Title

A chain of title was previously carried out by Ms. Jennifer Mackenzie and is summarized as follows:

Table 3 – Chain of Title Summary

Year	Name of Owner
Prior to 1808	Crown
1808	John Sherbeck
1855	George B. Lawrence
1848	George Cairns
1868	John Kirby

1878	William Kirby
1882	Charles M. Gripton
1886	Margaret E. Rogers
1887	Henry C. Rogers
1897	Roland Clark
1949	Anne Mildred Hilton
1955	Valentay Szczepankiewicz Sofia Szczepankiewicz
1955	Walter Salack
1959	Frank Steiger Anna Steiger
1981	Elizabeth Nicol
1986	Gunner Doerwald
2015	Rudy Doerwald (CURRENT OWNER)

(vi) Environmental Reports

No previous environmental reports were identified or reported for review.

(vii) Other Reports Relating Potential Contamination or APEC on or under the Phase One Property

An environment database search request was submitted to EcoLog Environmental Risk Information Services (ERIS) for the Site and study area and is included in Appendix D. Data sources include:

Table 4: ERIS Data Bases

Federal Government Source Database	
Environmental Effects Monitoring 1992 – 2007	EEM
Environmental Issues Inventory System 1992 -2001	EIIS
Federal Convictions 1988 – Jan 2007	FCON
Contaminated Sites on Federal Land June 2000 – Sept 2011	FCS
Fisheries and Oceans Fuel Tanks 1964 – Sept 2003	FOFT
Indian and Northern Affairs Fuel Tanks 1950 – Aug 2003	IAFT
National Analysis Of Trends in Emergencies Systems (NATES) 1974 – 1994	NATE
National Defence and Canadian Forces Fuel Tanks Up to May 2001	NDFT
National Defence and Canadian Forces Spills Mar 1999 – Aug 2010	NDSP
National Defence and Canadian Forces Waste Disposal Sites 2001 – April 2007	NDWD
National Environmental Emergencies System 1974 – 2003	NEES
National PCB Inventory 1988 – 2008	NPCB
National Pollutant Release Inventory 1993 – 2009	NPRI
Parks Canada Fuel Storage Tanks 1920 – Jan 2005	PCFT
Transport Canada Fuel Storage Tanks 1970 – March 2007	TCFT
Provincial Government Source Database	
Abandoned Aggregate Inventory Up to Sept 2002	AAGR
Aggregate Inventory up to Jun 2010	AGR
Abandoned Mines Information System 1800 -2005	AMIS

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Borehole 1875 – Sept 2010	BORE
Certificates of Approval 1985 – Sept 2002	CA
TSSA Comercial Fuel Oil Tanks 1948 – Aug 2010	CFOT
Coal Gasification Plants April 1987 and November 1988	COAL
Compliance and Convictions 1989 – June 2011	CONV
Drill Holes 1886 – 2005	DRL
Environmental Registry 1994 – June 2011	EBR
TSSA Fuel Storage Tanks Current to June 2011	FST
Ontario Regulation 347 Waste Generators Summary 1986 – Oct 2010	GEN
Mineral Occurrences 1846 – Nov 2010	MNR
Non-Compliance Reports 1992 (water only) 1994 – 2009	NCPL
Ontario Oil and Gas Wells 1800 – Jun 2011	OOGW
Ontario Inventory of PCB Storage Sites 1987 – Oct 2004	OPCB
Pesticide Register 1988 – 1998	PES
Private Fuel Storage Tanks 1989 – 1996	PST
Ontario Regulation 347 Waste Receivers Summary 1986 – 2008	REC
Record of Site Condition 1997 – Sept 2001, Oct 2004 – Jun 2011	RSC
Ontario Spills 1988 – Nov 2010	SPL
Wastewater Discharger Registration Database 1990 – 1998	SRDS
Waste Disposal Sites – MOE CA Inventory 1970 – June 2011	WDS
Waste Disposal Sites – MOE Historical Inventory Up to Oct 1990	WDHS
Water Well Information Systems 1955 – Mar 2011	WWIS
Private Source Databases	
Anderson’s Waste Disposal Sites 1860s - Present	ANDR
Automobile Wrecking and Supplies 2001 – June 2010	AUWR
Chemical Register 1992, 1999 – Sept 2002	CHEM
ERIS Historical Searches 1999 – Apr 2011	EHS
Canadian Mine Locations 1998 – 2009	MINE
Oil and Gas Wells Oct 2001 – Jun 2011	OGW
Canadian Pulp and Paper 1999, 2002, 2004, 2005, 2009	PAP
Retail Fuel Storage Tanks 1989 – Jun 2010	RST
Scotts’ Manufacturing Directory 1992 – Mar 2011	SCT
Anderson’s Storage Tanks 1915 - 1953	TANK

No listings were identified on the Site.

Within the Study Area 70 listings were identified at 20 locations, which included: 1 Borehole (BOR) listing; 2 Certificates of Approval (CA) listings, both for municipal sewage works; 1 Delisted Fuel Tank (DTANK) listings, 132 m downgradient of the Site; 6 Environmental Compliance Agreements (ECAs) listings, all for municipal sewage works; 12 ERIS Historical Searches (EHS) listings; 6 Expired Fuel Safety Facilities (EXP) listings, 132 m downgradient of the Site; 8 Fuel Storage Tank (FST) listings, 6 of which are 132 m downgradient and 2 of which are 220 m downgradient; 5 Fuel Storage Tanks – Historic (FSTH) 3 of which are down gradient of the Site and 2 of which are 220 m downgradient of the Site; 13 Ontario Regulation 347 Waste Generator (GEN) listing, 3 of which were 170 m distant from the Site, 12 of which were 220 m distant from the Site, and 1 of which was 132 m downgradient of the Site; 2 Private and Retail Fuel Storage Tanks (PRT) listings: 1 of which is 80 m and trans-gradient to the Site and the other 220 m downgradient of the Site; 3 Retail Fuel Storage (RST) listings all located 132 m downgradient of the Site; 3 Scotts Manufacturing Directory (SCT) listings for newspaper publisher located 135 m and trans gradient to the Site; and, 8 Ontario Spills (SPL) listings, one of 34 l of diesel fuel 80 m trans-gradient to the south, three involving a natural gas leaks, one involving 200 l of gasoline 92 m trans-gradient to the Site, one involving a mercury spill at a residence 90 m downgradient of the Site, one involving gasoline 132 m downgradient to the Site, and one involving 10 l of water based paint 170 m downgradient of the Site.

Listings with potential contaminating activities (PCAs) identified above are not

considered to represent areas of potential environmental concern due insignificant size, distance from the Site or being trans or downgradient of the Site.

(b) Environmental Source Information

(i) National Pollutant Release Inventory (NPRI)

The NPRI data base searched for records in the study area. The phase one property was not listed under the NPRI.

(ii) Ontario Inventory of PCB Storage Sites (October 1992)

A search of the Ontario Inventory of PCB Storage Sites (1992) did not identify any listings in the Study Area.

(iii) Certificates of Approval, Permits to Take Water, Certificates of Property Use and similar instruments

No certificates of Approval, Permits to Take Water, Certificates of Property Use or similar instruments were identified on the Phase One Study or adjacent properties.

(iv) Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario

The MOE's 'Inventory of Industrial Sites Producing or Using Coal Tar or Related Tars in Ontario, November, 1988' was reviewed and no such facilities were identified within the Study Area.

(v) Records concerning reported violations, prosecutions, or clean-up orders, past or present, with respect to environmental regulations, pertaining to the Site.

There are no reported violations, prosecutions, or clean-up orders, past or present, with respect to environmental regulations, pertaining to the Site.

(vi) Waste Management Records

Waste generated on the Site is picked-up by municipal curb-side service.

(vii) Reports submitted to the Ministry related to environmental conditions

There are no reported violations, prosecutions, or clean-up orders, past or present, with respect to environmental regulations, pertaining to the Phase One Property or adjacent properties.

(viii) Retail Fuel Storage Tanks maintained by the Technical Standards and Safety Authority

See Section 4.(a) (vi).

(ix) Notices and Instruments, including RSCs, posted in the Registry

See Section 4.(a) (vi).

(x) Areas of Natural and Scientific Interest (ANSIs)

The Ontario Ministry of Natural Resources ANSI map was reviewed and no ANSIs were identified on the phase one property or study area. within one kilometer of the property.

(xi) Waste Disposal Inventory

No waste disposal sites within the study area.

(xii) Town of Niagara-Om-The-Lake's Zoning By-law

In accordance with the Town of Niagara-Om-The-Lake's zoning by- law, the east half of the Phase One Property is designated C1 -commercial, and the west half of the Phase One Property is designated 'R1 = residential.

The adjacent property to the north is designated residential, The adjacent property to the east is designated commercial. The adjacent properties to the south is designated institutional and open space.

(c) Physical Setting Sources

(i) Aerial Photographs

Aerial photographs from 1934, 1954, 1965, 2000, 2006, 2010, 2013, 2015, 2018, 2020 and 2023 obtained from Brock University and Niagara Navigator were reviewed.

