STAGE 1 ARCHAEOLOGICAL ASSESSMENT
RIDGE LANDFILL EXPANSION
PART OF LOTS 13-25, CONCESSIONS 1-4 WEST OF COMMUNICATION ROAD AND PART OF LOTS 19-25, CONCESSION 1 EAST OF COMMUNICATION ROAD (FORMER TOWNSHIP OF HARWICH, COUNTY OF KENT) MUNICIPALITY OF CHATHAM-KENT, ONTARIO

ORIGINAL REPORT

Prepared for:

Dillon Consulting Limited
235 Yorkland Blvd., suite 800
Toronto, ON M2J 4Y8

Archaeological Licence #P1066 (Lytle)
Ministry of Tourism, Culture and Sport PIF# P1066-0026-2017
ASI File: 16EA-143

5 May 2017

ASI Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 F 416-966-9723 asiheritage.ca

Stage 1 Archaeological Assessment
Ridge Landfill Expansion
Part of Lots 13-25, Concessions 1-4 West of Communication Road and
Part of Lots 19-25, Concession 1 East of Communication Road
(Former Township of Harwich, County of Kent)
Municipality of Chatham-Kent, Ontario

EXECUTIVE SUMMARY

ASI was contracted by Dillon Consulting Limited to conduct a Stage 1 Archaeological Assessment (Background Research and Property Inspection) as part of the Ridge Landfill Expansion Individual Environmental Assessment near the community of Blenheim in the Municipality of Chatham-Kent. This project involves the expansion of the existing landfill site to an area of approximately 340 hectares, and use of an approximately 10 kilometre haul route using the existing right-of-ways from the landfill along Erieau Road, Drury Lane, and Communication Road to the right-of-way of the westbound Highway 401 on-ramp.

The Stage 1 background study determined that eight previously registered archaeological sites are located within one kilometre of the Study Area, two of which are within the Study Area. The property inspection determined that parts of the Study Area exhibit archaeological potential and will require Stage 2 assessment, prior to development.

In light of these results, the following recommendations are made:

1. The Study Area exhibits archaeological potential. These lands require Stage 2 archaeological assessment by test pit/pedestrian survey, where appropriate, at a five metre intervals prior to any proposed impacts to the property;

2. At least 262 hectares of the Study Area were previously subject to a Stage 1-4 assessment for an earlier iteration of this project dating to 1997. These areas do not require further archaeological assessment.

3. The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance associated with construction of the landfill, right-of-ways, and artificial drainage ditches. These lands do not require further archaeological assessment; and,

4. Should the proposed work extend beyond the current Study Area, further Stage 1 archaeological assessment should be conducted to determine the archaeological potential of the surrounding lands.

ASI

PROJECT PERSONNEL

Senior Project Manager:	Lisa Merritt, MSc. (P094) *Partner / Director* *Environmental Assessment Division*
Project Coordinator:	Sarah Jagelewski, Hon. BA (R405) *Archaeologist / Assistant Manager* *Environmental Assessment Division*
Project Director (Licensee):	Jessica Lytle, MSc *Archaeologist / Project Manager* *Environmental Assessment Division*
Project Manager:	Eliza Brandy, MA (R1109) *Archaeologist / Project Manager* *Environmental Assessment Division*
Field Director:	Andrew Clish, BES (P046) *Senior Archaeologist / Technical Writer* *Planning Assessment Division*
Report Preparation:	Eliza Brandy
Graphics:	Blake Williams, MLitt (P383) *Archaeologist / Geomatics Specialist* *Operations Division*
Report Reviewer:	Lisa Merritt

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF PLATES

1.0 PROJECT CONTEXT

Archaeological Services Inc. (ASI) was contracted by Dillon Consulting Limited to conduct a Stage 1 Archaeological Assessment (Background Research and Property Inspection) as part of the Ridge Landfill Expansion Individual Environmental Assessment near the community of Blenheim in the Municipality of Chatham-Kent (Figure 1). This project involves the expansion of the existing landfill site (Figure 2) in an area approximately 340 hectares, and use of an approximately 10 kilometre haul route using the existing right-of-ways from the landfill along Erieau Road, Drury Lane, and Communication Road to the intersection of the westbound Highway 401 on-ramp.

All activities carried out during this assessment were completed in accordance with the *Ontario Heritage Act* (1990, as amended in 2009) and the 2011 *Standards and Guidelines for Consultant Archaeologists* (S & G), administered by the Ministry of Tourism, Culture and Sport (MTCS).

In the S & G, Section 1, the objectives of a Stage 1 archaeological assessment are discussed as follows:

- To provide information about the history, current land conditions, geography, and previous archaeological fieldwork of the Study Area;
- To evaluate in detail the archaeological potential of the Study Area that can be used, if necessary, to support recommendations for Stage 2 archaeological assessment for all or parts of the Study Area; and,
- To recommend appropriate strategies for Stage 2 archaeological assessment, if necessary.

This report describes the Stage 1 archaeological assessment that was conducted for this project and is organized as follows: Section 1.0 summarizes the background study that was conducted to provide the historical and archaeological contexts for the project Study Area; Section 2.0 addresses the field methods used for the property inspection that was undertaken to document its general environment, current land use history and conditions of the Study Area; Section 3.0 analyses the characteristics of the project Study Area and evaluates its archaeological potential; Section 4.0 provides recommendations; and the remaining sections contain other report information that is required by the S & G, e.g., advice on compliance with legislation, works cited, mapping and photo-documentation.

1.1 Development Context

All work has been undertaken as required by the *Environmental Assessment Act*, RSO (1990) and regulations made under the Act, and are therefore subject to all associated legislation.

Authorization to carry out the activities necessary for the completion of the Stage 1 archaeological assessment was granted by Dillon Consulting Limited on February 15, 2017.

1.2 Historical Context

The purpose of this section, according to the S & G, Section 7.5.7, Standard 1, is to describe the past and present land use and the settlement history and any other relevant historical information pertaining to the

Study Area. A summary is first presented of the current understanding of the Indigenous land use of the Study Area. This is then followed by a review of the historical Euro-Canadian settlement history.

1.2.1 Indigenous Land Use and Settlement

Southern Ontario has been occupied by human populations since the retreat of the Laurentide glacier approximately 13,000 years before present (BP) (Ferris 2013). Populations at this time would have been highly mobile, inhabiting a boreal-parkland similar to the modern sub-arctic. By approximately 10,000 BP, the environment had progressively warmed (Edwards and Fritz 1988) and populations now occupied less extensive territories (Ellis and Deller 1990).

Between approximately 10,000-5,500 BP, the Great Lakes basins experienced low-water levels, and many sites which would have been located on those former shorelines are now submerged. This period produces the earliest evidence of heavy wood working tools, an indication of greater investment of labour in felling trees for fuel, to build shelter, and watercraft production. These activities suggest prolonged seasonal residency at occupation sites. Polished stone and native copper implements were being produced by approximately 8,000 BP; the latter was acquired from the north shore of Lake Superior, evidence of extensive exchange networks throughout the Great Lakes region. The earliest evidence for cemeteries dates to approximately 4,500-3,000 BP and is indicative of increased social organization, investment of labour into social infrastructure, and the establishment of socially prescribed territories (Ellis et al. 1990, 2009; Brown 1995:13).

Between 3,000-2,500 BP, populations continued to practice residential mobility and to harvest seasonally available resources, including spawning fish. Exchange and interaction networks broaden at this time (Spence et al. 1990:136, 138) and by approximately 2,000 BP, evidence exists for macro-band camps, focusing on the seasonal harvesting of resources (Spence et al. 1990:155, 164). It is also during this period that maize was first introduced into southern Ontario, though it would have only supplemented people's diet (Birch and Williamson 2013:13–15). Bands likely retreated to interior camps during the winter. It is generally understood that these populations were Algonquian-speakers during these millennia of settlement and land use.

From approximately 1,000 BP until approximately 300 BP, lifeways became more similar to that described in early historical documents. During the Early Iroquoian phase (AD 1000-1300), the communal site is replaced by the village focused on horticulture. Seasonal disintegration of the community for the exploitation of a wider territory and more varied resource base was still practised (Williamson 1990:317). By the second quarter of the first millennium BP, during the Middle Iroquoian phase (AD 1300-1450), this episodic community disintegration was no longer practised and populations now communally occupied sites throughout the year (Dodd et al. 1990:343). In the Late Iroquoian phase (AD 1450-1649) this process continued with the coalescence of these small villages into larger communities (Birch and Williamson 2013). Through this process, the socio-political organization of the First Nations, as described historically by the French and English explorers who first visited southern Ontario, was developed.

The lands between Lake Erie and Lake Huron were highly contested during the contact period of southwestern Ontario. An early Jesuit map entitled Nouvelle France depicts this area as a border zone between peoples of difference cultures and languages. The introduction of European trade goods, weapons, missionaries, and diseases served to exacerbate previous tensions between Indigenous groups (Johnston 2004:9). The period between AD 1400 and 1600 in southwestern Ontario is the least

understood. Of the few known sites from this period, the majority are located near the Ontario-Michigan border and so much of the archaeological record from this period may have been destroyed by the urban development of this region, e.g., in the greater vicinity of the Cities of Windsor and Detroit. The evidence which does exist, however, indicates a trend towards population aggregation and construction of larger, fortified settlements. Settlement locations are also situated in areas typically less well-suited towards agriculture but quite well suited to alternate resource utilization, and so this pattern of supplementary agriculture seems to continue in this period. The Thames River Valley has documented occupation by Western Basin Tradition culture from approximate AD 1000-1400 (Murphy and Ferris 1990).

The western end of the Lake Erie north shore is understood to have been generally abandoned during the seventeenth century. The region may have been occupied by Central Algonquian populations whom Neutral Nation groups came into conflict with during hunting forays (Murphy and Ferris 1990:260). Between AD 1638 and 1641, the Neutral Nation are reported to have taken captive 1000 individuals of the Fire Nation (Lennox and Fitzgerald 1990:418). Late Western Basin Tradition populations may have been related to the seventeenth century Kickapoo, Miami, Potawatomi, Fox and Sauk Nations (Heidenreich 1990:Figure 15.1).

The north shore Iroquoian populations are understood to have been displaced from southern Ontario by the 1650s and were largely replaced by the New York Iroquois—or Haudenosaunee[1]. When the Seneca's established Teiaiagon at the mouth of the Humber, they were in command of the traffic across the peninsula to Lake Simcoe and the Georgian Bay. Later, Mississauga and earliest European presence along the north shore, was therefore also largely defined by the area's strategic importance for accessing and controlling long established economic networks. Prior to the arrival of the Seneca, these economic networks would have been used by indigenous groups for thousands of years.

Due, in large part, to increased military pressure from the French upon their homelands south of Lake Ontario, the Haudenosaunee abandoned their north shore frontier settlements by the late 1680s, although they did not relinquish their interest in the resources of the area, as they continued to claim the north shore as part of their traditional hunting territory. The territory was immediately occupied or re-occupied by Anishinaabek groups, including the Mississauga, Ojibwa (or Chippewa) and Odawa, who, in the early seventeenth century, occupied the vast area extending from the east shore of Georgian Bay, and the north shore of Lake Huron, to the northeast shore of Lake Superior and into the upper peninsula of Michigan. Individual bands were politically autonomous and numbered several hundred people. Nevertheless, they shared common cultural traditions and relations with one another and the land. These groups were highly mobile, with a subsistence economy based on hunting, fishing, gathering of wild plants, and garden farming. Their movement southward also brought them into conflict with the Haudenosaunee.

Peace was achieved between the Haudenosaunee and the Anishinaabek Nations in August of 1701 when representatives of more than twenty Anishinaabek Nations assembled in Montreal to participate in peace negotiations (Johnston 2004:10). During these negotiations captives were exchanged and the Iroquois and Anishinaabek agreed to live together in peace. Peace between these nations was confirmed again at council held at Lake Superior when the Iroquois delivered a wampum belt to the Anishinaabek Nations.

[1] The Haudenosaunee are also known as the New York Iroquois or Five Nations Iroquois and after 1722 Six Nations Iroquois. They were a confederation of five distinct but related Iroquoian–speaking groups - the Seneca, Onondaga, Cayuga, Oneida, and Mohawk. Each lived in individual territories in what is now known as the Finger Lakes district of Upper New York. In 1722 the Tuscarora joined the confederacy.

In 1763, following the fall of Quebec, New France was transferred to British control at the Treaty of Paris. The British government began to pursue major land purchases to the north of Lake Ontario in the early nineteenth century, the Crown acknowledged the Mississaugas as the owners of the lands between Georgian Bay and Lake Simcoe and entered into negotiations for additional tracts of land as the need arose to facilitate European settlement.

The eighteenth century saw the ethnogenesis in Ontario of the Métis, when Métis people began to identify as a separate group, rather than as extensions of their typically maternal First Nations and paternal European ancestry (Métis National Council n.d.). Living in both Euro-Canadian and Indigenous societies, the Métis acted as agents and subagents in the fur trade but also as surveyors and interpreters. Métis populations were predominantly located north and west of Lake Superior, however, communities were located throughout Ontario (MNC n.d.; Stone and Chaput 1978:607,608). During the early nineteenth century, many Métis families moved towards locales around southern Lake Huron and Georgian Bay, including Kincardine, Owen Sound, Penetanguishene, and Parry Sound (MNC n.d.). By the mid-twentieth century, Indigenous communities, including the Métis, began to advance their rights within Ontario and across Canada, and in 1982, the Métis were federally recognized as one of the distinct Indigenous peoples in Canada. Recent decisions by the Supreme Court of Canada (Supreme Court of Canada 2003, 2016) have reaffirmed that Métis people have full rights as one of the Indigenous people of Canada under subsection 91(24) of the Constitution Act, 1867.

In 1790, the McKee Treaty was signed between the Crown and the Ottawa, Chippewa, Pottowatomi and Huron Nations of Detroit. This treaty included the lands of the study area (AANDC 2013).

1.2.2 Euro-Canadian Land Use: Township Survey and Settlement

Historically, the Study Area is located in the Former Harwich Township, County of Brant, in Part of Lots 13-25, Concessions 1-4 West of Communication Road (WCR) and, Part of Lots 19-25, Concession 1 East of Communication Road (ECR).

The S & G stipulates that areas of early Euro-Canadian settlement (pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches, and early cemeteries are considered to have archaeological potential. Early historical transportation routes (trails, passes, roads, railways, portage routes), properties listed on a municipal register or designated under the *Ontario Heritage Act* or a federal, provincial, or municipal historic landmark or site are also considered to have archaeological potential.

For the Euro-Canadian period, the majority of early nineteenth century farmsteads (i.e., those that are arguably the most potentially significant resources and whose locations are rarely recorded on nineteenth century maps) are likely to be located in proximity to water. The development of the network of concession roads and railroads through the course of the nineteenth century frequently influenced the siting of farmsteads and businesses. Accordingly, undisturbed lands within 100 m of an early settlement road are also considered to have potential for the presence of Euro-Canadian archaeological sites.

The first Europeans to arrive in the area were transient merchants and traders from France and England, who followed Indigenous pathways and set up trading posts at strategic locations along the well-traveled river routes. All of these occupations occurred at sites that afforded both natural landfalls and convenient access, by means of the various waterways and overland trails, into the hinterlands. Early transportation

routes followed existing Indigenous trails, both along the lakeshore and adjacent to various creeks and rivers (ASI 2006).

Harwich Township

Survey of Harwich Township was initiated in 1798, and eventually three surveys were conducted from three different directions; as a result, the same lot and concession numbers appear three times (Mika and Mika 1983:246–248). Settlement in north Harwich began between 1785 and 1800 with clearing of land along the Thames River. Many of the first settlers in Harwich were Loyalists, such as the Rushton, Newcombe, and Pardo families and by 1817, the population of Harwich was only 114. There were only two clusterings of settlement as early as 1850, Charing Cross and Huffman's Corners. Rondeau Bay was considered a safe harbor for and an important port for supplies, so Communication Road was opened and by 1844 to connect Chatham on the Thames River to Shrewsbury on the harbour. Places such as Mull and Fargo developed later close to the railways. The Township of Harwich was amalgamated into the new Municipality of Chatham-Kent January 1, 1998. (Armstrong 1985)

Town of Blenheim

In 1837 James W. Little – of Raleigh Township and militia captain from the War of 1812 – purchased land at the intersection of Ridge Road and Communication Road, where he surveyed the Blenheim village plot. Few lots had sold by 1847 until the development of the lumber industry after the opening of Rondeau harbour which resulted in the construction of a steam sawmill. By 1857 the population reached 450 and had formed a prosperous agricultural centre. It was incorporated as a village, with a population of 1,096, in 1874, and as a Town in 1885. (Brown 2004)

Village of Charing Cross

Charing Cross, straddling the Harwich-Raleigh town line, was settled around 1830 by a Mr. Cook from England, originally naming the village Cook’s Corners. A cluster of log buildings was built on a trail, later Charing Cross Road, from Buckhorn (Cedar Spring) to Chatham. The area was generally avoided by settlers who preferred the lakeshore road with higher farm lots draining toward the lake (Armstrong 1985).

Canada Southern Railway

Originally founded in 1868 as the Erie & Niagara Extension Railway, it became the Canada Southern Railway (CSR) in 1869, running along the entire north shore of Lake Erie, from Fort Erie where it connected to Buffalo, to Windsor where it connected to Detroit. The railway was leased to the Michigan Central Railroad in 1883. (Chatham-Kent Metal Detecting Club 2005)

Chatham-Wallaceburg-Lake Erie Electric Railway

The Chatham-Wallaceburg-Lake Erie Electric Railway (CWLEER) was an electric passenger line that flourished between 1905 and 1915, with just four electric freight motors. It travelled from Wallaceburg, northwest of Chatham near the St. Clair River, through Chatham and Cedar Springs to Erie Beach. It faced serious competition from automobiles as well as problems in service after being purchased by the Canadian Northern Railway. Despite economic losses, the CWLEER was obliged to continue carrying

passengers, then provided a brief freight-only service until an accident on the Third Street Bridge in 1929 that brought an end to the line (Rhodes 2013).

Erie & Lake Huron Railway

The Erie & Lake Huron Railway (E&LHR) linked the Lake Huron and Lake Erie, from Shrewsberry to Sarnia, through the communities of Blenheim, Chatham, Dresden and Wallaceburg. Construction began in 1879 from Lake Erie and was completed in 1886 (Hughes 2000). Initially, operations were handled by the Canada Southern Railway. The original purpose of this line was to be for the hauling of cordwood, however during the summer months, passengers service was busy, with people accessing lakefront properties, resorts and public beaches (Hughes 2000; Moore Museum 2017). In 1898, the E&LHR was purchased by the Lake Erie & Detroit River Railway and merged into that system, which was in turn purchased in 1903 by the Pere Marquette Railway, a regional line that purchased existing property in Ontario to compete with other ambitious American lines in the neighbourhood. The PMR fell into receivership in both 1905 and 1912, and eventually merged with the Chesapeake & Ohio Railway in 1947, later called CSX Transportation. The original line was abandoned in 1974 and all tracks were lifted (Hughes 2000).

1.2.3 Historical Map Review

The 1831 Patent Plan Map of Harwich Township (Burwell 1831), the 1876 Map of the County of Kent, (Shackleton and McIntosh 1876), and the 1880 Illustrated Historical Atlas of the County of Kent, Township of Harwich page, (Belden 1882) were examined to determine the presence of historic features within the Study Area during the nineteenth century (Figures 3-5).

It should be noted, however, that not all features of interest were mapped systematically in the Ontario series of historical atlases, given that they were financed by subscription, and subscribers were given preference with regard to the level of detail provided on the maps. Moreover, not every feature of interest would have been within the scope of the atlases.

In addition, the use of historical map sources to reconstruct/predict the location of former features within the modern landscape generally proceeds by using common reference points between the various sources. These sources are then geo-referenced in order to provide the most accurate determination of the location of any property on historic mapping sources. The results of such exercises are often imprecise or even contradictory, as there are numerous potential sources of error inherent in such a process, including the vagaries of map production (both past and present), the need to resolve differences of scale and resolution, and distortions introduced by reproduction of the sources. To a large degree, the significance of such margins of error is dependent on the size of the feature one is attempting to plot, the constancy of reference points, the distances between them, and the consistency with which both they and the target feature are depicted on the period mapping.

Table 1: Nineteenth-century property owner(s) and historical features(s) within or adjacent to the Study Area

		1876 *Map of the County of Kent*		*1880* *Illustrated Historical Atlas of the County of Kent*	
Con #	**Lot #**	**Property Owner(s)**	**Historical Feature(s)**	**Property Owner(s)**	**Historical Feature(s)**
1 ECR	19	D. Rice	CSR	None	None
	20	F. Rice	None	None	None
	21	S. W. White	None	John Hood (tenant)	None
	22	J. Brown J. Eagle	None	None	None
	23	N. Tompkins H. Smyth	None	None	None
	24	T. Smith	None	Estate of the late Robert Smyth	None
	25	T. Boyce	None	Sam. Johnston	House
1 WCR	18	R. A. Tomkins	None	W. Blair (?)	House
	19	P. Huffman	CSR	None	None
	20	J. W. Condle	CSR	None	None
	21	D. Boyes	None	Jane Cundle	None
	22	None	None	Jane Cundle	None
	23	T. Mosa T. Coatsworth	None	None	None
	24	A. & R. Palmer	None	None	None
	25	J. Hocksworth J. Reid	None	None	None
2 WCR	18	None	None	None	None
	19	None	None	None	None
3 WCR	16	D. Walker T. Gales	None	None	None
	17	J. & W. Walker	None	None	None
	18	T. W. Knott	None	None	None
	19	T. Bennett J. Hutchison	None	None	None
4 WCR	13	L. Kelly F. McGuggan J. & C. Irving S. Irving	None	None	None
	14	W. & J. Keefer	None	None	None
	15	J. McGibbin J. Drury	None	None	None
	16	H. White T. Pardee	None	None	None
	17	C. & J. White	None	None	None
	18	J. Broadbent	None	None	None
	19	J. Hutchison	None	None	None

According to the 1831 map, the original patents for lots within the existing landfill expansion area are as follows: Lots 13, Concession 4 was granted to George Young, Lot 14 to Janet McKillip, Lots 15 and 16 are illegible on this map. By 1876, the study area remained within a rural context, near the villages of Blenheim and Charing Cross. No structures are illustrated on this map, however it does show the CSR

alignment through Lot 19, Concessions 1 ECR and Lot 20, Concession 1 WCR. It also illustrates Erieau Road, Allison Line, Charing Cross Road, and Communication Road in their present alignments. Drury Line is shown in the 1880 map however it appears unfinished on either side of the Huron and Erie Railway, which was not yet operating. The 1880 map also illustrates two structures adjacent to the proposed haul route. No structures are illustrated on either map within the landfill property area.

Lots 14 and 15 were originally granted to United Empire Loyalists in 1808 and 1811 respectively, however no structures were established there until 1864 (Dillon Consulting Ltd. 1998:1)

1.2.4 Twentieth-Century Mapping Review

The 1913 and 1940 National Topographic System Chatham sheet was examined to determine the extent and nature of development and land uses within the Study Area (Figures 6 and 7). The maps show that the Study Area remained within a rural landscape into the mid-twentieth century, and the continued development of railways throughout Kent County. The maps illustrate 11 structures (1 brick and 10 wood) within the landfill property area. This includes the Cedar Springs Station on the CWLEER line in 1913 near the abandoned railway line running through the Study Area. It is no longer present in 1940.

A review of available Google satellite imagery shows that the Study Area continues to be within a rural agricultural landscape since 2005. It also indicates that the Ridge Landfill expanded to the railway easement and the large berm and road adjacent to Charing Cross road in the southwestern part of the Study Area was constructed sometime between 2011 and 2014.

1.3 Archaeological Context

This section provides background research pertaining to previous archaeological fieldwork conducted within and in the vicinity of the Study Area, its environmental characteristics (including drainage, soils or surficial geology and topography, etc.), and current land use and field conditions. Three sources of information were consulted to provide information about previous archaeological research: the site record forms for registered sites available online from the MTCS through “Ontario’s Past Portal”; published and unpublished documentary sources; and the files of ASI.

