

Stage 1 Archaeological Assessment East Side Lands (Woolwich) Sanitary Servicing Municipal Class Environmental Assessment (Lots 101-103, 109-111, 116, and 126, German Company Tract, Geographical Waterloo Township, County of Waterloo) Township of Woolwich, Regional Municipality of Waterloo and City of Cambridge

Original Report

Prepared for:

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- DRAFT FOR REVIEW -

Executive Summary

Archaeological Services Inc. was contracted by Associated Engineering (Ont.) Ltd., on behalf of the Township of Woolwich, to conduct a Stage 1 Archaeological Assessment (Background Research and Property Inspection) as part of the East Side Lands Woolwich Sanitary Servicing Municipal Class Environmental Assessment. This project is being undertaken to evaluate alternative solutions for the extension of sanitary servicing infrastructure that is required to support existing and future developments within the Township of Woolwich. The Stage 1 Study Area consists of alignments between Menno Street to the north, Kossuth Road to the south, Fountain Street North to the west, and Lonsdale Road/Cober Road to the east.

The Stage 1 background study determined 32 previously registered archaeological sites are located within one kilometre of the Study Area. Two sites are within 50 metres of the Study Area (AiHc-530, AiHc-555), however neither have continued cultural heritage value or interest. The property inspection determined that parts of the Study Area exhibit archaeological potential and will require archaeological assessment.

The following recommendations are made:

- 1) Parts of the Study Area exhibit archaeological potential. These lands require Stage 2 archaeological assessment by test pit/pedestrian survey at five metre intervals, where appropriate. Stage 2 is required prior to any proposed construction activities on these lands;
- 2) Part of the Study Area has been disturbed during the construction of the airport but will require a Stage 2 judgemental test pit survey to confirm the previous disturbance, where appropriate, prior to any proposed impacts to the property;
- 3) The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance or being previously assessed

(P094-0295-2019, P007-1169-2020, P007-1260-2021). These lands do not require further archaeological assessment; and,

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

Project Personnel

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1.0 Project Context

Archaeological Services Inc. (ASI) was contracted by Associated Engineering (Ont.) Ltd., on behalf of the Township of Woolwich, to conduct a Stage 1 Archaeological Assessment (Background Research and Property Inspection) as part of the East Side Lands (Woolwich) Sanitary Servicing Municipal Class Environmental Assessment. This project is being undertaken to evaluate alternative solutions for the extension of sanitary servicing infrastructure that is required to support existing and future developments within the Township of Woolwich. The Stage 1 Study Area consists of the 3 preferred alternatives for gravity sewer alignments between Menno Street to the north, Kossuth Road to the south, Fountain Street North to the west, and Lonsdale Road/Cober Road to the east (Figure 1):

- Alternative 2: Alignment 3B along Otter and Fountain
- Alternative 4: Alignment 3D Cober and Kossuth
 - Associated Cober PS located on Region of Waterloo-owned property west of Cober Road
- Alternative 5: Alignment 3B along Jetliner and Fountain
 - Associated Jetliner Court Pumping Station (PS) located on Region of Waterloo-owned property southeast of Jetliner Court and Fountain Street

All activities carried out during this assessment were completed in accordance with the *Ontario Heritage Act* (1990, as amended in 2023) and the 2011 *Standards and Guidelines for Consultant Archaeologists* (S & G), administered by the Ministry of Citizenship and Multiculturalism (MCM 2011).

1.1 Development Context

All work has been undertaken as required by the *Environmental Assessment Act*, RSO (Environmental Assessment Act, R.S.O. c. E.18, 1990 as amended 2022) and regulations made under the Act, and are therefore subject to all associated legislation. This project is being conducted in accordance with the *Municipal*

Class Environmental Assessment process (Municipal Engineers Association, 2023).

The *Regional Municipality of Waterloo Archaeological Facilities Master Plan* (Region of Waterloo, 1989) was also consulted.

Authorization to carry out the activities necessary for the completion of the Stage 1 archaeological assessment and property inspection was granted by Associated Engineering (Ont.) Ltd. on May 23, 2023.

1.1.1 Treaties

In 1701 the Haudenosaunee entered into the Treaty of Fort Albany (Nanfan) with the British Crown where they agreed to place their beaver hunting grounds under the protection of the King of Britain and to reject the French from building forts on their lands, which included most of southcentral and southwestern Ontario.

In the following years, the Haudenosaunee called upon the King to honour this Treaty and “tear down” the French forts at Detroit, Niagara and Fort Frontenac (Kingston) from their Beaver Hunting Grounds. The King did honour the terms of the 1701 Treaty. To confirm the Kings’ commitment to the Five Nations and to allow their forts in the Five Nations lands as protection against the French an affirming agreement was entered into on September 14, 1726.

The protection of the Five Nations interests throughout their Beaver Hunting Grounds was again affirmed in Article 15 of the Treaty of Utrecht, signed in 1713 between the British and the French, wherein the Five Nations specifically would not be interfered with between (Lakes) Ontario, Erie and Huron.

The Study Area is also within the Between the Lakes Purchase (Treaty 3) and Haldimand Grant (Treaty 4) territory. Following the American Revolutionary War, the British Crown needed to find lands on which to settle United Empire Loyalists, including approximately 2,000 members of the Six Nations confederacy who had fought alongside British troops. Due to their service to the Crown during this war and the dispossession of Indigenous lands in New York

State by American forces, the English Colonial government offered to protect Six Nations peoples and give them land within the boundaries of English territory in Upper Canada. On August 8, 1783, Lord North instructed the Governor of Quebec, Sir Frederick Haldimand, to set apart land for the Six Nations people and ensure that they carried on their hunting and fur trading with the British. The Crown initially planned to provide lands for Loyalist settlers in Quebec and southeastern Ontario, including providing land in the Bay of Quinte region for Six Nations peoples. This was not suitable for many of the members of Six Nations and a contingent of approximately 1,800 community members, led by Chief Joseph Brant, requested land north of Lake Erie along the Grand River. Brant felt that the location in the Bay of Quinte was too isolated and that his followers could be better served by being closer to the Six Nations communities that chose to remain in the United States in western New York (Surtees, 1984).

Recognizing that under the terms of the Royal Proclamation the land needed to be purchased prior to settlement, Colonel John Butler was sent to negotiate with the Mississaugas of the Credit for lands east of Lake Ontario and north of Lake Erie. On May 22, 1784, the Mississaugas of the Credit agreed to cede approximately 3,000,000 acres of land containing all or part of what are now Brant, Elgin, Middlesex, Oxford, and Wellington Counties as well as the Regions of Haldimand-Norfolk, Halton, Hamilton-Wentworth, Niagara, and Waterloo. In exchange for these lands, the Mississaugas received £1180.74 worth of trade goods (Government of Canada, 2016; Surtees, 1984). Of the 3,000,000 acres, approximately 650,000 acres were set aside for the settlement of Six Nations people.

On October 25, 1784, Haldimand signed a proclamation that allotted land six miles (10 kilometres) on either side of the Grand River from its mouth at Lake Erie to its headwaters near Dundalk, Ontario. This land was to be used solely by the people of Six Nations, who were also granted the right to sell or lease the land within this territory providing the Crown was first offered to purchase the land (Filice, 2018; Surtees, 1984). Under the terms of the Haldimand Proclamation, Six Nations people were authorized to “Settle upon the Banks of the River” and were allotted “for that Purpose six miles [10 kilometres] deep

from each Side of [its] beginning at Lake Erie, & extending in the Proportion to [its] Head” (Filice, 2016; Johnston, 1964).

Due to uncertainties with the description of the lands in the original surrender, Treaty 3 was renegotiated on December 7, 1792, to clarify what was ceded. This largely revolved around the northern boundary of the Treaty area and in particular the area set aside for Six Nations settlement along the Haldimand Tract. The signees of the treaty on the side of the British included Lieutenant Governor John Graves Simcoe, John Butler, Robert Kerr, Peter Russell, John McGill, and Davie William Smith. The signees of the Treaty on the side of the Mississauga included Chiefs Wabakyne, Wabanip, Kautabus, Wabaniship, and Mottotow (Government of Canada, 2016; Surtees, 1984).

As part of the 1792 renegotiation of Treaty 3, the Crown also redefined the boundaries of the Haldimand Tract. Upon review of the Haldimand Proclamation, politician and Indian Department official Sir John Johnson noted an error involving the location of the northern boundary of the tract. Haldimand had mistakenly assumed in 1784 that the headwaters of the Grand River resided within the area negotiated under Treaty 3. However, the northern reach of the Haldimand Tract was within lands that were not negotiated until 1818 under Treaties 18 and 19 (Filice, 2016; Government of Canada, 2016; Surtees, 1984). In order to clarify the boundaries of the tract, the Crown appointed surveyor Augustus Jones to complete a survey of the Haldimand Tract in 1791. In so doing, Jones redefined the borders of the Six Nations’ land parcel. This included defining the northern limit of the Haldimand Tract as Jones Baseline near the Town of Fergus in the Township of Centre Wellington. In addition, Jones established straight-lined boundaries, rather than sinuous boundaries following every curve in the river, which can still be seen in today’s municipal boundaries. Six Nations and Joseph Brant were not in agreement with this new definition and petitioned the government for control over the tract. This eventually led to the 1793 Simcoe Patent which defined the rules of land ownership and leasing within the revised 30,000 acres of land provided to Six Nations. This 1793 patent did not address those lands northeast of the Jones Baseline and continues to be a source of dispute between Six Nations and the Crown.

The difference between the original land grant of the Haldimand Proclamation and the Simcoe Patent was significant. Not only did the new territory remove the upper 275,000 acres of the tract north of Jones Baseline, Jones' redefinition of the boundaries along the portions of the Haldimand Tract within the Treaty 3 lands did not consistently provide six miles on either side of the Grand River. Six Nations of the Grand River contend that they were not involved in the renegotiation of this land and therefore the redefined territory is not consistent with the terms of the original land grant. In particular, it is the view of Six Nations of the Grand River that it was the responsibility of the Crown to provide the land that was agreed to in the Haldimand Proclamation (Six Nations of the Grand River, 2019).

Following the establishment of the Haldimand Tract, Six Nations of the Grand River began to negotiate leases within the Haldimand Tract as a means of generating income for the community. These transactions were made under the understanding that this would provide a continuous revenue stream for the Confederacy and that these represented long term leases rather than formal land sales (Six Nations of the Grand River, 2019). The Crown was responsible for administering these funds which Six Nations of the Grand River argue they never received. Many of the leases were confirmed by the Crown in 1834-5, although unauthorized sales and squatting by settlers remained a significant issue (Johnston, 1964; Lytwyn, 2005). In 1841, the Superintendent of Indian Affairs, Samuel P. Jarvis, informed the Six Nations of the Grand River that the only way to keep white intruders off their land would be for the Crown to manage these lands on behalf of the Nation, to be administered for their sole benefit. Under this plan, the Six Nations of the Grand River would retain lands that they actually occupied and a reserve of approximately 20,000 acres near the present-day city of Brantford. This transfer of land to the Crown was made by the Six Nations in January 1841 (Johnston, 1964; Lytwyn, 2005).

This history and those surrenders are still contested by the Confederacy and there are numerous specific land claims that have been filed by the Six Nations of the Grand River with the federal government in regard to lands within the Haldimand Tract.

1.2 Historical Context

1.2.1 Indigenous Land Use and Settlement

Current archaeological evidence indicates humans were present in southern Ontario 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 & Fritz, 1988) and populations now occupied less extensive territories (Ellis & 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 archaeological evidence for cemeteries dates to approximately 4,500-3,000 B.P. and is interpreted by archaeologists to be indicative of increased social organization and the investment of labour into social infrastructure (Brown, 1995, p. 13; Ellis et al., 1990, 2009).

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 begins around 2,500 B.P. and exchange and interaction networks broaden at this time (Spence et al., 1990, pp. 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, pp. 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 & Williamson, 2013, pp. 13–15). As is evident in detailed Anishinaabek 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.), larger settlement sites focused on horticulture begin to dominate the archaeological record. Seasonal dispersal of the community for the exploitation of a wider territory and more varied resource base was still practised (Williamson, 1990, p. 317). By 1300-1450 C.E., archaeological research focusing on these horticultural societies note that this episodic community dispersal was no longer practised and these populations now occupied sites throughout the year (Dodd et al., 1990, p. 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 these First Nations, as described historically by the French and English explorers who first visited southern Ontario, was developed. Other First Nation communities continued to practice residential mobility and to harvest available resources across landscapes they returned to seasonally/annually.