The rationale for the time between aerial photographs referenced is based on availability and photo clarity for a more accurate documentation of changes in property use.

- The 1934 aerial photograph shows the Site under agricultural use with the west portion of the Site under orchards and the east portion under cereal crop use. There is a church to the south and agricultural lands to the west, north and east of the Site.
- The 1955 aerial photograph shows the Site under agricultural use under cereal crop use. There is a church to the south and agricultural lands to the west, north and east of the Site.
- The 1965 aerial photograph shows east portion of the Site developed with current building on the Site. The west portion appears to left to fallow. There is a small building to the north and commercial development to the east.
- The 2000 to 2006 aerial photographs show the current building footprint with the western part overgrown with mature trees. The church to the south has been replaced with a parking lot.
- The 2000 to 2023 aerial photographs show residential development to the north of the west portion of Site

Copies of the aerial photographs are included in the appendices.

(ii) Topography, Hydrology and Geology

The Site is mostly level except for the far west portion of the Site which drops down about 4 m to Four Mile Creek. A 2024 topographic survey of the Site identifies a maximum elevation of 92.30 m.a.s.l. on the east side of the Site dipping along the bank to the Four Mile Creek to 85.05 m.a.s.l. at the west end of the Site.

The site is situated within the physiographic region known as the Haldimand Clay Plain (Chapman and Putnam, 1984).

Ontario Geological Survey (OGS) map, "Surficial Geology of Southern Ontario" available on the Ministry of Natural Resources website was reviewed. The map places the Site on Fine-textured glaciolacustrine deposits of silt and clay, minor sand and gravel, Massive to well laminated.

Ontario Geological Survey (OGS) map, "Paleozoic Geology of Southern Ontario" available on the Ministry of Natural Resources website were reviewed. The map place the Site and study area on the Unit Name: Bertie; Group: Formation: Bertie; Lithology: dolostone; Description: dolostone; argillaceous, laminated, bituminous or burrowed.

(iii) Fill Materials

Setting aside engineered fill around structures, there is no evidence of other extraneous fill material on the Site.

(iv) Water Bodies and Areas of Natural Significance

The National Heritage Information Centre (NHIC) database was searched for areas of natural significance within a study area. The Four Mile Creek runs south to north through the west end of the Site.

(v) Well Records

According to the MECP Well Records there were no well records identified on the Site or study area.

(d) Site Operating Records

The Site is not considered an enhanced property investigation and therefore operating records were not discussed.

5.0 INTERVIEWS

General Information

Date and Time	24/10/22
Method	In Person
Interviewee	Melanie Williams & Rudy Doerwald
Title	Owners
Reason for Selection	Owners

Interview Information

Phase One Property

Mr. Doerwald purchased the Site from his father who acquired the Site in 1986. The building was originally occupied by a bank and was converted to a flower shop in 2004.

Structures

1. Structures

- (i) Description of structure and other improvements – There is a single storey brick sided concrete block building erected in the early 1960s.
- (ii) Below ground structures – There are no below ground structures.
- (iii) Tanks - There was no evidence of current or former tanks on the Site.
- (iv) Potable water sources – The Site is on municipal water supply

2. Utilities

There are underground utilities on the Phase One Property, but the locations are unknown.

3. Building Interior(s)

- (i) Exit and entry points – There are single doors on the front and the south side of the building.
- (ii) Existing and former heating systems – The building is currently heated by a natural gas fired furnaces. There is no evidence of previous heating systems.
- (iii) Cooling systems – Th building is cooled by roof top HVAC unit.
- (iv) Current and former drains, sumps and pits – No current or former drains, or pits were noted other than the drains to the washrooms.
- (v) Unidentified substances – none noted
- (vi) Stains and corrosion – No staining or corrosion was noted.

4. Other features

- (i) Wells – none noted

- (ii) Sewage works – The Phase One Property has access to municipal sanitary service
- (iii) Ground surfaces – The Phase One Property is mostly level, except for the far west portion of the Site level. There is a paved asphalt parking pad in the front of the store with a laneway along the south to rear parking pad. The remainder of the Site is grass covered with trees and fenced off. The Site is mostly level except for the far west portion of the Site which drops down about 4 m to Four Mile Creek.
- (iv) Current or former rail lines – No current or former rail lines were noted

5. Exterior

- (i) Areas of stained soil, vegetation or pavement – None identified.
- (ii) Stressed vegetation – There was no stressed vegetation identified.
- (iii) Areas of fill – None known other.
- (iv) Potentially contaminating activity – None identified known.
- (v) Unidentified substances – None noted.

6. Enhanced Investigation Items – Not applicable.

Phase One Study Area

- (a) Potentially contaminating activities – Except for the automotive repair garage to the east and downgradient of the Site, none were observed.
- (b) Water bodies – The Four Mile Creek runs south to north through the west end of the Site.
- (c) Areas of natural significance – A non-provincially significant wet land is along the west side of the Site.

6.0 SITE RECONNAISSANCE




(a) General Requirements

Table 8: Site Reconnaissance Information




Date and Time	24/10/22
Weather Conditions	Sunny and clear
Length of time of Reconnaissance	60 minutes
Facility operating (Y/N)	Y
Name and Qualifications of Assessor	Andre Breberina. P.Geo. QP. (see Appendix E)

Table 4b: Photographic Log

Photograph	Orientation	Description
	West	East side of Site
	North	South side of building.

	South	North side of the building.
	Southeast	West side of Site.
	Looking south	Storage shed

 A wide-angle photograph of a large, open grassy area. In the background, there are several tall evergreen trees and some deciduous trees with yellowing leaves, suggesting an autumn setting. A house is partially visible through the trees in the distance.	Looking east	View of undeveloped part of the Site west of building.
 A photograph showing a grassy area from a different perspective. A long, low building is visible on the left side of the frame. The background is filled with a dense line of trees, including evergreens and deciduous trees with autumn foliage.	Looking west	View of undeveloped part of the Site west of building
 An interior photograph of a retail area, likely a nursery or garden center. The space is filled with various potted plants, including large green foliage and several tall orchids in white and purple pots. The ceiling has recessed fluorescent lighting, and the floor is made of light-colored wood.	Looking west	Store interior - retail area

	Looking southwest	Store interior - retail area
		Store room
		Supply room

(b) Specific Observations of the Phase I Property and Investigation Description

Phase One Property

The Phase One Property and the interior of the building on the Phase One property were inspected.

Structures

1. Structures

- a. Description of structure and other improvements – There is a single storey brick sided concrete block building erected in the early 1960s.
- b. Below ground structures – There are no below ground structures.
- c. Tanks - There was no evidence of current or former tanks on the Site.
- d. Potable water sources – The Site is on municipal water supply

2. Utilities

There are underground utilities on the Phase One Property, but the locations are unknown.

3. Building Interior(s)

- a. Exit and entry points – There are single doors on the front and the south side of the building.
- b. Existing and former heating systems – The building is currently heated by a natural gas fired furnaces. There is no evidence of previous heating systems.
- c. Cooling systems – Th building is cooled by roof top HVAC unit.
- d. Current and former drains, sumps and pits – No current or former drains, or pits were noted other than the drains to the washrooms.
- e. Unidentified substances – none noted
- f. Stains and corrosion – No staining or corrosion was noted.

4. Other features

- a. Wells – none noted
- b. Sewage works – The Phase One Property has access to municipal sanitaryservice
- c. Ground surfaces – The Phase One Property is mostly level, except for the far west portion of the Site level. There is a paved asphalt parking pad in the front of the store with a laneway along the south to rear parking pad. The remainder of the Site is grass covered with trees and fenced off. The Site is level is mostly level except for the far west portion of the Site which drops down about 4 m to Four Mile Creek.
- d. Current or former rail lines – No current or former rail lines were noted

5. Exterior

- a. Areas of stained soil, vegetation or pavement – None identified.
- b. Stressed vegetation – There was no stressed vegetation identified.

- c. Areas of fill – None known other.
- d. Potentially contaminating activity – None identified known.
- e. Unidentified substances – None noted.

6. Enhanced Investigation Items – Not applicable.

Phase One Study Area

- (d) Potentially contaminating activities – Except for the automotive repair garage to the east and downgradient of the Site, none were observed.
- (e) Water bodies – The Four Mile Creek runs south to north through the west end of the Site.
- (f) Areas of natural significance – A non-provincially significant wet land is along the west side of the Site.

7.0 REVIEW AND EVALUATION OF INFORMATION

(i) Current and Past Uses

The Site is currently used for a flower shop and previously as a bank on the east end and the remainder is undeveloped. Prior to the 1960s the site was formerly under agricultural use mostly as cereal crops and the west end of the Site was used as an orchard in the 1930s.

(ii) Potentially Contaminating Activity (PCAs)

On-Site PCAs

PCA 1 – PCA Item # 40: Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications. The 1934 aerial photograph identified orchards in the west part of the property.

Off-site PCAs

No PCAs were identified in the Study Area that would impact the Phase One Property.