1.3.1 Current Land Use and Field Conditions

A Stage 1 property inspection was conducted on March 10, 2017 that noted the Study Area is located at the Ridge Landfill site near Blenheim, roughly bounded by Erieau Road to the north, Allison Line to the west, and Charing Cross Road to the south. The existing landfill reaches between Erieau Road and Charing Cross Road northwest of an abandoned railway and is surrounded by a large berm. Lands adjacent to the landfill and within the site's property boundary include three areas of woodlot, agricultural fields and an orchard, and four residential properties. An extension of the landfill boundary berm runs parallel to Charing Cross Road into agricultural fields in the southwestern part of the Study Area. Stormwater management ponds and artificial drainage ditches run throughout the landfill property. The haul route is within the existing rights-of-ways on Erieau Road, Drury Lane and Communication Road until it meets the on/off-ramp to the westbound Highway 401.

1.3.2 Geography

In addition to the known archaeological sites, the state of the natural environment is a helpful indicator of archaeological potential. Accordingly, a description of the physiography and soils are briefly discussed for the Study Area.

The S & G stipulates that primary water sources (lakes, rivers, streams, creeks, etc.), secondary water sources (intermittent streams and creeks, springs, marshes, swamps, etc.), ancient water sources (glacial lake shorelines indicated by the presence of raised sand or gravel beach ridges, relic river or stream channels indicated by clear dip or swale in the topography, shorelines of drained lakes or marshes, cobble beaches, etc.), as well as accessible or inaccessible shorelines (high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh, etc.) are characteristics that indicate archaeological potential.

Water has been identified as the major determinant of site selection and the presence of potable water is the single most important resource necessary for any extended human occupation or settlement. Since water sources have remained relatively stable in Ontario since 5,000 BP (Karrow and Warner 1990:Figure 2.16), proximity to water can be regarded as a useful index for the evaluation of archaeological site potential. Indeed, distance from water has been one of the most commonly used variables for predictive modeling of site location.

Other geographic characteristics that can indicate archaeological potential include: elevated topography (eskers, drumlins, large knolls, and plateaux), pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground, distinctive land formations that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases. There may be physical indicators of their use, such as burials, structures, offerings, rock paintings or carvings. Resource areas, including; food or medicinal plants (migratory routes, spawning areas) are also considered characteristics that indicate archaeological potential (S & G, Section 1.3.1).

The study area is situated within the St. Clair Clay Plains and the Bothwell Sand Plains physiographic regions of southern Ontario. The St. Clair Clay Plains physiographic region is characterized by extensive low-lying clay plains between Lake St. Clair in Essex and Kent Counties and the St. Clair River in Lambton County, except for a moraine at Ridgetown and Blenheim (Chapman and Putnam 1984:147). Deposits are deep except near Amherstburg, where a dome of limestone comes to the surface. Part of this limestone comes to the surface in Kent County, but the majority of bedrock is black shale. The very flat tract of land east of Lake St. Clair was submerged after the disappearance of Glacial Lake Warren in a correlative of Early Lake Algonquin and received a deeper covering of stratified clay and silt. The study area contains regions of sand and clay plain. Historically, this area supported a swamp forest of elm, black ash, white ash and silver or red maple (Chapman and Putnam 1984:150).

The Blenheim Moraine sub-region extends in a southwest-northeast direction through the town of Blenheim. To the west of Blenheim a well-defined morainic ridge is present, but to the east, in the study area, the moraine is not a prominent topographic feature. Never-the-less, moraine is very apparent in the patterns of soil texture and drainage east of Blenheim (Figures 2 and 3). Ridges of mixed sand and gravel form the north and south margins, with mixed drainage between the ridges. The records of the early land surveyors indicate oak forest on the moraine ridges (Finlay 1978).

The Bothwell Sand Plain is the delta of the Thames River in glacial Lake Warren. The region has an approximate elevation of between 183 and 213 m above sea level and covers an area of approximately

1813 square kilometers. The region consists of relatively thin (approximately one meter) deposits of sand over the underlying glaciolacustrine clays of Lake Warren. The topography is generally level except where gullies have cut through former shorecliffs (Chapman and Putnam 1984:147).

Figure 8 depicts surficial geology for the Study Area. The surficial geology mapping demonstrates that the Study Area is underlain by clay to silt-textured till/diamicton, and fine-textured glaciolacustrine deposits of silt, and modern alluvial deposits (Ontario Geological Survey 2010). Soils in the Study Area consist of a small area of well-drained Fox gravelly loam, imperfectly drained Napanee clay, and poorly drained Brookston clay and sandy loam (Ontario Agricultural College and Experimental Farms Service 1930). Figure 9 depicts soil drainage in the Study Area. There are four well-drained knolls located within the southwestern end of the Study Area.

The study area is adjacent to a tributary of the Thames River. This watershed drains an area of approximately 5700 square kilometers and is approximately 273 kilometres in length from its source near Brodhagen to Lake St. Clair. The Thames River was designated a heritage river by the Canadian Heritage Rivers System in 2000 because of its importance as a transportation route and critical resource extraction area for Indigenous peoples for over 11,000 years and, since the 17th century, for Euro-Canadian settlement, warfare, and trade (Chapman and Putnam 1984:93; CHRS 2011).

There are three artificially channelized drains within the Study Area: Howard, Duke and Scott Drains.

1.3.3 Previous Archaeological Research

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (OASD) maintained by the MTCS. This database contains archaeological sites registered within the Borden system. Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden block is approximately 13 km east to west, and approximately 18.5 km north to south. Each Borden block is referenced by a four-letter designator, and sites within a block are numbered sequentially as they are found. The Study Area under review is located in Borden block *AbHm* and *AcHm.*

According to the OASD, eight previously registered archaeological sites are located within one kilometre of the Study Area, two of which are within the Study Area (Ministry of Tourism, Culture and Sport 2016). A summary of the sites is provided below.

Table 2: List of previously registered sites within one kilometre of the Study Area

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AbHm-1	**Charing Cross**	**Indigenous Pre-Contact**	**Findspot**	**Dillion Consulting Ltd. 1997**
AbHm-2	**Erieau**	**Indigenous Pre-Contact**	**Scatter**	**Dillion Consulting Ltd. 1997, 1998**
AcHm-22	Durfy 1	Archaic	Scatter	Foster 1980
AcHm-23	Durfy 2	Archaic	Scatter	Foster 1980
AcHm-24	Durfy 3	Indigenous Pre-Contact	Camp	Foster 1980
AcHm-52	N/A	Euro-Canadian	Unknown	ARA 2010
AcHm-53	N/A	Euro-Canadian	Unknown	ARA 2010
AcHm-63	N/A	Euro-Canadian	Industrial/Midden	ASI 2011, 2013

NB – sites in bold are within the Study Area
ARA – Archaeological Research Associates Ltd.

According to the background research, four previous reports detail fieldwork within 50 m of the Study Area.

Dillon Consulting Limited (under the project direction of John MacDonald and Bruce Stewart) conducted Stage 1-4 archaeological assessments for the Ridge Landfill Expansion between 1995 and 1998. The Stage 2 was conducted in 1995, 1996 and 1997 by test pit and pedestrian survey, both at five metre intervals, within an area approximately 262 hectares in part of Lots 13-16, Concession 4 (Dillon Consulting Ltd. 1997a). The survey identified three small historic scatters and one non-diagnostic lithic findspot, all of which were considered not to retain further cultural heritage value or interest. The Stage 2 also identified the Charing Cross (AbHm-1) and Erieau (AbHm-2) sites within the proposed landfill expansion area. AbHm-1 was as a findspot near Charing Cross Road consisting of non-diagnostic lithic projectile point base and mid-section fragments. The site was considered clear of further archaeological concern. The Erieau site (AbHm-2) consisted of one biface and two flakes in Lot 14, Concession 4 WCR south of Erieau Road adjacent to edge of existing landfill. Stage 3 investigation of AbHm-2 consisted of a controlled surface pick-up and excavation of five test units within an area approximately 25 metres by 45 metres, resulting in an additional 19 artifacts, including faunal and non-diagnostic lithic fragments (Dillon Consulting Ltd. 1997b). The site was subject to Stage 4 mitigation, which involved topsoil stripping of an area approximately 12 metres by 18 metres, however no further archaeological material was recovered. The site was cleared of further archaeological concern (Dillon Consulting Ltd. 1998).

Archaeological Research Associates Limited (2011) conducted a Stage 1-2 archaeological assessment for the Highway 40 improvements project between Highway 401 and Longwoods Road, Municipality of Chatham-Kent. The investigation is within 50 metres of the current Study Area haul route where Communication Road/Highway 40 intersects the Highway 401 on-ramp. This part of the project adjacent to the former right-of-way was considered clear of further archaeological concern.

2.0 FIELD METHODS: PROPERTY INSPECTION

A Stage 1 property inspection must adhere to the S & G, Section 1.2, Standards 1-6, which are discussed below. The entire property and its periphery must be inspected. The inspection may be either systematic or random. Coverage must be sufficient to identify the presence or absence of any features of

archaeological potential. The inspection must be conducted when weather conditions permit good visibility of land features. Natural landforms and watercourses are to be confirmed if previously identified. Additional features such as elevated topography, relic water channels, glacial shorelines, well-drained soils within heavy soils and slightly elevated areas within low and wet areas should be identified and documented, if present. Features affecting assessment strategies should be identified and documented such as woodlots, bogs or other permanently wet areas, areas of steeper grade than indicated on topographic mapping, areas of overgrown vegetation, areas of heavy soil, and recent land disturbance such as grading, fill deposits and vegetation clearing. The inspection should also identify and document structures and built features that will affect assessment strategies, such as heritage structures or landscapes, cairns, monuments or plaques, and cemeteries.

The Stage 1 archaeological assessment property inspection was conducted under the field direction of Andrew Clish (P046) of ASI, on March 10, 2017, in order to gain first-hand knowledge of the geography, topography, and current conditions and to evaluate and map archaeological potential of the Study Area. It was a visual inspection only and did not include excavation or collection of archaeological resources. Fieldwork was only conducted when weather conditions were deemed suitable, per S&G Section 2. Previously identified features of archaeological potential were examined; additional features of archaeological potential not visible on mapping were identified and documented as well as any features that will affect assessment strategies. Field observations are compiled onto the existing conditions of the Study Area in Section 7.0 (Figures 10-12) and associated photographic plates are presented in Section 8.0 (Plates 1-26).

3.0 ANALYSIS AND CONCLUSIONS

The historical and archaeological contexts have been analyzed to help determine the archaeological potential of the Study Area. These data are presented below in Section 3.1. Results of the analysis of the Study Area property inspection are presented in Section 3.2.

3.1 Analysis of Archaeological Potential

The S & G, Section 1.3.1, lists criteria that are indicative of archaeological potential. The Study Area meets the following criteria indicative of archaeological potential:

- Previously identified archaeological sites (see Table 2);
- Water sources: primary, secondary, or past water source (Thames River tributaries);
- Early historic transportation routes (Charing Cross Road, Allison Line, Erieau Road, Drury Lane, Communication Road, Middle Line, CWLEER, E&LHR, CSR); and,
- Proximity to early settlements (Blenheim, Charing Cross);

These criteria are indicative of potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

3.2 Analysis of Property Inspection Results

The property inspection determined that the areas within the existing landfill and haul route have been subjected to deep soil disturbance events and according to the S & G Section 1.3.2 do not retain archaeological potential (Plates 1, 2, 4-9, 11, 12, 14--26; Figures 10-12: areas highlighted in yellow). The background research determined that parts of the Study Area have been previously assessed by Stage 2 pedestrian survey, test pit survey, and Stage 3 and 4 assessment (Dillon Consulting Ltd. 1997a, 1997b, 1998) (Figure 10: areas highlighted in red). These areas do not require further survey.

The remainder of the Study Area exhibits archaeological potential (Plates 1-5, 9-11, 13, 19; Figure 10: areas highlighted in green and orange). These areas will require Stage 2 archaeological assessment prior to any development. According the S & G Section 2.1.1, pedestrian survey is required in actively or recently cultivated fields (Plates 1-5, 9, 13, 19; Figure 10: areas highlighted in orange). According to the S & G Section 2.1.2, test pit survey is required on terrain where ploughing is not viable, such as wooded areas, properties where existing landscaping or infrastructure would be damaged, overgrown farmland with heavy brush or rocky pasture, and narrow linear corridors up to 10 metres wide (Plates 1, 2, 4, 10, 11; Figure 10: areas highlighted in green).

3.3 Conclusions

The Stage 1 background study determined that eight previously registered archaeological sites are located within one kilometre of the Study Area, two of which are within the Study Area. The property inspection determined that parts of the Study Area exhibit archaeological potential and will require Stage 2 assessment, prior to development.

4.0 RECOMMENDATIONS

In light of these results, the following recommendations are made:

1. The Study Area exhibits archaeological potential. These lands require Stage 2 archaeological assessment by test pit/pedestrian survey, where appropriate, at a five metre intervals prior to any proposed impacts to the property;

2. At least 262 hectares of the Study Area were previously subject to a Stage 1-4 assessment for an earlier iteration of this project dating to 1997. These areas do not require further archaeological assessment.

3. The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance associated with construction of the landfill, right-of-ways, and artificial drainage ditches. These lands do not require further archaeological assessment; and,

4. Should the proposed work extend beyond the current Study Area, further Stage 1 archaeological assessment should be conducted to determine the archaeological potential of the surrounding lands.

NOTWITHSTANDING the results and recommendations presented in this study, ASI notes that no archaeological assessment, no matter how thorough or carefully completed, can necessarily predict, account for, or identify every form of isolated or deeply buried archaeological deposit. In the event that archaeological remains are found during subsequent construction activities, the consultant archaeologist, approval authority, and the Cultural Programs Unit of the MTCS should be immediately notified.

5.0 ADVICE ON COMPLIANCE WITH LEGISLATION

ASI also advises compliance with the following legislation:

- This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, RSO 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological field work and report recommendations ensure the conservation, preservation and protection of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

- It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological field work on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act.*

- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the *Ontario Heritage Act*.

- The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

6.0 REFERENCES CITED

Archaeological Research Associates Ltd.
2011 Stage 1-2 Archaeological Assessment of the Highway 401 and Highway 40 Interchange, East Concession 1, Part of Lots 25-28 and West Concession 1, Part of 25 and 26, Harwich Township, Municipality of Chatham-Kent.

Armstrong, A.
1985 The First 200 years of Blenheim and South Harwich. The Blenheim News Tribune.

ASI
2006 Historical Overview and Assessment of Archaeological Potential Don River Watershed, City Of Toronto.

Belden, H.
1882 Illustrated Historical Atlas of the Counties of Essex and Kent 1880-1881. H. Belden & Co., Kent County.

Birch, J., and R. F. Williamson
2013 The Mantle Site: An Archaeological History of an Ancestral Wendat Community. Rowman & Littlefield Publishers, Inc., Latham.

Brown, A.
2004 Ontario's Historical Plaques: The Founding of Blenheim. <http://ontarioplaques.com/Plaques/Plaque_ChathamKent05.html>.

Brown, J.
1995 On Mortuary Analysis – with Special Reference to the Saxe-Binford Research Program. In Regional Approaches to Mortuary Analysis, edited by L. A. Beck, pp. 3–23. Plenum Press, New York.

Burwell, A.
1831 Harwich Township.

Canadian Heritage Rivers System
2011 Thames River. <http://chrs.ca/the-rivers/thames/>.

Chapman, L.J., and F. Putnam
1984 The Physiography of Southern Ontario. Vol. 2. Ontario Geologic Survey, Special Volume. Ontario Ministry of Natural Resources, Toronto.

Chatham-Kent Metal Detecting Club
2005 Railways of Chatham-Kent. Accessed February 24, 2017 from <http://www.netrover.com/~edgacres/Railways.html>.

Dillon Consulting Ltd.
1997a BFI Ridge Landfill Expansion Blenheim-Archaeological Assessment Stage 2: Archaeological Assessment.

1997b BFI Ridge Landfill Archaeological Assessment of Expansion Site, Stage 3: Archaeological Testing of the Erieau Site.

1998 BFI Ridge Landfill Archaeological Assessment of Expansion Site, Stage 4: Archaeological Mitigation of the Erieau Site.

Dodd, C. F., D. R. Poulton, P. A. Lennox, D. G. Smith, and G. A. Warrick
1990 The Middle Ontario Iroquoian Stage. In The Archaeology of Southern Ontario to A.D. 1650, edited by C. J. Ellis and N. Ferris, pp. 321–360. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London.

Edwards, T.W.D., and P. Fritz
1988 Stable-Isotope Palaeoclimate Records from Southern Ontario, Canada: Comparison of Results from Marl and Wood. Canadian Journal of Earth Sciences 25: 1397–1406.

Ellis, C. J., and D. B. Deller
1990 Paleo-Indians. In The Archaeology of Southern Ontario to A.D. 1650, edited by C. J. Ellis and N. Ferris, pp. 37–64. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London.

Ellis, C. J., I. T. Kenyon, and M. W. Spence
1990 The Archaic. In The Archaeology of Southern Ontario to A.D. 1650, edited by C. J. Ellis and N. Ferris, pp. 65–124. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London.

Ellis, C. J., P. A. Timmins, and H. Martelle
2009 At the Crossroads and Periphery: The Archaic Archaeological Record of Southern Ontario. In Archaic Societies: Diversity and Complexity across the Midcontinent., edited by T. D. Emerson, D. L. McElrath, and A. C. Fortier, pp. 787–837. State University of New York Press, Albany, New York.

Ferris, N.
2013 Place, Space, and Dwelling in the Late Woodland. In Before Ontario: The Archaeology of a Province, pp. 99–111. McGill-Queen's University Press.

Heidenreich, C. E.
1990 History of the St. Lawrence-Great Lakes Area to A.D. 1650. In The Archaeology of Southern Ontario to A.D. 1650, edited by C. J. Ellis and N. Ferris. Occasional Publication of the London Chapter OAS Number 5.

Hughes, R. J.
2000 The Pere Marquette Railway. Accessed February 24, 2017 from <http://trainweb.org/ontariorailways/railpmr.htm>.

Johnston, D.
2004 Connecting People to Place: Great Lakes Aboriginal in Cultural Context. Unpublished paper prepared for the Ipperwash Commission of Inquiry.

Karrow, P.F., and B.G. Warner
1990 The Geological and Biological Environment for Human Occupation in Southern Ontario. In The Archaeology of Ontario to A.D. 1650, pp. 5–36. Occasional Publications 5. London Chapter, Ontario Archaeological Society, London.

Lennox, P.A., and W.R. Fitzgerald
1990 The Culture History and Archaeology of the Neutral Iroquoians. In The Culture History and Archaeology of the Neutral Iroquoians, edited by C.J. Ellis and N. Ferris, pp. 405–456. Occasional Publication of the London Chapter, OAS Number 5. Ontario Archaeological Society Inc., London.

Métis National Council
n.d. The Métis Nation.

n.d. Métis Historic Timeline. <http://www.metisnation.org/culture-heritage/m%C3%A9tis-timeline/>.

Mika, Nick, and Helma Mika
1983 Places In Ontario: Their Name Origins and History, Part II F-M. Mika Publishing Company, Belleville.

Ministry of Culture
1990 Ontario Heritage Act, R.S.O. [as amended in 2009]. Province of Ontario.

Ministry of Tourism, Culture and Sport
2016 PastPortal.

Moore Museum
2017 A North-South Connection: The Erie & Huron Railroad. <http://www.mooremuseum.ca/newsletter-articles/north-south-connection-erie-huron-railroad>.

Murphy, C., and N. Ferris
1990 The Late Woodland Western Basin Tradition in southwestern Ontario. London Chapter, Ontario Archaeological Society The Archaeology of Southern Ontario to A.D. 1650(5): 189–278.

Ontario Agricultural College, and Experimental Farms Service
1930 Soil Map of Kent County. Ontario Soil Survey. Guelph.

Ontario Geological Survey
2010 Surficial geology of Southern Ontario.

Shackleton, J. W., and F. J. McIntosh
1876 Map of the County of Kent in the Province of Ontario, Dominion of Canada. Chatham.

Spence, M. W., R. H. Pihl, and C. Murphy
1990 Cultural Complexes of the Early and Middle Woodland Periods. In The Archaeology of Southern Ontario to A.D. 1650, edited by C. J. Ellis and N. Ferris. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London.

Stone, L.M., and D. Chaput
1978 History of the Upper Great Lakes. In Handbook of North American Indians, edited by Bruce G. Trigger, pp. 602–609. Smithsonian Institution, Washington.

Supreme Court of Canada
2003 R. v. Powley. September 19.

2016 Daniels v. Canada (Indian Affairs and Northern Development). April 14.

Williamson, R. F.
1990 The Early Iroquoian Period of Southern Ontario. In The Archaeology of Southern Ontario to A.D. 1650, edited by C. J. Ellis and N. Ferris, pp. 291–320. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London.