By 1600 C.E., the Confederation of Nations were encountered by the first European explorers and missionaries in Simcoe County. 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.

By the 1640s, devastating epidemics and the traditional enmity between the Haudenosaunee¹ and the Attawandaron and the Huron-Wendat (and their

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 nations - 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.

Algonquian allies such as the Nipissing and Odawa) led to their dispersal from southern Ontario. Shortly afterwards, the Haudenosaunee established a series of settlements at strategic locations along the trade routes inland from the north shore of Lake Ontario. Peace was achieved between the Haudenosaunee and the Anishinaabe Nations in August of 1701 when representatives of more than twenty Anishinaabe Nations assembled in Montreal to participate in peace negotiations. Peace was confirmed again at council held at Lake Superior when the Haudenosaunee delivered a wampum belt to the Anishinaabe Nations. This agreement between the Haudenosaunee and Anishinaabe nations is referred to as the Dish with One Spoon.

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 of the Credit 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.

1.2.2 Post-Contact Settlement

Historically, the Study Area is located in the Geographical Waterloo Township, County of Waterloo in Lots 101-103, 109-111, 116, and 126, German Company Tract.

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 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).

Waterloo Township

The historic Township of Waterloo was originally known as Block Two of the Grand River land grant which was deeded to the Six Nations of the Grand River by the British in 1784 for their loyalty to the Crown in the American War of Independence. In 1796, Block Two, a 38,045-hectare tract, was acquired by Richard Beasley from Joseph Brant on behalf of the Six Nations. He subdivided and sold the land, with an approximately 24,281-hectares tract of land going to the German Company of Pennsylvania, in November 1803 (Janusas, 1988). Company members included Samuel and John Bricker; and Daniel, Jacob, and John Erb. The German Company of Pennsylvania had the lands surveyed by Augustus Jones to subdivide the land into 128 farm lots of approximately 181-hectares each and 32 farm lots of approximately 34-hectares each (Janusas, 1988). On July 18, 1800, George Bechtel procured a deed for 3150 acres of land which would become known as Bechtel's Tract. In 1816, Bechtel's Tract became the Township of Waterloo. Between the 1820s and the 1870s a steady migration of German-speaking Europeans settled in the area.

When Block Two was incorporated into the District of Gore (County of Halton) in 1816, it was named Waterloo Township, in honour of the battle that ended the

Napoleonic Wars in Europe. It remained part of Halton County in the District of Gore until 1842 and then part of the District of Wellington. The County of Waterloo did not come into being until 1852 (Janusas, 1988).

The first immigrants to settle in Waterloo Township were almost exclusively German Mennonites from Pennsylvania, who had originally emigrated from Switzerland, Germany and France. Most of these settlers were farmers but many were tradesmen and millers. Later settlers were generally of Scottish, English, Irish, and continental German heritage, many of them farmers, but most of them were artisans and tradesmen. When the railway was laid through Waterloo Township in the mid-nineteenth century, it became the leading industrial center of Waterloo County (Janusas, 1988).

Abraham Erb purchased approximately 181-hectares of land in 1805 and became the first settler in the City of Waterloo. He transferred a portion of his land and ownership of two mills to Jacob Snider in 1829. Snider's son inherited approximately 129-hectares which he sold to John Hoffman and Isaac Weber, who sectioned and sold the lands in 1854, at which point the population of Waterloo began to expand (Janusas, 1988).

In the mid-1850s, the defining development of Waterloo Township and Waterloo County was the construction of the railway. The first railway line built into the township was a main line of the Grand Trunk Railway from Toronto, laid through in 1856. Several other railway lines were soon laid across the township including: a Grand Trunk branch between Preston and Berlin in 1857; a Great Western line from Galt, Preston, and Guelph in 1857; a Grand Trunk branch between Berlin (Kitchener) and Galt in 1882; and a Grand Trunk Branch between Waterloo and Elmira in 1891.

1.2.3 Map Review

The 1861 *Tremaine's Map of the County of Waterloo* (Tremaine, 1861), 1881 *Illustrated Historical Atlas of the County of Waterloo* (Parsell & Co., 1881), 1923 Topographic Map Galt Sheet, and the 1992 National Topographic Series Kitchener Sheet (Department of Energy, Mines and Resources, 1992) were

examined to determine the presence of historic features within the Study Area during the nineteenth and twentieth centuries (Figure 2 to Figure 6).

The 1861 map (Figure 2) depicts a settled rural area composed of divided lots. Historic transportation roads within or adjacent to the Study Area include part of what are now Menno Street, Kossuth Road, Fountain Street North, and the original historical alignments of Lonsdale Road. No historic structures are indicated within 100 metres of the Study Area. The Grand River flows within 300 metres southwest of the Study Area while one of its tributaries, now known as the Randall Drain, is within the Study Area.

The 1881 map (Figure 3) is more simplified than the 1861 map. It continues to show the aforementioned waterways, roads, and rural context. A new feature is the schoolhouse Number 15 is within 100 metres of the southwest corner of the Study Area.

The 1923 map (Figure 4) shows the wetland near the southern half of the Study Area and meandering tributaries draining into the Grand River. Several buildings are indicated within and adjacent to the Study Area. A small cluster of buildings west of Lonsdale Road are depicted as well as buildings north and south of Kossuth Road and east and west of Fountain Street North. An “S” marks the schoolhouse west of the Study Area at the Fountain Street North and Riverbank Crecent intersection.

The 1992 map (Figure 5) shows the Study Area surrounding the Region of Waterloo International Airport, which was constructed between 1945 and 1966. The Randall Drain tributary was also realigned during this period of construction and now exits the Study Area south of the airport through the eastern border. A new channel, the Breslau Drain, is illustrated intersecting the northern section of the Study Area, north of the airport. Two culverts are indicated along the southern part of Fountain Street North. Lonsdale Road has been reconfigured and this map shows it now matches its present-day alignment.

1.2.4 Aerial and Orthoimagery Review

Historical aerial imagery from 1954 (Hunting Survey Corporation Limited, 1954) shows the rural agricultural nature of most of the Study Area (Figure 6). The Region of Waterloo International Airport is shown under construction with a two-lane runway. A woodlot is shown west of the northern part of Lonsdale Road and another north of Kossuth Road. Image 31 further demonstrates the condition of the Study Area in 1950 with an aerial image of the airport under construction. 600 acres of farmland were cleared during this project.

A review of available Google satellite imagery shows between 2009 (Image 32) and 2012 (Image 33) a roundabout was constructed at the Kossuth Road, Fairway Road North and Fountain North intersection. Image 34 shows a series of land disturbing developments north and south of Jetliner Crescent within the Study Area in 2023. Image 35 shows the condition of a residential property located at 2183 Lonsdale Avenue in 2011. Image 2 and Image 36 reveal that the structures on this property have been demolished.

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 MCM through “Ontario’s Past Portal”; published and unpublished documentary sources; and the files of ASI.

1.3.1 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 B.P. (Karrow & 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 located within the spillways and drumlinized till plains of the Guelph Drumlin Field physiographic region of southern Ontario (Chapman & Putnam, 1984). The Guelph Drumlin Field centres upon the City of Guelph and Guelph Township and occupies roughly 830 kilometres squared. Within the Guelph Drumlin Field, there are approximately 300 drumlins of varying sizes. For the most part these hills are of the broad oval type with slopes less steep than

those of the Peterborough drumlins and are not as closely grouped as those in some other areas. The till in these drumlins is loamy and calcareous, and was derived mostly from dolostone of the Amabel Formation that can be found exposed below the Niagara Escarpment. Spillways are the former glacial meltwater channels. They are often found in association with moraines but in opposition are entrenched rather than elevated landforms. They are often, though not always, occupied by stream courses, the fact of which raises the debate of their glacial origin. Spillways are typically broad troughs floored wholly or in part by gravel beds and are typically vegetated by cedar swamps in the lowest beds (Chapman & Putnam, 1984).

Figure 7 depicts surficial geology for the Study Area. The surficial geology mapping demonstrates that the Study Area is underlain by stone-poor, sandy silt to silty sand-textured till on Paleozoic terrain, glaciofluvial deposits, river deposits and delta topset facies and gravelly deposits (Ontario Geological Survey, 2010).

Figure 8 shows soil drainage within the Study Area. Soil types within the Study Area include:

- Burford, a gravelly loam with good drainage
- Caledon, a well drained, sandy loam
- Brady, an imperfectly drained sandy loam
- Hawksville, a poorly drained loam
- Guelph, a well drained loam
- Lisbon, a well drained sandy loam and,
- Organic soils from 12-36 inches over fine materials (Presant & Wicklund, 1971).

Multiple tributaries of the Randall Drain watershed flow through the Study Area. The headwaters of the Randall Drain watershed begin east of Breslau Drain and drain in a southerly direction. In the lower reaches the Drain flows in westerly and south-westerly direction until it ultimately discharges to the Grand River. The Randal Drain watershed has a gently rolling terrain comprised mostly of

open agricultural land and early successional meadows (WSP and MMM Group, 2016).

The Grand River watershed is the largest watershed in southern Ontario at 6,800 square kilometres and includes the cities of Brantford, Cambridge, Guelph, Kitchener, and Waterloo. The Grand River Watershed begins in Dufferin County in the Dufferin Highlands and travels south 310 kilometres before emptying into Lake Erie at Port Maitland. The Conestogo, Nith, Speed and Eramosa rivers are the major four waterways which feed into the Grand. Roughly 70 percent of the watershed is made of intensive agricultural areas (Grand River Conservation Authority, 2020).

The Grand River was an important transportation route and a critical resource extraction area for generations of Indigenous people. Historically, the Grand River has been utilized as a navigable waterway, as a power source (such power sites served as settlement nuclei), and above Brantford as a course for driving logs (Chapman and Putnam 1984:98). It is also the focus of the Haldimand Tract; an area of six miles (10 kilometres) on either side of the river that was awarded to the Haudenosaunee in 1784 (Filice 2016; Lytwyn 2005). The Grand River (and its tributaries the Nith, Conestogo, Speed and Eramosa Rivers) was designated as a Canadian Heritage River in 1994 for its cultural history and recreation (Canadian Heritage Rivers System, 2016).

1.3.2 Previously Registered Archaeological Sites

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database 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 *AiHc*.

According to the Ontario Archaeological Sites Database, 32 previously registered archaeological sites are located within one kilometre of the Study Area (MCM

2024). Two sites are within 50 metres of the Study Area (AiHc-530, AiHc-555), neither of which have further cultural heritage value or interest (CHVI). A summary of the sites is provided below in Table 1. Sites within 50 metres are shown in *italics*.

Table 1: Registered Sites within One Kilometre of the Study Area

Borden number	Site Name	Temporal/ Cultural Affiliation	Site type	Researcher
AiHc-52	Woolner	Euro-Canadian	Unknown	Janusas 1986
AiHc-53	Rockway 1	Archaic, Middle	Findspot	Janusas 1986
AiHc-54	Rockway 2	Pre-Contact Indigenous	Findspot	Janusas 1986
AiHc-98	Grand River 1	Pre-Contact Indigenous	Scatter	ASI 1989
AiHc-99	Grand River II	Pre-Contact Indigenous	Scatter	ASI 1989
AiHc-100	Grand River III	Pre-Contact Indigenous	Findspot	ASI 1989
AiHc-101	Grand River IV	Pre-Contact Indigenous	Findspot	ASI 1989
AiHc-102		Pre-Contact Indigenous	Scatter	ASI 1989

Borden number	Site Name	Temporal/ Cultural Affiliation	Site type	Researcher
AiHc-103		Pre-Contact Indigenous	Scatter	ASI 1989
AiHc-236		Archaic	Scatter	Archaeologix Inc. 2000
AiHc-391	Huber 1	Pre-Contact Indigenous	Findspot	Archaeological Research Associates Ltd. 2007
AiHc-524		Pre-Contact Indigenous	Scatter	Archaeological Research Associates Ltd. 2021
AiHc-525		Pre-Contact Indigenous	Scatter	Archaeological Research Associates Ltd. 2021
AiHc-526		Archaic, Late	Findspot	Archaeological Research Associates Ltd. 2021
AiHc-527		Pre-Contact Indigenous	Scatter	Archaeological Research Associates Ltd. 2021

