



Draft Archaeological Resources Existing Conditions Report (Stage 1 Archaeological Assessment)

Twin Creeks Environmental Centre Landfill
Optimization Project Environmental Assessment

WM Canada Corporation

Watford, Ontario

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Executive Summary

Archaeological Services Inc. (ASI) was contracted by HDR Corporation on behalf of WM Canada (WM) to conduct a Stage 1 Archaeological Assessment (AA) (Background Research and Property Inspection) to characterize existing archaeological resources as part of the Twin Creeks Environmental Centre (TCEC) Landfill Optimization Project Environmental Assessment (EA). This Archaeological Resources Existing Conditions Report is one component of the EA and presents the results of the Stage 1 AA. This report will be included with the EA Study Report as a supporting document.

There are approximately 8 years of approved landfill airspace capacity remaining at the TCEC (i.e., capacity will be reached in approximately 2031). The proposed optimization would provide additional airspace of approximately 14 million cubic metres (m³), which could extend the site life by approximately 12 years (from 2031 to 2043) and may be achieved through alternative landfill configurations or alternative methods within the existing 301 ha TCEC site area. No changes are proposed to the size of the TCEC site area, approved service area, or annual fill rate.

The Study Area for the Stage 1 AA consists of the general On-Site Study Area defined for the EA in the approved Terms of Reference (ToR), which is the existing 301 hectare TCEC site, located east of Nauvoo Road between Zion Line and Confederation Line in the Township of Warwick. As archaeology is only concerned with areas of direct impact, or within 50 metres of a known archaeological resource, the general Off-Site Study Area was not included in the Study Area for the Stage 1 AA.

This Stage 1 AA determined that 37 previously registered archaeological sites are located within one kilometre of the TCEC site. Of these, only one site (AfHI-14) is of concern for the project and has further cultural heritage value or interest. This site (AfHI-14) is located in the southeastern corner of the TCEC site and has been protected in perpetuity with the establishment of a protective 10 metre buffer and surrounding conservation area upon the completion of a Stage 3 site-specific assessment in 2007 (P057-307-2006 and P057-374-2007). Further avoidance and protection is required for the site.

A historic cemetery, Watford Cemetery, is located adjacent to the western portion of the TCEC site. No cemetery investigation is required for this project.

The background research determined that the remainder of the Study Area was previously assessed (CIF 1999-007-054; PIFs P057-015 (2003), P057-122 (2004), P057-202 (2005), P057-307-2006, and P057-374-2007) and has no further archaeological concern.

Acronyms, Units and Glossary

Acronyms

Acronym	Definition
AA	Archaeological Assessment
ASI	Archaeological Services Incorporated
BAO	Bereavement Authority of Ontario
B.P.	Before Present
C.E.	Common Era
EA	Environmental Assessment
GIS	Geographic Information System
GHG	Greenhouse Gas
LFG	Landfill Gas
MCM	Ministry of Citizenship and Multiculturalism
MECP	Ministry of Environment, Conservation and Parks
OASD	Ontario Archaeological Sites Database
OEAA	<i>Ontario Environmental Assessment Act</i>
S&G	Standards and Guidelines for Consultant Archaeologists
ToR	Terms of Reference
WM	WM Canada

Units

Unit	Definition
km	kilometre
m	metre

Glossary

Term	Definition
Approval	Permission granted by an authorized individual or organization for an undertaking to proceed. This may be in the form of program approval, certificate of approval or provisional certificate of approval.
Capacity (Disposal Volume)	The total volume of air space available for disposal of waste at a landfill site for a particular design (typically in m ³); includes both waste and daily cover materials but excludes the final cover.
Composting	The controlled microbial decomposition of organic matter, such as food and yard wastes, in the presence of oxygen, into finished compost (humus), a soil-like material. Humus can be used in vegetable and flower gardens, hedges, etc.
Composting facility	A facility designed to compost organic matter either in the presence of oxygen (aerobic) or absence of oxygen (anaerobic).
Environment	As defined by the Environmental Assessment Act, environment means: <ul style="list-style-type: none"> • air, land or water; • plant and animal life, including human life; • the social, economic and cultural conditions that influence the life of humans or a community; • any building, structure, machine or other device or thing made by humans; • any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities; or • any part or combination of the foregoing and the interrelationships between any two or more of them (ecosystem approach).
Environmental Assessment (EA)	A systematic planning process that is conducted in accordance with applicable laws or regulations aimed at assessing the effects of a proposed undertaking on the environment.
Evaluation criteria	Evaluation criteria are considerations or factors taken into account in assessing the advantages and disadvantages of various alternatives being considered.
Greenhouse gas (GHG)	Any of the gases whose absorption of solar radiation is responsible for the greenhouse effect, including carbon dioxide, methane, ozone, and the fluorocarbons.
Indicators	Indicators are specific characteristics of the evaluation criteria that can be measured or determined in some way, as opposed to the actual criteria, which are fairly general.
Landfill gas (LFG)	The gases produced from the wastes disposed in a landfill; the main constituents are typically carbon dioxide and methane, with small amounts of other organic and odour-causing compounds.
Landfill site	An approved engineered site/facility used for the final disposal of waste. Landfills are waste disposal sites where waste is spread in layers, compacted to the smallest practical volume, and typically covered by soil.

Glossary

Term	Definition
Leachate	Liquid that drains from solid waste in a landfill and which contains dissolved, suspended and/or microbial contaminants from the breakdown of this waste.
Mitigation	Measures taken to reduce adverse impacts on the environment.
Proponent	A person who: <ul style="list-style-type: none"> • carries out or proposes to carry out an undertaking; or • is the owner or person having charge, management or control of an undertaking.
Receptor	The person, plant or wildlife species that may be affected due to exposure to a contaminant.
Terms of Reference (ToR)	A terms of reference is a document that sets out detailed requirements for the preparation of an Environmental Assessment.
Undertaking	Is defined in the Environmental Assessment Act as follows: <ul style="list-style-type: none"> • An enterprise or activity or a proposal, plan or program in respect of an enterprise or activity by or on behalf of Her Majesty in right of Ontario, by a public body or public bodies or by a municipality or municipalities; • A major commercial or business enterprise or activity or a proposal, plan or program in respect of a major commercial or business enterprise or activity of a person or persons other than a person or persons referred to in clause (1) that is designated by the regulations; or • An enterprise or activity or a proposal, plan or program in respect of an enterprise or activity of a person or persons, other than a person or persons referred to in clause (a), if an agreement is entered into under section 3.0.1 in respect of the enterprise, activity, proposal, plan or program ("enterprise").
Waste	Refuse from places of human or animal habitation; unwanted materials left over from a manufacturing process.

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1 Introduction

This report presents a description of the existing conditions for Archaeological Resources for the WM Canada (WM) Twin Creeks Environmental Centre (TCEC) Landfill Optimization Project in support of the environmental assessment (EA). The EA is being carried out in accordance with the requirements of the *Ontario Environmental Assessment Act (OEAA)* and Terms of Reference (ToR), which was approved by the Ministry of Environment, Conservation and Parks (MECP) on December 13, 2022.

There are approximately 8 years of approved landfill airspace capacity remaining at the TCEC (i.e., capacity will be reached in approximately 2031). The proposed optimization would provide additional airspace of approximately 14 million cubic metres (m³), which could extend the site life by approximately 12 years (from 2031 to 2043) and may be achieved through alternative landfill configurations or alternative methods within the existing 301 ha TCEC site area. No changes are proposed to the size of the TCEC site area, approved service area, or annual fill rate.

The approved ToR included a preliminary description of the existing conditions within the area surrounding the TCEC, with the commitment that a more detailed description of existing environmental conditions would be prepared as part of the EA. In accordance with the approved ToR, additional investigative studies were carried out as necessary to generate a more detailed description of the existing cultural environment to characterize existing conditions for the TCEC Landfill Optimization Project EA.

This Archaeological Resources Existing Conditions Report is one component of the EA and presents the results of the Stage 1 Archaeological Assessment (AA). The EA Study Report will incorporate the information presented herein as appropriate, and this report will be included with the EA Study Report as a supporting document.

1.1 Project Context

Archaeological Services Inc. (ASI) was contracted by HDR Corporation on behalf of WM Canada to conduct a Stage 1 AA (Background Research and Property Inspection) to characterize existing archaeological resources as part of the TCEC Landfill Optimization Project EA.

All activities carried out during this assessment were completed in accordance with the *Ontario Heritage Act* (1990, as amended in 2019) and the 2011 Standards and Guidelines for Consultant Archaeologists (S&G), administered by the Ministry of Citizenship and Multiculturalism (MCM 2011).

1.2 Development Context

All work has been undertaken as required by the OEAA (Ministry of the Environment 1990 as amended 2020) 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 AA and property inspection was granted by HDR Corporation on September 9, 2022.

1.2.1 Treaties

The Study Area is within an area that borders the Long Woods Purchase (Treaties No. 21 and 25 of the Upper Canada Land Surrenders) and the Huron Tract Purchase (Treaty 29). The area is the traditional territory of Walpole Island First Nation, Chippewas of the Thames First Nation, Aamjiwnaang First Nation, Chippewas of Kettle and Stony Point First Nation, Caldwell First Nation, the Oneida Nation of the Thames and the Chippewas of the Thames First Nation.

On October 16, 1818, several Anishinaabeg Chiefs met with John Askin at Amherstburg. An agreement was struck to sell land south of Lake Huron. A provisional treaty agreement was signed for the Longwoods Treaty Region on March 9, 1819 (Treaty #21). The terms were subsequently modified for the final agreement, Treaty #25, signed on July 8, 1822. The final agreement, Treaty #29, was not signed until eight years later, on July 10, 1827.

The surrendered treaty lands for the Longwoods Treaty covered 552,190 acres (223,463 hectares) of unceded land between Treaty #7, Treaty #6, and Treaty #2 along the Thames River between the Delaware village in London Township and the Moravian Village in Oxford Township. It includes the current communities of Strathroy and Mt. Brydges.

The final agreement for the neighboring Huron Tract Treaty #29 was not signed until eight years later, on July 10, 1827. This treaty also had a "provisional" agreement that was enshrined in Treaty #27 ½. The Huron Tract comprises 2,200,000 acres (890,308 hectares) of acres of land south of Lake Huron up to the Nine Mile River and bordering, to the south and east, the land ceded in Treaties #7, #21, #6, and #3. It includes most of the drainage of the St. Clair River and the present communities of Stratford and Sarnia.

The Anishinaabeg Chiefs retained land for the use of their communities below the St. Clair River rapids, at Sombra Township, at Kettle Point, and at the Ausable River. The signatory bands agreed on an annual payment of £1,100 to be distributed equally between the 460 persons inhabiting the tract in 1825.

The signees on the side of the Anishinaabeg included Wawanosh, Osawip, Shashawinibisie, Pukinince, Negig, Cheebican, Mukatuokijigo, Mshinikaibik, Animikince, Peetawtick, Shawanipinissie, Saganash, Annotowin, Pinessiwagum, Shaiowkima, Chekateyan, Mokeetchewan, and Quaikeegon. The signees on the

British side included Superintendent of Indian Affairs George Ironside, Captain Joseph de la Hay and Lieutenant William Taylor of the 70th regiment, Lieutenant H.D.C. Douglas, and M.P. Bailey (Surtees 1984:80–85; Crown-Indigenous Relations and Northern Affairs 2016).

Implications relating to un-surrendered harvesting and gathering rights on these "surrendered" treaty lands still plays a large part in duty to consult processes today, as well as concerns over cumulative effects impacting unceded reserved lands and un-surrendered fishing rights in Lake Huron that these First Nations continue to hold jurisdiction upon.

2 TCEC and Study Areas

The TCEC is located approximately 1 kilometre north of the Village of Watford in the Township of Warwick. The facility is situated southeast of the intersection of Zion Line and Nauvoo Road and the main entrance to the facility is located approximately 300 metres south of Zion Line on the east side of Nauvoo Road.

During the EA, existing conditions and potential effects will be considered in the context of two Study Areas: on-site and off-site. The general Study Areas proposed for the purposes of the EA in the approved ToR are:

- On-site Study Area: the existing TCEC.
- Off-site Study Area: the lands within the vicinity of the TCEC extending approximately 1 km out from the On-site Study Area.

The Study Area for the Stage 1 AA consists of only the general On-Site Study Area defined for the EA in the approved ToR, which is the existing 301 hectare TCEC site (**Figure 1**). As archaeology is only concerned with areas of direct impact, or within 50 metres of a known archaeological resource, the general Off-Site Study Area is not included in the Study Area for the Stage 1 AA.

3 Methods

This Archaeological Resources Existing Conditions Report was developed based on the evaluation criteria, indicators, and data sources included in the approved ToR, which were developed in consultation with government agencies and other stakeholders. The evaluation criteria, rationale, indicators and data sources used for Archaeology as per the approved ToR are provided in **Table 3-1**.