PCAs identified in the Study Area that would not impact the Phase One Property because they are trans or downgradient of the Site include:

PCA 2 – PCA Item #28; Gasoline and Associated Products Storage in Fixed Tanks: At the corner of Four Mile Creek Road and Niagara Stone Road approximately 80 m southeast and trans-gradient to the Site there was a former retail fuel outlet with fuel USTs.

PCA 3 – PCA Item #28; Gasoline and Associated Products Storage in Fixed Tanks: At the corner of 1437 Niagara Stone Road approximately 132 m southeast and trans-gradient to the Site there is a retail fuel outlet with fuel USTs.

PCA 4 – PCA Item #28; Gasoline and Associated Products Storage in Fixed Tanks: At the corner of 1593 Four Mile Creek Road approximately 211 m southeast and trans-gradient to the Site there is a former retail fuel outlet with fuel USTs.

(ii) Areas of Potential Environment Concern (APECs)

Area of potential environmental concern ¹	Location of area of potential environmental concern on phase one property	Potentially contaminating activity ²	Location of PCA (on-site or off-site)	Contaminants of potential concern ³	Media potentially Impacted (Ground water, soil and/or sediment)

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APEC1 - The 1934 aerial photograph identified orchards in the west part of the property.	West portion of the Site above the ravine to Four Mile Creek	PCA Item #28; # 40: Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	On-Site	OC Pesticides and Metals	Soil
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Notes:

- 1 - Areas of potential environmental concern means the area on, in or under a phase one property where one or more contaminants are potentially present, as determined through the phase one environmental site assessment, including through,
 - (a) identification of past or present uses on, in or under the phase one property, and
 - (b) identification of potentially contaminating activity.
- 2 - Potentially contaminating activity means a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a phase one study area
- 3 - When completing this column, identify all contaminants of potential concern using the Method Groups as identified in the Protocol for in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004, amended as of July 1, 2011, as specified below:

List of Method Groups:

ABNs	PCBs	Metals	Electrical Conductivity
CPs	PAHs	As, Sb, Se	Cr (VI)
1,4-Dioxane	THMs	Na	Hg
Dioxins/Furans, PCDDs/PCDFs	VOCs	B-HWS	Methyl Mercury
OCs	BTEX	Cl-	Low or high pH,
PHCs	Ca, Mg	CN-	SAR

- 4 - When submitting a record of site condition for filing, a copy of this table must be attached

(iii) Rationale for APECs :

APEC 1 - The 1934 aerial photograph identified orchards in the west part of the property above the Four Mile Creek ravine, and there is the possibility that organo-chlorinated (OC) pesticides or other pesticides like arsenic may have been used. Such pesticides are not highly mobile in the soil and may exist in the surface soils.

Phase I Conceptual Site Model

Current and Past Uses

The Site is currently used for a flower shop and previously as a bank on the east end and the remainder is undeveloped. Prior to the 1960s the site was formerly under agricultural use mostly as cereal crops and the west end of the Site was used as an orchard in the 1930s.

- i) Areas where PCAs on, or potentially affecting the phase one property has occurred –

On-Site PCAs

PCA 1 – PCA Item # 40: Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications. The 1934 aerial photograph identified orchards in the west part of the property.

Off-site PCAs

No PCAs were identified in the Study Area that would impact the Phase One Property.

PCAs identified in the Study Area that would not impact the Phase One Property because they are trans or downgradient of the Site include:

PCA 2 – PCA Item #28; Gasoline and Associated Products Storage in Fixed Tanks: At the corner of Four Mile Creek Road and Niagara Stone Road approximately 80 m southeast and trans-gradient to the Site there was a former retail fuel outlet with fuel USTs.

PCA 3 – PCA Item #28; Gasoline and Associated Products Storage in Fixed Tanks: At the corner of 1437 Niagara Stone Road approximately 132 m southeast and trans-gradient to the Site there is a retail fuel outlet with fuel USTs.

PCA 4 – PCA Item #28; Gasoline and Associated Products Storage in Fixed Tanks: At the corner of 1593 Four Mile Creek Road approximately 211 m southeast and trans-gradient to the Site there is a former retail fuel outlet with fuel USTs.

(ii) Areas of Potential Environment Concern (APECs)

Area of potential environmental concern ¹	Location of area of potential environmental concern on phase one property	Potentially contaminating activity ²	Location of PCA (on-site or off-site)	Contaminants of potential concern ³	Media potentially Impacted (Ground water, soil and/or sediment)
APEC1 - The 1934 aerial photograph identified orchards in the west part of the property.	West portion of the Site above the ravine to Four Mile Creek	PCA Item #28; # 40: Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	On-Site	OC Pesticides and Metals	Soil

Notes:

1 - Areas of potential environmental concern means the area on, in or under a phase one property where one or more contaminants are potentially present, as determined through the phase one environmental site assessment, including through,

- (a) identification of past or present uses on, in or under the phase one property, and
- (b) identification of potentially contaminating activity.

2 - Potentially contaminating activity means a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a phase one study area

3 - When completing this column, identify all contaminants of potential concern using the Method Groups as identified in the Protocol for in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004, amended as of July 1, 2011, as specified below:

List of Method Groups:

ABNs	PCBs	Metals	Electrical Conductivity
CPs	PAHs	As, Sb, Se	Cr (VI)
1,4-Dioxane	THMs	Na	Hg
Dioxins/Furans, PCDDs/PCDFs	VOCs	B-HWS	Methyl Mercury
OCs	BTEX	Cl-	Low or high pH,
PHCs	Ca, Mg	CN-	SAR

4 - When submitting a record of site condition for filing, a copy of this table must be attached

(iii) Rationale for APECs :

APEC 1 - The 1934 aerial photograph identified orchards in the west part of the property above the Four Mile Creek ravine, and there is the possibility that organo-chlorinated (OC) pesticides or other pesticides like arsenic may have been used. Such pesticides are not highly mobile in the soil and may exist in the surface soils.

- (iv) Contaminants of Potential Concern – OC pesticides and metals.
- (v) Underground Utilities – Underground utilities appear to come to the building from the street east of the Site and not through the APEC.
- (vi) Topography – The Site is mostly level except for the far west portion of the Site which drops down about 4 m to Four Mile Creek. A 2024 topographic survey of the Site identifies a maximum elevation of 92.30 m.a.s.l. on the east side of the Site dipping along the bank to the Four Mile Creek to 85.05 m.a.s.l. at the west end of the Site.
- (vii) Hydrology – Surface water drainage on-site was via runoff into the municipal storm sewer system. The Four Mile Creek runs south to north through the west end of the Site. Groundwater is inferred to flow west and southwestward towards Four Mile Creek.
- (viii) Geology – The site is situated within the physiographic region known as the Haldimand Clay Plain (Chapman and Putnam, 1984).

Ontario Geological Survey (OGS) map, “Surficial Geology of Southern Ontario” available on the Ministry of Natural Resources website was reviewed. The map places the Site on Fine-textured glaciolacustrine deposits of silt and clay, minor sand and gravel, Massive to well laminated.

Ontario Geological Survey (OGS) map, “Paleozoic Geology of Southern Ontario” available on the Ministry of Natural Resources website were reviewed. The map place the Site and study area on the Unit Name: Bertie; Group: Formation: Bertie; Lithology: dolostone; Description: dolostone; argillaceous, laminated, bituminous or burrowed.
- (ix) Water bodies and areas of natural significance – The Four Mile Creek runs south to north through the west end of the Site.
- (x) Uncertainty or Absence of Information – Underground utilities locations are known.

Based on the findings of this Phase I Environmental Site Assessment, no further investigation is warranted.