Borden number	Site Name	Temporal/ Cultural Affiliation	Site type	Researcher
AiHc-528		Woodland, Early	Scatter	Archaeological Research Associates Ltd. 2021
AiHc-529		Archaic, Late; Euro-Canadian	Campsite; House	Archaeological Research Associates Ltd. 2021
<i>AiHc-530</i>		<i>Pre-Contact Indigenous; Euro- Canadian</i>	<i>Scatter; House</i>	<i>Archaeological Research Associates Ltd. 2021</i>
AiHc-552		Archaic (Late, Middle, Early); Woodland Early	Campsite	Archaeological Research Associates Ltd. 2021
AiHc-553		Pre-Contact Indigenous	Campsite	Archaeological Research Associates Ltd. 2021
AiHc-554		Pre-Contact Indigenous; Euro-Canadian	Scatter; Refuse	Archaeological Research Associates Ltd. 2021

Borden number	Site Name	Temporal/ Cultural Affiliation	Site type	Researcher
<i>AiHc-555</i>		<i>Euro- Canadian</i>	<i>Refuse</i>	<i>Archaeological Research Associates Ltd. 2021</i>
AiHc-556		Pre-Contact Indigenous	Campsite	Archaeological Research Associates Ltd. 2021
AiHc-559		Pre-Contact Indigenous; Euro-Canadian	Scatter; Findspot	Archaeological Research Associates Ltd. 2022
AiHc-561		Pre-Contact Indigenous	Scatter	Archaeological Research Associates Ltd. 2022
AiHc-605		Archaic, Early Woodland, Early	Campsite	Archaeological Research Associates Ltd. 2022
AiHc-606		Archaic, Late	Scatter	Archaeological Research Associates Ltd. 2023

Borden number	Site Name	Temporal/ Cultural Affiliation	Site type	Researcher
AiHc-607		Archaic, Late	Scatter	Archaeological Research Associates Ltd. 2023
AiHc-608		Pre-Contact Indigenous	Scatter	Archaeological Research Associates Ltd. 2023
AiHc-609	Klotz	Euro-Canadian	Farmstead	Irvin Heritage Inc. 2023
AiHc-610	Becker	Euro-Canadian	Midden	Irvin Heritage Inc. 2023
AiHc-611	Binder	Euro-Canadian	Midden	Irvin Heritage Inc. 2023

1.3.3 Previous Archaeological Assessments

ASI reviewed previous archaeological assessments that detail fieldwork within 50 metres of the Study Area. Only those specific archaeological assessments of direct relevance to the present undertaking will be included here:

- (ARA, 2021) *Stage 1 and 2 Archaeological Assessments, Airport Master Plan Implementation – Runway 14-32 Extension, Region of Waterloo International Airport, 1-4881 Fountain Street North, Township of Woolwich, Regional Municipality of Waterloo, Part of Lots 109–111 and 126, German Company Tract, Geographic Township of Waterloo, Former Waterloo County, Ontario. P007-1169-2020*

- This project area overlaps with the current Study Area east of Jetliner Crescent, west of Lonsdale Road and north of the Kitchener Waterloo Airport runways. During test pit survey Site 20 (AiHc-530) was discovered within 50 metres of the current Study Area. AiHc-530 is a late post-contact house and a pre-contact scatter. The available evidence indicates that both the Indigenous and Euro-Canadian components are of no further CHVI. The area was cleared of archaeological concern.
- (ARA, 2022) *Stage 1 and 2 Archaeological Assessments New Remote Parking Lot, Region of Waterloo International Airport, 1-4881 Fountain Street North, Township of Woolwich, Regional Municipality of Waterloo, Part of Lots 111 and 126, German Company Tract, Geographic Township of Waterloo, Former Waterloo County, Ontario. P007-1260-2021*
 - This project area overlaps with the current Study Area east of Fountain Street North within the southwest corner of the airport parcel. Stage 2 test pit and pedestrian survey at five metre intervals were required. Stage 2 pedestrian survey revealed Site 9 (AiHc-555) and Site 11 within 50 metres of the current Study Area. It was determined that Site 9 was a Euro-Canadian and Site 11, an Indigenous findspot, both had no further CHVI. The area was cleared of archaeological concern.
- (ASI, 2019) *Stage 1 Archaeological Assessment, Breslau East Connector Road Corridor Part of Lots 104-105 and 108-109, German Company Tract, (Former Township of Waterloo, County of Waterloo), Township of Woolwich, Regional Municipality of Waterloo, Ontario. P094-0295-2019*
 - This project area narrowly overlaps with the current Study Area west of Lonsdale Road and south of Menno Street. This narrow overlapping section is within Menno Street and the road right-of-way. This overlapping section was determined to be disturbed.

2.0 Property Inspection

2.1 Field Methods

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 Elizabeth Matwey (R392) on June 10, 2024, 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 systematic visual inspection from public right-of-ways only and did not include excavation or collection of archaeological resources. Fieldwork was conducted when weather conditions were deemed clear with good visibility (partly cloudy with seasonal temperatures), per S & G Section 1.2., Standard 2. Field photography is presented in Section 7.0 (Image 1 to Image 25), and field observations are overlaid onto the existing conditions of the Study Area in Section 8.0 (Figure 10 to Figure 18).

2.2 Current Land Use and Field Conditions

2.2.1 Alternative 2: Alignment 3B along Otter and Fountain

The path of Alternative 2 begins at the Kossuth Road and Fountain Street North roundabout and continues north along Fountain Street North. It then travels east and north again through airport lands where it continues through an agricultural field west of Lonsdale Road. From here it exits the Study Area at Menno Street. Alternative 2 has narrow stretches of undisturbed grassy areas east and west of Fountain Street North. Several other sections are disturbed by hydro utilities, ditches, roadbeds and previous development on airport lands (Image 31, Image 34).

2.2.2 Alternative 4: Alignment 3D Cober and Kossuth

The path of Alternative 4 begins at the Kossuth Road and Fountain Street North roundabout and then continues east along Kossuth Road. This stretch has narrow grassy sections between the roadbed, ditches and the agricultural fields. At Cober Road, Alternative 4 extends north to the disturbed lands of the airport (Image 7, Image 8). Cober Road is a narrow road with ditches extending in a north-south direction along the east and west sides (Image 9 to Image 12). There is one square section west of Cober Road that is presently an active agricultural field. North of the airport lands Alternative 4 passes through more agricultural fields, woodlots and a former residential parcel.

2.2.3 Alternative 5: Alignment 3B along Jetliner and Fountain

Similar to Alternative 2, the path of Alternative 5 begins at the Kossuth Road and Fountain Street North roundabout and continues north along Fountain Street North. It then travels east along Jetliner Crescent, extends east through airport lands where it continues through an agricultural field west of Lonsdale Road. From here it exits the Study Area at Menno Street. Image 28 to Image 30 show disturbance in the right-of-way along Jetliner Crescent caused by ditches and utilities.

Generally, the Study Area follows extant roads and proposed corridors surrounding the Region of Waterloo International Airport. The northern portion of the Study Area, along Lonsdale Road between Menno Street and the airport, is a mix of industrial, forested, and agricultural lands, as well as a watercourse associated with the Randall Drain watershed. Image 18 shows one section of the Randall Drain, a 3.06 metre by 2.00 metre concrete box culvert. South of the airport, north and south of Kossuth Road, there is land designated as a provincially significant wetland adjacent to the Study Area.

3.0 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 1);
- Water sources: primary, secondary, or past water source (Grand River and tributaries);
- Well-drained soils (Burford, Caledon, Guelph, Lisbon);
- Early settlements within 100 metres (schoolhouse in Lot 116);
- Early historic transportation routes (Menno Street, Lonsdale Road, Kossuth Road and Fountain Street North)

According to the S & G, Section 1.4 Standard 1e, no areas within a property containing locations listed or designated by a municipality can be recommended for exemption from further assessment unless the area can be documented as disturbed. The Township of Woolwich Municipal Heritage Register (Township of Woolwich, 2019) was consulted no properties within the Study Area are Listed or Designated under the *Ontario Heritage Act*:

The *Regional Municipality of Waterloo Archaeological Facilities Master Plan* (Region of Waterloo, 1989) was reviewed for background information and to help inform any indicators of archaeological potential not captured in other research. Generally speaking, archaeological management plans are high-level analyses of archaeological potential for non-specialists but cannot be considered a replacement for Stage 1 archaeological assessments. ASI's review of the above

archaeological management plan data indicates that parts of the Study Area exhibit archaeological potential, given its proximity to the Grand River and various tributaries and wetlands. The Master Plan dataset included some previous archaeological assessments within the Study Area however the files are not up to date with the MCM database.

The property inspection determined that parts of the Study Area exhibit archaeological potential. These areas will require Stage 2 archaeological assessment prior to any construction activities or other proposed impacts. According to the S & G Section 2.1.1, pedestrian survey is required in actively or recently cultivated fields (Image 1, Image 3, Image 5, Image 6; Figure 10 to Figure 13, Figure 18: 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 (Image 2, Image 4, Image 15, Image 16, Image 19, Image 23; Figure 10, Figure 11, Figure 14 to Figure 18: areas highlighted in green).

Part of the Study Area has been previously assessed (P094-0295-2019, P007-1169-2020, P007-1260-2021) and does not require further archaeological assessments (Figure 10, Figure 16, Figure 18: areas highlighted in dark orange).

Part of the Study Area has been disturbed during the construction of the airport but will require a Stage 2 judgemental test pit survey to confirm the previous disturbance, where appropriate, prior to any proposed impacts to the property; (Figure 10, Figure 18: areas highlighted in light green).

Part of the Study Area has been subjected to deep soil disturbance events due to the construction of roads, culverts, ditches, utilities, airport runways, airport facilities and other commercial buildings. According to the S & G Section 1.3.2 these areas do not retain archaeological potential (Image 7 to Image 14, Image 17, Image 18, Image 20 to Image 30; Figure 10 to Figure 18: areas highlighted in yellow) and do not require further survey.

3.1 Conclusions

The Stage 1 background study determined 32 previously registered archaeological sites are located within one kilometre of the Study Area. Two sites are within 50 metres of the Study Area (AiHc-530, AiHc-555), however neither have further CHVI. The property inspection determined that parts of the Study Area exhibit archaeological potential and will require archaeological assessment (Figure 10 to Figure 18: areas highlighted in orange and green).

4.0 Recommendations

The following recommendations are made:

- 1) Parts of the Study Area exhibit archaeological potential. These lands require Stage 2 archaeological assessment by test pit/pedestrian survey at five metre intervals, where appropriate (Figure 10 to Figure 18). Stage 2 is required prior to any proposed construction activities on these lands;
- 2) Part of the Study Area has been disturbed during the construction of the airport but will require a Stage 2 judgemental test pit survey to confirm the previous disturbance, where appropriate, prior to any proposed impacts to the property (Figure 10, Figure 18);
- 3) The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance or being previously assessed (P094-0295-2019, P007-1169-2020, P007-1260-2021). These lands do not require further archaeological assessment; and,
- 4) Should the proposed work extend beyond the current Study Area, further 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 Archaeology Programs Unit of the MCM should be immediately notified.

The above recommendations are subject to MCM approval and it is an offence to alter any archaeological site without MCM concurrence. No grading or other activities that may result in the destruction or disturbance of any archaeological sites are permitted until notice of MCM approval has been received.

5.0 Legislation Compliance Advice

ASI advises compliance with the following legislation:

- This report is submitted to the MCM 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 MCM 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.

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7.0 Images

7.1 Field Photography



Image 1: Alternative 2 and Alternative 4 - Archaeological potential in field west of Lonsdale Road; pedestrian survey required.



Image 2: Alternative 2 and Alternative 4 - Archaeological potential within former residential lot; test pit survey required.



Image 3: Alternative 4 - Archaeological potential in fields south of Lonsdale Road, beyond gravel lane; pedestrian survey required.



Image 4: Alternative 4 - Archaeological potential south of Lonsdale Road beyond channelized ditch; test pit survey required.



Image 5: Alternative 4 - Archaeological potential in fields east and west of Lonsdale Road; pedestrian survey required.



Image 6: Alternative 4 - Archaeological potential in field west of Lonsdale Road; pedestrian survey required.



Image 7: Alternative 4 – Disturbed airport lands; no archaeological potential.



Image 8: Alternative 4 – Disturbed airport lands; no archaeological potential.



Image 9: Alternative 4 – Disturbed by roadbed and ditches in right-of-way east of Cober Road; no archaeological potential.



Image 10: Alternative 4 – Disturbed channelized ditch west of Cober Road; no archaeological potential.



Image 11: Alternative 4 – Disturbed by roadbed and ditches in right-of-way west of Cober Road; no archaeological potential.



Image 12: Alternative 4 – Disturbed by roadbed and ditches in right-of-way east and west of Cober Road; no archaeological potential.