Table 3-1. Evaluation Criteria, Indicators and Data Sources for Archaeology

Evaluation Criteria	Rationale	Indicators	Data Sources
Cultural Environment			
Archaeology			
Archaeological Resources	<p>Archaeological resources are non-renewable cultural resources that can be destroyed by the construction and operation of a waste disposal facility.</p> <p>Activities related to construction and operation of the landfill may cause negative effects on archaeological sites or areas with archaeological potential.</p>	<ul style="list-style-type: none"> Archaeological resources on-site and predicted impacts on them Cemetery properties within approximately 10 metres of the proposed impacts 	<ul style="list-style-type: none"> Published data sources Standards and Guidelines for Consultant Archaeologists Ontario Archaeological Sites Database (OASD) MCM register of archaeological reports Existing Stage 1, 2, 3 Archaeological Assessments for the landfill site Stage 1 property inspection results Bereavement Authority of Ontario (BAO) Cemetery records, plans and plot maps Historical mapping, topographical maps and aerial photographs and imagery Proposed facility characteristics Landfill design and operations data

3.1 Data Collection and Review

The purpose of the Stage 1 AA is to identify known archaeological sites that may be affected by the undertaking, and to describe the potential for the presence of archaeological resources throughout the Study Area . The Stage 1 AA provides an inventory of known or potentially existing archaeological resources within the Study Area (Existing Conditions) for the purposes of assessing alternative methods, and development of mitigation measures and monitoring programs of the undertaking. The Stage 1 AA involved the following tasks:

1. Project Initiation, Background Research, and Review of Existing Archaeological and Historical Data
 - a. Updating ASI's existing database of known archaeological sites within the Study Area and identifying data gaps that may need to be addressed through subsequent field investigations by:
 - i. Reviewing pertinent provincial government files (OASD)
 - ii. Reviewing and compiling the results of a literature search (published and unpublished), including but not limited to archival material held at the

Archives of Ontario, and the reports generated by previous archaeological assessment activities within the vicinity of the Study Area.

2. Determining the Archaeological Potential of the Study Area

- a. Reviewing the former geomorphological and hydrological character of the Study Area, and the reconstructed locations of former settlement and industrial features on the basis of available project mapping, to delimit zones of archaeological potential.
- b. Notifying municipal and/or regional cemetery officials and/or heritage planners to obtain relevant information. If necessary, should one or more cemeteries be identified.
- c. Conducting a field review of the Study Area to confirm the research-based characterization of archaeological potential and to determine the degree to which recent construction disturbances may have affected archaeological potential.

3. Compiling Archaeological Inventory and Developing Management Strategy

- a. Compiling an inventory of known and potential archaeological resources within the Study Area on the basis of the results of the preceding research. For each resource that may be impacted by the proposed undertaking, a series of mitigation measures will be recommended for incorporation within the overall development framework plan.

4. Report Preparation

- a. The Archaeological Resources Existing Conditions Report will describe the results of the Stage 1 AA and will contain all necessary photographic and cartographic documentation. Available and derived spatial data will be compiled within a geographical information system (GIS) to produce a mapped inventory of known archaeological resources as well as a zone of archaeological potential for the Study Area. The report will fulfill the project requirements, while at the same time addressing all of the archaeological and licensing concerns outlined in the *Ontario Heritage Act* and the OEAA.
- b. A Stage 1 AA report will be sent to MCM as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act, R.S.O. 1990, c 0.18*. The report is reviewed to ensure that it complies with the S&G 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 MCM, 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. A copy of this letter will be provided to WM. The report will then be entered into the Ontario Public Registry of Archaeological Reports.

3.2 Field Studies

A property inspection for a Stage 1 AA 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 AA property inspection was conducted under the field direction of Jessica Lytle (P1066) of ASI, on November 1, 2022, 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 random spot-checking visual inspection from publicly accessible lands/public right-of-ways only of lands not previously assessed and did not include excavation or collection of archaeological resources. Fieldwork was conducted when weather conditions were deemed clear with good visibility (sunny and seven degrees Celsius), per S&G Section 1.2., Standard 2. Field photography is presented in **Section 9 (Image 1 to Image 10)**, and field observations are overlaid onto the existing conditions of the Study Area in **Section 10 (Figure 9 to Figure 13)**.

3.3 Characterization of Existing Conditions

The existing conditions for Archaeological Resources were characterized as follows:

1. Information collected from the sources identified in **Section 3.1** were reviewed and summarized;
2. Field studies were undertaken to confirm the research-based characterization of archaeological potential and to determine the degree to which recent construction disturbances may have affected archaeological potential (**Section 3.2**); and
3. Information from all sources was compiled by environmental criterion.

4 Historical Context

4.1 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 (B.P.) (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 B.P., the environment had progressively warmed (Edwards and Fritz 1988) and populations occupied less extensive territories (Ellis and Deller 1990).

Between approximately 10,000-5,500 B.P., 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 B.P.; 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 B.P. and is indicative of increased social organization, investment of labour into social infrastructure, and the establishment of socially prescribed territories (Ellis et al. 1990; Ellis et al. 2009; Brown 1995:13).

Between 3,000-2,500 B.P., populations continued to practice residential mobility and to harvest seasonally available resources, including spawning fish. The Woodland period began around 2,500 B.P. and exchange and interaction networks broadened at this time (Spence et al. 1990:136, 138) and, by approximately 2,000 B.P., evidence exists for small community camps, focusing on the seasonal harvesting of resources (Spence et al. 1990:155, 164). By 1,500 B.P. there is macro botanical evidence for maize in southern Ontario, and it is thought that maize only supplemented people's diet. There is earlier phytolithic evidence for maize in central New York State by 2,300 B.P. – it is likely that once similar analyses are conducted on Ontario ceramic vessels of the same period, the same evidence will be found (Birch and Williamson 2013:13–15). As is evident in detailed Anishinaabeg ethnographies, winter was a period during which some families would depart from the larger group as it was easier to sustain smaller populations (Rogers 1962). It is generally understood that these populations were Algonquian-speakers during these millennia of settlement and land use.

From the beginning of the Late Woodland period at approximately 1,000 B.P., lifeways became more similar to that described in early historical documents. Between approximately 1000-1300 Common Era (C.E.), the communal site was 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 practiced (Williamson 1990:317). By 1300-1450 C.E., this episodic community disintegration

was no longer practiced and populations communally occupied sites throughout the year (Dodd et al. 1990:343). By the mid-sixteenth century these small villages had coalesced into larger communities (Birch et al. 2021). 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.

By 1600 C.E., the Huron-Wendat communities within Simcoe County had formed the Confederation of Nations encountered by the first European explorers and missionaries. Samuel de Champlain in 1615 reported that a group of Iroquoian-speaking people situated between the Haudenosaunee and the Huron-Wendat were at peace and remained “la nation neutre”. Like the Huron-Wendat, Petun, and Haudenosaunee, the Neutral or Attawandaron people were settled village agriculturalists. In the 1640s, the Attawandaron and the Huron-Wendat (and their Algonquian allies such as the Nipissing and Odawa) were decimated by epidemics and ultimately dispersed by the Haudenosaunee. Shortly afterwards, the Haudenosaunee established a series of settlements at strategic locations along the trade routes inland from the north shore of Lake Ontario. By the 1690s however, the Anishinaabeg were the only communities with a permanent presence in southern Ontario. From the beginning of the eighteenth century to the assertion of British sovereignty in 1763, there was no interruption to Anishinaabeg control and use of Southern Ontario.

4.2 Post-Contact Settlement

Historically, the Study Area is located in the Geographical Warwick Township, County of Lambton in Lots 19-20 & Concessions 3 South of Egremont Road and Lots 20-21 & Concessions 4 South of Egremont Road.

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) were 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 metres 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).

4.2.1 Township of Warwick

The first survey of Warwick Township occurred in 1832 by Peter Carrol, who described the land as level, fertile, and well suited to agriculture. The name Warwick was chosen after a county in England. In 1836 the Township of Warwick had a population numbering 472. The population grew substantially to 3,330 in 1859 after the Grand Trunk and Great Western railways began operations in the area. By 1869 Warwick was largely cleared and settled with a thriving agricultural industry (Mika and Mika 1983; Stott 2008).

4.2.2 Village of Watford

First known as Brown's Corners after Richard Brown, an early settler who arrived in 1853, the name Watford was later chosen after a city in Hertfordshire County in England. Watford retains its historical character as a small rural agricultural community and is located south of the intersection of Nauvoo Road and Confederation Line. (Township of Warwick 2018; Mika and Mika 1983).

4.2.3 Watford Cemetery

The Watford Cemetery is an active cemetery located at 5606 Nauvoo Road and was established in 1888, although it contains some markers dating to the 1860s (ASI 2005a).

The Watford Cemetery is about 1.6 kilometres north of Watford on the east side of Nauvoo Road. A bylaw was passed in 1888 empowering the Corporation of the Village of Watford to raise \$1,500 for the purpose of paying for a cemetery, fencing and general improvements. On May 26, 1888, over 11 acres of the most northern portion of Lot 19, Concession 4 South of Egremont Road was purchased by the Corporation of Watford from William Deas Cameron and his wife for \$850 (Lambton County Museums 2020). Members of the Cameron family were buried in the Watford Cemetery, including William Cameron in 1924 after the sale. The cemetery is open to the public. An extension was added to the cemetery in 1969, east of its original boundary. The extension is bound by the north-south driveway to the west, and tree lines to the north, south, and east. The cemetery was administered by the Watford Cemetery Board and is now managed by the Corporation of the Township of Warwick.

4.3 Map Review

The 1880 *Illustrated Historical Atlas of the County of Lambton* (Belden 1880) 1911 Topographic Map of Strathroy (Base Map: Department of Militia and Defence 1911),

1933 topographic map of Strathroy (Base Map: Department of National Defence 1933), and 1996 topographic map of Strathroy (Base Map: National Topographic System 1996) were examined to determine the presence of historical features within the Study Area during the nineteenth century (**Figure 2** to **Figure 5**).

The 1880 map shows the Study Area within a primarily rural agricultural context with the village of Watford nearby. Nauvoo Road (County Road 79), Confederation Line, and Zion Line are historically surveyed roads that follow alignments similar to the present. Power Road is depicted as a planned road from Zion Line to the south end of the Study Area. One structure is within the southwest corner of the Study Area. Three additional structures are in proximity to the southwest corner, and one structure is shown east of the planned road. A racecourse is labelled on the south side of Confederation Line, east of the village of Watford limits.

Mapping from 1911 shows the Study Area remained in a primarily rural agricultural context with some development along the major roadways and in the village of Watford outside of the Study Area. The map depicts Power Road terminating approximately halfway towards Confederation Line. Confederation Line has a telephone or telegraph running along its northern side and a wooden bridge carries a river across the road at the southeast corner of the Study Area. The river runs east of the Study Area in a generally north-south alignment. Watford Cemetery is shown along the southern boundary of the Study Area, east of Nauvoo Road (County Road 79).

Topographic mapping from 1996 shows a dump within the northeastern portion of the Study Area. The mapping shows considerable development in the village of Watford, which has expanded its village limits, however the surrounding area continues to be primarily rural agricultural with structures and farmsteads along Confederation Line, Nauvoo Road, and Zion Line.

4.4 Aerial and Orthoimagery Review

Aerial photography from 1954 aerial survey of Warwick (Hunting Survey Corporation Limited 1954) shows that the Study Area has remained in a generally rural agricultural context with little development in the Study Area (**Figure 6**). A creek follows the eastern limits of the southern portion of the Study Area. The cemetery is visible along the southern boundary of the Study Area. The cemetery is shown to be bound by tree lines along its north and south limits, Nauvoo Road at its west limit, and a gravel driveway on its east limit. To its east, the future expansion is an empty field, bound by tree lines to its north, south, and east limits.

5 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 OASD, published and unpublished documentary sources; and the files of ASI.

5.1 Geography

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 B.P. (Karrow and Warner 1990:fig. 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 bevelled till plains and beaches of the St. Clair Clay Plains, and the undrumlinized till plains of the Horseshoe Moraine physiographic regions of southern Ontario (Chapman and Putnam 1984).

The St. Clair Clay Plains are 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. 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 drainage in the area generally flows into Lake St. Clair, and includes three major rivers, the St. Clair, the Sydenham and the Thames Rivers (Chapman and Putnam 1984:147).

The Horseshoe Moraine forms the core of a horse-shoe shaped area flanking the upland that lies to the west of the highest part of the Niagara cuesta (Chapman and Putnam 1984). The southwestern limb of the region, located in the southern part of Huron County, has a fairly simple landscape consisting of morainic ridges composed of pale brown, hard calcareous, fine-textured till, with a moderate degree of stoniness.

Figure 7 depicts surficial geology for the Study Area. The surficial geology mapping demonstrates that the Study Area is underlain by fine-textured glaciolacustrine deposits of silt and clay, minor sand and gavel, massive to well laminated, clay to silt-textured till derived from glaciolacustrine deposits or shale, and modern alluvial deposits of clay, silt, sand, gravel, and organic remains (Ontario Department of Lands and Forests 1962).

Soil within the Study Area consist of Perth clay, a grey brown podzolic with imperfect drainage (Cartography Section, Agriculture Canada 1979). Drainage is illustrated on **Figure 8**.

Tributaries of Bear Creek flow through the Study Area at six points from the Study Area's western side, and tributaries of Brown Creek flow out of the Study Area from the eastern side.

The Brown Creek subwatershed has an area of 155 square kilometres, for a total of 3.8 percent of the St. Clair Region watershed. The physiography of the subwatershed is 50 percent clay plains, 23 percent till moraines, 23 percent undrumlinized till plains, three percent bevelled till plains, and one percent beaches and shorecliffs. The length of Brown Creek is 209 kilometres, and the watercourse is 23 percent natural, 42 percent municipal drain, and 34 percent unclassified. Soils in the Brown Creek subwatershed consist of 64 percent silt and clay, 25 percent silt and clay loams, five percent bottom land and beach, four percent loam, two percent sand loams, and less than one percent is not mapped (St. Clair Conservation 2018a).