7.0 MAPS

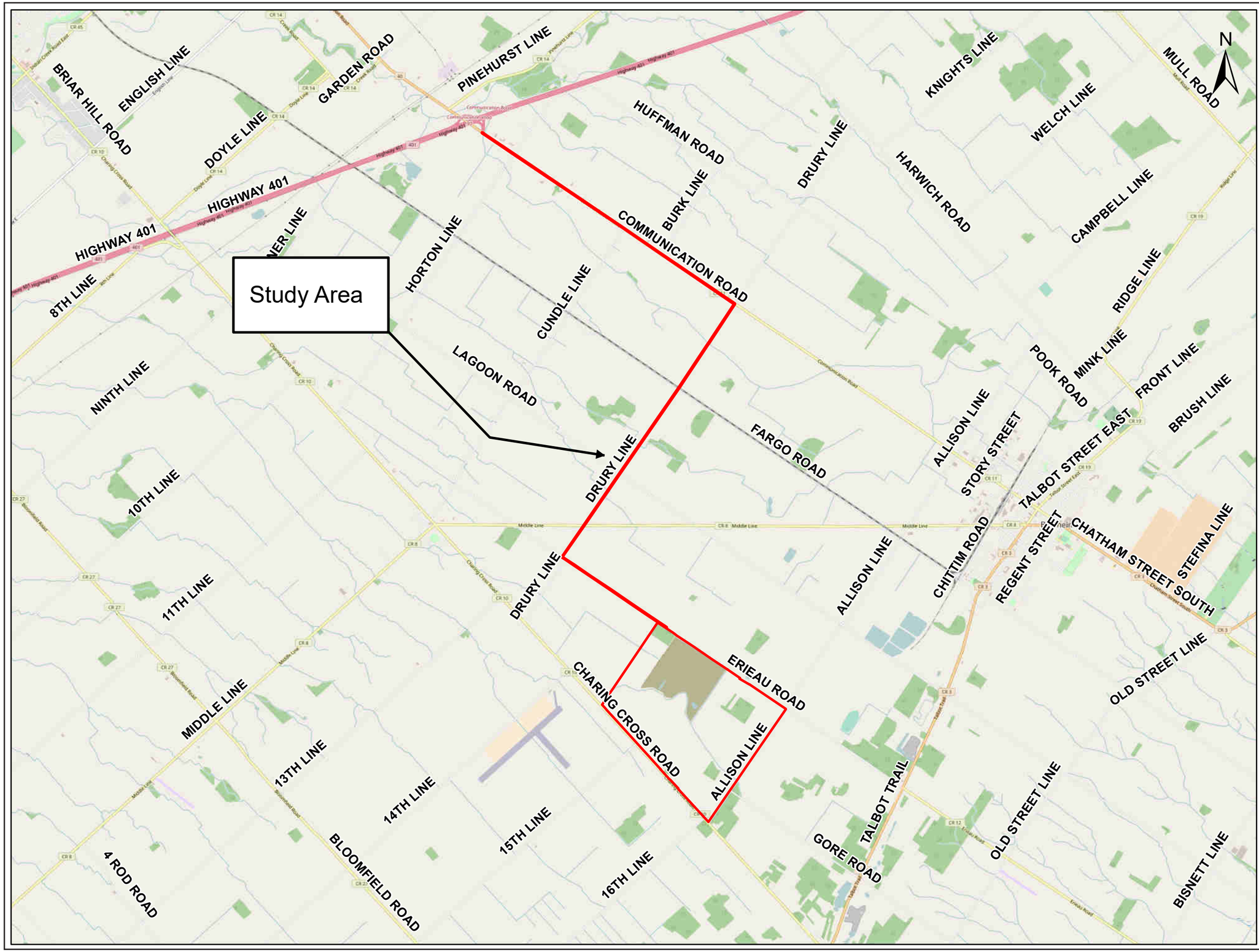


Figure 1: Ridge Landfill Expansion - Location of the Study Area

SITE ENTRANCE
GALES DRAIN
DUKE DRAIN
ERIEAU ROAD (CONCESSION ROAD 4)
ALLISON LINE
NORTHEAST WOODLAND
PROPOSED BERM
DUKE DRAIN
POND 9
POND 10
OLD LANDFILL
'C3'
'C2'
'C'
'C1'
EX. BLOWER / FLARE STATION
LEWIS DRAIN
POTENTIAL FLOOD CONTROL/ WOODLOT COMPENSATION AREA
INFILL LANDFILL
SCALE HOUSE
OFFICE
SOUTH LANDFILL
'B'
PROPOSED BERM
ALLISON LINE
EX. FLOOD CONTROL FACILITY
WEST LANDFILL
POND 6
PROPOSED HOWARD DRAIN CULVERT
HOWARD DRAIN
EX. STORMWATER POND 3
'A'
POND 7
POND 8
PROPOSED HOWARD DRAIN REALIGNMENT
OLD SCOTT DRAIN
PROPOSED RELOCATED POND 3
PROPOSED ADDITIONAL FLOOD CONTROL FACILITY 2.0 ha
REMOVE BERM, ADD TREE ROW
PROPOSED HOWARD DRAIN REALIGNMENT
CHARING CROSS ROAD
SCOTT DRAIN
CHARING CROSS ROAD (COUNTY ROAD 10)
PROPOSED BERM
CONTEMPLATED DEPRESSION/FLOOD CONTROL FACILITY
14TH LINE
15TH LINE
16TH LINE
GORE ROAD
ERIEAU ROAD

N

WASTE CONNECTIONS OF CANADA

RIDGE LANDFILL
ENVIRONMENTAL ASSESSMENT

PROPOSED EXPANSION FILL AREAS
FIGURE 2 - REV.2

- PROPERTY LIMITS
- APPROVED WASTE LIMIT
- EXISTING WATER COURSE
- PROPOSED WASTE LIMIT FOR EXPANSION AREAS
- PROPOSED STORMWATER POND
- PROPOSED WATERCOURSE
- PROPOSED ROAD
- EXISTING WOODLOT AREAS

0 100 200 400m

TRUE NORTH

PLAN NORTH

MAP/DRAWING INFORMATION
MAPPING FROM THE BASE MAP CO. LTD., MAY 16, 2016

CREATED BY: SKB
CHECKED BY: CO
DESIGNED BY: FG

DILLON CONSULTING

PROJECT: 15 2456
STATUS: DRAFT
DATE: 04/24/17

FILE: P:\...\DOCUMENTS\PROJECTS\2015\152456 RIDGE LANDFILL TOR\...\Option Volumes – Maximum – LF-A and LF-B.dwg

Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 | F416-966-9723 | asiheritage.ca

Study Area
Rail
Roads
Water

BASE:
Google Earth
Image date 4/15/2016
Captured March 29 2017

0 500
Metres

ASI PROJECT NO.: 16EA-143
DATE: 05 May 2017

DRAWN BY: BW
FILE: 16EA143_Fig2_Devp

Path: X:\2016 Projects\EA\16EA-143_144 Ridge Landfill\View\16EA143_workspace.mxd

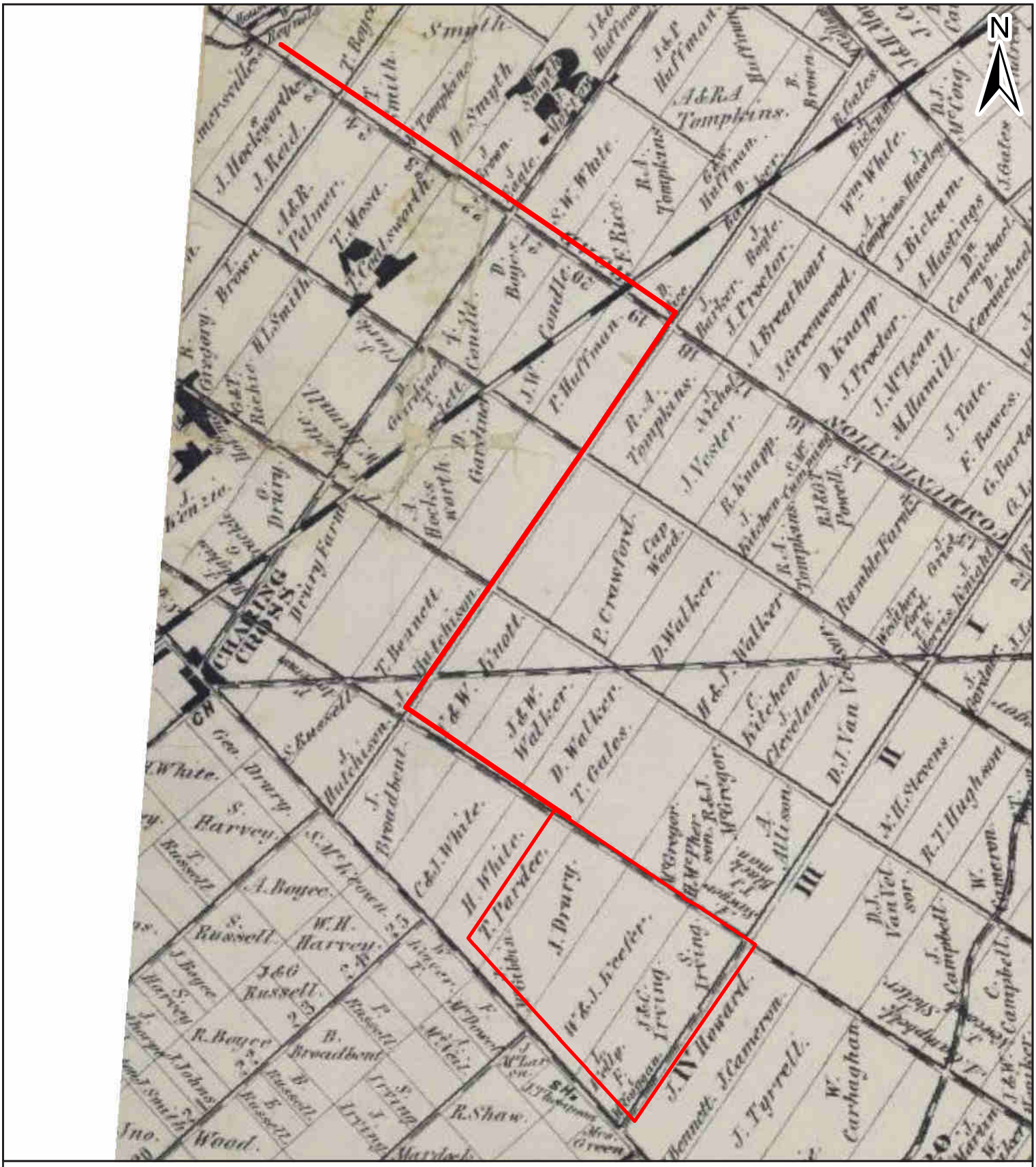
Figure 2: Ridge Landfill Expansion Plan and Existing Landfill Development

Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 | F416-966-9723 | asiheritage.ca

0 2,500
Metres

ASI PROJECT NO.: 16EA-143
DATE: 06 Mar 2017
DRAWN BY: BW
FILE: 16EA143_Fig2_1831

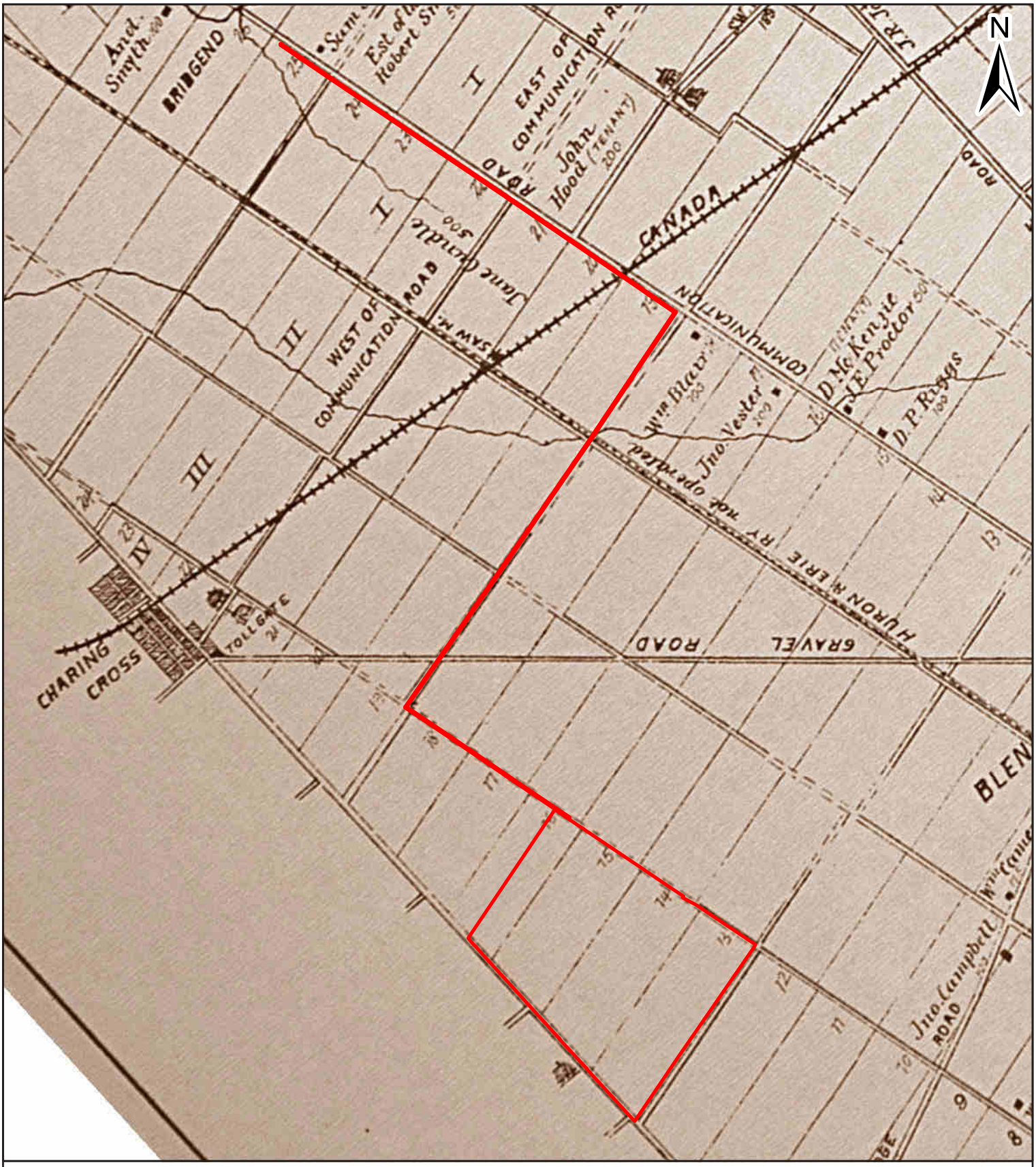
Figure 3: Ridge Landfill Expansion Study Area (Approximate Location) Overlaid on the 1831 Patent Plan Map of Harwich Township



Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 | F416-966-9723 | asiheritage.ca

ASI PROJECT NO.: 16EA-143
DRAWN BY: BW
DATE: 06 Mar 2017
FILE: 16EA143_Fig3_1876

Figure 4: Ridge Landfill Expansion Study Area (Approximate Location) Overlaid on the 1876 Map of the County of Kent



Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 | F416-966-9723 | asiheritage.ca

0 2,500
Metres

ASI PROJECT NO.: 16EA-143
DATE: 06 Mar 2017
DRAWN BY: BW
FILE: 16EA143_Fig4_1880

Figure 5: Ridge Landfill Expansion Study Area (Approximate Location) Overlaid on the 1880 Illustrated Historical Atlas of the Township of Harwich

Figure 6: Ridge Landfill Expansion Study Area (Approximate Location) Overlaid on the 1913 NTS Chatham Sheet

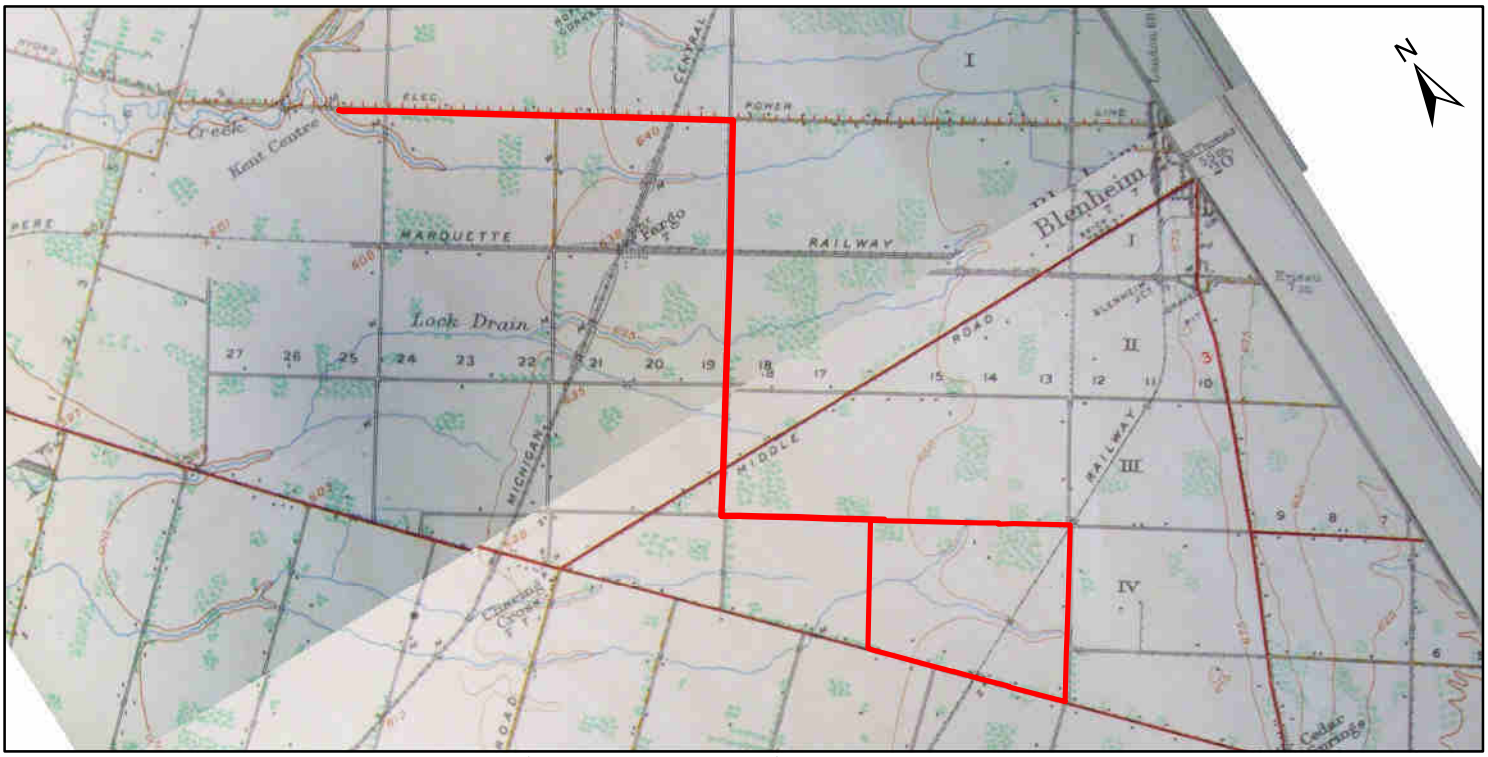


Figure 7: Ridge Landfill Expansion Study Area (Approximate Location) Overlaid on the 1940 NTS Chatham Sheet

Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 | F416-966-9723 | asiheritage.ca

Study Area

0 2,000
Metres

ASI PROJECT NO.: 16EA-143 DRAWN BY: BW
DATE: 06 Mar 2017 FILE: 16EA143_Fig5_6

Path: X:\2016 Projects\EA\16EA-143_144 Ridge Landfill\View\16EA143_Port_Multi_Letr.mxd

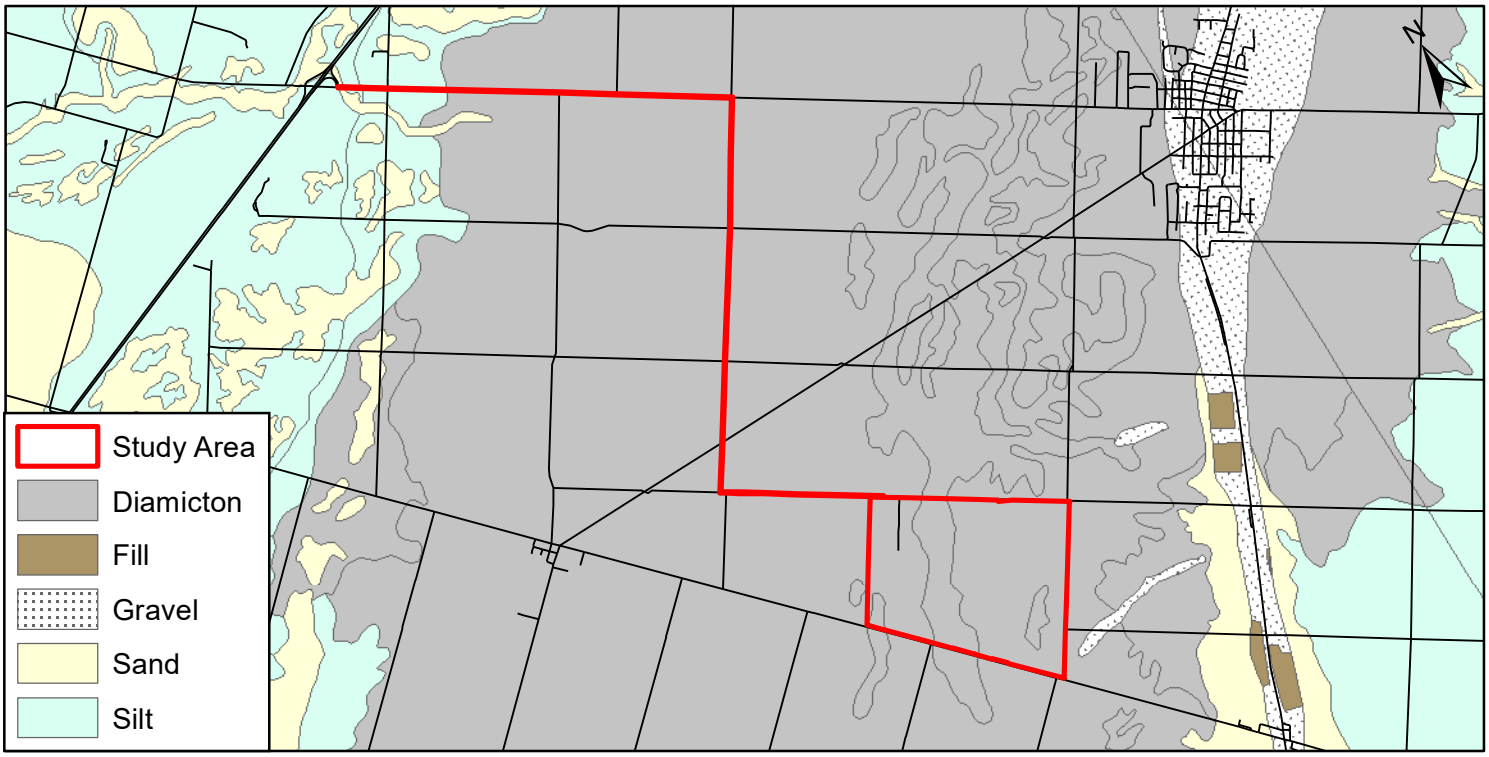


Figure 8: Ridge Landfill Expansion Study Area – Surficial Geology

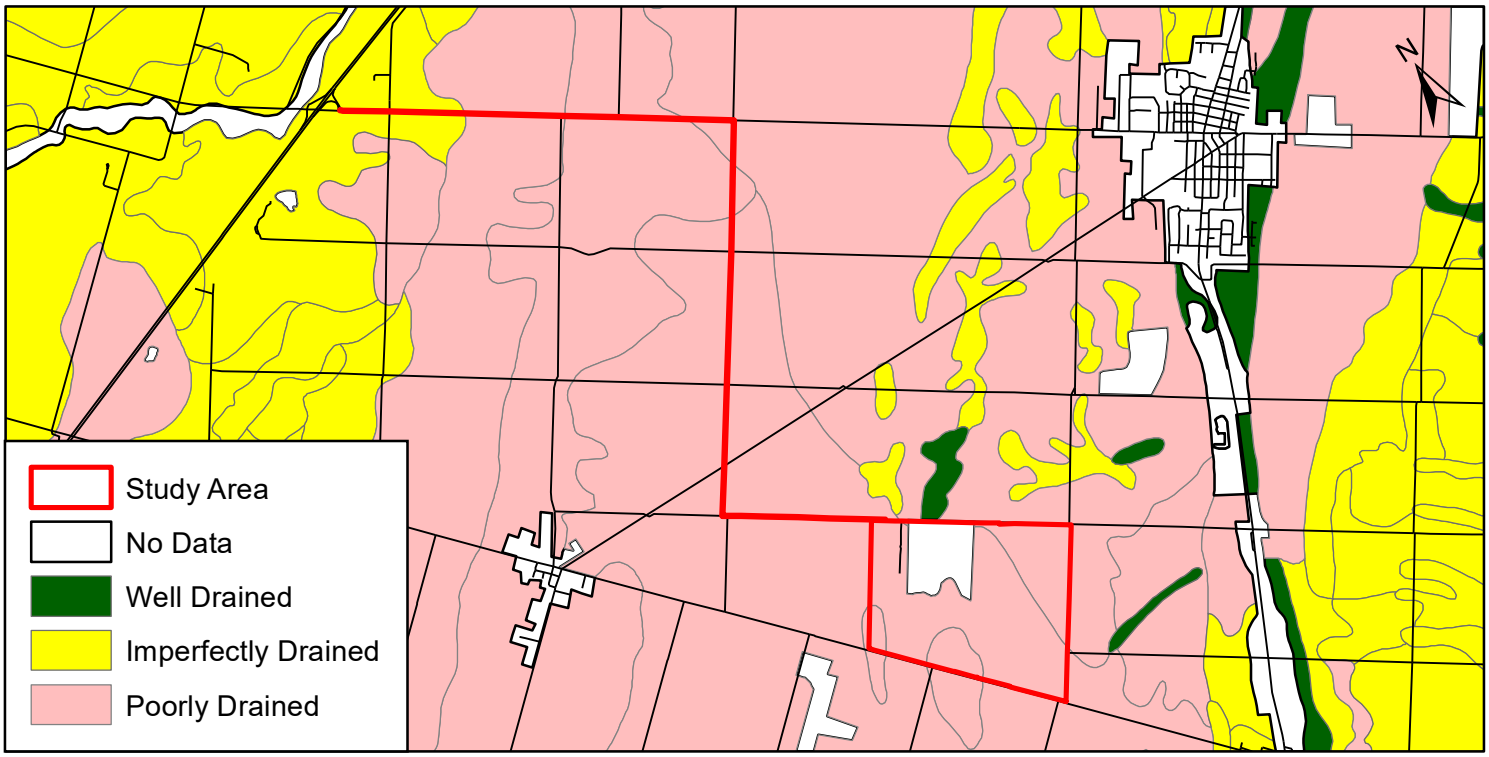


Figure 9: Ridge Landfill Expansion Study Area – Soil Drainage

Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 | F416-966-9723 | asiheritage.ca

0 2,000
Metres

ASI PROJECT NO.: 16EA-143 DRAWN BY: BW
DATE: 06 Mar 2017 FILE: 16EA143_Fig7_8

Path: X:\2016 Projects\EA\16EA-143_144 Ridge Landfill\View\16EA143_Port_Multi_Letr.mxd

Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 | F416-966-9723 | asiheritage.ca

Study Area
Photo Plate
Disturbed - No Potential
Archaeological Potential - Requires Stage 2 Pedestrian Survey
No Potential - Previously Assessed (Dillon 1995-1999)
Archaeological Potential - Requires Stage 2 Test Pit Survey
Roads
Rail
Water

BASE:

Google Earth
Image date 4/15/2016
Captured March 29 2017

0 500
Metres

ASI PROJECT NO.: 16EA-143
DATE: 07 Apr 2017
DRAWN BY: BW
FILE: 16EA143_Fig10_Stg1_S1

Figure 10: Ride Landfill Expansion Study Area - Results of the Property Inspection (Sheet 1)

Path: X:\2016 Projects\EA\16EA-143_144 Ridge Landfill\View\16EA143_workspace.mxd

Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 | F416-966-9723 | asiheritage.ca

Study Area
Photo Plate
Disturbed - No Potential
Archaeological Potential - Requires Stage 2 Pedestrian Survey
Archaeological Potential - Requires Stage 2 Test Pit Survey
Roads
Rail
Water

BASE:
Ortho
Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 500
Metres

ASI PROJECT NO.: 16EA-143
DATE: 29 Mar 2017
DRAWN BY: BW
FILE: 16EA143_Fig11_Stg1_S2

Figure 11: Ride Landfill Expansion Study Area - Results of the Property Inspection (Sheet 2)

Path: X:\2016 Projects\EA\16EA-143_144 Ridge Landfill\View\16EA143_workspace.mxd

Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 | F416-966-9723 | asiheritage.ca

- Study Area
- Photo Plate
- Disturbed - No Potential
- Archaeological Potential - Requires Stage 2 Pedestrian Survey
- Archaeological Potential - Requires Stage 2 Test Pit Survey
- Roads
- Rail
- Water

BASE:

Ortho
Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 500
Metres

ASI PROJECT NO.: 16EA-143
DATE: 29 Mar 2017
DRAWN BY: BW
FILE: 16EA143_Fig12_Stg1_S3

Path: X:\2016 Projects\EA\16EA-143_144 Ridge Landfill\View\16EA143_workspace.mxd

Figure 12: Ride Landfill Expansion Study Area - Results of the Property Inspection (Sheet 3)

8.0 IMAGES

Plate 1: Northwest view of Study Area and drain ditch at Erieau Road and Allison Line; Area has been previously assessed, no potential.