Image 13: Alternative 4 – Disturbed by roadbed and ditches in right-of-way at Cober Road and Kossuth Road intersection; no archaeological potential.



Image 14: Alternative 4 - Disturbed road and driveways within Study Area; no archaeological potential.



Image 15: Alternative 4 - Archaeological potential along grass south of Kossuth Road; test pit survey required.



Image 16: Alternative 4 - Archaeological potential along grass north of Kossuth Road; test pit survey required.



Image 17: Alternative 2 - Disturbed roundabout at Fairway Road North and Fountain Street North; no archaeological potential.



Image 18: Alternative 2 - Randall Drain; disturbed, no archaeological potential.



Image 19: Alternative 2 - Archaeological potential; test pit survey required on lawn.



Image 20: Alternative 2- Disturbed by roadbed and ditching; no archaeological potential.



Image 21: Alternative 2- Disturbed by roadbed and utilities; no archaeological potential.



Image 22: Alternative 2- Disturbed by roadbed and ditching no archaeological potential.



Image 23: Alternative 2 - archaeological potential; test pit survey required.



Image 24: Alternative 2 - Disturbed by roadbed and ditch; no archaeological potential.



Image 25: Alternative 2 - Disturbed airport land; no archaeological potential.



Image 26: Alternative 2 - Disturbed airport land; no archaeological potential.



Image 27: Alternative 5 - Disturbed airport land east of Fountain Street North; no archaeological potential.



Image 28: Alternative 5 - Disturbed airport land along Jetliner Crescent; no archaeological potential.



Image 29: Alternative 5 - Disturbed airport land along Jetliner Crescent; no archaeological potential.



Image 30: Alternative 5 - Disturbed airport land along Jetliner Crescent; no archaeological potential.

7.2 Historical Imagery



Image 31: A 1950 aerial image of the Waterloo Wellington Airport (the future Region of Waterloo International Airport) during construction. 600 acres of farmland were cleared to make way for two runways and an apron (Region of Waterloo, 2017). Previous disturbance within the Study Area is shown.

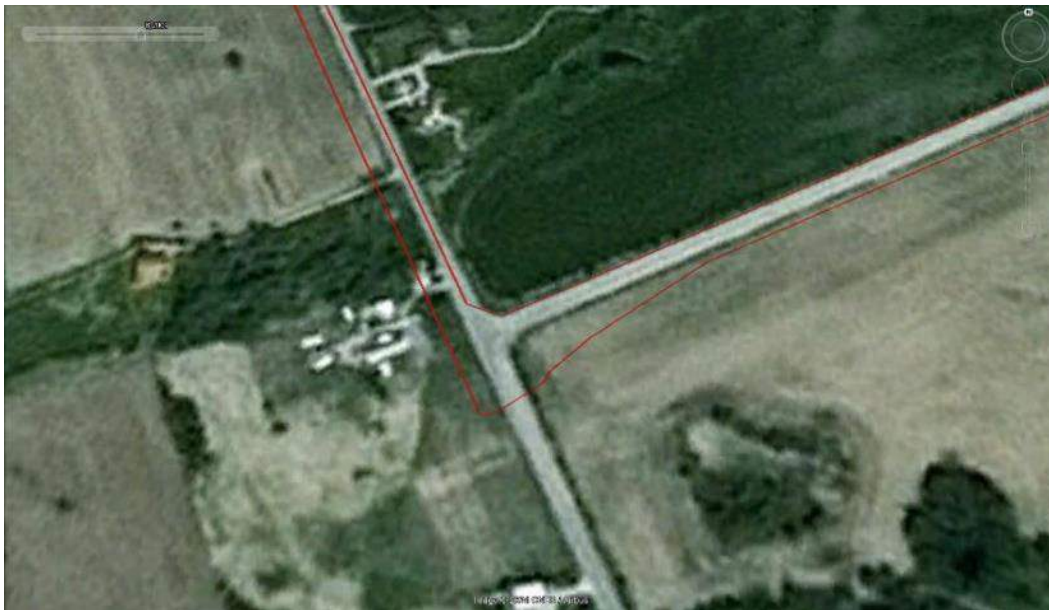


Image 32: Intersection of Kossuth Road and Fountain Street North in 2009.

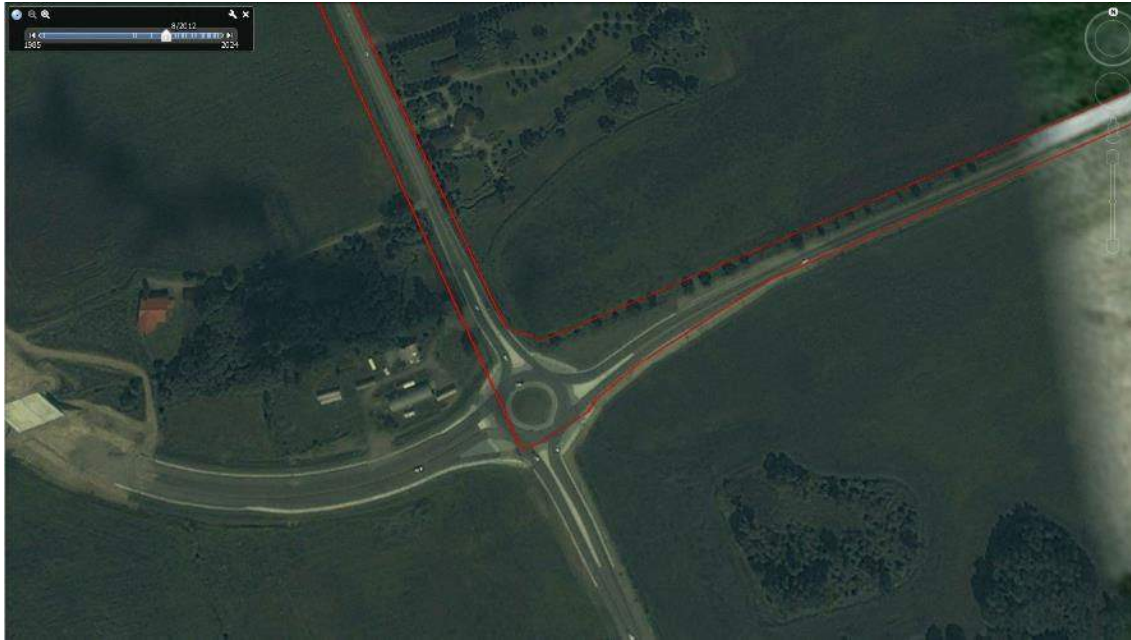


Image 33: Intersection of Kossuth Road, Fountain Street North and Fairway Road North in 2012 with new roundabout.



Image 34: Land disturbing developments north and south of Jetliner Crescent within the Study Area in 2023.



Image 35: Google image of 2186 Lonsdale Avenue in 2011.



Image 36: Google image of 2186 Lonsdale Avenue in 2023.

8.0 Maps

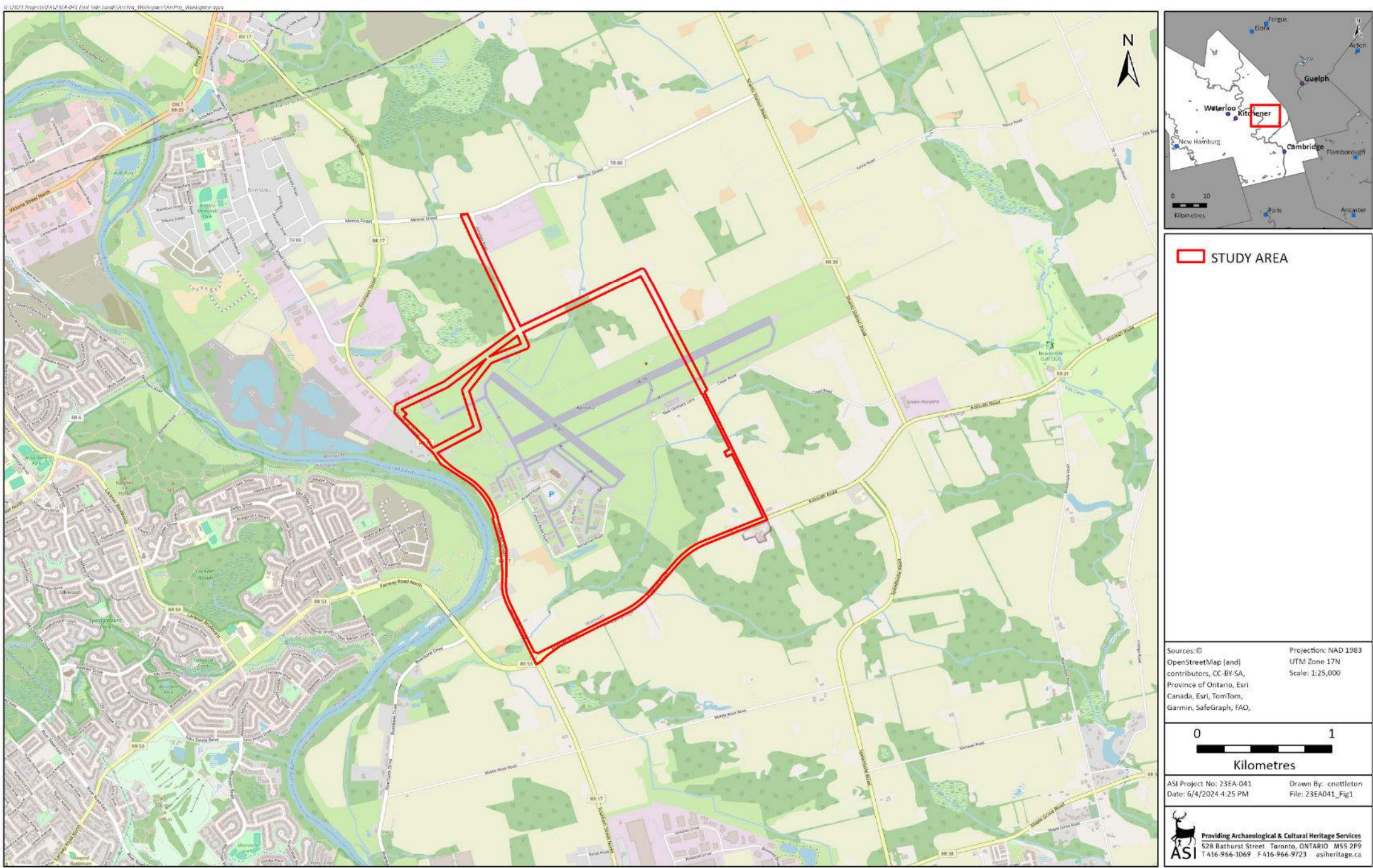


Figure 1 East Side Lands Sanitary Lift/Pumping Station Study Area.