The Bear Creek subwatershed has an area of 379 square kilometres, for a total of 9.2 percent of the St. Clair Region watershed. The physiography of the subwatershed is 70 percent bevelled till plains, 16 percent till moraines, 10 percent undrumlinized till plains, four percent sand plains, and less than one percent beaches and shorecliffs. The length of Brown Creek is 540 kilometres, and the watercourse is 21 percent natural, 61 percent municipal drain, and 18 percent unclassified. Soils in the Bear Creek subwatershed consist of 84 percent silt and clay, five percent silt and clay loams, five percent loam, four percent bottom land and beach, and two percent sand loams (St. Clair Conservation 2018b).

5.2 Previously Registered Archaeological Sites

In Ontario, information concerning archaeological sites is stored in the OASD maintained by the MCM. 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 kilometres east to west, and approximately 18.5 kilometres 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 *AfHI*.

According to the OASD, 37 previously registered archaeological sites are located within one kilometre of the Study Area (MCM 2022). Of these sites, only AfHI-14 is of concern for the project and has been noted to have further cultural heritage value or interest. The remainder are not considered to be of archaeological concern to the project. A summary of the sites is provided below in **Appendix A:Table A-1**. Sites which are within the Study Area indicated in **bold** and sites within 50 metres of the Study Area indicated in *italics*.

As described below in Section 5.3, AfHI-14 has been protected in perpetuity (P057-307-2006 and P057-374-2007) in association with the St. Clair Conservation Authority and Walpole Island First Nation, so long as no future impacts are proposed within this area .

5.3 Previous Archaeological Assessments

The entirety of the Study Area was previously assessed by ASI as part of past landfill expansion projects. Four studies have largely addressed all impacts to archaeological resources in the Study Area. Between 1999 and 2008, 11 archaeological sites were identified within the Study Area, including AfHI-14 in the southeast corner of the Study Area, which was protected within a tree plantation following Stage 3 assessment in conjunction with Walpole Island First Nation. The remaining 10 sites in the north half of the On-Site Study Area no longer have cultural heritage value or interest and are cleared of archaeological concern. A summary of each assessment is provided below.

- Stage 1 and 2AA (Archaeological Services Inc. 2001) , Warwick Landfill Expansion Project, Township of Warwick, County of Lambton, Ontario. CIF 1999-007-054.
 - In 1999, ASI completed a Stage 1 and 2 Archaeological Resource Assessment for the Warwick Landfill Expansion Project. The northern half of the On-Site Study Area was subject to Stage 2 in 1999. During the initial visit, 467 acres was assessed by pedestrian survey, while 30.3 acres required test-pit survey at five metres. In total, 10 pre-contact Indigenous findspots remains were identified, seven of which were given the Borden numbers AfHI-8 to AfHI-14. The report recommended that the seven sites exhibited cultural heritage value or interest and would require Stage 3 assessment to determine the nature and extent of deposits. The three

findspots were cleared of cultural heritage value or interest. The remainder of the property was cleared of archaeological concern.

- Stage 1 and 2 AA (Archaeological Services Inc. 2005b) for the Warwick Landfill Expansion Environmental Assessment, Township of Warwick, County of Lambton, Ontario. PIFs P057-015 (2003), P057-122 (2004) and P057-202 (2005).
 - From 2003 to 2005 ASI completed additional Stage 1 and 2 Archaeological Assessment Warwick Landfill Expansion Environmental Assessment. Following completion of the original archaeological assessment in 1999, the footprint of the proposed Warwick Landfill Expansion site was extended with the addition of Lot 19 West Half (known as the King Property), Concession 3 South of Egremont Road. This 100-acre parcel was surveyed in October 2003, December 2004 and September 2005 by pedestrian survey and test pit survey, both at five metre intervals. Four pre-contact Indigenous sites were identified and assigned Borden numbers AfHI-39 to AfHI-42 (King 1-4 Sites). Four findspots were identified and did not exhibit cultural heritage value or interest. Stage 3 assessment was recommended for AfHI-39 to AfHI-42 and AfHI-8 to AfHI-14
- Stage 3 AA (Archaeological Services Inc. 2007) Sites AfHI-8 to -14, -39 to -42, and -45, Warwick Landfill Expansion, Township of Warwick, County of Lambton, Ontario. P057-307-2006 and P057-374-2007.
 - In 2007 Stage 3 archaeological assessment was conducted in 2007 on eleven archaeological sites (AfHI-8 to AfHI-14 and AfHI-39 to AfHI-41) within the proposed Warwick Landfill Expansion, and one new isolated pre-contact Indigenous find was identified (AfHI-45). The eleven registered sites within the Warwick Landfill Expansion project, AfHI-8 to AfHI-13, AfHI-39 to AfHI-42, and AfHI-45 were cleared of any further archaeological concern. Additional artifacts were recovered from Site AfHI-14, over an area of 15 metres by 20 metres.
 - Walpole Island First Nation was invited to observe and participate in the Stage 3 assessment with ASI and Waste Management. Representatives from Walpole Island First Nation met on site, walked the fields where the Stage 2 identified the archaeological sites, and discussed the nature of the archaeological work to be completed and established a protocol for communicating the results. Walpole Island First Nation communicated that they did not intend to observe any further fieldwork. Walpole Island First Nation was sent a copy of the Stage 3 report and had no comments. Waste Management has entered into an Impact Benefits Agreement with Walpole Island First Nation. Waste Management and Walpole Island First Nation established an Environmental Liaison Committee for any planned activities relevant to the site including future archaeological work.
 - Waste Management, in association with the St. Clair Conservation Authority, implemented a plan in May 2007 to protect the AfHI-14 and its vicinity by

converting it into a conservation area, and these lands have now been removed from active agriculture or other land use. It was recommended that starting at the southeast property corner adjacent to Brown Creek, a mixture of 700 silver maple, 50 bur oak, 50 red oak, 100 chinquapin oak, 50 hackberry, 50 sycamore, and 1,300 Norway spruce be planted with two metre spacing between spruce trees, three metres between deciduous trees, and three metres between rows. No further archaeological assessment is required at AfHI-14, as long as the site continues to be protected and avoided. A clearance letter approving this strategy was received from the Ministry on September 19, 2007

- Stage 1 and 2 AA (Archaeological Services Inc. 2008) Highway 402 and County Road 79 Improvements Class Environmental Assessment Warwick Township, Lambton County, Ontario. P057-423-2007.
- ASI completed Stage 1 and 2 AA for proposed improvements to upgrade the Highway 402 and County Road 79 interchange and County Road 79 south of the interchange through the new Waste Management Corporation site entrance to improve traffic capacity and safety and accommodate increased truck traffic associated with the proposed expansion of Waste Management's Warwick Landfill. No archaeological materials were recovered, and the project area was cleared of further archaeological concern.

5.4 Current Land Use and Field Conditions

The Study Area for the Stage 1 AA consists of the general On-Site Study Area, which is the existing 301 hectare TCEC site, located east of Nauvoo Road between Zion Line and Confederation Line as . The TCEC site has an existing landfill, four ponds, a maintenance facility, an office, leachate management infrastructure, landfill gas management infrastructure, a stockpile of excess soil, and a poplar plantation. The Study Area also consists of open agricultural fields, treed lands, and Watford Dog Park along Confederation Line. The southern limit of the Study Area east of Nauvoo Road borders Watford Cemetery, which is at 5606 Nauvoo Road. A gravel driveway in a west-east orientation is north of the burials in the original section of the cemetery. The driveway continues east in the post 1969 section of the cemetery. North of the driveway is Nauvoo Park gazebo and driveway, and an area of trees. The portion of the Study Area which contains site AfHI-14 has been converted into a conservation area, containing a mixture of deciduous and spruce trees as recommended in the Stage 3 AA report for avoidance and protection.

5.5 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 A-1** in **Appendix A**; AfHI-14);

- Water sources: primary, secondary, or past water source (Bear Creek, Brown Creek);
- Proximity to early settlements (Watford, Watford Cemetery); and
- Early historic transportation routes (Confederation Line, Nauvoo Road, Zion Line).

The limits of AfHI-14 have been established through Stage 2 and Stage 3 AAs as per S&G Section 4.1, Standard 1 (Archaeological Services Inc. 2005b; Archaeological Services Inc. 2007). The Stage 3 AA recommended converting the area surrounding AfHI-14 into a conservation area, containing a mixture of deciduous and spruce trees, creating at minimum a ten-metre buffer around the site (S&G Section 4.1.4, Standard 1). No activities that might alter the archaeological site may occur within the conservation area, in accordance with S&G Section 4.1.4, Standard 2. Further avoidance and protection is required for site AfHI-14 (**Figure 13**: areas highlighted in green).

The remainder of the Study Area has been cleared of archaeological concern by previous assessments (PIFs P057-015, P057-122, P057-202, P057-307-2006, P057-374-2007) and does not require further archaeological assessments (**Figure 10** to **Figure 13**: areas highlighted in orange).

5.5.1 Cemetery Analysis

Watford Cemetery, established in 1888, is an active cemetery located at 5606 Nauvoo Road, abutting the edge of the Study Area. It is currently operated by the Township of Warwick under license CM-01845.

The north boundary of the Watford Cemetery property is defined by a post and wire fence that separates the cemetery and the TCEC Landfill, as confirmed during the Stage 1 AA property inspection. There is a gravel driveway is between the fence and grave markers.

Heather Willemse, Deputy Clerk of the Warwick Township Office was contacted by ASI on October 6, 2022, by email, and on October 14, 2022, by phone to inquire about other information regarding Watford Cemetery and its current and past boundaries. At the time of writing this report no response to our requests for information was received. On October 12, 2022, the BAO provided a plan of the Watford Cemetery prepared by Monteith and Sutherland Ontario Land Surveyors showing the cemetery's legal boundaries (**Figure B-1, Figure B-2**) and the plan for the Extension to Watford Cemetery, conducted by the same surveyor (**Figure B-3, Figure B-4**).

The plan of the Watford Cemetery prepared by Monteith and Sutherland Ontario Land Surveyors (**Figure B-1, Figure B-2**) is dated to 1974 and shows the northmost burial plots nearest to the Study Area are Row XXI, Columns 1 to 23. These plots are set back from the northern legal boundary. Only graves 1 to 8 had internments at the time of survey, the earliest belonging to James Kersey in Internment 4 and dating to 1923. The 1983 plan for the Extension to Watford Cemetery (**Figure B-3, Figure B-4**) shows the extension continuing east from the eastern of the original boundaries. A north-

south oriented gravel driveway is west of the extension along what had been the eastern border of original portion of cemetery.

The legal boundaries are clearly defined, bound by a fence to the north, Nauvoo Road to the west, and treelines to the east and south (**Image 3 to Image 6; Figure 11, Figure 12**: areas outlined in purple). The Study Area is adjacent to the northern limits of the cemetery, separated by the fence line. This portion of Study Area adjacent to the cemetery was previously assessed by ASI in 1999 by test pit survey at five metre intervals and was part of the property that was cleared of archaeological concern (Archaeological Services Inc. 2001). Due to the low potential for unmarked graves within the Study Area, and the clear legal boundaries, as demonstrated by the information from the BAO and the property inspection, no cemetery investigation is required for this project.

6 Description of Existing Conditions

6.1 Archaeological Resources

Archaeological resources are non-renewable cultural resources that can be destroyed by the construction and operation of a waste disposal facility. Activities related to construction and operation of the landfill may cause negative effects on archaeological sites or areas with archaeological potential.

The purpose of a Stage 1 AA is to identify known archaeological sites that may be affected by the undertaking, and to describe the potential for the presence of archaeological resources throughout the Study Area(where potential disturbance may occur. The Stage 1 AA provides an inventory of known or potentially existing archaeological resources within the Study Area (Existing Conditions) for the purposes of assessing alternative methods, development of mitigation measures and monitoring programs of the undertaking.

As described in Section 2, the Study Area for the Stage 1 AA consists of the general On-Site Study Area, which is the existing 301 hectare TCEC site, located east of Nauvoo Road between Zion Line and Confederation Line in the Township of Warwick.

Activities related to construction and operation of the landfill may cause negative effects on the following indicators: archaeological sites or areas with archaeological potential including archaeological resources on-site and predicted impacts on them, and cemetery properties within approximately 10 metres of the proposed impacts.

6.1.1 Indicator 1: Archaeological resources on-site and in vicinity and predicted impacts on them

The Stage 1 existing conditions study determined 37 previously registered archaeological sites are located within one kilometre of the Study Area. Site AfHI-14 is the only site relevant to the project and is located within the Study Area (**Figure 13**:

areas highlighted in green). It is considered to have further cultural heritage value or interest and has been protected in perpetuity with the establishment of a protective 10 metre buffer and surrounding conservation area at the completion of Stage 3 AA site-specific assessment in 2007 (P057-307-2006 and P057-374-2007).

The background research determined that the remainder of the Study Area beyond the protected area of AfHI-14 has been previously assessed and has no further archaeological concern.

6.1.2 Indicator 2: Cemetery Properties within approximately 10 metres of the proposed impacts

The northern portion of Watford Cemetery is immediately adjacent to the Study Area and is well defined and has low potential for unmarked burials outside of the cemetery boundary and into the Study Area, as confirmed during the Stage 1 AA property inspection and by the information gathered from the BAO (**Figure 11, Figure 12**: areas outlined in purple). No cemetery investigation is required for this project.

6.2 Summary of Existing Conditions

A buffer with a minimum of ten-metres has been applied to the limits of AfHI-14 by converting the area surrounding AfHI-14 into a conservation area, where no activities that may alter the archaeological site may occur, as per S&G Section 4.1.4, Standard 2. Further avoidance and protection is required for the site AfHI-14 (**Figure 13**: areas highlighted in green).