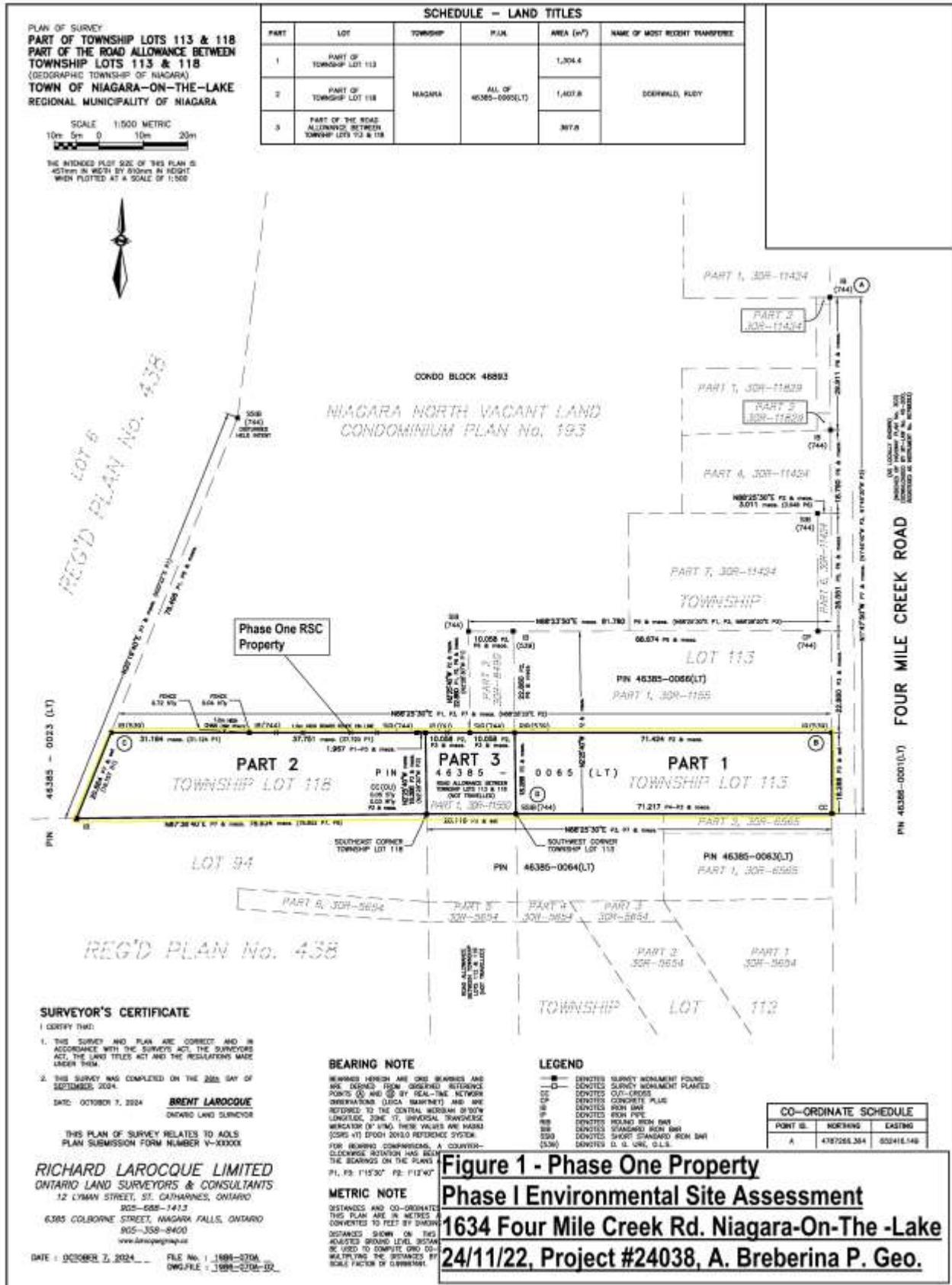
Figure 1 – Phase One/RSC Property

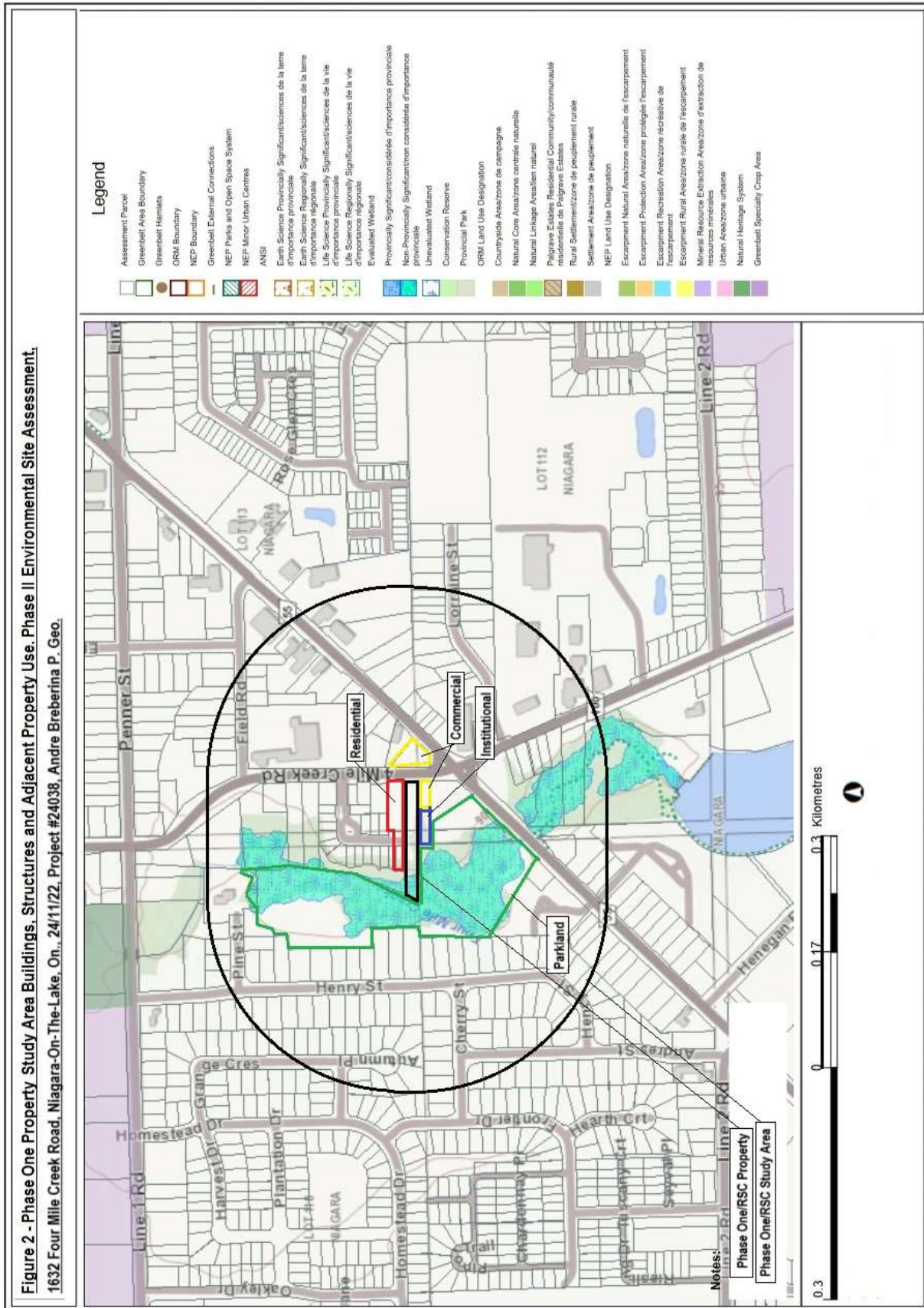
Figure 2 – Phase One Study Area Buildings, Structures and Adjacent Property Uses

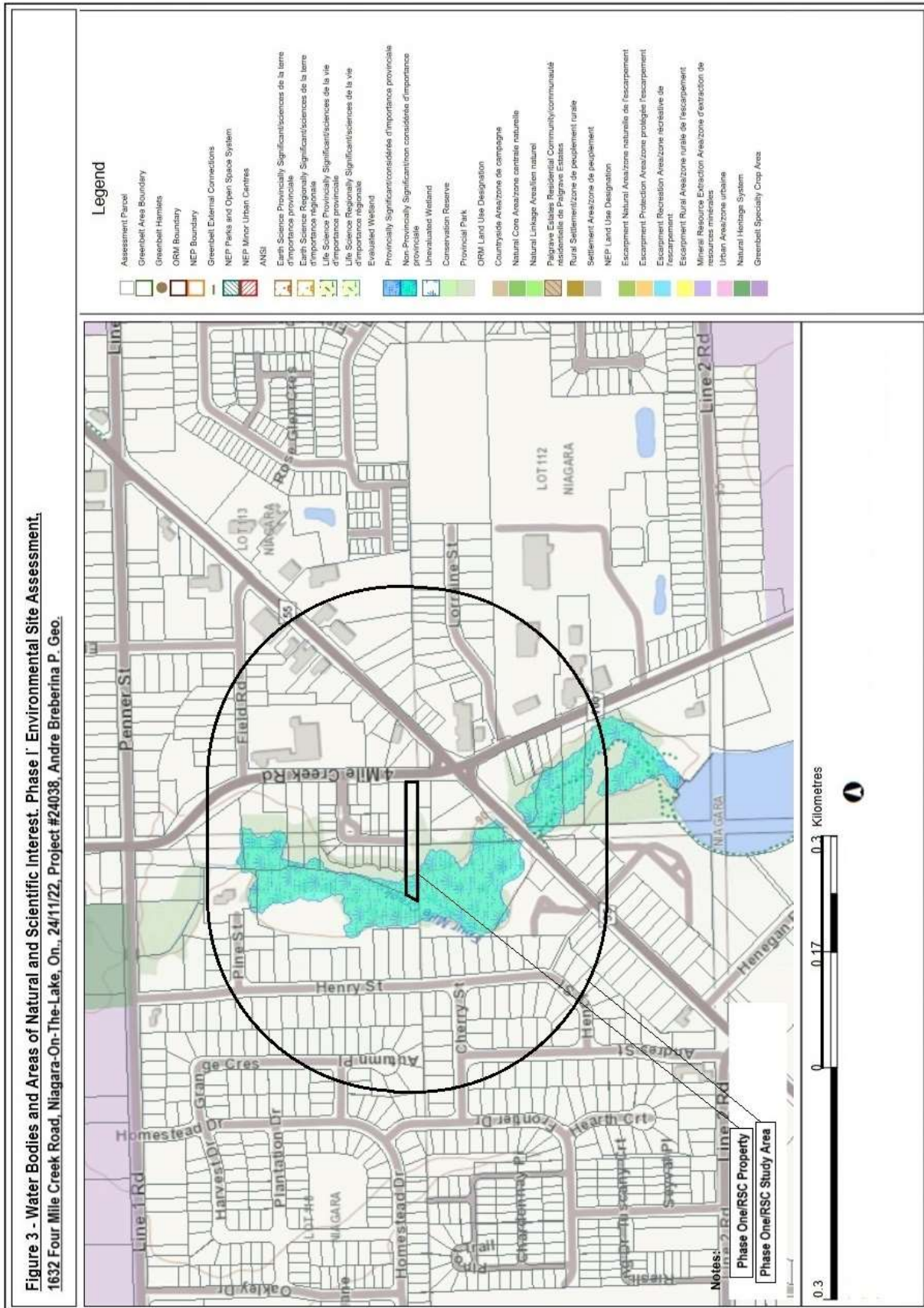
Figure 3 – Areas of Natural and Scientific Interest and Provincially Significant Water Bodies.