Plate 2: Southwest view of Study Area from Allison Line; Area exhibits potential, requires Stage 2 survey. Note, disturbed abandoned railway berm to the west.

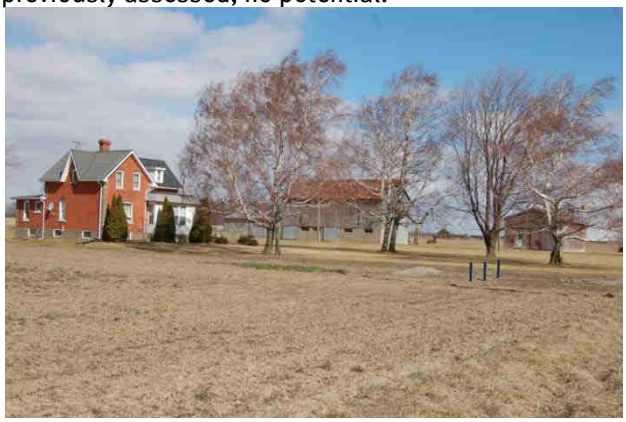


Plate 3: Northeast view of Study Area near Allison Line; Area around existing buildings exhibits potential, requires Stage 2 survey.

Plate 4: West view of Study Area from Allison Line; Area exhibits potential, requires Stage 2 survey. Drainage ditch is disturbed, no potential.

Plate 5: Northwest view of existing landfill area from Charing Cross Road; Area south and west of disturbed berm exhibits potential, requires Stage 2 survey.

Plate 6: Northeast view of existing landfill area from Charing Cross Road; Area within former railway corridor is disturbed, and surrounding lands have been previously assessed, no potential.

Plate 7: Northwest view of existing landfill area from Charing Cross Road; Area is disturbed and has been previously assessed, no potential.

Plate 8: North view of existing landfill area from Charing Cross Road; Area is disturbed and has been previously assessed, no potential.

Plate 9: Northeast view of Study Area from Charing Cross Road; Areas surrounding disturbed residential property exhibit potential, require Stage 2 survey.

Plate 10: South view of Study Area from Erieau Road; Area exhibits potential, requires Stage 2 survey.

Plate 11: Southeast view of Study Area at Erieau Road; Area south of the disturbed ROW and drainage ditch exhibits potential, requires Stage 2 survey.

Plate 12: South view of landfill entrance on Erieau Road; Area is disturbed, no potential.

Plate 13: West view of Study Area from landfill entrance; Area has been previously assessed, no potential.

Plate 14: South view of existing landfill area; Area is disturbed, no potential.

Plate 15: South view of existing landfill area; Area is disturbed, no potential.

Plate 16: South view of existing landfill area; Area is disturbed, no potential.

Plate 17: South view of existing landfill area from Erieau Road; Area is disturbed, no potential.

Plate 18: South view of existing landfill area from Erieau Road; Area is disturbed and has been previously assessed, no potential.

Plate 19: Southeast view of existing landfill area from Erieau Road; Area south of disturbed drainage ditch exhibit potential, requires Stage 2 survey.

Plate 20: Northwest view of haul route on Erieau Road; Study Area is within existing disturbed ROW, no potential.

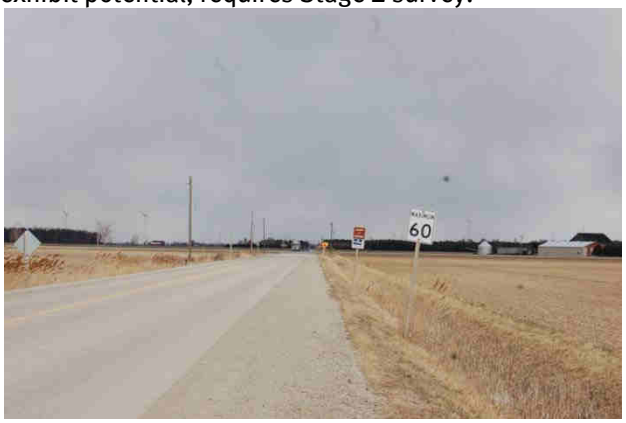


Plate 21: Northeast view of haul route on Erieau Road; Study Area is within existing disturbed ROW, no potential.

Plate 22: Northeast view of haul route on Erieau Road; Study Area is within existing disturbed ROW, no potential.

Plate 23: Northeast view of haul route on Erieau Road; Study Area is within existing disturbed ROW, no potential.

Plate 24: Northwest view of haul route on Erieau Road; Study Area is within existing disturbed ROW, no potential.

Plate 25: Northwest view of haul route on Erieau Road; Study Area is within existing disturbed ROW, no potential.

Plate 26: Northwest view of haul route on Erieau Road; Study Area is within existing disturbed ROW, no potential.

Stage 2 Archaeological Assessment: Proposed Ridge Landfill Expansion

Part of Lots 13, 14, and 16, Concession 4 West of Communication Road, Geographic Township of Harwich, County of Kent, now Municipality of Chatham-Kent, Ontario

June 17, 2019

Prepared for:

Dillon Consulting Limited
235 Yorkland Boulevard, Suite 800
Toronto, Ontario
M2J 4Y8
Tel: (416) 229-4646
Fax: (416) 229-4692

Prepared by:

Stantec Consulting Ltd.
300W – 675 Cochrane Drive
Markham, Ontario
L3R 0B8
Tel: (905) 944-6259
Fax: (905) 474-9889

Licensee: Peter Popkin, Ph.D., CAHP, MClfA
License Number: P362
PIF Number: P362-0250-2019
Project Number: 160940484

ORIGINAL REPORT

Table of Contents

LIST OF TABLES

LIST OF FIGURES

Executive Summary

Stantec Consulting Ltd. (Stantec) was retained by Dillon Consulting Ltd. (Dillon) on behalf of Waste Connections of Canada Inc. (Waste Connections) to conduct a Stage 2 archaeological assessment on a portion of the proposed Ridge Landfill Expansion Project (the Project) area, located on part of lots 13, 14, and 16, Concession 4 West of Communication Road, Geographic Township of Harwich, County of Kent, now Municipality of Chatham-Kent, Ontario. The Stage 2 assessment was conducted as part of the Environmental Assessment process associated with the Project under the *Environmental Assessment Act*.

The study area consists of three parcels with a total area of approximately 66.4 hectares. The eastern parcel is approximately 58.7 ha in area and is comprised of 53.2 ha of agricultural field, 4.1 ha of undeveloped wood lot and 1.4 ha of landscaped ground around a homestead. The northern parcel is an approximately 6.1 ha area comprised of dwarf apple tree orchard. The southwestern parcel is approximately 1.6 ha of grass around a homestead.

The Stage 2 archaeological assessment for a portion of the proposed Ridge Landfill Expansion identified one archaeological site: Location 1 (AbHm-27). Maps identifying exact site locations do not form part of this public report; they may be found in the Supplementary Documentation.

The Stage 2 assessment of Location 1 (AbHm-27) resulted in the recovery of a lithic scatter of 21 pre-contact Indigenous artifacts. The site area includes six positive test pits, one positive test unit and nine surface artifacts over an area 75 metres by 38 metres. The pre-contact Indigenous assemblage is comprised of 17 pieces of chipping detritus, 2 cores, 1 retouched flake, and 1 utilized flake.

Despite the non-diagnostic nature of the artifacts recovered from Location 1 (AbHm-27), the site represents a spatially discrete cluster of pre-contact Indigenous artifacts. Six pre-contact lithic artifacts were recovered from a single test unit, fulfilling the criteria to require Stage 3 archaeological investigation as per Section 2.2 Standard 1a(ii)(2) of the MTCS' 2011 *Standards and Guidelines* (Government of Ontario 2011). Therefore, **Stage 3 archaeological assessment is recommended for Location 1 (AbHm-27) to further evaluate the site's cultural heritage value or interest**.

Further, because Location 1 (AbHm-27) extends to the edge of an agricultural field that has not yet been subject to Stage 2 archaeological survey (See Tile 3 in the Supplementary Documentation), additional Stage 2 survey of the site should be conducted for a minimum of 20 metres within the agricultural field after it has been suitably ploughed and weathered to confirm the southern extent of the site.

The Stage 3 archaeological assessment will be conducted according to the procedures outlined in the MTCS' 2011 *Standards and Guidelines* (Government of Ontario 2011). Since Location 1 (AbHm-27) is located in an area that is not suitable to be ploughed due to a high rock content, ploughing prior to a controlled surface pick-up (CSP) will not be required as part of the Stage 3 archaeological assessment unless additional Stage 2 survey of the site indicates that the site continues into the agricultural field. However, because the surface area of Location 1 (AbHm-27) located beyond the woodlot is within a

portion of the property that may have good surface visibility, pedestrian survey of the area at one-metre intervals prior to the excavation of test units is recommended. The pedestrian survey at one-metre intervals will be followed by the hand excavation of Stage 3 test units every five metres in systematic levels and into the first five centimetres of subsoil. Additional one-metre test units, amounting to 20% of the grid total, will be placed in areas of interest within the site extent. All excavated soil will be screened through six millimetre mesh. All artifacts recovered will be recorded and catalogued by their corresponding grid unit designation. If a subsurface cultural feature is encountered, the plan of the exposed feature will be recorded, and geotextile fabric will be placed over the unit before backfilling the unit.

The unassessed portions of the study area retain archaeological potential and **are recommended for Stage 2 archaeological assessment.**

Stage 2 archaeological assessment will include test pit survey at five metre intervals in areas not accessible for ploughing (i.e. woodlot, meadow), as outlined in Section 2.1.2 Standard 1f of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The MTCS standards require that each test pit be approximately 30 centimetres in diameter, excavated to at least five centimetres into subsoil, and have all soil screened through six millimetre hardware cloth to facilitate the recovery of any cultural material that may be present. Prior to backfilling, each test pit will be examined for stratigraphy, cultural features, or evidence of fill.

Stage 2 archaeological assessment will also include the systematic walking of open ploughed fields at five metre intervals as outlined in Section 2.1.1 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The MTCS standards further require that all agricultural land, both active and inactive, be recently ploughed and sufficiently weathered to improve the visibility of archaeological resources. Ploughing must be deep enough to provide total topsoil exposure, but not deeper than previous ploughing, and must be able to ensure at least 80% ground surface visibility.

Should any additional areas of disturbance or features indicating that archaeological potential have been removed, including permanently wet areas and steep slopes, not previously identified during the Stage 1 property inspection be encountered during the Stage 2 archaeological assessment, they will be documented as outlined in Section 2.1.8 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

The MTCS is asked to accept this report into the *Ontario Public Register of Archaeological Reports*.

Personnel

Licensed Archaeologist:	Peter Popkin, Ph.D, CAHP, MClfA (P362)
Project Manager:	Peter Popkin, Ph.D, CAHP, MClfA (P362)
Licensed Field Director:	Darren Kipping, MA (P422)
GIS Specialist:	Dan Harvey
Report Writer:	Patrick Hoskins, MA (P415)
Quality Review:	Peter Popkin, Ph.D, CAHP, MClfA (P362)
Independent Review:	Colin Varley, MA, RPA (P002)

Acknowledgements

Ministry of Tourism, Culture and Sport	Robert von Bitter

1.0 PROJECT CONTEXT

1.1 DEVELOPMENT CONTEXT

Stantec Consulting Ltd. (Stantec) was retained by Dillon Consulting Ltd. (Dillon) on behalf of Waste Connections of Canada Inc. (Waste Connections) to conduct a Stage 2 archaeological assessment on a portion of the proposed Ridge Landfill Expansion Project (the Project) area, located on part of lots 13, 14, and 16, Concession 4 West of Communication Road, Geographic Township of Harwich, County of Kent, now Municipality of Chatham-Kent, Ontario. The Stage 2 assessment was conducted as part of the Environmental Assessment process associated with the Project under the *Environmental Assessment Act*.

The study area consists of three parcels with a total area of approximately 66.4 hectares (Figure 2). The eastern parcel is approximately 58.7 ha in area and is comprised of 53.2 ha of agricultural field, 4.1 ha of undeveloped wood lot and 1.4 ha of landscaped ground around a homestead. The northern parcel is an approximately 6.1 ha area comprised of dwarf apple tree orchard. The southwestern parcel is an approximately 1.6 ha area of grass around a homestead.

The full study area was not assessed because field conditions were not suitable at the time of the Stage 2 survey due to an exceptionally wet spring. At the request of the client, all fieldwork completed up to May 1, 2019 was documented in this report with the understanding that the unassessed areas of the study area will be subject to Stage 2 survey when field conditions allow.

1.1.1 Objectives

In compliance with the provincial standards and guidelines set out in the Ministry of Tourism, Culture and Sport's (MTCS) 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), the objectives of the Stage 2 property assessment are as follows:

- Document archaeological resources within the study area;
- Determine whether the study area contains archaeological resources requiring further assessment; and
- Recommend appropriate Stage 3 assessment strategies for archaeological sites identified.

Permission to enter the study area to conduct the archaeological assessment and remove archaeological resources was provided by Waste Connections with individual landowner consents.

1.2 HISTORICAL CONTEXT

1.2.1 Post-contact Indigenous Resources

In defining post-contact Indigenous resources, "Contact" is typically used as a chronological benchmark when discussing Indigenous archaeology in Canada and describes the contact between Indigenous and

European cultures. Contact in what is now the province of Ontario is broadly assigned to the 16th century (Loewen and Chapdelaine 2016).

The post-contact Indigenous occupation of southern Ontario was heavily influenced by the dispersal of various Iroquoian-speaking communities by the New York State Iroquois and the subsequent arrival of Algonkian-speaking groups from northern Ontario at the end of the 17th century and beginning of the 18th century (Konrad 1981; Schmalz 1991). By 1690, Algonkian speakers from the north appear to have begun to repopulate Bruce County (Rogers 1978:761). This is the period in which the Mississaugas are known to have moved into southern Ontario and the lower Great Lakes watersheds (Konrad 1981). In southwestern Ontario, however, members of the Three Fires Confederacy (Chippewa, Ottawa, and Potawatomi) were immigrating from Ohio and Michigan in the late 1700s (Feest and Feest 1978:778-779).

The study area falls within the lands of the archaeologically known Western Basin tradition. It has been suggested that the Western Basin people were of the Fire Nation, an Algonkian-speaking group pushed out of the territory now known as Ontario by the Iroquoian-speaking Neutral people in the early 17th century (Murphy and Ferris 1990). The Neutral, in turn, ceased to exist as an organized entity following the incursion of the New York Iroquois in 1650 (Heidenreich 1990). The Indigenous people who occupied this portion of what is now known as southwestern Ontario have been referred to as Anishinaabe or Anishinaabeg, Chippewa, and Ojibwa, an Algonquian-speaking people. According to traditional history, they were once one nation, but subdivisions occurred as people migrated to different areas. They were also known as the Three Fires Confederacy and acted together in political and military affairs through the 17th to 19th centuries.

Under British administration in the 19th century, the Indigenous groups were divided into separate bands. The Anishinaabe included the western Algonquian peoples, among them the Chippewa and the Odawa. Until the 18th century, the central Algonquian-speaking peoples, among them Potawatomi, were located in the Michigan Peninsula (Blackbird 1887). In the middle of the 18th century the Chippewa were located on the south shores of Lake Huron, the east shores of Georgian Bay, and on the west end of Lake Ontario. Indigenous peoples continue to play a large role in the occupation of the study area and its environs.

Following the American Revolutionary War (1775-1783), Britain focused on the settlement of European immigrants into what became the province of Upper Canada in 1791. To enable widespread settlement, the British government negotiated a series of treaties with Indigenous peoples. One of the earliest treaties involving lands associated with the study area was made on May 19, 1790. Originally identified as the Detroit Treaty, the chiefs of the Odawa, Chippewa, Pottawatomi, and Huron nations and representatives of the British Crown established a vast tract of land "*…from the Detroit River easterly to Catfish Creek and south of the river La Tranche [now Thames River] and Chenail Ecarté [now St. Clair River], and contains Essex County except Anderdon Township and Part of West Sandwich; Kent County except Zone Township, and Gores of Camden and Chatham; Elgin County except Bayham Township and parts of South Dorchester and Malahide…[i]n Middlesex County, Deleware and Westminster Township and part of North Dorchester*" (Morris 1943:17). Today, this treaty is identified as Treaty Number 2, illustrated by the letter "C" on Figure 3. As discussed in Section 1.2.2.3, geo-referencing of early maps provides inconsistences in spatial boundaries, so the boundaries of treaties shown on Figure 3 are approximate. A

plaque erected by the Historic Sites and Monuments Board of Canada further identifies this treaty as *McKee's Purchase*. A commemorative plaque located in the Blenheim Memorial Park in Blenheim, Ontario reads (Ontario Plaques 2018):

> *In May 1790 Alexander McKee, Deputy Agent of the British Indian Department, and the principal chiefs of the Ottawa, Potawatomi, Chippewa and Wyandot negotiated a treaty whereby the British Crown acquired title to what is now southwestern Ontario. This treaty completed the process begun with Niagara treaties of 1781 and 1784, with the result that most of the Ontario peninsula was soon opened to British and Loyalist settlement.*

As demonstrated above, the nature of Indigenous settlement size, population distribution, and material culture shifted as European settlers encroached upon Indigenous territory. However, despite this shift, "written accounts of material life and livelihood, the correlation of historically recorded villages to their archaeological manifestations, and the similarities of those sites to more ancient sites have revealed an antiquity to documented cultural expressions that confirms a deep historical continuity to…systems of ideology and thought" (Ferris 2009:114). As a result, Indigenous peoples of southern Ontario have left behind archaeologically significant resources throughout the region which show continuity with past peoples, even if they have not been explicitly recorded in Euro-Canadian documentation. Examples of Indigenous documentation (e.g., notations on early township survey plans and surveyor's field notes) are noted below.

1.2.2 Euro-Canadian Resources

French fur trappers and missionaries were the first Euro-Canadian explorers of the Lake Erie shoreline in present day Chatham-Kent. The earliest Euro-Canadian occupants of southern Ontario relied on Indigenous peoples to guide and supply indigenous watercraft and to transport people and materials. The first European to visit Lake Erie was most likely the interpreter and explorer Étienne Brûlé (Canadian Museum of History 2019), followed certainly by a small number of French missionaries or fur traders, as the imposing forest of Eastern white pine (*Pinus strobus*) led the French to name the peninsula Pointe Aux Pins.

The first exploration of the northern shore of Lake Erie was likely completed by Louis Jolliet on a return journey from surveying the copper mines of Lake Superior for the Governor of New France in AD 1669 (Kellogg 1917:191). On the return journey, Jolliet happened to encounter Rene Robert Cavelier, Sieur de La Salle and two Sulpician missionaries François Dollier de Casson and René Bréhent de Galinée (Kellogg 1917:191). Jolliet shared his observations and maps with the Sulpician missionaries who split from La Salle to travel into the interior of the Great Lakes region, determined to follow the route suggested by Jolliet (Parkman 1910). Travelling along the north shore of Lake Erie by canoe, Casson and Galinée provide the first description of Pointe aux Pins, camping there for a few days to replenish food supplies:

> *…we found ourselves in a place that appeared very suitable to put animals in and where there was plenty of game. We stopped there in the thought that we should not die of hunger, there being always a certainty of killing game enough to keep body and soul together, whilst the others were off looking for some animal. Our men went hunting accordingly, and after missing their aim*

> *at a herd of more than two hundred does that they came upon, vented their wrath on a poor wolf, which they skinned and brought to camp, and which was just about to be put in the kettle, when one of our men on the look-out told us that he perceived on the other side of a little lake, on the shore of which we were encamped, a herd of twenty or thirty does. We rejoiced at this news, and after we had arranged a plan for securing them, they were surrounded from behind so successfully that they were obliged to take to the water. They were immediately overtaken with the canoes, so that not a single one should have escaped if we had desired: but we selected those that appeared to us the best, and killed ten, letting the rest go.*
>
> (Kellogg 1917:202)

They named the bay on the west side of Pointe Aux Pins as “Ronde Eau” because of its somewhat round shape (Historic ‘Ronde Eau’ n.d.).

Because of the protective tree canopy, ample wildlife, and strategic location between French forts in Detroit and Niagara, Pointe Aux Pins became an important stopping point for French soldiers, traders, and missionaries. In 1763, New France was ceded to Great Britain as per the terms of the Treaty of Paris.

1.2.2.1 Kent County

The initial Euro-Canadian presence in Kent County included French-Canadian traders and missionaries who were based out of Fort Detroit in present day Essex County. The French often used Point Aux Pins, now Rondeau Provincial Park, as a camp site (Armstrong 1985:3) After the conclusion of the Seven Years War in 1763, the Treaty of Paris ceded New France to Great Britain. New France was reorganized into the Province of Quebec, and French rights in the colony were secured through the passage of the *Quebec Act* in 1774. However, the Quebec Act further inflamed tensions with the 13 Colonies, who wished to settle lands in the Ohio Valley that were now part of Quebec (Dagenais 2013). The second Treaty of Paris was signed in 1783, which recognized the independence of the United States of America.

Frederick Haldimand, Governor of Canada, wished to attract United Empire Loyalists leaving the United States to Canada (Craig 1963:4-5). In June 1791, the *Constitution Act*, or *Canada Act*, was given royal assent, and the Province of Quebec was divided into Upper and Lower Canada (Craig 1963:17). Upper Canada was created to settle United Empire Loyalists. John Graves Simcoe was chosen to be the first Lieutenant Governor of Upper Canada (Craig 1963:20). Simcoe had ambitious plans for Upper Canada and aimed to mold it into “the very image and transcript of that of Great Britain” (Taylor 2007:9).

Simcoe reorganized Upper Canada into four districts and 19 counties. On July 26, 1792, Simcoe established Kent County (Lauriston 1952:43). The original borders of Kent County were larger and included present day Lambton County. The Municipal Act of 1850 abolished districts in the province and separated Lambton County from Kent County (Belden 1881:49).