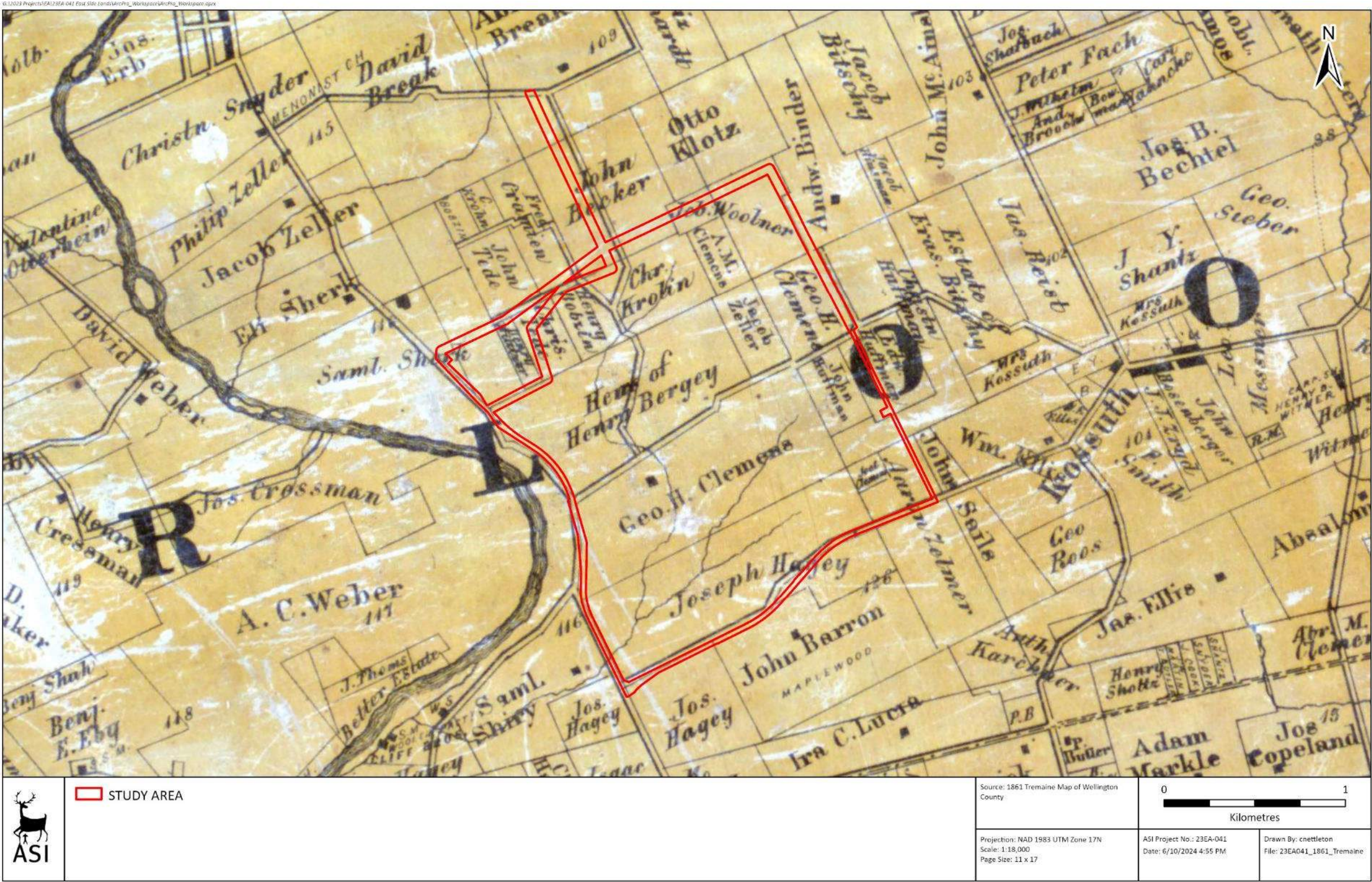


Figure 2 Study Area (Approximate Location) Overlaid on the 1861 Tremaine’s Map of Waterloo County.



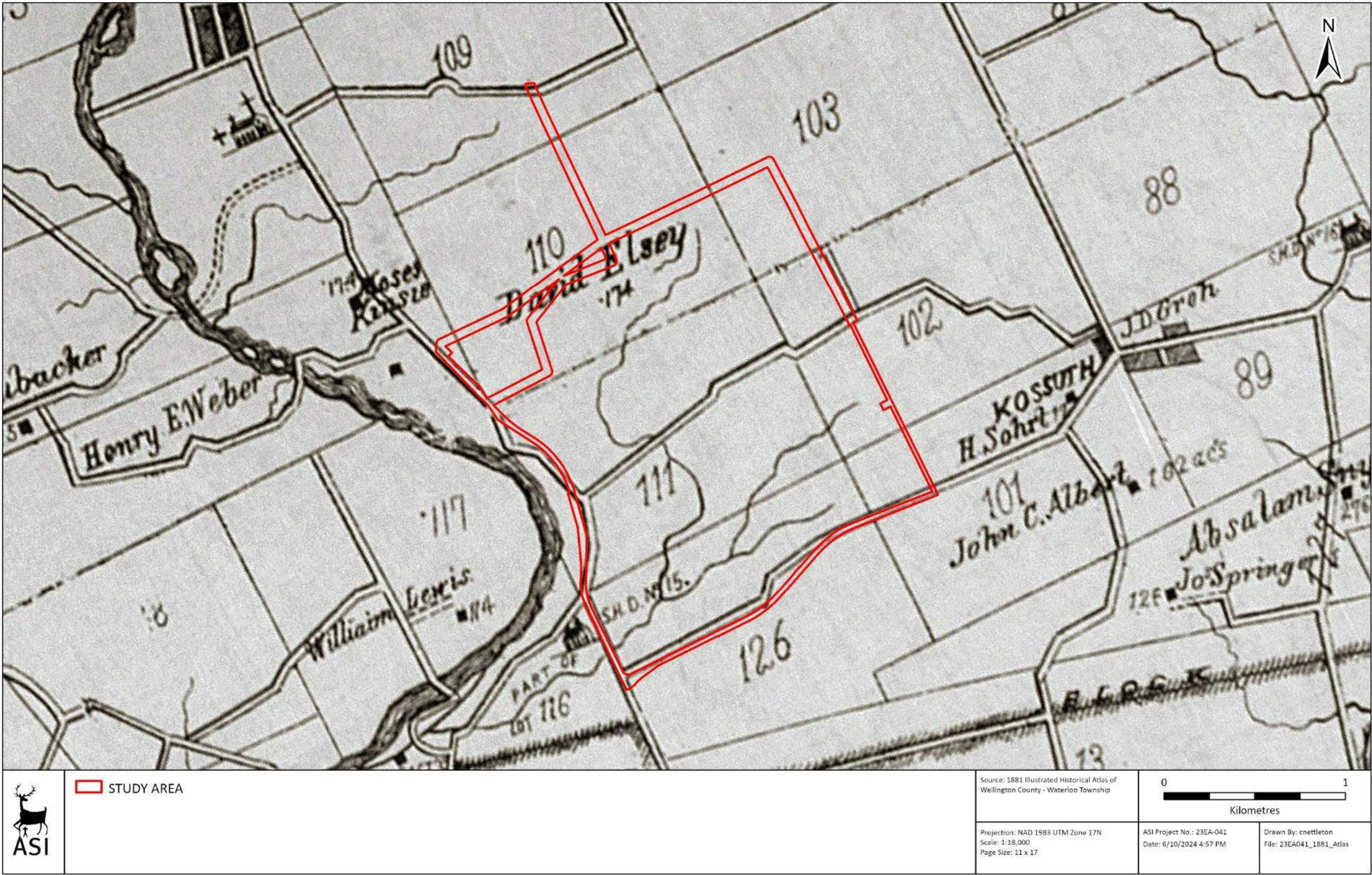


Figure 3 Study Area (Approximate Location) Overlaid on the 1881 Illustrated Historical Atlas of the County of Waterloo.



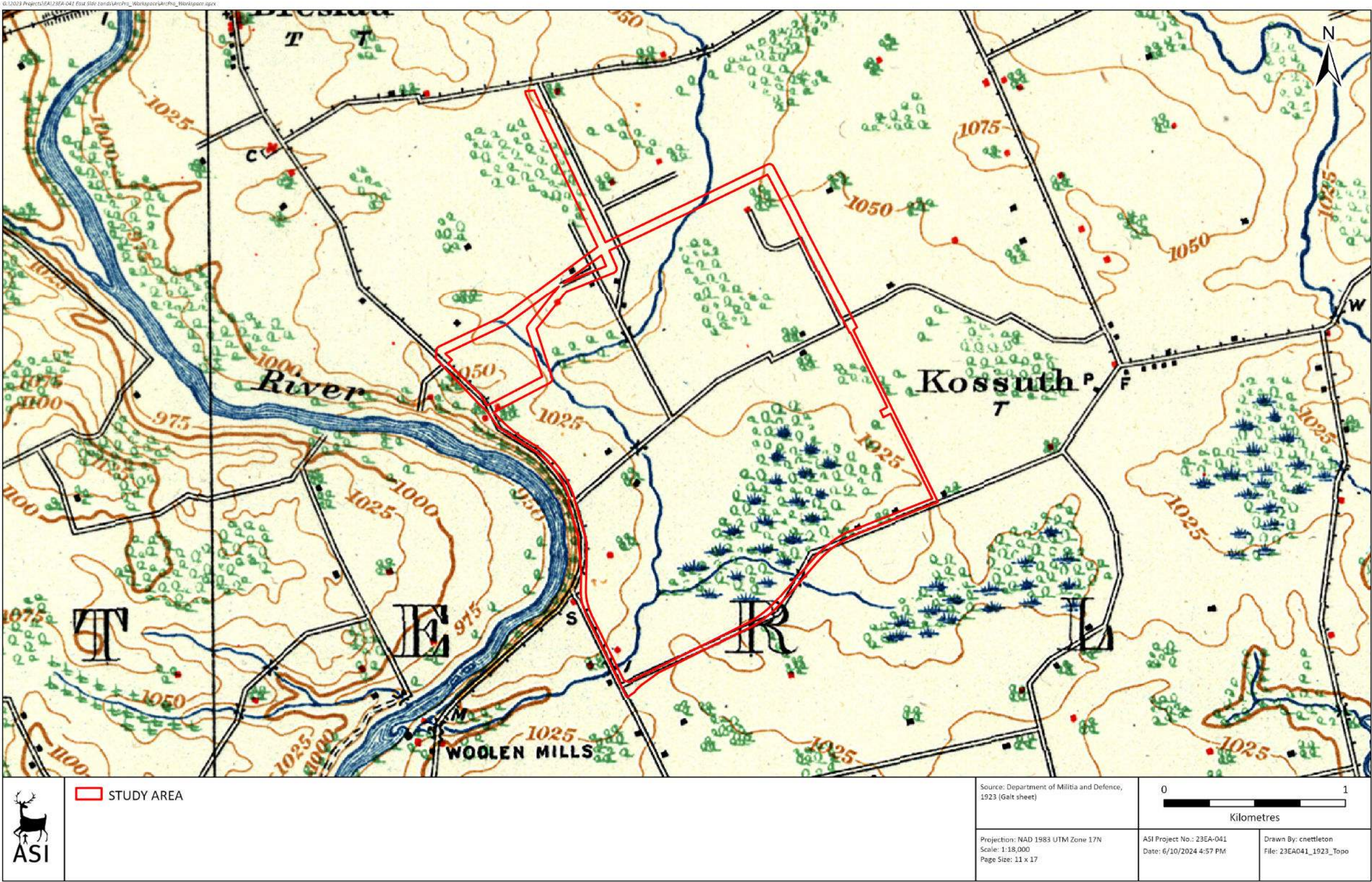


Figure 4 Study Area (Approximate Location) Overlaid on the 1923 Topographic Map Galt Sheet.



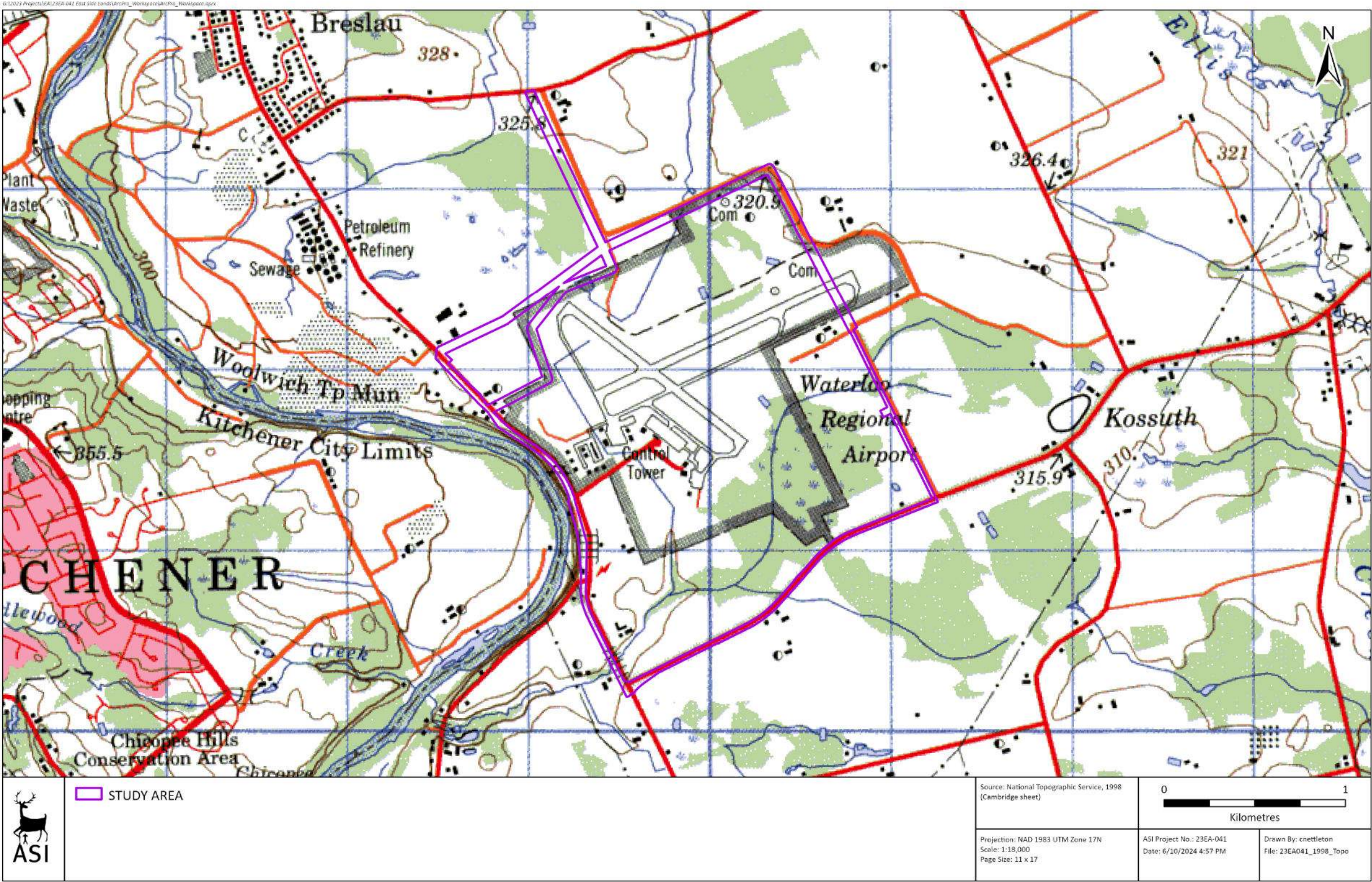


Figure 5 Study Area (Approximate Location) Overlaid on the 1992 National Topographic Series Kitchener Sheet.