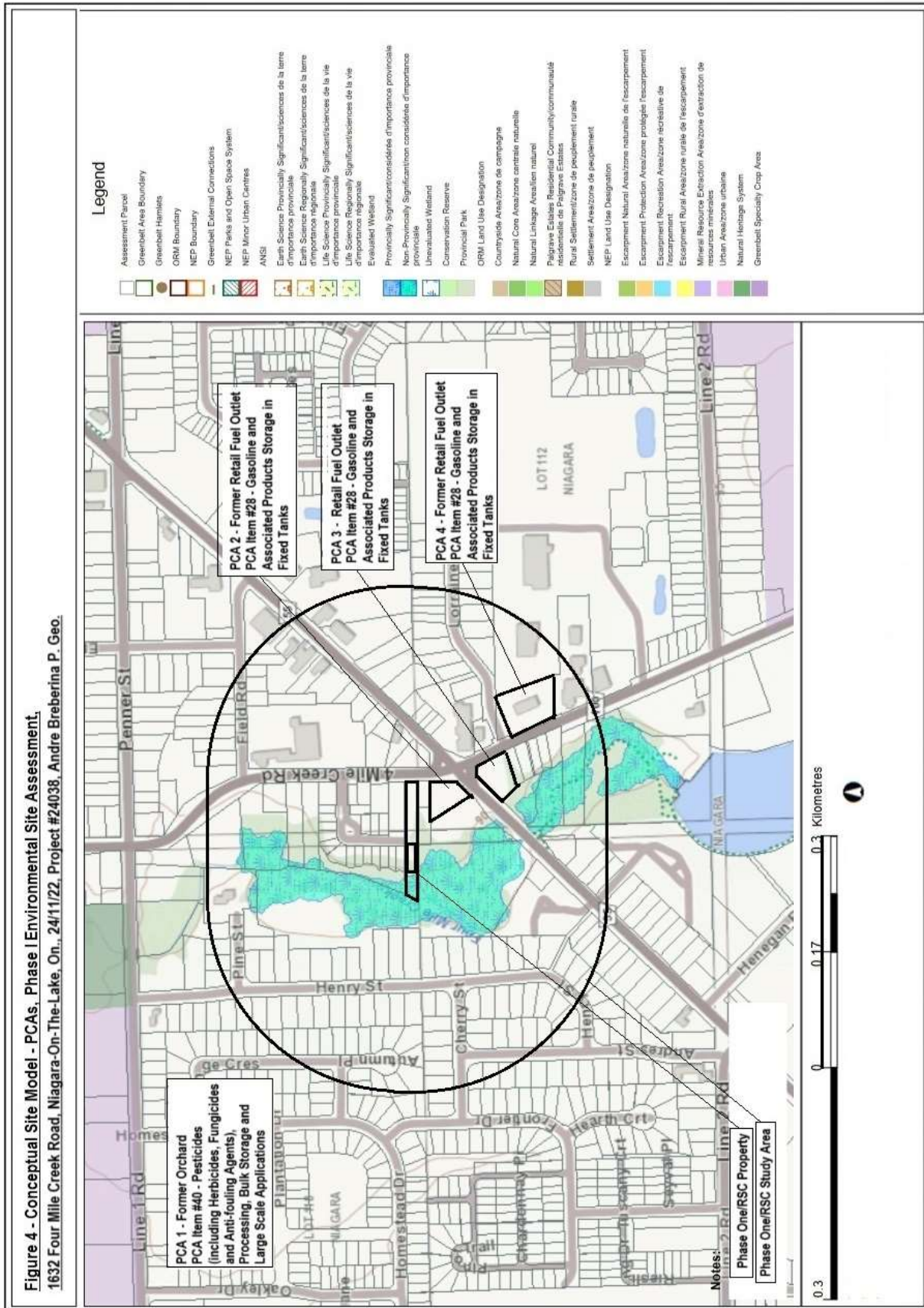
Figure 4 – Conceptual Site Model: PCAS

Figure 5 – Conceptual Site Model: APECs









8.0 CONCLUSIONS

APEC 1 on the Site needs to be analyzed for CoPCs and therefore a Phase II ESA will be required before a Record of Site Condition can be submitted.

We trust that this report will accommodate your requirements. If you have any questions or comments, please contact the undersigned.

The gathering of information, evaluation of the information and conclusions and recommendations made in this Phase I ESA have conducted by, or supervised by, the undersigned QP.



Andre Breberina P. Geo

9.0 REFERENCES

Association of Professional Geoscientists of Ontario, April 2011, “Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended)”

Town of Niagara-on-the-Lake’s Official Plan www.portcolborne.ca

Town of Niagara-on-the-Lake’s Zoning By-Laws www.portcolborne.ca

CSA, 2000. ‘Phase II Environmental Site Assessment’. CSA Publication Z768-00.

CSA, 2001. ‘Phase I Environmental Site Assessment’. CSA Publication Z768-01.

Chapman, L.J., and D.F. Putnam, 1951. “The Physiography of Southern Ontario”. Toronto: University of Toronto Press.

Hazardous Waste Information Network (HWIN, 1986 – 2005) www.hwin.ca

Environment Canada, “National Pollutant Release Inventory (NPRI)” www.ec.gc.ca

Natural Heritage Information System, www.nhic.gov.on.ca

Ontario’s Environmental Registry, www.ebr.gov.on.ca

Ontario Geological Survey “Palezoic Geology of Southern Ontario” www.mndm.gov.on.ca

Ontario Geological Survey “Surficial Geology of Southern Ontario” www.mndm.gov.on.ca

Ontario Ministry of Environment, June 1988, “Waste Site Disposal Inventory.”

Ontario Ministry of Environment, November 1988, “Inventory of Industrial Sites Producing or Using Coal Tar or Related Tars in Ontario”.

Ontario Ministry of Environment, 1991, “Ontario Inventory of PCB Storage Sites (October 1991)”

Ontario Ministry of Environment, June 1996, "Guidelines for Use on Contaminated Sites in Ontario."

Ontario Ministry of Environment, December, 1996, "Guidance on Sampling and Analytical Methods for Use on Contaminated Sites in Ontario."

Ontario Ministry of Environment July, 2011 "Soil, Sediment and Groundwater Standards for Use in Accordance Part XV.1 of the Environmental Protection Act"

Ontario Ministry of Environment, June, 2011, Guide for Completing Phase One Environmental Site Assessments Under Ontario Regulation 153/04

Ontario Ministry of Environment, July 1, 2011, Ontario Regulation 153/04 as amended by Ontario Regulation 511/09. Environmental Protection Act, R.S.O. 1990, Part XV.1