After 1850, Kent County comprised 10 townships, Camden, Chatham, Dover, Howard, Orford, Raleigh, Romney, Tilbury East, Zone, and Harwich, where the study area is located. Kent County was bordered on the north by Lambton County, the east by Middlesex and Elgin Counties, the west by the St. Clair River, Lake St. Clair, and Essex County. Lake Erie is the southern border of Kent County. The county

encompassed 574,210 acres and 5,776 square kilometres (Belden 1881:45). Similar to the southern portions of Lambton County, Kent County initially contained vast tracts of low lying marshy and swampy areas. As a result, once cleared and properly drained, the land became a fertile agricultural block. The major centre of trade in Kent County became the Town of Chatham, situated on the Thames River, and linked to the rest of the province by the Great Western Railway (Belden 1881:53). Kent County remained primarily agricultural through the 20th century, but other economic activities included oil extraction (Lauriston 1952:420) and manufacturing (Francis 2012).

In the 1990s, the provincial government embarked on a program of municipal amalgamations. In 1997, Dr. Peter Meyboom, the appointed provincial restructuring commissioner, announced in a binding decision that the separate 22 municipalities of Kent County would be merged into a single municipality named Chatham-Kent. The amalgamation of Kent County into the single tier municipality of Chatham-Kent was completed in 1998 (Francis 2012).

1.2.2.2 Geographic Township of Harwich

The first survey in Harwich Township was undertaken in 1792 by Patrick McNiff (Ontario Genealogical Society 2006) and 1795 by Abraham Iredell. Iredell was instructed to lay out a road named Communication Road from Rondeau Bay to Chatham and use it as a baseline for laying out 200-acre lots on each side. Simcoe intended these lots to be settled by Loyalists (Belden 1881:53). The first settlers arrived in Harwich in 1796 and settled close to present-day Chatham. The first settler was Thomas Clark, who lived along the river in present-day Chatham. Most of these settlers were Late Loyalists, and not part of the original groups of Loyalists who arrived in Canada after the American Revolution (Belden 1881:53).

The initial wave of Loyalist and Late Loyalist settlers ended after the War of 1812, when British officials began to discourage American immigration and place restrictions on land grants for Americans (Taylor 2007:31). In the 1820s, part of Harwich Township came under the administration of Thomas Talbot's settlement scheme. The Talbot Road, one of the best maintained roads in Southwestern Ontario, was extended into Harwich Township, and settlers under Talbot's direction began to receive lots in the southern part of Harwich. Overall, settlement in Harwich Township proceeded slowly (Lauriston 1952:267-268). Talbot preferred settlers from the British Isles, and many of the settlers to arrive in Harwich after the War of 1812 were of Scottish origin (Lauriston 1952:270).

By the 1850s, much of the land in Harwich Township was settled, and the population of the township in 1851 was 2,627 (Armstrong 1985:95). From 1850 to about 1875 the lumber industry played an important role in the township, as settlers began to clear *en masse* the dense forests of the township. Settlers initially used slash and burn clearing methods and exported the ash or used it for soap making (Armstrong 1985:52). As the 19th century progressed, sawmills were built throughout the township, and industries such as cabinet making took place in Harwich. Much of the lumber was also exported to the United States until 1866, when the Reciprocity Agreement between the United States and Canada ended (Armstrong 1985:53-54). The most important village in Harwich Township was Blenheim, which started as a milling site. The opening of a post office at Blenheim spurred further growth, and it became the main agricultural trading spot in the township. In 1875, Blenheim was incorporated as a village (Belden 1881:54).

The population of Harwich Township in 1881 stood at 6,410, an increase of 436 since 1871 (Armstrong 1985:95). By the 1880s, the lumber industry in Harwich had declined, and agriculture became the driving economic force. Most farmers practiced mixed farming with a combination of crops, orchards, and pastureland. Some farmers had specialized farms that grew either corn, tobacco, beans, or fruit (Armstrong 1985:111). The 1880 *Illustrated Historical Atlas of the County of Kent, Ontario* (Belden 1881) shows the extent to which Harwich Township was settled by the late 19th century. In addition to the early communities of Blenheim, Shrewsbury, and West Troy, settlement of the township was focused along major roadways (i.e., Communication Road and Kent Bridge Road). Rondeau (Point aux Pins) is depicted as being surveyed with a road running north to south connecting Kent Bridge Road to the pier at the south end opening to Lake Erie.

At the start of the 20th century, Harwich Township continued to remain rural and agricultural. Blenheim continued to be the largest town in Harwich and was home to the township's main feed mills, flour mills, and saw mills (Armstrong 1985:117-118). During the 1910s, efforts were undertaken to reclaim the swampy lands of the township that bordered Rondeau Bay and Lake Erie, and by 1920 much of the acreage in the southern part of the township became cultivatable (Armstrong 1985:164-165). The effects of the Great Depression during the 1930s depressed prices for farm products, bringing hardship to many Harwich farmers. Relief efforts in the township included "welfare gardens," and the purchasing of a woodlot for township men to clear (Armstrong 1985:198-199).

In the post-war period, a new influx of immigrants arrived in Harwich Township, primarily from war torn portions of Europe. Increases in population led to the construction of a drinking water pipeline from Lake Erie to service the township, replacing well water. New residential subdivisions were constructed in Blenheim and an industrial park was opened in the 1970s (Armstrong 1985:253). In 1971, the population of Harwich Township was 6,905 (Statistics Canada 1972). In 1998, Harwich Township became part of the new Municipality of Chatham-Kent.

1.2.2.3 Historic Map Review

Historic maps can often provide information on land tenure and historic features throughout the townships. In discussing the late 19th century historical mapping, however, it must be remembered that historical county atlases were produced primarily to identify factories, offices, residences, and landholdings of subscribers and were funded by subscription fees. Landowners who did not subscribe were not always listed on the maps (Caston 1997:100). Therefore, all structures were not necessarily depicted or placed accurately (Gentilcore and Head 1984). Review of historic mapping also has inherent accuracy difficulties due to potential error in geo-referencing. Geo-referencing is conducted by assigning spatial coordinates to fixed locations and using these points to spatially reference the remainder of the map. Due to changes in fixed locations over time (e.g., road intersections), errors/difficulties of scale and the relative idealism of the historic cartography, historic maps may not translate accurately into real space points. This may provide obvious inconsistencies during the historic map review. The historical mapping that was reviewed for this project is shown in Figures 4 to 6.

Historical maps for the Township of Harwich reviewed consisted of the 1831 Harwich Township Patent Plan (Burwell 1831) (Figure 4), the 1876 Map of Kent Country (Shackleton and McIntosh 1876) (Figure 5), and the 1880 map of Harwich Township from the *Illustrated Historical Atlas of the Counties of Essex*

and Kent (Belden 1881) (Figure 6). The landowners for the 1831 and 1876 maps are depicted in Tables 1 and 2. The 1880 map did not depict any landowners for the lots.

Table 1: Land Owners Listed on 1831 Harwich Township Patent Plan

Lot	Conc.	Portion	Grantee	Euro-Canadian Features
13	4 West of Communication Road	Whole	George Young	No features depicted
14		Whole	Janet McKeller	No features depicted
16		Whole	Illegible	No features depicted

Table 2: Land Owners Listed on 1876 Map of the County of Kent

Lot	Conc.	Portion	Grantee	Euro-Canadian Features
13	4 West of Communication Road	Southeast quarter	F. McFuggan	No features depicted
		Southwest quarter	L. Kelly	No features depicted
		Central quarter	J. & C. Irving	No features depicted
		North quarter	S. Irving	No features depicted
14		Whole	W. & J. Keefer	No features depicted
16		South half	J. McGibbin	No features depicted
		North half	J. Drury	No features depicted

1.3 ARCHAEOLOGICAL CONTEXT

1.3.1 The Natural Environment

The study area is situated across the St. Clair Clay Plain physiographic region. The St. Clair Clay Plain is an extensive area of clay plains covering 5,880 square kilometres in Essex, Kent, and Lambton counties. The region is fairly flat with little relief, lying between approximately 175 to 215 metres above sea level. The area during the glacial period was covered by Glacial Lake Whittlesey and Lake Warren, which failed to leave deep stratified beds of sediment on the underlying clay (Chapman and Putnam 1984:147). The region is mostly of underlying limestone, with some areas of black shale. The majority of the region has a history of poor drainage, which required the installation of dredged ditches and tile underdrains to have satisfactory conditions for crop growth and tillage. (Chapman and Putnam 1984:149).

Soils within the study area consists of Brookston clay. Brookston clay is poorly drained and has a mottled heavy clay subsoil. Occasional sandy knolls are present with Brookston clay.

An unnamed drain crosses through the eastern parcel. Lake Ontario is approximately four kilometres to the south of the study area.

1.3.2 Pre-contact Indigenous Resources

This portion of southwestern Ontario has been occupied by Indigenous peoples since the retreat of the Wisconsin glacier approximately 11,000 years ago. Much of what is understood about the lifeways of these Indigenous peoples is derived from archaeological evidence and ethnographic analogy. In Ontario, Indigenous culture prior to the period of contact with European peoples has been distinguished into cultural periods based on observed changes in material culture. These cultural periods are largely based in observed changes in formal lithic tools, and separated into the Early Paleo-Indian, Late Paleo-Indian, Early Archaic, Middle Archaic, and Late Archaic periods. Following the advent of ceramic technology in the Indigenous archaeological record, cultural periods are separated into the Early Woodland, Middle Woodland, and Late Woodland periods, based primarily on observed changes in formal ceramic decoration. It should be noted that these cultural periods do not necessarily represent specific cultural identities but are a useful paradigm for understanding changes in Indigenous culture through time. Table 3 provides a general outline of the cultural chronology of the study area, summarized from Ellis and Ferris (1990).

Table 3: Generalized Cultural Chronology of the Study Area

Period	Characteristics	Time	Comments
Early Paleo-Indian	Fluted Projectiles	9000 – 8400 B.C.	spruce parkland/caribou hunters
Late Paleo-Indian	Hi-Lo Projectiles	8400 – 8000 B.C.	smaller but more numerous sites
Early Archaic	Kirk and Bifurcate Base Points	8000 – 6000 B.C.	slow population growth
Middle Archaic	Brewerton-like Points	6000 – 2500 B.C.	environment similar to present
Late Archaic	Narrow Point	2500 – 1800 B.C.	increasing site size
	Broad Point	1800 – 1500 B.C.	large chipped lithic tools
	Small Point	1500 – 1100 B.C.	introduction of bow hunting
Terminal Archaic	Hind Points	1100 – 950 B.C.	emergence of true cemeteries
Early Woodland	Meadowood Points	950 – 400 B.C.	introduction of pottery
Middle Woodland	Couture Corded Pottery	400 B.C. – A.D. 500	increased sedentism
	Riviere au Vase Phase	A.D. 500 – 800	seasonal hunting and gathering
Late Woodland	Younge Phase	A.D. 800 – 1200	incipient agriculture
	Springwells Phase	A.D. 1200 – 1400	agricultural villages
	Wolf Phase	A.D. 1400 – 1550	earth worked villages, warfare
Contact Indigenous	Various Algonkian and Iroquoian Groups	A.D. 1600 – 1875	early written records and treaties
Historic	French/Euro-Canadian	A.D. 1749 – present	European settlement

Local environmental conditions were significantly different from what they are today. Ontario's first peoples would have crossed the landscape in small groups in search of food, particularly migratory game species. In this area, caribou may have been a Paleo-Indian diet staple, supplemented by wild plants, small game, birds, and fish. Given the low density of populations on the landscape at this time and their mobile nature, Paleo-Indian sites are small and ephemeral. Such sites are sometimes identified by the

presence of fluted points. Sites are frequently located adjacent to the shorelines of large glacial lakes (Ellis and Deller 1990).

Archaeological records indicate subsistence changes around 8000 B.C. at the start of the Archaic Period in southwestern Ontario. Since the large mammal species that formed the basis of the Paleo-Indian diet became extinct or moved north with the warming of the climate, Archaic populations had a more varied diet, exploiting a range of plants and bird, mammal, and fish species. Reliance on specific food resources like fish, deer, and several nut species became more noticeable through the Archaic Period and the presence of warmer, more hospitable environs led to expansion of group and family sizes. In the archaeological record, this is evident in the presence of larger sites. The coniferous forests of earlier times were replaced by stands of mixed coniferous and deciduous trees by about 4000 B.C. The transition to more productive environmental circumstances led to a rise in population density. As a result, Archaic sites become more abundant over time. Artifacts typical of these occupations include a variety of stemmed and notched projectile points; chipped stone scrapers; ground stone tools (e.g., celts, adzes) and ornaments (e.g., bannerstones, gorgets); bifaces or tool blanks; animal bone; and chert waste flakes, a byproduct of the tool making process (Ellis et al. 1990).

Significant changes in cultural and environmental patterns occurred in the Early and Middle Woodland periods (*circa* 950 B.C. to A.D. 800). Occupations became increasingly more permanent in this period, culminating in major semi-permanent villages by roughly 1,000 years ago. Archaeologically, the most significant changes by Woodland peoples were the appearance of artifacts manufactured from modeled clay and the emergence of more sedentary villages. The earliest pottery was crudely made by the coiling method and early house structures were simple oval enclosures. The Early and Middle Woodland periods are also characterized by extensive trade in raw materials, objects and finished tools, with sites in Ontario containing trade items with origins in the Mississippi and Ohio River valleys (Spence et al. 1990).

By the Late Woodland period there was a distinctive cultural occupation in southwestern Ontario, including Essex, Kent, and Lambton counties. The primary Late Woodland occupants of the area were populations described by archaeologists as Western Basin Tradition. Murphy and Ferris (1990:189) indicate that these people had ties with populations in southeastern Michigan and northwestern Ohio and represent an *in situ* cultural development from the earlier Middle Woodland groups. The Western Basin Tradition seems to have been centred in the territory comprising the eastern drainage basin of Lake Erie, Lake St. Clair, and the southern end of Lake Huron. The Western Basin Tradition is divided up into four phases based on differences in settlement and subsistence strategies and pottery attributes.

1.3.3 Registered Archaeological Sites and Surveys

In Canada, archaeological sites are registered within the Borden system, a national grid system designed by Charles Borden in 1952 (Borden 1952). The grid covers the entire surface area of Canada and is divided into major units containing an area that is two degrees in latitude by four degrees in longitude. Major units are designated by upper case letters. Each major unit is subdivided into 288 basic unit areas, each containing an area of 10 minutes in latitude by 10 minutes in longitude. The width of basic units reduces as one moves north due to the curvature of the earth. In southern Ontario, each basic unit measures approximately 13.5 kilometres east-west by 18.5 kilometres north-south. In northern Ontario,

adjacent to Hudson Bay, each basic unit measures approximately 10.2 kilometres east-west by 18.5 kilometres north-south. Basic units are designated by lower case letters. Individual sites are assigned a unique, sequential number as they are registered. These sequential numbers are issued by the MTCS who maintain the *Ontario Archaeological Sites Database*. The project area is located within Borden block AbHm.

Information concerning specific site locations is protected by provincial policy and is not fully subject to the *Freedom of Information and Protection of Privacy* Act (Government of Ontario 1990a). The release of such information in the past has led to looting or various forms of illegally conducted site destruction. Confidentiality extends to all media capable of conveying location, including maps, drawings, or textual descriptions of a site location. The MTCS will provide information concerning site location to the party or an agent of the party holding title to a property, or to a licensed archaeologist with relevant cultural resource management interests.

An examination of the *Ontario Archaeological Sites Database* has shown that six archaeological sites have been registered within one kilometre of the study area (Table 4) (Government of Ontario 2019a). A query of the *Ontario Public Register of Archaeological Reports* indicates that there have been four previous archaeological studies undertaken within the study area or within 50 metres of the study area and are detailed below (Government of Ontario 2019b).

Table 4: Registered Sites within One Kilometre of the Study Area

Borden Number	Site Name	Cultural Affiliation	Site Type
AbHm-1	Charing Cross	Unknown Pre-contact	Findspot
AbHm-2	Erieau	Unknown Pre-contact	Scatter
AbHm-7		Late Woodland	Campsite; scatter
AbHm-13		Euro-Canadian	Dump
AbHm-19	AbHm-19-P2	Unknown Pre-contact	Campsite
AbHm-20	P3	Unknown Pre-contact	Findspot

1.3.4 Summary of Previous Investigations

Archaeological Services Inc. (ASI) carried out a Stage 1 archaeological assessment for the proposed Ridge Landfill Expansion (ASI 2017). The Stage 1 assessment found that much of the land for the proposed Ridge Landfill Expansion had been previously assessed by Dillon (1997a, 1997b, 1998) and did not require further assessment. ASI determined that portions of the property, including the current study area, retained archaeological potential and was recommended for further work (Figure 7).

Dillon conducted a Stage 2 archaeological on the lands adjacent to the current study area (Dillon 1997a). The assessment consisted of a mix of test pit and pedestrian surveys and resulted in the identification of the Charring Cross (AbHm-1) and Erieau (AbHm-2) sites, three Euro-Canadian scatters and one pre-contact Indigenous lithic findspot (see Tile 1 in the Supplementary Documentation). Charring Cross (AbHm-1) comprised a non-diagnostic projectile point base and mid-section fragment. Erieau (AbHm-2) comprised a biface and two lithic flakes. Of the sites, only Erieau (AbHm-2) was recommended for further

work (1997a). The Stage 3 assessment of Erieau (AbHm-2) consisted of a controlled surface pick-up and excavation of five test units and resulted in the recovery of 19 artifacts, including lithic fragments and faunal remains (Dillon 1997b). Erieau (AbHm-2) was recommended for Stage 4 mitigation (Dillon 1997b). The Stage 4 mitigation consisted of topsoil stripping of the site with no additional artifacts being recovered (Dillon 1998). No further work was recommended for Erieau (AbHm-2).

1.3.5 Existing Conditions

The study area consists of three parcels with a total area of approximately 66.4 hectares. The eastern parcel is approximately 58.7 ha in area and is comprised of 53.2 ha of agricultural field, 4.1 ha of undeveloped wood lot and 1.4 ha of landscaped ground around a homestead. The northern parcel is an approximately 6.1 ha area comprised of dwarf apple tree orchard. The southwestern parcel is an approximately 1.6 ha area of grass around a homestead.

2.0 FIELD METHODS

As discussed in Section 1.3.5, the study area comprises three parcels with a total area of approximately 66.4 ha and consists of agricultural field, undeveloped wood lot, orchard, homesteads, and lawns. The Stage 2 archaeological assessment was conducted under PIF P362-0250-2019 issued to Peter Popkin, Ph.D., CAHP, MCIfA by the MTCS. The Stage 2 survey was carried out between April 24, 2019 and May 1, 2019, during which the weather was overcast and cool (Table 5). Because the spring of 2019 was so wet, the agricultural fields within the study area had not yet been ploughed when the survey was scheduled, so these portions of the study area were not subject to Stage 2 survey. Similarly, the grassed area around farmstead at the west end of the study area was too wet to undergo Stage 2 survey. In total, approximately 54 hectares have not yet been subject to Stage 2 survey (approximately 82% of the total study area). All other portions of the study area (approximately 12.4 hectares total) have been subject to Stage 2 survey. At no time were the field or weather conditions detrimental to the recovery of archaeological material in the areas that were subject to Stage 2 survey. Figure 8 provides an illustration of the assessment methods, as well as photograph locations and directions.

Table 5: Weather and Field Conditions during the Stage 2 Survey

Date	Activity	Weather	Field Conditions
April 24, 2019	Test Pit Survey	Overcast, cool	Soils friable and dry
April 29, 2019	Test Pit Survey	Overcast, cool	Soils friable and dry
April 30, 2019	Test Pit Survey	Overcast, cool	Soils friable and dry
May 1, 2019	Test Pit Survey	Overcast, cool	Soils friable and dry

Approximately 11% of the study area was subject to test pit survey at a five metre interval (Photos 1 to 3) in accordance with Section 2.1.2 of the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Where disturbed test pits were encountered further test pits were excavated throughout the study area at a 10 metre interval to confirm the area was completely disturbed (approximately 0.4% of the total study area), as per Section 2.1.8 of the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Each test pit was approximately 30 centimetres in diameter and excavated five centimetres into sterile subsoil. The soils were then examined for stratigraphy, cultural features, or evidence of fill. Test pits were approximately 25 centimetres deep. All soil was screened through six millimetre hardware cloth to facilitate the recovery of small artifacts and then used to backfill the pit. All test pits were backfilled after excavation.

In accordance with Section 2.1.3 Standard 1 of the MTCS' 2011 *Standards and Guidelines* (Government of Ontario 2011), when archaeological resources were encountered during the Stage 2 test pit survey, the test pit excavation continued on the survey grid to determine the extent of further positive test pits. UTM coordinates were recorded for all positive test pits using a Topcon FC-25A handheld GPS unit with Magnet Field software. All UTM coordinates are located in zone 17T and are based upon the North American Datum 1983 (NAD83). All artifacts were collected and recorded according to their associated positive test pit. When the initial finds of the test pit assessment were insufficient to determine the need

for additional Stage 3 archaeological assessment, the archaeological location was intensified in accordance with Section 2.1.3 Standard 2 (Option A) of the MTCS' 2011 *Standards and Guidelines* (Government of Ontario 2011).

A portion of the study area to the east of a woodlot within Lot 13, Concession 4, was beyond the boundaries of the woodlot itself, but unploughable due to the high rock content of the area (Photo 7). The area is elevated relative to the surrounding agricultural fields. Stantec was informed by the client that that portion of the property was planted with seed, but never subject to deep ploughing due to the potential for damage to the agricultural equipment. Because the ground visibility within that portion of the study area was close to what might be expected within a typical agricultural field, that portion of the study area was surveyed by pedestrian survey at one-meter intervals as well as test pit survey at five-meter intervals (Figure 8). This area is approximately 0.5 hectares in size (0.7% of the total study area).

Location 1 (AbHm-27) was located partially within a very rocky portion of agricultural field that was planted but not subject to ploughing and partially within the adjacent woodlot (see Tile 2 in the Supplementary Documentation). The unploughed area beyond the woodlot was subject to pedestrian survey at one metre intervals as well as test pit survey at five metre intervals. For each surface find identified, the artifact was collected and a UTM coordinate was taken. As Location 1 measured more than 10 by 10 metres in area, five UTM coordinates were recorded for the site as per Section 5, Standard 2 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). All UTM coordinates were taken using a Topcon GRS-1 handheld GPS unit with Magnet Field software at an accuracy of four metres. All UTM coordinates are located in zone 17T and are based upon the North American Datum 1983 (NAD83).

Some portions of the study area were identified as previously disturbed (approximately 1.1% of the total study area) and some portions of the study area were identified as low and wet (approximately 5.3% of the total study area) (Photos 8 to 13). These areas were not subject to further assessment as per Section 2.1 Standard 2a and b of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The previously disturbed and low and wet areas were photo documented as per Section 7.8.6 Standard 1b of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

3.0 RECORD OF FINDS

The Stage 2 archaeological assessment was conducted employing the methods described in Section 2.0. An inventory of the documentary record generated by fieldwork is provided in Table 6. One new archaeological location was identified during the Stage 2 survey of the study area: Location 1 (AbHm-27). Maps illustrating exact site locations do not form part of this public report, rather they are found in the Supplementary Documentation.

Table 6: Inventory of Documentary Record

Document Type	Current Location of Document Type	Additional Comments
17 pages of field notes	Stantec office, Markham	In original field book and photocopied in project file
1 map provided by Client	Stantec office, Markham	Hard and digital copies in project file
78 digital photographs	Stantec office, Markham	Stored digitally in project file

All the material culture collected during the Stage 2 archaeological survey of the study area is contained in one Bankers box, labeled by location number. The box will be temporarily housed at the Stantec London office until formal arrangements can be made for a transfer to an MTCS collections facility.