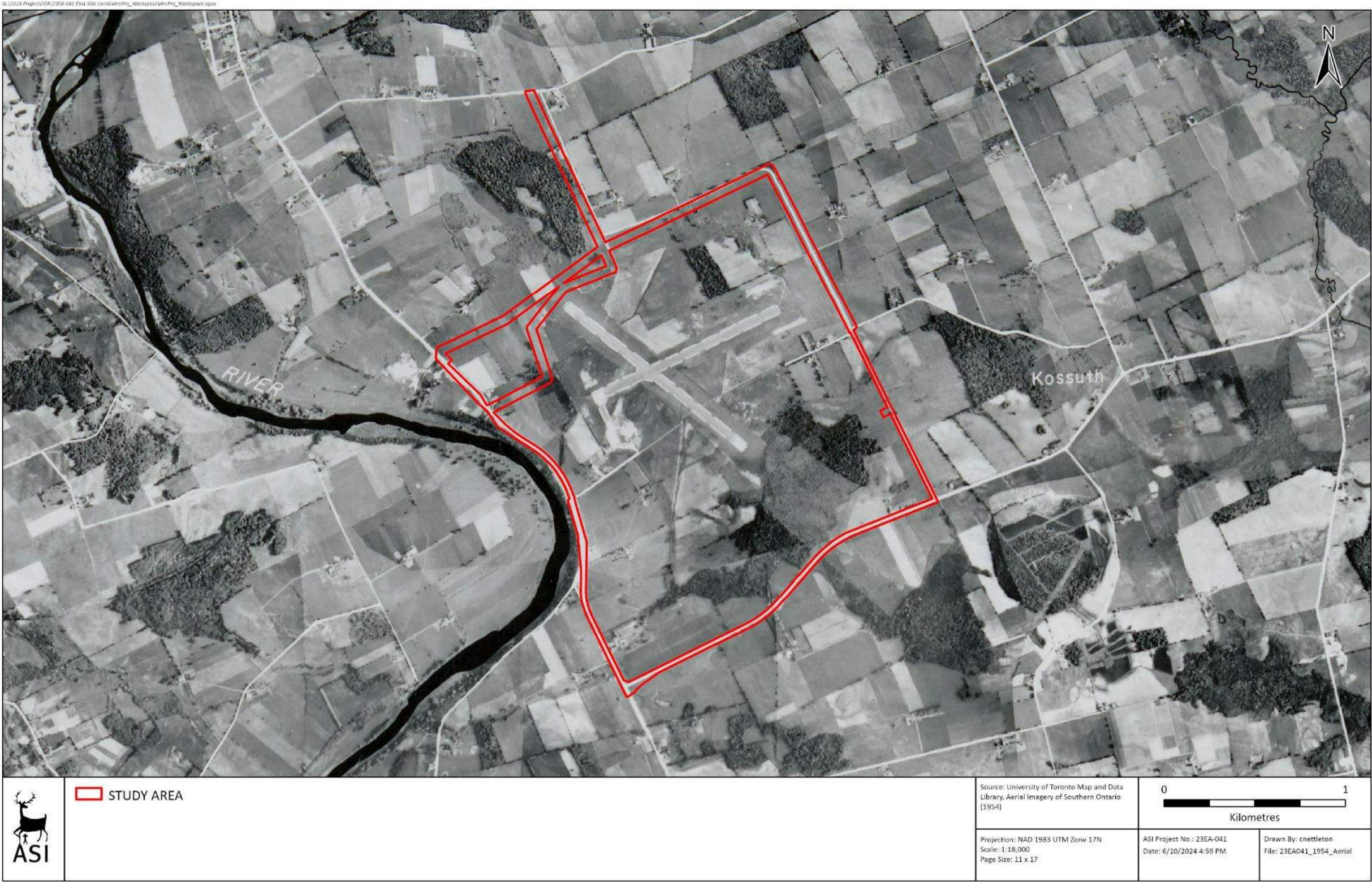


Figure 6 Study Area (Approximate Location) Overlaid on the 1954 Aerial Photography.



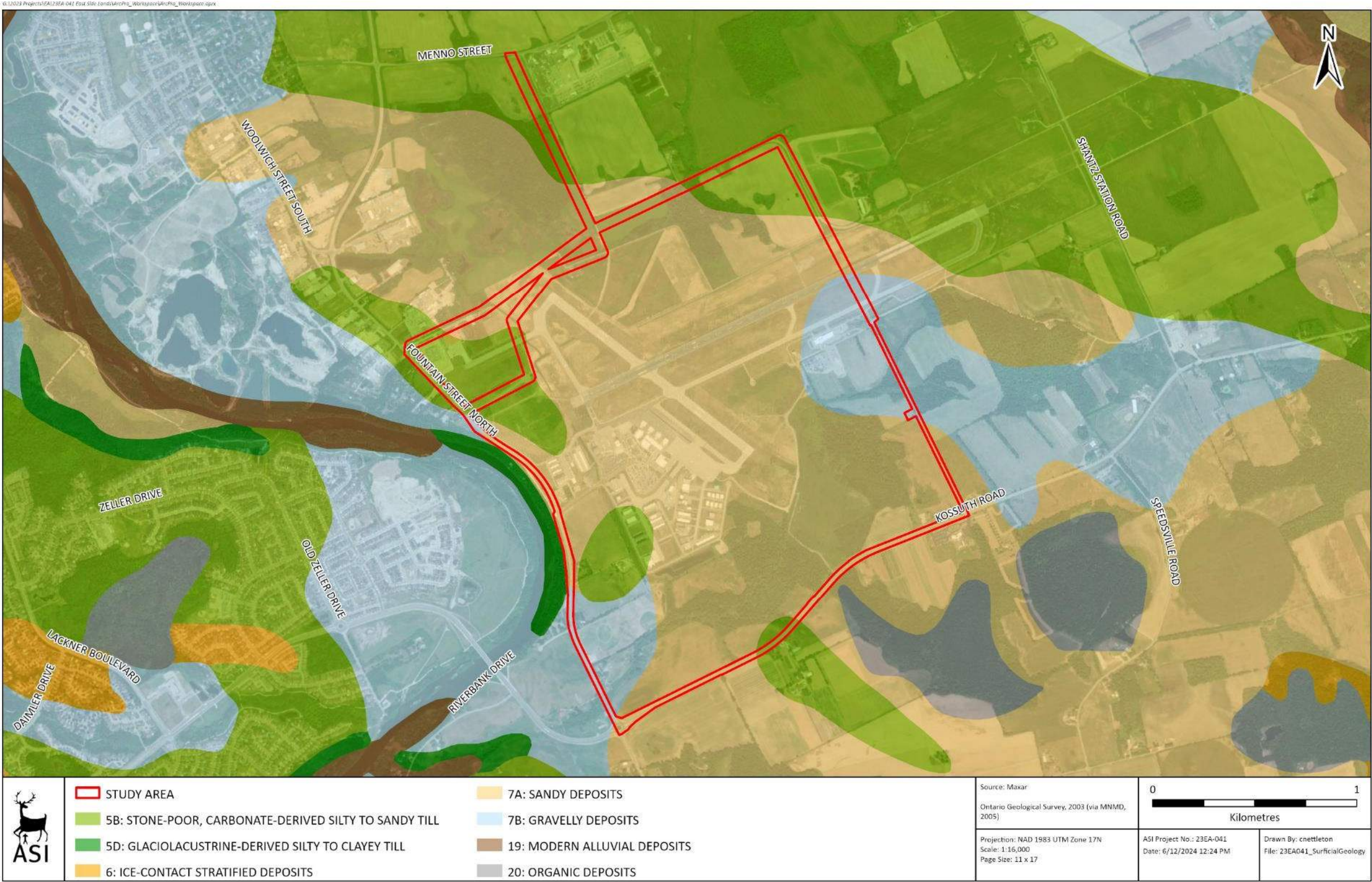


Figure 7 Study Area – Surficial Geology.



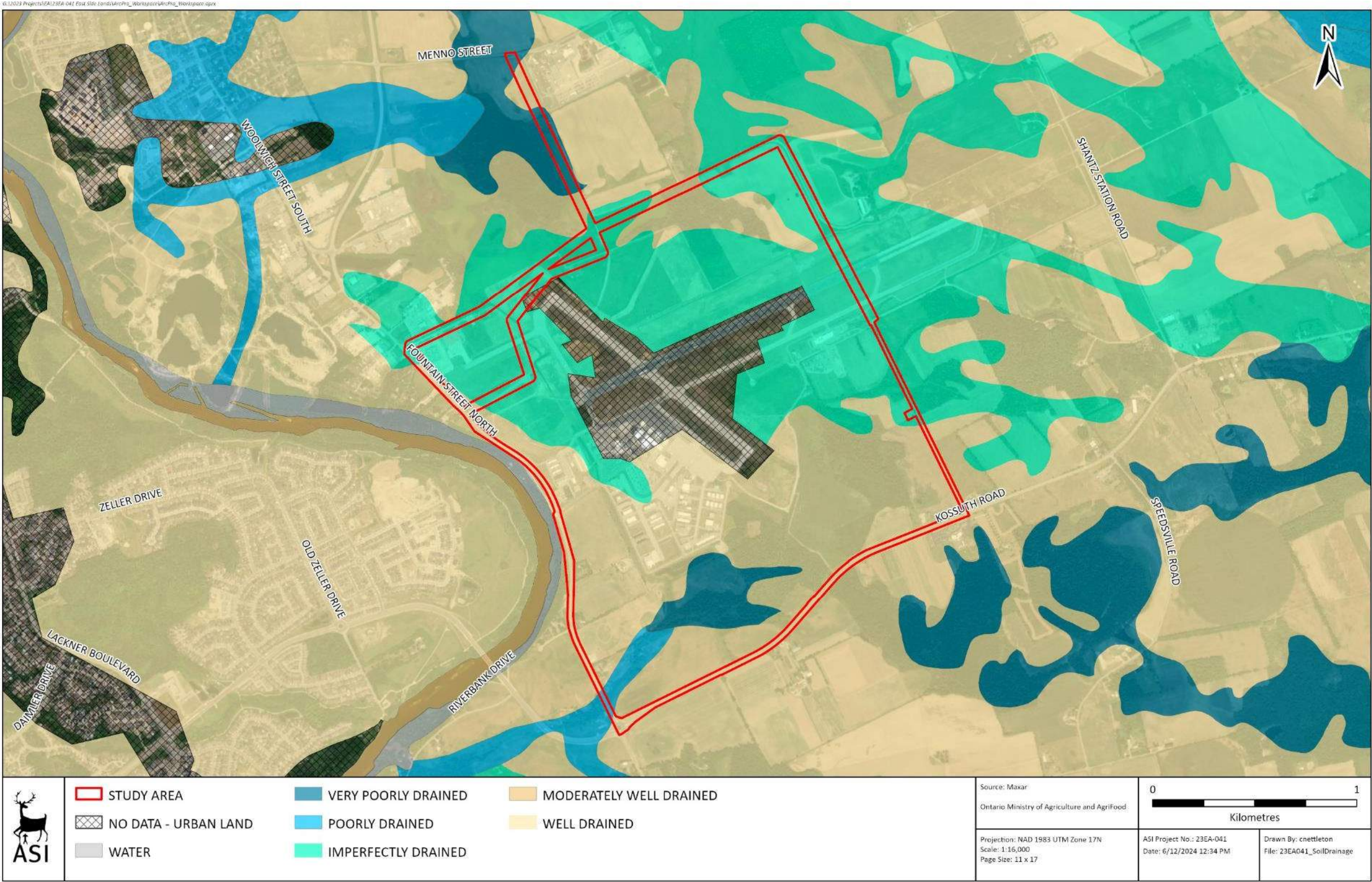


Figure 8 Study Area – Soil Drainage.