10.0 APPENDICES

Appendix A – Survey

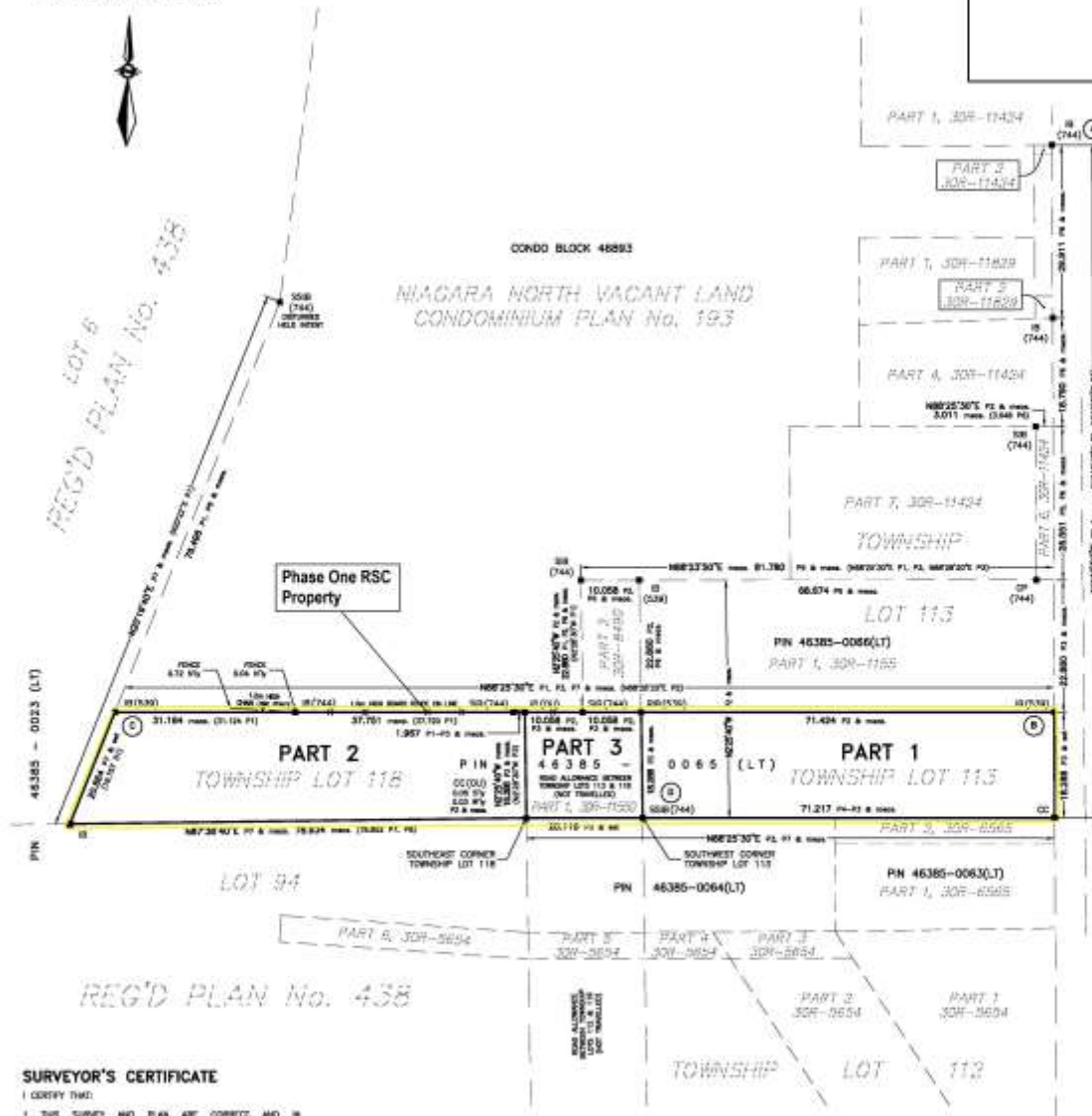
PLAN OF SURVEY
PART OF TOWNSHIP LOTS 113 & 118
PART OF THE ROAD ALLOWANCE BETWEEN
TOWNSHIP LOTS 113 & 118
 (GEOGRAPHIC TOWNSHIP OF NIAGARA)
TOWN OF NIAGARA-ON-THE-LAKE
 REGIONAL MUNICIPALITY OF NIAGARA



THE INTENDED PLOT SIZE OF THIS PLAN IS
 407m x 627m BY DIMENSIONS IN HEIGHT
 WHEN PLOTTED AT A SCALE OF 1:500



SCHEDULE - LAND TITLES					
PART	LOT	TOWNSHIP	P.L.N.	AREA (M ²)	NAME OF MOST RECENT TRANSFER
1	PART OF TOWNSHIP LOT 113	NIAGARA	ALL OF 46385-0066(LT)	1,204.4	DEERWALL, RUDY
2	PART OF TOWNSHIP LOT 118			1,407.8	
3	PART OF THE ROAD ALLOWANCE BETWEEN TOWNSHIP LOTS 113 & 118			307.8	



SURVEYOR'S CERTIFICATE
 I CERTIFY THAT:
 1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYORS ACT, THE SURVEYORS ACT, THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
 2. THIS SURVEY WAS COMPLETED ON THE 28th DAY OF OCTOBER, 2024.
 DATE: OCTOBER 7, 2024 **BRENT LAROUCHE**
 ONTARIO LAND SURVEYOR

THIS PLAN OF SURVEY RELATES TO ADS
 PLAN SUBMISSION FORM NUMBER V-XXXX

RICHARD LAROUCHE LIMITED
 ONTARIO LAND SURVEYORS & CONSULTANTS
 12 CYRAN STREET, ST. CATHARINES, ONTARIO
 905-686-1413
 6385 COLBORNE STREET, NIAGARA FALLS, ONTARIO
 905-358-8400
 www.larouchesurveyors.com
 DATE: OCTOBER 7, 2024 FILE NO. 1-1888-0704
 DWG FILE: 1-1888-0704-02

BEARING NOTE

BEARINGS HEREON ARE GROUND BEARINGS AND ARE DERIVED FROM SIGHTED REFERENCE POINTS (A) AND (B) BY REAL-TIME NETWORK OBSERVATIONS (LEICA STATION) AND ARE REFERRED TO THE CENTRAL MERIDIAN OF 80°W LONGITUDE, ZONE 17, UNIVERSAL TRANSVERSE MERCATOR (UTM). THESE VALUES ARE MARKED CLOSE BY FROM 2010 REFERENCE SYSTEM FOR BEARING COMPUTATIONS. A COUNTER-CLOCKWISE ROTATION HAS BEEN THE BEARINGS ON THE PLANS.
 P1, P2: 115°30' P2: 112°40'

METRIC NOTE

DISTANCES AND CO-ORDINATES THIS PLAN ARE IN METRES & CONVERTED TO FEET BY DIVIDING DISTANCES GIVEN ON THE ADJUSTED GROUND LEVEL SECTION BE USED TO COMPUTE GROUND DISTANCES BY MULTIPLYING THE DISTANCES BY SCALE FACTOR OF 0.3048.

LEGEND

- DENOTES SURVEY MONUMENT FOUND
- DENOTES SURVEY MONUMENT PLANNED
- CC DENOTES CURB-CROSS
- CP DENOTES CONCRETE PILE
- IR DENOTES IRON NAIL
- IP DENOTES IRON PIPE
- IRB DENOTES IRON ROD FROM PAV
- SB DENOTES STANDARD IRON BAR
- SSB DENOTES STAKE STANDARD IRON BAR
- USB DENOTES U.S. IRON, U.S.S.

CO-ORDINATE SCHEDULE		
POINT ID	NORTHING	EASTING
A	4787265.264	524116.148

Figure 1 - Phase One Property
Phase I Environmental Site Assessment
1634 Four Mile Creek Rd. Niagara-On-The-Lake
24/11/22, Project #24038, A. Breberina P. Geo.

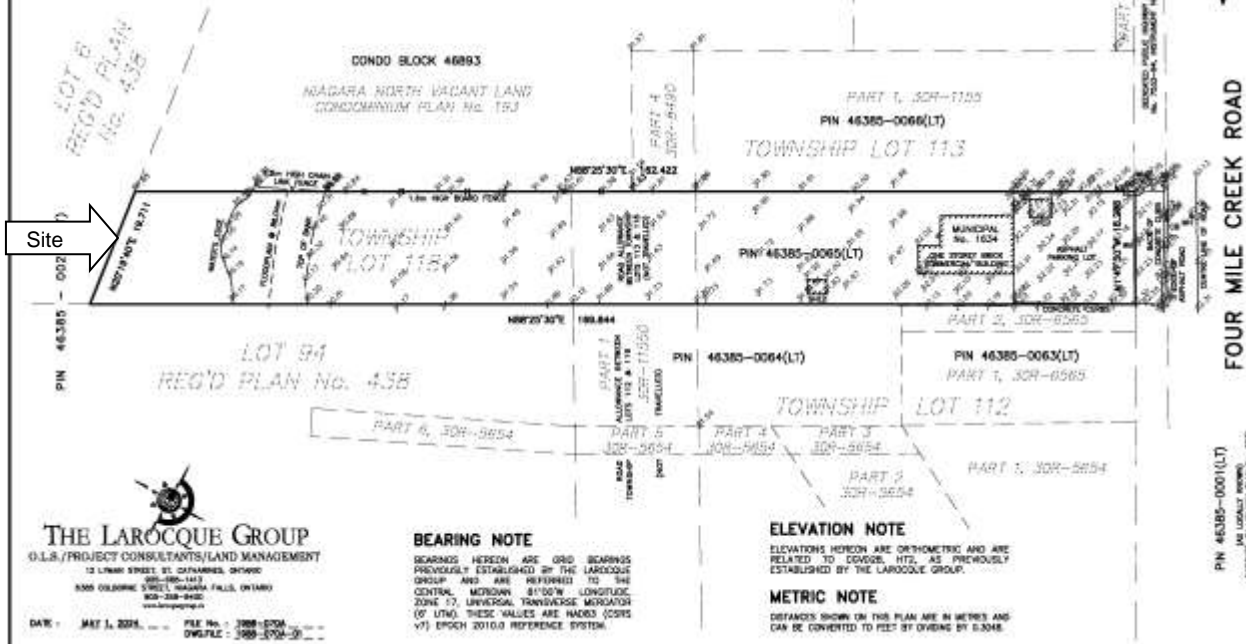
Appendix B – Topographic Maps

SITE CONDITION PLAN
PART OF TOWNSHIP LOTS 113 & 118
PART OF THE ROAD ALLOWANCE BETWEEN
TOWNSHIP LOTS 113 & 118
 (GEOGRAPHIC TOWNSHIP OF NIAGARA)
TOWN OF NIAGARA-ON-THE-LAKE
 REGIONAL MUNICIPALITY OF NIAGARA