3.1 LOCATION 1 (AbHm-27)

Location 1 (AbHm-27) was identified during a combination of test pit and pedestrian survey. The Stage 2 assemblage comprises 21 pre-contact indigenous artifacts. Of these, six were recovered from six positive test pits, six were recovered from a single test unit, and nine were recovered as surface finds. Artifacts associated with Location 1 (AbHm-27) were recovered from an area measuring approximately 75 metres by 38 metres. All artifacts were collected and retained for analysis. An artifact summary for the Stage 2 archaeological assessment of Location 1 (AbHm-27) is provided in Table 7 and a sample of the artifacts are illustrated in Plate 1.

Table 7: Location 1 (AbHm-27) Artifact Summary

Artifact	Frequency	%
Chipping detritus	17	80.95
Core	2	9.52
Retouched flake	1	4.76
Utilized flake	1	4.76
Total	**21**	**100.0**

3.1.1 Raw Material

For any pre-contact Aboriginal lithic artifacts recovered, chert type identifications were accomplished visually using reference materials located in the Stantec London office. Two lithic material types were identified within the Stage 2 artifact assemblage: Onondaga chert and Kettle Point chert.

Chert is a naturally occurring mineral found in sedimentary rocks that is a granular crystalline form of quartz, composed of cryptocrystalline and microcrystalline crystals (Eley and von Bitter 1989). Raw material acquisition and procurement strategies have long been theorized in academic literature. Some researchers suggest that raw material choices are purely utilitarian (e.g. Deller 1979; Ellis 1989; Parker 1986a, 1986b; Roosa 1977; and Whitthoft 1952), while others suggest non-utilitarian reasons (e.g. Wheat 1971; Wormington 1957; Simmons et al. 1984; and Hall 1993). Regardless of the reason, chert type identification and their respective quantities within a particular assemblage provide an opportunity to evaluate numerous archaeological variables, including: group mobility and sedentism, lithic reduction strategy and technique, transportation, trade, and symbolism.

Of the 21 lithic materials recovered, 11 were manufactured from Kettle Point chert and 10 were manufactured from Onodaga chert.

Onondaga formation chert is from the Middle Devonian age, with outcrops occurring along the north shore of Lake Erie between Long Point and the Niagara River (Eley and von Bitter 1989). It is a high-quality raw material frequently utilized by pre-contact people and often found at archaeological sites in southern Ontario. Onondaga chert occurs in nodules or irregular thin beds, it is a dense non-porous rock that may be light to dark grey, bluish grey, brown or black and can be mottled with a dull to vitreous or waxy luster (Eley and von Bitter 1989).

Kettle Point formation chert is from the Late Devonian age and is situated between the Kettle Point (Late Devonian shales) and the Ipperwash Formations (Middle Devonian Limestone). It occurs as submerged outcrops that extend approximately 1,350 metres into Lake Huron (Janusas 1984). Secondary deposits have been reported in Essex County (Janusas 1984) and in the Ausable Basin (Kenyon 1980; Eley and Von Bitter 1989). Kettle Point chert can be identified by the presence of a waxy lustre and occurs in a wide range of colours including brown, grey and greenish colours as well as reddish purple and dark blue varieties (Eley and von Bitter 1989). A rusty staining on the surface of artifacts is frequently noted (Fisher 1997).

3.1.2 Chipping Detritus

The Stage 2 archaeological assessment of Location 1 (AbHm-27) recovered 17 pieces of chipping detritus. All recovered flakes were subject to morphological analysis following the classification scheme described by Lennox et al. (1986) and expanded upon by Fisher (1997). The results of the morphological analysis of the chipping detritus are presented in Table 8.

Table 8: Chipped Stone Debitage Analysis

Material	Primary		Secondary		Tertiary		Broken		Shatter		Micro		Total Analyzed	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Onondaga	0	0.00	0	0.00	4	23.53	5	29.41	0	0.00	0	0.00	9	52.94
Kettle Point	0	0.00	2	11.76	2	11.76	4	23.53	0	0.00	0	0.00	8	47.06
Total	**0**	**0.00**	**2**	**11.76**	**6**	**35.29**	**9**	**52.94**	**0**	**0.00**	**0**	**0.00**	**17**	**100.00**

Primary flakes feature dorsal surfaces that are either entirely covered with cortex or have substantial visible cortex present. Secondary flakes can also have a trace of cortex on the dorsal surface. Both varieties, along with shatter, are associated with early stages of lithic reduction as chert cores or flint nodules are converted into blanks or preforms. Tertiary flakes and micro flakes are produced during the further reduction of blanks and preforms into formal tool shapes. They are the result of precise flake removal through pressure flaking, where the maker applies direct pressure onto a specific part of the tool in order to facilitate flake removal. Pressure flaking generally produces smaller, thinner flakes than does percussion flaking. Broadly, primary, secondary, and shatter flakes indicate early stages of lithic reduction, while, tertiary and micro flakes indicate later stages of the reduction sequence.

Broken flakes were most often encountered within the Stage 2 assemblage, comprising 52.94%, with tertiary (35.29%) and secondary flakes (11.76%) also recovered. No primary, shatter or micro flakes were identified. A sample of the chipping detritus recovered from Location 1 (AbHm-27) is presented in Plate 1.

The morphological analysis of the chipped stone debitage indicates that the lithic practices at the site consist mainly of the re-sharpening and finishing of formal tools from prepared blanks. Primary reduction activities, from which primary, secondary, and shatter flakes would be created, were most likely being conducted at a different location. The distribution of Onondaga (52.94%) and Kettle Point (47.06%) cherts suggests that the people at Location 1 (AbHm-27) were utilizing two sources of raw material.

3.1.3 Core

Also recovered from the Stage 2 assessment of Location 1 (AbHm-27) were two Kettle Point chert cores. Cores are used as sources of raw material for tool and blank production. A sample of cores recovered from Location 1 (AbHm-27) is presented in Plate 1.

3.1.4 Expedient Lithic Tools

Retouched flakes are fragments of chipping detritus that display chipping or sharpening marks along their edges and are flakes from which further flakes have been struck. Utilized flakes are chipping detritus that show evidence of expedient use and are considered informal tools that were discarded after use. Spokeshaves are similar to retouched flakes but have pronounced concave, semi-circular use-edges. One retouched flake, showing retouch on both lateral edges and manufactured from Kettle Point chert, was recovered from Location 1 (AbHm-27). One utilized flake, showing use wear on its lateral edge and manufactured form Onondaga chert, was recovered from Location 1 (AbHm-27) (Plate 1).

3.1.5 Location 1 (AbHm-27) Artifact Catalogue

The complete artifact catalogue of the Stage 2 artifact assemblage recovered from Location 1 (AbHm-27) is presented in Table 9.

Table 9: Location 1 (AbHm-27) Artifact Catalogue

Cat. #	Subunit or Context	Depth (m)	Artifact	Quantity	Chert	Morph.	Comments
1	surface find 001	0	retouched flake	1	Kettle Point		retouch on both lateral edges, dorsal side
2	surface find 002	0	chipping detritus	1	Kettle Point	tertiary	
3	surface find 003	0	chipping detritus	1	Kettle Point	broken	
4	surface find 004	0	chipping detritus	1	Onondaga	broken	
5	surface find 005	0	core	1	Kettle Point		
6	surface find 006	0	chipping detritus	1	Kettle Point	secondary	
7	surface find 007	0	core	1	Kettle Point		
8	surface find 008	0	chipping detritus	1	Kettle Point	broken	
9	surface find 009	0	chipping detritus	1	Kettle Point	broken	
10	test pit 1		chipping detritus	1	Onondaga	tertiary	
11	test pit 10		chipping detritus	1	Onondaga	broken	
12	test pit 13		chipping detritus	1	Kettle Point	tertiary	
13	test pit 22		chipping detritus	1	Onondaga	tertiary	
14	test pit 31		chipping detritus	1	Kettle Point	secondary	
15	test unit 1	0.21	chipping detritus	2	Onondaga	tertiary	
16	test unit 1	0.21	chipping detritus	3	Onondaga	broken	
17	test unit 1	0.21	utilized flake	1	Onondaga		use wear on lateral edge, dorsal side
18	test pit 40		chipping detritus	1	Kettle Point	broken	

4.0 ANALYSIS AND CONCLUSIONS

The Stage 2 archaeological assessment for a portion of the proposed Ridge Landfill Expansion identified one pre-contact Indigenous archaeological site referred to here as Location 1 (AbHm-27). Maps identifying exact site locations do not form part of this public report; they may be found in the Supplementary Documentation.

The Stage 2 assessment of Location 1 (AbHm-27) resulted in the recovery of a lithic scatter of 21 pre-contact Indigenous artifacts. The site area includes six positive test pits, one positive test unit and nine surface artifacts over an area 75 metres by 38 metres. The pre-contact Indigenous assemblage is comprised of 17 pieces of chipping detritus, 2 cores, 1 retouched flake, and 1 utilized flake.

Chipping detritus is the waste product from the production of lithic tools and is the most often recovered artifact on pre-contact Aboriginal archaeological sites in southern Ontario. Chipping detritus, along with utilized and retouched flakes, are generally considered to be temporally non-diagnostic other than being produced by pre-contact Aboriginal peoples. For this reason, artifacts such as these cannot help place the archaeological site within a specific time period or cultural group.

Despite the non-diagnostic nature of the artifacts recovered from Location 1 (AbHm-27), the site represents a spatially discrete cluster of pre-contact Indigenous artifacts. Six pre-contact lithic artifacts were recovered from a single test unit fulfilling the criteria to require a Stage 3 archaeological investigation as per Section 2.2 Standard 1a(ii)(2) of the MTCS' 2011 *Standards and Guidelines* (Government of Ontario 2011). Therefore, a Stage 3 archaeological assessment is recommended for Location 1 (AbHm-27) to further evaluate the site's cultural heritage value or interest.

5.0 RECOMMENDATIONS

Based on the Stage 2 assessment of the study area completed to date, the following recommendations are made:

Location 1 (AbHm-27) fulfills the criteria for Stage 3 archaeological investigation as per Section 2.2 Standard 1a(ii)(2) of the MTCS' 2011 *Standards and Guidelines* (Government of Ontario 2011). Therefore, **Stage 3 archaeological assessment is recommended for Location 1 (AbHm-27) to further evaluate the site's cultural heritage value or interest**.

Further, because Location 1 (AbHm-27) extends to the edge of an agricultural field that has not yet been subject to Stage 2 archaeological survey (see Tile 3 in the Supplementary Documentation), additional Stage 2 survey of the site should be conducted for a minimum of 20 metres within the agricultural field after it has been suitably ploughed and weathered to confirm the southern extent of the site.

The Stage 3 archaeological assessment will be conducted according to the procedures outlined in the MTCS' 2011 *Standards and Guidelines* (Government of Ontario 2011). As Location 1 (AbHm-27) is located in an area that is not suitable to be ploughed due to a high rock content, ploughing prior to a controlled surface pick-up (CSP) will not be required as part of the Stage 3 archaeological assessment unless additional Stage 2 survey of the site indicates that the site continues into the agricultural field. However, because the surface area of Location 1 (AbHm-27) located beyond the woodlot is within a portion of the property that may have good surface visibility, pedestrian survey of the area at one-metre intervals prior to the excavation of test units is recommended. The pedestrian survey at one-metre intervals will be followed by the hand excavation of Stage 3 test units every five metres in systematic levels and into the first five centimetres of subsoil. Additional one-metre test units, amounting to 20% of the grid total, will be placed in areas of interest within the site extent. All excavated soil will be screened through six millimetre mesh. All artifacts recovered will be recorded and catalogued by their corresponding grid unit designation. If a subsurface cultural feature is encountered, the plan of the exposed feature will be recorded, and geotextile fabric will be placed over the unit before backfilling the unit.

The unassessed portions of the study area retain archaeological potential and **are recommended for Stage 2 archaeological assessment.**

Stage 2 archaeological assessment will include test pit survey at five metre intervals in areas not accessible for ploughing (i.e. woodlot, meadow), as outlined in Section 2.1.2 Standard 1f of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The MTCS standards require that each test pit be approximately 30 centimetres in diameter, excavated to at least five centimetres into subsoil, and have all soil screened through six millimetre hardware cloth to facilitate the recovery of any cultural material that may be present. Prior to backfilling, each test pit will be examined for stratigraphy, cultural features, or evidence of fill.

Stage 2 archaeological assessment will also include the systematic walking of open ploughed fields at five metre intervals as outlined in Section 2.1.1 of the MTCS' 2011 *Standards and Guidelines for*

Consultant Archaeologists (Government of Ontario 2011). The MTCS standards further require that all agricultural land, both active and inactive, be recently ploughed and sufficiently weathered to improve the visibility of archaeological resources. Ploughing must be deep enough to provide total topsoil exposure, but not deeper than previous ploughing, and must be able to ensure at least 80% ground surface visibility.

Should any additional areas of disturbance or features indicating that archaeological potential have been removed, including permanently wet areas and steep slopes, not previously identified during the Stage 1 property inspection be encountered during the Stage 2 archaeological assessment, they will be documented as outlined in Section 2.1.8 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

The MTCS is asked to accept this report into the *Ontario Public Register of Archaeological Reports*.

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c O.18 (Government of Ontario 1990b). The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* (Government of Ontario 1990b) for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the *Ontario Heritage Act* (Government of Ontario 1990b).

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990b). The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990b).

The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (Government of Ontario 2002) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence.

7.0 BIBLIOGRAPHY AND SOURCES

Archaeological Services Inc. 2017. *Stage 1 Archaeological Assessment, Ridge Landfill Expansion, Part of Lots 13-25, Concessions 1-4 West of Communication Road and Part of Lots 19-25, Concession 1 East of Communication Road (former Township of Harwich, County of Kent), Municipality of Chatham-Kent, Ontario.* PIF Number P1066-0026-2017. Report on file with the Ministry of Tourism, Culture and Sport.

Armstrong, Alvin. 1985. *The First 200 Years of Blenheim and South Harwich*. Blenheim: Blenheim News-Tribune.

Belden, H. 1881. *Illustrated Historical Atlas of the Counties of Essex and Kent*. Toronto: H. Belden and Co.

Blackbird, Andrew J. 1887. *History of the Ottawa and Chippewa Indians of Michigan*. Ypsilanti Job Print House. Electronic document: http://eco.canadiana.ca/view/oocihm.00429#oocihm.00429/3?r=0&s=1&_suid=142558197786609233669627186604. Last accessed May 24, 2019.

Borden, Charles E. 1952. A Uniform Site Designation Scheme for Canada. *Anthropology in British Columbia*, No. 3, 44-48.

Caston, Wayne A. 1997. Evolution in the Mapping of Southern Ontario and Wellington County. *Wellington County History* 10:91-106.

Canadian Museum of History. 2019. Étienne Brûlé 1615-1621. Electronic Document: https://www.historymuseum.ca/virtual-museum-of-new-france/the-explorers/etienne-brule-1615-1621/ Last Accessed May 30, 2019.

Chapman, L.J. and Putnam, D.F. 1984. *The Physiography of Southern Ontario*. Third Edition. Ontario Geological Survey. Special Volume 2. Ontario: Ministry of Natural Resources.

Craig, Gerald. 1963. *Upper Canada: The Formative Years*. Don Mills: Oxford University Press.

Dagenais, Maxime. 2013. *Quebec Act*. Electronic Document: http://www.thecanadianencyclopedia.ca/en/article/quebec-act/. Last Accessed: May 24, 2019.

Deller, D.B. 1979. Paleo-Indian Reconnaissance in the Counties of Lambton and Middlesex, Ontario. *Ontario Archaeology* 26:3-20.

Dillon Consulting Ltd. 1997a. *BFI Ridge Landfill Expansion Blenheim – Archaeological Assessment Stage 2: Archaeological Assessment Final Report.* Report on file with the Ministry of Tourism, Culture and Sport.

Dillon Consulting Ltd. 1997b. *BFI Ridge Landfill Archaeological Assessment of Expansion Site, Stage 3: Archaeological Testing of the Erieau Site.* Report on file with the Ministry of Tourism, Culture and Sport.

Dillon Consulting Ltd. 1998. *BFI Ridge Landfill Archaeological Assessment of Expansion Site, Stage 4: Archaeological Mitigation of the Erieau Site.* Report on file with the Ministry of Tourism, Culture and Sport.

Eley, B. E. and P. H. von Bitter. 1989. *Cherts of Southern Ontario*. Royal Ontario Museum, Toronto.

Ellis, C.J. 1989. The Explanation of Northeastern Paleoindian Lithic Procurement Patterns. In *Eastern Paleoindian Lithic Resource Use*, edited by C.J. Ellis and J. Lothrop. Pp. 139-164. Boulder, CO: Westview Press.

Ellis, Chris J. and D. Brian Deller. 1990. Paleo-Indians. In Ellis and Ferris 1990, pp. 37-64.

Ellis, Chris J., Ian T. Kenyon, and Michael W. Spence. 1990. The Archaic. In Ellis and Ferris 1990, pp. 65-124.

Ellis, Chris J. and Neal Ferris (editors). 1990. *The Archaeology of Southern Ontario to A.D. 1650*. Occasional Publication of the London Chapter, Ontario Archaeological Society, Number 5.

Feest, Johanna E. and Christian F. Feest 1978. The Ottawa. In *Handbook of North American Indians*. Vol.15 Northeast, pp. 772-786. B.G. Trigger, ed. Washington: Smithsonian Institute.

Ferris, Neal. 2009. *The Archaeology of Native-Lived Colonialism: Challenging History in the Great Lakes*. Tucson: University of Arizona Press.

Fisher, J. A. 1997. *The Adder Orchard Site: Lithic Technology and Spatial Organization in the Broadpoint Late Archaic*. Occasional Publications of the London Chapter, OAS, Number 3.

Francis, Daniel. 2012. Chatham-Kent. Electronic Document: http://www.thecanadianencyclopedia.ca/en/article/chatham-kent/. Last Accessed: May 24, 2019.

Gentilcore, R. Louis and C. Grant Head. 1984. *Ontario's History in Maps*. Toronto: University of Toronto Press.

Government of Ontario. 1990a. *Freedom of Information and Protection of Privacy Act, R.S.O. 1990, CHAPTER F.31*. Last amendment: December 6, 2018. Electronic document: https://www.ontario.ca/laws/statute/90f31. Last accessed May 24, 2019.

Government of Ontario. 1990b. *Ontario Heritage Act, R.S.O. 1990, CHAPTER O.18*. Last amendment: April 3, 2018, c. 33, Sched. 11, s. 6. Electronic document: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90o18_e.htm. Last accessed May 24, 2019.

Government of Ontario. 2002. *Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, CHAPTER 33.* Last amendment: December 14, 2017. Electronic document: https://www.ontario.ca/laws/statute/02f33. Last accessed May 24, 2019.

Government of Ontario. 2011. *Standards and Guidelines for Consultant Archaeologists***.** Toronto: Ministry of Tourism, Culture and Sport.

Government of Ontario. 2019a. Sites within a one Kilometre Radius of the Study Area Provided from the *Ontario Archaeological Sites Database*.

Government of Ontario. 2019b. Archaeological Assessments Completed with the Study Area or within 50 Metres of the Study Area Provided from the *Ontario Public Register of Archaeological Reports*.

Hall, Robert L. 1993. A Pan-Continental Perspective on Red Ocher and Glacial Kame Ceremonialism. In *Lulu Linear Punctated: Essays in Honor of George Irving Quimby*. Edited by R.C. Dunnell and D.K. Grayson. Pp. 75-107. Anthropological Papers, Museum of Anthropology, University of Michigan, No. 72.

Heidenreich, Conrad E. 1990. History of the St. Lawrence-Great Lakes Area to A.D. 1650. In Ellis and Ferris 1990, pp.475-492.

Historic 'Ronde Eau.' n.d. *A History of Rondeau Provincial Park*. On File at Stantec.

Janusas, S. 1984. *Petrological Analysis of Kettle Point Chert and Its Spatial and Temporal Distribution in Regional Prehistory*. National Museums of Canada, Ottawa.

Kellogg, Louise Phelps. 1917. *Early Narratives of the Northwest 1634-1699*. Original Narratives of American History. New York: Charles Scribner's Sons.

Kenyon, I. 1980. The Satchell Complex in Ontario: A Perspective from the Ausable Valley. *Ontario Archaeology.* 34: 17-43.

Konrad, Victor. 1981. An Iroquois Frontier: The North Shore of Lake Ontario during the late Seventeenth Century. *Journal of Historical Geography* 7(2): 129-144.

Lauriston, Victor. 1952. *Romantic Kent: More Than Three Centuries of History, 1626-1952*. Wallaceburg: Standard Press.

Lennox, P., C. Dodd, and C. Murphy. 1986. *The Wiacek Site: A Late Middleport Component, Simcoe County*. Ontario Ministry of Transportation and Communications, London.

Loewen, Brad and Claude Chapdelaine (editors). 2016. *Contact in the 16th Century: Networks among Fishers, Foragers and Farmers*. Mercury Series Archaeology Paper 176. Ottawa: University of Ottawa Press.

Morris, J.L. 1943. *Indians of Ontario*. 1964 reprint. Toronto: Department of Lands and Forests.

Murphy, Carl and Neil Ferris. 1990. The Late Woodland Western Basin Tradition in Southwestern Ontario. In Ellis and Ferris 1990, pp. 189-278.

Ontario Genealogical Society. 2006. Tracing your family in Kent County. Electronic Document: https://ogs.on.ca/wp-content/uploads/sites/17/2017/11/Kent-Tracing-Your-Family-ISBN-1-55075-752-0.pdf. Last Accessed: May 24, 2019.

Ontario Plaques. 2018. *McKee's Purchase / L'achat de McKee*. Electronic Document: http://ontarioplaques.com/Plaques/Plaque_ChathamKent29.html Last accessed May 24, 2019.

Parker, L. 1986a. Haldimand Chert: A Preferred Raw Material in Southwestern Ontario During the Early Holocene Period. *KEWA* 86(4):4-21

Parker, L. 1986b. *Haldimand Chert and its Utilization During the Early Holocene Period in Southwestern Ontario*. Unpublished MA Thesis, Department of Geology, Brock University, St. Catherines, Ontario.

Parkman, Francis. 1910. *La Salle and the Discovery of the Great West: France and England in North America, Part Third*. Boston: Little Brown and Company.

Rogers, Edward S. 1978. Southeastern Ojibwa. In *Handbook of North American Indians*, Vol. 15 Northeast, pp. 760-771. B.G. Trigger, ed. Washington: Smithsonian Institute Press.

Roosa, W.B. 1977. Great Lakes Paleo-Indian: The Parkhill Site, Ontario. *Annals of the New York Academy of Sciences* 288:349-354.

Schmalz, Peter S. 1991. *The Ojibwa of Southern Ontario*. Toronto: University of Toronto Press.

Simmons, D.L., M. Shott, and H.T. Wright. 1984. The Gainey Site: Variability in a Great lakes Paleo-Indian Assemblage. *Archaeology of Eastern North America* 12:266-279.

Spence, Michael W., Robert H. Pihl, and Carl Murphy. 1990. Cultural Complexes of the Early and Middle Woodland Periods. In Ellis and Ferris 1990, pp. 125-170.

Statistics Canada. 1972. 1971 Census of Canada, Population Electoral Districts. Electronic Document: http://publications.gc.ca/collections/collection_2017/statcan/CS92-703-1971.pdf. Last Accessed: May 24, 2019.

Taylor, Alan. 2007. The Late Loyalists: Northern Reflections of the Early American Republic. *Journal of the Early Republic*, Vol. 27, No. 1:1-34.

Wheat, Joe Ben. 1971. Lifeways of Early Man in North America. *Arctic Anthropology* 8(2):22-31.

Whitthoft, J. 1952. A Paleo-Indian Site in Eastern Pennsylvania: An Early Hunting Culture. *Proceedings of the American Philosophical Society* 96(4):464-495.

Wormington, H.M. 1957. *Ancient Man in North America*. Denver Museum of Natural History, Popular Series #4.