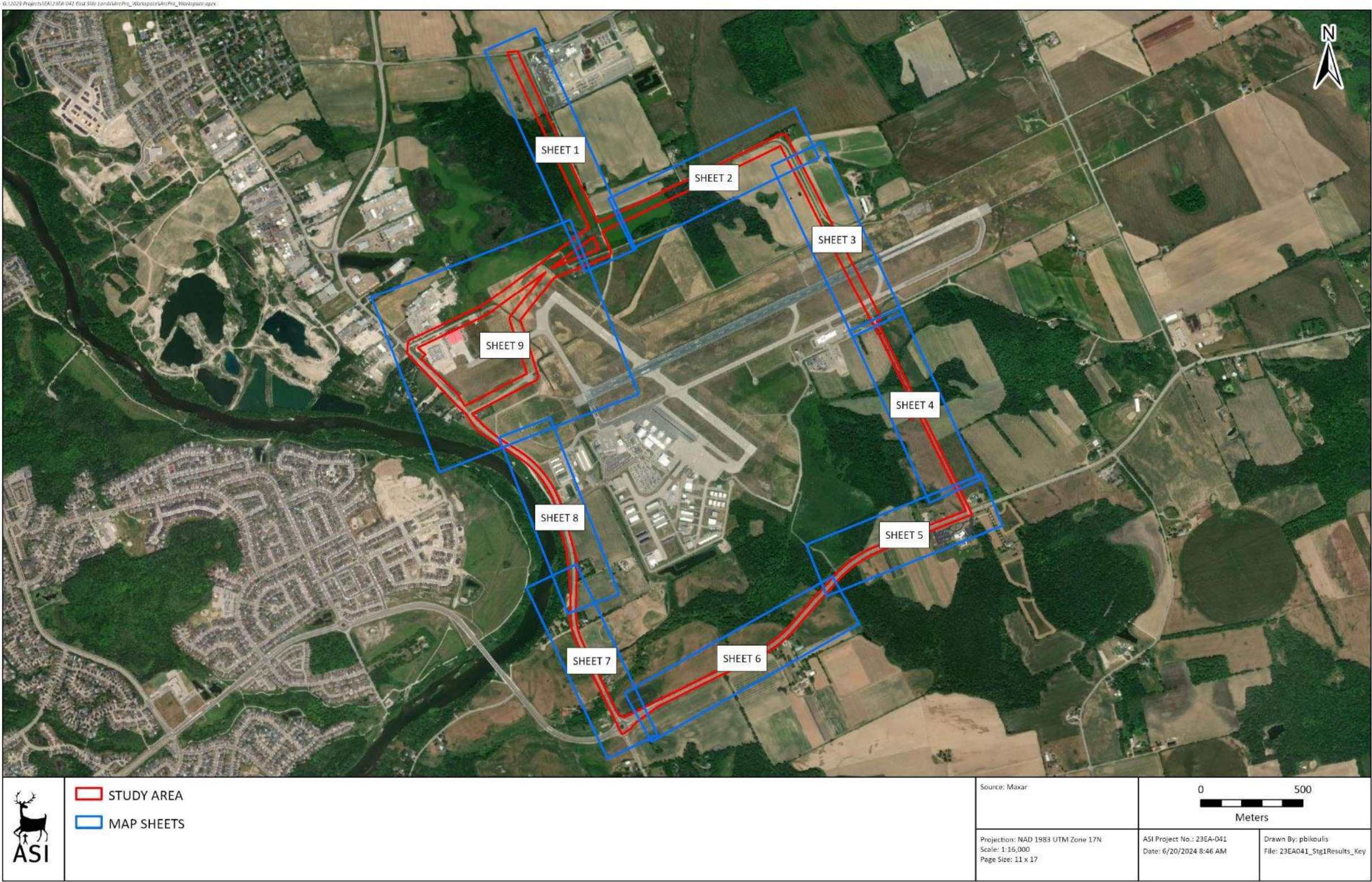


Figure 9: East Side Lands Sanitary Servicing Stage 1 Results – Key Sheet



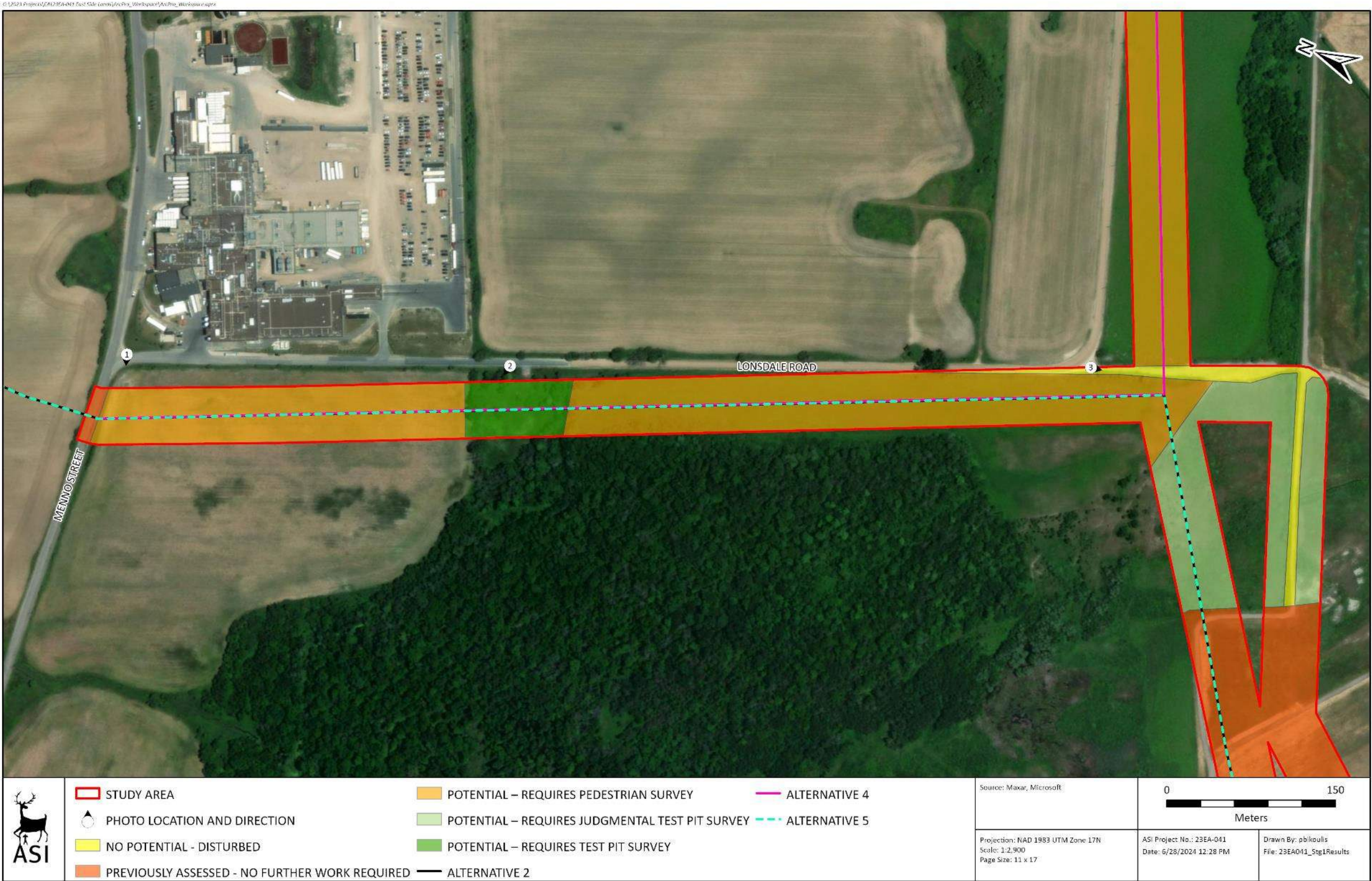


Figure 10: East Side Lands Sanitary Servicing Stage 1 Results – Sheet 1



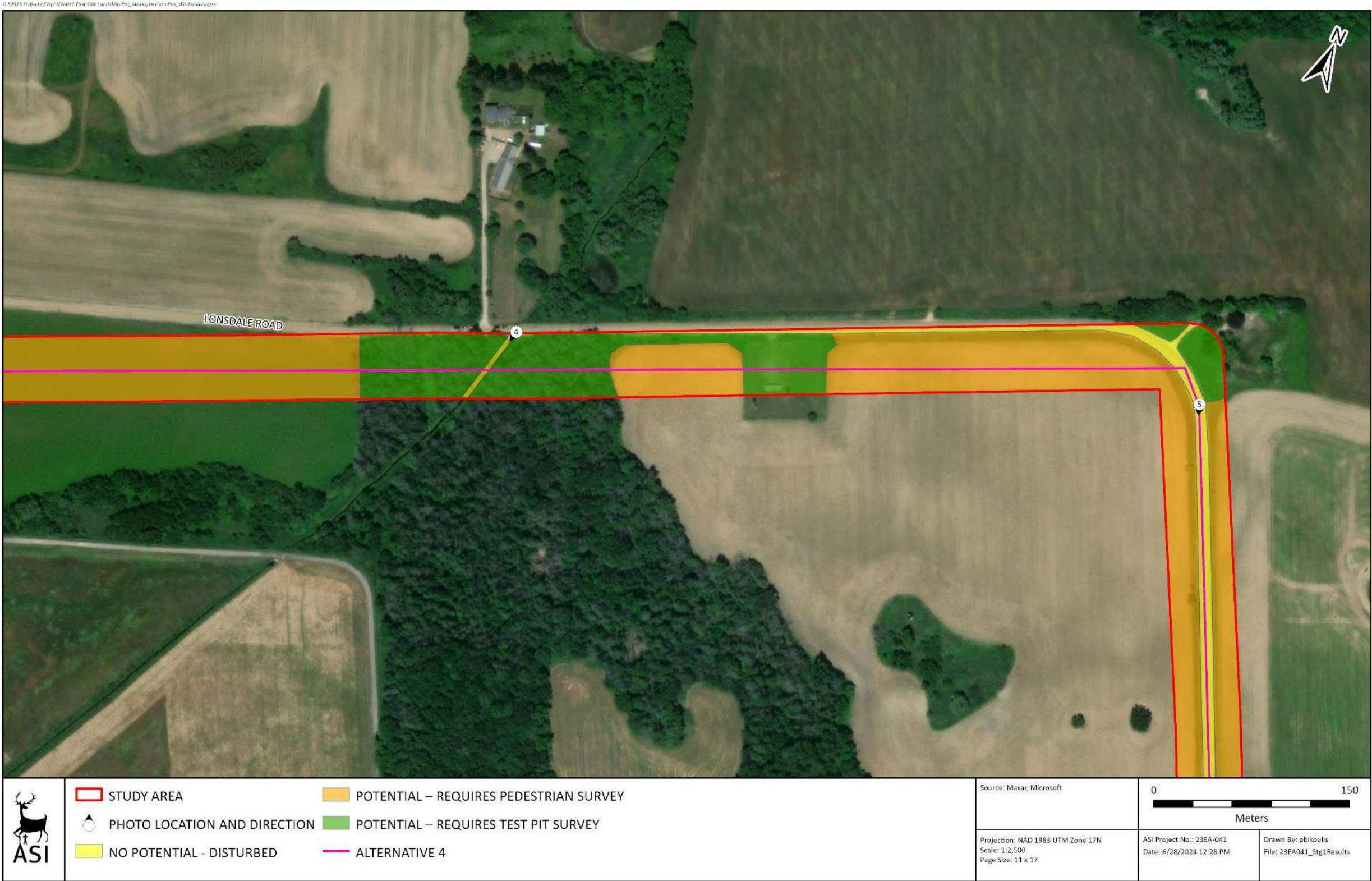


Figure 11: East Side Lands Sanitary Servicing Stage 1 Results – Sheet 2



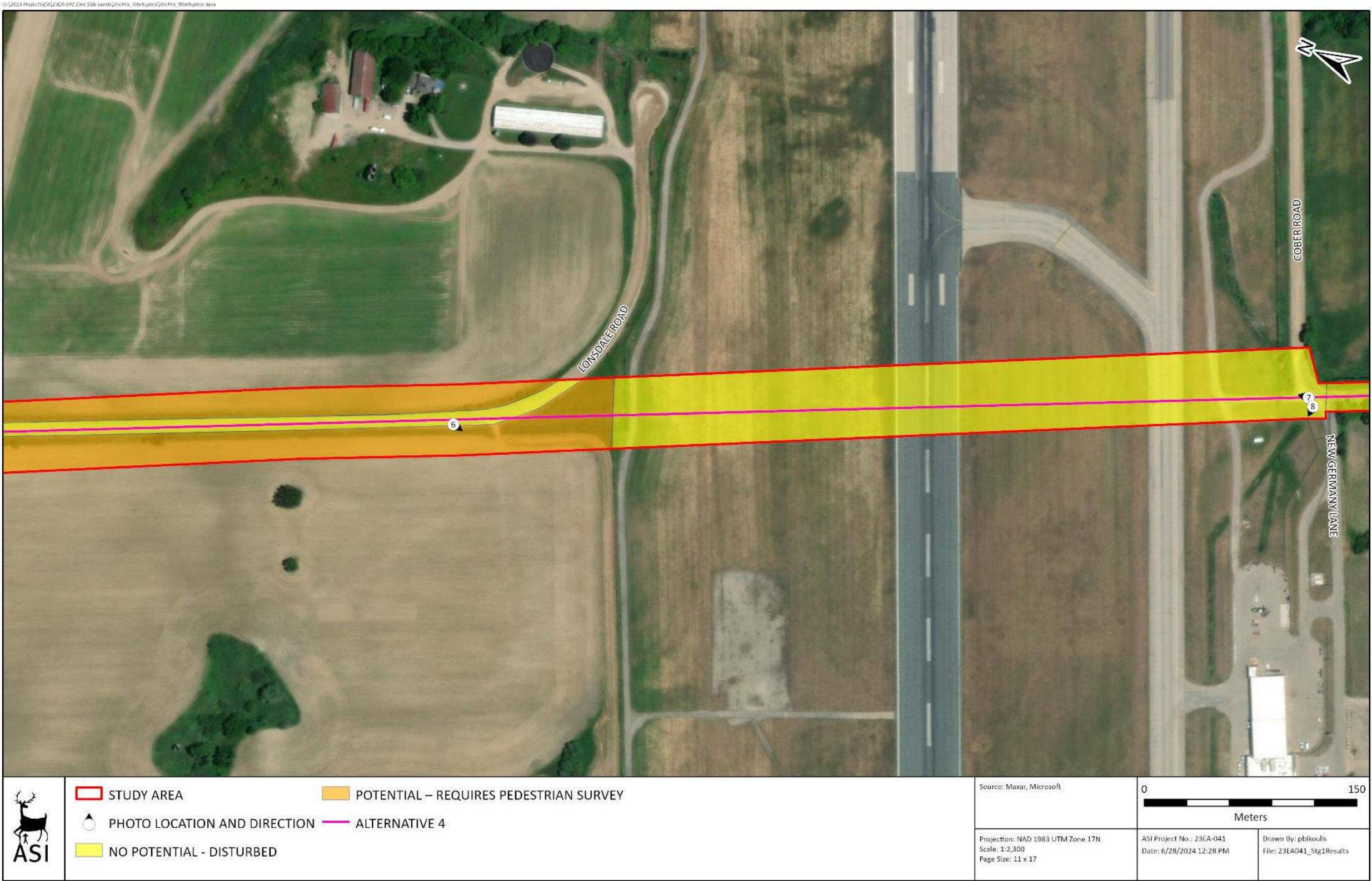


Figure 12: East Side Lands Sanitary Servicing Stage 1 Results – Sheet 3





Figure 13: East Side Lands Sanitary Servicing Stage 1 Results – Sheet 4