The northern portion of Watford Cemetery is immediately adjacent to the Study Area and is well defined and has low potential for unmarked burials outside of the cemetery boundary and into the Study Area, as confirmed during the Stage 1 property inspection and by the information gathered from the BAO (**Figure 11, Figure 12**: areas outlined in purple). No cemetery investigation is required for this project.

The remainder of the Study Area does not retain archaeological potential on account of being previously assessed (**Figure 10 to Figure 13**: areas highlighted in red). These lands do not require further archaeological assessment.

7 Legislation Compliance Advice

ASI advises compliance with the following legislation:

- This report is submitted to the Ministry of Citizenship and Multiculturalism as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, RSO 2005, 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 Citizenship and Multiculturalism, a letter will be issued by the Ministry stating that there are no further concerns with regards 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 *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33, requires that any person discovering or having knowledge of a burial site shall immediately notify the police or coroner. It is recommended that the Registrar of Cemeteries at the Ministry of Consumer Services is also immediately notified.
- Archaeological sites recommended for further archaeological field work or protection remain subject to Section 48(1) of the *Ontario Heritage Act* and may not be altered, nor may artifacts be removed from them, except by a person holding an archaeological license.

8 References

Archaeological Services Inc.

2001 Stage 1/2 Archaeological Resource Assessment, Warwick Landfill Expansion Project, Township of Warwick, County of Lambton, Ontario [1999-007-054].

2005a Warwick Landfill Expansion Environmental Assessment Cultural Heritage Resources.

2005b Stage 1 and 2 Archaeological Assessment Warwick Landfill Expansion Environmental Assessment, Township of Warwick, County of Lambton, Ontario [1999-007-054, P057-015 (2003), P057-122 (2004) and P057-202 (2005)].

2006 Historical Overview and Assessment of Archaeological Potential Don River Watershed, City of Toronto. Report on file with the Ontario Ministry of Tourism,

Culture and Sport, Toronto.

2007 Stage 3 Archaeological Assessment Sites AfHI-8 to -14, -39 to -42, and -45, Warwick Landfill Expansion, Township of Warwick, County of Lambton, Ontario [P057-307-2006 and P057-374-2007].

2008 Stage 1 and 2 Archaeological Assessment Highway 402 and County Road 79 Improvements Class Environmental Assessment Warwick Township, Lambton County, Ontario [P057-423-2007].

Belden, H.

1880 Illustrated Historical Atlas of the County of Lambton.

Birch, J., and R. F. Williamson

2013 The Mantle Site: An Archaeological History of an Ancestral Wendat Community. Rowman & Littlefield Publishers, Inc., Latham.

Birch, Jennifer, Sturt W. Manning, Samantha Sanft, and Megan Anne Conger

2021 Refined Radiocarbon Chronologies for Northern Iroquoian Site Sequences: Implications for Coalescence, Conflict, and the Reception of European Goods. *American Antiquity* 86(1):61–89.

Brown, J.

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

Cartography Section, Agriculture Canada

1979 Soils of Lambton County Soil Survey Report No.22.

Chapman, L.J., and F. Putnam

1984 The Physiography of Southern Ontario. 3rd edition . Vol. 2. Ontario Geologic Survey, Special Volume. Ontario Ministry of Natural Resources, Toronto.

Crown-Indigenous Relations and Northern Affairs

2016 Huron Tract, No. 29. Treaty Texts – Upper Canada Land Surrenders. <https://www.rcaanc-cirnac.gc.ca/eng/1370372152585/1581293792285#ucls21>.

Department of Militia and Defence

1911 Strathroy Sheet 40I13. NTS.

Department of National Defence

1933 Strathroy Sheet (40-I/13). Topographic.

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*, C. J. Ellis and N. Ferris, editors, pp. 321–360. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London, ON.

Edwards, T.W.D., and P. Fritz

1988 Stable-Isotope Paleoclimate 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*, C. J. Ellis and N. Ferris, editors, pp. 37–64. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London, ON.

Ellis, C. J., I. T. Kenyon, and M. W. Spence

1990 The Archaic. In *The Archaeology of Southern Ontario to A.D. 1650*, C. J. Ellis and N. Ferris, editors, pp. 65–124. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London, ON.

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.*, T. D. Emerson, D. L. McElrath, and A. C. Fortier, editors, 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.
<http://www.jstor.org/stable/j.ctt32b7n5.15>.

Hunting Survey Corporation Limited

1954 1954 Air Photos of Southern Ontario.

<https://mdl.library.utoronto.ca/collections/air-photos/1954-air-photos-southern-ontario/index>.

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.

Lambton County Museums

2020 From Cradle to Grave (Churches and Cemeteries). Lambton County Museums. <https://www.lambtonmuseums.ca/en/lambton-county-archives/from-cradle-to-grave-churches-and-cemeteries.aspx>.

Mika, N., and H. Mika

1983 Places In Ontario: Their Name Origins and History, Part III, N-Z. Mika Publishing Company, Belleville.

Ministry of Citizenship and Multiculturalism

1990 Ontario Heritage Act, R.S.O. c. O.18.

2022 Ontario's Past Portal. PastPortal. <https://www.pastport.mtc.gov.on.ca>.

Ministry of the Environment

1990 Environmental Assessment Act, R.S.O. c. E.18.

Ministry of Tourism and Culture

2011 Standards and Guidelines for Consultant Archaeologists. Cultural Programs Branch, Ministry of Tourism and Culture.

National Topographic System

1996 Strathroy Sheet (40-1/13). National Topographic System.

Ontario Department of Lands and Forests

1962 Algoma, Sudbury, Timiskaming and Nipissing Surficial Geology Map S465.

Rogers, Edward S.

1962 The Round Lake Ojibwa. Art and Archaeology Division, Royal Ontario Museum Occasional Paper 5. Royal Ontario Museum.

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, C. J. Ellis and N. Ferris, editors. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London.

St. Clair Conservation

2018a Brown Creek Subwatershed Report Card 2018.

<https://www.scrca.on.ca/wp-content/uploads/2019/02/2018-SCRCA-WRC-Brown-Creek.pdf>.

2018b Bear Creek Headwaters Subwatershed Report Card 2018.

<https://www.scrca.on.ca/wp-content/uploads/2019/02/2018-SCRCA-WRC-Bear-Creek-Headwaters.pdf>.

Stott, Glen

2008 From Forest to Field. In The Township of Warwick: A Story Through Time., Chapter 3: Warwick History Township Committee.

<https://www.lambtonmuseums.ca/en/lambton-county-archives/early-years.aspx>.

Surtees, R.

1984 Indian Land Surrenders in Ontario 1763-1867. Research Branch, Corporate Policy, Department of Indian and Northern Affairs Canada.

Township of Warwick

2018 History and Heritage. <https://www.warwicktownship.ca/en/things-to-do/history-and-heritage.aspx>.

Williamson, R. F.

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

9 Field Photography

Photo locations are provided on **Figures 10** through **13** in **Section 11**.



Image 1: Area has been previously assessed, no potential.



Image 2: Area has been previously assessed, no potential.

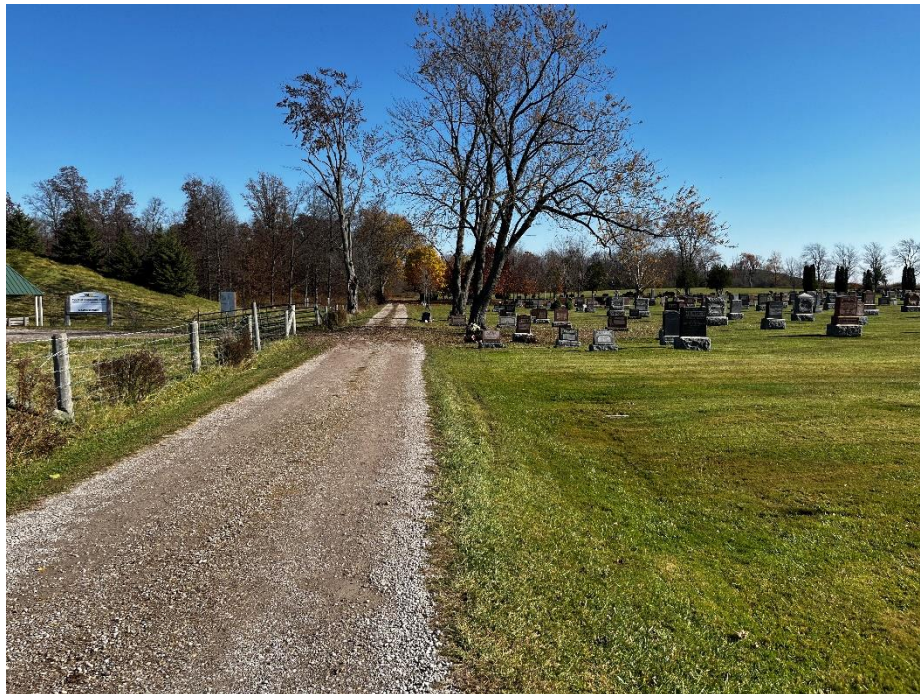


Image 3: The northern boundary of Watford Cemetery is clearly defined by fence line abutting south limit of the Study Area



Image 4: North of Watford Cemetery limits has been previously assessed, no potential.



Image 5: Watford Cemetery



Image 6: Northern portion of Watford Cemetery has been previously assessed, no potential.



Image 7: Area has been previously assessed, no potential.



Image 8: Area has been previously assessed, no potential.



Image 9: Conservation area subject to avoidance and protection



Image 10: Conservation area subject to avoidance and protection

10 Figures

Figure 1. Study Area for Archaeological Resources

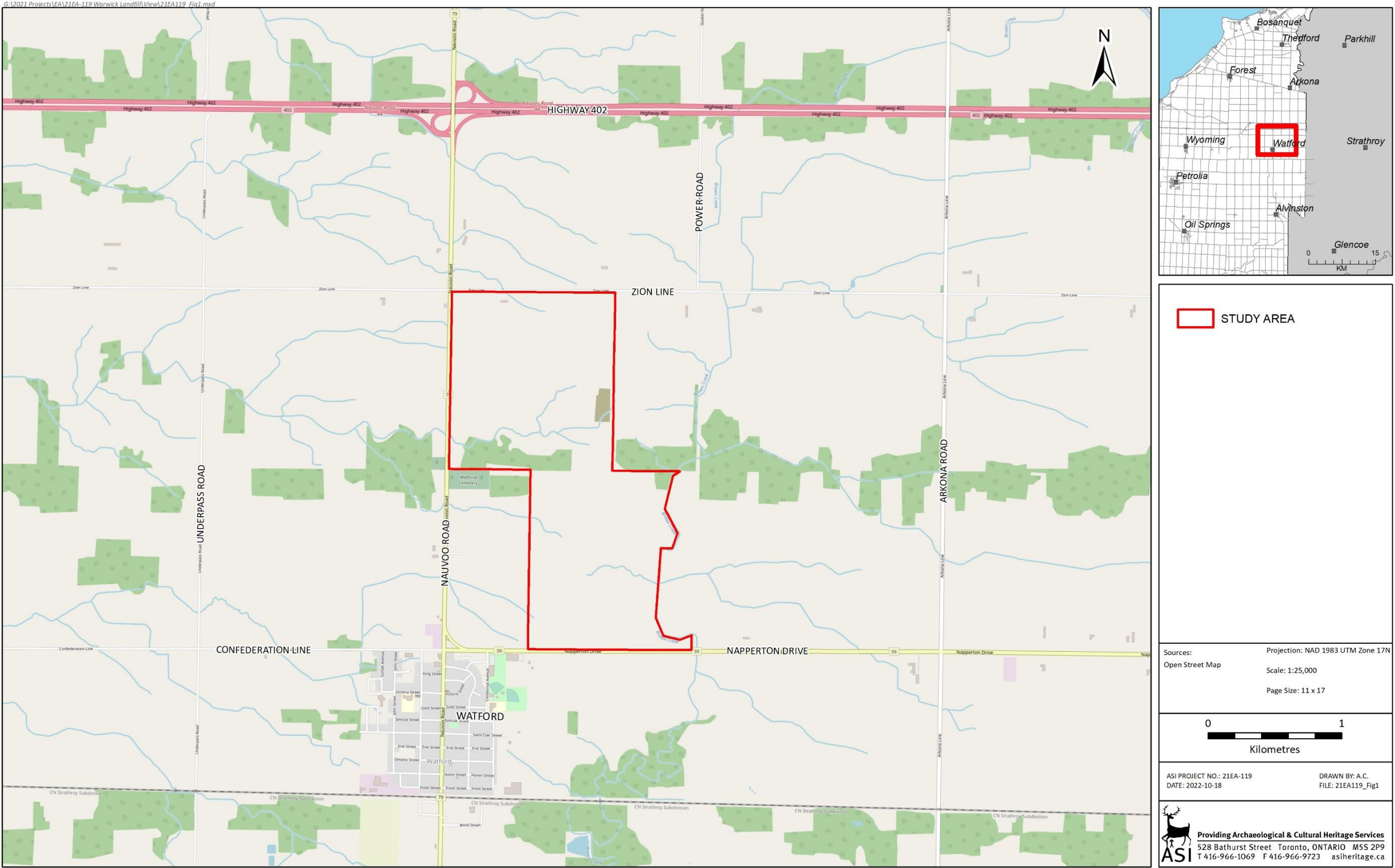




Figure 2. Study Area (Approximate Location) Overlaid on the 1880 Illustrated Historical Atlas of the County of Lambton