8.0 IMAGES

8.1 PHOTOGRAPHS

Photo 1: Test pit survey at five metre intervals, facing northeast

Photo 2: Test pit survey at five metre intervals, facing southeast

Photo 3: Test pit survey at five metre intervals, facing northeast

Photo 4: Test pit intensification at Location 1 (AbHm-27), facing west-southwest

Photo 5: Test unit excavation at Location 1 (AbHm-27), facing east

Photo 6: Test unit south wall profile, facing south

Photo 7: Pedestrian survey at one metre interval at Location 1 (AbHm-27), facing northeast

Photo 8: Existing house, yard and parking area, previously disturbed – not surveyed, facing southeast

Photo 9: Demolished barn, previously disturbed – not surveyed, facing west

Photo 10: Existing house, previously disturbed – not surveyed, facing southeast

Photo 11: Buried watermain within orchard, facing southeast

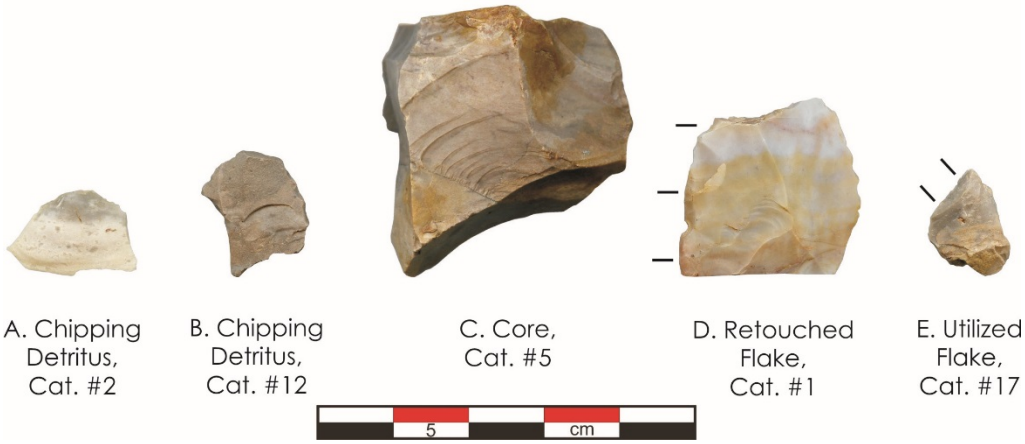
Photo 12: Piled field stones at edge of woodlot, facing southeast

Photo 13: Low and wet area – not surveyed, facing north

Images
June 17, 2019

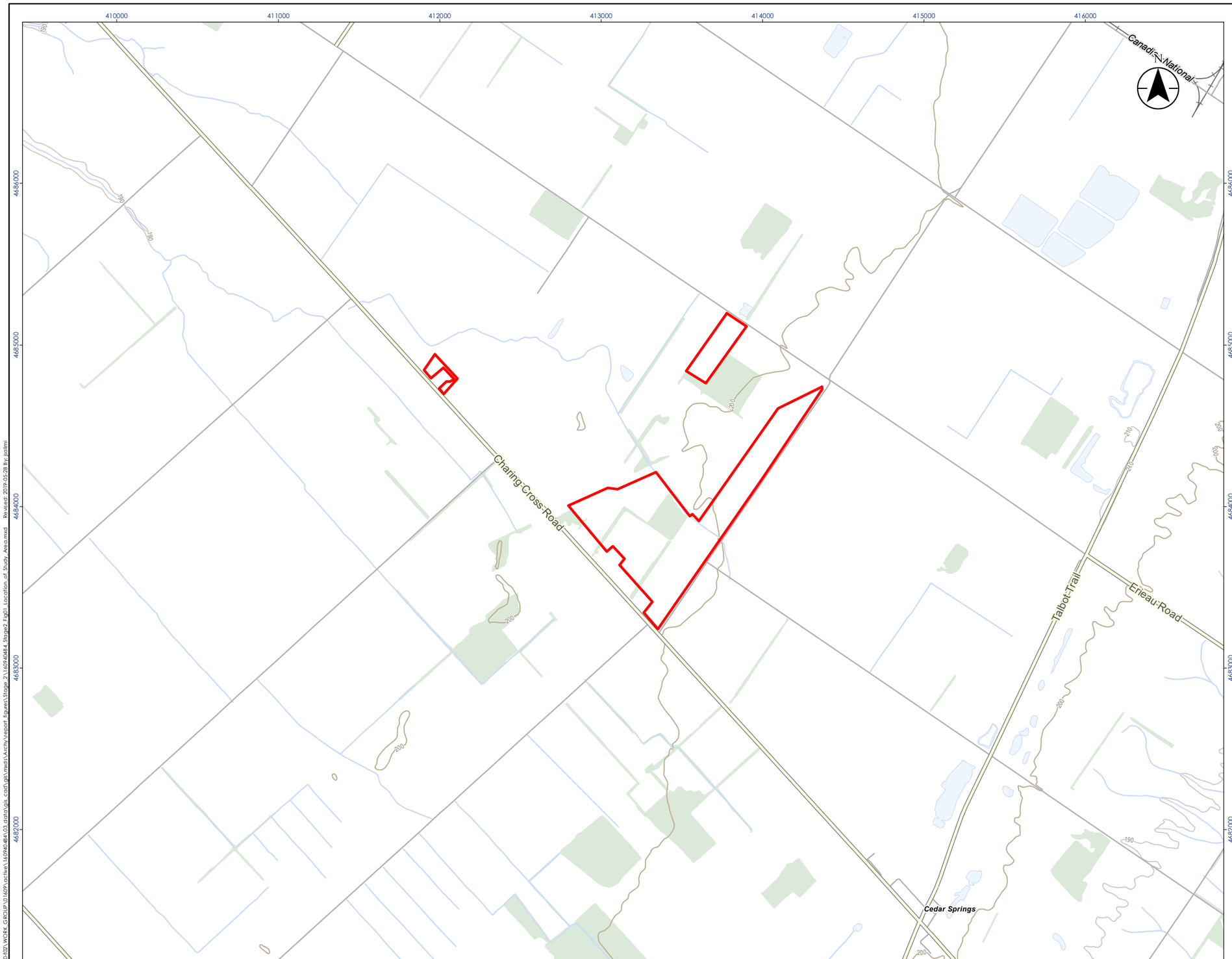
8.2 ARTIFACTS

Plate 1: Sample of Lithic Artifacts Recovered from Location 1 (AbHm-27)



9.0 MAPS

All maps will follow on succeeding pages.



Stantec

Legend

- Study Area
- Contour
- Major Road
- Railway
- Watercourse
- Waterbody
- Wooded Area

0 0.5 1 km

1:24,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.

Project Location
Municipality of Chatham-Kent,

160940484 REVA
Prepared by JS on 2019-05-28
Independent Review by CDV on 2019-05-31

Client/Project
DILLON CONSULTING LIMITED
RIDGE LANDFILL EXPANSION
STAGE 2

Figure No.
1

Title
Location of the Study Area

\\cat1201f02.WORK_GROUP\01609\active\160940484\03_data\gis_cad\gis\mxd\Arcmy\report_figures\Stage_2\160940484_Stage2_Fig01_Location_of_Study_Area.mxd Revised: 2019-05-28 By: jsalmi

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Stantec

Legend

- Study Area
- Watercourse
- Waterbody

0 250 500 Metres

1:10,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Orthographic Imagery Source: © 2019 Microsoft Corporation © 2019 DigitalGlobe ©CNES (2019) Distribution Airbus DS © 2019 HERE
Image Date: Unknown

Project Location
Municipality of
Chatham-Kent,

160940484 REVA
Prepared by JS on 2019-05-28
Independent Review by CDV on 2019-05-31

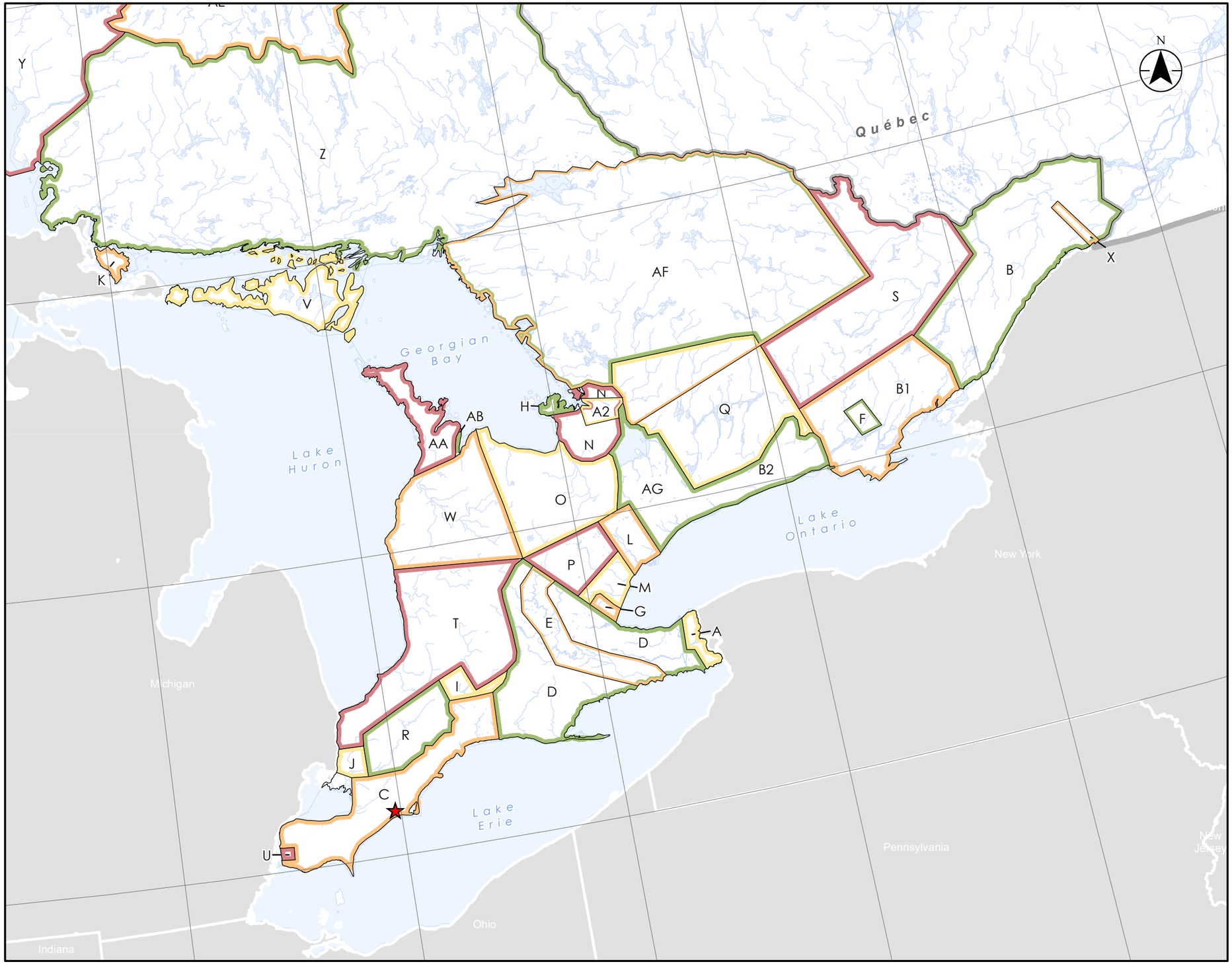
Client/Project
DILLON CONSULTING LIMITED
RIDGE LANDFILL EXPANSION
STAGE 2

Figure No.
2

Title
Location of the Study Area – Detail

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

X:\ca\120\02\WORK_GROUP\01\609\active\160940484\03_data\gis_cad\gis\mxd\Activity\report_Figures\Stage_2\160940484_Stage2_Fig02_StudyArea_Detail.mxd Revised: 2019-05-28 By: jstami



Stantec

Legend

- Study Area
- Waterbody

A Treaty No. 381, May 9th, 1781 (Mississauga and Chippewa)
AA Treaty No. 72, October 30th, 1854 (Chippewa)
AB Treaty No. 82, February 9th, 1857 (Chippewa)
AE Treaty No. 9, James Bay 1905, 1906 (Ojibway and Cree)
AG Williams Treaty, October 31st, 1923 (Chippewa)
A2 John Collins' Purchase, 1785 (Chippewa)
B Crawford's Purchase, October 9th, 1783 (Algonquin and Iroquois)
B1 Crawford's Purchase, October 9th, 1783 (Mississauga)
B2 Crawford's Purchase, 1783, 1787, 1788 (Mississauga)
C Treaty No. 2, May 19th, 1790 (Odawa, Chippewa, Pottawatomi, and Huron)
D Treaty No. 3, December 2nd, 1792 (Mississauga)
E Haldimand Tract: from the Crown to the Mohawk, 1793
F Tyendinaga: from the Crown to the Mohawk, 1793
G Treaty No. 3 3/4: from the Crown to Joseph Brant, October 24th, 1795
H Treaty No. 5, May 22nd, 1798 (Chippewa)
I Treaty No. 6, September 7th, 1796 (Chippewa)
J Treaty No. 7, September 7th, 1796 (Chippewa)
K Treaty No. 11, June 30th, 1798 (Chippewa)
L Treaty No. 13, August 1st, 1805 (Mississauga)
M Treaty No. 13A, August 2nd, 1805 (Mississauga)
N Treaty No. 16, November 18th, 1815 (Chippewa)
O Treaty No. 18, October 17th, 1818 (Chippewa)
P Treaty No. 19, October 28th 1818 (Chippewa)
Q Treaty No. 20, November 5th, 1818 (Chippewa)
R Treaty No. 21, March 9th, 1819 (Chippewa)
S Treaty No. 27, May 31st, 1819 (Mississauga)
T Treaty No. 27½, April 25th, 1825 (Ojibwa and Chippewa)
U Treaty No. 35, August 13th, 1833 (Wyandot or Huron)
W Treaty No. 45½, August 9th, 1836 (Saugeen)
X Treaty No. 57, June 1st, 1847 (Iroquois of St. Regis)
Y Treaty No. 60, Robinson, Superior, September 7th, 1850 (Ojibwa)
Z Treaty No. 61, Robinson, Huron, September 9th, 1850 (Ojibwa)

0 50 100 Km
1:3,000,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 Statistics Canada Lambert
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Treaty boundaries adapted from Morris 1943 (1964 reprint). For cartographic representation only.

Project Location
Municipality of

160940484 REVA
Prepared by JS on 2019-05-28
Independent Review by CDV on 2019-05-31

Client/Project
DILLON CONSULTING LIMITED
RIDGE LANDFILL EXPANSION
STAGE 2

Figure No.
3

Title
Treaties and Purchases (Adapted from Morris 1943)

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

\\cd1220-f02\WORK GROUP\01609\active\160940484\03 data\gis_cad\gis\mxd\Archy\report Figures\Stage 2\160940484_Stage2_Fig03_Treaties.mxd Revised: 2019-05-28 By: jadimi

Stantec

Legend

Study Area

(MAP NOT TO SCALE)

Notes

1. Historical Map reference: Burwell, A. 1831. Harwich Township

Project Location
Municipality of Chatham-Kent,

160940484 REVA
Prepared by JS on 2019-05-28
Independent Review by CDV on 2019-05-31

Client/Project
DILLON CONSULTING LIMITED
RIDGE LANDFILL EXPANSION
STAGE 2

Figure No.
4

Title
Portion of 1831 Harwich Township Patent Plan

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

\\cd1220101\WORK_GROUP\01609\active\160940484\03_data\gis_cad\gis\mxds\Activ\report figures\Stage 2\160940484_Stage2_Fig04_Portion_of_1831_HistoricalMap_County_of_Kent.mxd Revised: 2019-05-28 By: jsalmi

(MAP NOT TO SCALE)

Notes

1. Historical Map reference:Shackleton, J.W. and F.J. McIntosh. 1876. Map of the County of Kent in the Province of Ontario, Dominion of Canada. Chatham. .

Project Location
Municipality of Chatham-Kent,

160940484 REVA
Prepared by JS on 2019-05-28
Independent Review by CDV on 2019-05-31

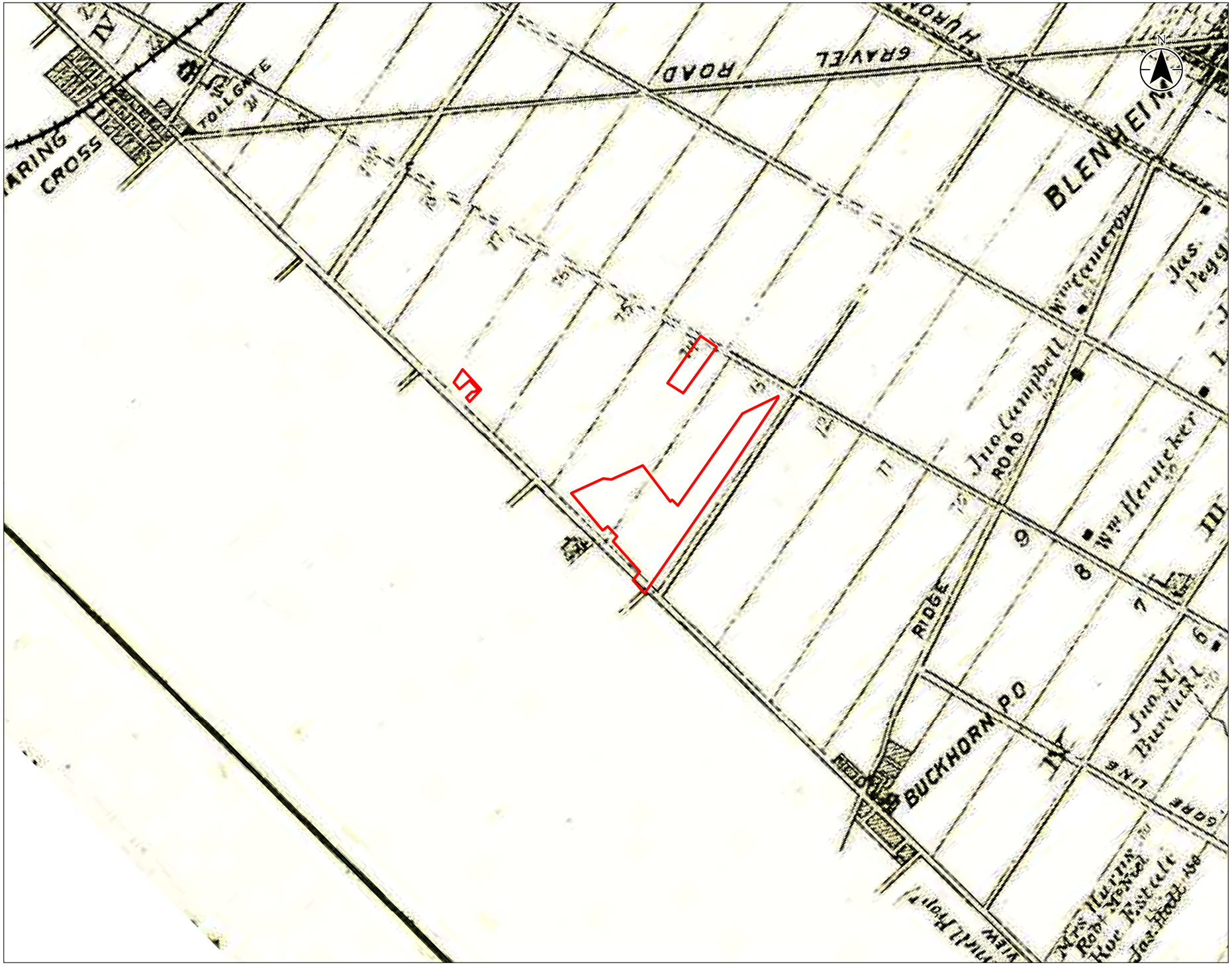
Client/Project
DILLON CONSULTING LIMITED
RIDGE LANDFILL EXPANSION
STAGE 2

Figure No.
5

Title
Portion of the 1876 Map of the County of Kent

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

\\cd1220-f01.WORK GROUP\01609\active\160940484\03 data\gis\mxds\Ashley report figures\Stage 2\160940484_Stage2_Fig05_Portion of 1876 HistoricalMap County of Kent.mxd Revised 2019-05-28 By: jpalmi



Stantec

Legend

Study Area

(MAP NOT TO SCALE)

Notes

1. Historical Map reference:1881. Illustrated Historical Atlas of the Counties of Essex and Kent, 1880-1881. Toronto: H. Belden & Co.

Project Location
Municipality of Chatham-Kent,

160940484 REVA
Prepared by JS on 2019-05-28
Independent Review by CDV on 2019-05-31

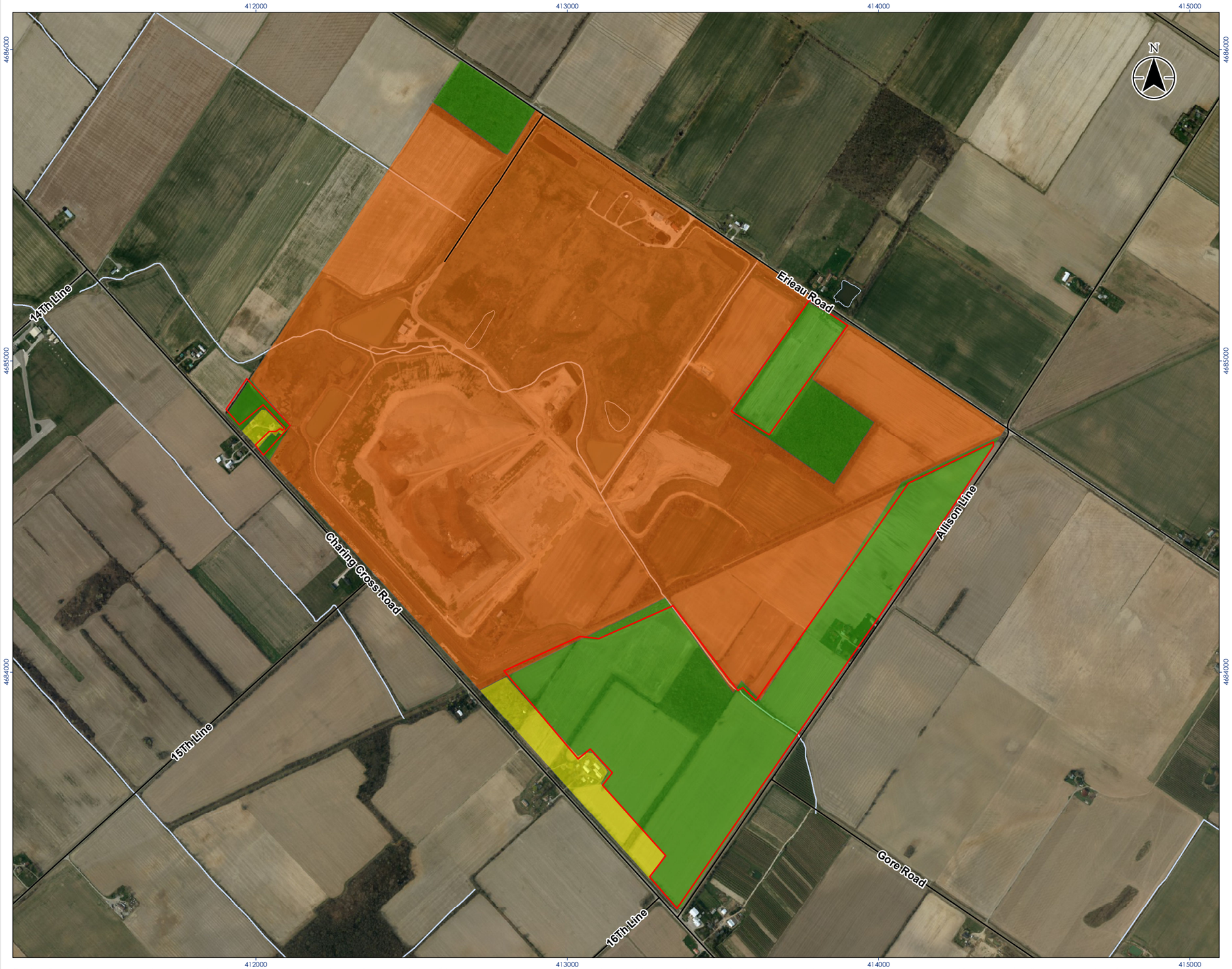
Client/Project
DILLON CONSULTING LIMITED
RIDGE LANDFILL EXPANSION
STAGE 2

Figure No.
6

Title
Portion of the 1880 Illustrated Historical Atlas of the Township of Harwich

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

\\Cd1220-f02\WORK GROUP\01609\active\160940484\03 data\gis_cad\gis\mxd\Archy\report Figures\Stage 2\160940484 Stage2 Fig06 Portion of 1880 HistoricalAtlas Harwich.mxd Revised: 2019-05-28 By: jksimi



Stantec

Legend

- Watercourse
- Waterbody
- Study Area

Previous Archaeological Assessment (ASI 2017)

- Archaeological Potential - Requires Stage 2 Archaeological Survey (ASI 2017)
- Disturbed - No Archaeological Potential, No Further Archaeological Work Required (ASI 2017)
- Previously Assessed, No Further Archaeological Work Required (Dillon 1997a, 1997b and 1998)

0 250 500 Metres

1:12,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Orthoimagery © First Base Solutions, 2018. Imagery taken in 2010.