Figure 14: East Side Lands Sanitary Servicing Stage 1 Results – Sheet 5

- DRAFT FOR REVIEW -





Figure 15: East Side Lands Sanitary Servicing Stage 1 Results – Sheet 6

- DRAFT FOR REVIEW -





Figure 16: East Side Lands Sanitary Servicing Stage 1 Results – Sheet 7

- DRAFT FOR REVIEW -



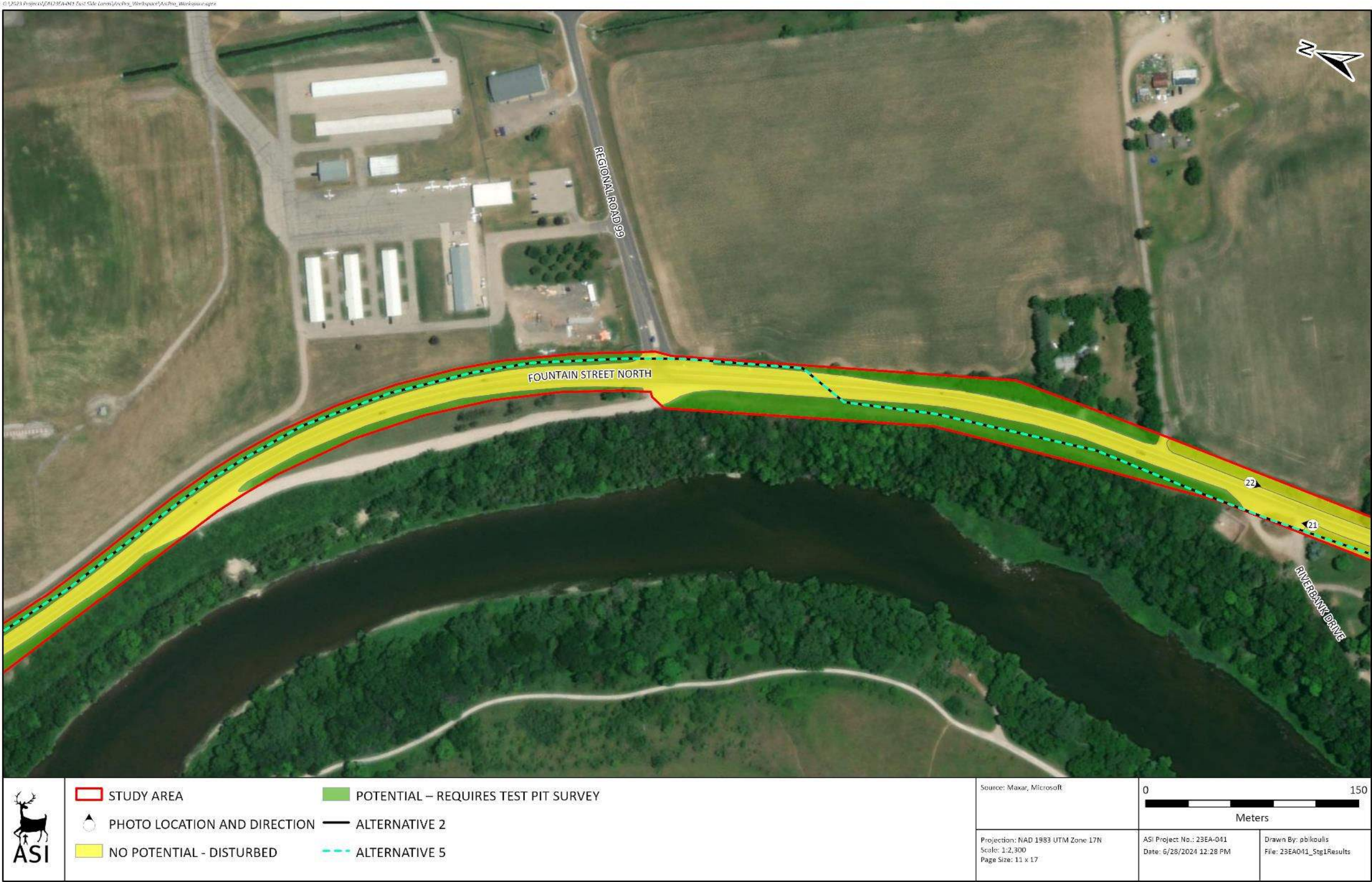


Figure 17: East Side Lands Sanitary Servicing Stage 1 Results – Sheet 8

- DRAFT FOR REVIEW -



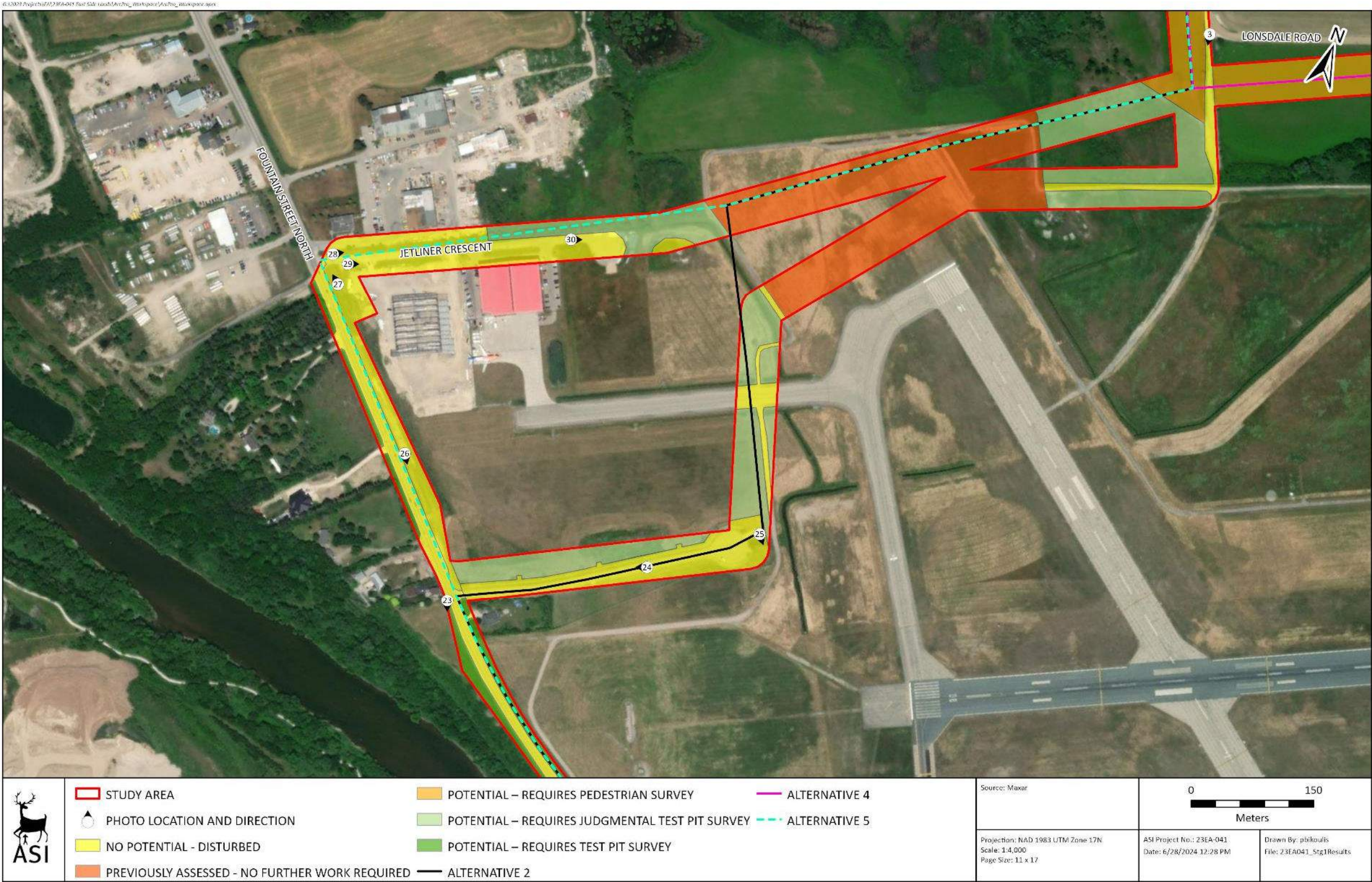


Figure 18: East Side Lands Sanitary Servicing Stage 1 Results – Sheet 9