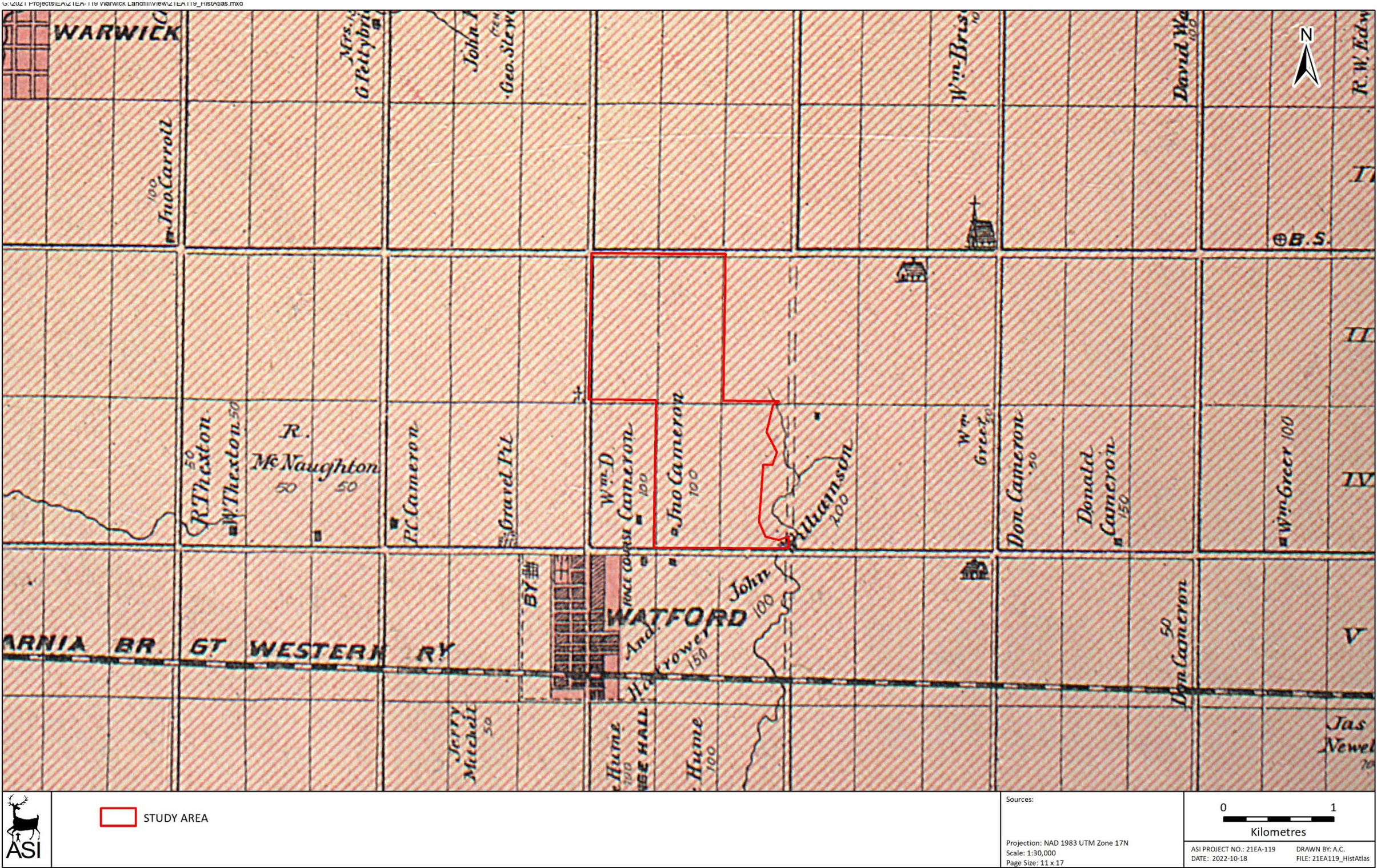


Figure 3. Study Area (Approximate Location) Overlaid on the 1911 Topographic Map Strathroy Street

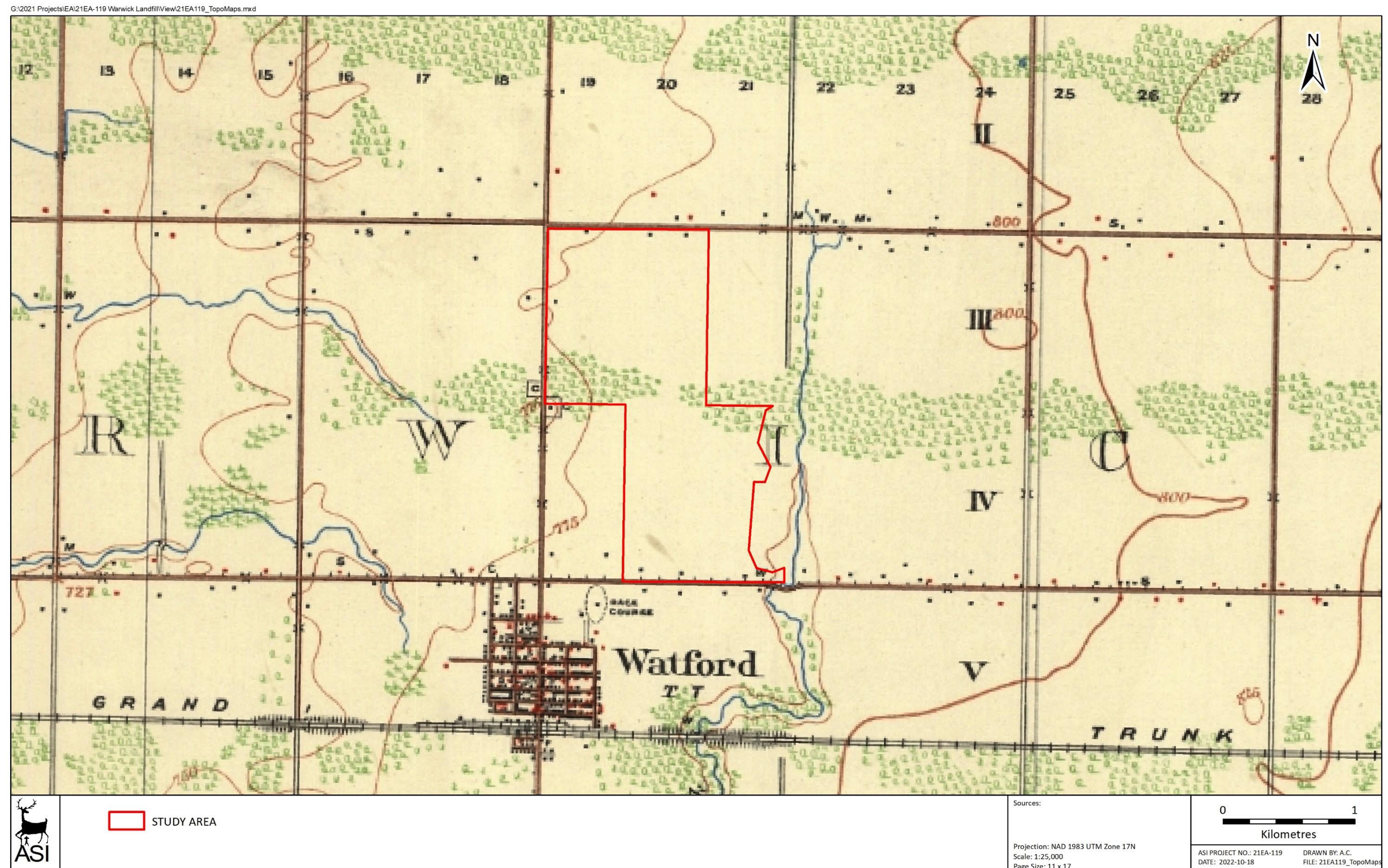


Figure 4. Study Area (Approximate Location) Overlaid on the 1911 National Topographic Series Strathroy Street

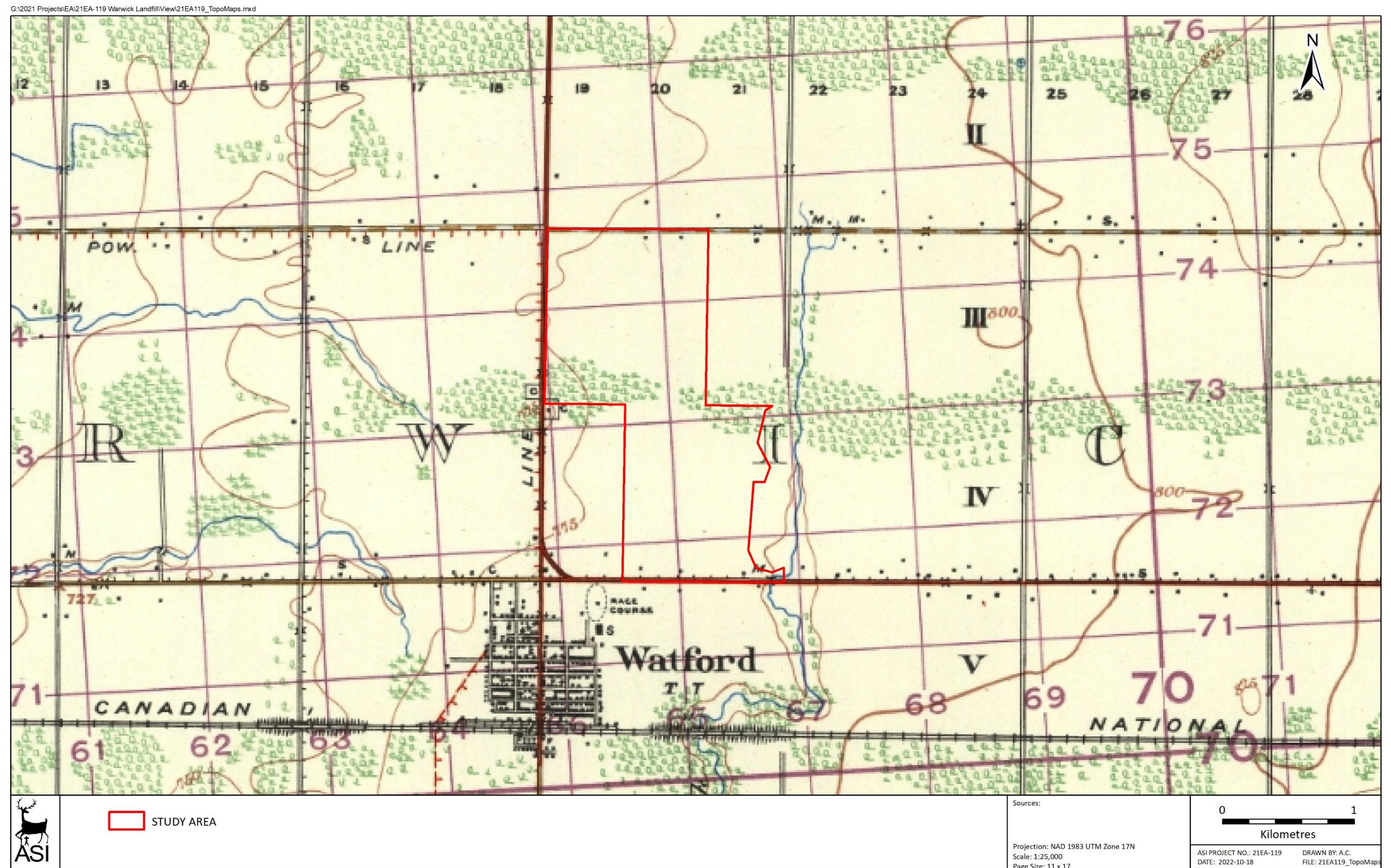


Figure 5. Study Area (Approximate Location) Overlaid on the 1996 National Topographic Series Strathroy Street