Project Location
Municipality of Chatham-Kent,

160940484 REVA
Prepared by JS on 2019-05-31
Independent Review by CDV on 2019-05-31

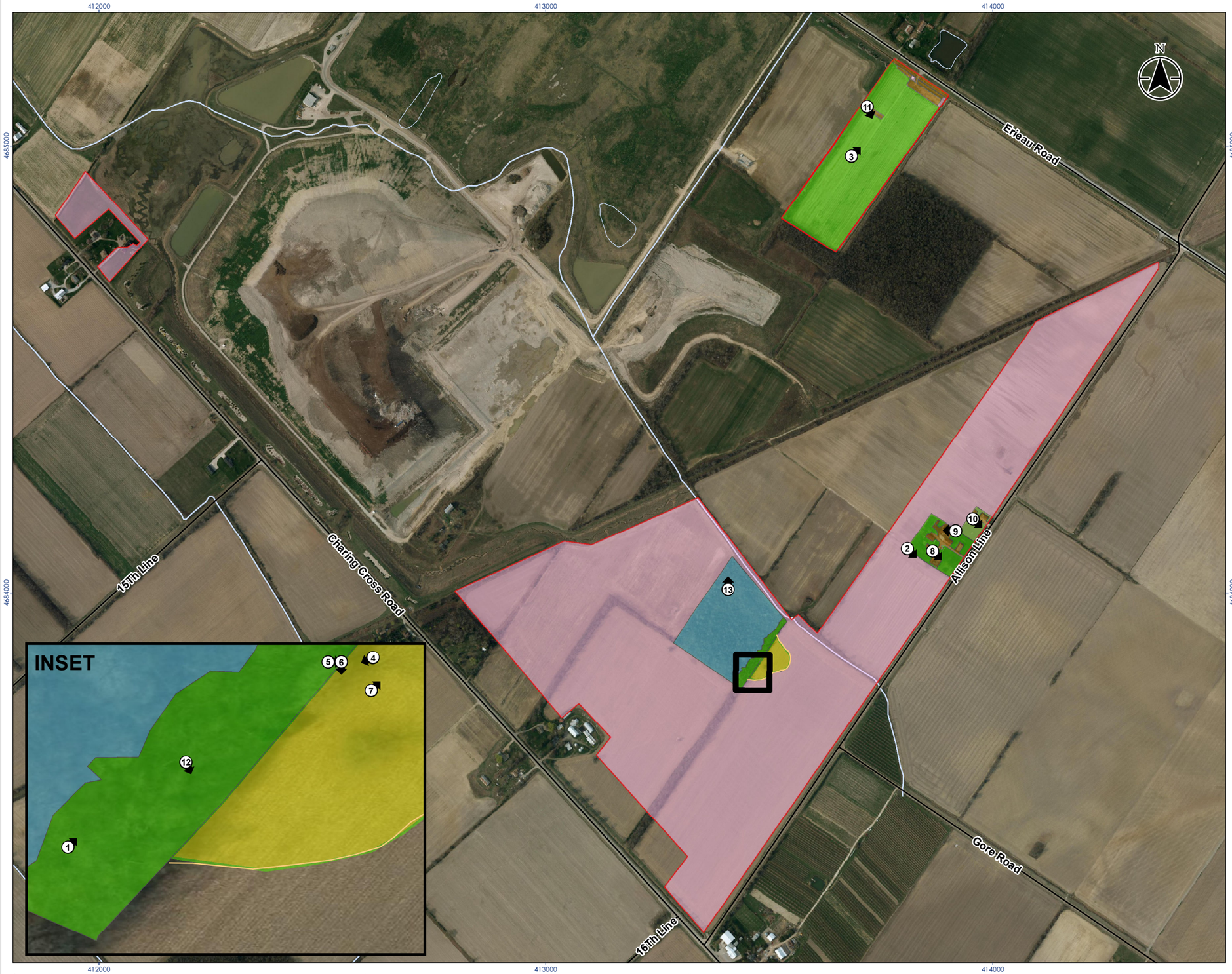
Client/Project
DILLON CONSULTING LIMITED
RIDGE LANDFILL EXPANSION
STAGE 2

Figure No.
7

Title
Previous Archaeological Assessments

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

\\cd2210f01\WORK_GROUP\01659\active\160940484\03_data\gis_cad\gis\mxds\Activity\report_figures\Stage 2\160940484_Stage2_Fig07_Previous_Arch_Assess.mxd Revised: 2019-05-31 By: jsdmi



Stantec

Legend

- Photo Location and Direction'
- Watercourse
- Waterbody
- Slope Edge
- Study Area

Stage 2 Archaeological Assessment Methods

- Not surveyed, Retains Archaeological Potential - Stage 2 Survey Required
- Low and Wet Area, Low to No Archaeological Potential - No Further Archaeological Work Required
- Previously Disturbed, Low to No Archaeological Potential - No Further Archaeological Work Required
- Pedestrian Survey at 1 m Intervals and Test Pit Survey at 5 m Intervals
- Test Pit Survey, 5 m Intervals
- Test Pit Survey, 10 m Intervals

0 250 500 Metres

1:8,750 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Orthoimagery © First Base Solutions, 2018. Imagery taken in 2010.

Project Location
Municipality of Chatham-Kent,

160940484 REVA
Prepared by JS on 2019-05-31
Independent Review by CDV on 2019-05-31

Client/Project
DILLON CONSULTING LIMITED
RIDGE LANDFILL EXPANSION
STAGE 2

Figure No.
8

Title
Stage 2 Archaeological Assessment Methods

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

\\cd2210101\WORK_GROUP\01659\active\160940484\03_data\gis_cad\gis\mxds\Activity\report_figures\Stage_2\160940484_Stage2_Fig08_Arch_Methods_Result.mxd Revised: 2019-05-31 By: jksimi

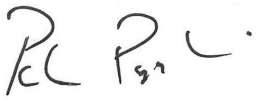
10.0 CLOSURE

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential archaeological resources associated with the identified property.

All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report and are based solely on the scope of work described in the report, the limited data available and the results of the work. The conclusions are based on the conditions encountered by Stantec at the time the work was performed. Due to the nature of archaeological assessment, which consists of systematic sampling, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire property.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report. We trust this report meets your current requirements. Please do not hesitate to contact us should you require further information or have additional questions about any facet of this report.

Quality Review 

(signature)

Peter Popkin, Associate, Senior Archaeologist

Independent Review _____

(signature)

Colin Varley, Senior Associate, Senior Archaeologist

Stage 2 Archaeological Assessment: Proposed Ridge Landfill Expansion

Part of Lots 13, 14, and 16, Concession 4 West of Communication Road, Geographic Township of Harwich, County of Kent, now Municipality of Chatham-Kent, Ontario

June 17, 2019

Prepared for:

Dillon Consulting Limited
235 Yorkland Boulevard, Suite 800
Toronto, Ontario
M2J 4Y8
Tel: (416) 229-4646
Fax: (416) 229-4692

Prepared by:

Stantec Consulting Ltd.
300W – 675 Cochrane Drive
Markham, Ontario
L3R 0B8
Tel: (905) 944-6259
Fax: (905) 474-9889

Licensee: Peter Popkin, Ph.D., CAHP, MClfA
License Number: P362
PIF Number: P362-0250-2019
Project Number: 160940484

ORIGINAL SUPPLEMENTARY DOCUMENTATION

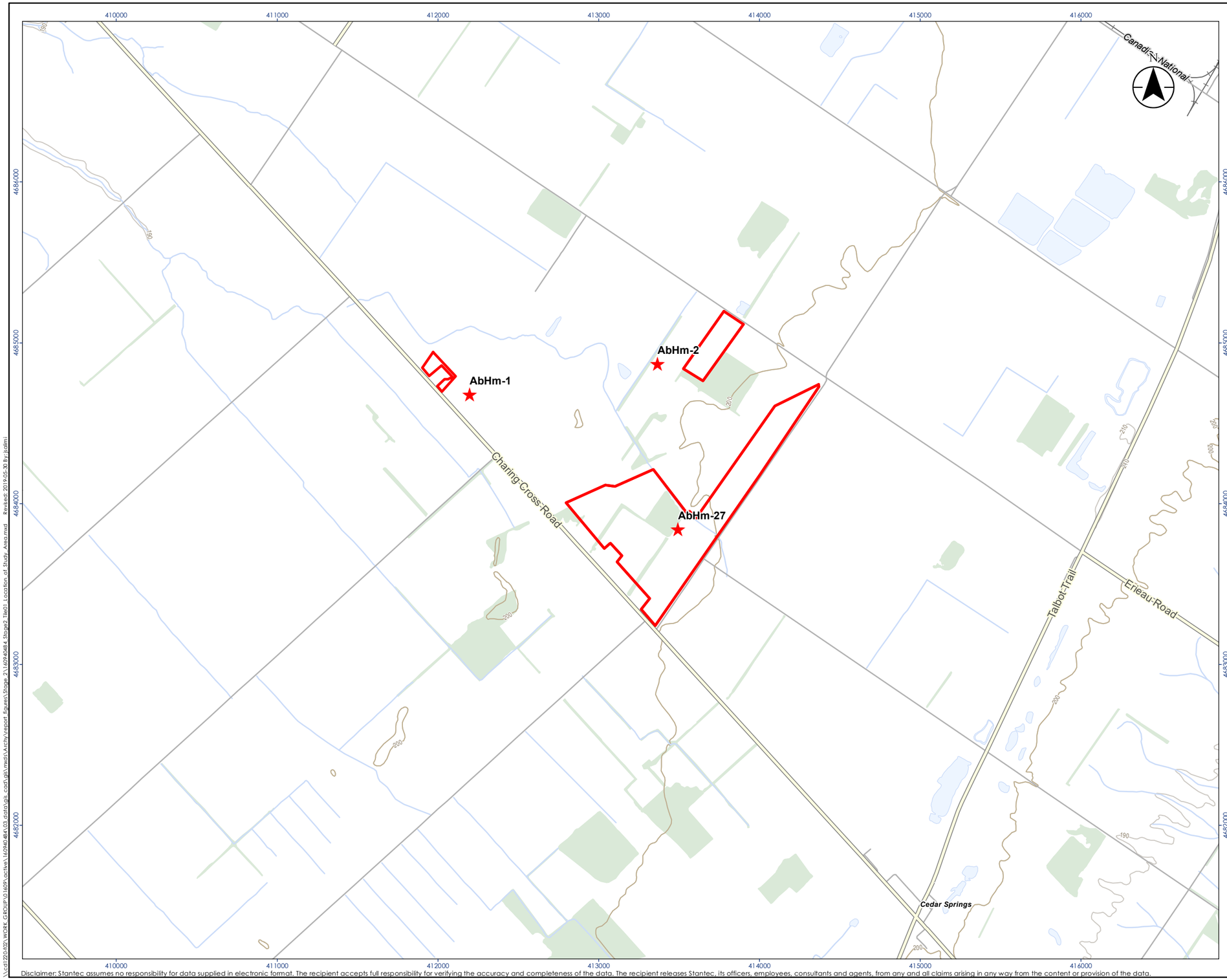
Table of Contents

LIST OF TABLES

LIST OF FIGURES

1.0 MAPS

The following pages provide maps for the Stage 2 archaeological assessment of the study area, illustrating the exact site location.



Stantec

Legend

- Archaeological Site
- Study Area
- Contour
- Major Road
- Railway
- Watercourse
- Waterbody
- Wooded Area

0 0.5 1 km

1:24,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.

Project Location
Municipality of
Chatham-Kent,

160940484 REVA
Prepared by JS on 2019-05-30
Independent Review by CDV on 2019-05-31

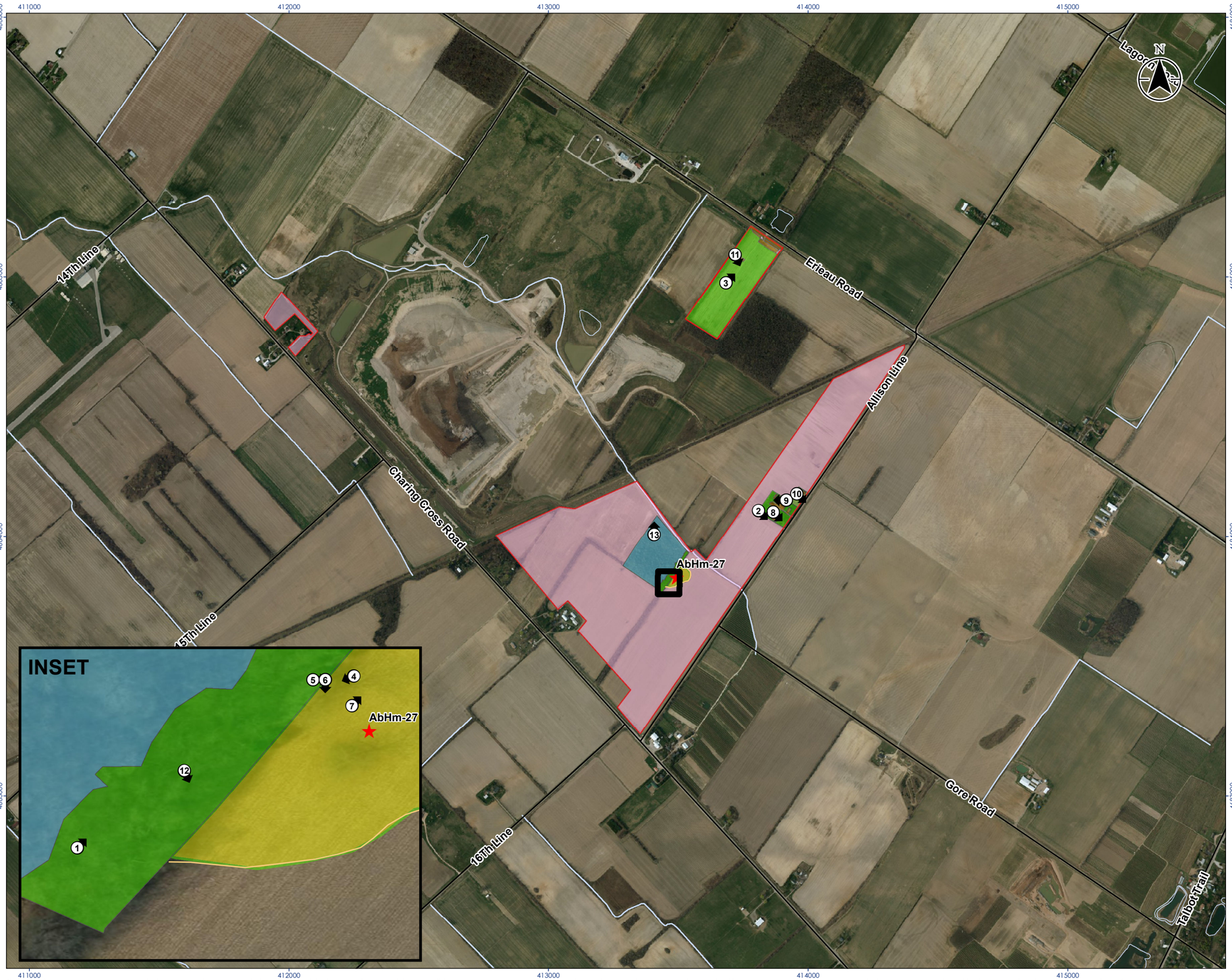
Client/Project
DILLON CONSULTING LIMITED
RIDGE LANDFILL EXPANSION
STAGE 2

Tile No.
1

Title
Position of Registered Archaeological Sites in the Vicinity of the Study Area

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

\\cd1220-f02.WORK_GROUP\01609\active\160940484\03_data\gis_cad\gis\mxds\Archy\report_figures\Stage_2\160940484_Stage2_Tile01_Location_of_Study_Area.mxd Revised: 2019-05-30 By: jsdmi



Stantec

Legend

- Archaeological Site
- Photo Location and Direction'
- Watercourse
- Waterbody
- Slope Edge
- Study Area

Stage 2 Archaeological Assessment Methods

- Not surveyed, Retains Archaeological Potential - Stage 2 Survey Required
- Low and Wet Area, Low to No Archaeological Potential - No Further Archaeological Work Required
- Previously Disturbed, Low to No Archaeological Potential - No Further Archaeological Work Required
- Pedestrian Survey at 1 m Intervals and Test Pit Survey at 5 m Intervals
- Test Pit Survey, 5 m Intervals
- Test Pit Survey, 10 m Intervals

0 250 500 Metres

1:15,149 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Orthoimagery © First Base Solutions, 2018. Imagery taken in 2010.

Project Location
Municipality of Chatham-Kent,

160940484 REVA
Prepared by JS on 2019-05-30
Independent Review by CDV on 2019-05-31

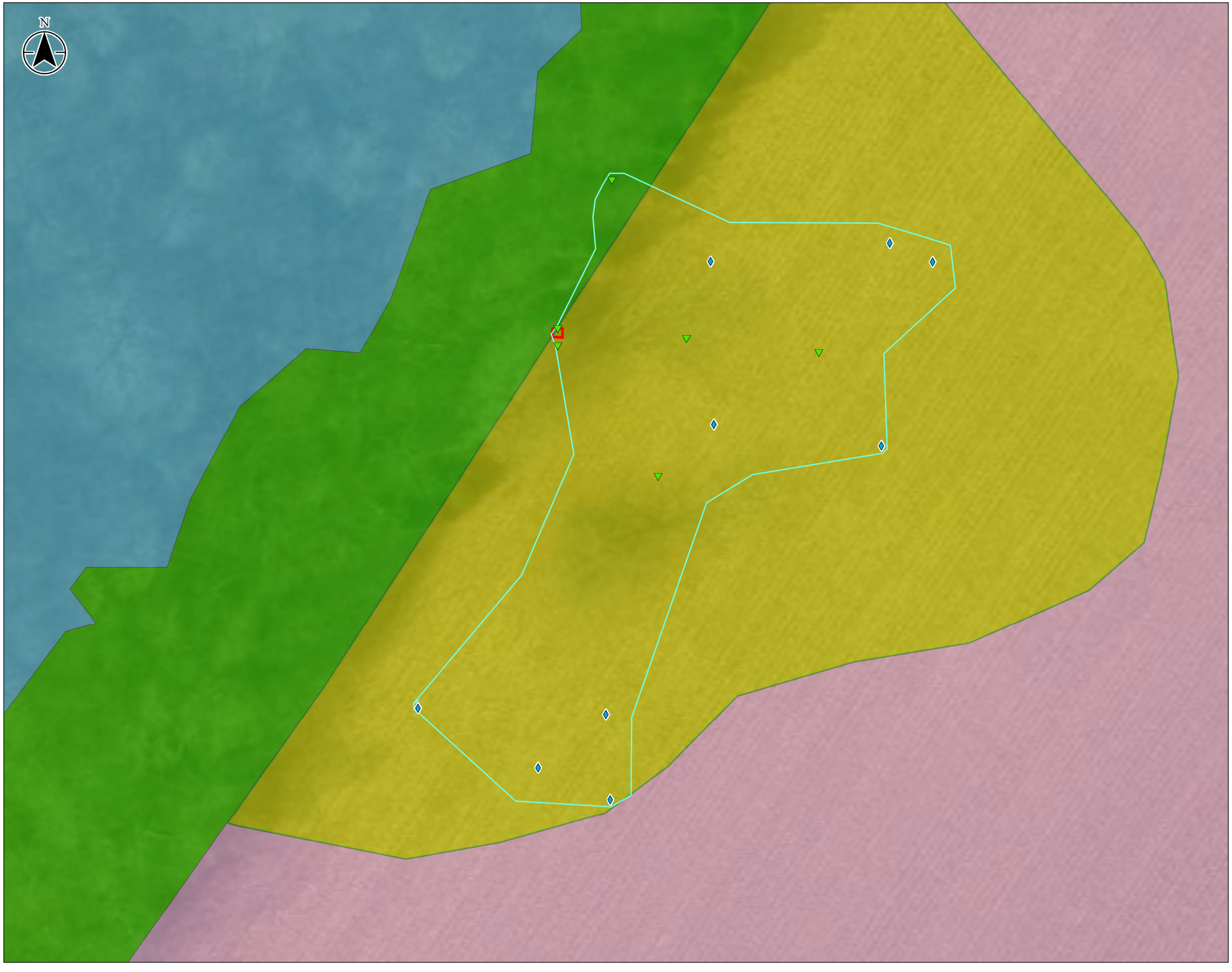
Client/Project
DILLON CONSULTING LIMITED
RIDGE LANDFILL EXPANSION
STAGE 2

Tile No.
2

Title
Location of Archaeological Site Identified in the Current Assessment - Location 1

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

\\cd2210101\WORK_GROUP\01659\active\160940484\03_data\gis_cad\gis\mxds\Activity\report_figures\Stage 2\160940484_Stage2_Tile02_Arch_Assess_Methods_Results.mxd Revised: 2019-05-30 By: jstrini



Stantec

Legend

- Positive Shovel Test
- Artifact - Pre-contact Indigenous
- Location 1 (AbHm-27)
- Test Unit 1

Archaeological Assessment

- Not surveyed, Retains Archaeological Potential - Stage 2 Survey Required
- Low and Wet Area, Low to No Archaeological Potential - No Further Archaeological Work Required
- Pedestrian Survey at 1 m Intervals and Test Pit Survey at 5 m Intervals
- Test Pit Survey, 5 m Intervals

0 5 10 Meters

1:394 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.

Project Location
Municipality of Chatham-Kent,

160940484 REVA
Prepared by JS on 2019-05-30
Independent Review by CDV on 2019-05-31

Client/Project
DILLON CONSULTING LIMITED
RIDGE LANDFILL EXPANSION
STAGE 2

Tile No.
3

Title
Location 1 (AbHm-27)

\\cd1220-f02\WORK_GROUP\0\160940484\03 data\gis_cad\gis\mxds\Archy Report Figures\Stage 2\160940484_Stage2_Tile03_Location1.mxd Revised: 2019-05-30 By: jstimi

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

2.0 UTM COORDINATES

The UTM coordinates recorded during the Stage 2 archaeological assessment of the study area are provided in Table 1. A Topcon FC-5000 GPS unit paired with a Topcon HiPer high precision base and rover with Magnet Field software was used to record the location of the positive test pits. The UTM coordinates are located in zone 17T are based upon the North American Datum 1983 (NAD83).

Table 1: UTM Coordinates for Location 1 (AbHm-27)

Context	Type	Easting	Northing
Site Location	Centre	413498	4683850
Site Location	Northern Extent	413490	4683872
Site Location	Southern Extent	413491	4683805
Site Location	Eastern Extent	413522	4683861
Site Location	Western Extent	413483	4683856
Surface Find 001	Chipping Detritus	413489	4683814
Surface Find 002	Chipping Detritus	413491	4683806
Surface Find 003	Chipping Detritus	413470	4683818
Surface Find 004	Chipping Detritus	413489	4683817
Surface Find 005	Core	413500	4683846
Surface Find 006	Chipping Detritus	413517	4683844
Surface Find 007	Core	413522	4683862
Surface Find 008	Chipping Detritus	413517	4683864
Surface Find 009	Chipping Detritus	413500	4683863
Positive Test Pit 1	Positive Test Pit	413490	4683871
Positive Test Pit 10	Positive Test Pit	413484	4683856
Positive Test Pit 13	Positive Test Pit	413484	4683854
Positive Test Pit 22	Positive Test Pit	413497	4683855
Positive Test Pit 31	Positive Test Pit	413495	4683841
Positive Test Pit 40	Positive Test Pit	413511	4683854
Test Unit 1	Test Unit – Southwest Corner	413484	4683855