SCALE 1:500 METRIC
 10m 5m 0 10m 20m

LEGEND

RP	DEMOTES	WELL PROVISION
CB	DEMOTES	CATCH BASIN
WH	DEMOTES	WHAFFLE
MS	DEMOTES	METAL SIGN
WP	DEMOTES	WOOD HYDRO POLE
WV	DEMOTES	WATER VALVE
EL	DEMOTES	EXISTING ELEVATION



THE LAROUCHE GROUP
 O.L.S./PROJECT CONSULTANTS/LAND MANAGEMENT
 12 LINAR STREET ST. CATHARINES, ONTARIO
 905-586-1453
 800 OLEBINE STREET NIAGARA FALLS, ONTARIO
 905-338-9900
 www.larouche.ca

DATE: MAY 1, 2008 FILE No.: 388-020
 DWG FILE: 388-020-0

BEARING NOTE
 BEARINGS HEREON ARE GRID BEARINGS PREVIOUSLY ESTABLISHED BY THE LAROUCHE GROUP AND ARE REFERRED TO THE CENTRAL MICHIGAN 81°50'W LONGITUDE ZONE 17, UNIVERSAL TRANSVERSE MERCATOR (UTM). THESE VALUES ARE HADSD (GSD v7) EPOCH 2011.0 REFERENCE SYSTEM.

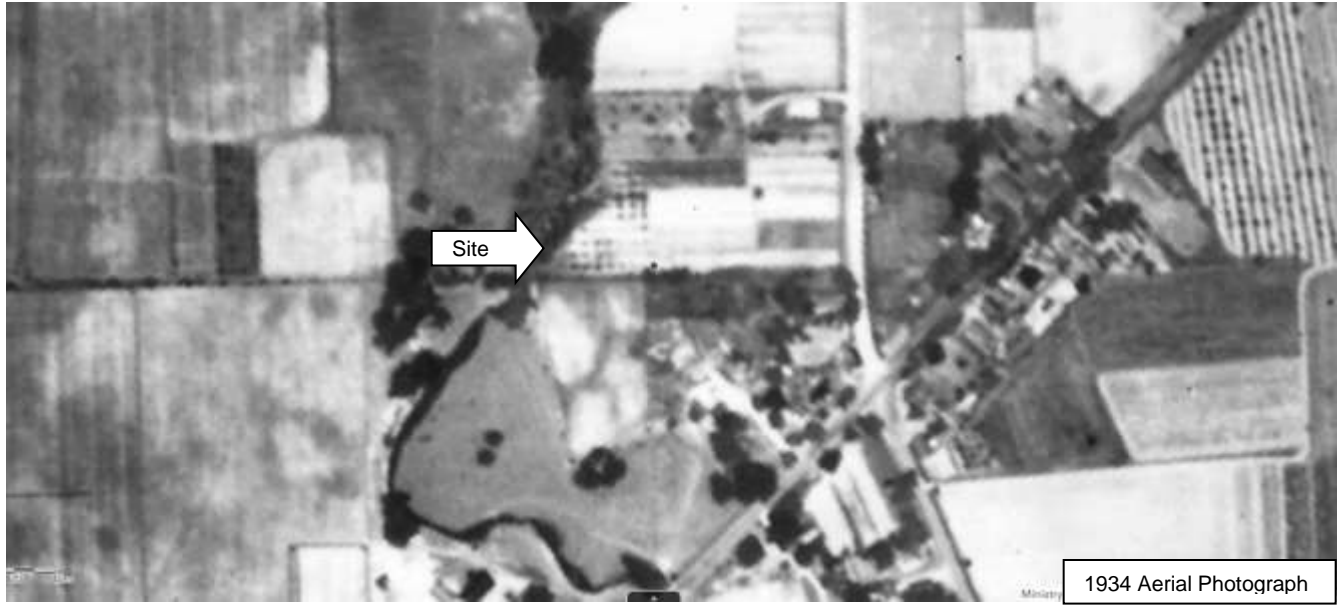
ELEVATION NOTE
 ELEVATIONS HEREON ARE ORTHOMETRIC AND ARE RELATED TO CGVD08, HTL, AS PREVIOUSLY ESTABLISHED BY THE LAROUCHE GROUP.

METRIC NOTE
 DISTANCES SHOWN ON THIS PLAN ARE IN METERS AND CAN BE CONVERTED TO FEET BY DIVING BY 0.3048.

FOUR MILE CREEK ROAD
 PIN 46385-0001(LT)
 (AS LOCALITY NUMBER)
 (PART OF TOWNSHIP LOT No. 903)

APPENDIX C
AERIAL PHOTOGRAPHS

Plate 1A – 1934 Aerial Photograph
Plate 2A – 1954 Aerial Photograph
Plate 3A – 1965 Aerial Photograph
Plate 4A – 2000 Aerial Photograph
Plate 5A – 2006 Aerial Photograph
Plate 6A – 2010 Aerial Photograph
Plate 7A – 2013 Aerial Photograph
Plate 8A – 2015 Aerial Photograph
Plate 9A – 2018 Aerial Photograph
Plate 10A – 2020 Aerial Photograph
Plate 11A – 2023 Aerial Photograph



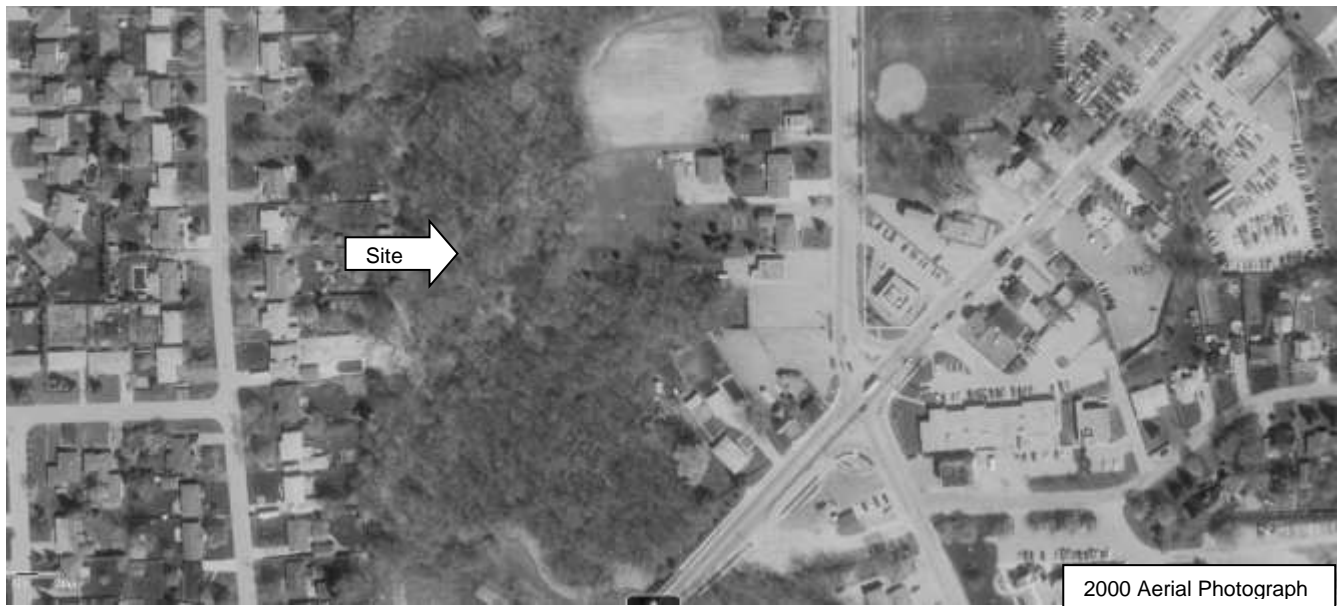
1934 Aerial Photograph



1954 Aerial Photograph



1965 Aerial Photograph



2000 Aerial Photograph



2006 Aerial Photograph



2010 Aerial Photograph



2013 Aerial Photograph



2015 Aerial Photograph





2023 Aerial Photograph

Appendix D – Qualifications of Assessor

Qualifications of Assessor

Andre Breberina B.E.S. P. Geo. Q.P*.