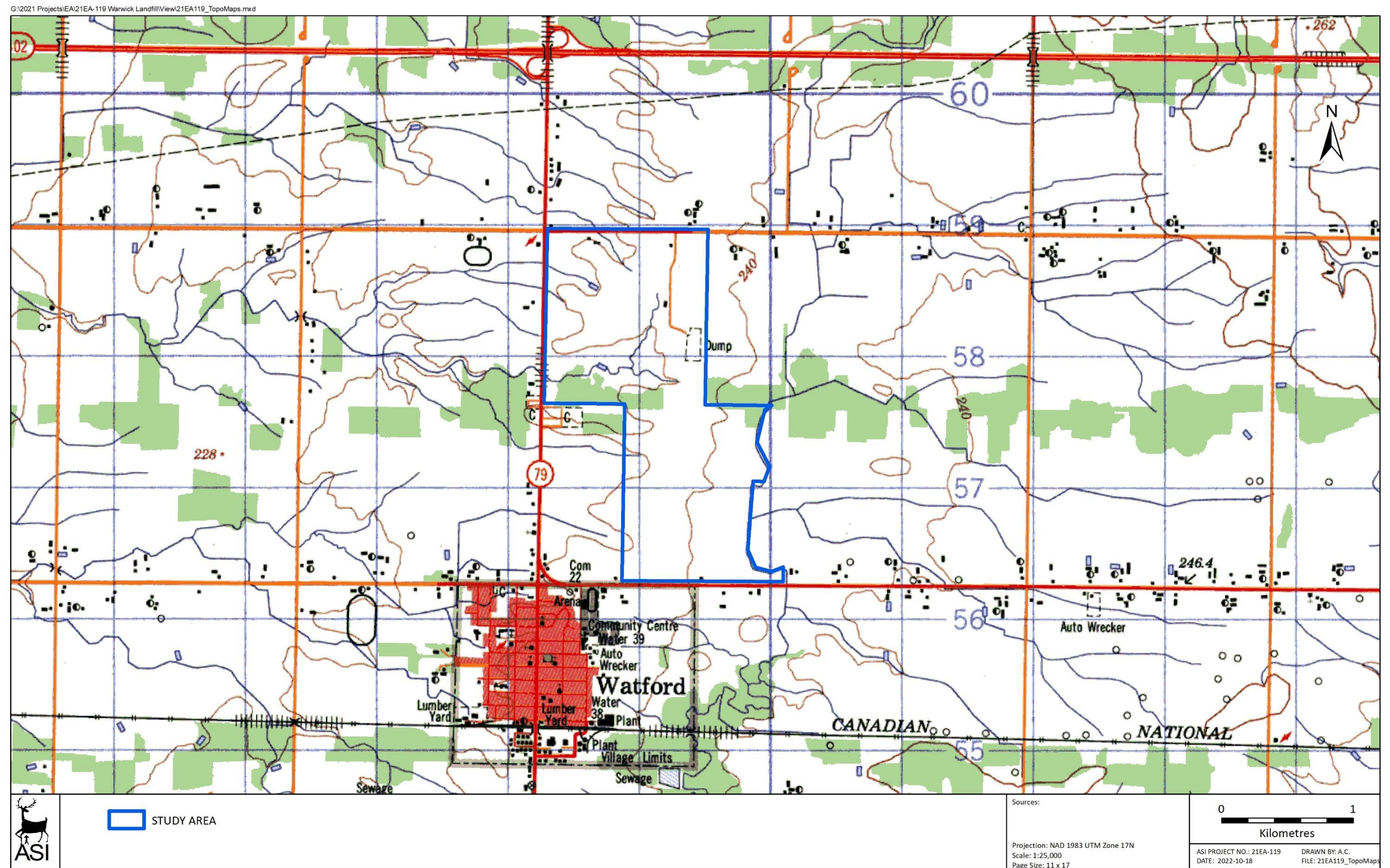


Figure 6. Study Area (Approximate Location) Overlaid on the 1954 Aerial Photography

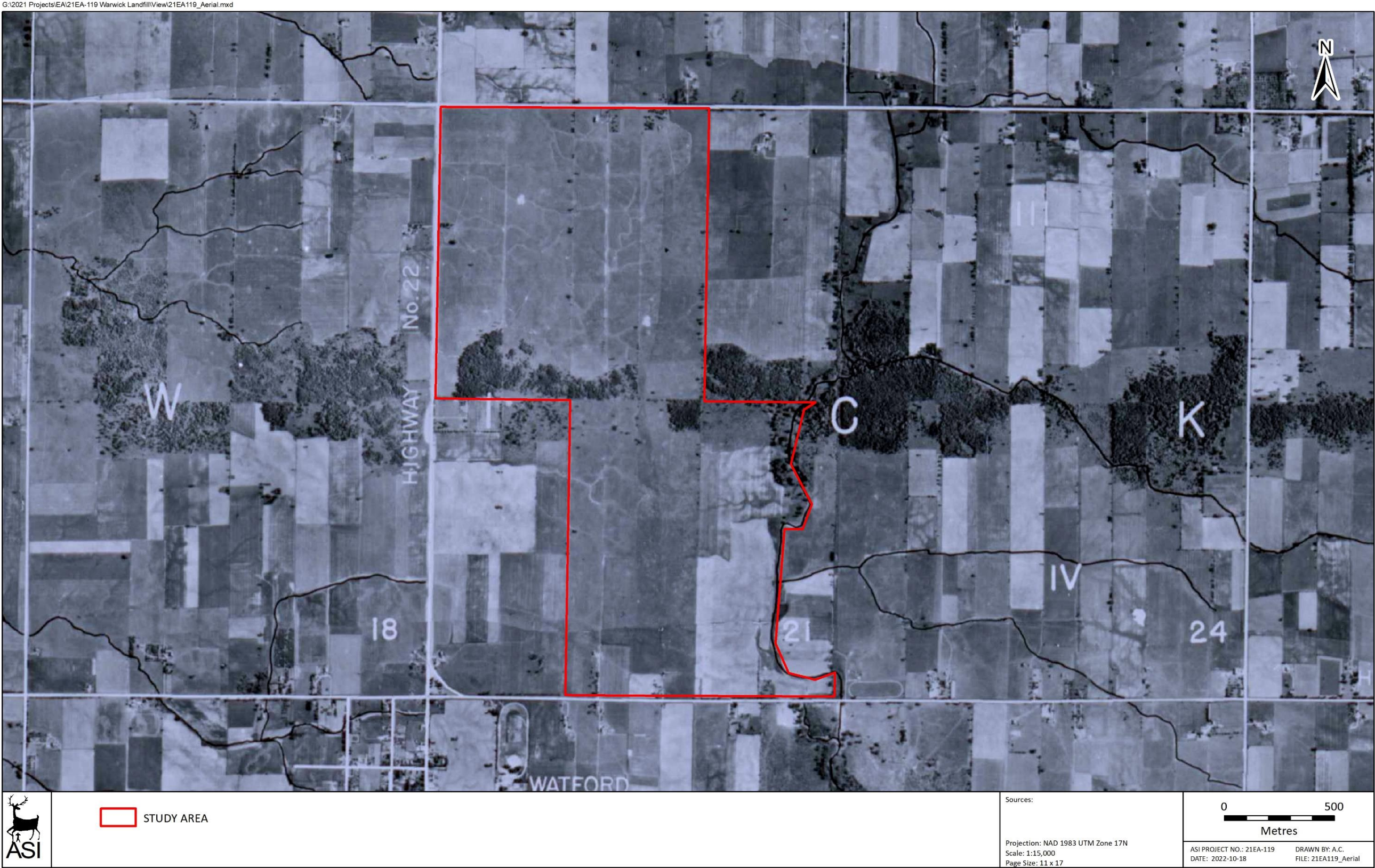


Figure 7. Study Area – Surficial Geology

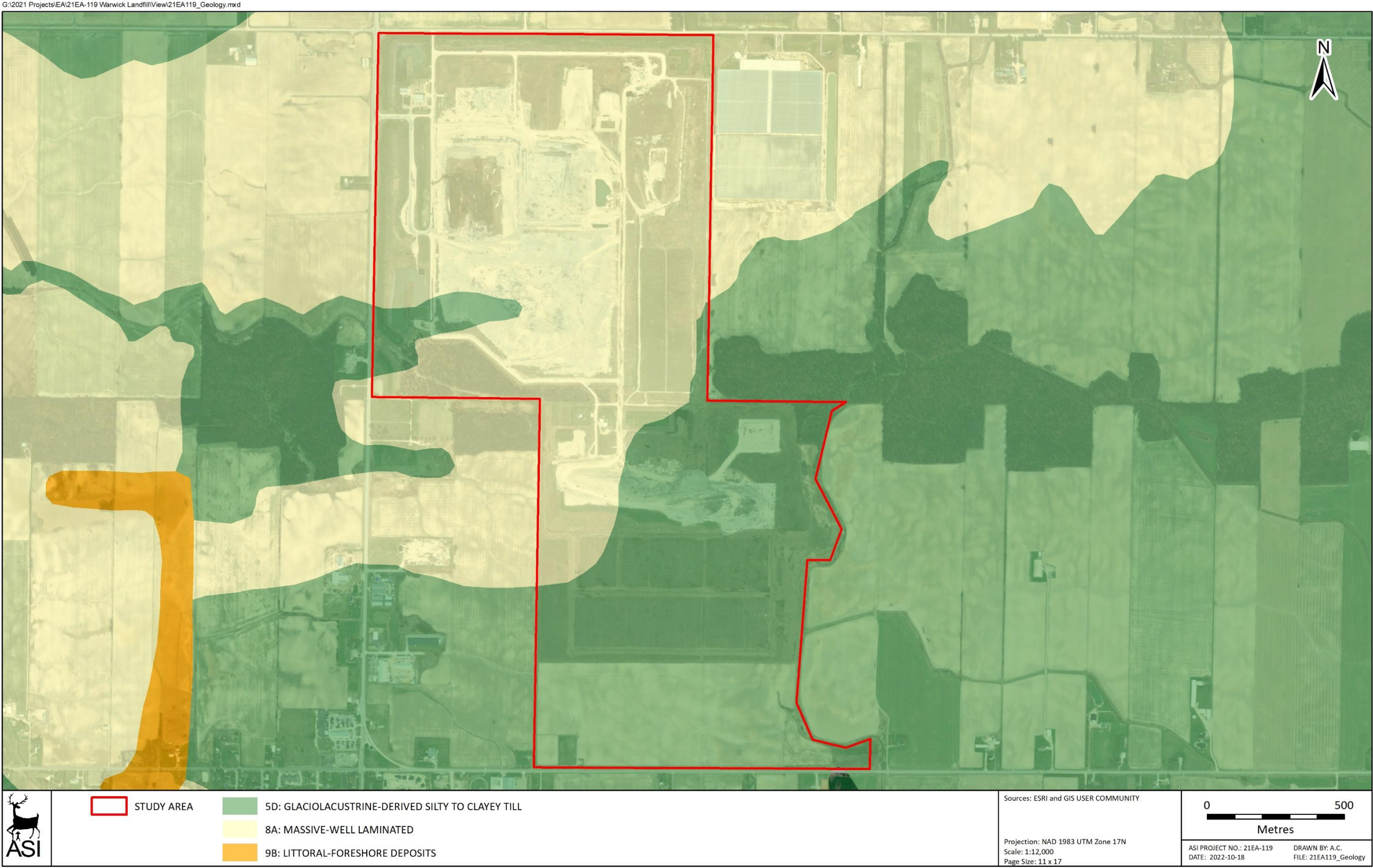


Figure 8. Study Area – Soil Drainage

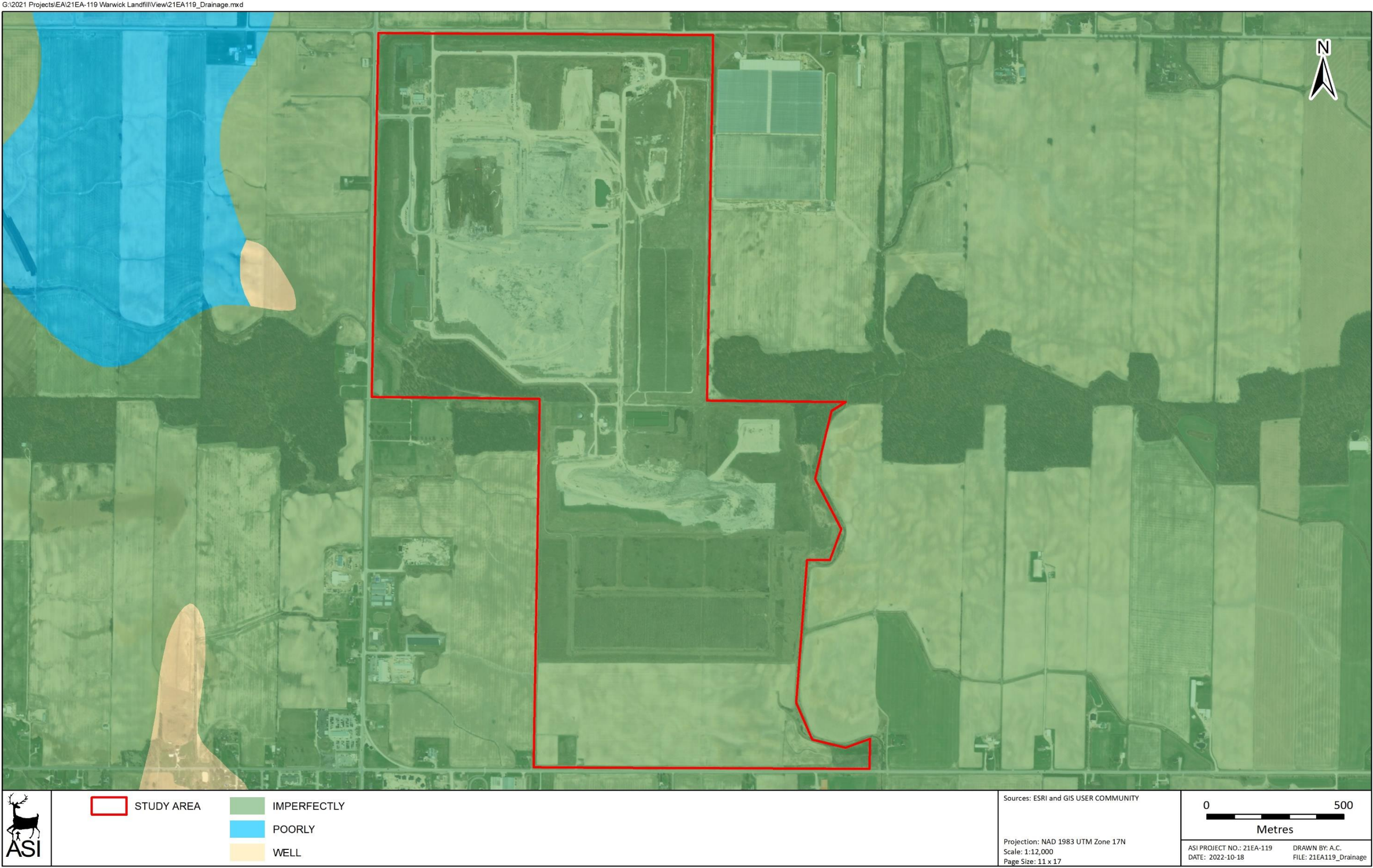


Figure 9. Study Area – Stage 1 Results (Key Map)

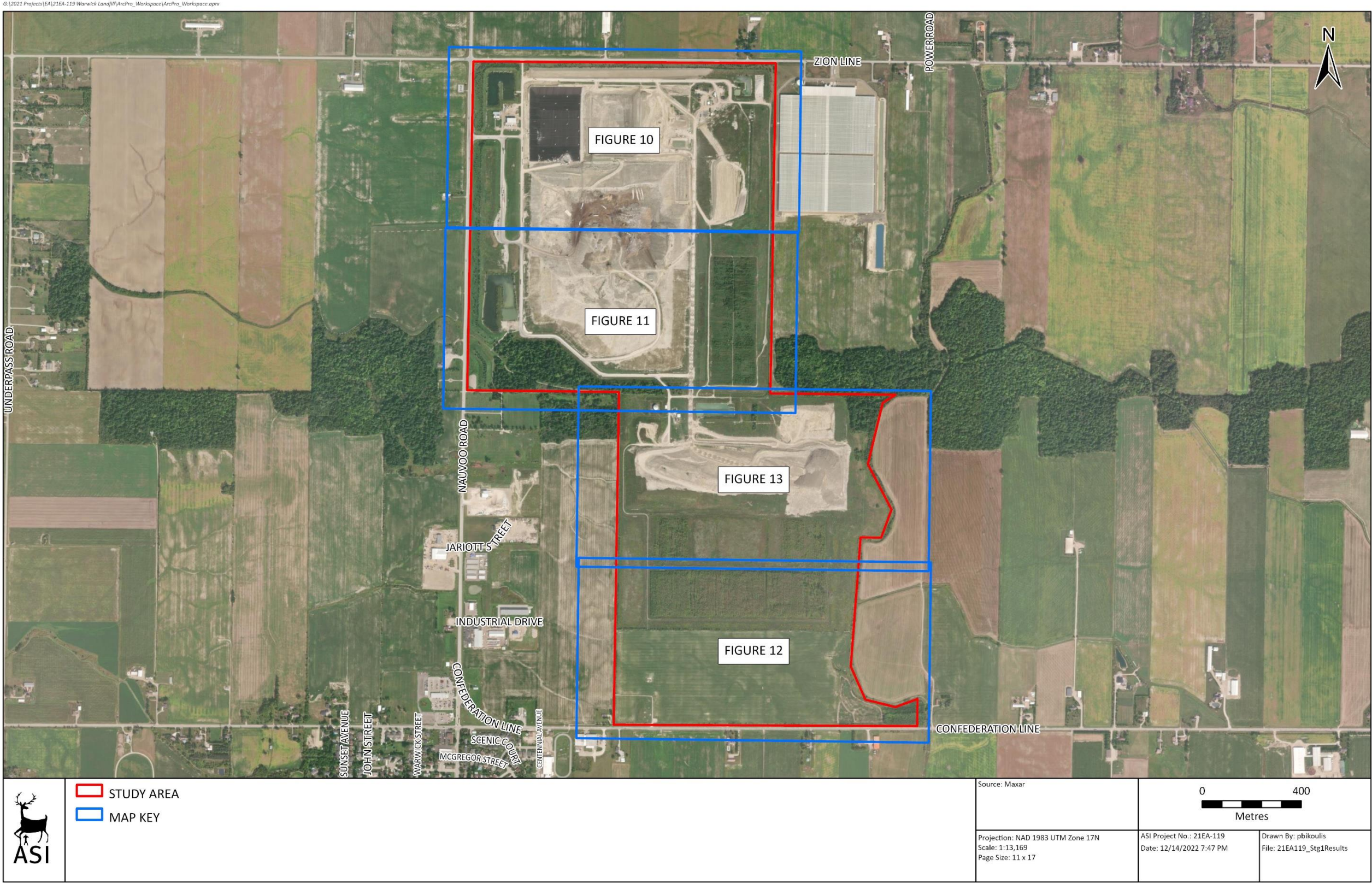


Figure 10. Study Area – Stage 1 Results (Sheet 1)



Figure 11. Study Area – Stage 1 Results (Sheet 2)

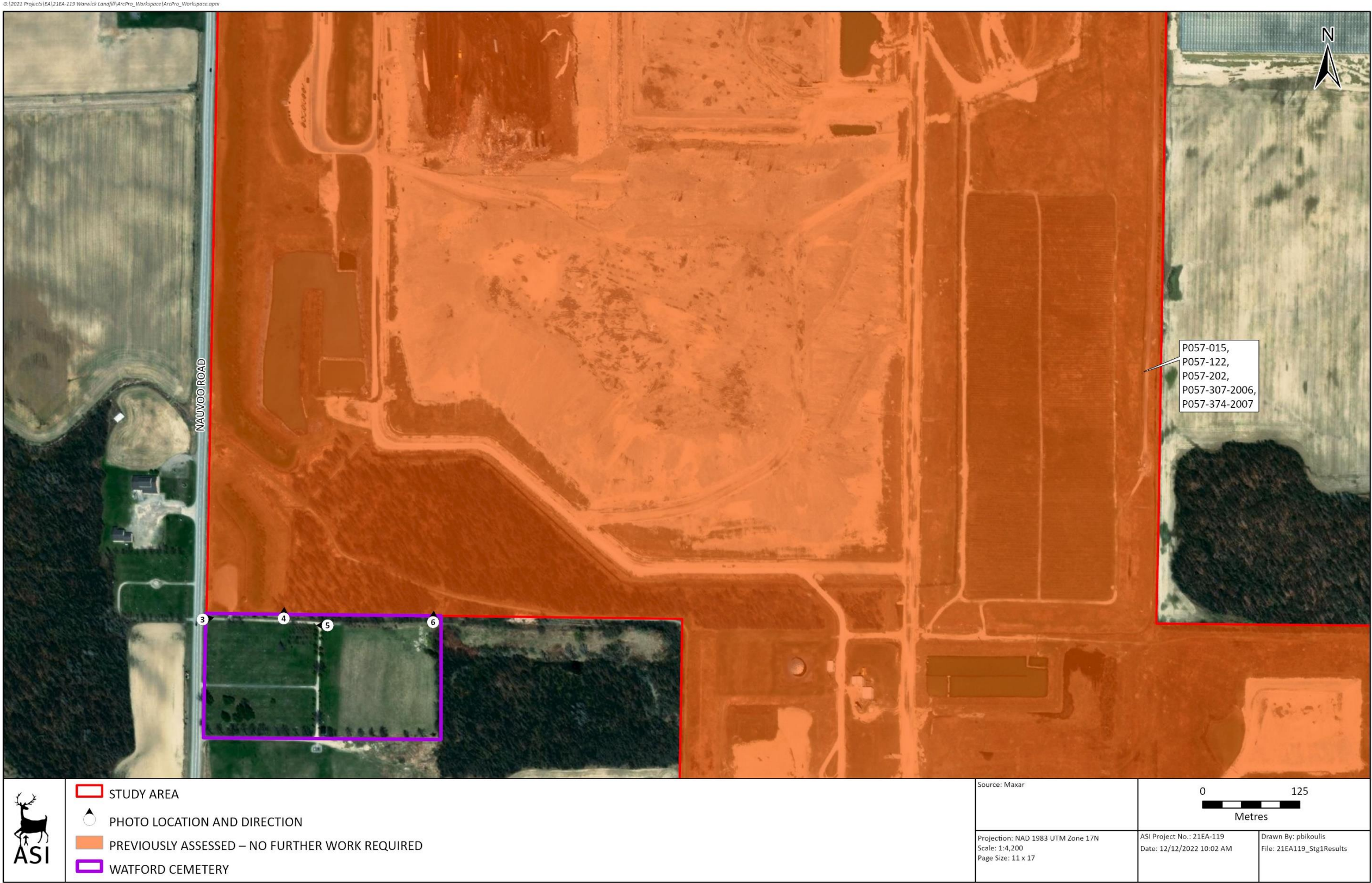
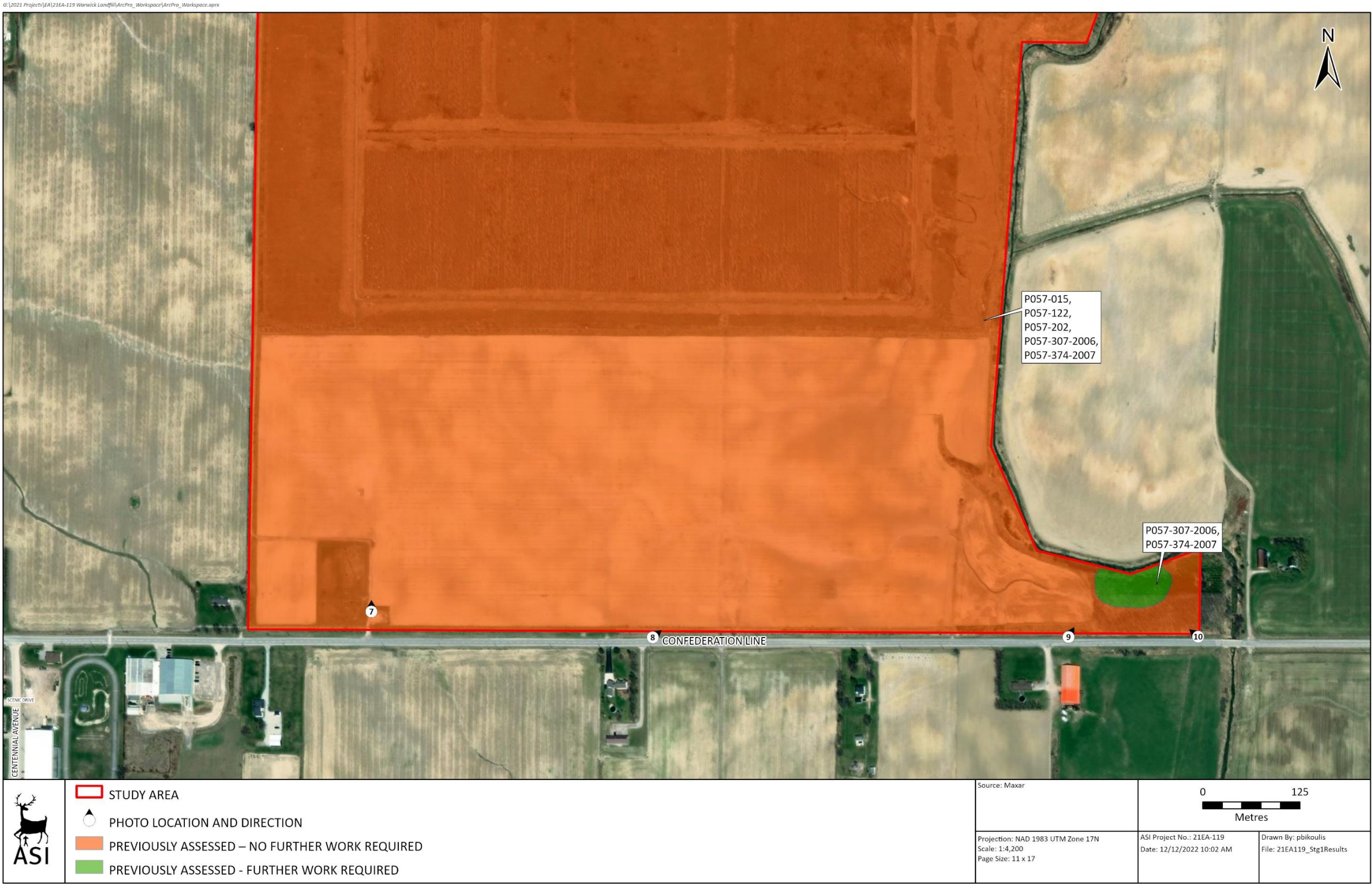
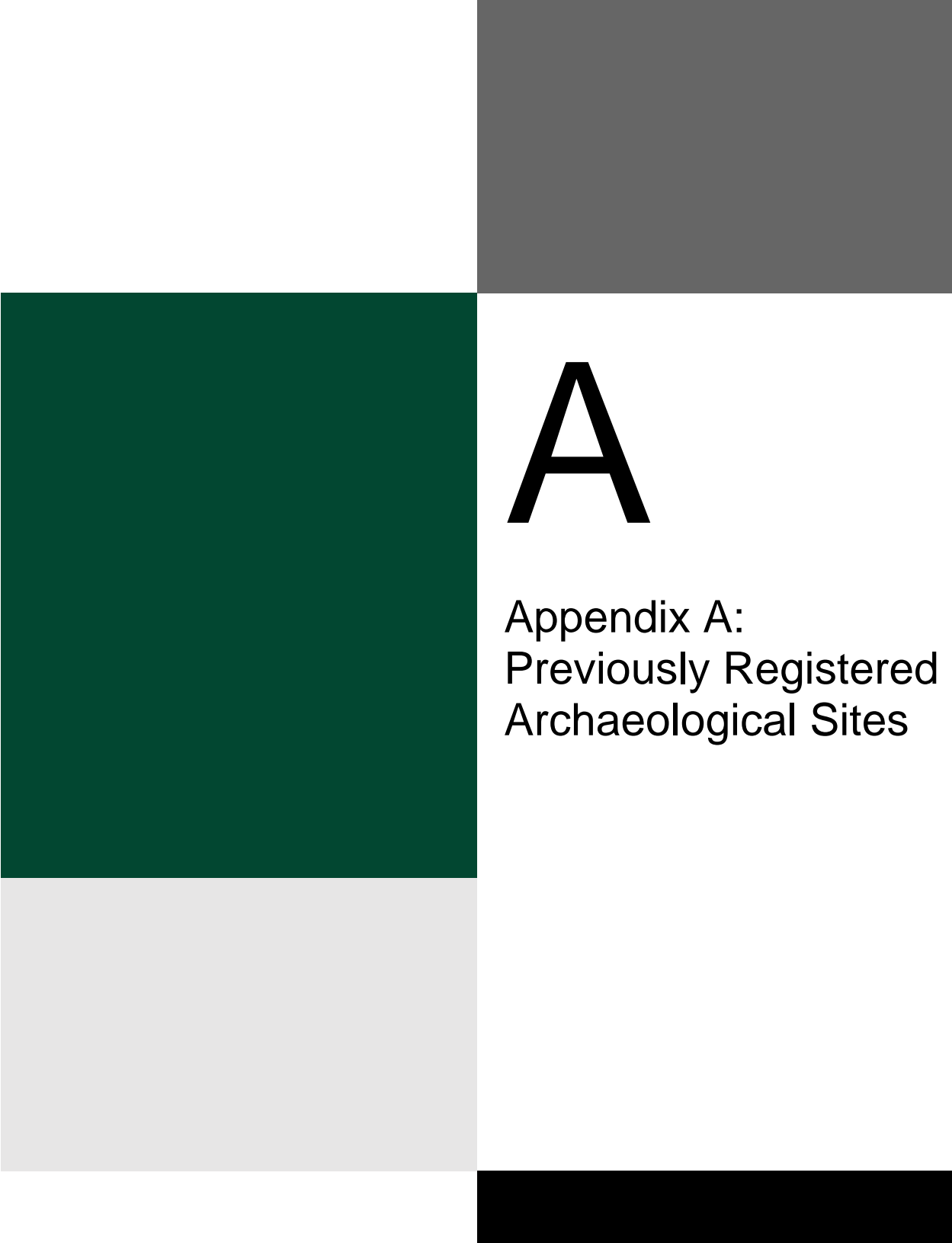