Environmental Geoscientist

**Qualified Person (Ontario Ministry of Environment O. Reg 153/04) (E&O Insured)*

Expertise:

- Project development and management.
- Environmental Site Assessments – Phase 1 and 2.
- Site remediation and Brownfield re-development project design and management.
- Aboveground and underground storage tank decommissioning.
- Emergency Spill Response assessment, management and abatement.
- Waste Transfer Station, Waste Management System Waste Processing Site Certificates of Approval submissions, including design and operations, environmental management systems and training.
- Waste Audits and Minimization/Diversion Programs.

Client support involving:

- Regulatory compliance, complaints and orders.
- Records of Site Condition.
- Applications for Certificates of Approval.
- Property acquisitions, divestitures, leasing and finance.
- Stakeholder peer reviews.
- Baseline studies for due diligence, environmental management systems and strategic planning.
- Site/operation EMS procedures and training.
- Expert testimony at Ontario Municipal Board hearing and at Provincial Courts in litigation matters.

Sector involvement:

- Federal, Provincial and Municipal governments and agencies
- Chemical processors and storage facilities
- Paint manufacturers and warehousing
- Printing and photochemical facilities
- Plastics processors
- Steel producers
- Metal fabricating, plating and warehousing sites
- Textile processing
- Aggregate producers
- Automotive manufacturers, dealerships, service and body repair shops
- Trucking companies, service depots and dealerships
- Gasoline stations and other private petroleum outlets
- Airport, seaport and rail road operations
- Salvage, recycling, waste disposal, composting facilities and transfer sites
- Public and private utility companies
- Federal, provincial and municipal facilities
- Hospitals and other health care facilities
- Educational institutions and school boards
- Retail and other commercial sites
- Developers and holding companies
- Residential houses and apartments

Teaching and Training Experience

- Lecturer - Solid Waste and Hazardous Materials Management Course as part of the Environmental Engineering Diploma Program at Mohawk College, Hamilton, from 1998 to 2009.

- Lecturer - Youth Enviro-Entrepreneurs Program. Human Resources Canada, Canadian Environmental Industry Association, Niagara College and the Business Advisory Centre, Hamilton, 1995
- Trainer to private environmental contractors and waste management operators of O. Reg 347, TGDA, waste manifesting, sampling and monitoring procedures, EMS record keeping, hazardous materials handling procedures, level A to D personnel protection equipment use and maintenance, spills and emergency response procedures.

Education, Professional Development and Certifications

- Bachelor of Environmental Studies (Honours), University of Waterloo. Waterloo, 1983
- Environmental Legislative Compliance Program, Mohawk College, Hamilton, 1992
- Environmental Chemistry, Mohawk College, Hamilton, 1993
- Benthic Macro Invertebrate Survey, McMaster University, Hamilton 1995
- WHMIS Certificate, Team-1 Environmental Services Inc., Hamilton 1996
- Confined Space Entry/Rescue Certificate, Team-1 Environmental Services Inc., 1997
- Tanker Truck Roll-over Specialist, Oil Spill Control Services, Toronto, 1997
- Explosives Recognition and Forensic Documentation, RSP International Inc, Mississauga, 1998
- TDGA and Waste Manifesting Inc., Talon Environmental Inc., Hamilton, 1998
- Air Emission Summary and Dispersion Modeling Workshop, Ontario Ministry of Environment, Toronto, 1999
- Radiation Safety Certification, Ontario Power Generation Corp., Pickering Nuclear Station, Pickering, 1999
- Shoreline Clean-up Assessment, Team-1 Environmental Services Inc. Hamilton, 1999
- Open Water Oil Spill Marine Containment, Eastern Canada Spills Response Corp., Sarnia, 1999
- International SCUBA Certifications – Open Water, Advanced, Scuba Rescue and DAN Oxygen Provider, American and Canadian Underwater Council
- First Aid Certification and CPR (current), Canadian Red Cross
- Canadian Coast Guard accredited Watercraft Operator Certificate, Watercraft Rescue and Training Centre, Hamilton, 2000
- Technical Standards and Safety Authority Licensed PM2 and PM3 Petroleum Mechanic
- ISO 14001 Internal Auditor, Quality Management Institute, Mississauga, 2002
- Environmental Sampling, National Contaminated Sites Training Program, Environment Canada, 2002
- Hazmat Technician Certificate, Team 1 Environmental Services Inc. 2003

Professional Associations

- Association of Professional Geoscientists of Ontario – Practicing Member
- Canadian Council of Professional Geoscientists

Professional Profile

Andre Breberina has over 25 years experience in environmental consulting in Ontario and has provided professional services to address environmental concerns for clients in private and public sectors. Prior to his own private practice, Mr. Breberina worked with Trow Inc. where he performed materials testing, geotechnical investigations and QA/QC programs on construction projects. Mr. Breberina later worked with Hydrology Consultants Inc. where he conducted field work for the Environmental Impact Assessment for the Halton Region Landfill Study and CN Rail Lands decommissioning for the Skydome (now Rogers Centre) site.

Environmental Site Assessments:

Phase I and Phase II Environmental Site Assessments have been conducted on a wide range of property types from undeveloped land to industrial parks throughout southern and central Ontario.

Phase II Environmental Site Assessments have involved a variety of non-intrusive and intrusive investigation and sampling techniques of various media on site, and off-site as required, to identify: chemicals of concern, their presence and concentrations, migration pathways, extent of contamination, actual and potential receptors, the risk to the receptors and recommendations for mitigation and/or remedial action. Investigations have included to not only surface and sub-surface conditions but also hazardous materials in buildings.

Site Remediation and Brownfield Re-development:

Site remediation work has included problem identification, conceptualization of remedial options with risks and costs, consultation with client to determine preferred remedial option, finalization and implementation of work plan, arranging necessary sub-contractor and support services, project management and quality control and regulatory compliance assurance to the target clean-up level. Upon completion of remedial work, Records of Site Conditions are filed, if requested, or as required under regulations for Brownfields to be-redeveloped to an active use. Remediated sites have included problems with a range of contaminants including petroleum products, solvents, (LNAPLs and DNAPLs), heavy metals and other organics, pesticides and fertilizers and leachate control. Remedial methods have included: extraction and disposal, ex-situ treatment, in-situ treatment pump and treat methods and bioremediation methods. Brownfield re-developments projects have included taking former rail lands, gas stations and industrial sites to high density residential land uses and health care facilities.

Aboveground and Underground Tank Management:

Tanks and tank farms have been assessed to determine if decommissioning is warranted by virtue of actual or potential leakage or regulation. Recommendations were made and implemented to bring tanks to regulatory requirements and/or leak and spill mitigation measures were undertaken that met or exceed standards. During the decommissioning of tanks by qualified contractors, either through voluntary removal or as required under regulation, environmental assessments were conducted of soil and groundwater conditions to determine if, remedial action plan and/or a containment management plan was required. Remedial action plans and/or containment management plans were developed and implemented through to completion in accordance with regulatory compliance. The scope of tanks assessed ranged from residential fuel oil tanks to industrial/commercial tank farms.

Emergency Spill Response:

Consulting services were provided for emergency spills response teams for last 15 years throughout Ontario to assess the nature and extent of spills, develop emergency responses on site with team personnel in the unique situations where S.O.Ps did not apply, identification of primary and secondary hazards, conducted sampling of various media to assess impact from spills, assessed the extent of emergency clean-up and recommendations for further assessment and remediation. Reports were written detailing the cause and nature of the spill, work undertaken to contain and clean up the spill and the results of the clean-up efforts. The reports were submitted to clients, insurance companies and regulatory authorities who relied upon them in the event prosecutions were undertaken. Emergency response situations included: tanker truck roll-overs, chemical tanker car train derailments, marine spills, chemical and industrial fires. Also, on behalf of Team 1 Environmental Services Inc. Mr. Breberina designed, assembled and operated mobile laboratory consisting of a converted 34' mobile home fitted with PID/GC, FID/GC, ECD/GC, FTIR and IR scanners, meteorological station and support equipment to provide emergency analytical services at spill sites.

Waste Management:

A cost accounting of a municipal blue box Material Recovery Facility's operation was conducted to improve handling and operations procedures. Waste Audits and Waste Minimization programs in accordance with O. Reg 102/94 and 103/94 were conducted for industrial and commercial operations and school boards. Certificates of Approval for solid waste and hazardous waste Waste Transfer Stations and Waste Management Systems have been prepared and submitted on behalf of clients. Preparation for the client included design and operations details, containment design, handling and storage procedures, contingency measures, record management and training requirements based on regulatory requirements, best practices and ISO 14001 practices, as well as financial assurance calculations and public consultation. Since 2002, consulting services have been provided to commercial composting operation that have included: routine monitoring of ground and surface waters to assess

potential off-site impacts as required under their Certificate of Approval, annual assessment of spray irrigation field to control leachate as required under their Certificate of Approval, repair of existing and setting of new monitoring wells, sampling and assessment compost in compliance with Certificate of Approval and MOE Guidelines, and, as requested, addressed specific compliance and operational issues through training, monitoring operational procedures.

Appendix E – Eris EcoLog Search