Figure 12. Study Area – Stage 1 Results (Sheet 3)



Figure 13. Study Area – Stage 1 Results (Sheet 4)



The page features a large, dark green rectangular block on the left side, a grey rectangular block at the top right, and a black rectangular block at the bottom right. The title 'Appendix A: Previously Registered Archaeological Sites' is positioned to the right of the green block.

A

Appendix A: Previously Registered Archaeological Sites

Table A-1. Previously Registered Archaeological Sites within One Kilometre of the Study Area

Borden number	Site Name	Temporal / Cultural Affiliation	Site type	Researcher
AfHI-8	Fisher	Middle Archaic	Isolated finds	ASI 1999
AfHI-9	Hume	Pre-contact Indigenous	Isolated finds	ASI 1999
AfHI-10	Burwell	Late Archaic	Isolated find	ASI 1999
AfHI-11	Murdo	Pre-contact Indigenous	Undetermined	ASI 1999
AfHI-12	Cameroon	Pre-contact Indigenous	Isolated finds	ASI 1999
AfHI-13	Collier	Late Archaic, Innis	Isolated find	ASI 1999
AfHI-14	Hy	Pre-contact Indigenous	Scatter	ASI 1999
AfHI-15	Jariott 1	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-16	Jariott 2	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-17	Jariott 3	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-18	Jariott 4	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000

Table A-1. Previously Registered Archaeological Sites within One Kilometre of the Study Area

Borden number	Site Name	Temporal / Cultural Affiliation	Site type	Researcher
AfHI-19	Jariott 5	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-20	Jariott 6	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-21	Jariott 7	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-22	Jariott 8	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-23	Jariott 9	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-24	Jariott 10	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-25	Jariott 11	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-26	Jariott 12	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-27	Jariott 13	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000

Table A-1. Previously Registered Archaeological Sites within One Kilometre of the Study Area

Borden number	Site Name	Temporal / Cultural Affiliation	Site type	Researcher
AfHI-28	Jariott 14	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-29	Jariott 15	Pre-contact Indigenous; Late Woodland	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-30	Jariott 16	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-31	Jariott 17	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-32	Warwick 1	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-33	Warwick 2	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-34	Jariott 18	Euro-Canadian	Homestead	Mayer Heritage Consultants Inc. 2000
AfHI-35	Jariott 19	Euro-Canadian	Homestead	Mayer Heritage Consultants Inc. 2000
AfHI-36	Jariott 20	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000

Table A-1. Previously Registered Archaeological Sites within One Kilometre of the Study Area

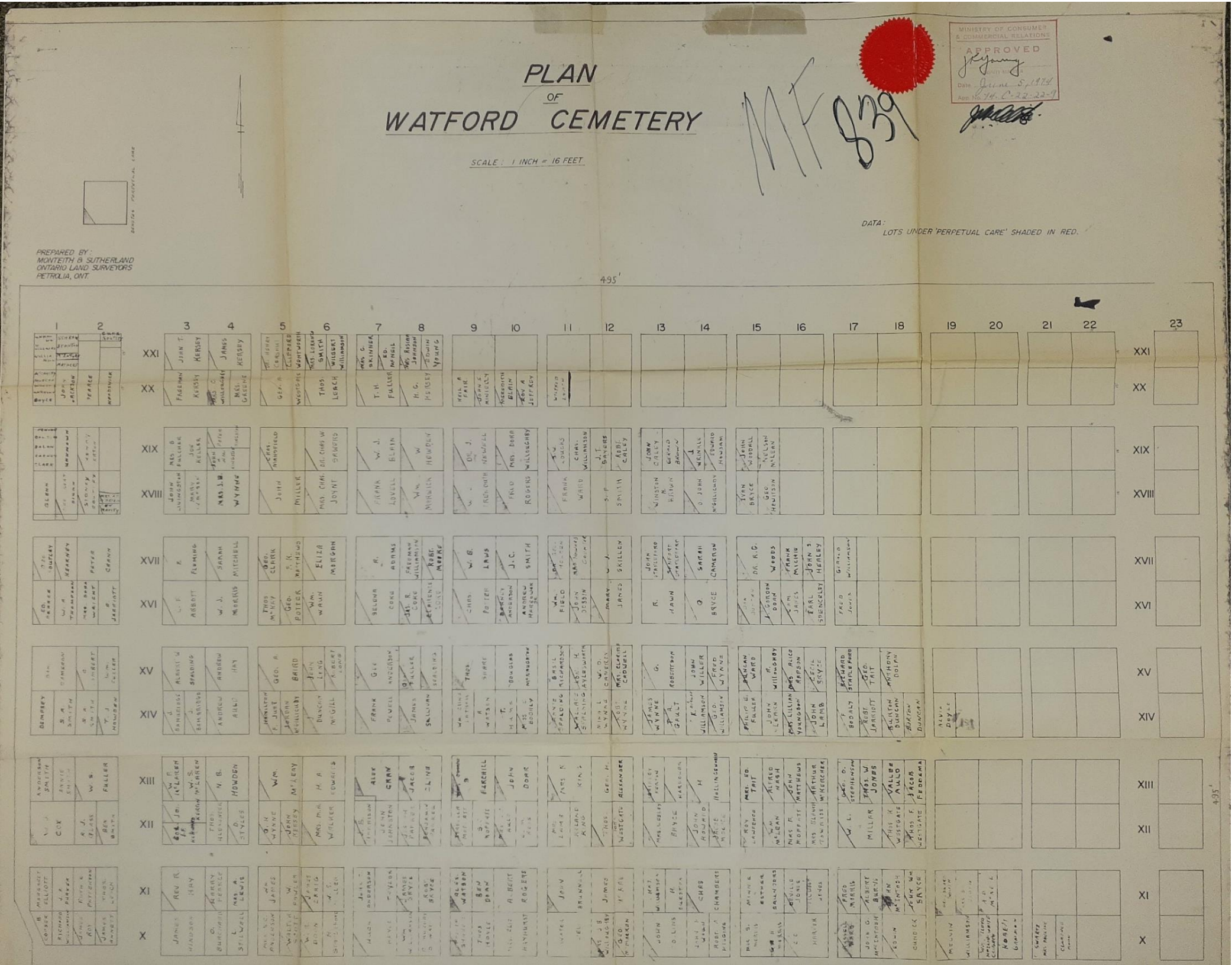
Borden number	Site Name	Temporal / Cultural Affiliation	Site type	Researcher
AfHI-37	Jariott 21	Pre-contact Indigenous	Campsite	Mayer Heritage Consultants Inc. 2000
AfHI-39	King 1	Pre-contact Indigenous	Isolated find	ASI 2005
AfHI-40	King 2	Pre-contact Indigenous	Isolated finds	ASI 2005
AfHI-41	King 3	Late Archaic	Undetermined	ASI 2005
AfHI-42	King 4	Middle Archaic	Undetermined	ASI 2005
AfHI-45	Warwick 1	Pre-contact Indigenous	Isolated find	ASI 2005
AfHI-49	Not Applicable	Woodland, Middle	Hunting	Timmins Martelle Heritage Consultants Inc. 2020
AfHI-50	Not Applicable	Pre-contact Indigenous; Euro-Canadian	Unknown; Farmstead, Homestead	Timmins Martelle Heritage Consultants Inc. 2020
Source: OASD Sites in bold are within the Study Area <i>Sites in italics are within 50 metres of the Study Area</i>				

a

B

Appendix B: Cemetery Maps

Figure B-1. Legal Survey of the Plan of Watford Cemetery (1974) Obtained from the Bereavement Authority of Ontario – Sheet 1



[illegible]

Figure B-3. Legal Survey of the Extension to Watford Cemetery (1983) Obtained from the Bereavement Authority of Ontario – Sheet 1

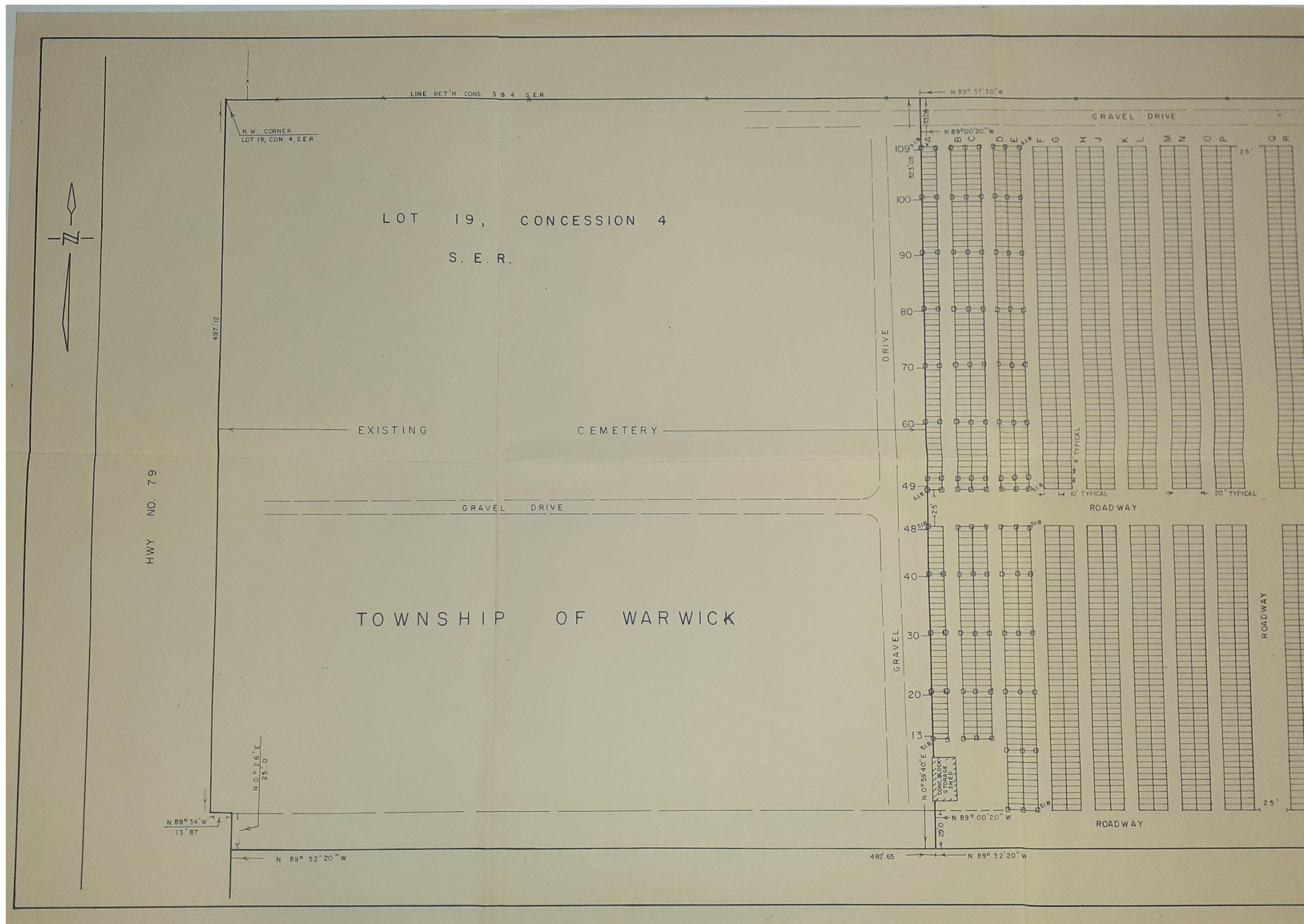


Figure 14. Legal Survey of the Extension to Watford Cemetery (1983) Obtained from the Bereavement Authority of Ontario – Sheet 2

